

Joint Report: Taxation of Savings and Investment Income

Date:	27 September 2012	Report No:	T2012/2470 PAD 2012/206
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Action Sought

	Action Sought	Deadline
Minister of Finance (Hon Bill English)	Note contents of the report Agree to recommendations Refer the report to the Minister for Economic Development	Joint Ministers' meeting on 16 October 2012
Minister of Revenue (Hon Peter Dunne)	Note contents of the report Agree to recommendations	Joint Ministers' meeting on 16 October 2012

Contact for Telephone Discussion (if required)

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Enclosure: Yes: [Annex 2 - savings and investment joint report \(Treasury:2366671v10\)](#)

Executive Summary

This report responds to the Minister of Finance's question as to whether changing tax settings could lead to a material improvement in economic performance. It provides a high-level assessment of a number of potential reforms to the taxation of savings and investment, based on whether reforms could improve efficiency, incentives to save and invest, and reduce macroeconomic vulnerabilities. These are important in contributing to the ultimate goals of increasing economic performance and improving economic welfare in New Zealand. This has clear links to the Business Growth Agenda: work in this space is urgent, so it is important Ministers consider what tax reforms could offer.

We have complemented existing analysis by using a computable general equilibrium model that has been adapted to reflect the New Zealand economy (the DZ model). Overall we think the model is useful for drawing general observations/insights to use as part of a broader assessment into different tax reforms, but does not offer the level of confidence to rely on quantified results. For capital gains tax only, we have used a simpler general equilibrium model focused on housing and taxation in New Zealand (the Andrew Coleman model). The analyses do not examine practical aspects of designing and implementing reforms in detail, which would need to be considered more fully if such reforms were pursued.

The modelling work has suggested that **personal income tax cuts may have greater economic benefit than corporate income tax cuts in New Zealand**. This is primarily because most of the benefits of personal tax cuts would accrue to residents, whereas a larger proportion of the benefits of corporate income tax cuts 'leak' overseas to non-residents given New Zealand's high level of foreign capital ownership; and that a personal income tax cut would increase incentives for **both** savings and investment, **and** labour supply.

It also suggests that **reforms which cut corporate income tax may result in a net welfare loss**. This is because the country may lose more from giving up tax revenue to non-residents than it gains from improved investment incentives generally (due to imputation, a corporate income tax cut is expected to have little impact on investment incentives for residents, limiting economic welfare gains, but does increase foreign investment). This welfare result may at first be surprising given economic literature suggests cuts to the corporate tax rate tend to be best for economic growth.¹ However such studies tend to focus only on the effects of lower tax rates on GDP rather than on economic welfare, so do not pick up the fact that some of the economic benefits of a tax cut may accrue to non-residents (which is important for New Zealand given our relatively high levels of foreign capital ownership). This will act to reduce economic welfare benefits compared to impacts on GDP. In addition studies often do not account for the general equilibrium effect of the tax cut (which is captured in the DZ model) – so while residents only enjoy some of the benefits of the tax cut, they bear the entire burden of the revenue offset to fund the tax cut, which will further reduce economic welfare.

There are also likely to be dynamic growth benefits from reducing corporate taxes (e.g. higher productivity growth and spillovers from FDI), which are not captured by the model. Personal tax cuts will also likely have wider growth benefits, which are also not captured in the results (e.g., increased investment in human capital and spillovers from this investment),

¹ Such as *Tax and Economic Growth*, Economics Department Working Paper No. 620, OECD (2008), although this is based on cross-country "average" results, so does not pick up important variations between countries (such as the relatively high level of foreign capital ownership and presence of an imputation system noted above).

and this is not expected to change the earlier insight that personal tax cuts are more favourable than corporate tax cuts

Overall, we think the welfare result suggests caution in considering a further corporate income tax reduction at this stage – but that it is only one factor. Corporate tax rates have been falling in other countries (although there has been some slowing of the rate of these reductions with the Global Financial Crisis) and it is important to make sure that our company rate is not too far out of line with rate in other countries to minimise the risk of profit-shifting pressures (using transfer pricing). This may lead to an increased case for company rate cuts in the future. It is important that New Zealand remains an open dynamic economy and an attractive destination for FDI, given the benefits foreign investment can bring.

The following table summarises some of the main conclusions from our analysis. The various reforms are modelled at a fiscal cost of \$1 billion to aid comparability (with the exception of the Allowance for Corporate Equity),² with the cost offset by reduced government transfers.

Reform	Steady state impacts					
	National savings	GDP	Economic welfare	Macro vulnerability	Equity ³	Complexity of change
Cut in corporate income tax	↑	↑	↓	↓	Small -ve impact	Low
Cut in all personal income tax rates	↑	↑	↑	↑	Depends on design	Low
Cut in tax on interest income	↑	↑	↑	↔	Worsens	Medium
Dual income tax	↑	↑	↓	↔	Worsens	High
Allowance for corporate equity	↑	↓	↓	↓	Worsens	High

Key: ↑ = significant positive impact, ↗ = some positive impact, ↔ = negligible impact or unclear, ↓ = some negative impact, ↓ = significant negative impact

These indicate:

- The tax reform option that appears most effective in boosting economic welfare and reducing macroeconomic vulnerability is a **personal income tax reduction**. This also boosts GDP and increases national savings. The other tax reform which also boosts economic welfare but has a negligible effect on macroeconomic vulnerability is a **cut in personal capital income tax** restricted to residents (such as reducing tax on interest income). This has the biggest effect in promoting savings.
- A reduction in **corporate income tax** offers a more limited increase in national savings compared to other reforms, and also leads to an increase in macro vulnerability. The result that this reform may reduce economic welfare also suggests caution around considering a further corporate income tax reduction at this time.⁴ As noted earlier wider factors, such as the competitiveness of our corporate tax rate, may increase the case for a further corporate rate reduction in the future.
- A **dual income tax** is likely to increase national savings and GDP, but reduce economic welfare. However, while there are economic gains from a dual income tax, greater gains can be realised from simpler cuts to personal tax rates as shown above.

² Given the high cost of an ACE, part of the fiscal impact is met through increasing remaining income tax rates as well as reducing government transfers.

³ Based on current equity impacts. Assessing equity impacts on a lifetime basis has not been possible given lack of longitudinal data. However, such assessments would tend to dampen the impacts noted above.

⁴ This may suggest that an increase in the corporate tax rate will be welfare-enhancing for New Zealand. However such a tax change might not be sustainable given our corporate tax rate is already above the OECD average. It would be a negative signal for business, impacting New Zealand’s ability to attract FDI, and would increase incentives for firms to shift profits overseas, eroding the corporate tax base.

A dual income tax would be complex to implement given current IR systems capability. We therefore do not recommend prioritising further work on a dual income tax in the medium term.

- The negative fiscal and economic impacts of an **Allowance for Corporate Equity (ACE)** outweigh the benefits of any additional savings and investment. It would also add significant complexity and would be challenging to implement. For these reasons, we do not recommend pursuing this option.

Treasury has reported previously on allocative efficiency issues caused by gaps in the tax base (primarily not taxing capital gains) and the interaction of inflation and the tax system.⁵ Treasury continues to see a capital gains tax as the best way of reducing these distortions, although it is cognisant that a fully developed regime must be considered before policy decisions can be made. Inland Revenue acknowledges that this reform is consistent with our BBLR framework but it considers the devil is in the detail - as well as additional complexity, it is not clear that a CGT that applied on realisation and exempted the family home would be more efficient than not having one.

Reductions in personal capital income tax, discussed above as one of the most beneficial reforms, may have some second best effects in reducing allocative distortions depending on how they are implemented. Options include:

- **Reducing tax on interest income** which was modelled and indicated a strong increase in national savings, similar to a personal tax reduction. The reform is also expected to improve economic welfare (the measure of economic efficiency in the model). However, the reduction in tax on interest income may also cause other distortions, not captured in the model (such as between debt and equity investments), so overall efficiency impacts are unclear. There are also fiscal risks from tax arbitrage opportunities which would have to be managed or addressed with new anti-arbitrage rules, adding to complexity of the tax system.
- **Reforming the PIE regime** for example by extending PIE rates to portfolio investments directly held by taxpayers (debt and equity).⁶ This would encourage more domestic savings. On balance, the Treasury consider that overall efficiency would likely be improved; whereas Inland Revenue considers that the opposite may be true. Inland Revenue considers that for coherence reasons it may be preferable to instead remove the cap on PIE tax rates, as was suggested by the Tax Working Group, and use the revenue raised to lower personal tax rates. Both options will be considered as part of further work on PIE reform.
- **Indexing the tax base for inflation**, which would increase after-tax returns to interest income and likely result in a significant increase in savings (although the level of foreign investment will likely fall given only real interest expense would now be deductible, which could reduce macro vulnerabilities). Indexation is also a very complex exercise due to high ongoing compliance costs (especially for SMEs), meaning overall net benefits are unclear, and it would be challenging to implement given current IR systems capability. We do not recommend that it be pursued as a medium-term reform.

⁵ Shown by the differences in real effective tax rates for different forms of capital investment – see *Briefing to the Incoming Minister of Finance: Increasing Economic Growth and Resilience (2011)*, p. 16 (Figure 15)

⁶ An alternative PIE extension would be to lower PIE rates, as recommended by the Savings Working Group. The type of impacts of such a reform are likely to be similar to the reduction in tax on interest income, modelled above, given it involves reducing the tax rate on specific forms of capital investment.

Next steps

Tax policy resources will continue to focus primarily on delivering the Government's tax policy work programme, and supporting IR's business transformation programme. We are also reporting separately to Ministers on possible packages to consider for Budget 2013, balancing revenue raising and wider economic objectives. Beyond this, we recommend focusing further "investment" work on:

- *Considering reforms to capital income taxes that apply to resident individuals.* As noted above this could include reforms to the PIE regime or reducing the tax rate on interest income. Officials will report on these options as part of work on PIE reform on the current tax policy work programme.
- *Considering possible changes to the personal tax structure, including adjusting for fiscal drag.* A simple change to current thresholds in 2015, to correct for five years of fiscal drag since the 2010 tax reform, is estimated to cost around \$1.5 billion per annum. You may wish to consider such a change beyond Budget 2013 as the impact of fiscal drag increases and the fiscal position improves.

Many of these potential reforms would have a fiscal cost. Given the tight fiscal position in the next few years there may be merit in a 'package' approach, as was done in Budget 2010, with tax reductions being offset either by increasing other rates (such as GST) or by base broadening (for instance, Treasury's advice is this could include a CGT and/or a land tax).

Recommended Action

We recommend that you:

- a. **note** the report responds to the Minister of Finance's question as to whether changing tax settings could lead to a material improvement in economic performance.

Noted

Noted

- b. **note** that, in preparing this report, officials have analysed whether reforms could improve efficiency, incentives to save and invest, and reduce macroeconomic vulnerabilities, which are important in contributing to the ultimate goals of increasing economic performance and improving economic welfare in New Zealand.

Noted

Noted

- c. **agree/note** the recommendations made for each tax reform below:

Reform	Recommendation	Minister of Finance	Minister of Revenue
Cut in corporate income tax	• Note some positive impact on savings and GDP but not macro vulnerability	Noted	Noted
	• Note the finding that this reform may reduce economic welfare but that other factors may enhance the case for a future cut in the tax rate.	Noted	Noted
Cut in all personal income tax rates	• Note that this reform is likely to offer the biggest gains overall for GDP and welfare, strong gains for savings, and improvements in macro vulnerability	Noted	Noted
	• Agree that officials do further work on options to reduce personal tax such as address fiscal drag	Y / N	Y / N

Cut in tax on interest income	<ul style="list-style-type: none"> • Note this reform offers the biggest gains for savings and the capital stock but its impact on economic efficiency is unclear 	Noted	Noted
	<ul style="list-style-type: none"> • Agree that officials consider a reduction in tax on interest income as part of the PIE reform work, currently on the tax policy work programme 	Y / N	Y / N
PIE reform	<ul style="list-style-type: none"> • Note that officials will report later on options related to PIE reform 	Noted	Noted
Dual income tax	<ul style="list-style-type: none"> • Note this reform is likely to offer some additional savings and investment, and gains to GDP, but these are smaller than gains from cutting personal tax rates, and that a dual income is more complex to implement 	Noted	Noted
	<ul style="list-style-type: none"> • Agree that officials do not prioritise further work on a dual income tax in the medium term 	Noted Y / N	Noted Y / N
Allowance for corporate equity	<ul style="list-style-type: none"> • Note that while there are additional savings and investment, complexity, fiscal cost, and welfare loss are likely to be high 	Noted	Noted
	<ul style="list-style-type: none"> • Agree not to pursue an allowance for corporate equity as a medium-term tax reform 	Y / N	Y / N
Indexation of the tax system	<ul style="list-style-type: none"> • Note that while there are additional savings from indexation, it will increase finance costs for some firms, and will be complex to implement and have high ongoing compliance costs 	Noted	Noted
	<ul style="list-style-type: none"> • Agree not to pursue indexing the tax base for inflation as a medium-term tax reform 	Y / N	Y / N

- d. **note** that officials are not currently doing work on a capital gains tax or a land tax, but that further work could be necessary on these or other options if revenue-raising reforms are needed to offset revenue-negative reforms;

Noted

Noted

- e. **refer** a copy of this report to the Minister for Economic Development.

Agree/disagree.

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Purpose of Report

1. This report provides a high-level assessment of a number of potential tax reforms to the taxation of savings and investment, as agreed in Treasury's 2011/12 output plan and the Government's Tax Policy Work Programme. In doing so, the report responds to the Minister of Finance's question as to whether changing tax settings could lead to a material improvement in economic performance. We would like to discuss the report with you at the joint Ministers' meeting on 16 October 2012 and get your agreement on medium-term reform priorities.

Background

2. There have been a number of New Zealand tax and other policy reviews that have examined potential reforms around the taxation of savings and investment income. These include the Tax Working Group (2009-10) and the Savings Working Group (2010-11), alongside Australia's Henry Tax Review and the UK's Mirrlees Tax Review. Background to these reviews has been provided in Annex 1. In particular the Savings Working Group raised concerns that New Zealand's low level of national savings increased its vulnerability due to high levels of external debt and low levels of domestic saving. Treasury's interest in this project has also been motivated by concerns about low productivity growth (underpinned by capital shallowness), which is forecast to continue. These issues have clear links to the Business Growth Agenda: work in this space is urgent, so it is important Ministers consider what tax reforms could offer.

Aims and objective of the work

3. Drawing on these recent reviews, Treasury and Inland Revenue officials have been assessing the merits of a number of major and minor tax reforms to understand their impact from a New Zealand context better, establish whether there is a *prima facie* case for their implementation, and to identify medium-term reform priorities.
4. In addition to economic welfare, key issues have been how different reforms would affect the:
 - Overall efficiency of the allocation of savings and investment in the economy; and
 - Total *level* of savings and investment, along with the potential to reduce macroeconomic vulnerabilities in the economy.
5. These are important in contributing to the ultimate goals of increasing economic performance and improving economic welfare in New Zealand. The different issues are motivated by a number of considerations:
 - Efficiency is the standard benchmark for determining how well a tax system contributes to economic performance. It generally tries to assess how **little** a tax system creates distortions, for example to investment and labour supply decisions;
 - Treasury has expressed concern that there are low levels of national savings in New Zealand. It considers that there may be potential for tax reform (in combination with policies in other areas) to improve savings performance and allocation of investments even if the tax system is not the fundamental cause of the problem; and

- Concern about the vulnerability posed by New Zealand's high net external liability position has gained increased importance in the wake of the global financial crisis. All else equal, increases in national savings relative to investment, changes in the mix of external liabilities (from debt to equity) and increasing GDP growth for a given supply of capital reduces vulnerability or mitigates the impact of an increase in net external liabilities. But assessing the impact of policy changes on vulnerability is complex and requires consideration of economic variables such as the current account and gross and net levels of national debt, as well as debt servicing capacity factors such as national savings, exports and offshore investments.
6. This analysis is intended to inform us and Ministers as to whether any tax reforms have the potential to improve economic performance, and therefore whether officials should do any significant further analysis of them. The analysis presented here does not examine practical aspects of designing and implementing reforms in detail, which would need to be considered more fully before forming a final judgement on whether such reforms should be pursued.
 7. This work may have little immediate policy implications given that the Government recently completed a major tax reform, but is important going forward given the Government's strategic priority of building a more productive and competitive economy, and the Business Growth Agenda. It also helps ensure officials are well placed to provide advice on future economic and fiscal challenges (for example, this work will also be used to inform the discussion of tax in the Long Term Fiscal Statement).

Analysis

8. We have drawn on a number of analyses to inform our assessments. These include:
 - Standard first principles analysis including drawing from analyses we have done for the Tax Working Group and the Savings Working Group;
 - A computable general equilibrium model developed by US academics John Diamond and George Zodrow and modified by Treasury and IR officials (known as the DZ model), which allows us to examine how tax reforms might affect the allocation of capital in New Zealand, and impact key variables such as GDP, economic welfare (the measure of economic efficiency in the model)⁷ and the level of savings;
 - A model designed by Andrew Coleman to provide insights into how a capital gains tax could impact investment in housing in New Zealand; and
 - High-level analyses of the likely impacts on equity, tax system integrity (arbitrage potential), complexity, compliance, and administration costs (which is important given IR systems capability for substantial tax reform in the short term). These assessments do not consider detailed design issues for the specific tax reforms.
9. The general equilibrium modelling is a step forward in building our analytical capability, consistent with Inland Revenue and Treasury work on quantifying the effects of tax policy changes and as part of the wider Treasury work on quantifying our key policies. It has been calibrated to include specific factors relevant to New Zealand (e.g. high levels of foreign capital ownership and likely location-specific economic rents) to help us understand how these make the analysis different from standard results. Overall we

⁷ Economic welfare is important to consider as a rise in GDP may not necessarily mean that New Zealanders are better off given some benefits from the tax change and higher GDP may accrue to foreign investors.

think the model is useful for drawing general observations/insights that can help as part of a broader assessment into each of the modelled tax reforms, but does not offer the level of precision to use quantified results. The DZ model has its limitations, particularly as it does not pick up dynamic growth impacts or distributional impacts. We have attempted to address these through additional assessment outside of the model to help us reach conclusions.

10. Further discussion and results from the analytical work can be found in Annex 2. No one method of analysis is determinative but considered together they provide guidance as to which tax reforms have the greatest potential economic benefits.
11. Reforms considered in the analytical work include major changes to our current BBLR system (allowance for corporate equity, dual income tax, and the indexation of tax bases). Alongside this we have considered incremental changes to existing tax rates within the BBLR system. This has broadened our understanding of the marginal economic impact of reducing tax rates of different tax bases (corporate income, personal income, and interest income). Reforms are modelled on a fiscally neutral basis with reduction in lump-sum government payments to offset the fiscal cost of the reforms, which isolates the impact of the change being modelled.⁸ This is most closely proxied by a reduction in government spending or by introducing a well-designed land tax. If tax cuts are financed by tax increases that are not completely efficient, this will obviously reduce the benefits of the tax reforms noted here.
12. We have also commented on revenue-raising tax reforms we have considered previously (such as land tax and a risk-free return method for taxing housing investments) and have undertaken further analysis of capital gains tax using the Andrew Coleman model.

Findings

13. The analytical work has provided the following high-level insights:
 - Personal income tax cuts may have greater economic benefit than company income tax cuts in New Zealand. This is primarily because:
 - Most of the benefits of personal tax cuts would accrue to residents, whereas some benefit of company income tax cuts would accrue to non-residents given New Zealand's high level of foreign capital ownership; and
 - A personal income tax cut would increase incentives for **both** savings and investment by residents, **and** labour supply.
 - General company income tax cuts may result in a net welfare loss. This is because the country may lose more from a reduction in tax revenue to non-residents than it gains from improved investment incentives generally (company income tax cut is expected to have little impact on investment incentives for residents, because the imputation system claws back the benefit for resident shareholders when income is distributed, but does increase levels of foreign investment). Examples of these are a general company tax cut and an allowance for corporate equity (ACE); and
 - Capital income tax cuts that apply to resident individuals may have some net benefits, although these will have effects that are not able to be captured in the modelling (such as the tax reductions will not apply to all types of capital) and the effects are not as great as for a personal tax rate cut. Examples of these include

⁸ Reforms (with the exception of ACE) are modelled at a fiscal cost of \$1 billion to aid comparability, with the cost offset by reduced government transfers. See Table 1 for further details.

a reduced tax rate on interest income which we have modelled and an extended PIE regime which has not been modelled.

14. While the modelling work suggests that there may be a net economic welfare loss from corporate income tax cuts that increase foreign direct investment (FDI), this does not mean other policies (such as regulatory changes) which encourage additional FDI may not be desirable. New Zealand currently has a very large stock of FDI and corporate income tax cuts also apply to non-resident owners of the stock of existing FDI. It is giving up revenue on existing FDI which contributes to the net welfare reduction. Further work, such as the work on location-specific rents, may help us get more confidence in understanding how much of the tax reductions are enjoyed by non-resident shareholders. In addition there may be other factors, such as profit-shifting pressures and the question of whether our corporate tax rate is too far out of line with other countries, which affect the decision around future changes to corporate tax settings.

Allocation of capital

15. The DZ and Coleman models do give some insights into the consequences of how changing the tax settings would change the allocation of capital, and how this affects GDP and economic welfare. In focusing the issue of capital allocation on amounts invested in housing versus other investments, the Coleman model of tax and housing (which is simpler than the DZ model but more informative about the impacts on housing) suggests that taxing housing more heavily (by taxing capital gains, even when the tax is limited to investment housing only) does tend to:
 - reduce the total amount invested in housing;
 - increase the amount invested in interest-bearing assets;
 - reduce the price of housing and increase affordability of owner-occupied housing;
 - increase rents and reduce the affordability of rental housing;
 - increase economic welfare; and
 - reduce the level of foreign borrowing compared to the status quo.

Key conclusions

16. A summary of our assessments is presented in Table 1 at the end of the report (with a more detailed discussion of results in Annex 2). At this stage, the findings from these assessments lead us to the following conclusions on medium-term reform priorities.

Potential medium-term reform priorities

- **Personal income tax reduction** – This reform reduces all personal income tax rates and appears strongly beneficial. It provides higher GDP and economic welfare, increased savings (because lower personal rates also reduce the taxation of interest income) and reduced macroeconomic vulnerability. The model does not pick up dynamic growth benefits from reducing personal tax rates, (e.g. higher productivity and entrepreneurship), which will further improve the benefits of this reform. It is also relatively easy to implement given the fairly simple structure of the current tax system and would help with overall coherence of the tax system if the top rate is lowered;

- **Capital income tax reduction accruing to residents** – Another area of potential reform is a capital tax reduction targeted towards residents. The reform modelled above which does this is a cut in tax on interest income. In the model this increases GDP, welfare, and has the biggest impact on savings. The increase in economic welfare in the DZ model suggests some gain in economic efficiency. However, there are other effects on economic efficiency which are not captured in the model so the impact on the allocative efficiency of investment is unclear. On one hand, a discounted tax rate on interest may reduce the effective tax rate on interest to be closer to the effective tax rate on housing and other real property investments, where capital gains are not taxed. On the other hand, an arbitrary discount amount could also increase effective tax rate differentials with other investments. Two other reforms which also reduce capital taxes on residents are extended PIE and indexing the tax base for inflation. These are:
 - **Reforming the PIE regime** for example by extending PIE rates to portfolio investments directly held by taxpayers (debt and equity) – i.e. removing the requirement that the investment be held in a managed fund.⁹ This would encourage more domestic savings. Although direct investments would be taxed at the normal rates, Treasury considers this boundary is more sustainable than the current boundary. On balance, Treasury considers that overall efficiency would likely be improved; whereas Inland Revenue considers that the opposite may be true. Inland Revenue considers that for coherence reasons it may be preferable to instead remove the cap on PIE tax rates, as was suggested by the Tax Working Group, and use the revenue raised to lower personal tax rates. Officials will report later on both options these as part of the current tax policy work programme.
 - **Indexing the tax base for inflation** – Although not specifically modelled, this reform is also a capital tax reduction that is restricted to residents. Inflation adjustments to interest income would be expected to increase savings significantly given it will increase after-tax returns. However by allowing the deduction of only real interest expense the cost of capital borrowed from non-residents may increase, possibly reducing the overall level of investment (although in itself this could improve macro vulnerability). Indexation is also a very complex exercise given the inflation adjustment factor is likely to be imprecise, which will dampen overall benefits, and due to high ongoing compliance costs (especially for SMEs).¹⁰ Overall net benefits are unclear, and would be challenging to implement given current IR systems capability. We do not recommend it be pursued as a medium-term reform.

17. Many of these potential reforms would have a fiscal cost. Given the tight fiscal position in the next few years, there may be merit in considering a ‘package’ approach, as was done in Budget 2010, with reductions in taxes being offset either by increasing other tax rates or by base broadening. Specific base broadening options considered at the time of Budget 2010¹¹ include:

⁹ An alternative PIE extension would be to lower PIE rates, as recommended by the Savings Working Group. The type of impacts of such a reform are likely to be similar to the reduction in tax on interest income, modelled above, given it involves reducing the tax rate on specific forms of capital investment.

¹⁰ It may be possible to mitigate compliance costs for smaller taxpayers without sophisticated systems by allowing them to “elect out”, however this also has some complications and may also be challenging for the IR to administer with its current systems limitations

¹¹ Risk-free return tax on rental property (taxing rental housing on a deemed return basis) is also revenue positive. However, the need for such a tax may be less now that depreciation for buildings has been removed, and the revenue potential for this tax is minor compared to a capital gains tax and a land tax and is not sufficient to fund a reduction in personal tax rates or capital tax.

- **Capital gains tax (CGT)** – Treasury considers a capital gains tax should improve allocative efficiency on a first principles basis. The Andrew Coleman model suggests it would tend to reduce investment in rental housing and increase investment in debt investments (although increase investment in owner-occupied housing if that is exempt from the tax). The Coleman analysis also suggests a reduction in foreign borrowing (due to the impact of the tax lowering the cost of housing) and that effect could allow sustainable economic growth for a longer period before macro imbalances become too great. A capital gains tax has some complexities in operation (although it can help with complexity too given the current unclear capital/revenue boundary may become irrelevant in some cases) and a lot depends on design features which would have to be considered in an overall assessment of the merits of the tax.
 - **Land tax** – A tax on the value of unimproved land should be efficient on a first principles basis provided there are no exemptions, for example, for owner-occupied housing. It is likely to be fairly simple to implement with low compliance costs. The main downside to a land tax is that it would cause a windfall loss to existing land owners and not to taxpayers who own wealth in a different form. There would also likely be significant pressures for exemptions which, if included, would significantly reduce the efficiency of the tax.
18. Treasury continues to see merit in a general capital gains tax or a land tax as possible revenue-raising reforms, and considers that a capital gains tax offers the best way of improving allocative efficiency by reducing economic distortions caused by gaps in the tax base. Inland Revenue acknowledges that these reform options are consistent with our BBLR framework but it considers that a land tax would impose an unacceptable loss on those who hold wealth in land. Especially for capital gains taxes, all the devil is in the detail. Working through the full details of how best to design a capital gains tax in practice and evaluating whether the pros of the best possible capital gains tax would outweigh the cons would be a very substantial exercise. Inland Revenue's view remains that the practical disadvantages of a capital gains tax are likely to outweigh its advantages. For example, rollover relief may be required so that taxpayers do not face a disincentive to move to a larger building or larger farm, for example, when it makes economic sense to do so. However, rollover relief may mean that a farmer who sells a farm would face no capital gains tax if he or she purchases another farm, but would be taxed if they bought a different type of business. Inland Revenue is concerned that this can be quite distorting. That the practical disadvantages of a capital gains tax outweigh its advantages was also the on-balance view of the Tax Working Group.
19. In addition another revenue raising option may be to raise the GST rate.¹² This would not change the tax base as currently defined. However, raising GST could increase trends for domestic labour to emigrate (as the value of local wages in terms of consumption would fall) and it could also disadvantage domestic retailers when alternative direct imports are available (although reducing the de minimis below the current \$400 in value, and having an efficient way to enforce this may mitigate against this). Raising GST would also cause a windfall loss on existing savings as its value in terms of future consumption would fall.

Reforms not to consider in the medium term

20. Based on overall assessment, officials consider the following tax reforms should not be actively considered as possible medium-term tax reforms. However, they may be revisited at a later stage in response to future economic and fiscal challenges.

¹² The DZ model showed that a \$1 billion reduction in GST, comparable to the size of the other modelled reforms, had the smallest change in GDP and GNP. This is not surprising since consumption is generally considered a more efficient tax base than income (so the impact of cutting the rate should be smaller), and New Zealand has a highly efficient GST.

- **ACE** – The analysis shows there this would attract savings and investment, but any economic benefits are outweighed by the adverse labour supply impacts from meeting the high cost of the reform through higher income taxes (unlike other reforms, the ACE reform is not scalable and is estimated to cost about \$9 billion per year given the magnitude of the tax changes). This is shown by the negative GDP and welfare results. It would add significant complexity to the tax system and would be challenging to implement (e.g. given risks around tax avoidance through international arbitrage). We therefore do not recommend this option be taken forward in the medium term.
- **Dual income tax** – While the analysis shows a dual income tax would attract some additional savings and investment (which in turn increases GDP), these gains are smaller than for simple rate changes to personal income taxes or interest income tax. It would also not increase economic welfare because the benefits of the additional investment are outweighed by the loss of tax revenue on existing investments. The overall impact on macro vulnerability is unclear but likely to be small. It would also add significant complexity to the tax system and would be challenging to implement given current IR systems capability. Given the complexity of implementing the reform, and that the analysis suggests greater economic gains can be achieved through other rate changes for the same fiscal cost, we do not recommend prioritising further work on a dual income tax in the medium term.
- **Further corporate tax rate reduction** – A company tax reduction results in some increase in savings and GDP, although this is lower than for personal tax reductions. This is predominately from increasing foreign investment (as imputation claws back the benefit for residents), which acts to increase macro vulnerability. The analysis also suggests a corporate tax reduction may reduce economic welfare because the welfare loss from giving up tax revenue to non-resident owners exceeds the welfare gain from additional investment and GDP. This suggests caution in considering a further corporate tax rate reduction at this time.¹³ There are also likely to be dynamic growth benefits (as a result of higher productivity growth and spillovers from additional FDI) from reducing corporate tax, which are not captured in the modelling results. At the same time there are likely to also be wider benefits from personal tax cuts such as increased investment in human capital and spillovers from this investment which are also not captured so this will not necessarily tilt the balance in favour of company rate cuts ahead of personal tax cuts. But there are other factors, such as the need to make sure that our corporate tax rate is not too far out of line with tax rates in other countries. For example, New Zealand's corporate tax rate is higher than the OECD average but currently lower than Australia although Australia is currently considering a tax rate reduction. A comparable corporate rate to other countries is important to minimise the risk of profit-shifting pressures (using transfer pricing). These considerations may increase the case for a further reduction in the corporate rate in the future. It is important that New Zealand remains an open dynamic economy and an attractive destination for FDI, given the benefits foreign investment can bring.
- **Comprehensive inflation adjustment of tax bases** – For the reasons discussed earlier under capital income tax reduction targeted towards residents,






¹³ The implication of this result may suggest that an increase in the corporate tax rate will be welfare-enhancing for New Zealand. However such a tax change might not be sustainable given our corporate tax rate is already above the OECD average. It would be a negative signal for business, impacting New Zealand's ability to attract FDI, and that it would increase incentives for firms to shift profits overseas, eroding the corporate tax base.













we do not recommend that full inflation adjustment of tax bases be pursued as a medium term tax reform.

Further work









21. Tax policy resources will continue to focus primarily on delivering the Government's tax policy work programme, in particular high priority projects such as on charities, taxation of intellectual property and supporting IR's business transformation programme. We are also reporting separately to Ministers on possible packages to consider for Budget 2013, balancing revenue raising and wider economic objectives. Beyond this, we recommend focusing further "investment" work on:
 - Considering reforms to capital income taxes that are restricted to residents. As noted above this could include extending the PIE regime to other forms of capital income, removing the PIE cap to fund personal tax reductions, or reducing the tax rate on interest income. Officials will report on these options as part of work on PIE reform on the current tax policy work programme.
 - Possible changes to the personal tax structure, including adjusting for fiscal drag. A simple change to current thresholds in 2015, to correct for five years of fiscal drag since the 2010 tax reform, is estimated to cost around \$1.5 billion per annum. You may wish to consider such a change beyond Budget 2013 as the impact of fiscal drag increases and the fiscal position improves.
22. We are currently undertaking work looking at the extent of location-specific economic rents in New Zealand (important given the finding of gains from corporate income tax reductions accruing to non-residents), which is due to report later this year.
23. While the models are far from being definitive, the development and use of economic modelling work has improved our policy analysis capability and we will continue to invest in the models to improve robustness and capability. This analysis will also help inform Treasury's discussion of tax options in the long-term fiscal statement.

Table 1: Summary assessments of tax reforms

Key:  = significant positive impact,  = some positive impact,  = negligible impact ($\pm 0.1\%$ change) or unclear,  = some negative impact,  = significant negative impact

Reform	Steady state impacts						Fiscal impact	Overall assessment
	National savings	GDP	Economic welfare	Macro vulnerability	Equity ¹⁴	Complexity of change		
Cut in corporate income tax					Small negative impact	Low	\$1 billion equates to ~4ppt reduction in tax rate	While GDP increases (due to increased investment in corporate sectors, and longer term productivity gains) welfare falls slightly due in the main part to the high level of foreign capital ownership in New Zealand – so only some of the tax reduction accrues to residents, but they bear the entire burden of the revenue offset. There is some small improvement in the level of savings. Macro vulnerability may also worsen due to the increase in foreign capital, little domestic capital response and worsening of the current account (although dynamic growth benefits from the tax cut can help mitigate this through increased servicing capacity of external liabilities). Reducing the company rate would increase the possibility of companies being used to shelter personal income and reduce coherence.
Cut in all personal income tax rates					Depends on design	Low	\$1 billion equates to ~1ppt reduction in average tax rates	This reform offers the largest gains in GDP and economic welfare (including additional dynamic growth effects) compared to changing other tax rates. It also has a positive impact on savings. There is some reduction in macro vulnerability given that the domestic capital response to the tax change is larger than the change in foreign capital, which is also expected to improve the current account balance and net indebtedness, and given higher savings will increase servicing capacity. This reform has been based on a proportionate cut across tax rate schedule to maintain progressivity – cutting certain rates more than others can have different equity impacts (and therefore expected economic impacts). By itself, cutting personal rates is likely to improve coherence of the tax system if the top rate is lowered, by closing the gap with the corporate tax rate.
Cut in tax on interest income					Worsens	Medium	\$1 billion equates to ~4ppt reduction in tax rate	This reform offers the greatest increase in savings compared to other tax rate changes, but the impact on GDP and welfare is smaller than a personal income tax cut (which also reduces taxes on labour). The reform could reduce distortions between debt and housing investments but could possibly increase distortions between debt and equity, not captured in the modelling, so benefits to the allocative efficiency of

¹⁴ This is based on current equity impacts. Assessing equity impacts on a lifetime basis has not been possible for the majority of tax reforms given lack of longitudinal data. However, such assessments would dampen the impacts on equity noted here.

Reform	Steady state impacts						Fiscal impact	Overall assessment
	National savings	GDP	Economic welfare	Macro vulnerability	Equity ¹⁴	Complexity of change		
								investment are unclear. The impact on macro vulnerability is also mixed: while there is an increase in net indebtedness, there are higher national savings and capital stock, which may improve the economy's servicing capacity of external liabilities. The reform would be regressive given higher income households tend to earn more interest income. Complexity is higher than other rate changes given the need for anti-arbitrage rules.
Dual income tax					Worsens	High	\$1 billion equates to capped capital rate of ~30%	A dual income tax would attract some additional savings and investment although not as much as a personal income tax cut or discount on interest income alone. When adjusting for the differences in fiscal cost, the resulting GDP increase from a dual income tax is also lower than these two reforms. As with the corporate income tax change, economic welfare falls given some of the benefit of reductions in tax rates accrues to non-residents while residents bear the entire burden of the revenue offset. It is difficult to gauge the overall impact on macro vulnerability, for the reasons explained above. Implementing a DIT would also add significant complexity to the tax system.
Allowance for corporate equity					Worsens	High	Modelling suggests cost of a full ACE system would be around \$9 billion pa.	Economic gains from reduced savings distortions outweighed by adverse labour supply effects from increasing taxes to fund the ACE. ¹⁵ This (along with some gains accruing to non-residents) also reduces welfare. There is a likely increase in macro vulnerability given a large increase in foreign investment and worsening of the current account, although a change in the mix of external liabilities from debt to equity (caused by the ACE) and higher national savings (increasing servicing capacity) will serve to mitigate this. The reform would be regressive given higher income households tend to earn more interest income. It would be complex to implement and rules would be needed to manage fiscal cost given arbitrage risks.

¹⁵ Given the high cost of an ACE, part of the fiscal impact is met through increasing remaining income tax rates as well as reducing government transfers.

Annex 1: Background to recent tax reviews

24. In 2009 the Tax Working Group considered a number of alternatives to New Zealand's broad-base low-rate tax (BBLR) system. These included:
- A classical company tax system with a low company income tax rate and a high tax rate on residents (as is done in Ireland);
 - A dual income tax (a low tax rate on capital income than on labour income, as is done in Norway);
 - An allowance for corporate equity (ACE) (a deduction allowed for a deemed return on company equity so that a normal return earned by a company is not taxed, but returns in excess of a normal return are taxed); and
 - A combination of a dual income tax and an ACE system.
25. The Tax Working Group did not recommend any of these alternatives, noting they would add complexity and arbitrage opportunities to the tax system.
26. The Tax Working Group also considered less comprehensive base broadening within the BBLR system. This was partly to address perceived under-taxation in real property investments. It considered (but only a minority recommended) a comprehensive capital gains tax,¹⁶ and a majority recommended a risk-free return method of taxing residential investment property and a broad-based land tax. It should be noted that, as part of Budget 2010, the government removed depreciation deductions on rental housing (and other buildings). This will have increased the tax payable by landlords. The aggregate impact of this change on the level of tax paid by landlords has not yet been studied.
27. The Savings Working Group was established to consider matters of private and national savings from a number of perspectives. It did not focus on tax issues primarily but it did examine the tax system from a perspective of improving the efficiency of savings and investment. In its 2010 report, it saw merit in a number of possible changes to the tax system, such as making adjustments for the impact of inflation (either by comprehensively indexing the tax base for inflation or providing a discounted tax rate on interest income to adjust for the inflation component of interest) and reducing the intermediate (10.5% and 17.5%) PIE tax rates and extending PIE tax rates to directly held capital income, such as dividends and interest.
28. In addition, the Mirrlees tax review in the UK concluded there were potential economic benefits to a combined ACE/RRA (rate of return allowance) which would impose no tax on all forms of capital income to the extent they earn a normal return, and tax only capital income in excess of a normal return and labour income. However the review did not consider the practical implementation of this reform, or attempt to clarify how the 'normal' rate should be determined.

Annex 2: Analytical annex

Attached as an additional paper:

[Annex 2 - savings and investment joint report \(Treasury:2366671v10\)](#)

¹⁶ The Tax Working Group was concerned that a capital gains tax may become very complex once real-world design features are incorporated and an exemption for owner-occupied housing may undermine many of its efficiency advantages.

Annex 2: Analytical annex for taxation of savings and investment report

Analytical approach

1. We have drawn on several pieces of analytical work developed as part of this review of different tax reforms. The primary model we have used is a computable general equilibrium (CGE) model developed by two US academics, John Diamond and George Zodrow (known as the DZ model), then modified by Treasury and IR. This model has been calibrated to New Zealand specific parameters (based on 2007 data). It allows us to estimate how tax reforms might affect the allocation of capital in New Zealand, and impact key variables such as economic growth, individual economic welfare and the level of savings. A more detailed description and diagram of the model can be found in **Appendix A**.
2. The DZ model has its limitations. Clearly, as with any model, the DZ work is a necessary simplification of the real world so the results are subject to constraints of the methodology and quality of assumptions used (see Appendix A for further discussion). In particular, the model only considers changes to *levels* of economic variables (e.g. GDP) and does not pick up endogenous growth effects. Endogenous growth effects can be important given the link between tax reform and productivity growth,¹ so the full extent of economic impacts of tax reform may not be fully reflected in the results. Given these limitations, such models should not be regarded as definitive; they can only inform a wider analysis. We have therefore complemented discussion of DZ model results with a wider assessment of the likely economic impacts of tax reforms that are not captured in the model (such as dynamic effects), based on wider evidence and studies and also anecdotal evidence from other countries on their experiences with specific tax reforms. Another weakness of the model is that it does not have an explicit exchange rate, and exports are calculated purely to clear the balance of payments. This means that it is likely the model isn't properly capturing the full impacts of tax changes on external balances. This, together with the fact that it is difficult to assess the impact of reforms on macro-vulnerability anyway,² means that we have been cautious in our assessments of impacts on macro-vulnerability. Finally it is not possible to use the model to assess certain reform options, such as a land tax or full indexation of the tax base, as the model does not include land as a separate form of wealth and does not include inflation.
3. Overall we think the model is useful for drawing general observations/insights that can help as part of a broader assessment into each of the modelled tax reforms, but does not offer the level of confidence to rely on quantified results.

¹ See, eg, *Tax and Economic Growth, Economics Department Working Paper No. 620, OECD (2008)*

² The impacts of any reform on macro-vulnerability depend not only on the impact on the current account balance and level of net external liabilities, but also on their composition. All else equal, capital inflows of equity will tend to create less vulnerability than inflows of debt, and the quality of additions to the capital stock is an important determinant of debt servicing capability. Real world assessments of macro-vulnerability are also dynamic, conditioned by events, overall economic performance, market attitude to risk etc, and these factors move over time.

4. Separately, we have also considered a simple three sector general equilibrium model by Andrew Coleman looking in more detail at the impacts of introducing a CGT in New Zealand. This is a highly stylised, simplistic model but we think it provides additional insights in assessing the impacts of a CGT. Unlike the DZ model, it allows for inflation and reflects the likely impact of a CGT on real property investments. Further details of this work can be found in **Appendix B** and results are shown alongside DZ modelling work below.
5. Finally, we have included additional high-level assessments covering distributional impacts,³ tax system complexity and compliance costs and integrity (avoidance and arbitrage opportunities). More detailed analysis of these issues would of course depend on detailed design issues of the possible reforms.
6. Overall, assessments require some subjective weighting of the different factors considered, some of which are analysed with more confidence than others. Reform options will be analysed in the context of the current and likely near-term world economic environment. Some reforms which do not appear to be worthwhile in the current environment could potentially become more viable if the economic or fiscal environment were to change in the future.
7. The assessments consider the impact of potential tax reforms when in a steady state, consistent with other such work. Generally not discussed are the transitional impacts, which may be significant and may include creating windfall gains and losses among different taxpayers. Also not considered in detail are compliance and administrative issues which are complicated now by the difficulty in adding to the Inland Revenue systems burdens until new processing capability is in place. If any tax change were to be seriously considered these matters would have to be considered in greater detail.

Assessment of potential tax reforms

8. We have considered a number of tax reforms drawing on work from both the Savings and Tax Working Groups, and also recommendations from recent international tax reviews. These are set out below.






A	Reduction in corporate income tax rate
B	Reduction in all personal income tax rates
C	Reduced tax on interest income (as recommended by Australia's Henry Review);
D	Dual income tax, with a lower flat rate for all forms of capital income
E	Allowance for corporate equity (ACE) system, with risk-free return on all capital income exempt from tax (as recommended by the UK's Mirrlees Review)

9. These reforms (with the exception of an ACE which is not a scalable reform) have been modelled at a cost of \$1 billion, offset by reducing lump-sum government transfers in the model, which is equivalent to levying lump-sum taxes. These lump sum taxes are theoretically non-distorting ways of balancing the government's

³ These are based on current equity impacts. Assessing equity impacts on a lifetime income basis has not been possible for the majority of tax reforms given lack of longitudinal data. However, such assessments would tend to reduce the size of any positive/negative impact on equity noted here.

budget. The closest proxy for this is likely to be a well-designed land tax (of around 0.25% based on current revenue estimates). Scaling all reform options to the same fiscal cost has been done to allow better comparability of the different reform options. In reality these options should not be considered as complete reform packages, because to be a package the \$1 billion fiscal cost must be offset by government spending reductions or the introduction of a non-distorting lump-sum tax such as a well-designed land tax. In the absence of lump sum alternatives or acceptable government expenditure reductions, any revenue shortfalls are likely to need to be made up by increasing other distorting taxes which will create additional costs and may reduce any economic benefits of the tax reforms explored here.

- The remainder of this report sets out the results for the tax reforms listed above. Results for key economic variables from the DZ model are set out for each reform based on the colour-coded scale noted below. Additional assessments are provided alongside these results.

-  = significant positive impact
-  = some positive impact
-  = negligible impact ($\pm 0.1\%$ change) or unclear
-  = some negative impact
-  = significant negative impact

Analytical results

Reform A: Corporate Income Tax (CIT) Reduction





Context

- This reform looks at a simple reduction to the corporate income tax rate.

DZ Modelling Results

- We have modelled a \$1 billion reduction in corporate income tax, which is equivalent to reducing the CIT rate by 4.3 percentage points (based on standard Treasury fiscal cost estimates). As noted above, this is offset by reduced government transfers to households.

Table 1: Summary of modelling impacts for a corporate income tax reduction

GDP	Economic welfare	Personal savings	Total capital stock	Foreign capital	Current account
					

See key on p.3 of Annex 2

- The DZ model indicates that one of the main impacts of a corporate tax reduction would be a deterioration of the current account balance due to an increase in foreign capital inflows (and therefore outflows of capital income to non-residents), as shown in Table 1. This also increases net indebtedness. There is an increase in GDP and a small increase in both savings and in total capital stock, driven by the increase in foreign capital from the reform. These changes take effect almost immediately, with little difference between short- and long-run results.

14. However there is a small decline in economic welfare despite the fact that GDP increases. This is because the economic welfare loss from giving up tax revenue to non-resident owners exceeds the welfare gain from additional investment and GDP; while only some of the gain of the CIT reduction accrues to residents, they bear the entire burden of the revenue offset.
15. The effects of a corporate tax cut are small, in part, due to the presence of imputation in the New Zealand tax system (so after tax returns to residents are not affected significantly). There is an increase in capital stock in the corporate sectors, given they are the only two sectors to receive the tax cut, with capital falling in other sectors in the economy (notably the non-corporate sector but also the housing sectors).
16. The impact on macro vulnerability is always difficult to assess, but overall this scenario suggests that it may worsen, given the increase in foreign capital and little domestic capital response and worsening of the current account (although dynamic growth benefits, noted below, from the cut in corporate tax could help mitigate this through increased servicing capacity of external liabilities).

Wider Economic Assessment

17. The result from the DZ modelling – that a CIT reduction increases GDP - is consistent with wider evidence⁴ that corporate income taxes are harmful to levels of economic growth. However, the result that the CIT reduction leads to a small economic welfare loss (and a smaller change in GNP compared to GDP) is not something picked up in wider evidence. Much of this evidence (including the OECD work referenced below) looks only at the effects of lower tax rates on GDP rather than on economic welfare. As a result, these analyses won't pick up the fact that some economic benefits accrue to non-residents, which will tend to reduce economic welfare benefits relative to impacts on GDP. The DZ model takes these welfare impacts into account as part of its general equilibrium analysis of the tax change. This is important for New Zealand because we have a higher share of foreign investment as a proportion of GDP than most other OECD countries. This may also explain why the model suggests a smaller impact on economic growth from a change in CIT rates than a change in personal income tax rates (see Reform B).⁵ In addition, other studies tend to be based on cross-country averages, which make it difficult to draw inferences about individual countries.
18. Evidence shows⁶ that, as with personal income tax rates, reducing taxes on capital investment can also affect economic growth rates, not just levels, although the OECD suggest persistent growth effects are likely to fade out in the long run. Reducing taxes on capital investment can remove distortions in relative factor prices resulting in a more efficient re-allocation of resources towards potentially more productive sectors (shown in the modelling results by a shift in capital from

⁴ See, eg, *Tax and Economic Growth*, Economics Department Working Paper No. 620, OECD (2008)

⁵ Studies such as the OECD (2008) study and work from Australia (*CGE Analysis of the Current Australian Tax System*, KPMG Econtech, 2010) find that corporate income taxes tend to have a more distorting impact on economic growth – although these focus on studies from other countries and don't fully reflect the NZ-specific factors discussed above such as imputation clawing back the benefit of the company tax reduction for domestic investors.

⁶ OECD (2008)

housing/non-corporate to corporate sectors). This has the potential to increase total factor productivity (TFP)⁷ and economic growth, which is not picked up in the model results.

19. The model results suggest a large foreign capital response to the modelled CIT reduction. In general FDI can be an important source of the capital needed to support increased productivity growth (through spillovers to domestic firms), which would not be picked up in the model. However, evidence is limited about whether FDI has any additional increased productivity benefits over and above the usual benefits from increasing capital investment.

Non-Economic Assessment

20. The equity implications of this option are lower than for other capital tax reductions such as ACE and DIT as, for individual shareholders, much of the benefit of a company tax reduction is clawed back by imputation. However, cutting the company tax rate without cutting personal income tax rates reduces the integrity of the tax system by making it easier for people to use companies to shelter income from higher rates of personal taxation. On its own, changing the tax rate should have little impact on complexity or administrative costs, but other measures may be required to address the integrity issues identified above, which could add complexity.

Reform B: Personal Income Tax (PIT) Reduction




Context

21. This reform looks at a simple reduction to personal income tax rates (labour income, dividend income and interest income taxes).

DZ Modelling Results

22. We have modelled a \$1 billion personal income tax reduction⁸, which is equivalent to reducing the average tax rate by around 1 percentage point (from 23.4% to 22.4% in the model based on 2007 rates), while retaining the current progressive structure. As noted above, this is offset by reduced government transfers to households.

Table 2: Summary of modelling impacts for a personal income tax reduction

GDP	Economic welfare	Personal savings	Total capital stock	Foreign capital	Current account
					

See key on p.3 of Annex 2

23. The DZ model suggests that this change would result in increases in GDP, savings, economic welfare and capital stocks as shown in Table 2. There is some reduction

⁷ Reducing the corporate tax rate from 35% to 30% is estimated to increase long-run TFP growth by 0.4 percentage points (OECD, 2008)

⁸ Modelled as a reduction in both the average tax rate and average marginal tax rate in order to maintain the same level of progressivity in the personal income tax structure

in macro vulnerability given the domestic capital response to the tax change is larger than the change in foreign capital, which is also expected to improve the current account balance and net indebtedness, and given higher savings will increase servicing capacity. Initially, much of the increase in disposable income for households is saved, causing an increase in investment. Consumption levels take longer to increase, but reduce the initial increase in savings as they do so.

24. The lower personal income tax rate means individuals have more disposable income, allowing them to both save and consume more. The increased consumption increases GDP, and the increased saving increases capital stocks. All sectors see increases in their capital stocks, although the highest increase is seen in the non-corporate sector given the nature of the tax change.

Wider Economic Assessment

25. The results from the DZ modelling are consistent with wider evidence that personal income taxes are harmful to levels of economic growth. The OECD⁹ also found that taxes affecting labour supply mainly influence GDP levels (rather than growth rates), but that there may be some additional productivity growth benefits from such a tax change, which are not captured in the model. In particular, reducing PIT rates can promote R&D activities and enterprise creation, given it is likely the most relevant tax rate facing small, start-up entrepreneurs. It can also affect TFP through immigration of those with high skills and management expertise, and can affect human capital formation. The OECD note these are likely to have persistent long-run effects on economic growth.
26. The model may also underestimate the impact of reducing labour taxes on FDI: evidence¹⁰ suggests the impact of the labour tax rate on FDI is potentially large (although, as noted above, evidence is limited about whether greater FDI flowing into New Zealand will led to increased productivity or economic growth). However, if greater FDI flows were to result from reducing the personal tax rate, it is unlikely to have the same economic welfare-reducing result as seen by a corporate tax reduction since almost all personal tax revenues are earned from residents.

Non-Economic Assessment

27. The equity impact of such a change will depend on how the personal income tax structure is changed in practice to bring about the assumed reduction in the average tax rate. Of course, the way that the personal tax structure is changed will also have some impact on the other variables that we have commented on above. There is likely to be little change to complexity, compliance and administration costs compared to the current system. Reducing the top personal tax rate, relative to the company rate, would also reduce the benefits of sheltering income within companies, increasing the coherence of the tax system.

⁹ OECD (2008)

¹⁰ OECD (2008)

Reform C: Reduced tax on interest income

Context

28. Currently, all income from interest payments is taxed, including that part of the nominal return that is due to inflation. Taxing the inflationary component of returns has efficiency consequences as it can distort how people decide to invest. A simple option to address this partially would be a tax discount applying to interest income only, such as considered in the (Australian) Henry review. Discounting the interest income taxation rate would, by itself, be a relatively simple change to the current tax system, but anti-arbitrage rules (e.g. to prevent individuals converting one form of capital income into another) and other tax integrity issues could add significant complexity.

DZ Modelling Results

29. We have modelled a \$1 billion reduction in tax received from interest, which is equivalent to reducing the average tax rate on interest income by around 4 percentage points (from 24.9% to 21% in the model based on 2007 rates). As in other reforms, this is offset by reduced government transfers to households.

Table 3: Summary of modelling impacts for a reduction in tax on interest income

GDP	Economic welfare	Personal savings	Total capital stock	Foreign capital	Current account
					

See key on p.3 of Annex 2

30. The DZ model estimates this would result in increases in savings and capital stocks, but smaller increases in GDP and economic welfare, as shown in Table 3. Initially, savings and therefore investment and the capital stock increase substantially. Over the longer term, savings settle back to a level that is still higher than pre-reform, and consumption increases so that the extra household income ends up being more balanced between consumption and savings.
31. Our modelling results suggest that reducing the tax on interest income increases the effective return on that income, and so encourages more personal saving. This increases the capital available for production, enabling some increase in GDP. Economic welfare also increases. The effects on the level of savings and the total capital stock are similar to those estimated to arise from a reduction in PIT (see reform B). However, the impact on production and GDP is muted in part as, unlike a reduction in PIT, a reduction in the tax on interest income does not directly incentivise additional labour supply. Furthermore, the accumulation of capital under a reduction in the tax on interest income owes partially to an increase in foreign capital, due to general equilibrium effects, as opposed to a reduction in PIT where the level of foreign capital is estimated to decrease.
32. The impact on macro-vulnerability is likely to be mixed: while there is an increase in net indebtedness and worsening of the current account, there is also higher national savings and capital stock, which may partly improve the economy's servicing capacity of external liabilities.

Wider Economic Assessment

33. As noted earlier, any increase in private saving from changes to tax rates is likely to overstate the increase in capital stock given investment alternatives abroad. This is not picked up in the DZ model. If it were the case, this would reduce additional capital investment taking place in New Zealand and the model results may overestimate the economic impacts of the tax reform. In reality, we would also expect much of the savings response to be driven by changes in peoples' saving habits (e.g. shifting from shares to term deposits to take advantage of the lower tax on interest income as compared to other capital income).
34. The DZ model is also limited in that it doesn't capture the economic cost of incentivising debt investments when the pre-tax return is lower than the pre-tax cost of capital. The impact would tend to reduce economic welfare.

Non-Economic Assessment

35. The reform in itself is regressive (as higher income households tend to earn more interest income) and it would add complexity. An important question is how comprehensive the rules would be. For example, lease payments have an interest component and systematically attempting to tax this at a low rate could be complex. The reform would remove the neutrality of debt and equity financing domestically and instead favour debt financing of domestic companies, which could reduce the financial stability of the domestic company sector. It also raises the arbitrage potential of back-to-back lending where a tax advantage is obtained and there is no net debt created overall. It may require some potentially complicated rules, such as a domestic thin capitalisation regime.

Reform D: Dual Income Tax

Context




36. A dual income tax, as used in Norway, constitutes a low, flat tax rate on all capital income (corporate and interest income, with tax on most dividend income removed to avoid double taxation)¹¹ and a higher, progressive rate structure for labour income. This would be a fundamental change to New Zealand's tax system.

DZ Modelling Results

37. We have modelled the introduction of a dual income tax at cost of \$1 billion, comparable to other reform options. This is equivalent to capping capital income tax rates at 30% in the model (while this reduces corporate income tax from 33%, it does not change the average interest income tax rate in the model, which is 24.9% - a reform that set a single capital rate equal to this rate would instead cost around \$2.5billion). It also includes the removal of imputation and dividend taxation given capital is only taxed once under a dual income tax regime. Consistent with other reforms, fiscal cost is then offset by reduced government transfers to households.

¹¹ In practice, dividends and capital gains are taxed to the extent that they exceed the after-tax risk-free interest rate (which in itself penalises risk). A full Norwegian system also ensures that double taxing at the capital tax rate is equivalent to single taxation at the top personal rate.

Table 4: Summary of modelling impacts for a dual income tax

GDP	Economic welfare	Personal savings	Total capital stock	Foreign capital	Current account
					

See key on p.3 of Annex 2

38. The model results (in Table 4 above) show that the introduction of a DIT regime at a cost of \$1 billion would lead to an increase in personal savings and total capital stock, and some increase in GDP. This is due in part to the increase in foreign capital resulting from the reduction in capital tax rates, which also leads to a small reduction in economic welfare for reasons discussed under the corporate income tax reform above. The tax change sees the capital stock increase in all sectors of the economy, although this is more pronounced in the corporate sectors. Economic welfare and GDP are not significantly affected.
39. Impacts on macro-vulnerability are mixed. On the one hand, the model results suggest a small worsening of the current account and net indebtedness. On the other hand, the more significant increase in national savings and the capital stock may improve debt servicing capacity.
40. While the fiscal cost of a DIT is modelled here as offset by reduced government transfers to households, it could also be offset by higher labour income taxes. Results for this combination of reforms show that, while there would still be increases in savings and capital, there would be a fall in both GDP and economic welfare due to the negative impact of higher labour taxes on labour supply.

Wider Economic Assessment

41. As indicated earlier in the paper, reductions in corporate income tax rates are likely to have additional dynamic growth effects not captured in the model through increased TFP.
42. In its study on tax and economic growth, the OECD¹² notes that for open economies with mobile capital (such as New Zealand), any increase in private saving is likely to overstate the increase in capital stock given investment alternatives abroad, meaning some private savings will flow into foreign investment options. This is not picked up in the DZ model. If it were the case, this will reduce additional capital investment taking place in New Zealand and the model results may overestimate the economic impacts of the tax reform.
43. It has been argued that dual income tax could be a way of reducing perceived preferences for investing in owner-occupied housing or rental housing or both. Norway, which has the most complete example of dual-income tax system, also has a high level of domestic savings invested in residential property compared to financial assets. The same observation has been made of New Zealand. Norway also has significant tax preferences relating to housing, such as:
- Non-taxation of imputed rental income combined with a deduction for mortgage interest expense;
 - Non-taxation of capital gains on owner-occupied housing; and

¹² *Tax and Economic Growth, Economics Department Working Paper No. 620, OECD (2008)*

- A wealth tax on all capital (including housing) but calculated in such a way that the effective tax rate on housing capital is lower than the effective tax rate on other capital.
44. This suggests that a low income tax rate on capital income alone (or other measures considered elsewhere in this report such as cutting personal tax rates) will not necessarily correct for any preferences for investment in housing; instead these should be addressed more directly.¹³

Non-Economic Assessment

45. In a steady state a dual income tax would tend to be a less progressive tax structure, because individuals who earn a high level of capital income compared to labour income tend to be wealthier than individuals who earn predominately labour income.
46. The need to differentiate between labour and capital income at the personal level requires rules to distinguish capital and labour income, and also to distinguish normal capital returns from very high capital tax returns (as this is often bundled with labour income in a way that cannot be separated). Such a system would significantly increase complexity, compliance costs and administration costs compared to the current system, and lead to considerable arbitrage risk associated with having people reclassify labour income as capital income.

Reform E: Allowance for Corporate Equity

Context

47. An allowance for corporate equity (ACE), as recommended for the UK by the Mirrlees Review, only taxes above-normal returns on equity capital, and does not tax normal returns. In its full form it also includes a rate of return allowance (RRA) for normal returns to investment at the individual level, which was also included in the Mirrlees Review's recommendations. This would also be a fundamental change to New Zealand's tax system.

DZ Modelling Results

48. The ACE/RRA reform has been modelled by reducing the tax rate to zero on normal corporate returns and on interest and dividends earned by individuals. Above-normal returns (which are assumed to exist only in the imperfectly competitive company sector) would continue to be taxed. The total cost of the reform is estimated to be around \$9bn p.a. - \$1 billion of this cost has been met through reduced government transfers to households (so it is consistent with other reforms presented) with the remainder of the cost met by increasing remaining income tax rates.

Table 5: Summary of modelling impacts for a dual income tax

GDP	Economic welfare	Personal savings	Total capital stock	Foreign capital	Current account
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¹³ See OECD Economic Surveys Norway (2010).

↓	↓	↑	↑	↑	↓
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See key on p.3 of Annex 2

49. The model results show that the introduction of an ACE/RRA would lead to large increases in personal savings (due to the RRA element) and the capital stock, both from domestic sources and increased FDI. The tax change also causes a significant reallocation of capital from housing to non-housing sectors.
50. However, there are significant reductions in GDP and economic welfare. This is due to the adverse labour supply effects from the higher labour tax rates required to offset the bulk of the fiscal cost of implementing the ACE (aside from the \$1 billion from reduced transfers), and from part of the tax reduction accruing to foreign owners of capital (which generate windfall gains without improving marginal incentives to invest). This is shown in Table 5.
51. There is a likely increase in macro vulnerability given a large increase in foreign investment and worsening of the current account, although a change in the mix of external liabilities from debt to equity (caused by the ACE) and higher national savings (increasing servicing capacity) will serve to mitigate this.

Wider Economic Assessment

52. As indicated earlier in the paper, reductions in corporate income tax rates (in this case for normal returns, where tax rates fall to zero) are likely to have additional dynamic growth rates not captured in the model through increased TFP. However there is a large increase in personal income tax rates which is likely to discourage human capital formation and make New Zealand a much less attractive place to set up a business. Also, assessments of ACE regimes in Belgium and Brazil have indicated there is some impact on the debt-equity ratio, although this is likely to be less important for New Zealand as, for domestic firms, imputation largely removes any bias towards debt finance. Changes to debt-equity ratios would have efficiency effects that have not been factored into the DZ model, although given the size of adverse labour supply effects, these are not likely to alter the overall model findings.
53. As noted earlier, any increase in private saving due to changes to tax rates, is likely to overstate the increase in capital stock given investment alternatives abroad. This is not picked up in the DZ model. If it were the case, this would reduce additional capital investment taking place in New Zealand and the model results may overestimate the economic impacts of the tax reform.

Non-Economic Assessment

54. As with a dual income tax, an ACE would tend to be a less progressive tax structure than the current structure, as earners of large amounts of capital income would benefit the most and they tend to be wealthier. An ACE regime would also add significant complexity to the tax system, and could open up substantial international arbitrage opportunities that would be very difficult to guard against. Anecdotal evidence from Belgium suggests it has been difficult to manage the fiscal cost by attempting to restrict the ACE deduction to new equity – rules attempting to do this have been difficult to design and enforce.

55. Further, although an ACE system is likely to result in lower debt to equity ratios, this will not reduce overall tax arbitrage possibilities. In fact, they are likely to increase as equity investment will have an arbitrage of being deductible/non-assessable. This is likely to be a larger arbitrage advantage than for debt as interest income is taxable in most countries, while foreign equity income is often not taxed. These arbitrage opportunities risk the corporate tax base and could increase fiscal cost.

APPENDIX A: THE DIAMOND AND ZODROW CGE MODEL

Description

56. The model used to inform much of this report is an overlapping-generations dynamic computable general equilibrium (CGE) model, originally designed for a closed economy by George Zodrow and John Diamond. They have extended the model to an open economy for New Zealand. This model allows the calculation of changes to GDP, savings, utility, and other economic variables due to the tax changes considered in the model. It also provides a guide to understanding the indirect effects of the tax changes, some of which are counter-intuitive at first glance.
57. The economy is made up of five sectors: the perfectly competitive corporate, imperfectly competitive corporate (to reflect the presence of location-specific economic rents in New Zealand), a non-corporate sector, rental housing, and owner-occupied housing sector. **Firms** in each sector uses capital and labour to produce goods and maximise the value of the sector, based on the dividends each sector provides to investors. Capital and goods can be both imported and exported from the corporate sectors. **Individuals**, in the model, work for 45 years then retire and live off their savings for 10 years before dying and leaving a bequest to younger generations. They maximise their lifetime utility from consumption, leisure, and bequests. The **government** taxes personal income, corporate income, consumption, and some types of capital gains, then use the funds primarily for government consumption. The money flows modelled in the Diamond and Zodrow model are shown in Figure 1 below.

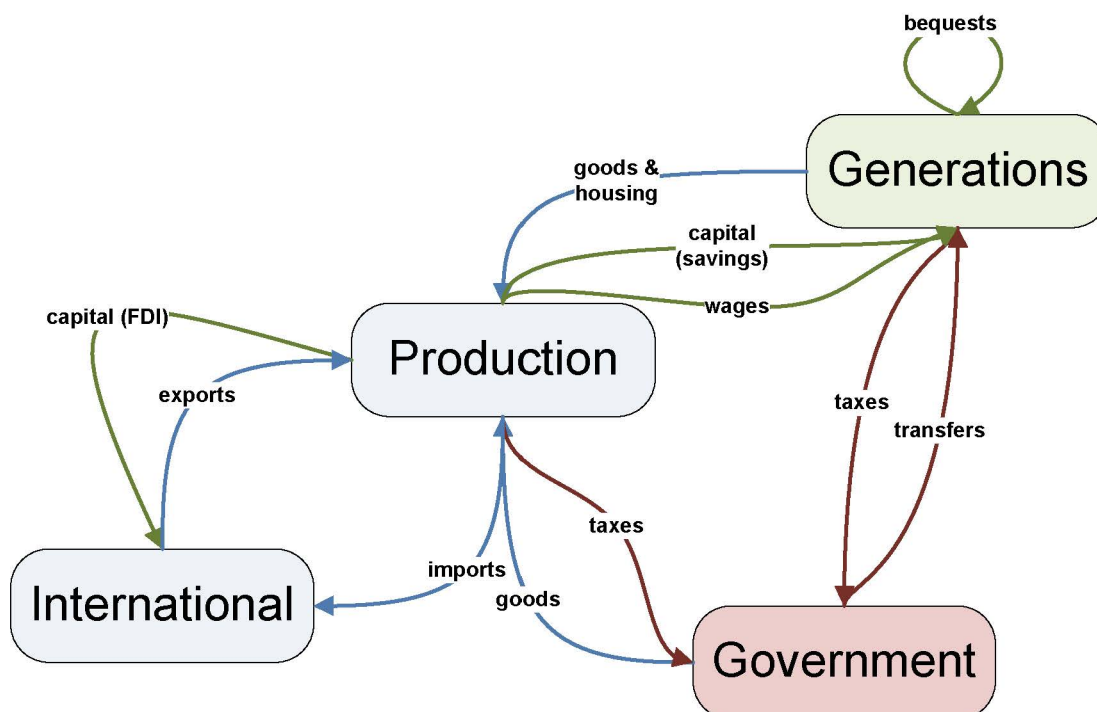


Figure 1: Money flows in the Diamond and Zodrow model.

Note that, as this is a money flows diagram, the arrows labelled "capital" refer to the return from capital, rather than the capital itself.

58. The model parameters were taken from New Zealand data when possible, and the model starts from a presumed equilibrium of 2007 (the latest year for which we had complete data). The model then calculates a new equilibrium based on a tax change. When tax changes are implemented the revenue loss is made up either from changes to lump-sum government transfers (fiscally neutral changes) or by making proportional, offsetting changes to income tax rates to make the reform revenue neutral. This varies by tax reform but is noted in the discussion of the results for each scenario.

Interpretation of economic welfare

59. Economic welfare, in the DZ model, is represented by a lifetime utility function of consumption, leisure, and the bequest left for future generations. Utility does not have a measureable value, just a comparative ranking. Therefore the choice of mathematical function is arbitrary provided the utility function ranks different options in a suitable way, (e.g. more leisure means more utility all else equal). Because of this feature, a 3.1% improvement in utility will not necessarily make people 3.1% happier – the only thing this number can say is that people have a greater improvement in utility (and by proxy, economic welfare) than if the reform gave a 2.4% improvement in utility, for example.

Model testing

60. Analysts from Treasury and IR carried out robustness testing of the initial version of the DZ model to ensure it was suitable for our purposes and to understand the shortcomings of the model. This highlighted a number of issues around how the open economy part of the model is being modelled, which centre around the calculation of foreign capital (and how it responded to changes in the corporate income tax rate).

61. As a result we made a number of improvements to the model to address these, and other, issues and improve the robustness of the results. The key changes are:

- Changing the production functions used in the model to give a more realistic elasticity of substitution between capital and labour for New Zealand, and improve model calibration using New Zealand national accounts data;
- Separately calculating the after-tax rate of return earned by foreign investors in New Zealand in the model. This allows for a more robust calculation of the foreign capital flows in response to a New Zealand tax change (foreign capital flows had previously been based on the domestic investors' rate of return, which included a term for imputation so does not properly reflect the impact of a change in corporate tax, for example);
- Allowing foreign capital to be invested as bonds as well as equity. This now allows the model to pick up the different rates of return (and different tax treatments) of debt vs. equity investments by foreign investors, and therefore provides for more realistic foreign income flows in the balance of payments; and
- Updating the wage profile so it uses New Zealand data and properly incorporates the cohort effect of increasing labour productivity.

62. Separately, we are concerned that the absence of an explicit exchange rate in the model and the fact that exports are calculated purely to clear the balance of payments. This means it is likely the model is not properly capturing the full impacts of tax changes on external balances. This was not possible to address in the time available but is something we can look to refine going forward.
63. Overall though we think the model is useful for drawing broad observations/insights that can help as part of a broader assessment into each of the modelled tax reforms rather than reporting specific quantified results. Going forward there are a number of refinements we would seek to make in the longer term alongside additional testing work to increase our confidence in the internal workings of the model further.

Sensitivity analysis

64. We have also carried out sensitivity analysis on key parameters in the revised CGE model. These include the elasticity of labour supply, the elasticity of supply of foreign capital and the assumption about the size of economic rents. In addition we assessed changes to some of the main parameters underpinning the model calculations (such as the intertemporal elasticity of substitution and rate of time preference). In general these assumptions were varied by $\pm 50\%$ of their original values to assess changes on model results for separate changes in the corporate income tax rate, personal income tax rates and GST rate. Table 2 below shows the central assumptions from the model that have been included in the sensitivity analysis.
65. Overall varying these key parameters did not materially change the conclusions of the results and direction of impact of the model results.
- The size of model results was most sensitive to changes in the intertemporal elasticity of substitution, which is not surprising given it determines how consumption changes over time. The assumption used in the model is based on existing economic literature and is a midpoint of the elasticity values used in other similar models. In all cases the direction of the model results were not affected by varying this assumption.
 - The results are generally not overly sensitive to changes in the elasticity of labour supply (proxied in the model by the intratemporal elasticity of substitution between labour and leisure), although changes to results are more significant when looking at a personal income tax change. Again the direction of impact of the model results are not affected by varying this assumption.¹⁴ The assumption used in the model is within a range of elasticities estimated in a study by Guyonne Kalb¹⁵ as part of recent work for Treasury.
 - Model results are not sensitive to the size of economic rents assumed in the model, including for a change in the corporate income tax rate. While further work understanding location-specific economic rents is important, our analysis suggests it is not a key sensitivity for the model results.

¹⁴ The only exception is for the ACE reform, where reducing the intratemporal elasticity of substitution caused the GDP impacts of the reform to be slightly positive. This is not unexpected given the size of the labour supply response to the income tax fiscal offset and that this variable has been varied quite significantly by 50%.

¹⁵ For the model this was converted by Diamond and Zodrow into an intratemporal elasticity of substitution (between leisure and consumption) of 0.80, which they advised was approximately equivalent in effect to the 0.44 hours worked elasticity.

- Changes to the elasticity of supply of foreign capital (which is assumed to be highly elastic) also does not change the direction of the impacts of model results. There is more sensitivity when looking at these changes alongside a corporate income tax reduction - what seems to be more important here is the fact there is already high levels of foreign capital invested in New Zealand. In the case of a corporate income tax reduction, for example, this appears to be a more significant driver of the divergent impacts on GDP (which increases) and economic welfare (which decreases), rather than any new foreign investment resulting from the reduction in the corporate tax rate.

Table 2: Key parameter values used in DZ model (values varied by $\pm 50\%$ during sensitivity analysis)

Parameter	Value used in the model	Notes
Intertemporal elasticity of substitution (between consumption now and consumption later)	0.30	Mid-point value of assumptions used in comparable studies.
Intratemporal elasticity of substitution (between leisure and consumption)	0.80	Set at a value that approximates the Galb ² labour supply elasticity of 0.44, and within the range of values used in comparable studies
Size of price markup in non-competitive sector (denotes size of economic rents in the model)	0.25 (i.e. 25%)	Based on estimates from Bayoumi, Laxton, and Pesenti (2004)
Elasticity of supply of foreign capital	5.0	Relatively high elasticity value used to approximate highly elastic supply of capital
Rate of time preference	0.0175	Based on value used in a comparable study and modified to calibrate capital and labour income in the initial equilibrium

APPENDIX B: THE ANDREW COLEMAN MODEL OF TAX AND HOUSING

Description

66. The high-level model developed by Andrew Coleman is a version of the overlapping generations lifecycle model pioneered by Modigliani and Brumberg (1980), and adapted to analyse housing issues by Ortalo-Magné and Rady (1998, 2006). It is deliberately complex to capture the key features of the factors that affect how people make housing choices. The heart of the model is a dynamic, forward looking maximization problem in which a series of agents who differ by income, age, and wealth make choices about the type of housing in which they live, how much they consume and save, and how much they borrow and lend. These agents have choices over whether to rent or buy, to live in large or small houses, or to share housing with other people. They face realistic bank imposed constraints on the amount they can borrow and the repayment schedule they face if they purchase a house, and they face a tax system that closely reflects that prevailing in New Zealand. Long-term house prices and rents are determined endogenously in the model, and reflect the interaction of the decisions to supply or demand housing by households, landlords, and a construction sector.
67. The model calculates dynamic steady-state paths for house prices and rents, and a set of equilibrium housing supply and demand patterns that depend on fundamental parameters such as interest rates, construction sector supply elasticities, the inflation rate, and the features of the tax system. Particular attention is paid to the various ways that capital income, including housing income, is taxed, how these taxes differ according to whether one is an owner-occupier of housing or a landlord, and how these taxes will change if a capital gains tax is introduced.
68. The model analyses the effect of a capital gains tax on the economy when property prices increase because there is real population growth or real income growth, and not just because there is generalised inflation. The three cases are analysed separately, because there are significant differences in the underlying behaviour of the economy in each case.

Conclusions

69. The paper accompanying the model derives algebraically a formula for determining the price to rent ratio for residential rental property given values for interest rates, inflation rates, and expected real property appreciation rates. The paper shows that the price to rent ratio determined in the absence of any income tax is the same as the price to rent ratio resulting if there were a comprehensive income tax that included taxing accrued capital gains. The price to rent ratio may be different if there is an income tax that taxes rents but not capital gains. Therefore, in the presence of an incomplete income tax that does not include taxing capital gains, changing values for inflation and interest rates may change the price to rent ratio resulting in house prices (and rental rates) changing as interest rates and inflation changes. Applying historical data from the 1990s and the 2000s decades, and assuming the current tax system, the price to rent ratio would have doubled from the 1990s to the 2000s compared to either a no tax or full tax (including capital gains) environment. This means house prices increased more than they otherwise would have if capital gains had been taxed (or if there had been no income tax at all).

70. Coleman also modelled the impact the impact of rising house prices resulting from either income growth or population growth in an environment with both the current tax system and a system that taxed capital gains.
71. The model results show the introduction of a capital gains tax on residential rental property only would (compared to a policy of no capital gains tax) tend to reduce the price of all housing, increase rents, reduce the stock of rental housing and increase the stock of owner-occupied housing, reduce the amount invested in housing and increase the amount invested in debt (other fully-taxed investments). It would also increase economic welfare by assuming the revenue raised from a capital gains tax would be used to reduce consumption taxes. The Coleman model also shows a fairly significant impact on net foreign borrowing, as lower housing prices would reduce the demand for foreign borrowing to buy housing.