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Publication Date
1985-07-01

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TAX REFORM AND REAL ESTATE

BY

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# TAX REFORM AND REAL ESTATE

by
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University of California
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July 1985

Financial support for this research was provided by the Center for Real Estate and Urban Economics, University of California, Berkeley. Research assistance was provided by Watson Chan, Carl Mason, and Michael Smith-Heimer.

## I. INTRODUCTION

Tax reforms[1] proposed by the Administration in November of 1984 and revised in May of 1985 have occasioned a bitter debate over the consequences of tax changes for rents and for the value of real properties. This debate highlights the contrast between economic analysis designed to improve management and investment decisions and those studies primarily intended to influence legislation. Many managers and investors have read reports and congressional testimony which conclude that tax reform would lead to an immediate and sharp reduction in property values and would eventually lead to increased rental payments by tenants of 20 to 45 percent, or more.[2] Even though much of the analysis was offered by acknowledged experts, it would be unwise, or perhaps foolish, to rely upon the underlying logic for the basis of any real investment decision or for the evaluation of policy change.

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[1] U.S. Department of the Treasury, Office of the Secretary, *Tax Reform for Fairness, Simplicity, and Economic Growth*, 2 Volumes, November 1984 (processed). Executive Office of the President, *The President's Tax Proposals to the Congress for Fairness, Growth and Simplicity*, May 1985, Washington, DC, U.S. Government Printing Office, 1985.

[2] For example, in a front page report, *The New York Times* quoted extensively from a study prepared by the staff of Secretary of Housing and Urban Development, Samuel R. Pierce. That study concluded that passage of the November 1984 tax reform proposals would lead to a 30 percent increase in rental prices. See: Robert Pear, "Tax Plan Termed Threat to Housing at Lower Incomes," *The New York Times* April 21, 1985, pp. 1,19. Similarly, the *San Francisco Chronicle*, reported the results of studies suggesting that enactment of the May 1985 tax reform proposals would increase rents by 20 to 24 percent and homeownership costs by 10 to 12 percent. See: "Real Estate Industry Rallies to Preserve its Tax Benefits," *The San Francisco Chronicle*, July 15, 1985, p.22. The latter reportage is evidently based upon two recent large-scale studies: "Impacts of the President's Tax Proposal on Housing," National Association of Home Builders (NAHB), Division of Housing Policy and Mortgage Finance, July 1, 1985, mimeo; William C. Apgar and H. James Brown, "Assessment of the Likely Impacts of the President's Tax Proposal on Rental Housing Markets," prepared for Tax Fairness for Housing Coalition, July 15, 1985, mimeo.

In contrast, the analysis presented in this paper shows that the effect of the proposed tax reforms on rents and property values is likely to be minor. The values of commercial buildings would be more likely to rise than to fall. The impact of tax reform on the values of apartment buildings is less certain, but neither housing values nor tenants' rents are likely to change very much.

The second section of this paper compares the research strategies employed in those analyses intended primarily to persuade with a more general and, we believe, more credible approach to assessing the impact of tax reform. Section III specifies the simulation model we use in some detail and indicates the most important features of the Administration proposals for tax reform as they affect housing and real estate. Section IV presents the results of this more general analysis; the conclusion appears in Section V.

## II. GENERAL MODELS VERSUS SPECIAL AND IRRELEVANT CASES

To reiterate: several recent studies and a variety of testimony presented before the House Ways and Means Committee predicted that the Administration's tax reform proposals would greatly increase rents, especially in rental dwelling units. Our own results, produced contemporaneously[3] and reported in Section IV below, indicate that these changes in the Internal Revenue Code would have little or no effect on rents.

What causes these differences in predictions? In our view, the results obtained and discussed in recent testimony arise because competent analysts chose

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[3] This paper was initially drafted during the fourth week of July, 1985.

to limit drastically their assumptions and to concentrate on special cases. As a result, decisionmakers may be misled even though the studies themselves need not be logically incorrect. By asking the wrong question, analysts got the wrong answer. The alarming results widely reported in the media follow directly from three critical simplifications: first, a single variable -- rents -- is forced to equilibrate the entire market for real capital to an environment changed by tax and depreciation rules; second, the role of taxes in affecting pre-tax interest rates is neglected; third, the differential effect of tax reform on various property owning entities is ignored. When these simplifying assumptions are relaxed, the projected increases in rents decline sharply. In fact, as we demonstrate below, tax reform may well cause rents to decline.

Although rent is only one of several economic variables which may change as tax rules vary, other published studies concentrate on it. These studies show, correctly, that if the tax proposals were adopted and *no other changes occurred in the economic system*, then the after-tax rate of return to real estate investors would fall. These studies then compute and solve for that level of rents required to restore investors' internal rates of return (IRR's) to their initial pre-reform positions. That is, all of the necessary adjustment takes place in the required level of rents. Framed this way, the proposed changes in tax and depreciation rules must lead to hefty rent increases. Our analysis also indicates substantial rent increases in this special case. For example, at 5 percent inflation, typical syndicates or individual owners would have to receive 23 percent higher rents for an apartment house and 9 percent more for commercial office space to offset the effects of the proposed tax reforms. Similarly, if only asset prices changed, values would have to drop by 19 and 8 percent respectively to compensate current investors. Precise numerical esti-

mates differ depending on the specific parameters used, but the general character of the results is unchanged.

Elementary economic theory, however suggests that several other forms of adjustment are equally logical. The complete burden need not fall on tenants.

1. A drop in returns may cause readjustments in management and development costs. During the past decade, land prices have risen substantially. Promoters of syndicates have increased their mark-up and profit shares; construction wages have risen relative to others. Reductions in any of these components would lower development and operating costs and would help to maintain returns to investors.

2. Tax reform influences unequally the advantages and disadvantages of different forms of tax entity. Individuals, limited partnerships, corporations, investment trusts, and pension funds are taxed at different rates. Taxes influence their investment choices, and any change in the tax system will alter the amount each will bid for property. Changes in the entities which find property ownership profitable will serve to adjust overall rates of return to investment in real property.

3. The interaction of inflation, the form of ownership, and the tax system has led to inequities. In some cases, inflation has sharply raised real after-tax returns. In other cases, owners of assets have been penalized by inflation. By narrowing existing variation in rates of return, investments in financial assets, inventories, equipment, structures, and land would each experience dissimilar impacts. All must readjust together, and

the analysis of tax reform must explicitly address the interaction of inflation with real variables.

4. Even more important is the neglect of the effect of the tax reforms themselves on interest and capitalization rates. Most models of investment assume that savers and investors make decisions based on their real after-tax costs and returns. To the extent this is true, lowered tax rates should decrease pre-tax interest rates and IRR's. If aggregate saving depends on its real rate of return, as many assume, then a reduction in marginal tax rates should immediately reduce market interest rates and property capitalization rates.

5. Other macro impacts on saving and investment may also occur as capital moves among specific sectors of the domestic economy and across international boundaries. However, while such movements in response to tax parameters may increase efficiency, their influence on after-tax real interest rates is likely to be small, especially in contrast to the direct effects of tax changes.

## III. A GENERAL MODEL OF REAL ESTATE TAXATION

Clearly, when additional factors are considered in any behavioral model, it is logically possible for the effects of exogeneous changes to be diffused more widely. In this respect the results of our more general analysis of the effects of taxation on real estate should be expected. Economic analysis leads us to believe that tax changes should significantly influence variables other than rent. Trade-offs occur as markets adjust to changed circumstances; their mag-

nitudes can be estimated in the real estate market only if they are explicitly considered in the behavioral model.

Specifically, our analysis shows that rents would rise or property values would decline if: (a) interest rates did not fall; and (b) the costs of development remained constant; and (c) syndicates and individual proprietors remained the dominant form of ownership; and (d) these entities maintained their existing procedures, costs, mark-up, and profit levels. These necessary conditions are not likely to hold. Interest and capitalization rates will decline. Some costs will fall. The competition of real estate investment trusts (REIT's) and tax-exempt entities for real property ownership will become more intense. As a result of these adjustments, any movement in rents will be quite small. In fact, the small net change in rents or property values may be in either direction. The remainder of this paper explains why.

### A. Model Specification

This analysis is based upon a straightforward model for investment analysis developed using a typical spread sheet program for a microcomputer. The inputs to the model include a variety of parameters describing an investment property:

Its costs and occupancy: the acquisition costs of land and capital, the time pattern of rents, vacancies, operating expenses and other fees.

Its financing: loans, interest rates and payments, and

Its final disposition: selling price, capitalization, selling commissions, and so forth.

The model applies the provisions of the current tax and depreciation regulations to the annual flows associated with the investment.[4] Assuming a given holding period, the model also computes the sale and taxes associated with liquidation. The model then uses this information to compute the internal rate of return net of tax to an investor participating in the project. The spread sheet program has been designed to apply those provisions of the Internal Revenue Code relevant to limited partnership syndicates (or sole proprietorships) and real estate investment trusts (REIT's) as well as those relevant to tax-exempt entities. The model also distinguishes between the treatment of residential and non-residential properties under the tax code.

Exhibit A presents the basic parameters used in our comparisons. For office buildings, the parameters are based on an analysis of building appraisals in ten cities and by inspecting a large number of syndicate offerings.
The parameters for apartment houses more closely approximate building conditions in California. These parameters are based on a study conducted for a large San Francisco bank in the summer of 1985. In these simulations it is assumed that the investor's current marginal tax rate is 52.5 percent (including a 5 percent deductible non-federal income tax); after the reform, investor tax rates decline to 40 percent (including a 5 percent non-deductible non-federal income tax). Simulation results are reported for three sets of initial economic conditions: a "base case," which includes a 5 percent inflation rate, a 13 percent mortgage interest rate, and the currently observed 9.75 capitalization

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[4] For examples of similar models and explanations of their operations, see J.S. Fisher, G.H. Lentz, J.J. Stern, "Tax Incentives for Investment in Nonresidential Real Estate", *National Tax Journal*, Vol. 37, January 1984. The NAHB and Apgar-Brown studies (see footnote 2) are evidently structured using similar models.

## EXHIBIT A

Basic Parameters Used for Simulating Tax Reforms
Proposed in May 1985

| Property and Financing | Office Building | Apartment Building |
|---|---|---|
| Acquisition Costs | $37.50 M | $6.80 M |
| Land | 7.50 M | 1.40 M |
| Amortizable Costs | -- | 0.70 M |
| Building | 30.00 M | 4.70 M |
| Initial Fee | | |
| Syndicate | 15.00 % | 15.00 % |
| REIT | 4.00 % | 4.00 % |
| Rent Increases: Inflation Plus | 2.00 % | 2.00 % |
| Capitalization Rate (base case) | 9.75 % | -- |
| Gross Rent Multiplier (base case) | -- | 9.00 x |
| Expenses as a Percent of Rent | 33.50 % | 32.00 % |
| Expense Increases: Inflation Plus | 0.00 % | 0.00 % |
| Management Fee as a Percent of Rent | 5.00 % | 5.00 % |
| Debt Ratio | | |
| Syndicate | 85.00 % | 80.00 % |
| REIT | 75.00 % | 65.00 % |
| Tax-Exempt | 0.00 % | 0.00 % |

Economic Conditions

| | Inflation | Mortgage Interest | Cap. Rate | GRM |
|---|---|---|---|---|
| Base Case | 5.00% | 13.00% | 9.75% | 9.00x |
| Non-Inflationary | -0- | 9.00 | 8.00 | 7.40 |
| High-Inflationary | 10.00 | 17.00 | 11.00 | 10.20 |

| | Income Tax Rates |
|---|---|
| Current Tax Rate of Investor | 52.50 % |
| Proposed Tax Rate of Investor | 40.00 % |

rate (cap rate) for office buildings and 9.00 gross rent multiplier (GRM) for apartments; a non-inflationary case, with zero inflation, nine percent mortgage rates, 8.00 cap rates, and a 7.4 GRM; and a highly inflationary case, with ten

percent inflation, 17 percent mortgage rates, 11.00 cap rates and a 10.2 GRM. The conclusions of the simulation are robust to changes in these parameters.[5]

The model is used to calculate and compare the internal rates of return under the existing tax system with rates that would exist if the four key ingredients of the real estate tax reform proposals were enacted. While the final act will presumably differ from these specific proposals, the model illustrates the main analytical forces at work. For any property, of course, the specific results will differ depending on the parameters of that investment as well as the specific tax changes which are enacted.

The proposed tax changes we analyze include:

1. A change from the Accelerated Cost Recovery System (ACRS) of depreciation to the Capital Cost Recovery System (CCRS) and repeal of the more rapid amortization of construction period interest and taxes. This would reduce the depreciation deductions permitted to offset property income. The expected average life of buildings would rise from 19 to 28 years for tax purposes. For most buildings, the allowable depreciation would fall from 5.26 percent of the initial basis to four percent of the unrecovered inflation-indexed basis. For apartment houses, the reduction in depreciation allowances would be larger. At five percent inflation, allowable depreciation in the first five years would be reduced by one half, from roughly 32 percent under the current law to 16 percent under CCRS.

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[5] The model also replicates the estimates presented in the NAHB and Apgar-Brown studies. See Footnote 2.

2. A change in capital gains treatment. Under the Administration's proposal, buildings and other depreciable properties would no longer be eligible for capital gains treatment, and the capital gains exclusion for land would decline from 60 percent to 50 percent. However, after 1991, the capital gains tax on land may be calculated from an inflation-adjusted basis.

3. A delay in interest deductions for "passive" investors in limited partnerships. The interest deductions for a taxpayer's distributive share from limited partnerships would be severely limited. Providing other investment income is not available to be offset, these tax entities would not be able to deduct excess interest expense exceeding net property income. Excess interest expenses could, however, be accumulated to reduce future taxable income. The exclusion would be phased in at a rate of ten percent a year, and it would not apply to interest incurred as part of a trade or business. This change primarily delays the timing of the tax deduction.

4. A reduction in marginal tax rates. Under the Administration's proposal, the marginal income tax rate, including state and local taxes, would fall from about 52.5 percent to 40 percent. The maximum federal tax rate (assumed for the property investor) would fall from 50 percent to 35 percent. In the short run, marginal state and local income taxes would remain at five percent (their averages nationally), but they would no longer be deductible in computing federal tax liabilities.

This list excludes two proposed changes which might be of significance: (1) the prohibition against using bonds exempt from state and local taxes for housing finance; (2) the inclusion of real estate in investments subject to

"at-risk" loss limitation, i.e., tax-payer losses would be limited to those amounts actually contributed or borrowed with personal liability.

Tax-exempt bond financing is a special subsidy for particular real estate investments. If properly targeted, this subsidy affects only a small fraction of new units, and its repeal would not affect the overall equilibrium of the real estate market. It should be analyzed in comparison with other special housing subsidies with respect to cost, efficiency, and the ability to target deserving recipients.[6]

The effect of the proposed change in the at-risk rule would be largely to reinforce the impact of the proposed limits on interest deductibility for limited partnerships. This reform would bring the non-recourse returns of individual owners into parity with the returns of limited partners. The at-risk proposal can be offset by restructuring financing. This would result in quite small differences compared to the proposed changes included in the analysis.

Together, the enactment of these proposals would cause a sharp fall in expected returns for individual owners and syndicates. Why? Much of the change results from the difference in the timing of allowances for depreciation and deductions for interest. Currently, a large portion of these deductions are taken "up front" by syndicates of limited partners. The tax reforms delay the deductions until the properties show sufficient taxable income or gains on sale.

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[6] Some evidence on efficiency and targeting issues is presented in Dan Durning and John M. Quigley, "On the Distributional Implications of Mortgage Revenue Bonds and Creative Finance," *National Tax Journal*, December 1985, forthcoming.

Thus, IRR's are reduced. Since tax-exempt entities and REIT's make little or no use of these "up front" deductions, they are barely affected.

The loss of the capital gains exclusion potentially raises the taxes upon sale. However, because the basis is indexed for inflation, the gain upon which taxes are calculated can be lower.

Finally, the reduction in individual income tax rates by about 24 percent tends to raise after tax yields.

### B. The Initial Impact of Tax Reform

Table 1 shows that the initial effect of the Administration's proposed tax reforms would be to lower the rates of return on new investment in real estate by syndicates of limited partners. The amount of decrease would depend on the type of building, the level of inflation, and the type of ownership. Individuals investing in apartment houses directly or through syndicates of limited partners would see their current rates of return decline substantially, depending upon the actual rate of inflation. Declines for commercial type buildings (which are currently depreciated by the straight line method) would be from 14 to 34 percent. While returns are extremely sensitive to inflation, the tax changes have almost equal impacts at each inflation rate.

On the other hand, the impacts on tax-exempt owners and investors through REIT's would be quite small. Returns to tax-exempt entities do not change for obvious reasons; the model assumes these entities invest their own funds and are not subject to income taxes. The initial tax implications for REIT's are more complex. If they distribute 95 percent of their taxable earnings, they are not taxed. In addition, they can make tax-free distributions of contributed

## TABLE 1

Internal Rates of Return Net of Taxes Under Current Tax Rules Compared to Those Proposed by the Administration, May 1985**

| Inflation Rate | Individual or Syndicate | | REIT | | Tax-Exempt Entity | |
|---|---|---|---|---|---|---|
| | Current | Proposed | Current | Proposed | Current | Proposed |
| | | | Commercial Office Building | | | |
| 0% | 11.3% | 7.5% | 14.9% | 11.1% | 13.6% | 13.6% |
| 5% | 16.1 | 13.6 | 14.3 | 13.6 | 15.7 | 15.7 |
| 10% | 23.1 | 19.9 | 17.5 | 18.6 | 19.7 | 19.7 |
| | | | Apartment Building | | | |
| 0% | -1.6% | -8.8% | 1.4% | 1.8% | 6.4% | 6.4% |
| 5% | 17.5 | 8.5 | 11.2 | 12.4 | 12.6 | 12.6 |
| 10% | 31.6 | 20.7 | 18.1 | 20.5 | 18.3 | 18.3 |

** See Exhibit A for description of specific properties and economic conditions.

capital when their cash flow exceeds their taxable income. According to the parameters of the model, their taxable income is negative for most of the period (as are cash flows in the earlier years). Under these conditions, the proposed tax reforms have a minimal influence on the timing of the tax obligations of REIT investors. In fact, at moderate inflation levels, the tax rate reductions more than offset other changes; investor IRR's increase by more than ten percent for apartments. Less highly leveraged trusts or ones with higher returns would show more adverse effects.

The effects at different inflation rates are rather straightforward. The greater the leverage, the greater the influence of inflation on investor returns. In contrast to the initial tax reform proposals of November 1984, real estate components of the reforms proposed in May 1985 are not sensitive to in-

flation rates. With one or two exceptions resulting from the interaction of taxes, leverage and inflation, the reductions in returns brought about by tax reforms are similar at these three inflation rates.

## IV. RESULTS: RESTORING EQUILIBRIUM

The investment model described in Section III can be used to compute those changes in economic variables required to offset the effects of changes in the tax code and to maintain the current returns, net of taxes, earned by investors in commercial office buildings and apartments.

### A. Changes in a Single Variable

Table 2 presents the basic calculations. It indicates how much an individual variable would have to change to restore the internal rates of return after the tax reform to their initial levels. These calculations are presented separately for several assumptions about the underlying inflation rate in the economy and the associated mortgage interest rates and capitalization rates. The calculations are made for office buildings and apartments, and for different entities competing in the market. For example, with no inflation, it would require a 9.8 percent increase in rents for individual owners or syndicate investors to receive the same rate of return after enactment of the tax reforms as they currently enjoy. Similarly, investors could have the same rate of return if the prices of commercial buildings declined by about 8.9 percent, if the capitalization rate declined by 12 percent, or if the mortgage interest rate declined by 26.8 percent. At a five percent underlying inflation rate, it would require a rent increase in commercial buildings of about 8.9 percent to offset the losses to limited partners of syndicates incurred by the tax reform. Alternatively, a reduction in the price of commercial buildings of about 8.2

percent, a decline in the capitalization rate of 15.8 percent, or a reduction in the mortgage interest rate of 26.2 percent would restore market equilibrium at the current internal rate of return. At the 10 percent inflation rate, where the current tax law heavily favors syndicated ownership of commercial property, the required increases in rents would be 15.1 percent, the decrease in the price of commercial property would be 13.1 percent, and the change in the capitalization rate would be almost 21 percent.

**TABLE 2**

Changes in Individual Variables Required to Return Internal Rates of Return to Pre-Tax-Reform Levels. Assuming No Other Changes in Economic Conditions*

| | 0% Inflation | | 5% Inflation | | 10% Inflation | |
|---|---|---|---|---|---|---|
| Variable | Individual or Syndicate | REIT | Individual or Syndicate | REIT | Individual or Syndicate | REIT |
| | | | Commercial Office Building | | | |
| Rents | 9.8% | 7.0% | 8.9% | 2.7% | 15.1% | -5.8% |
| Prices | -8.9 | -6.6 | -8.2 | -2.7 | -13.1 | 6.1 |
| Cap. Rates | -12.0 | -9.0 | -15.8 | -5.3 | -20.7 | 10.6 |
| Mort. Rates | -26.8 | -19.1 | -26.2 | -6.2 | -33.5 | 8.5 |
| | | | Apartment Building | | | |
| Rents | 12.9% | -1.7% | 22.9% | -4.2% | 23.5% | -6.0% |
| Prices | -11.4 | 1.7 | -19.0 | 4.5 | -19.4 | 6.5 |
| GRM | 24.2 | -2.4 | 26.9 | -8.4 | 12.8 | -11.1 |
| Mort. Rates | -28.2 | 6.3 | -62.5 | 7.2 | -83.2 | 8.2 |

* Calculations assume a 10 year holding period, except for a few cases where, at high inflation rates, the optimal holding period is shorter. No changes are required for tax-exempt entities to retain initial rates of return.

Ownership of commercial property under the REIT form would require smaller changes in economic variables to offset the effects of tax reforms and to re-

store current internal rates of return. At a five percent inflation rate, rents would have to go up by 2.7 percent, values of commercial buildings to decline by 2.7 percent, or capitalization rates to decline by 5.3 percent.

For apartment buildings, the changes in economic variables required to restore initial internal rates of return are greater for syndicates, but less for REIT's. For example, at a five percent inflation rate, the rents of tenants would need to go up by about 23 percent to keep the rate of return to syndications constant, the values of such properties to decline by 19 percent, or the gross rent multiplier to change from about 9 to 11.4 percent. These are rather large changes indeed. Again, for higher levels of inflation, larger adjustments in the underlying economic variables would be required to restore the original internal rate of return. For REIT's, the changes in economic variables necessary to restore initial internal rates of return are quite small. At a five percent inflation rate, the tabulations suggest that rents could actually fall or the values of apartment buildings rise on the order of five percent.

### B. Changes in Market Conditions

Although the results in Table 2 suggest substantial changes in rents or values of apartments, at least for those owned by syndicators, the comparisons in the table may be very misleading. Clearly, the expectation of the tax reform is a reduction in mortgage interest and capitalization rates after the reforms are enacted. If this expectation is realized, it means that the results in Table 2 overstate the changes in rents or prices which would be required to compensate investors fully for the changes in the tax law.

Secondly, it is unlikely that the market's equilibration to variations in tax parameters would be isolated in only one of the underlying economic variables. Thus, even if the calculations suggesting a 23 percent increase in rents or a 19 percent reduction in property values for limited partnerships is logically correct, it is unlikely that either of these extreme changes would be observed. Thus they tend to overestimate the effect of tax reform upon the well being of syndicators and individual owners. Although it is logically possible that rents or housing values alone would change sufficiently to restore a rate of return, it is more likely that some combination of changes in capitalization rates and prices and rental levels would be experienced.

Thirdly, it is unlikely indeed that the market for rental housing would continue to be dominated by single owners and syndicates of limited partners after these tax reforms were enacted. If restoration of pre-reform IRR's requires a 23 percent rent increase for syndicates and no increase for REIT's, pension funds, or other tax exempt entities, it follows that the latter should take a larger share of the market.

1. Changes in interest and capitalization rates.

A decrease in income tax rates should cause a fall in interest rates, although the exact amount of the decline is problematic. Exhibit B clearly indicates the reasoning. Column 1 reports the real after-tax return to savers when interest rates are 13 percent and inflation is 5 percent. On a $100 loan, the nominal return is $13.00. The IRS collects $6.50, leaving $6.50; of this $5.00 offsets the decline in purchasing power, leaving an after-tax real return of $1.50. Column 2 indicates investors' returns if the tax rate fell and interest rates did not. At a 35 percent marginal tax

rate, tax payments decline by $1.95 and the real after-tax rate of return would increase by 133 percent.

## EXHIBIT B

Real After Tax Rate of Return on $100 Loan at 5% Inflation

| | Current 50% Marginal Tax Rate 13% Interest Rate | Proposed 35% Marginal Tax Rate 13% Interest Rate | Proposed 35% Marginal Tax Rate 10% Interest Rate |
|---|---|---|---|
| Interest Payment | $13.00 | $13.00 | $10.00 |
| Tax | - 6.50 | - 4.55 | - 3.50 |
| After-Tax Return | 6.50 | 8.45 | 6.50 |
| Inflation Correction | - 5.00 | - 5.00 | - 5.00 |
| Real Return | $ 1.50 | $ 3.50 | $ 1.50 |

This result is clearly illogical since investment and savings decisions are based upon real after-tax costs and earnings. Column 3 indicates that savers will receive the same after-tax real rate of return if interest rates fall to ten percent.[7]

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[7] This assumes that the real after-tax interest rate ($r^*$) is determined by the supply and demand for saving and investing in the economy. The nominal pre-tax interest rate ($i$) equals the after-tax rate plus an inflation adjustment ($p^e$), corrected for the tax rate ($t$):

$$i = \frac{r^* + p^e}{1 - t} \; ; \; 13 = \frac{1.5 + 5}{1 - .5} \; ; \; 10 = \frac{1.5 + 5}{1 - .35} \; .$$

These tax reforms are not expected to change the after-tax real interest rate substantially. This rate equates the quantity of savings with the marginal efficiency of capital (MEC). The MEC is derived from the production function in the economy and the *stock* of capital. Tax rate changes which differentially affect costs across industries may greatly influence the distribution of marginal investment among sectors in the economy. However, such changes only influence $r^*$ as they affect the total stock of

Recent papers by Peek and Wilcox[8] indicate why some analysts believe the fall in nominal interest rates may be greater or less than the amounts indicated in Column 3. Empirically, however, Peek and Wilcox find that the resulting changes in nominal interest rates in the U.S. have been insignificantly different from variations in the effect of personal tax rates.

Table 3 shows how rates of return to real estate would be affected if interest and capitalization rates fell by 20 percent (a fall less than the proposed tax cut).

It presents the same information as in Table 2, the required change in individual variables to restore internal rates of return, but it allows for a 20 percent reduction in the mortgage and capitalization rates as a result of the tax reform. (Because the IRR's are net of taxes, they remain constant; pre-tax IRR's decline). The entries in Table 3 suggest that the changes in economic variables to restore real internal rates of return net of tax are quite small. Specifically, these results suggest that changes in rent levels in apartment buildings are substantially lower than estimated in Table 2; at five percent inflation, the 23 percent increase in rents and

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capital. See Irwin Friend and Joel Hasbrouck, "Saving and After-Tax Rates of Return," *Review of Economics and Statistics*, Vol. 65, No. 4, November 1983, pp. 537-543.

[8] See Joe Peek and James A. Wilcox, "Taxable and Tax-Exempt Interest Rates: The Role of Personal and Corporate Tax Rates," Working Paper #146, Research Program in Finance, Graduate School of Business, University of California, Berkeley, January 1985. Empirical evidence documenting the relationship between marginal tax rates and market interest rates appears in Joe Peek and James A. Wilcox, "The Degree of Fiscal Illusion in Interest Rates: Some Direct Estimates," *American Economic Review*, Vol. 74, No. 5, December 1984, pp. 1061-1066.

## TABLE 3

Required Changes in Rents or Prices to Return Internal Rates of Return to Pre-Tax-Reform Levels, When Mortgage Rates and Capitalization Rates Fall by 20 Percent*

| Variable | 0% Inflation | | 5% Inflation | | 10% Inflation | |
|---|---|---|---|---|---|---|
| | Individual or Syndicate | REIT | Individual or Syndicate | REIT | Individual or Syndicate | REIT |
| | | | Commercial Office Building | | | |
| Rents | -10.9% | -12.8% | -9.9% | -16.4% | -5.8% | -25.6% |
| Prices | +12.3 | +14.6 | +11.0 | +19.7 | +6.1 | +34.4 |
| | | | Apartment Building | | | |
| Rents | -6.5% | -18.2% | +2.9% | -23.3% | +2.2% | -27.0% |
| Prices | +6.8 | +22.3 | -2.9 | +30.4 | -2.2 | +37.2 |

* For example, at five percent inflation, the original mortgage interest rate is 13 percent. After reduction by 20 percent, it is 10.4 percent. Similarly, the capitalization rate is reduced from 9.75 to 7.8 percent and the gross rent multiplier is increased from 9 to 10.8.

the 19 percent reduction in housing values for syndicators are much too large to be credible. If interest rates adjust to the new tax rates, only a 2.9 percent increase in rents would be required to maintain syndicator IRR's. However, because both REIT's and tax-exempt entities could afford to reduce their rents, it is more likely that adjustments would occur elsewhere.

2. Changes in Several Variables:

As noted above, the most important adjustment expected from tax reform and rate reduction would be in interest rates. However, other adjustments are also possible. Table 3 shows an almost one-to-one percentage trade-off

between prices or costs of a property and rent levels. The 1980-82 depression in housing witnessed a good deal of flexibility in costs -- wages, profit margins and fees. One should expect any pressure for higher rents to lead also to increased productive efficiency, lower input prices, and lower expenses.

3. Changes in the Entities of Investors:

Table 4 illustrates another reason why some syndicator margins and costs would be under pressure. It compares the pre-tax reform rates of return with the post-tax reforms yields under the assumption that mortgage interest rates, capitalization rates, and gross rent multipliers adjust by 20 percent. All rates of return except for apartment houses owned by individuals or limited partnerships show an increased return. The decrease in this latter case is about five percent. If the proposed tax reforms were adopted, some changes in the form of ownership as well as in rents, prices, and expenses would also be expected.

## V. CONCLUSION

Taken together, the results of this analysis suggest rather different implications for real estate and housing from the well-publicized congressional testimony which concludes that the Administration's proposed tax reforms would lead to rent increases of one fourth or more and to substantial declines in property values.

In contrast, the analysis presented in this paper suggests that all actors in the market for commercial office facilities -- tenants as well as syndicate,

## TABLE 4

Comparison of Pre- and Post-Tax-Reform Internal Rates of Return, When Mortgage Rates and Capitalization Rates Fall by 20 percent*

| Inflation Rate* | Individual or Syndicate | | REIT | | Tax-Exempt Entity | |
|---|---|---|---|---|---|---|
| | Current | Proposed | Current | Proposed | Current | Proposed |
| | | | Commercial Office Building | | | |
| 0% | 11.3% | 18.2% | 14.9% | 22.4% | 13.6% | 17.6% |
| 5 | 16.1 | 18.7 | 14.3 | 21.6 | 15.7 | 18.3 |
| 10 | 23.1 | 24.6 | 17.5 | 24.8 | 19.7 | 21.1 |
| | | | Apartment Building | | | |
| 0% | -1.6% | 1.4% | 1.4% | 6.5% | 6.4% | 7.7% |
| 5 | 17.5 | 16.4 | 11.2 | 20.6 | 12.6 | 14.4 |
| 10 | 31.6 | 30.7 | 18.1 | 30.8 | 18.3 | 21.2 |

* For example, at five percent inflation, the original mortgage interest rate is 13 percent. After reduction by 20 percent, it is 10.4 percent. Similarly, the capitalization rate is reduced from 9.75 to 7.8 percent and the gross rent multiplier is increased from 9 to 10.8.

REIT, and pension fund owners -- may be better off under the proposed reforms. The analysis also suggests that REIT and tax exempt owners of apartment buildings will be better off, and individual or syndicate apartment owners slightly worse off as a result of the reforms. In fact, even if tax rate reduction caused no changes in interest rates and pre-tax IRR's, our analysis indicates that REIT's would become a greater competitive force in the marketplace.

These results imply that with passage of the tax reforms we should expect to see increased attention to productive efficiency by syndicators and some reductions in their costs, markups, and fees. We should also expect that real

estate investment trusts and tax-exempt entities will be encouraged to increase their level of activity in the apartment market and to become more active as owners of apartment buildings. Finally, we should also expect little or no increase in tenant rents as a result of tax reform; in fact, we may well expect apartment rents to decline.

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