DP2008/06

The tax system and housing demand in New Zealand

David Hargreaves

February 2008

JEL classification: H21, R21

Discussion Paper Series

DP2008/06

The tax system and housing demand in New Zealand[1]

Abstract

This paper uses a simple model to illustrate the influence of the tax system on New Zealand's housing market and analyses several alternative tax treatments. This analysis informed the Reserve Bank's (2007) comments on the tax system and housing in a recent submission to the New Zealand parliament's Finance and Expenditure Committee. Reflecting present tax policy, two key tax distortions that encourage property investment are factored into our model. First, capital gains on property are often not taxed, but all interest earnings are (and interest payments are fully tax deductible for geared landlords). Second, owner occupiers do not pay rent out of their after tax income. All else equal, these distortions imply it is often more tax efficient to accrue capital gains than interest earnings, and it is tax efficient to own your own home if it is unmortgaged or lightly mortgaged. Moreover, inflation makes the distortions more significant as real assets like houses will tend to rise in capital value over time in an inflationary environment. In the simple model used in this paper, these distortions have important effects on house prices. However, various simplistic features of the model imply it likely overstates the implications of the distortions and no particular connection is made from these distortions to the recent housing cycle. That said, shifting to a system where only real (instead of nominal) interest flows are taxable or deductible would substantially reduce the tax distortions. A range of other possible policies are examined, but they tend to either be less effective in reducing the distortion, or appear harder to implement.

[1] The views expressed in this paper are those of the author and do not necessarily reflect the views of the Reserve Bank of New Zealand. The author thanks Phil Briggs, Andrew Coleman, Ian Harrison, and Michael Reddell (RBNZ) and Geoff Leggett (IRD) for comments and suggestions. Staff at the NZ Treasury, and participants at workshops at the Reserve Bank and NZ Treasury also provided valuable comments. Any remaining errors are the author's responsibility. Contact information: Financial Stability Department, Reserve Bank of New Zealand, 2 The Terrace, PO Box 2498, Wellington; phone +64 4 471 3665 (direct line) or +64 472 2029; fax +64 4 473 1209; email david.hargreaves@rbnz.govt.nz.

ISSN 1175-4117

1 Introduction

We analyse the New Zealand tax system and its impact on the desire to hold residential property. In New Zealand, certain sorts of capital gain are untaxed, while all interest returns are taxed (and interest costs are tax deductible). This can create a significant incentive to earn capital gains rather than interest. Additionally, owner occupiers can effectively earn 'rent' by occupying their own homes without tax implications.

These distortions are likely to lead to associated efficiency costs from misallocated resources. For example, the relatively favourable status of capital gains makes the value of property higher, probably means we build bigger houses, and (in our model) also makes the value of property more volatile. The volatility arises because capital gains are 'worth more' relative to other returns (when they are tax free) – so when expected future capital growth fluctuates the percentage impact on today's valuation is larger. This could make house prices more cyclical and may contribute to macroeconomic volatility more generally.

These distortions could be removed through redefinitions of the tax base. We analyse the effects of shifting to a system where only real (instead of nominal) interest flows are taxable or deductible, and show this would substantially reduce the tax distortion. A range of other possible policies are examined, but they tend to either be less effective in reducing the distortion, or appear harder to implement.

The conceptual basis for taxation of rental housing is broadly comparable to the conceptual basis for the taxation of share investments. On this basis, there is "no tax advantage" to investing in property. However, while capital gains are probably treated in similar ways, there is still a substantive distortion, which is between assets that tend to accrue capital gains over time (houses and equities[2]) and interest bearing assets. This distortion was particularly significant when New Zealand and other economies had higher inflation rate in the 1970s and early 1980s, and there was active consideration of possible remedies within the Reserve Bank at that time[3]. While the distortions are less substantial in a low inflation environment, the analysis in this paper suggests they are likely to still be significant, as has also been noted in other reviews of investment taxation such as the 2001 McLeod tax review.

[2] Other commentators, such as the IMF, have made the separate point that favourable tax treatment of capital gains is more of an advantage for housing investors than share investors because portfolios of housing can be more highly geared without attracting undue risk. We don't deal with that issue in this paper.

[3] See for example Reserve Bank (1980,1981).

2 A discounted cashflow model of property purchase

A paper by Poterba (1992) contains an example of a model treating the decision to purchase a property as a discounted cashflow decision. More recently, this sort of model has been applied in work by Giroud *et al*. (2006) and in New Zealand by Stephens (2007).

The discounted cashflow model used in Stephens (2007) values houses based on assumptions about:

- annual rent flows (*A*),
- mortgage interest rates (*i*),
- costs of ownership (*f*) (assumed to be a fixed proportion of property values, and all tax deductable)
- expected capital gain (*g*), which is also the expected growth rate of rents, and
- tax rates (*t*).

The valuation model works by equating the returns from holding property to the costs of holding (after tax deductions) the property if the investor has a 100% mortgage, and their capital gains are not taxable:

$$A(1-t) + Vg = V(i+f)(1-t) \quad (1)$$

Rearranging we have:

$$V = \frac{A(1-t)}{(i+f)(1-t)-g} \quad (2)$$

Since an investor with 100% mortgage has contributed no equity, we can assume that a willing supply of landlords (perfect competition) drives expected returns for this position to zero, and this leads to equation (1) and (2). The left hand side of equation one shows returns: rent (taxed) and capital gain (assumed to be tax free in this case and in most of the discussion in this paper). The right hand side shows interest and other expenses (which are reduced by the fact they are tax deductible).

It is instructive to examine the underlying assumptions of this model further. We are treating A, i, f and g as fixed. This is only going to be defensible under certain strong conditions (e.g. a view that population and the supply of houses are fixed). We discuss this further in Appendix One.

Appendix One also discusses the fact that this valuation equation is based around a 100% geared landlord. An mortgage free landlord would face a different cost of funds $r(1-t_c)$, where r is the bank deposit rate and t_c is the top marginal tax rate on capital income[4]. The ungeared landlord's valuation equation is then:

$$V = \frac{A(1-t)}{r(1-t_c)+f(1-t)-g} \quad (3)$$

[4] Capital income is any income earned by investing (including, for example, interest and capital gains).

Parameterising the model

In Table 1 below we report our baseline calibration and compared it to the parameterisation in Stephens (2007). We also show how the value of a house changes when tax rates are cut under the two parameterisations.

Stephens (2007) initially calibrates the model to 1999 conditions. He uses data on average rents at the time ($10,261), interest rates (9%), and an expected capital gain that is set to 3.3% plus expected inflation from surveys (this gives him 5.3% in 1999 and 6% in 2007 for expected nominal capital gain). The 'other costs' of home ownership appear to be a calibration choice which is used to make the model roughly fit 1999 house prices. He sets this equal to 5.25%. This appears a pretty large number, implying that a $200,000 rental property faces $11,000 in various tax deductible expenses every year. The reason it needs to be a large number is that the assumed capital gain (g) is close to i(1-t). If g was equal to i(1-t), in the absence of these other costs proportionate to property value, house prices would rise to infinity.

In our alternative calibration a lower expected capital gain (1.3% real or 4% nominal using the Stephens inflation assumption) and lower tax deductible expenses (1.8%) are assumed. This gives similar baseline results but, importantly, reduces the extent to which changes in the personal tax rate affect house prices. Stephens (2007) reported that a cut in the top marginal tax rate from 39% to 33% would cut house prices by around 15%, and that was after an ancillary assumption that rents would rise by 8% (as a result of the tax cut increasing income and reducing demand to hold rental property). Using our calibration the equivalent price fall is 8%.

Table 1
Property Values as Tax Rates Change (for different assumptions)

	Rent	Interest	Expected gain	Other costs	Tax	Investor value	Change
Baseline model	10,600	8.0%	4.0%	1.8%	39.0%	326,896	
Baseline with tax cut	11,550	8.0%	4.0%	1.8%	33.0%	301,578	-7.7%
Stephens model	10,600	8.0%	6.1%	5.25%	39.0%	326,154	
Stephens with tax cut	11,550	8.0%	6.1%	5.25%	33.0%	278,614	-14.6%

Our parameterisation reduces the scale of the impact of marginal tax rates on property values. Furthermore, as argued further below we believe the model will still tend to overstate the impact of tax on valuations. On balance, it seems likely that changing marginal income tax rates can alter property values, but probably not to the extent suggested in Stephens (2007).

Owner Occupiers

In the New Zealand tax system, owner occupiers can't deduct mortgage interest or housing costs (f), but receive tax free 'inputed rent': that is, they can live in their home tax free. If they have sufficient net worth to own the house mortgage free and have a required rate of return $r(1-t_c)$ the value of the property to them is $V = A/(r(1-t_c)+f-g)$. The owner occupier's house value (if mortgage free) will typically be higher than the value of the house to a geared landlord[5]. On the other hand, the value of the house to an owner occupier with a 100% mortgage is A/((i+f)-g). This is always going to be *less* than the property value for a geared landlord (the loss of tax deductions matters more than the tax free imputed rent).

A numerical example of all 4 potential owners of a home follows. If A=10,000, i=8%, r=7.2% f =2% and g =4%, t=39%, and t_c=33% we have the following valuations:

$$\text{100\% mortgaged landlord value } V = \frac{A(1-t)}{(i+f)(1-t)-g} = 290{,}000$$

$$\text{unmortgaged landlord value } = \frac{A(1-t)}{r(1-t_c)+f(1-t)-g} = 298{,}000$$

$$\text{100\% mortgaged owner occupier value } = \frac{A}{i+f-g} = 167{,}000$$

$$\text{unmortgaged owner occupier } = = \frac{A}{r(1-t_c)+f-g} = 354{,}000$$

The "non-distorted" valuation of the house (abstracting for a moment from the disparity between mortgage interest rates and deposit rates) is the value to the mortgaged owner occupier. This is the value of the discounted stream of rents, given other costs, in the absence of taxation. The reason the fully mortgaged owner occupier values the house at this value is that none of their returns or expenses associated with homeownership have tax implications.

An investor can often receive capital gain tax free, which raises the value they are willing to pay for the house since interest income is not tax free and interest costs are fully deductible.
An unmortgaged owner occupier receives capital gains tax free and avoids having to pay rent out of after-tax income (alternatively, this can be described by saying the 'imputed rent' that the occupier derives from living in the house is untaxed). This puts them in an even better position.

These differences in valuation are large, and likely to overstate the sort of tax-related distortions arising in the real world:

[5] If g is sufficiently high, this may not be true. With very high g, i and ρ_o (e.g. in a high inflation environment), tax deductability of interest is more of an advantage than the tax free imputed rent the owner occupier receives.

- Firstly, there is probably a limit to the extent to which individuals allow tax considerations to influence their investment decisions, which will partly reflect the fact that tax regimes can change in the future. Our model assumes tax policies are perceived to be permanent and capitalised into asset prices accordingly.
- Secondly, the idea of a permanently fully geared homeowner is too stark. In reality most investors and owner occupiers will see declining loan to value ratios over time as they pay off the original mortgage and the house value rises. Thus a fully geared owner occupier can bid more than our model assumes in the knowledge that they will not be fully geared in the future, reducing the valuation disparity between them and other homeowners.
- Finally, in calculating the value to a landlord it is assumed the alternative investment choice is to place funds in a bank account. In reality, there are a range of assets (e.g. equities) available to NZ investors. Like housing, many of these assets earn part of their return in the form of (typically untaxed) capital gains. The availability of these alternatives will make investors less willing to bid the price of housing up to the point where expected returns are no higher than the interest rate on bank deposits.

Nevertheless, a proportion of these estimated tax related valuation disparities are likely to be genuine. As people respond to these incentives, the impacts on demand and supply of housing will be fairly complex. Some likely implications of these incentives include the following:

- People with sufficient net wealth to own their own home mortgage free will tend to do so.
- People will tend to own a larger home than they would in the absence of the tax distortions, since ownership is tax preferred.
- People with low net worth are relatively likely to rent a house, even if they could service a mortgage. They may even rent the house they live in while owning another rental, since this can create tax advantages.
- House prices will be higher than in the absence of these distortions, since many people are willing to pay more than the 'distortion free' price.
- Rental yields will tend to be lower than in the absence of these distortions, since they will be driven down by the desire of investors to own rental properties. Tenants will tend to rent better houses than they would in the absence of this tax distortion.

When people alter their behaviour for taxation related reasons (away from the optimal decision in the absence of tax) there is typically a net cost to society, often described as a deadweight loss. All of the phenomena predicted above are likely to be associated with deadweight losses. Solely for tax reasons, some individuals who would prefer to rent are homeowners (and vice versa), and many people live in a larger home (rather than spending the extra costs on something else). Poterba (1994) specifically quantifies deadweight loss from the tax treatment of housing in the United States and suggests it is substantial. It should be noted that because Governments need to generate tax revenue, some deadweight loss from revenue generation is inevitable, and a model much more complex than the one in this paper would be needed to quantify the losses and consider 'optimal' tax policy. However, in section 3 below, we look at alternative tax policies that could reduce the implicit

subsidy to housing and/or reduce the disparities between different sorts of homeowners.

Research undertaken at the RBNZ suggests that fluctuations in house prices and construction activity are an important part of the business cycle and therefore a driver of inflation pressures in New Zealand (e.g. see Coleman and Landon-Lane (2007) and De Veirman and Dunstan (2008)). A further implication of the tax treatment of housing that may have important monetary policy implications is that house prices and construction activity will tend be more variable than in the absence of these distortions, since fluctuations in people's expectation of growth or interest rates (r or g) will have a larger impact on expected future house prices. This can be seen by observing that the denominator in the valuation equation with tax effects e.g. ((i+f)(1-t)-g) is nearer zero than the denominator (i+f-g) in the absence of tax, so that changes in g or i have larger percentage impacts on valuations with tax effects.

3 Alternative tax regimes

Fundamentally, the valuations calculated above include a component that reflects the generally tax free status of capital gains on housing. This favourable tax treatment of capital gains has been discussed elsewhere, such as in the 2001 McLeod tax review.

In this section, some alternative tax regimes that might help correct this distortion are considered. First examined is a regime where all capital gains are taxed (section 3.1). This appears to remove the distortions discussed in the previous section. However, an accrual based capital gains tax regime would be difficult to implement. Also examined are changing the basis for interest taxation to real rather than nominal flows (section 3.2); the risk free rate of return system discussed in the McLeod review (section 3.3); and some suggestions from the OECD's 2007 review of New Zealand, including adjusting capital income tax rates (section 3.4), and the impact of property taxes (section 3.5). The discussion of capital income tax rates (section 3.4) proves a convenient point to examine the possibility of "ring-fencing" losses on residential investment. Numerical examples to illustrate the effects of these alternative tax regimes are presented.

3.1 A capital gains tax

Suppose a robust capital gains tax (on an accrual basis) was introduced. The value of the property to a landlord with a 100% mortgage recalculates as:

$$V = \frac{A}{i + f - g} \tag{4}$$

The tax rate becomes irrelevant because all of the returns and costs associated with the property are taxable or tax deductible (and under 100% gearing, returns equal costs[6]). Value to a landlord drops substantially.

Consider a simplified case where there is no spread between the mortgage rate and the bank deposit rate (i=r) and no differential in income tax rates ($t=t_c$). If the capital gains tax applies to landlords but not owner occupiers, the value of the house has then become identical for 100% geared landlords and 100% mortgaged owner occupiers. Moreover, this valuation is the same as it would be in a zero tax system, so that their decisions are no longer distorted. The remaining substantive distortion is that an unmortgaged owner occupier is still better off. By owning a home, they avoid paying rent out of after tax income, and avoid earning taxable interest income.

3.2 A tax on real interest rates

Suppose instead that the basis for taxing interest payments is altered so that only real interest returns are taxed or tax deductible. Suppose further for simplicity that there is no real growth in house prices, so that the expected growth in house prices is equal to the expected inflation rate[7]. This alters the valuation identity to:

$$A(1-t) + Vg = (i-g+f)[1-t]V + Vg \qquad (5)$$

In (5) only a proportion of mortgage interest payments (i-g) are tax deductible. This can be solved for V and gives the same answer as in the case of the capital gains tax above. This demonstrates that altering the basis for the taxation of interest income to taxing only real returns would produce approximately equivalent results to the capital gains tax.

Again, an owner occupier who has no mortgage remains advantaged because they are no longer paying rent out of after tax income, but the other distortions are removed.

There is a key practical difference between the two tax policies: an accrual based capital gains tax policy is almost certainly not feasible. For example, it requires very sound annual estimates of property value, and will create cashflow problems for people who happen to live in areas where property values have risen dramatically since their purchase. Unfortunately, a tax on realised capital gains would probably have a substantially weaker effect and distorts behaviour in other ways[8].

---

[6] This depends to some degree on the rules about offsetting the capital gain against other income. Here it is assumed that the landlord must offset interest costs against the capital gain before using any remaining tax losses against labour income. Otherwise the investor pays some .33 capital gains tax but avoids some .39 labour income tax, gaining a small distortion back.

[7] In an economy with rising trend per-capita GDP the expected capital gain on rental properties (g) is probably greater than the rate of inflation (so that the real interest rate taxation policy would have a milder effect on house prices than the accrual based capital gains tax). We quantify the effects of g being higher than the rate of inflation in examples below.

[8] How much weaker is a function of the frequency with which rental properties are traded, which currently averages around 7 years but could be expected to substantially fall. In the limit, rental houses might pass down through generations and never be sold, making the tax ineffective and generating deadweight costs.

Taxing real interest income (and only allowing real interest to be deducted) might not have substantial implications for Crown revenue. Gordon and Slemrod (1988) suggested that interest deductions on US tax returns (for 1983) were close to sufficient to offset all other US capital taxation receipts in that year. New Zealand is a substantial international debtor, so it is quite likely that there is significantly more interest being deducted than earned by New Zealand residents. Moreover, the taxation of interest income earned in New Zealand by non-residents is at a very low rate, and the regime is incomplete[9]. Thus it seems possible that this change in taxation basis would actually increase Government tax revenue (see Appendix Two for further discussion).

3.3 Deemed rate of return taxes

The McLeod committee (2001) introduced the idea of taxing assets on a deemed rate of return. This deemed rate of return (which would have been subject to tax) is an assumed rate that would be imposed instead of trying to calculate the true return (since for many asset classes it is difficult to measure a true return including capital gain). The system was called the RFRM (risk free rate of return method) and the deemed rate would be

"the amount that would have been earned if:

- *the funds invested in an asset subject to the regime had instead been invested in a risk-free government bond; and*
- *the portion of the return on the bond that represented compensation for inflation was exempt from tax."*

This would mean that the starting period value of any asset (the committee suggested including even owner occupied dwellings) would be taxed on the assumption that it earned this deemed rate of return. The "value" of the asset would exclude any debt secured over the asset, but the interest costs of the debt would not have been tax deductible.

For residential property, again abstracting from interest rate premia (assuming r=i), the taxable deemed rate of return would be r less the inflation rate. This would be taxed, but all other flows associated with the property would presumably be tax free.

Thus for an ungeared landlord or owner occupier, and again assuming zero real house price growth[10], we have:

Rent	+ Capital gain	= RFRM tax	+ Forgone interest	+ Other costs
A	+ Vg	= $V(r-g)t$		+ $V(r-g)(1-t)+Vg$
		+ Vf		

[9] Specifically, certain structures are used to bypass Approved Issuer Levy, which is only a 2% tax at any rate.

[10] In this case, the result is the same even if there is a difference between expected growth in house prices and expected CPI inflation.

Rearranging:

$$V = \frac{A}{r + f - g} \qquad (6)$$

The cost terms represent the RFRM (V(r-g)t), forgone interest income V(r-g)(1-t)+Vg, and other costs Vf. For a 100% geared owner of the property, ownership would have no taxation implications since there is no asset position: income would not be taxed, but costs could not be deducted against other income.

While this approach has recently been applied to many foreign investment assets in New Zealand, it would be a fundamental change to the tax system if it was applied to other capital income.

The 2004 Stobo report suggested that the RFRM (called the IST in that report) should also be applied to returns from domestic investment vehicles. Additionally, Stobo remarked on his preference that the RFRM should be inflation-indexed, and the rest of the capital tax system also indexed.

"My preferred option is a single inflation-indexed IST rate. Realistically, however, if we were to introduce an inflation-indexed IST there would need to be a clear commitment from the Government to inflation-index the rest of the income tax system. Otherwise inconsistencies would arise."

This inflation indexation would probably imply taxing interest on a real basis as discussed in section 3.2.

3.4 Reduced taxation of capital assets

The OECD (2007) suggested that reduction of capital income taxation rates could be used to remove or reduce any tax advantages facing housing. Intuitively, the distortion is caused by the fact that most capital gains on property go untaxed. In the extreme, if all capital income (including rental and interest income) was untaxed, this would level the playing field between housing and bank deposits.

The New Zealand taxation system for capital income is "TTE". That is, labour and investment income is taxed when earned, however, when investment assets are cashed up and spent (e.g. in retirement) they are not taxed. Some countries have at least partial "EET" taxation systems for retirement income. That is, a portion of labour income is tax free if it is saved, returns from investing that income are also tax free, while withdrawals from the account in retirement for consumption purposes are taxed. An "EET" system for taxing all investments could effectively eliminate taxation on returns from savings and thus remove the advantages for housing.

The transition to an EET regime would be reasonably complex. One possibility is that vehicles similar to the recently created Kiwisaver schemes could be introduced. An employee would be able to put a portion of earnings into these schemes without paying tax on the income, and any income earned within the scheme would also be tax free. However, any withdrawal from these schemes would be treated as taxable income. Since any capital income earned within the scheme (including interest) is not

taxed, there is no incentive to allocate assets within the scheme to seek capital gains instead of interest income.

While there is no announced plan to introduce EET investment vehicles in New Zealand, there are now some differences between labour and capital taxation rates. Recently, Portfolio Investment Entities (PIEs) have been introduced. These effectively reduce taxation of capital income (if it is earned within a PIE) to 30% (relative to the best available current rate of 33%, which can be earned in a superannuation vehicle). Interest bearing assets in PIE structures are likely to be readily available and they will offer better after tax returns than a typical bank deposit. Thus the opportunity cost of investing wealth in residential property will increase.
However, the impact of capital taxation reductions on rental properties would be limited if it remained possible to deduct losses on heavily geared residential investments against labour income. For some individuals (on the top marginal tax rate) the value of these tax deductions will be based on the current 39% tax rate, and demand from geared investors could be expected to remain strong. Thus the recent PIE changes may not substantially affect the rental housing market unless the incentives to gear are also addressed.

Some commentators (including the Reserve Bank of New Zealand and the Treasury's (2006) report on supplementary stabilisation instruments) have suggested the idea of ring-fencing losses on residential property so that they could not be applied against labour income. This would make heavily gearing a rental property (for a long period of time) tax inefficient,[11] but wouldn't affect returns to unmortgaged landlords. It would seem likely that over time investor property in New Zealand would become substantially less geared (with some properties transferred from heavily geared owners to owners with more equity).

The extent to which this would reduce the value of property is a function of the willingness of investors with significant assets to transfer their funds into the housing market (to replace exiting investors who are heavily geared)[12]. As discussed above, reduced capital income taxation (such as the PIE regime) raises the opportunity cost of investing in housing by increasing returns on alternative investments. More generally, ring fencing losses to prevent them offsetting labour income could be expected to have a greater effect if income tax rates applying to capital income have been reduced. Without further cuts to capital income tax, ring fencing might have an initial disruptive effect on the housing market but not greatly affect the cyclicality of house prices going forward.

A possible alternative to ring fencing would be to reduce the rate at which interest can be deducted to a maximum of 30%. Companies already effectively deduct at 30%. A 30% deduction would make the tax distortions for geared investors similar to those facing ungeared property investors. For someone currently deducting at 39%, this

[11] It is assumed that losses can be cumulated and deducted against future profits, but given a long period of time may elapse before a property investment becomes profitable there is a cost in terms of present value. It is further assumed that losses could not be recoverable if the property was sold.
[12] Another possible source of landlords is Australia – Australian investors could presumably still deduct losses on NZ residential property against their labour income at home.

would roughly take away the inflation distortion. However, the complications this introduces might outweigh the benefits.

3.5 Property Taxation

In the analysis so far, the nature of *f* (the other costs associated with owning a property) have not been specified. A significant proportion of this in reality is property tax (rates), which are often levied in New Zealand on the value of a house.

Property taxation effectively creates a disincentive to hold residential property. In principle, an increase in property taxes could be used to offset the tax advantages of investing in residential property. If we assume the true economic costs of home ownership are *f* (including in that a property tax which allows local councils to meet all the costs of an additional dwelling in the locality), further property taxes could be used to raise *f* to *f2*, with a consequently lower housing valuation.

One issue is that (as described above) fully geared owner occupiers do not face any tax advantages – the tax advantages of owning property are distributed quite unevenly. A property tax that applied to every dwelling would strike fully geared owner occupiers as well as other homeowners, so it wouldn't make things more "even". Unless it was specifically made non-deductible against other taxable income it would also hit owner occupiers more than landlords.

On the other hand, if it was considered desirable to clear up all housing related tax distortions without recourse to a deemed rate of return method, a property tax that was based on imputed rent could eliminate the residual advantage to owner occupiers that something like a real basis for interest taxation would maintain. Specifically, an imputed rent tax on owner occupiers that could be offset by any interest payable on debt secured on the property would only affect lightly geared or ungeared owner occupiers. If imputed rent was correctly calculated and taxed at the labour income rate, an ungeared owner occupier and ungeared landlord would face an identical valuation decision.

Numerical examples

In this section the base case examples from section 2 are used as a starting-point to examine the tax regimes described above. A summary of the results is presented in Table 2.

As discussed above, the capital gains tax regime (line 1 in Table 2) lowers the value of a house for landlords to roughly the value for the geared homeowner, while the ungeared homeowner is unaffected. Also examined is an alternative example (line 1a) where the effective incidence of the capital gains tax is halved (e.g. by protracted delays between capital gains being acquired and actually realised). This mitigates the effectiveness of the capital gains tax, though landlord values are still much closer to the undistorted value than the base case values.

Switching to taxation of real interest rates (line 2) has the same impact on landlords as a robust capital gains tax *if* we make the simplistic assumption that the inflation rate

for house prices and the CPI are equal. The ungeared owner occupier's valuation for the house falls, but remains higher (since they still avoid paying rent out of after tax income). The effects of this policy would be mitigated (line 2a) if we instead assume CPI inflation (2%) is lower than house price inflation (4%). However, the returns to landlords are still much less distorted than in the base case.

A tax on a deemed rate of return (r-g) (line 3) addresses all distortions. For a landlord with no mortgage, rental income is no longer taxed, but the forgone interest income is more lightly taxed, and the deemed rate of return tax is levied on the asset value. For a geared landlord, rental income is no longer taxed, but the value of the interest deduction has fallen. For an ungeared owner occupier, foregone interest is more lightly taxed and the deemed rate of return tax is levied on the asset value. The net effect is that the value for all participants is the same as the undistorted value. This reflects the fact that the tax payable simply reflects asset value rather than asset allocation (and that interest deductions are not available).

We consider 3 examples of capital taxation rates that differ from the labour tax. Line 4a documents the effect of a PIE structure under the assumption that rental property is not transferred into PIEs. The impact is on the landlord or occupier without a mortgage, and arises because their alternative use of funds (a PIE cash deposit) attracts a better return since it is taxed more lightly. It is interesting to note that line 4a implies that recent changes to the PIE structure have reduced the value of a house to our "model" owner occupier. Under our assumptions the reduction in valuation is around 7 percent[13].

Line 4b investigates the effect of *additionally* adding a ring fence that prevents deduction of rental losses. This greatly reduces the value of a home to a fully geared investor. We can hypothesise that the change in 4a would not actually greatly reduce rental property values, because lightly geared or ungeared investors would take over from the geared ones. However, the ring fence would impact on heavily geared landlords, and so demand to hold rental properties could drop more significantly.

[13] However (as discussed in section 2) most of the estimated effects from alterations to the tax regime will be overestimates, since this model ignores supply side responses, and assumes the tax changes are a surprise which (once announced) will hold in perpetuity. Also, not all homeowners deduct at the top marginal tax rate.

Table 2
Property Values under various tax regimes
(baseline: A=10,000, i=8%,r=7.2%, t=39%, t_c= 33%, g=4%, f=2%. "Fair value" in absence of tax distortions for a mortgaged holder of the property is 166,667)

Sort of owner Tax regime	Landlord, 100% geared	Landlord, no debt	Occupier, 100% geared	Occupier, no debt
0) Base case	290,476 A(1-t)/[(i+f)(1-t)-g]	298,434 A(1-t)/[(r(1-tc)+f(1-t)-g]	166,667 A/[i+f-g]	354,108 A/[r(1-tc)+f-g]
1) Capital Gains tax (landlords only)	166,667 A/[i+f-g]	181,332 A(1-t)/[(r-g)(1-tc)+(f)(1-t)]	166,667 A/[i+f-g]	354,108 A/[r(1-tc)+f-g]
1a) CGT (landlords only. Effective CGT tax rate assumed to be half standard tax rate)	211,806 A(1-t)/[(i+f)(1-t)-g(1-t*cgeff)]	225,592 A(1-t)/[(r)(1-tc)+(f)(1-t)-g(1-tc*cgeff)]	166,667 A/[i+f-g]	354,108 A/[r(1-tc)+f-g]
2) Real rate tax (assuming inflation rate = house price growth rate)	166,667 A/[i+f-g]	181,332 A(1-t)/[(r-g)(1-tc)+(f)(1-t)]	166,667 A/[i+f-g]	241,313 A/[(r-g)(1-tc)+f]
2a) Real rate tax (inflation 2%, house price growth 4%)	211,806 A(1-t)/[(r-pi+f)[1-t]pi-g)	225,592 A(1-t)/[(r-pi)[1-tc]+f(1-t)+pi-g)	166,667 A/[i+f-g]	287,026 A/[(r-pi)(1-tc)+f+pi-g]
3) Risk free rate of return (RFRM) tax	166,667 A/[i+f-g]	192,308 A/[r+f-g]	166,667 A/[i+f-g]	192,308 A/[r+f-g]
4a) Reduced capital income tax (.30 – not applicable to rental income or capital gain)	290,476 A(1-t)/[(i+f)(1-t)-g]	269,912 A(1-t)/[(r(1-tc)+f(1-t)-g]	166,667 A/[i+f-g]	328,947 A/[r(1-tc)+f-g]
4b) Reduced capital income tax and ring fence	166,667 A/[i+f-g]	269,912 A(1-t)/[(r(1-tc)+f(1-t)-g]	166,667 A/[i+f-g]	328,947 A/[r(1-tc)+f-g]
4c) Reduced capital income tax (zero – applicable to rent and capital gain) + ring fence	166,667 A/[i+f-g]	192,308 A/[r+f-g]	166,667 A/[i+f-g]	192,308 A/[r+f-g]
5) Additional 2% property tax (so that f = .04)	183,735 A(1-t)/[(i+f2)(1-t)-g]	186,887 A(1-t)/[(r(1-tc)+f2(1-t)-g]	125,000 A/[i+f2-g]	207,297 A/[r+f2-g]
5a) Tax (rate t) on owner occupied rent	290,476 A(1-t)/[(i+f)(1-t)-g]	298,434 A(1-t)/[(r(1-tc)+f(1-t)-g]	166,667 A/[i+f-g]	298,434 A(1-t)/[r(1-tc)+f(1-t)-g]

Line 4c shows the impact of a more radical shift where no returns to capital are taxed (e.g. a EET system of capital income taxation – interest deductions would no longer be allowed). In this case all investors face the correct incentives: no returns on housing are taxed and no associated costs are tax deductible.

A property tax (based on housing value – line 5) would lower values for all market participants. The value to a fully geared owner occupier would then be substantially below the undistorted value. An imputed rent tax on owner occupiers (line 5b) would

only affect ungeared owner occupiers, and reduces the value for them towards the values to an ungeared landlord. This could complement the real rate tax (line 2) to remove the residual advantage for the ungeared owner occupier.

Overall, we can see that the distortions in the housing market can be substantially removed by either putting taxation of interest rates on a real basis (line 2), adopting the risk free rate of return method for all assets (line 3) or cutting capital income taxes to zero and ring fencing (line 4c). Without large cuts in capital income taxes the impact of ring fencing is relatively small, although there would be a change in the composition of rental property owners as geared landlords would gradually become less common. Taxation of interest rates on a real basis leaves a residual advantage for ungeared owner occupiers that a tax on imputed rent could in principle counteract.

If expected house price growth somewhat exceeds expected CPI inflation, using the real basis for interest taxation doesn't fully offset the distortion, but it does substantially reduce it.

Numerical example of higher expected growth rates

Besides affecting the level of house prices, these tax changes will alter the variability of house prices. In Table 3 this is illustrated by examining a shock to the expected future growth rate of house prices and rents (g)[14]. An undistorted valuation would rise by around 9% if the expected (permanent) future growth rate of rents and house prices went from 4% to 4.5%. However, in most distorted cases the value rises by significantly more than this, *because the increased capital gains have a preferential tax status that makes them more valuable*. For example, in the base case tax system, that growth rate change would shift values to landlords by more like 30% than 9%.

In general, the regimes that largely correct the distortions also reduce the variability of house prices in response to a shock to g. For example, a deemed rate of return tax or zero capital income tax (lines 3 and 4c) give valuation changes of around 10% in response to this shock for all market participants. The valuation changes are larger in the case of a real rate tax (line 2a) since an increase in g will make the difference between g and the CPI inflation rate (pi) larger and thus the increased capital gains will be tax free. Similarly, the imperfect capital gains tax (line 1a) leads to more variability than an undistorted system but less than the existing system.

Ring fencing reduces the cyclicality of property values for a geared landlord, but under same regimes the variability of house valuations to an ungeared landlord would remain substantial (see e.g. line 4b).

[14] Notice that in equilibrium, expected rental growth g and the expected future growth rate of house prices are necessarily identical. This wouldn't be true in a model where the expected rental growth wasn't constant over the infinite future - but in this simplified model it is.

Table 3

Change in property values from a .5% increase in future expected rental growth

(**new values in bold,** with original value and % change shown below)

Sort of owner Tax regime	Landlord, 100% geared	Landlord, no debt	Occupier, 100% geared	Occupier, no debt
0) Base case	**381,250** 290,476 31%	**395,078** 298,434 32%	**181,818** 166,667 9%	**430,293** 354,108 22%
1) Capital Gains tax (landlords only)	**181,818** 166,667 9%	**201,387** 181,332 11%	**181,818** 166,667 9%	**430,293** 354,108 22%
1a) CGT (landlords only. Effective CGT tax rate assumed to be half standard tax rate)	**246,216** 211,806 16%	**251,910** 225,592 12%	**181,818** 166,667 9%	**430,293** 354,108 22%
2) Real rate tax (assuming inflation rate = house price growth rate)	**181,818** 166,667 9%	**201,387** 181,332 11%	**181,818** 166,667 9%	**262,536** 241,313 9%
2a) Real rate tax (inflation 2%, house price growth 4%)	**256,303** 211,806 21%	**276,770** 225,592 23%	**181,818** 166,667 9%	**335,121** 287,026 17%
3) Risk free rate of return (RFRM) tax	**181,818** 166,667 9%	**212,766** 192,308 11%	**181,818** 166,667 9%	**212,766** 192,308 11%
4a) Reduced capital income tax (.30 – not applicable to rental income or capital gain)	**381,250** 290,476 31%	**346,591** 269,912 28%	**181,818** 166,667 9%	**393,701** 328,947 20%
4b) Reduced capital income tax and ring fence	**181,818** 166,667 9%	**346,591** 269,912 28%	**181,818** 166,667 9%	**393,701** 328,947 20%
4c) Reduced capital income tax (zero – applicable to rent and capital gain) + ring fence	**181,818** 166,667 9%	**212,766** 192,308 11%	**181,818** 166,667 9%	**212,766** 192,308 11%
5) Additional 2% property tax (so that f = .04)	**216,312** 183,735 18%	**220,695** 186,887 18%	**133,333** 125,000 7%	**231,267** 207,297 12%
5a) Tax (rate t) on owner occupied rent	**381,250** 290,476 31%	**395,078** 298,434 32%	**181,818** 166,667 9%	**395,078** 298,434 32%

4 Conclusions

In this paper the simple discounted rental model used in other recent studies is extended to consider some distortions inherent in the way the tax system affects housing in New Zealand. The model suggests that the distortions can have a significant effect on house prices, and is a useful framework to consider alternative policies.

A key point that the model illustrates is that the tax free status of some capital gains does not necessarily create incentives to gear. A geared landlord can generally fully deduct their interest payments. But if you have money in the bank and then buy a rental with that money, by doing so you avoid receiving taxable interest, which has the same substantive effect. Thus the value of a rental property to a geared and ungeared landlord should be basically similar. Instead of gearing, the underlying distortion relates to the different tax treatment of interest and capital gains. This is also not inherently a *housing* issue. It also applies to other assets like equities, which are not analysed in this paper.

Besides reducing income tax (by not receiving interest on bank deposits), unmortgaged owner occupiers avoid paying rent out of after tax income, and tend to derive the greatest tax benefits from home ownership. Our results suggest that the only house buyer who does not get substantial tax relief in the current system is a heavily geared owner occupier: this probably makes it harder (less economic) to purchase before accumulating a significant amount of equity.

There are a range of policies that seem to have some potential to reduce these distortions. A capital gains tax is one option, but if administrative and other difficulties make this approach unattractive, two other possibilities analysed in this paper are reducing taxes on capital income (and removing the ability to offset labour income with capital losses), or changing the tax treatment of interest to a real basis. Clearly, most possible policy changes in this area have implications that go beyond the housing market and would require substantial analysis.

References

Coleman, A and J Landon-Lane, "Housing markets and migration in New Zealand, 1962-2006" , *Reserve Bank of New Zealand Discussion Paper, 2007/12*.

De Veirman, E and A Dunstan, "How do Housing Wealth, Financial Wealth and Consumption Interact? Evidence from New Zealand", *Reserve Bank of New Zealand Discussion Paper, 2008/05*.

Feldstein, M (1998), "The costs and benefits of going from low inflation to price stability", *NBER Working Paper,* 5469.

Girouard, N, Kennedy, M, van den Noord, P and C André (2006), "Recent house price developments: the role of fundamentals", *OECD Working Paper,* 475.

Gordon, R (2003) "Taxation of interest income", *NBER Working Paper,* 9503.

Gordon, R and J Slemrod (1987), "Do we collect any revenue from taxing capital income?" In *Tax Policy and the Economy, Vol. 2*, ed. L. Summers, MIT Press, Cambridge.

OECD (2007), "Chapter 4: Towards a more efficient tax system", in *OECD Review of New Zealand*, Paris.

Poterba, J (1992), "Taxation and housing: old questions, new answers", *American Economic Review,* 82, 2, pp 237-242.

Reserve Bank (1980), "On the effects of inflation", *Reserve Bank Bulletin*, October.

Reserve Bank (1981), "Tax indexation", *Reserve Bank Bulletin*, January-February.

Reserve Bank and The Treasury (2006), *Supplementary stabilisation instruments: An initial report.*

Reserve Bank (2007), *The future monetary policy framework: Submission by the Reserve Bank of New Zealand.*

Stephens, D (2007) "Bubble, schmubble", *Westpac Economic Research.*

Stobo, C (2004) "Towards consensus on the taxation of investment income" , available from www.beehive.govt.nz.

Taxation Review Committee (the McLeod review), "Taxation Review 2001: issues paper", available from www.treasury.govt.nz.

Appendix One
Underpinnings of the discount model for housing valuation

In the model used in this paper, A, i, f and g are treated as exogenous. This is only defensible under certain strong conditions (e.g. a view that population and the supply of houses are fixed). Demand to occupy housing (given that fixed supply) can then be assumed to imply a market clearing rent of A. Further assumed is that economic growth (g) causes the market clearing rent to rise by g% each period, and that tax rates are set by Government and not influenced by V.

In this analysis i (the expected long term interest rate) is also treated as exogenous. This seems problematic, but would be justifiable if we posit that at the margin capital is supplied by the rest of the world with an infinitely elastic supply curve. It is clear from the valuation condition that (i+f)(1-t) needs to be greater than g for the model to solve for a finite V. This illustrates a limitation of the model. In reality, a fall in world interest rates which meant that condition no longer held would push house prices up until a set of construction projects were put into place that induced expected rental growth g to fall. The general point is that housing supply and thus g will generally respond to V. The model ignores this and as a result probably tends to overstate the impact of changes in g, i or t on the value of housing.

Another interesting issue is that (following Stephens 2007) it is presumed in some places in this paper that the value of a house is set by the value to a 100% geared landlord, and it is worthwhile considering the conditions under which this will be plausible. If we use ρ to denote the required return after tax to an ungeared landlord, the value to the ungeared landlord can be computed as

$$V = A(1-t)/(\rho +f(1-t)-g) \qquad (7)$$

Suppose we had 2 people seeking to purchase the rental property (one planning to be 100% geared, one planning to own the property outright). Comparison of this formula with (2) in the main text shows that the landlord holding the house with a 100% mortgage will value the asset more highly than the owner occupier so long as $i(1-t)$ is less than ρ. That is, if the after tax cost of borrowing $i(1-t)$ is less than the required after tax return to the prospective landlord planning to hold the property outright.

Suppose New Zealand had an unlimited supply of risk neutral high net worth individuals, and that the key alternative to residential property is a bank deposit. Clearly a bank deposit earns $r(1-t)$, where r is the deposit rate and is less than i, so that $\rho = r(1-t)$ will be less than the after tax mortgage rate. Thus under these conditions no rental property would be geared.

It is thus interesting to consider why many rental properties are heavily geared. One obvious factor is that high net worth individuals have other asset classes available to them (e.g. equities in NZ and overseas) that may earn a better expected after tax return than bank deposits. High net worth individuals will typically already be exposed to property prices through owning their own home. These factors may mean that at the margin, most owning of rental properties is conducted by landlords who are borrowing a significant proportion of the cost of the dwelling.

Appendix Two
Taxing real interest rates

There was a significant amount of work on the possibility of indexing the tax treatment of interest (and other capital income) in the high inflation environment of the 1970s and 1980s. For example the US Treasury published a substantial study in 1984, and the Reserve Bank of New Zealand published a series of Bulletin articles on this and related indexation issues (e.g. Reserve Bank (1980,1981)). Besides the issues discussed above there are a number of other points that should be considered.

- **Feasibility.** In principle changing the basis for interest taxation to only taxing real interest sounds pretty simple. However, Feldstein (1997) argues that it would not be so simple. Because dividend income would be fully taxed while interest income would receive some rebates for inflation compensation, there would be an incentive to create products with some characteristics of equity but interest flows (such as a convertible bond with a strike price well below the current price). There would also be difficulty with debt claims with interest linked to real economic variables (Feldstein uses the example of a mortgage on a commercial property with interest linked to rent). NZ has significant overseas debts and there could be a particular incentive to redefine those as non-debt liabilities so they remain fully tax deductible in New Zealand.

- **Impact on business investment and other macro-variables.** If a real interest tax system was introduced, compared to the current regime, investment in real assets (including plant and machinery as well as housing) would be discouraged and putting money in the bank encouraged. Thus we might expect this tax change to lead to a lower capital stock, and greater national savings: which would mean a lower overseas debt.

- **Impact on interest rates.** Analysis such as Gordon (1998) has looked at the impact of indexing the tax treatment of interest and presumed that it would lower the pre-tax rate of interest (by encouraging saving and discouraging borrowing). However, in a small open economy like New Zealand is that it is likely that international capital markets will make up the difference at prevailing interest rates. Thus, to a first approximation this change could probably be expected to only marginally change New Zealand interest rates.