



Australian Housing  
and Urban Research Institute

# **Fundamental tax reform and its impacts on alternative providers of rental housing**

## **Positioning Paper**

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# 1. INTRODUCTION

This project aims to measure the impact of the 1999-2000 fundamental tax reforms on the rental housing costs and rents of non-mainstream rental housing supplies. These reforms introduce a new tax on consumption expenditures (the goods and services tax); remove the wholesale sales taxes; reduce in the marginal income tax rates of most taxpayers; and introduce taxation of nominal capital gains, where previously only real capital gains were taxed. In aggregate these reforms reduce the tax burden on ordinary sources of income, and shift the burden onto consumption and capital gains. These are important changes that justify the description of fundamental tax reform.

We concentrate on the following non-mainstream providers of rental accommodation;

- Boarding Houses and Caravan Parks
- Public Housing Authorities
- Community Housing Organisations.

This subject is controversial principally because of the differential treatment of commercial residential property providers such as boarding houses and caravan parks, as compared to landlords in mainstream private rental housing, landlords of public housing authorities and community housing organizations (Senate Community Affairs References Committee 1999). These suppliers can be treated as providers of premises used typically for short-term accommodation, and are subject to a more complex set of good and services tax provisions. Residents of this form of accommodation are subject to the full GST rate of 10 per cent for the first 27 days of their tenancy, and thereafter at a concessional rate. It has been argued that this puts the long-term residents of boarding houses and caravan parks at a disadvantage, because other providers are input taxed (see below) only, and this is a less onerous impost on these other providers.

In the public housing context, critics have pointed out that, although public housing agencies are input taxed like private landlords, they will be unable to pass on all of the increase in operating costs into rents. **This is because most tenants have low incomes, and most state government rent setting policies limit rents to a percentage of household income. Unable to pass on increase in operating costs, the consequence is a leakage of resources out of public housing that curbs the ability of authorities to maintain and supply public housing.**

Community Housing Organizations (CHO) are said to be discriminated against, as their charitable status meant that previously they were exempt from Wholesale Sales Tax (WST). The abolition of WST is of no benefit to **CHO**. If they are input taxed (see below), operating costs will rise relative to those of other input taxed supplies of long term accommodation (**NSW Federation of Housing Associations, 2001**).

Each of these criticisms has been used to substantiate the proposition that official estimates by Treasury and the Australian Competition and Consumer Commission (ACCC), have underestimated the impact of the GST on these providers. This project develops a different angle on the issues that has attracted little attention. The modeling of impacts has concentrated on providers' operating costs, on the implicit assumption that rents are determined by operating costs. However, long-term survival of private **proprietors** is conditional on rents covering both operating costs and capital costs.<sup>1</sup> The fundamental tax reform package (the New Tax System)

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<sup>1</sup> In the case of public and community housing providers, rents and subsidies (grants) must cover the sum of operating and capital costs.

introduced in the period 1999-2000 covers a range of changes in addition to the GST. These changes as well as the GST itself, will impact on capital costs. This aspect of the issue has been neglected, yet these other changes can have a potentially more profound impact on the financial position of private proprietors<sup>2</sup>. The impacts on proprietors of boarding houses and caravan parks are of particular importance because these proprietors are an important source of low income private rental housing (Foley, 1997). Recent research by Yates and Wulff (2000) has shown that low-income private rental housing is in decline in Australia. Wood and Watson (2001, forthcoming) offer evidence to suggest that tax factors are one reason for this decline. Wood and Watson's (op cit) research focuses on the individual landlords of residential housing. This project extends that research to the proprietors of caravan parks and boarding houses.

In this Positioning Paper we begin by describing the main features of the New Tax System (NTS), and in particular, we describe the way in which the GST will apply to the different providers of non-mainstream rental housing. A brief description of official estimates of the impact of the GST on rental housing is followed by a discussion of the analytical framework that will be the basis of this project's methodological approach.

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<sup>2</sup> The emphasis on private proprietors is warranted because the reforms to capital gains tax arrangements, and cuts in marginal income tax rates will not affect the financial position of public and community housing providers.

# THE NEW TAX SYSTEM

A supply-based taxation reform package was introduced in Australia, effective July 2000, by the Howard government. The centrepiece of the NTS is the GST, based on the 'value added tax' model. The GST is a 'broad-based tax of 10 percent on most supplies of goods and services consumed in Australia' (Australian Taxation Office (ATO) 2000a:9). The consumer will pay the cost of the tax, although the liability for the payment of the GST to the ATO lies with the supplier of the goods and services (ATO 2000a:9). Thus, the supplier is responsible for transferring the cost of the tax on the good supplied onto the consumer. The cost of the tax will be determined largely by the taxation category under which the particular good lies, of which there are three under the NTS.

## Taxable Supplies

A stated intention of the NTS is that sales from one business to another will be effectively tax free' (Costello 1998:80). This is achieved through the *input tax credit* system. GST is payable by businesses and registered organisations on most goods and services that they sell or supply. Such supplies are referred to as *taxable supplies*. Goods in this category include the GST in their cost (it may not be shown separately) and this is paid to the supplying firm in the act of purchase. The supplying firm is then responsible for the payment of this tax to the ATO. Purchases made by a firm will also include GST, and this GST can be claimed as an input tax credit from the ATO, provided that these purchases are *creditable acquisitions*. A purchase by a firm is regarded as being a creditable acquisition only if it purchased for a *creditable purpose*. It cannot be claimed as an input tax credit if it is for making input taxed supplies (see below) or for a private purpose (ATO (1) 2000:12). The difference between the GST payable on a firm's sales, and the GST included in their purchases (input tax credits) is the amount owed to or refundable from the ATO (ATO (2) 2000:10).

## GST Free Supplies (Zero-rated)

Goods and services that are regarded as GST free will include no GST in their sale price, but input tax credits can still be claimed for creditable acquisitions. GST free supplies include basic foods, sewerage, exports, water and drainage, non-commercial charitable activities, childcare and most education and health services. (ATO (1) 2000:14).

## Input Taxed Supplies

Similarly, there is to be no GST charged on input taxed supplies. However, no input tax credit can be claimed for purchases of taxable supplies. It is under this category that rented residential premises fall, along with most financial supplies. (ATO (1) 2000:14). Residential premises are categorised in this manner so as to ensure comparable changes in costs with owner-occupiers (Costello 1998:96)<sup>3</sup>.

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<sup>3</sup> Owner-purchasers pay no GST on loan repayments, and outright owners have no GST liability on the *imputed rental value* of the housing services they consume. But they must pay GST on supplies, such

The NTS also includes the following major changes;

- Abolition of WST and some other State and Territory taxes
- Reductions in marginal rates of income tax and adjustment to income tax bands that lower income tax burdens
- Increased support for low income households in the form of improved pension and benefit entitlements
- Changes to business taxes – capital gains tax changes being the most relevant reform in the present context.

## **HOW THE GST APPLIES TO RENTAL HOUSING**

The GST is applied differently in different rental housing situations. There is a distinction between private residential property and commercial residential property

### **Private Residential Property**

As residential rents are an input taxed supply, GST is not to be included in these rents. GST that is paid by landlords on any goods and services used in association with the rental property cannot be claimed as input tax credits. This applies to all repairs and maintenance, replacement of appliances, and management, advertising, legal and accountancy services (ACCC 2000a:1). Furthermore, landlords are not able to claim an input tax credit for GST paid on the construction of property for residential rental (ATO 2000a:27). As the landlord is likely to pass on any increase in costs they face due to the GST, there is the potential for an increase in rent. However, the reduction or abolition of other taxes faced by the landlord (eg WST) will help to curb rent increases. The ACCC states that 'any adjustments to rental prices should reflect reductions as well as increases in costs' and that if any increase is to result, it will be minimal (ACCC 2000a:2).

This puts private rental housing landlords on the same footing as their counterparts in the UK, where the broad based value added tax (VAT) applies. In the UK VAT is not applied to residential rents, but landlords are not able to claim a credit for VAT charged on taxable supplies. Though tax treatment in relation to the broad based consumption tax is the same in the two countries, the income tax treatment of rents and capital gains differ (see Wood and Kemp, 2001).

### **Commercial Residential Property**

The renting of commercial residential property is a somewhat more complex matter. A variety of premises, including boarding houses, some boarding schools, caravan parks, mobile home parks, camping grounds, hotels, motels, and hostels may be described as commercial residential properties (ACCC 2000b:2). Commercial residential properties are described as premises used 'typically for short-term accommodation' (ATO 2000a:28). But such premises can provide either short-term (less than 28 days) or long-term (28 days or more) accommodation, or both.

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as repairs and improvements, and a tax credit cannot be claimed on these taxable purchases. This puts owner occupiers on the same footing as landlords of private rental housing.

A commercial residential property is defined as providing predominantly short-term accommodation if less than 70 per cent of the property's occupants stay for 28 days or more. Short-term accommodation is treated as a taxable supply and the business must levy the full GST rate of ten percent. When a resident stays for a period longer than 27 days, the business will include the full GST rate of 10% for the first 27 days, and then must choose between either input tax status or a concessional rate of GST. If the concessional rate is chosen, GST will be calculated from the 28<sup>th</sup> day onwards at the 10% rate on half the GST-inclusive price charged over the first 27 days. To illustrate, suppose the GST – inclusive over the first 27 days is \$220 per night. The base or GST –exclusive rate is then \$200 per night. "From day 28 onwards, GST will be calculated on half the GST-inclusive price. Half \$220 is \$110. 10% of \$110 is \$11, which is then added to the base rate." (Australian Competition and Consumer Commission, 2000b, p3). From day 28 onwards a charge of \$211 will apply.

In the case of a property where the occupants are predominantly long-term residents, long-term accommodation can be treated in two different ways<sup>4</sup>. The supplier may choose to treat the supply of long-term accommodation as an input taxed supply. As in the case of residential renting, the provider will not be able to claim input tax credits for the GST they would have paid in providing that accommodation.

Alternatively, the provider of the long-term accommodation may charge a concessional rate of GST for the entirety of the long-term resident's stay. This concessional rate is the **10%** rate applied to half of the normal GST inclusive price (ACCC 2000b:2). The provider of this accommodation can then claim input tax credits on the creditable purchases made in providing this accommodation.

For example, suppose the base rate for a caravan park is a site fee of \$100 per week. This base rate incorporates any savings from the New Tax System. The GST-inclusive charge is \$110 per week for short-term accommodation providers; The GST for long-term accommodation providers opting for the concessional rate is worked out on \$55, and will be \$5.50. This is then added to the base rate of \$100 to obtain a site fee of \$105.50 per week (Australian Competition and Consumer Commission, 2000b, p2).

## **Public and Community Housing**

The GST is intended to be an activity not entity based tax. Thus public sector organizations must comply with the same requirements as private organizations. Public rental housing is typically long-term accommodation and is therefore categorized as an input tax supply as is private rental housing.

The difference between public and private rental housing providers is that the former cannot pass-on increases in operating costs into rents. Rents are set at between 20 and 25 percent of tenants' income depending upon state or territory. State governments have quarantined pension and benefit increases introduced as part of the compensation package for low-income households. Critics have noted that this implies an outflow of resources from the public housing sector that curbs the ability of agencies to maintain and supply public housing. However, the Commonwealth government increased funding under the Commonwealth and State Housing Agreement by \$269 million over three years to offset the increase in operating costs (Shelter WA 1999:1).

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<sup>4</sup> A commercial residential property is defined as providing predominantly long-term accommodation if at least seventy percent of the property's guests stay for 28 days or more.

Community housing provided by housing associations not endorsed as non-profit organizations and who supply long-term accommodation will be input taxed. In this case, the issues are the same as those raised in connection with public housing.

If endorsed as a charitable, religious or non-profit organization the GST category depends upon whether accommodation is charged at less than 75 percent of the market value or cost of supply. If these conditions are met, community housing agencies accommodation supplies will be GST-free. Since these organizations were exempt from WST, their position is unchanged. If accommodation is supplied at 75 percent or more of market value or cost of supply, accommodation supplies will be input taxed. The abolition of WST provides no benefits to endorsed community-housing organizations, thus the impact of input tax status on operating costs will be greater than that on private rental landlords.<sup>5</sup>

**Table 1 below offers a summary of the GST provisions that are applied to the different providers of rental housing.**

**Table 1. A Summary of GST Provisions in the Rental Housing Sector**

Provider		GST Tax Status	GST Tax Rate	Eligible for Input Tax Credit	Benefit From WST Removal
Private Landlord		Input Taxed Supply	Zero	Not Eligible	Yes
Commercial Residential Property <sup>1</sup>	Short-Term Accommodation Provider; opts for concessional rate	Taxable Supply if <28 days	10% for first 27 days; concessional rate thereafter	Eligible	Yes
	Short-Term Accommodation Provider; opts for input tax status	Taxable Supply if <28 days	10% for first 27 days; Input tax status thereafter	Eligible	Yes
Public Housing		Input Taxed Supply	Zero	Not Eligible	No
Community Housing	Endorsed Charitable Status	GST Free (Zero Rated) <sup>2</sup>	Zero	Eligible	No
	Not Endorsed	Input Taxed Supply	Zero	Not Eligible	Yes

Notes; 1. Includes Boarding Houses and Caravan Parks.

2. Conditional on rents charged at less than 75% of market rents or cost of supply. If not, then input taxed.

<sup>5</sup> There are also potential impacts from the GST tax treatment of donations, grants and sponsorships accepted by endorsed organizations (ATO, 2000c).

## ESTIMATES OF THE IMPACT OF THE GST ON RESIDENTIAL RENTS

The Government original estimate was that housing rents would increase by approximately 2.3 percent (Costello 1998:159,172).<sup>6</sup> However, this estimate makes no distinction between private residential rental properties and commercial residential properties with predominantly long-term residents.

The ACCC did, however, make a distinction. With an example of costs commonly faced by a landlord in the supply of residential property and the changes induced as a result of the GST, there is an increase in the rent of approximately 2.2 percent (ACCC 2000a: 2).

An example of the change in costs faced by a long-term resident in a commercial residential property (a caravan park) with predominantly long-term residents is also provided (ACCC 2000b:2-3). The owner of the site is faced with a 3.2 percent reduction in the pre-tax site fee, as a result of the accompanying changes in the NTS. With the incorporation of the GST, there is an overall increase in rent of approximately 2.1 percent. In another example involving long-term lodgings it is estimated that removal of WST and use of input tax credits cause a reduction in costs of 4.8 percent. When the concessional rate of GST is applied to this situation, there is a net increase of only 0.3 percent (ACCC 2000b:3).

The example of a long-term resident staying in lodgings predominantly utilised by short-term lodgers provides a slightly different outcome. The lodger is confronted by the full GST for the first 27 days, and a net increase of five percent. After this point, the lodger faces the concessional rate which translates to a net increase of only 0.9 percent (ACCC 2000b:3).

We believe that modelling of the impacts of the GST on the rental housing sectors has only partially captured the effects on costs. The modelling has ignored the impacts of cuts in marginal tax rates on financing costs; in addition prior changes to capital gains tax arrangements have not been taken into account. Our research question is concerned with measurement of the effects on rents of these changes, and whether their inclusion makes any significant difference to estimates of the overall impacts of the New Tax System. The analysis is particularly relevant to landlords of private rental housing and proprietors of boarding houses and caravan parks. It is of less relevance to public and community housing bodies because they are exempt from ordinary income tax on all their income. The exposition set out below is therefore only applicable to landlords subject to ordinary income tax. It assumes that the personal income and capital gains tax regime is applicable to the proprietors of boarding houses and caravan parks.

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<sup>6</sup> In May 2000 negotiations between Commonwealth, States and Territories resulted in changes to the new tax system. In view of these changes, the estimated increase was revised to 3.6%.

## ANALYTICAL FRAMEWORK

To begin with assume that a proprietor has a one-year holding period, zero transaction and operating costs, 100 percent loan financing of acquisition costs and no taxation of capital gains.<sup>7</sup> Net rental income (gross rent in the special circumstances assumed here) as a proportion of acquisition cost is denoted  $r$ , the expected rate of capital gain is  $q$ ,  $i$  is the interest rate on loan finance and  $t$  the marginal tax rate. If all economic costs are to be covered, capital gains must be such that

$$q = (1 - t)(i - r) \quad (1)$$

Which assumes that losses are deductible, so that if loan interest payments exceed net rental income, the deficit can be deducted from other sources of income.<sup>8</sup> The right hand side is after-tax losses given that in competitive markets  $r$  will be insufficient to meet  $i$ . A normal economic return requires the capital gain to exactly offset this after-tax loss. Reductions in  $t$  must then be accompanied by an increase in  $r$  if investors are to secure a normal economic rate of return.<sup>9</sup> Cuts in marginal income tax rates were of course introduced as an important part of the compensation package accompanying introduction of the GST.

We have therefore shown that the fundamental tax reform package will impact on rents even when ignoring operating costs. Though financial advisors were aware of these issues and were offering such advice to clients in the lead up to the package's introduction (Barbara Dury, Sydney Morning Herald, 3 1 2000), these potential impacts did not feature in either official statements from Commonwealth government or in independent assessments.

### The Introduction of Capital Gains Taxation

Under pre-2000 tax rules we can re-write equation (1) as

$$q - t(q - p) = (1 - t)(i - r) \quad (2)$$

Where  $p$  is the rate of inflation and the left hand side are after-tax capital gains. The fundamental tax reform package has changed the taxation of capital gains so that we now have;

$$(1 - 0.5t)q = (1 - t)(i - r) \quad (3)$$

Tax liabilities on capital gains will increase under the new tax regime if<sup>10</sup>

$$0.5tq - t(q - p) > 0 \quad (4)$$

$$\text{or } tp - 0.5tq > 0 \quad (5)$$

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<sup>7</sup> These assumptions are not necessary in order to establish the key relationships between marginal income tax rates and rents. They serve to simplify the analysis. See Wood and Watson (2001 forthcoming) and Wood (2000) where these assumptions are relaxed.

<sup>8</sup> This equality still holds when the loan – value ratio is less than one. The investor's equity stake could be realised and placed in an interest bearing account and earn  $(1-t)i$ . This after-tax opportunity cost is equal to after-tax borrowing costs by assumption. Note also that the equality assumes competitive market conditions so that excess returns are competed away in the long run, and investors all earn a normal economic return.

<sup>9</sup> This required increase might be mitigated by a reduction in  $i$  if markets respond favourably to the tax reform package. This possibility is taken into account in microsimulations that will be reported in our final report.

<sup>10</sup> This formulation assumes that capital gains do not shift the landlord (proprietor) into a higher tax bracket.

The higher is the general rate of inflation  $p$  relative to the rate of housing capital appreciation ( $q$ ), the more likely is a rise in capital gains tax (CGT) liabilities. Indeed if  $p=q$ , then CGT liabilities will increase by  $0.5tp$ . Equation (5) suggests a general rule of thumb; if the rate of house price appreciation is less than double the rate of inflation, the capital gains tax liabilities of proprietors and landlords will increase under the post-GST tax regime.

## Methodology

As in previous research work (see Wood and Watson, 2001 forthcoming and Wood, 2000) I will employ the present value model. This model invokes the condition that an investor will be willing to finance a rental development, provided the equity investment is at least equal to the present value of after-tax cash inflows and outflows over the project's economic life. This condition can be represented by a discrete time discounted cash flow equation, in which debt and equity cash flows are set equal to the value of the developer's equity investment in the project. When this equation is solved for the gross rental yield, the right hand side is a user cost-of-capital expression for rental housing. It can be interpreted as the hurdle rate which gross rental yields must at least equal in the first year of operation, if the project is to earn the required rate of return. In a competitive market setting, the user cost-of-capital expression can be used to compute the rent required to offset a tax reform's impact.

A typical project model approach will be used, in which the representative cost components of a rental housing development are defined for each of the non-mainstream providers providers.<sup>11</sup> These are inserted into the user cost expression to obtain pre- and post- tax reform measures. The effective tax burden imposed by the tax reform package is the magnitude obtained by taking the difference between pre- and post-tax reform measures of the user cost of capital. Simulations will be undertaken to test the sensitivity of estimates to key parameter assumptions. The appendix contains summaries of key studies that have employed this approach in the USA and Canada.

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<sup>11</sup> See, for example, Brueggeman, Fisher and Stern (1982), De Leeuw and Ozanne (1981), Dotzour and Levi (1995), Fisher and Lentz (1986), Gordon, et al. (1987), Follain, Hendershott and Ling (1987), Hendershott and Ling (1984), Hendershott, Follain and Ling (1987), Ling (1992), and MacNevin (1997a, 1997b).

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# APPENDIX

## Literature Review: Project Model Studies

**Brueggeman, N.B., Fisher, J.D. and Stern, J.J. (1982), Rental Housing and the Economic Recovery Tax Act of 1981, *Public Finance Quarterly*, Vol.10, No.2: pp222-241.**

The effects of 1981 tax reforms are analysed in a present value framework in which the present value of after-tax cash flows are set equal to the present value of equity invested in the property. The model is used to estimate the long run decline in real rents (and s/r increase in demand prices). Investors in rental properties occupied by low-income and “conventional” households are treated differently under the tax reforms, and a comparative analysis is undertaken. The model is calibrated for a baseline case of investment in a rental housing project in the year preceding passage of the Act.

The analytic framework. The familiar PV model is presented on page 226, and it is pointed out that if the after-tax required rate of return ( $K_i$ ) is assumed, rents can be determined given estimates of other variables. Simulations are run under different assumptions about inflation and real interest rates.

Parameterization. Table 2 lists the baseline case assumptions. Note that an economic life and holding period of 70 and 30 years is adopted respectively. Instead of assuming a constant rate of increase in nominal rents, the authors adopt a specification in which the rate of increase declines as  $t$  approaches 70 years. However, operating costs rise in line with inflation. The discount rate, or required return on equity ( $K_i$ ) is set equal to the after-tax yield on the prevailing mortgage interest rate, adjusted by a risk premium.

The present value model is used to identify the optimal holding period, defined as the year of sale in which net tax benefits are maximized. Transaction costs are also incorporated (p232). Before the 1981 ERTA, the optimal holding period was between 20 to 30 years, while after ERTA it is slightly less than 15 years.

Simulation results. Under one set of simulations, the inflation rate is set at 10%, and mortgage interest rates range from 15% to 17%.

Under a second set of assumptions, the inflation rate declines from 10% to 6% while interest rates decline to a range from 9.5% to 12%. This implies an increase in real pre-tax interest rates, reflecting an assumed general equilibrium response to the incentives for industrial capital provided by ERTA (or restrictive monetary policy viewed as a prerequisite to lower inflation).

In respect of  $K$ , a 3% risk premium is added to the after-tax mortgage interest rates. They acknowledge that investment in low-income housing may be more risky, but there is no evidence on this issue.

The present value model estimates of decline in rents, assume that investors instantaneously compete away short-run increases in demand price by increasing the supply of housing. The estimate therefore represents a maximum value.

The simulations indicate that the percentage reduction in rent is lower the higher is the real mortgage interest rate. Simulations are conducted for holding periods of 30 and 15 years. The impact of ERTA is much greater (on rent-value ratios) when there is a reduced holding period of 15 years.

The authors are cautious about estimates for rent-value ratios on low-income properties. The estimates are likely to be underestimated if they are more costly to operate due to rent losses (and higher maintenance costs), or more risky than conventional properties because of greater variability in rents and capital gains.

**Fisher, J.D. and Lentz, G.H. (1986), Tax Reform and the Value of Real Estate Income Property, *AREUEA Journal*, Vol.14, No.2: pp287-315.**

This paper measures the impact of the Treasury department's proposals to reform the federal income tax code so that it approximates tax neutrality wrt the taxation of income from invested capital. It also examines the impact of the Reagan administration's proposal's, which depart from the Treasury's in retaining some tax preferences.

The impact of these two measures is measured by reference to the tax burden on income-producing real estate (the effective tax rate), and the user cost of real estate assets.

Tax neutrality and tax reform. The authors begin by examining how taxation would operate under a comprehensive income base corresponding to that of the Haig-Simons concept of taxable income. They introduce or explain why economic depreciation is a deductible cost, but I do not follow (p289). They also explain how neutrality would be achieved in the presence of inflation.

Summary of the Treasury Department's proposals for tax reform. Under the proposals, real capital gains would be taxed on realization, and the authors note that retention of the realization principle "provides a tax benefit by deferring the recognition of any real gain." Under the proposed system of tax depreciation, the rate of economic depreciation is set at 3%.

Reagan Administration's proposals for tax reform. For real estate investors, it would appear that the gain on sale of income producing real estate would be taxed as ordinary income, but indexed for inflation.

The analytical framework and assumptions. On pp295-296 we are offered the following assumption. "The user cost of capital is defined as the rental price of a capital asset per dollar of asset value (cost) that is charged by the owner of the asset to a renter-user under presumed conditions of long-run market equilibrium". Under these conditions, the level of net rent (rent net of operating expenses) is assumed to be just sufficient to permit the owner of the asset to recover the full economic costs of the investment. The net rent must cover taxes, which are a cost of holding an asset.

The user cost is obtained from a discounted cash flow model;

$$V_o = \sum_{i=1}^n \frac{NOI_i(1 - t_o) - DS_i + t_o(D_i + \alpha I_i)}{(1 + K_A)^i}$$

$$+ \frac{V_n - \beta_n - S_n = G_n t_g - RCD_n t_o^n}{(1 + K_A)}$$

where  $DS_i$  – debt service (principal and interest) in year  $i$ ,  $l_i$  = the mortgage interest in year  $i$ ,  $\alpha$  the portion of interest that is deductible for tax purposes,  $\beta_0$  is the initial loan balance,  $\beta_n$  is the loan balance at the end of the holding period,  $V_0$  is the initial cost of the investment,  $n$  is the holding period (years),  $K_A$  is the nominal after-tax discount rate (for equity cash flow),  $NO1_i$  is net operating income,  $D_i$  is tax depreciation taken in year  $i$ ,  $t_o$  is the marginal ordinary income tax rate (assumed to be constant),  $t_g$  is the marginal capital gains tax rate (assumed to be constant),  $V_n$  is the estimated property value and selling price in year  $n$ ,  $S_n$  is selling and other transaction costs in year  $n$ ,  $G_n$  is capital gain, net of selling costs ( $S_n$ ), resulting from sale in year  $n$ , and,  $RCD_n$  is depreciation recaptured upon sale.

This equation sets the asset cost (value) equal to the present value of the debt and equity claims. Note that if  $\beta_0$  is taken over to the  $lh_s$ , the  $lh_s$  of the equation represents the value of the investor's equity stake. In equilibrium this is set equal to the present value of after-tax cash flows paid and received by the equity investor from operating and selling the investment. If  $K_A$  is equal to the interest rate on the debt, then  $\beta_0$  cancels out and the equation corresponds to the capital budgeting approach/model.

The equation is rearranged and solved for  $NO1$  for the first period of operation. If the asset cost/value  $V_0$  is assumed to be exogenous, the rearranged form of the model forces all of the adjustment to be reflected in user cost or  $NO1$ . In the rearranged PV model, the fraction  $1/1 - t_o$  converts the  $rh_s$  variables into taxable income equivalents i.e. the pre-tax values that ensure an after-tax return equal to  $K_A$ .

Assumptions employed in this study. The PV model is calibrated with respect to the building component of the real estate investment component. All cash flows are assumed to be annual and received at the end of the year. A typical holding period of ten years is chosen, based on a survey by Real Estate Research Corporation. A loan of 75% of the value of the property is assumed.

In order to measure the effect of tax law changes at different inflation rates, it is important to take into consideration the effect of inflation on nominal interest rate and hence  $K_a$ . Two models are experimented with; the strict Fisher hypothesis

$$i = r + f$$

where  $r$  is the real before-tax interest rate, and

$$i = r + f / (1 - t_o)$$

which is the modified Fisher hypothesis. Nominal interest rates have been modeled in both ways. The discount rate or required after-tax rate of return on equity will, in market equilibrium, differ from after-tax interest rates by a risk premium ( $p$ ). "Business risk alone is assumed to be 2%, and the total risk premium is expressed as

$$p = \frac{2\%}{1 - \beta_0} V_0$$

where  $\beta_o / V_o$  is the ratio of debt to property value

Economic depreciation. Occurs at a constant annual rate of 3% in accordance with the declining balance (geometric) pattern. The marginal real estate investor is assumed to be an investor in the 46% marginal tax bracket. House price inflation is assumed to be equal to the general rate of inflation, which is fully anticipated and equally affects rents and expenses.

The results indicate sensitivity to chosen rates of inflation (0%, 4% and 8%). In the conclusion, the authors argue that because economic returns replace tax shelter motivations, real estate should be more attractive to a broader range of investors.

**Follain, J.R., Hendershott, P.H. and Ling, D.C. (1987), Understanding the Real Estate Provisions of Tax Reform: Motivation and Impact, *National Tax Journal*, Vol.3: pp363-372.**

The authors simulate the impacts of the 1986 Tax Reform Act using the “typical project model”, which is a model that

“begins with assumptions regarding the initial loan-ratio, the debt rate, the tax rate of the marginal investor, and the required rate of return on equity. The model computes the minimum rent needed in the first year of operation of the project to equate the net present value of all after-tax cash flows associated with the project, discounted by the equity rate, to zero”.

In the author’s view, a major problem with the typical project model concerns the equity rate ( $e$ ). Economists typically specify this as an opportunity cost rate plus a risk premium. But financial economists would employ an after-tax capital asset pricing model, where  $e$  is dependent upon the loan-value ration ( $v$ ) (see equation 1). In the typical project model, a constant discount rate is chosen for all future cash flows. However, because  $v$  falls so must  $e$ .

Somewhat obscurely, the authors explain that they use a weighted average cost of capital approach, debt payments are not included in the cash flows and they are able to obtain a  $e$  which is independent of  $v$ .

**Follain, J.R. and Ling, D.C. (1988), Another Look at Tenure Choice, Inflation and Taxes, *AREUEA Journal*.**

Authors examine the impact of inflation on the relative cost of owner versus renter housing. They note that accelerating inflation lowers the user cost of owner occupied housing, but if it lowers the user cost of renter housing even more, then the rate of homeownership could decline.

In section 2 they develop a simple one-period user cost model. For homeowners the equilibrium rental price  $R_e$  is

$$R_e = uc_o = [(1 - t_y)(i + pt) + m + \sigma - \pi]P \quad (1)$$

where  $uc_o$  is user cost (owner),  $t_y$  is the marginal tax rate of the household,  $i$  is the nominal risk-free debt rate,  $pt$  is the property tax rate,  $\sigma$  is the rate of economic depreciation,  $m$  is the rate of miscellaneous expenses,  $\pi$  is the anticipated rate of

inflation and  $P$  is the real price per unit of housing stock. Provided  $\partial i / \partial \pi < 1 / (1 - t_y)$  inflation reduces  $uc_o$ .

The different tax treatment of private investors yields an equilibrium rental price of

$$R_e = uc_r : [(i + pt + m + \delta^*) - (\delta^* - \delta) / (1 - t_L) - (1 - \lambda t_L) \pi / (1 - t_L)] P \quad (2)$$

where  $\delta^*$  is the rate of depreciation allowed for tax purposes and  $\lambda$  is the rate of preferential tax treatment of capital gains.<sup>12</sup> We can then ask, at what tax rate will the individual be indifferent between investing in rental housing or owner occupied housing. This is found by equating (1) and (2), then solving for  $t_y$ , to obtain the breakeven tax rate ( $t^*$ )

$$t^* = \frac{t_L [(\delta^* - \delta) + (1 - \lambda) \pi]}{(1 - t_L)(i + pt)} \quad (3)$$

If  $t_y > t^*$ , the individual will invest in owner occupied housing. Note that an unambiguous increase in  $t_y$  lowers  $uc_o$ , but a rise in  $t_L$  will not necessarily reduce  $uc_r$ . Can we employ this in the private investor context? It implies that  $t_y > t^*$  the potential investor is better off increasing holdings of owner occupied housing. But it also has a somewhat different interpretation; the higher is  $t_L$ , the higher is the hurdle rate that  $t_y$  must exceed if investment in owner occupied housing is to be more worthwhile. Increasing the range of tax expenditures will increase  $t^*$  for our sample of private investors.

Under Australian tax arrangements the after-tax rental income, when equated with after-tax user costs is

$$(1 - t_L) R_m = uc_r = [(1 - t_L) l (1 - \beta) + (1 - \beta) (\gamma_s d - q) + (1 - t_L) t_r] P \quad (4)$$

where we have ignored land taxes. For the owner occupier, whose notional rental income is untaxed

$$R_o = uc_r = \left[ (1 - t_y) i (1 - \beta) + t_y i \alpha + \left( 1 + \frac{\alpha t_y}{1 - t_y} - \beta \right) (\gamma_s d - q) + t_r \right] f \quad (5)$$

For the individual to be indifferent between investing in owner occupied or rental housing  $(1 - t_L) R_m = uc_r = R_o = uc_o$ . On solving for  $t_L = t^*$  by setting (4) = (5) we obtain

$$t^* = t_y \frac{\left[ i(1 - \beta) - i\alpha - \frac{\alpha}{1 - t_y} (\gamma_s d - q) \right]}{i(1 - \beta) + t_r} \quad (6)$$

As long as  $t_L > t^*$  the individual will choose to invest in rental housing. Note that  $(1 - t_y) l > (q - \gamma_s d)$  is a necessary condition for equilibrium, and therefore

$$\partial t^* / \partial \alpha < 0.$$

<sup>12</sup>  $T_L$  is the tax rate of the marginal investor if investing in rental housing.

ie. the breakeven tax rate is lower the more highly geared is the investor.

Simulations can be conducted to identify the critical value of  $t^*$  in high cost and low cost segments of the market.

Alternatively the simulations can be conducted in terms of a critical value  $\alpha^*$  at which the individual is indifferent between investing in owner occupied housing or rental housing. This  $\alpha^*$  is given by

$$\alpha^* = \frac{i(1-\beta) - \frac{t_L}{t_y} [i(i-\beta) + t_r]}{i + \frac{(\gamma_s d - q)}{1-t_y}}$$

If  $\alpha > \alpha^*$  the individual will choose to invest in rental housing.

Note that  $\frac{\partial \alpha^*}{\partial t_L} < 0$ . Also  $\frac{\partial \alpha^*}{\partial q} > 0$ .

**Gordon, R.H., Hines Jr., J.R. and Summers, L.H. (1987), *The Effects of Taxation on Capital Accumulation in Feldstein, M. (ed.), Notes on the Tax Treatment of Structures*, Chicago, Chicago University Press.**

The authors argue the following proposition "... the conventional view that the tax system is biased in favour of homeownership is wrong. Because of the possibility of tax arbitrage between high-bracket landlords and low-bracket tenant, the tax system has long favoured rental over ownership for most landlords".

The analytical framework is based on Titman's break-even model, in which the rent-value ratios are, in long run equilibrium, equal to user cost per dollar of property value. It is assumed that because top-bracket landlords are able to charge the lowest rents, they represent the marginal supplier of rental housing.

In the USA, the user cost of owner-occupied housing  $C_o$  for a taxpayer in the  $t_p$  per cent tax bracket is

$$C_o = (1 - t_p)(i + p_t) - \pi + n + \delta \quad (1)$$

where  $p_t$  is the property tax rate,  $\pi$  is the inflation rate,  $n$  is maintenance costs and  $\delta$  is the sum of the depreciation rate and risk premium. For top-bracket landlords, we have (at top bracket  $t^*$ )

$$C_r = \frac{[(1 - t^*)i - \pi + \delta](1 - t^*z)}{(1 - t^*)} + p_t + n \quad (2)$$

where  $z$  represents the present value of depreciation allowances permitted for tax purposes. Note that this would be identical to the Australian expression if  $z = 0$ .

Taxpayers will prefer to rent rather than own if  $C_o > C_r$ , which occurs if  $t_p$  is less than the break-even tax rate ( $t^*$ ) obtained by setting (1) = (2) and solving for  $t_p$ .

This break-even tax rate is obtained/measured for 1965-'85, using  $p_t = 0.02$  and  $\delta = 0.014$  following the assumptions in DeLeew and Ozanne. Note that 0.014 is applied to property value, while our parameter is applied only to ratio of building structure to property value. A 0.04 premium is added to  $\delta$  in order to adjust the cost of asset depreciation for risk. Expectations of inflation are represented by a distributed lag on past inflation.

The results show that before 1982, the high max. personal tax bracket encouraged most taxpayers to rent their dwellings from top-bracket individuals. On recent trends they argue: "... it is hard to escape the conclusion that falling personal taxes have undone changes in the depreciation provisions to make homeownership much more attractive in recent years". So why is homeownership so predominant? Their answer is the moral hazard problem associated with rental contracts; these problems are solved when people rent from themselves as with owner-occupied housing.

The discussant (Sunley) points out that their conclusions are contradicted by the facts. For most groups in recent years, homeownership rates have declined when the break-even tax model predicts that it should be increasing. The rapid increase in homeownership rates occurred when the model suggests that renting was most tax favoured.

Sunley argues that Gordon et.al's critical assumption – the marginal supplier comes from top-bracket landlords – is wrong. There are not enough top-bracket investors with a net worth sufficient to hold all depreciable rental estate. This limits the tax arbitrage effect. A more realistic tax rate for marginal suppliers would have resulted in different conclusions.

**Hendershott, P.H., Follain, J.R. and Ling, D.C., Effects on Real Estate in J.A. Pechman (ed.) (1987), Tax Reform and the US Economy.**

The Tax Reform Act of 1986 introduced provisions that generally tax investment activities more heavily. This study evaluates the impacts on Real Estate given a fall in interest rates that is expected given a reduced demand for investable funds. Allowance for interest rate effects significantly alters the impacts. In the simulations, a 1% decline in US interest rates is assumed. The major thrust of the reforms was reduction in the marginal rates of tax, financed by expansion in the tax base attributable to limits of tax shelters. Of the latter, the most relevant are:

- the introduction of a new income class; - passive income – that which is generated from business and trade activities in which the taxpayer does not materially participate, and from rental activities such as real estate;
- losses from passive activities can be offset against passive income. Losses that cannot be claimed as an offset in any one year, can be banked and used to offset passive income in future years;
- there is a partial exemption for "small" landlords with gross income less than \$100,000; \$25,000 of losses can be deducted from non-passive income;
- interest expenses on loans to finance investment activities can only be offset against net investment income. (Previously, net investment income +

\$10,000). Excess interest expense can be banked. Real estate is not subject to the interest expenses limitation, including owner occupied housing;

Parameterization. The following assumptions are of particular interest:

- Differential depreciation rates of rents (2½%) and structure price (3%).
- Required after-tax return on equity (e) given by

$$e = (1 - t^*) \left[ i + \frac{\beta}{1 - v} (rm - i) \right]$$

where  $t^*$  is weighted average of the taxpayer's income and effective capital gains tax rates,  $i$  is the risk-free interest rate,  $\beta$  is the measure of the covariance of an unlevered real estate investment with the market return (assumed to be 0.5),  $v$  is the loan-value ratio and  $rm-i$  the excess of the market portfolio return over  $i$ .

Simulations are based on a discounted cash flow model in which the long-run equilibrium level of rent is the initial rent that would equate the upv of the investment to zero for a given set of assumptions (inflation,  $i$  and  $e$ ).

P85. Apparently the TRA removes the capital gains tax exclusion for real estate. The effects are negligible, and authors list the reasons.

. Apparently the TRA removes the capital gains tax exclusion for real estate. The effects are negligible, and authors list the reasons.

J. Yinger. Comments

Some useful points on method. The approach assumes that investors must earn an equal return on all investments ie. the long-run supply of funds to each investment alternative is perfectly elastic (perfect capital markets). This enables the authors to compute the rent required to offset the act's impact on the returns to investment in housing.

There is an oversimplified characterisation of housing supply. The rent calculation is carried out for a single investor (representative) in newly constructed rental housing, not a distribution of investors, with different characteristics, who provide rental housing from existing housing with varying maintenance ... etc.

The authors long-run changes in equilibrium rent per dollar of capital value (investment) when increases are project, how can these come about?

- the rent on each rental housing unit could go up, with no change in capital value (market price).
- the capital value could drop, with no change in rent per apartment.

The second possibility is more likely as rents are sticky in the short run – this establishing a short-run equilibrium. For new construction the capital value (market price) must at least equal construction, so the TRA will greatly reduce new construction until new apartment rents rise.

Finally, in footnote 18 it is argued that the author assume a horizontal supply curve, so that rent per unit is determined entirely on the supply side.

**Hendershott, P.H. and Ling, D.C. (1984), Prospective Changes in Tax Law and the Value of Depreciable Real Estate, *AREUA Journal*, Vol.12, No.3: pp297-317.**

Authors estimate the impact of prospective changes in tax law that will increase the tax lives of property. The study has two novel aspects:

- though a conventional discounted cash flow equation is used as the basis for valuation, a dynamic programming algorithm is employed to determine the optimal year of sale, sale price in that year and depreciation method;
- there is explicit consideration of the supply side, using

$$Q_s = \alpha P^\beta \quad \text{- supply equation} \quad (1)$$

$$Q_d = aR^b \quad \text{- demand equation} \quad (2)$$

and solving for P,

$$P = ZR^\gamma \quad (3)$$

where  $Z = (\partial/\alpha)^\beta$  and  $\gamma = b/\beta$ . P is obtained from the valuation equation.  $\beta$  and b are obtained from previous econometric studies. On insertion into (3) the authors obtain estimates of R.

These simulations could also be used in our own study.

Parametization. The opportunity cost of equity capital (discount rate) is the after-tax mortgage interest rate for low income to medium income investors. For high income investors, it is set equal to the rate on tax-exempt municipal lands, that have generally been 70% of the nominal interest rate. A risk premium of 8% is added.

The nominal mortgage interest rate bears a fixed relationship (Fisher interest rates) to the expected rate of inflation, which imply that the real after-tax discount rate declines with increases in anticipated inflation.

**Ling, D.C. (1992), Real Estate Values, Federal Income Taxation and the Importance of Local Market Conditions, *Journal of the American Real Estate and Urban Economics Association*, Vol.20(1), pp122-139.**

Ling distinguishes between two versions of the typical project model. In the first, “the model computes the minimum rent needed in the first year of operation of the project to equate the net present value of the after-tax cash flows associated with the project, discounted by the appropriate rate, to zero”. The approach is partial equilibrium, in that tax induced changes in market interest rates and risk premiums, are ignored. Furthermore, the comparative static exercises employing the typical project model assume that the market is initially in long run equilibrium. Given perfectly elastic supply, there will be instantaneous adjustment to the new long run equilibrium rent levels post-reform. This instantaneous adjustment is illustrated in diagram 1 over the page, where  $ER^0$  is the initial long run equilibrium and  $ER^n$ , is the

post-tax reform long run equilibrium rent. The area between the horizontal lines is the value of the increased tax benefits.

In the second version of the project model, the long run supply of real estate is assumed to be perfectly inelastic; real rent levels are assumed to be unaffected by the tax reform, and the full affect of the latter is capitalized into current market prices. “The model computes the maximum price that investors can afford to pay for the expected rent stream under both old and new tax law”

Ling’s approach is more sophisticated. He assumes that supply is less than perfectly elastic, and hence market clearing real rental rates fall gradually, as new construction adds to the existing stock. The faster is this adjustment, the steeper is the trajectory of real rents as they adjust a line such as  $ER^0-A$ . Furthermore, part of the tax benefits – the shaded area in figure 1 – will be immediately capitalized into market prices of existing properties. This area is the excess of current market clearing rents over long run equilibrium rent.

The discrete-time discounted cash flow equation reflects a capital budgeting approach, in which debt inflows and outflows are not included in the projected cash flows. The left hand side of the equation is the acquisition price/current market price. Future cash flows are discounted at a weighted average cost of capital that includes a risk premium. This discount rate is invariant to the loan-value ratio.

The project model includes an adjustment parameter; it assumes a 10 year holding period and analyses the impact of eliminating capital gain taxation.

**MacNevin, A.S. (1997a), Marginal Effective Tax Rates on Canadian Rental Housing Investments: An Asset Pricing Model Approach, *Public Finance Review*, Vol.25, No.3: pp306-326.**

The Asset Pricing model approach seems very similar to that which I invoke. It is based on the “assumption that rental housing investors achieve a target after-tax return (rate of) from the net present value of total cash flow from the property over an optimal holding period. The target rate of return is assumed to equal the risk-adjusted expected return on alternative marginal investments”.

The equation defining or representing this equilibrium condition equates the current value of a rental housing investment to the net present value of total cash flow from the property over the investment period. My equilibrium condition equates the net present value of this total cash flow to the net present value of the return on the next best alternative asset. I suspect that this is two equivalent ways of getting to the same result. I should experiment, by working through the solution to the asset pricing model.

A second, and more important difference, is that I assume an infinite asset holding period. MacNevin chooses an exogenously determined holding period, which in the base case is 15 years. My framework can be adapted.

A third difference is that I assume a discount rate – ie. the required rate of return on equity – which is equal to the after-tax interest rate on debt. As a result, my real cost of finance term is independent of the loan-value ratio. This is convenient, as the investor’s outstanding loan is not known from the ABS Rental Investor’s survey.

MacNevin is to choose the initial property value, the discount rate, the (expected) inflation rate, the rate of economic depreciation, the income tax rate and the effective rate of tax on capital gains as exogenous variables. This enables him to solve interactively for the components of his asset price model equation, including the rental income flow. In order to isolate the effect of changes in the exogenous variables, the debt/equity ratio is maintained constant. This is achieved by means of a term that represents a process of continual re-financing.

A problem I have is that MacNevin's asset pricing model is misspecified. The l.h.s. of equation (5) should be the investor's equity stake, not the initial value of the property.

Specific points. Footnote 4 clarifies the summation procedures. Stock values are measured at the beginning of the period in question, while flow values are paid or earned at the end of the year to which they relate.

The simulations are reported for a variety of assumed holding periods, inflation rates and real interest rates.

**MacNevin, A.S. (1997b), Tax Effects on Rental Housing in Halifax, Nova Scotia, *Canadian Tax Journal*, Vol.45, No.1: pp87-113.**

A more detailed exposition than that presented in Public Finance Review. It is emphasized that the Rental Housing Asset Price Model is "based on the premise that adjustments to changes in exogenous parameter values is instantaneous" ... and that "adjustment to any exogenous shock is assumed to take place through the level of rents".<sup>13</sup> This analytical approach does not provide any information on the magnitude of any induced changes in the stock of rental housing units.

It would be more correct to say that this approach yields the rent or gross rates of return at which personal investors are prepared to lease their property investment, given various assumptions about the values of exogenous variables.

Empirical simulations. The depreciation rate applicable to buildings is set at 3.3%. The average ratio of building value to total property value is set at 0.79. The expected inflation rate is assumed to be 2 per cent. Both building and land components are assumed to increase at the expected rate of inflation. For the Federal income tax rate, a weighted average rate is employed.

Note that if simulations are conducted with respect to expected inflation rates, assumptions must be made about parallel movements in the nominal interests ie. tax-adjusted Fisher effect? The precise form that this takes will convey implications for the real interest rate (pre-tax). (In addition, simulations can be conducted for alternative values of the real interest rate? ie changes in the nominal interest rate, holding expected inflation constant.)

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<sup>13</sup> It is assumed that property values are fixed, which implies an infinite long-run supply elasticity in the view of MacNevin.