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# TAXATION AND HOUSING MARKETS: PRELIMINARY EVIDENCE ON THE EFFECTS OF RECENT TAX REFORMS

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ABSTRACT

The tax changes of the 1980s altered the incentives for housing consumption. Marginal tax rate reductions in both the Economic Recovery Tax Act (1981) and the Tax Reform Act (1986) reduced the attraction of homeownership, particularly at high income levels. The Tax Reform Act, by lowering depreciation allowances and implementing anti-tax shelter provisions, also reduced the net tax subsidy to rental housing. In the long run these changes will raise real rents and reduce the fraction of national income that is allocated to housing. Preliminary evidence shows a pronounced decline in rental housing construction since the 1986 tax bill, as well as a decline in the real price of owner-occupied homes which may be partly attributable to the tax change.

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Housing accounts for one sixth of consumption expenditure in the United States, second only to food among major budget categories. It is also the expenditure category which is most directly affected by federal tax policy. The federal income tax subsidizes homeownership because imputed rent is not included in the tax base, while mortgage interest payments are tax-deductible. Renters also receive tax subsidies, since landlords have historically received generous depreciation allowances which subsidize investment in rental properties relative to other real assets.

The tax reforms of the last decade have significantly affected incentives for housing consumption. Reductions in marginal tax rates have reduced the value of tax-exempt imputed income for homeowners, with particularly large changes for high-income individuals whose tax rates were 70% at the beginning of the 1980s but are 28% today. The changes in the tax incentives for rental investment have been even more dramatic. The 1981 Economic Recovery Tax Act liberalized depreciation provisions for rental property, while the Deficit Reduction Act of 1984 and the Tax Reform Act of 1986 reversed these changes. The 1986 Act included provisions designed to reduce investment in tax shelters, including real estate shelters. The net effect of these refomrs has been a reduction in the net tax incentives to rental construction.

The effects of these changes are just becoming manifest in U.S. housing markets. In the long run, reduced incentives for housing consumption will raise rents, lower the housing stock, and potentially affect the division of the population between

homeowners and renters. In the short run, however, the effects of tax reform are most likely to appear in house prices and new construction of rental and owner-occupied properties.

This paper describes the tax reforms of the last decade and presents preliminary evidence on their housing market effects. The paper is divided into five sections. The first documents the importance of analyzing how tax changes affect housing markets, demonstrating that these changes have an important influence on more general incidence calculations. Section two presents a framework for analyzing how the tax system affects housing markets, developing the concept of the user cost for both owner-occupied and rental housing. The next section describes the various tax reforms of the last decade, focusing on how these reforms altered the incentives for homeownership and investment in rental properties. Section four examines the reaction of housing starts, real rents, house prices, and homeownership rates to recent tax changes. Trends in U.S. housing markets, as well as comparisons between the United States and Canada, provide some evidence on the sensitivity of housing markets to tax policy. There is a brief conclusion.

## 1. Why Study Tax Policy Toward Housing?

Three factors make changes in the tax treatment of housing a critical component of applied tax incidence analysis. First, there are important differences in housing tenure across groups with different economic status. Table 1 illustrates this using

tabulations from the 1986 Consumer Expenditure Survey. Households are divided into deciles based on their total expenditures, with higher outlays indicating better economic circumstances.[1] More than sixty percent of the households in the lowest expenditure decile are renters, compared with only fifteen percent of those in the highest outlay category. The bottom third of the expenditure distribution contains half of all renter households, and the probability of owning a home increases throughout the expenditure distribution. Changes in the relative tax treatment of owner-occupied versus rental housing therefore have important distributional effects. Higher subsidies to rental accomodation benefit poorer households, while subsidies to homeownership yield benefits which are more concentrated among better-off households.

Second, for low income households the changes in real rents which result from tax reforms can easily outweigh the direct changes in tax liability. Table 1 shows that in the bottom expenditure decile, average federal tax payments are $133 per year and average rent payments by households who rent are $978. A five percent change in real rents can therefore offset a thirty percent change in taxes. Results presented below suggest that the 1986 Tax Reform Act will ultimately increase real rents by nearly ten percent, more than the actual reductions in tax payments for low-income households.

Finally, tax reform can induce significant changes in house prices. Since houses are the primary asset of most elderly households and many younger middle-income households, these

effects must be included in any complete analysis of tax redistribution. For a household with an annual income of $50,000, a home worth $200,000, and a $125,000 mortgage, lowering the personal income tax rate from 35% to 30% would reduce annual tax payments by less than $500. The capitalized reduction in the value of mortgage interest deductions, however, could reduce home values by at least five percent, or $10,000 in this example. Because asset prices are forward-looking and reflect the present value of changes in renter or homeowner costs, the revaluation effects fall on households who own homes when the tax reform takes effect. They are frequently an order of magnitude larger than the effects on current income and expenditure which are typically modelled in applied incidence studies.

## 2. Taxation and Housing Markets: Analytical Framework

The net effect of the tax code on incentives for tenure choice and for housing consumption can be formalized by computing the after-tax user costs of owner-occupied and rental housing under various tax regimes. The user cost of homeownership measures the marginal cost of an incremental amount of owner-occupied housing, including the foregone return on the owner's equity. The user cost for rental property reflects the landlord's cost of investing in the property; in equilibrium, the landlord must earn rents equal to his user cost. The user cost of homeownership is defined as

$$(1) \qquad c_o = [(1 - \theta)(i + \tau_p) + \delta + \alpha + m - \pi_e]P_o$$

where i is the the nominal interest rate, $\tau_p$ is the property tax rate per dollar of property value[2], $\theta$ is the household's marginal federal income tax rate, $\delta$ is the physical decay rate for the property, $\alpha$ is the risk premium for housing investments, m is the cost of home maintenance as a fraction of house value, $\pi_e$ is the expected rate of house price appreciation, and $P_o$ is the real price of owner-occupied housing.[3] This expression applies only to households who itemize for federal income tax purposes. For the nearly half of all homeowners who do not, the marginal user cost sets $\theta = 0$ in equation (1).

The user cost of homeownership varies across households and, for itemizers, is inversely related to a household's marginal tax rate. While it reflects the <u>marginal</u> cost of additional housing purchases, it may not reflect the <u>average</u> cost. The

latter is the key determinant of whether owner-occupied or rental housing is the most cost-effective way for a given household to obtain housing services. The distinction between average and marginal costs arises because some households may itemize if they are homeowners, but not if

they are renters. Many such households have itemized deductions excluding housing costs equal to less than the standard deduction; they forego the tax saving associated with the standard deduction when they become homeowners.

The user cost for rental property is

$$(2) \qquad c_r = \{[(1 - \tau)i + \delta + \alpha - \pi_e](1 - \tau^*z)/(1 - \tau) + \tau_p + m\}P_r$$

where the parameters not defined above are $\tau$, the marginal income tax rate of the rental landlord, $P_r$, the real price of rental property, and $z$, the present value of tax depreciation allowances.[4] In equilibrium the rent charged must equal $c_r$ so that the landlord is willing to hold the rental property.

Two parameters in the rental user cost are controversial. The first is $\tau$, the marginal tax rate of the rental landlord. Some studies, such as Titman (1982) and Scholes, Terry, and Wolfson (1989), assume that the landlord is a top-bracket individual investor. Such an investor receives maximum advantage from the depreciation allowances on rental property, since these allowances generate deductions which reduce taxable income. If the marginal supplier of funds to the rental industry is in a lower tax bracket, however, this will reduce the value of these deductions and therefore raise equilibrium rents.[5] Particularly when the dispersion of marginal tax rates is large, as it was prior to the 1981 tax reform, assumptions about the identity of

the marginal investor could have important effects on estimated user costs.

Second, the measurement of z, the present discounted value of depreciation allowances, is complicated because buildings may be depreciated more than once. Particularly during inflationary periods when there are substantial gains to selling a building and redepreciating its increased nominal basis, investors may "churn" their properties. This can substantially increase the present value of depreciation allowances for investors in rental property,[6] lowering the user cost and the equilibrium rent demanded by landlords.

## 3. Tax Reform Provisions Affecting Housing Markets, 1980-1988

The Economic Recovery Tax Act of 1981 and the Tax Reform Act of 1986 changed residential investment incentives. This section sketches the five most important provisions of these bills and describes their effects on both owner-occupied and rental housing demand.

Marginal Tax Rates: Both tax reforms lowered personal income tax rates. Holding constant the pretax interest rate at which households borrow and lend,[7] this raises the after-tax cost of homeownership. In 1980, the weighted average marginal federal tax rate on mortgage interest deductions was 32%. By 1984, when the rate reductions of 1981 had taken full effect, this average tax rate was 28%.[8] Lower tax rates reduce the value of homeowners' deductions for mortgage interest payments and

property taxes. The 1981 reform should therefore have lowered the quantity of housing demanded by some homeowners, and (holding other factors constant) reduced home prices. This downward price pressure should have been greatest for high-priced homes whose owners received the largest marginal rate reductions.[9]

Standard Deductions: The 1986 reform reduced the fraction of the population who would itemize if they were not homeowners. For a joint filer, the standard deduction rose from $3670 to $5000. As noted above, the average tax benefit to homeownership, and the tax incentive for owning rather than renting depends, depends on the difference between a household's total itemized deductions and the standard deduction. This difference falls when the standard deduction increases. This effect is particularly important for lower- and middle-income households with relatively few non-housing itemized deductions. Higher standard reductions reduce the incentive for a household to own, but conditional on deciding to own, they do not affect the marginal cost of additional housing services.

Depreciation Provisions: The 1981, 1984, and 1986 reforms affected tax depreciation benefits for rental property and thereby changed the incentives for households to own rather than rent their accomodation. Table 2 shows the recent history of depreciation policy for rental property. ERTA shortened the tax lifetime for residential rental property from 32 to 15 years.[10] The 1986 Act reversed this policy, extending the lifetime to 27.5 years and requiring straight-line depreciation rather than more

accelerated 175% declining balance. The reduction in marginal tax rates in 1981 partly counteracted the expanded depreciation benefits in ERTA, but in 1986 less generous depreciation rules combined with lower marginal tax rates to significantly reduce the value of depreciation benefits. Since the present value of depreciation tax benefits is a key consideration in rental investment decisions, these changes should affect rental markets: real rents should increase because of the 1986 Tax Reform Act.

Capital Gains Tax Rates: Both major tax reforms affected capital gains tax rates, although in opposite directions. The 1981 tax reform reduced the marginal tax rate on long-term capital gains for top-bracket investors from 28% to 20%, while the 1986 act eliminated the distinction between capital gains and other types of income and raised the top tax rate to 28%. While the capital gains tax may have little effect on homeowners (except for those in top income brackets for whom the $125,000 lifetime exclusion on taxation of housing gains is inframarginal), it is potentially important in the rental market. There is no tax exemption for capital gains on rental property, and a substantial fraction of the returns to property investment often accrue as capital gains. In addition, the capital gains tax has an important effect on the incentive to "churn" real property. When capital gains taxes are low, the tax burden on the initial asset owner is reduced and the incentives for churning are greater. This implies that the capital gains reduction in 1981

further enhanced the depreciation benefits in ERTA, while the higher rates in 1986 magnified the reduction in these benefits.

Anti-Shelter Provisions: The Tax Reform Act of 1986 included several provisions designed to restrict tax shelter investments, including investments in real estate. The most important restrictions were passive loss limitations. Prior to 1986, investors in rental properties which generated tax losses could use these losses to shelter taxes on other income. The 1986 Act restricted this practice, allowing only other passive income to be offset by passive losses.[11] This provision raises the after-tax risk of rental projects, since it provides limited loss-offset in unprofitable projects. It also discourages high-leverage rental projects, because the interest deductions in these projects are no longer as valuable to their investors.

Table 3 provides evidence on the efficacy of the anti-shelter provisions in the 1986 Act. The table presents data on sales of publicly-traded real estate partnerships in each year since 1981. While not all tax shelters are publicly traded and not all real estate partnerships invest in rental property, these data provide some guide to the level of tax-shelter activity. The table shows a 37% real decline in real estate partnership sales between 1985 and 1988. While other types of partnerships (such as oil and gas leasing) have also been discouraged by recent tax changes, real estate has declined more than the others. Real estate related partnerships accounted for over 55%

of new sales before the 1986 Tax Reform Act, but only 44% in 1988.

The foregoing list of tax provisions affecting housing markets is far from exhaustive. Many other legal changes, such as removal of amortization of interest on "builder bonds," limits on tax-exempt financing for housing projects, and changes in the minimum tax also affected incentives for housing consumption. In addition, this discussion ignores the particular provisions affecting low income housing.[12] The 1986 change in depreciation benefits for such housing was even more dramatic than that for other rental housing, with a switch from double-declining balance depreciation on a 15 year lifetime to straight-line depreciation on a 27.5 year life. My analysis, however, will focus on the change in rents for units that do not qualify for low-income provisions.

To illustrate how recent tax reforms have affected the housing market, Table 4 reports the user cost of homeownership for three households at various times during the last decade. The first panel considers the user cost for a fixed pattern of interest and expected inflation rates, thereby identifying the effect of tax changes. The second panel evaluates the tax code of each year since 1980 using interest and expected inflation rates that prevailed at that time, thus indicating the net change in incentives for homeownership.[13] Other auxiliary parameters, such as the property tax rate and the cost of maintaining the home, are assumed constant throughout the calculations.

The results illustrate that recent reforms had their most pronounced effect on the cost of homeownership for high income households. For a family with Adjusted Gross Income (AGI) of $250K in 1988, the Tax Reform Act of 1986 lowered the marginal tax rate from .50 to .28 and raised the user cost of homeownership from .094 to .114, assuming the base case with an interest rate of 7% and 3% expected inflation rate.[14] The actual change in the user cost of homeownership since 1986, recognizing variations in interest rates and inflationary expectations, is from .074 to .095 for this household. Assuming a price elasticity of demand of -1.0 for owner-occupied housing[15], this tax change could have large effects on both demand and house prices. Although precise results depend on the tax experiment, simulation evidence[16] suggests that the percentage change in house prices is approximately half as large, and of opposite sign, as the change in user costs. This analysis would therefore predict roughly a ten percent decline in real house prices for the homes typically demanded by very high income households.

The post-1986 change in user costs for high income households, however, is small relative to the change from the beginning of the 1980s, when the estimated user cost was .017. Despite this substantial change, there is no evidence that house prices for the homes typically owned by these taxpayers have collapsed. This may be because households did not expect the low user cost of 1980 to prevail forever. This would make them reluctant to pay as much a home as this user cost would suggest, since higher

future user costs would lead to capital losses. If households expected inflation to decline, for example, then the user cost for 1980 understates the cost for a typical housing purchase. Households may view tax changes as more permanent than other sources of variation in user costs, although given the experience of the 1980s, this perception may be changing.[17]

The effect of rate reductions on homeownership incentives for those in lower income brackets is much smaller, since the decline in tax rates in the 1986 reform was less pronounced. For the household with AGI of $25,000 in 1988, the tax reform lowered the marginal tax rate from 16% to 15% and raised the user cost (in the benchmark case) from .125 to .126. Some middle-income households such as the $45,000 example presented here even experience increases in their marginal tax rates, and for them housing costs decline.[18]

The results in table 4 show that the combination of high expected inflation rates and high marginal tax rates at the beginning of the 1980s made user costs relatively low, particularly for high-income households. For the household with AGI of $45,000 in 1988, the user cost of homeownership increased nearly fifty percent -- from .064 to .095 -- during the eight years following 1980. This reflects rising real interest rates as well as the decline in tax incentives.

User costs of rental housing are also reported in Table 4.[19] Assuming that the marginal supplier of rental units was an individual in the top marginal tax bracket, the rental user cost

rose from .137 to .149, or nine percent, between 1986 and 1988. The increase would have been larger if the real interest rate had not declined during this period. The change in user costs in the early 1980s is smaller. If the nominal interest rate and expected inflation rate had been at their 1980 levels in 1982, rental user costs would have declined from .096 (assuming a landlord tax rate of 50% in 1980) to .089, or by 7.3%. The increase in real interest rates between 1980 and 1982, however, counteracted this effect so the reported user costs in the lower panel of Table 4 show virtually no change.[20]

The results for rental user costs during the late 1980s are sensitive to different assumptions about the "marginal investors" in rental properties. If corporations are the marginal suppliers of rental housing, for example, then the adverse effects of the 1986 Tax Reform Act on real rents would be much smaller. Corporate investors face smaller reductions in marginal tax rates, and are less affected by passive loss limits, than are individual investors.

It is essential to recognize the partial-equilibrium nature of the foregoing calculations, and the limitations this places on the analysis. The 1981 and 1986 tax reforms changed the tax treatment of housing as well as many other assets. In particular, the 1986 reform raised the tax burden on corporate assets while bringing tax burdens on equipment, structures, and other assets into closer alignment. If tax rates on housing and all other assets rise and capital is incompletely mobile internation-

ally, so changes in the U.S. system affect after-tax returns to U.S. investors, then a tax change of this type should reduce real after-tax interest rates. The amount of such a decline is crucial for calibrating the actual changes in housing user costs. General equilibrium simulations of the type performed by Hendershott (1987) or Berkovec and Fullerton (1989) are needed to aggregate the different tax changes for different assets into the single summary measure, the change in the interest rate, through which other aspects of tax reform affect the housing market. For some of the tax-induced changes in user costs isolated in Table 4, notably those for high-income individuals and those for landlords, however, implausibly large changes in interest rates would be needed to offset the reported effects.

## 4. Housing Market Response to Tax Reforms

The housing market adjusts slowly to external shocks from the tax system and other sources. The tax changes of 1981 were only in force for five years, and many of the changes in the Tax Reform Act of 1986 have only been fully effective for two years. It is unreasonable to expect large changes in the housing stock or in the fraction of households who rent as a result of these tax reforms. This section nevertheless examines the available evidence on changes in prices and quantities after the major tax reforms.

Table 5 displays single-unit and multi-unit housing starts for the United States during the period since 1970. The data

support the view that taxes affect the rental housing market. The table shows a sharp decline in multifamily starts since 1986: starts in 1988 were only 62.5% as large as in the 1983-1986 period.[21] The data also show an increase in rental construction in the 1983-4 period. This may reflect incentives for new construction that are not captured in the user cost measure of the last section, particularly the opportunities for "churning" rental properties during this period.

Predictions of how the recent tax reforms should affect owner-occupied housing starts are less clear than those with respect to rental housing. The 1986 tax reform raises homeownership costs for more than half of the taxpaying population, but the real rent increase which should also result blunts this effect. On balance the reform encourages homeownership. The data neither support nor contradict this prediction. Single family housing starts were low in the early 1980s when real interest rates were at record heights, and they were lower in 1988 than in either 1986 or 1987, but the decline is much smaller than that for multifamily starts.

Simply comparing the number of housing starts before and after tax reform is a weak test, because it fails to control for other changes which may alter the incentives for housing construction. One way of accounting for such changes is through international comparison, particularly between the U.S. and Canada. Canada provides a natural "control" since it has a similar demographic mix and is subject to economic shocks similar

to those in the U.S., but it has quite different and relatively stable tax policy with respect to housing. Canadian homeowners are not permitted to deduct mortgage interest from their taxable income, while they are permitted to use tax-deferred saving accounts to facilitate downpayment accumulation.

Canadian housing starts are also shown in Table 5. The comparison of the two nations strengthens the evidence for a tax-related slowdown in U.S. rental construction after 1986, since the Canadian data display an upturn in multifamily building. In 1988, the number of multifamily starts was 45.6% larger than the number in 1983-6. The pattern of single-family housing starts in the two nations are similar.

Tax changes which affect housing demand should affect the prices of existing rental and owner-occupied structures. A reform like that in 1986 which reduces incentives for housing consumption should reduce the prices of these assets, thereby discouraging new investment and eventually leading to a smaller housing stock. Table 6 presents data on house prices and real rents during the last two decades in both the U.S. and Canada.[22]

Movements in the real price of single-family homes in the United States are only partially consistent with the tax-based analysis described above. Price patterns in the 1970s and late 1980s accord with the earlier discussion. Although Table 4 did not present information before 1980, the rapid rise in inflationary expectations in the late 1970s reduced user costs relative to their levels in prior years. At the same time, Table 6 shows

that real house prices increased 18% between 1976 and 1980. Similarly, in the two years after the 1986 Tax Reform Act when user costs increased for most households, prices declined by more than five percent between 1986 and 1989.

Real house price movements in the early 1980s are difficult to reconcile with the after-tax user cost analysis, however. Although real interest rates increased and tax rates declined, raising user costs for households throughout the income distribution, real house prices declined only three percent between 1980 and 1983. The explanation of this price pattern must involve shifts in demand which are not related to after-tax real interest rates. The entry of the "baby boom" generation into their homebuying years, a demographic shift which increased the demand for owner-occupied housing, is one potential explanation.[23]

The view that slowly-changing demographic factors explain robust house prices in the early 1980s, however, is difficult to reconcile with the Canadian data in the third column of Table 6. These data show a twenty-five percent decline in real house prices between 1981 and 1984, the period when real interest rates increased. While after-tax real housing costs and demography probably both affect real house prices, still other factors may be needed to account for the U.S. and Canadian price trajectories in the 1980s. Table 6 also shows the time series for real rents in the U.S. and Canada. Since 1986 real rents in the United States have increased by less than two percent. This increase is smaller than that in the four years leading up to the

1986 reform, when real rents rose eight percent in a tax environment which was favorable to rental housing.[24] The user costs in Table 4 suggest that rising real interest rates in the early 1980s largely offset the tax incentives for rental housing investment during this period, potentially explaining this pattern.

The relatively slow increase in real rents since 1986, however, despite the sharp decline in new rental construction, is somewhat puzzling. One explanation for this pattern is that rental markets in many regions were overbuilt during the early 1980s, and this reduced real rents in the latter part of the decade. Rental vacancy rates provide some support for this view. These rates averaged 7.7% in 1988, a substantial increase from 5.7% in 1983. For large properties, those with five or more units, the increase in vacancies was even more pronounced: 11.4% in 1988, compared with 7.1% five years earlier.[25] The lags in construction, coupled with the sharp rise in multifamily starts earlier in the 1980s, could explain these changes. This view implies that recent tax changes may not be reflected in real rents for several years.

The tax changes of the last decade should affect homeownership rates. The 1986 reform should lead to a larger fraction of the population owning their homes rather than renting, although these changes may materialize even more slowly than the effects on housing investment and house prices. The homeownership rate changes very little from year to year, and it has remained stable

at 63.8% since 1986.[26] It is probably too soon to detect the effects of the recent reform on tenure choice. The homeownership rate declined in the years prior to the 1986 Tax Reform Act, falling from 65.6% in 1980 to 64.5% in 1984 to 63.8% in 1986. This shift was during a period when the user cost of homeownership increased faster than that for rental housing. The decline in homeownership was concentrated among younger households. For example, the homeownership rate for households headed by individuals between ages 25 and 29 declined from 43.8% to 36.2% between 1980 and 1988; for households aged 30-34, the decline from 61.1 to 52.6% was even more pronounced. These changes may have resulted more from the difficulties first-time buyers faced in meeting high nominal mortgage payments during this period than from tax incentives for owning rather than renting.

The tax changes of the last decade are only one of the factors that may have altered the affordability of homes for young buyers. The decline in nominal interest rates in the late 1980s has lowered the minimum income needed to qualify for a mortgage on a given-sized home. The rise of adjustable rate mortgages, which in many periods reduced still further the carrying costs for new homebuyers, have reinforced this pattern. It is difficult to separate these effects from the changes due to the tax law.

## 5. Conclusion

The tax changes of the 1980s altered the incentives for housing consumption. Marginal tax rate reductions in both 1981 and 1986 reduced the attraction of homeownership, particularly at high income levels. Reduced depreciation allowances, lower marginal rates, and anti-tax shelter provisions in the 1986 Tax Reform Act lowered the net tax benefit for rental landlords. This should ultimately increase real rents, and the data on housing starts already suggest that rental construction has been adversely affected by the tax reform.[27]

These changes have important implications for analyzing the incidence of the recent tax reforms. The increased cost of housing for high-income households should translate into reduced demand for high-priced homes. The capital losses for the current owners of these homes could be substantial, offsetting part of the benefit these households received from rate reductions in the 1986 tax act. For low-income households, the higher rents which result from reduced investment in rental housing could have more important welfare effects than the direct changes in tax payments from these reforms. The effects of housing market considerations are least important for middle-income households, where the 1986 reform had little effect on marginal tax rates.

This paper has not examined the efficiency gains in capital allocation that may result from the recent reforms. The tax incentives for housing consumption in the pre-1986 tax code led to more housing investment than a neutral tax code. Such distor-

tions in the size and allocation of the capital stock have efficiency costs, and some estimates suggest these costs are significant.[28] Resolving the questions this paper raises about how taxes affect house prices and real rents, however, seems logically prior to estimating deadweight burdens that result from tax incentives.

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Table 1: Housing Consumption by Expenditure Deciles, 1986

| Consumption Decile (Average) | Average Pretax Income | Average Federal Taxes | Average Rent (if Renters) | Percent Renters |
|---|---|---|---|---|
| 1 ($4,008) | $5,785 | $ 133 | $ 978 | 63.3% |
| 2 ( 7,260) | 9,212 | 285 | 2,170 | 60.0 |
| 3 ( 9,641) | 13,989 | 723 | 2,802 | 51.5 |
| 4 (11,941) | 16,691 | 1,062 | 3,380 | 49.7 |
| 5 (14,260) | 20,974 | 1,316 | 3,952 | 45.3 |
| 6 (17,009) | 25,847 | 1,772 | 4,114 | 34.9 |
| 7 (20,410) | 29,650 | 2,374 | 4,643 | 30.8 |
| 8 (24,739) | 36,752 | 2,801 | 4,438 | 27.3 |
| 9 (31,624) | 40,519 | 3,298 | 5,528 | 17.5 |
| 10 (58,477) | 51,499 | 4,841 | 5,506 | 15.2 |

Source: Tabulations from the Consumer Expenditure Survey, 1986 (First Quarte Expenditure Data). Parenthetic values in the first column are average consum tion within each decile. Average rent is per year.

Table 2: Depreciation Provisons for Residential Structures, 1969-1988

| | Lifetime | Depreciation Schedule |
|---|---|---|
| 1969-1981 | 32 Years | 150% Declining Balance |
| 1981-1984 | 15 Years | 175% Declining Balance |
| 1984-1985 | 18 Years | 175% Declining Balance |
| 1985-1986 | 19 Years | 175% Declining Balance |
| 1986 - | 27.5 Years | Straight Line |

Source: Author's compilation based on U.S. Internal Revenue Code.

Table 3: Investment in Publicly Registered Real Estate Limited Partnerships

| Year | Amount | Percent of Public Limited Partnership |
|---|---|---|
| 1981 | 1799.4 | 28.6% |
| 1982 | 2612.6 | 39.1% |
| 1983 | 4202.2 | 43.1% |
| 1984 | 5346.7 | 57.8% |
| 1985 | 6737.8 | 53.3% |
| 1986 | 6132.2 | 55.6% |
| 1987 | 4789.1 | 43.4% |
| 1988 | 4249.0 | 44.0% |

Source: The Stanger Report, various issues. Data in column 1 reflect sales o publicly registered limited partnerships, excluding a small number of master limited partnerships (with traded shares) which have appeared in the late 1980s. Real estate partnerships holding mortgages are also excluded. Dolla values are in 1988 prices.

Table 4: User Costs of Owner-Occupied and Rental Property, 1980-1988

| | 1980 | 1982 | 1984 | 1986 | 1988 |
|---|---|---|---|---|---|
| | Case 1: Fixed Parameters i = .07, $\pi^e$ = .03 | | | | |
| User Cost of Homeownership | | | | | |
| 1988 AGI = $25,000 | .120 | .122 | .125 | .125 | .126 |
| 1988 AGI = $45,000 | .110 | .113 | .117 | .117 | .114 |
| 1988 AGI =$250,000 | .081 | .094 | .094 | .094 | .114 |
| Rental User Cost | .126* | .116 | .117 | .118 | .132 |
| | Case 2: Prevailing Interest & Inflation Rate | | | | |
| User Cost of Homeownership | | | | | |
| 1988 AGI = $25,000 | .080 | .094 | .098 | .115 | .109 |
| 1988 AGI = $45,000 | .064 | .077 | .089 | .104 | .095 |
| 1988 AGI =$250,000 | .017 | .042 | .049 | .074 | .095 |
| Rental User Cost | .059 | .096 | .104 | .137 | .149 |
| Parameter Values | | | | | |
| Nominal Rate | .127 | .151 | .124 | .103 | .091 |
| Expected Inflation | .085 | .093 | .072 | .037 | .034 |

Notes: Calculations for both cases assume $\tau_p$ = .02, $\delta$ = .014, $\alpha$ = .04, and m .025. Rental user costs assume no churning, with marginal tax rates for the rental landlord of .50 in 1980-1986 and .28 in 1988. The starred entry for 1980 is notable because it does not assume the highest possible marginal tax rate for the rental landlord; it assumes a 50% rather than a 70% marginal rat At the 70% rate, this value would be .117.

Table 5: Housing Starts, U.S. and Canada, 1970-1988 (Thousands per year)

| | United States | | Canada | |
|---|---|---|---|---|
| | Single Family | Multifamily | Single Family | Multifamily |
| 1970-4 | 1058.6 | 786.5 | 107.6 | 125.4 |
| 1975-9 | 1226.6 | 463.5 | 117.9 | 117.9 |
| 1980 | 852.2 | 440.0 | 87.7 | 70.9 |
| 1981 | 705.4 | 378.8 | 89.1 | 88.9 |
| 1982 | 662.6 | 399.6 | 54.5 | 71.4 |
| 1983 | 1067.6 | 635.5 | 102.4 | 60.3 |
| 1984 | 1084.2 | 665.4 | 83.7 | 51.2 |
| 1985 | 1072.4 | 669.5 | 98.6 | 67.2 |
| 1986 | 1179.4 | 626.0 | 120.0 | 79.8 |
| 1987 | 1146.4 | 474.0 | 140.1 | 105.8 |
| 1988 | 1081.3 | 406.8 | 128.5 | 94.1 |
| 1989 | 1019.1 | 385.5 | ---- | ---- |

Source: Columns 1 and 3 report single-unit residential starts, columns 2 and the sum of all starts for residential structures with more than two units. Data are from the U.S. Commerce Department and Statistics Canada.

Table 6: Real House Prices and Real Rents, 1970-1988

| | United States | | Canada | |
|---|---|---|---|---|
| | Real House Prices | Real Rents | Real House Prices | Real Rents |
| 1970 | 77.9 | 123.9 | 84.0 | 108.2 |
| 1971 | 79.0 | 124.3 | 86.0 | 111.1 |
| 1972 | 81.2 | 124.3 | 90.9 | 111.7 |
| 1973 | 83.4 | 122.2 | 101.6 | 111.0 |
| 1974 | 82.6 | 115.3 | 116.7 | 107.3 |
| 1975 | 84.0 | 111.4 | 116.5 | 105.0 |
| 1976 | 85.7 | 111.2 | 119.6 | 108.8 |
| 1977 | 89.4 | 110.7 | 114.9 | 110.1 |
| 1978 | 94.7 | 109.9 | 108.0 | 108.5 |
| 1979 | 99.7 | 105.8 | 102.7 | 105.0 |
| 1980 | 99.5 | 101.6 | 100.6 | 101.6 |
| 1981 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1982 | 97.7 | 101.4 | 88.1 | 101.1 |
| 1983 | 96.7 | 103.8 | 80.7 | 102.1 |
| 1984 | 96.8 | 104.5 | 77.8 | 101.4 |
| 1985 | 96.3 | 106.7 | 75.7 | 101.0 |
| 1986 | 96.7 | 110.6 | 79.2 | 101.0 |
| 1987 | 95.2 | 111.7 | 86.2 | 101.7 |
| 1988 | 91.7 | 112.6 | 91.6 | 102.5 |
| 1989 | 90.6 | 111.9 | ---- | ---- |

Source: Real house prices are the ratio of constant-quality house price indices, provided by the Census Department and Statistics Canada, to the personal consumption deflator. Real rents are the ratio of the rental component for the Consumer Price Index in each country to the total CPI.

## Endnotes

1. Poterba (1989) argues that consumption provides a more satisfactory basis than annual income for classifying households. The results in Table 1 are insensitive, however, to the choice of income or expenditure to define the deciles.

2. Only the part of the property taxes which is not a "benefit tax," a fee for local public service provision, should actually be included in the user cost.

3. This equation assumes that all capital gains on owner-occupied dwellilngs are untaxed. Since each household is eligible for $125,000 in untaxed lifetime gains, this assumption may not be unrealistic. If it were not satisfied, $\pi_e$ would be replaced with $(1-\tau_g)\pi_e$ where $\tau_g$ is the effective capital gains tax rate. A more heroic implicit assumption is that the household faces identical borrowing and lending rates. Further discussion of these assumptions and information on plausible parameter values for the components of (1) may be found in Poterba (1984).

4. Equation (2) treats the government as sharing the risk associated with rental investments, an assumption which may be incorrect. If the government is not a partner to such risk, the $\alpha$ term would no longer be multiplied by $(1-\tau z)/(1-\tau)$.

5. Gravelle (1985) argues that corporations, not individuals, are the marginal suppliers of capital to the rental housing industry. Poterba (1986) reports that corporations held only 4.5% of residential rental property in 1985, compared with 38.6%

for partnerships and sole proprietorships which are taxed at individual rates. The relative unimportance of corporate investors casts doubt on the view that they are price-setters in this market.

6. The significance of churning for rental user costs is explored by Hendershott and Ling (1985), Gordon, Hines, and Summers (1987), and Scholes, Terry, and Wolfson (1989).

7. Major tax reforms can affect pretax returns. Slemrod (1982), Goulder and Summers (1989), and Berkovec and Fullerton (1989) report general equilibrium simulation results which recognize these effects.

8. These estimates are based on data reported in the IRS Statistics of Income: Individual Tax Returns for 1980 and 1984.

9. While the 1981 tax reform raised the price of owner-occupied housing for high-income households, it also raised the after-tax income of these households. This positive income effect should have partly offset the demand reduction.

10. Hendershott (1987) discusses the changes in depreciation provisions, and their likely effects, in detail.

11. Special provisions apply to passive losses of small landlords, those with adjusted gross incomes below $100,000. These landlords may deduct $25,000 in passive losses against other income.

12. After 1986, low-income housing was defined as rental construction in which 20% of the tenants were below 50% of a community's median income, or 40% were below 60%. The qualification rules prior to 1986 were more complex.

13. The first set of user cost changes reflects the effects of tax reform but in a counterfactual setting, while the second convolutes the effects of tax changes with the effects of other shocks, for example changes in monetary policy, that are unrelated to the tax system. A more complete analysis would involve general equilibrium analysis of tax policy, in particular with an endogenous real interest rate.

14. The reform would have to lower real interest rates by nearly three hundred basis points to offset the lost value of tax deductions.

15. Rosen (1986) and Olsen (1987) survey the voluminous housing demand literature.

16. More detailed treatment of the asset price changes which follow from housing tax reforms may be found in Poterba (1984).

17. It is also possible that the user cost expression mis-states the true costs for some high-income households. The assumption that the opportunity cost of funds is $(1-\theta)i$, for example, may be incorrect if high-tax-bracket households invest in tax-exempt debt, with a yield above $(1-\theta)i$, at the margin.

18. Hausman and Poterba (1987) find that only 59% of all taxpayers received marginal tax rate reductions as a result of the 1986 Tax Reform Act.

19. These user costs are preliminary and will be revised for presentation at the conference. They do not reflect capital gains on rental property appreciation and assume structures are depreciated only once.

20. If the marginal investor in rental property in 1980 was in the 70% tax bracket, then the net change from 1980 to 1982 is an increase in rental user costs since the reduction in the landlord's tax rate outweighs the increasingly generous depreciation provisions.

21. Multifamily starts include both apartment buildings and condominiums. Both declined between 1986 and 1988, with condominium starts falling from 143 (thousand) to 99 and rental starts from 483 to 307. Weakness in the condominium may in part reflect the changing incentives for homeownership by young households.

22. Data on the real price of rental structures are not compiled by the Commerce Department.

23. Mankiw and Weil (1989) present evidence that demographic factors have an important influence on house prices, even when they are forecastable long in advance. Their results along with those of Case and Shiller (1989) call into question the premise

that houses sell for the present discounted value of their rationally forecast imputed rents.

24. The accuracy of the Bureau of Labor Statistics Rental CPI component as a measure of rental costs for a constant-quality unit is somewhat controversial. Apgar (1988) argues that failure to control for quality change leads to systematic understatement of rental inflation rates in the CPI, while Randolph (1988) argues for the BLS assumption of a stable quality distribution on the grounds that it is difficult to identify depreciation rates of rental property even from longitudinal data. The Apgar thesis suggests that the data in Table 6 may understate the actual increase in real rents during the 1980s. There may also be biases due to "tenure discounts," the finding that tenants who live in a given property for a long period pay lower real rents than new tenants.

25. Vacancy data are drawn from the U.S. Bureau of the Census, Report H-111: Housing Vacancies.

26. Homeownership data are reported in the U.S. League of Savings Institutions (1989).

27. DiPasquale and Wheaton (1989) present empirical results showing that real rents respond to changes in tax incentives. They also present long-horizon forecasts of the effects of the 1986 Tax Reform Act on the rental market.

28. Mills (1987) discusses the efficiency costs of overinvestment in housing.