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# The Income Tax Penalty on Rental vs Owner-Occupied Housing: An Argument for Apartment Rent Tax Exemption

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## Abstract:

This paper presents a novel analysis of the differential incidence and effect of Federal income tax policy on owner-occupied and rental housing in the U.S. The objective is to examine whether, and how, rental housing is penalized relative to owner-occupied housing, and if so to estimate the magnitude of any such penalty that is caused by Federal income tax policy. The findings of the analysis suggest that a penalty does exist on rental housing relative to owner-occupied housing, and that the magnitude is substantial. On a present value capitalized basis the relative penalty is likely on the order of one-quarter the value of the housing. The model presented in this paper is novel in that it applies the basic tenets of modern corporate finance theory to identify the sources and magnitude of the differential tax impact. The causes of the differential impact that are thusly identified suggest a policy remedy that differs from the one traditionally proposed, which is simply to eliminate the home mortgage interest tax deduction. Instead, the analysis herein suggests that the home mortgage tax deduction is not the source of the differential tax impact (for one thing, interest on mortgages financing rental apartments is also deductible from the landlord's taxable income, and for another, lenders providing the mortgage capital are generally taxable investors on the margin). Rather, the model presented here implies that the more direct and appropriate policy remedy would be to allow apartment investment income to be deductible from taxable income. This could also be a more politically feasible policy than to remove the mortgage deduction.

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## Background and Introduction

The importance of housing to social and economic well-being cannot be over-stated. In the U.S. there has long been a preference for owner-occupied housing. People seem to naturally like to own the place where they live (at least most Americans do). And widespread home ownership is argued to have beneficial effects on households, neighborhoods, and communities. This paper has nothing against that assertion. It may well be true that home ownership is a worthy public objective. Nevertheless, it is important to recognize a couple issues with the public promotion of home ownership to the detriment of home rental. First, households are heterogeneous, and there will always be many (even if perhaps not a majority of) households for whom ownership is less practical and less useful than renting. It can be both unfair from an equity perspective as well as costly from the perspective of economic efficiency to penalize such households. Secondly, the households for which rental is preferred may tend to be disproportionately low and moderate income. If so, then tax policies that penalize home rental are regressive in nature.[1]

It is commonly thought that the primary income-tax impact on the home tenancy (own versus rent) issue is the tax-deductibility of home mortgage interest. Since homeowners can deduct mortgage interest payments from their taxable income, they

[1] Actually, I don't know that it is necessarily true that rental is preferable for low/moderate income households from a fundamental perspective. It may be that this only *appears* to be the case because, under the status quo of public policies and the financial system, rental units are in effect more widely available to most lower income households.

obtain a "tax shield" from buying and owning a house (assuming they finance the purchase with a mortgage). But mortgage interest deductibility is not actually a subsidy for home ownership, even if for no other reason than that apartment landlords also can take out mortgages on apartment properties and can deduct the interest costs of those mortgages from their otherwise taxable income. In fact, we will argue later in this paper that mortgages are only valuable as tax shields for borrowers who are in high income tax brackets (which probably includes most apartment landlords, but probably not most homeowners). In any case, the treatment of mortgage interest is symmetric between owner-occupied and renter-occupied housing, and so is not really the subsidy at issue.

In fact, the argument in the present paper is that differential income tax treatment between owner versus rental housing in the U.S. is not any sort of tax subsidy at all, but rather a tax penalty, on rental housing. In effect, the taxation of apartment rental income, without taxing the fundamentally equivalent benefit of living in an owner-occupied house, sets up a tilted playing field in which rental housing is penalized. The analysis in this paper suggests that the penalty is quite large, on the order of one-quarter of the entire cost (or value) of the housing in question. The proposed policy solution would simply be to allow apartment rental income to be deducted from taxable income, in effect, to treat apartment income exactly like the housing service flow provided by an owner-occupied house.[2]

The remainder of this paper will develop an economic model that presents the above argument, including a rough quantitative analysis using plausible numerical values of the relevant parameters.

[2] This also implies that landlords could not deduct apartment depreciation or other operating expenses from their taxable income.

## Economic Model and Analysis

Bear with us as we work through an algebraic model that will enable us to quantify the values of two identical houses, one in the owner-occupier configuration, the other in the landlord-tenant configuration. To isolate the effect of income tax policy on the values of these two houses, we need to be careful to make an *apples-vs-apples* comparison, holding equal between the two houses everything except the effect of income tax policy. We will proceed by defining a set of variables or parameters, and then put these together with some basic financial economic principles from mainstream corporate finance to derive the resulting present values of each of the two houses. We will see that as a direct result of income tax policy the same house, in effect, occupied by the same household, and providing the same value of housing services, is worth substantially less in the landlord-tenant configuration than it is in the owner-occupier configuration. We shall also see that this difference is not at all due to the deductibility of mortgage interest from homeowner taxable income. The problem is not a tax subsidy to homeowners, but rather an effective relative tax penalty on apartment landlords. The result must be in the real estate development marketplace to skew the production of housing stock away from rental and towards for-sale housing.

## Defining the Determinative Parameters

The first variable we want to include is the marginal income tax rate faced by a representative household, which we will label $t$. We will explore the implications of differences in this rate (e.g., corresponding to low, medium, and high-income households

in different tax brackets), but for now we can think of this as a representative mid-level income tax rate, such as 25%. There are two other marginal income tax rates that we also must separately identify. One is the tax rate faced by the landlord (property owner) of the house that is in the landlord-tenant configuration. We will label this tax rate as $t^L$. It is likely that most landlords would be in a high marginal tax bracket, perhaps 35% would be representative value for $t^L$. The $t^L$ rate will be important in valuing the house in the landlord-tenant configuration. The third relevant tax rate is that which effectively applies on the margin in the debt market, which we will label $t^D$. This is the rate which is relevant in determining the market yields (interest rates) in the debt market. The $t^D$ rate can be observed effectively in the difference between the yields in the municipal bond market and in the corporate and agency bond market for otherwise similar bonds (similar in duration and risk). Typically in the U.S. $t^D$ is around 25%. The $t^D$ rate is important in evaluating mortgages (either the homeowner's or the landlord's) from an after-tax perspective, and for evaluating other "debtlike" (contractual or fixed) cash flows such as the depreciation tax shield cash flow enjoyed by the apartment landlord.

After the tax rates, the next parameter we must define is very fundamental to our analysis. It is the annual gross value of the "housing services" to the homeowner (the owner-occupant). We will treat this value as a benchmark and then hold it equal for the tenant in the other house as well, otherwise we wouldn't be comparing *apples and apples*. The two houses are identical (including identical locations – this is a "thought experiment" and need not be literally possible in the physical world). And the two households that occupy the houses are identical (otherwise we won't isolate the pure effect of tax policy). Hence, the annual value of housing services provided by each house

to its occupant must be the same. We will label this value $v^O$ and note that it also equals the gross *cost* to the owner-occupier per year (in the initial year) of owning and living in the house, $c^O$:

$$v^O = c^O \quad (1)$$

Cost equals value because in the housing market competition in supply and demand drives prices to the point where there is no surplus on either side at the margin in the market. In other words, $c^O = v^O$ is an equilibrium market price.[3]

This gross annual cost of owning and living in a house consists of several components. These include:

- $h^O$, the opportunity cost of the capital invested in the house, which may be thought of as the annual pure "net rent" component of housing cost for the owner-occupier. It is most accurate and complete to think of $h^O$ as representing the opportunity cost of capital of *all* of the capital invested in the house, including both the homeowner's equity plus any mortgage-lenders' debt investment. In reality these two are investment partners and they both have their money tied up and at risk in the house, money which could otherwise be employed elsewhere earning a return. We will come shortly to consider the tax effects of the use of mortgage debt, but we will isolate that effect separately, so for analytical purposes we must define $h^O$ based on the entire capital invested in the house, equity plus debt. From the perspective of the opportunity cost of that capital, this is the current market value of the house. Thus, $h^O$ reflects, and determines, the market

[3] This is merely a convenient assumption to enable analysis. It does not imply that *every* household is exactly on the margin, indifferent between living in their house or not. Many households may be intra-marginal on the housing demand function, enjoying "consumer surplus" in their abodes paying market prices, but that does not affect the analysis or argument here, so it is convenient to treat both of our households (the owner and the renter) as marginal.

value of the house, but $h^O$ is an *annual* cost. In many parts of the U.S. $h^O$ is probably on the order of 4% to 5% of the house's market value per year.

- *p*, the annual property taxes owed on the house. In many urban and suburban areas property taxes are around 2% per year of the market value of the house. However, property taxes are deductible from taxable income, so this makes the effective cost of property taxes for the homeowner equal to $(1-t)p$ per year.
- *m*, the annual maintenance and insurance cost of the house. This component too is probably typically on the order of 2% per year of the house value, with most of this being maintenance cost. Of course, maintenance can be deferred and often occurs in a "lumpy" fashion over time, being much greater than 2% of the house value in years when a new roof must be put on or the house is repainted or a new furnace installed, but much less than 2% in most other years.
- *u*, the annual operating cost of utilities, such as heating and air-conditioning, lighting, and water/sewer supply. There is a fuzzy line between how much of utilities are attributable to the cost of the house as opposed to other categories of consumer expenditure. For example, telephone and cable-TV services would not normally be considered part of the cost of the house per se. Annual utility costs can vary widely according to geographic location and household preferences, but again we can take 2% of the house value as a not-untypical number.

To review and summarize the parameters we have defined so far, note that the total annual cost of owning and living in the house is given by the equation below:

$$c^O = h^O + (1-t)p + m + u \qquad (2)$$

As noted, we are taking this gross annual cost as given exogenously, assumed equal to the annual *value* of the housing services provided to the homeowner. The homeowner is able and willing to pay this much and no more (per year) to live in the house. The property taxes, maintenance and insurance, and utility costs also may be considered as exogenously specified for purposes of our argument. Thus, the net rent component, $h^O$, may be viewed as a "residual", determined by the other parameters:

$$h^O = c^O - (1\text{-}t)p - m - u \qquad (2a)$$

As noted, this annual "net rent" component, $h^O$, determines and reflects the market value of the house. To make this more explicit, we need to define two more parameters:

- *r*, is the opportunity cost of capital (OCC) for investment in housing, the expected annual total return rate that investors can earn (on average) in the capital market on investments of similar risk and durability to the house. Let us say that *r* is defined as the *before-tax* level (that is, before paying any income tax on the investment return), so that it can be most easily and directly observed in the investment marketplace. Thus, the after-tax OCC faced by the homeowner would be $(1\text{-}t)r$. In the U.S. a typical value for *r* would be in the neighborhood of 7% to 8% per annum, somewhat greater than the return to riskless investments such as Treasury Bonds. It is important to note that *r* consists of both current income or in-kind benefit flow provided by the investment as well as growth over time in the value of the investment asset (its resale value). To make this explicit, define another parameter:
- *g*, the long-run average annual growth rate in the housing net rent or value of the housing services provided by the house (i.e., the average annual growth rate in *h*).

A value of $g$ = 1% per annum might be typical in many locations in the U.S. (a bit less than inflation – keep in mind that the house structure will age over time).[4]

**Valuing the House in the Owner-Occupier Configuration**

Well, we've now defined quite an alphabet soup of variables. We owe you an equation to put them all together. Let's define $H$ to be the capitalized value of the house, the future stream of the net benefits of the house discounted to present value at the opportunity cost of capital:

$$H = h^O / ((1\text{-}t)r - g) = (c^O - (1\text{-}t)p - m - u) / ((1\text{-}t)r - g) \qquad (3)$$

This growth-perpetuity formula simply establishes that the value $H$ will cause an investment in the house to provide an after tax expected return of $(1\text{-}t)r$ per year, just enough to justify the investment (given the risk). The expected return on an investment of $H$ providing a perpetual annual after-tax value flow starting at $h^O$ in the first year and growing at $g$ percent per year thereafter will be $r$ percent per year before-tax or $(1\text{-}t)r$ after-tax for an investor facing the tax rate of $t$.[5]

Note that the analysis here is on an after-tax basis to the homeowner, that is, the costs and benefits are measured net of income taxes. In particular, all of the homeownership

[4] For simplicity we refer to $h^O$ as a single number, but in reality $h^O$ represents only the current or initial value in a stream or series of periodic values over time, values which may change with a long-term trend and which may vary randomly around any such trend (i.e., a risky stream of benefit flows over time). This is also true of the other cost components in $c^O$. While in recent years rents and housing values have tended to grow faster than inflation, this is uncharacteristic of the long-run historical experience, and the crash in property values commencing in 2007 has brought that fact painfully home. If long-run property values on average just keep pace with inflation for new buildings, then individual property values must decline in real terms as their structures age and depreciate. If structures are replaced every 50 years with site acquisition costs then 20% of the redeveloped property value, the implication is a real depreciation rate of 3% per annum relative to the new-building property value. If the latter tracks inflation, and inflation is 3%/year, then the expected long-run growth rate for individual properties would be zero in nominal dollars.

[5] This assumes that the after-tax cash flow stream continues in perpetuity. If the owner sells the house in a finite time horizon then the return will be slightly less than $r$ before-tax and $(1\text{-}t)r$ after-tax (or alternatively the initial price of the house would have to be slightly less than $H$), but this technicality does not substantively affect the argument and so will be ignored.

costs defined above must be paid by the homeowner using after-tax income and, apart from the property-tax deduction noted, cannot be charged against the homeowner's taxable income. However, there is another potential component to the value of the house which we need to consider to complete the picture of the after-tax cost of owning and living in the home for the homeowner. Most homeowners borrow a substantial fraction of their house value, and the interest on that loan is deductible from their taxable income. We need to consider the implications of that.

**The Value of the Mortgage Interest Tax Shield**

At first blush it would appear that the after-tax cost of the house to the homeowner is reduced by an annual "interest tax shield", the annual interest expense amount multiplied by the homeowner's marginal tax rate. In terms of the present value of the house that we computed in equation (3), this interest tax shield could be considered as another component of value that the homeowner obtains in the form of the present value of future income tax savings. But this is only a partial picture.

Remember that the homeowner and the lender are really partners in the home investment, and we cannot ignore that partner, the other side of the mortgage. The interest expense which the homeowner can deduct from her taxable income must be recorded as interest income by the lender, taxable at the lender's marginal income tax rate, which we have labeled $t^D$. The lender will pass his tax obligation through to the homeowner in the form of the interest rate on the mortgage being made high enough so that the lender obtains his necessary after-tax interest rate (the market rate in the debt market, as reflected for example in municipal bond yields). Unlike with a tax-exempt

bond, the Government does not lose any income tax revenue with the mortgage origination except to the extent that the homeowner's tax rate exceeds the marginal lender's tax rate: $t > t^D$ (the taxes saved by the homeowner deducting interest from her taxable income exceed the taxes paid by the lender on that same interest). And if the Government does not lose any revenue, then no tax-based value is created in the private sector. Thus, even though a "tax shield" appears to exist for the homeowner who is deducting her mortgage interest each year from her taxable income, in reality she is paying this tax indirectly through the interest rate the lender is charging (and who in turn is paying taxes to the Government on that interest).

In fact, if the homeowner faces a lower tax rate than the lender ($t < t^D$), the Government actually gains tax revenue as a result of the mortgage origination and the value of any "tax shields" is actually negative in the private sector (that is, to the homeowner, as the lender is a profit-maximizer who will not do a negative-NPV investment, making sure that his after-tax interest after applying his $t^D$ tax rate equals an equivalent tax-exempt municipal bond yield).[6]

[6] While not the focus of this paper, note that the implication of this point is that there is a regressive component in the taxation of interest income. Lower-income home mortgage borrowers are actually indirectly *increasing* the Government's tax revenue intake, because they face marginal income tax rates certainly lower than the marginal tax rates faced by the marginal investors in the debt market. On the other hand, high income home mortgage borrowers probably face marginal tax rates higher than that faced by marginal lenders in the debt market, thereby actually reducing the Government's income tax revenue when they take out a mortgage, as we will see when we examine the landlord-tenant configuration for our house. While it seems plausible that apartment property values might be bid up to reflect the value of the interest tax shield to high tax bracket landlords, the converse seems less likely, that house prices in home markets serving lower-income homeowners would be bid down as a result of an understanding on the part of the homebuyers of the negative present value in the mortgage for lower tax bracket borrowers.

**Back to the House Valuation**

The above described perspective for quantifying the tax shield value of mortgage borrowing is not widely employed or understood in current practice, but the traditional perspective of looking only at the homeowner's side of the equation in isolation is incomplete. The perspective just outlined here is more complete, and it is entirely consistent with mainstream financial economics principles as well as with the mainstream corporate finance pedagogy as it is taught in all top business schools.[7] With this in mind let us define a final element in the present value of the house, namely, the present value of the mortgage interest tax shields to the owner-occupier, which we will label $I^O$. As an approximation, we have:[8]

$$I^O = (t - t^D)(\text{LTV})H \qquad (4)$$

where "LTV" is the mortgage loan-to-value ratio, the mortgage amount as a fraction of the home value. (In other words, (LTV)$H$ is the amount of the loan.)

We can now define the complete market value of the house in the owner-occupier configuration. Labeling this value as $H^O$, we have:

$$H^O = H + I^O \qquad (5)$$

[7] See for example Brealey & Myers, *Principles of Corporate Finance*, Chapter 19; or Geltner & Miller, *Commercial Real Estate Analysis & Investments*, Chapter 14. We should also note, however, that if we did not adopt this perspective on valuing, our argument against taxation of apartment rent would be just as strong, that is, this is not an essential component of the main argument in this paper (as will become clear when we quantify the value of the house in the landlord-tenant configuration).

[8] Formula (4) is only an approximation. For one thing, if $I^O$ is non-zero, then it will add to (or subtract from) the market value of the house, such that $H$ would not exactly equal the house value, and that would need to be considered in quantifying the LTV so that the quantity (LTV)$H$ would equal the loan amount. Furthermore, any individual loan might be followed by subsequent loans on the same house. If the loan were a perpetuity the present value of the interest tax shield per dollar of loan amount would be: $(t - t^D)/(1 - t^D)$, not $(t - t^D)$. The exact value of the interest tax shields depends upon the interest rate, amortization rate, and holding period (until payback) of the loan. The simplification in formula (4) gives a ball-park figure and makes the point that the present value of the interest tax shields are a function of the $t - t^D$ differential and the magnitude of the loan. Formula (4) works fairly well for typical interest rates and for relatively long loan holding periods. Obviously the absolute value of the present value of the interest tax shields in any one loan is much smaller if the loan is going to be paid back shortly. (But then, will there be a subsequent loan?, and for a larger amount as the house's market value perhaps grows over time?)

Or, spelling this out fully from our underlying parameters, combining equations (3), (4) and (5):

$$H^O = (1 + (t - t^D)(\text{LTV}))[(c^O - (1\text{-}t)p - m - u) / ((1\text{-}t)r - g)] \quad (5a)$$

**Valuing the House in the Landlord-Tenant Configuration**

Let us now turn to an examination of the corresponding value of the identical house occupied by the same household, only now in the landlord-tenant configuration rather than in the owner-occupier configuration.

Since the house and the household are the same, the annual gross value of the housing services to the occupant household must be the same. Label this value as $v^R$, and recall that our basic condition for an *apples-vs-apples* comparison between the owner-occupier and landlord-tenant configuration is that this value is indeed the same across the two configurations. As before, while $v^R$ is the annual gross value of the housing services to the occupant household, in this case the tenant, $v^R$ must also exactly equal the gross rent charged by the landlord to the tenant, because value (benefit) exactly equals cost on the margin in the rental market just as in the home ownership market. In other words, the home renter is able and willing to pay this much and no more (per year) to live in the house. Thus, our fundamental condition for an *apples-to-apples* comparison to isolate the effect of income taxes is:

$$v^R = c^R = c^O = v^O \quad (6)$$

This value is charged to the tenant by the landlord as an annual gross rent, in what is called a “full service” lease, meaning that the landlord pays the operating costs, including the property taxes, maintenance and insurance, and the utilities. Thus, the rent covers all

of these costs, meaning that the tenant pays exactly the same amount, for exactly the same value of housing services, as the owner-occupier pays, making the housing occupant indifferent between owning or renting the (same) house, at least from a pecuniary perspective.[9]

As we are dealing with the same house and the same household, the operating costs are all also the same as we had before, that is, identical values of *p*, *m*, and *u*, and of course the OCC and net rental growth rate, *r* and *g* are also the same.[10] While the tax rates are also the same, the tax rate that is now relevant for determining the value of the house in its landlord-tenant configuration is the landlord's tax rate, $t^L$, rather than the occupant household's tax rate (*t*), because the landlord is the owner of the asset.

The value of the house in the landlord-tenant configuration will be determined in the market for investment real estate based on a capitalization to present value of the after-tax net cash flow provided by the house and its mortgage to its investors, the landlord and mortgage lender. In principle this is the same as the computation we did for the house in the owner-occupier configuration that culminated in equation (5). However, the income tax code results in four sources of differences in the value of the property between the

[9] Clearly there are psychological differences between owning and renting, and the owner is in the position of both the consumer and investor in the house. These are important considerations in broader studies of housing economics and public policy, but the purpose of the present analysis is to isolate the pure impact of income tax policy on the value of a building that provides its occupants with equal value of housing services whether it is in the owner-occupant or landlord-renter configuration, the condition we have just established in equation (6).

[10] Again, this is a device to insure apples-to-apples comparison and isolate the effect of taxes. In reality there would be different incentives regarding the operating costs. For example, the tenant in a full-service lease has less incentive than the owner-occupier to keep utility costs down (since the owner is paying the bill), while on the other hand the owner-occupier may have more incentive to spend more on maintenance of the house (since she benefits from living in an improved house and since the landlord cannot deduct all maintenance expenditures from taxable income). The capital markets may view rental housing as more, or less, risky than owner-occupied housing, with possible implications on the value of *r*, the opportunity cost of capital. It is likely that such differences would be minor, and in any case we abstract from all such differences in order to focus on the pure effect of income taxation on property value purely as a function of the tenancy status of the housing unit.

landlord-tenant configuration and the owner-occupier configuration: (i) taxation of the net rent component, (ii) deductibility of operating expenses from taxable income, (iii) depreciation tax shield, and (iv) possibly greater value of interest tax shields from the mortgage to the landlord (assuming the landlord is in a higher tax bracket than the owner-occupant). The first of these differences reduces the value of the house in the landlord-tenant configuration relative to the owner-occupier configuration, while the other three differences all redound to the benefit of the landlord-tenant configuration. Let us see how these differences come into play specifically.

The annual gross rental revenue provided by the house is $c^O$ as noted in equation (6), the same as what the homeowner pays. But the residual net income deriving from that gross rent is different. The resulting net cash flow before income tax considerations is the revenue minus the operating costs: $c^O - p - m - u$. However, income taxes must be paid on rental net income from apartment units, so the after-tax cash flow provided by the house (now as an apartment) will be less than this amount. The taxes are owed on *net* income, not on gross revenue, so *all* of the operating expenses of the apartment (that are paid for by the landlord) may be viewed as "tax deductions", not just the property taxes (as was the case for the owner-occupier).[11] However, not all maintenance expenditures can be deducted entirely as current expenses; some must be capitalized (and depreciated or amortized over a subsequent period of years). In principle, expenditures on items that have a lifetime over one year cannot be expensed entirely in the current year. We must therefore introduce another factor, labeled $f^m$, the fraction of $m$ which is able to be

[11] The formula is the same if the landlord passes through some operating expenses to the tenant, because the landlord must reduce the rent by exactly the amount of the operating expenses to maintain our benchmark condition of occupant indifference per equation (6). This reduction in rental income also reduces the landlord's tax obligation, leaving equation (7) unchanged.

currently expensed and deducted from taxable income. The resulting annual after-tax cash flow is the net rent provided by the house in the landlord-tenant configuration, its net rent as an apartment, which we will label $h^A$, the analog to $h^O$ of equation (2a) in the owner-occupier configuration, and is given by:

$$h^A = c^O - p - m - u - t^L c^O + t^L p + t^L f^m m + t^L u \qquad (7)$$

Comparing equations (7) and (2a) we see that the net rent generated by the house differs between the landlord-tenant and owner-occupier configurations as follows:

$$h^A - h^O = (t^L - t)p + t^L(f^m m + u) - t^L c^O \qquad (8)$$

Here we see explicitly two of the four differences noted earlier. The first two terms on the right-hand-side reveal how the landlord can take advantage of deducting all the operating expenses of the apartment from his taxable income. The homeowner can do this only with property taxes, and to the extent that the landlord might be in a higher tax bracket than the occupant ($t^L > t$) even the property tax deduction would be more valuable to the landlord. However, this advantage is countered by the fact that the landlord must pay taxes on the rental income, as represented by the third term in (8). In effect, in the landlord-tenant configuration the net rent is monetized and recorded and taxed as income to the landlord each year but not deductible from taxable income by the tenant, whereas in the owner-occupied configuration this net rent, though just as real in value and opportunity cost, is not taxed at all.

You might suggest that the landlord would just hike up the rent so that he receives the same net amount after taxes as the homeowner. But remember, $c^O$ is the value of the housing services to the home occupant. The house is only worth that much per year to the occupant, which means they will not pay more than that to live there. The landlord must

keep the gross rent at $c^O$. In short, taxation of the net rent is a substantial penalty on the landlord-tenant configuration relative to the owner-occupant configuration, other things being equal. However, the other effects of income taxation provide some offsetting relative benefit to the landlord-tenant configuration.

In addition to the greater deductibility of operating expenses, another important tax-based benefit to the landlord-tenant configuration is the effect of the allowance for depreciation expenses. The IRS allows deduction from the landlord's taxable income the annual depreciation expense associated with the rental property. In the case of residential property the deprecation allowance is computed at a straight-line 27.5-year lifetime rate applied to the structure value (not the land value), subject to "recapture" of the depreciation allowance tax obligation at the time of subsequent resale of the property.[12] The value of this depreciation tax shield as a percent of the property's current present value varies depending on the fraction of property value that is land as opposed to structure, as well as on the landlord's tax bracket and the length of time the property will be held before being re-sold (and of course also upon the expected long-run growth rate in the property value and the opportunity cost of capital[13]). Depending on these

[12] The portion of the sale price above the depreciated book value of the property is subject to the recapture tax which is currently 25%. Certain specific items of equipment and fixtures in the property may be able to be depreciated at a faster rate than the structure as a whole. In the present model this can be reflected in the magnitude of the $f^m$ parameter defined earlier as the component of maintenance expenditures that cannot be expensed up front (i.e., by making this parameter a bit lower than it otherwise would be).

[13] Both the riskfree and risky discount rate come into play, as the depreciation expense tax shield is effectively riskless within each investor's holding of the property, though the rate of growth in property value (hence the magnitude of the depreciation tax shields) is risky between the investors' holds, that is, the future prices at which the property will sell are unknown at present. The overall DTS present value formulation is complex, consisting of an annuity (the current depreciation tax shields for the remainder of the current holding) plus a discounted single sum (the PV of the recapture at the end of the current hold), all embedded in a growth perpetuity (the subsequent cycles of ownership as the property is re-sold from time to time, causing a resetting of the DTS magnitudes reflecting the long-run growth rate of the property value). Experimentation suggests that the full perpetuity present value of the DTS can range between 5% and 30% of what the property would otherwise be worth. The higher values are associated above all with a higher marginal tax rate for the landlord.

parameters the depreciation tax shield can add anywhere from just a few percent to upwards of around 25% or even more, to what the value of the apartment property would otherwise be. We will label this extra component of present value which the landlord obtains from depreciation allowances as *D*, and add it to what the house would be worth based only on $h^A$, to arrive at a valuation of the house as a rental apartment (so far without considering the mortgage). We label this all-equity value of the apartment as $H^A$ and quantify it analogous to equation (3) previously:

$$H^A = h^A/((1\text{-}t^L)r - g) + D \qquad (9)$$

The final component of value that we need to consider in the landlord-tenant configuration is the value of the interest tax shield in the mortgage on the apartment property. This is the same type of component as we described previously for the homeowner with a mortgage, only it seems more likely that an apartment landlord would be in a top tax bracket than would probably be the case for the typical occupant of the house. Recall that the value of the interest tax shield is very much a function of the difference between the borrower's tax bracket and that of the marginal lender in the debt market ($t^D$). Analogous to our definition in equation (4), the value of the landlord's interest tax shield is labeled $I^L$ and approximated as:

$$I^L = (t^L - t^D)(\text{LTV})H^A \qquad (10)$$

We can now define the complete market value of the house in the landlord-tenant configuration. Labeling this value as $H^L$, we have:

$$H^L = H^A + I^L \qquad (11)$$

Or, spelling this out fully from our underlying parameters, combining equations (7), (9), (10) and (11):

$$H^L = (1+(t^L-t^D)(\text{LTV}))[D + (c^O-p-m-u-t^L c^O+t^L + t^L f^m m+t^L u)/((1-t^L)r-g)] \quad (11a)$$

**Quantitative Implications**

Let us now plug in some typical realistic numbers for the parameters in our model to make a quantitative comparison of the difference between the values of our two identical houses providing the same value of housing services to their occupants: $H^O$ in the owner-occupied configuration versus $H^L$ in the landlord-tenant configuration. Table 1 (at the end of the paper) shows a range of plausible and internally-consistent values for the input parameters.

In Table 1 the top-line input of the annual gross value (and cost) of the housing services provided by the housing unit, $c^O$ = \$10,000, is an arbitrary benchmark and is by construction held equal between the two configurations. The other parameter values are chosen to be realistic in their own right (per dollar, relative to the scale of the gross rental benchmark) and to be plausible in the aggregate as well. The parameter values in the "low" and "high" scenarios are contrived to push the boundaries of plausibility in the direction that makes the rental apartment valuation low (or high depending on the scenario) relative to the owner-occupied house value. For example, when operating expenses are relatively high (e.g., compared to gross rent or property value), the apartment value is relatively low compared to the owner-occupied house. Even though the landlord benefits from greater operating expense tax deductions, the landlord net rent still declines more on a percentage basis after-tax because of the tax on the rent. The most fundamental and important reason for the valuation differential is the fact that the same

value of housing services benefit flows is taxed in the case of the rental apartment and not in the case of the owner-occupied house.

Quantitatively, we see in Table 1 that the most likely impact of taxes on the house value is to reduce the value in the landlord-tenant configuration to only 80% of the value in the owner-occupied configuration. The plausible range is from 62% to 104%, but with the extreme ends of that range being rather unlikely. For example, in 2008 typical "cap rates" (before-tax net income as fraction of property price) in the U.S. apartment property market were in the range of 5% to 8%, and gross rent multipliers were in the neighborhood of 8 to 10. The apartment cap rate of less than 4% associated with the "high" apartment value scenario seems too extreme to be realistic, while the cap rate of nearly 10% in the "low" apartment value scenario is also not typical of the market in recent years (though cap rates of 10% were indeed considered normal as recently as the 1990s). It seems safe to conclude that the effect of income taxation of apartment rent is to reduce the value of a house for rent to roughly 80% of the value it would have as an owner-occupied unit in many typical scenarios.[14]

This is the equivalent, in effect, of adding approximately one-quarter onto the effective cost of producing housing units for rent as compared to otherwise identical housing units for owner-occupancy. To see this, consider the "most likely" scenario in Table 1. In this scenario a housing developer producing homes for sale can sell them for $118,571 each. In a competitive industry (as homebuilding is), total production costs will be driven to this level (including land cost and minimum necessary profit for the

[14] Sensitivity analysis reveals that the $H^L/H^O$ ratio is most sensitive to the landlord's marginal tax rate ($t^L$). After that, the ratio is most sensitive to our assumptions about the magnitude of the annual operating expenses ($p$, $m$, and $u$), and the fraction of maintenance expenditures which can be currently expensed by the landlord ($f^m$). The $H^L/H^O$ ratio is surprisingly robust to assumptions about opportunity cost of capital and growth rate ($r$ and $g$), as well as to the loan-to-value ratio (LTV).

developer). If the developer takes the same houses in the same location (hence, with the same total production cost), and turns them into rental units providing the same value of housing services to their occupants, then the value of the development is reduced to $94,850 per house due to the effect of income taxes. This is effectively a 20% (as a fraction of $118,571) additional cost that the developer must bear (literally, a tax on apartments relative to owner-occupied houses). In order for the rental development to be sufficiently profitable to make sense as a business proposition as an alternative to the for-sale housing development, the developer would have to be able to raise the apartment rents sufficiently (even though the value of the housing services to the occupants remains the same) so as to increase the present value of the apartments to $118,571, an increase of 25% over the $94,850 value as apartments. Thus, the additional cost imposed by income taxation is effectively $23,721 per unit, or 25% as a fraction of the apartment value. In a supply-demand diagram of the housing market this would shift the supply function of rental housing upwards by that amount.[15]

**Conclusion and Public Policy Implications**

Figure 1 at the end of this paper depicts the effect of the relative taxation of rental housing compared to for-sale housing within the overall housing market. In effect, supply of rental units is reduced as a result of the higher production costs due to the taxation of apartment rental income.[16] While the exact quantitative effect on the number of rental versus owner-occupied units produced in the marketplace would depend on the

[15] Recall that the supply function in a market reflects the marginal costs of production.
[16] Note in Figure 1 that the apartment supply function is keyed on the owner-occupied home value ($H^O$), while the for-sale housing supply function is keyed off of the rental value ($H^L$), for the reason described in the previous paragraph. For example, in our previous illustration $H^O$ = $118,571 and $H^L$ = $94,850.

elasticities of supply and demand in the U.S. housing markets, this type of differential taxation surely is one reason why there are so many fewer rental units than owner-occupied units in the U.S. housing stock.[17]

As rental units tend to serve lower-income households, the overall result is a regressive impact of the current taxation policy, within the housing sector. This is no doubt a particular instance of an unintended effect of income tax policy. If one views rental income as a form of investment income, then the distortion of resource allocation between apartments (taxed as investment) and owner-occupied houses (as consumption not taxed) is seen to be a poignant case of the perverse impact of tax policy. The policy of taxing investment income, no doubt designed to be progressive (assuming that investment income tends to be earned largely by higher-income households) turns out in this particular instance to have a negative impact on the welfare of lower-income households via the impact on one of the most vital goods of consumption: housing.

The policy implications of the above analysis clearly fall short of arguing for the abolishment of all taxation of investment income. Indeed, there is no argument here for abolishing taxes on all real property rental income.[18] However, there is an argument in the above analysis for abolishing taxes on residential rental income. The prescription is simply to allow rental income derived from residential (apartment) property to be

[17] It may be argued that there are other public policies which effectively provide subsidies to rental housing that are not provided to owner-occupied housing, such as Section 8 programs to promote affordable housing. This is an important consideration that is beyond the scope of this paper. However, at a minimum the argument presented here begs the question of the relative magnitudes of the tax penalty on rental housing versus the fiscal subsidy to rental housing, as well as the possibility that the "left hand" of the Government may be partially negating what the "right hand" is trying to do (or vice versa).

[18] It is true that providing a tax exemption for apartment rental income and not for other forms of rental income (e.g., from commercial buildings such as offices and warehouses) will distort real estate development allocation away from commercial buildings and toward rental housing. The public policy rationale for such distortion would presumably be the social importance of housing. Such policy already exists to a slight degree in the differential depreciation allowances between residential versus commercial income property (27.5 year depreciation of apartments versus 39-year depreciation of commercial property). This would merely be an extension of that policy.

deductible from otherwise taxable income. As a concomitant, and to complete the equalizing of the playing field between rental and for-sale housing, apartment property owners would not be allowed to deduct depreciation or operating expenses, other than property taxes, from their taxable income. This would then place rental housing on an equal footing with owner-occupied housing from an income tax perspective.[19]

[19] To avoid tilting the playing field between different forms of ownership, it would also be necessary to exempt apartment REIT investment income (dividends and capital gains) from taxation. This might require some sort of rule of thumb to define what constitutes an "apartment REIT" (such as a requirement that at least, say, 75% of the REIT's gross revenues derive from residential real estate equity ownership).

| **Table 1: Quantitative Analysis of Income Tax Impacts on House Value as a function of tenancy configuration** | | | |
|---|---|---|---|
| | Scenario: | | |
| Parameter value: | Low | Most likely | High |
| $c^O$ Annual value of hsg svc = gross rent: | $10,000 | $10,000 | $10,000 |
| $p$ Annual property taxes | $2,000 | $1,750 | $1,500 |
| $m$ Annual maintenance & insurance cost | $2,000 | $1,750 | $1,500 |
| $u$ Annual utility cost | $2,000 | $1,750 | $1,500 |
| $f^m$ Fraction of maintenance expensed | 25% | 50% | 75% |
| LTV: Loan-to-Value Ratio for mortgage | 70% | 75% | 80% |
| $r$ Opportunity cost of capital per annum | 8.00% | 7.50% | 7.00% |
| $g$ Expected growth in values per annum | 1.00% | 1.25% | 1.50% |
| $t$ Marginal income tax rate to homeowner | 25% | 25% | 25% |
| $t^D$ Marginal income tax rate in debt mkt | 25% | 25% | 25% |
| $t^L$ Marginal income tax rate to landlord | 30% | 35% | 40% |
| Assumed $D/H^A$ percentage | 5% | 15% | 25% |
| Resulting net income (or cost) before-tax: | $5,500 | $5,625 | $5,875 |
| ***$H^O$* factors:** | | | |
| $h^O$ Net rent in owner-occupier configuration | $4,500 | $5,188 | $5,875 |
| $H$ Present value capitalization of net rent | $90,000 | $118,571 | $156,667 |
| $I^O$ Present value of mortg interest tax shield | $0 | $0 | $0 |
| ***$H^O$* = sum of above: Market Value of Owner-occupied House** | **$90,000** | **$118,571** | **$156,667** |
| Before-tax "cap rate" (net inc/price) | 6.11% | 4.74% | 3.75% |
| Gross Rent Multiplyer ($H^O/c^O$) | 9.0 | 11.9 | 15.7 |
| ***$H^L$* factors:** | | | |
| $h^A$ Net rent in landlord-tenant configuration | $2,350 | $2,781 | $3,150 |
| $D$ Present value of depreciation tax shields | $2,554 | $11,509 | $29,167 |
| $H^A$ Present value capitalization of net rent | $53,641 | $88,233 | $145,833 |
| $I^L$ Present value of mortg interest tax shield | $1,877 | $6,617 | $17,500 |
| ***$H^L$* = Sum of above: Market Value of House as Rental Unit** | **$55,519** | **$94,850** | **$163,333** |
| Before-tax "cap rate" (net inc/price) | 9.91% | 5.93% | 3.60% |
| Gross Rent Multiplyer ($H^L/c^O$) | 5.6 | 9.5 | 16.3 |
| | | | |
| **Rental Value / Homeowner Value: $H^L/H^O$** | **62%** | **80%** | **104%** |

Figure 1: Effect of taxation of apartment rental on the supply of for-sale vs rental units in the marketplace