# INTERNATIONAL MONETARY FUND

# NEW ZEALAND

## SELECTED ISSUES

February 2016

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# INTERNATIONAL MONETARY FUND

# NEW ZEALAND

## SELECTED ISSUES

January 21, 2016

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|---|---|
| **Asia and Pacific Department** | |

## CONTENTS

# PROSPECTS FOR POTENTIAL GROWTH IN NEW ZEALAND[1]

*New Zealand has world class institutions and strong policy framework, but income levels remain low relative to OECD peers. Boosting potential growth and income levels would require strengthening incentives to invest in productive assets, including through measures to raise domestic savings, enhance innovation and skills, boost infrastructure, and increase competition to mitigate the impact of distance on market size.*

## A.   Introduction

**1.      New Zealand's income level per capita remains lower than the average of OECD countries.** Over 1980-2014, per capita income levels have remained about 20 percent below the OECD average.  In Purchasing Power Parity (PPP) terms, the level is around 40 percent below the maximum OECD income level.
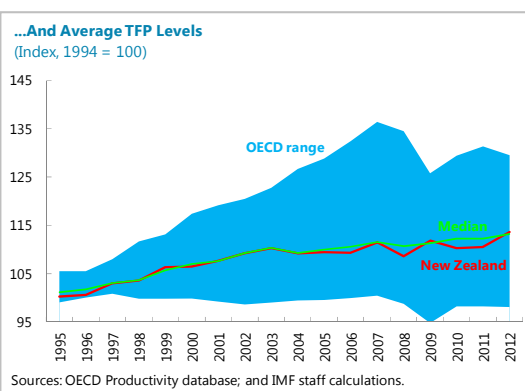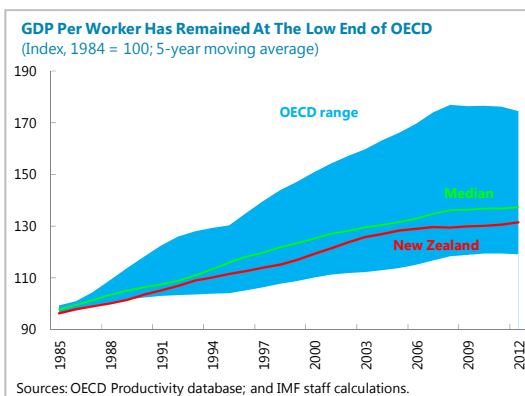
**2.      This reflects low labor productivity (LP) levels, linked to both low levels of total factor productivity (TFP) and of capital deepening.** Assuming a standard production function, LP levels can be decomposed into TFP and capital deepening levels.[2] OECD data show that the LP level is below average OECD levels, reflecting both TFP and capital deepening (measured as the ratio of capital to labor) being at or below the average.

**3.      Growth of LP (measured as output per worker), has been relatively low despite the income level gap.** The relatively modest pace of LP growth has left the sizeable relative income gap broadly unchanged over time. The average growth rate of LP of 1.1 percent over the last 25+ years is below the OECD average of 1.3 percent. The difference in LP growth rates relative to high income OECD countries is quite large, with the third quartile growth rate at 1.7 percent. In terms of PPP income per capita, New Zealand's growth over this period was the same as the OECD average at 4 percent, but little higher than the 3½ percent for the highest income OECD countries.



**Income Gap Relative to OECD Has Persisted** (%, PPP per capita)

Sources: IMF WEO database, and IMF staff calculations.



**…And Average TFP Levels** (Index, 1994 = 100)

Sources: OECD Productivity database; and IMF staff calculations.



**GDP Per Worker Has Remained At The Low End of OECD** (Index, 1984 = 100; 5-year moving average)

Sources: OECD Productivity database; and IMF staff calculations.

[1] Prepared by Adil Mohommad.

[2] This is a useful way to organize a discussion on per capita income in New Zealand into factors that have bearing on TFP and those that bear on capital deepening, though these factors are interconnected, as productivity both benefits from, and incentivizes, investment in capital. See "An Empirical Study of Sectoral Level Capital Investments in New Zealand," Treasury WP 14/04.
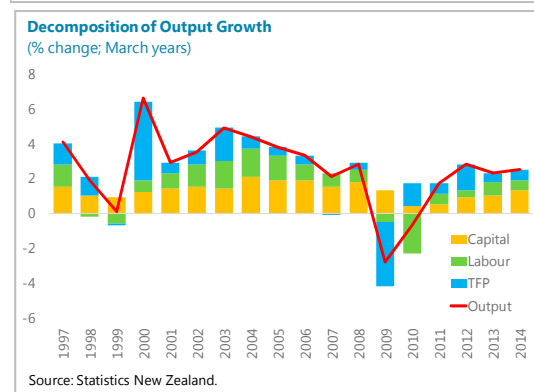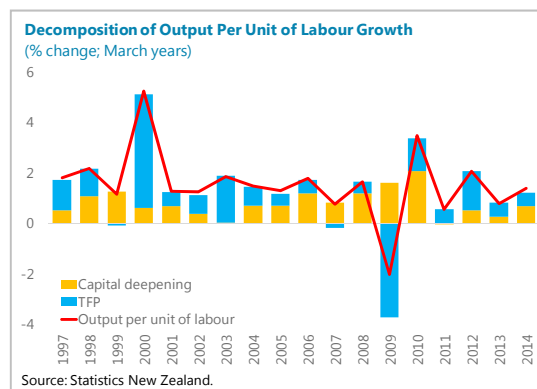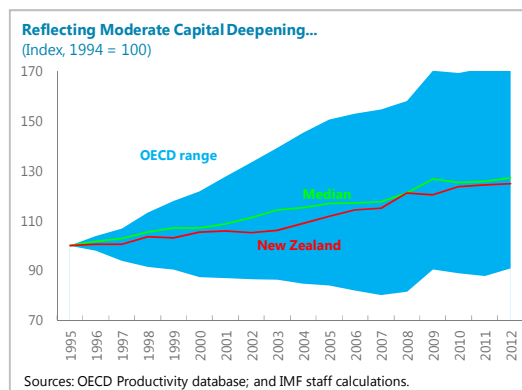
**4.      Moreover, LP growth has slowed since the GFC.**
A historical decomposition of LP growth into its components
reveals over 1997-2014, the measured sector[3] recorded
average LP growth of 1.5 percent. Compared to precrisis
growth rate of 1.8 percent over 1997-2008, LP growth has
declined to 1.2 percent over 2011-2014. This reflects a
slowing in the contribution of capital deepening from 0.8 to
0.4 percent, and of TFP from 1.0 to 0.8 percent over the
same time period.

**Reflecting Moderate Capital Deepening...**
(Index, 1994 = 100)

Sources: OECD Productivity database; and IMF staff calculations.

**5.      The slowdown in capital deepening occurred
even as labor input growth declined.** Capital input
growth has averaged 2 percent since 2011 compared to
3.5 percent precrisis (though the growth rate has been
rising in recent years). Meanwhile labor input growth fell
from 1.6 percent over 1997-2008 to 1 percent over 2011-
2014.

**Decomposition of Output Per Unit of Labour Growth**
(% change; March years)

Capital deepening
TFP
Output per unit of labour

Source: Statistics New Zealand.

**6.      Favorable terms of trade have supported
incomes, but commodity prices have recently weakened
considerably.** Gross domestic income per capita grew at
2.2 percent on average over 1992-2014, compared to
output per worker growth of around 1 percent. If
commodity prices stabilize at lower than historical levels, or
continue to decline over the medium term, this beneficial
boost to income will not be sustained, necessitating higher
GDP growth to sustain and increase growth rates of income.

**Decomposition of Output Growth**
(% change; March years)

Capital
Labour
TFP
Output

Source: Statistics New Zealand.

**7.       Measures to boost potential growth and
incomes would require addressing the long-standing
structural issues.** These include addressing the savings-
investment imbalance, which may be raising the cost of
capital and discouraging a faster rate of capital growth, and addressing issues related to incentives
for investment in directly productive assets as opposed to relatively high preference for housing.
While New Zealand has high levels of competitiveness based on global rankings such as Doing
Business when compared to other advanced economies, boosting productivity growth has yet
proven challenging. Policy measures will need to help mitigate the limiting effects of distance from
markets, boost innovation and competition, and address any infrastructure bottlenecks.

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[3] The measured sector excludes property and business services, health and community services, cultural and
recreational services, and personal and other community services, providing a coverage of about three-quarters of
the economy.

## B.  Estimates of Potential Growth

**8.      A number of approaches are employed below to establish the range of plausible estimates**. Estimates of potential growth are inherently subject to uncertainty, with different methods having different strengths and weaknesses. Methods like HP filt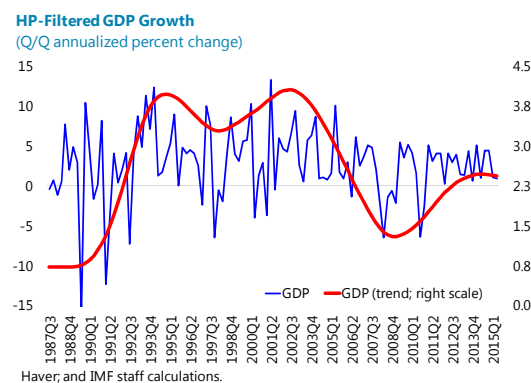ering and the Okun approach are simple to implement but are backward looking, and the HP filter is subject to known statistical problems. The production function approach is forward looking, but requires assumptions/projections of the evolution of inputs and productivity that may be subject to substantial uncertainty. Using a number of methods helps to establish a plausible range for potential growth.



**Okun Coefficient**

$y = -0.3445x + 0.9178$
$R^2 = 0.4304$

Annual change in Unemployment rate (percentage poins)

GDP growth (year-ended, %)

Haver; and IMF staff calculations.

**9.      Taking an Okun view, real GDP growth that appears to be consistent with stable unemployment is around 2.7 percent.** This is based on a sample over 1987Q2:2015Q2.  Over this period, unemployment growth rose in the early 1990s, and then declined steadily over the 2000s reaching a low of 3½ - 4 percent prior to the GFC. Since then, the unemployment rate has risen to stabilize around 6 percent. Over this period, GDP growth has fluctuated around the average rate of 2.7 percent.[4]



**HP-Filtered GDP Growth**
(Q/Q annualized percent change)

GDP — GDP (trend; right scale)

Haver; and IMF staff calculations.

**10.      A standard HP filter suggests that trend growth has hovered around 2.4 percent since 2013**, recovering in the post-GFC period, but slower than rates observed in the mid-1990s to mid-2000s.

**11.      A production function approach suggests potential growth around 2.5 percent.** Table 1 summarizes the baseline results using the production function approach. Potential growth is estimated to average 2.5 percent over the medium term.[5] The contribution of TFP growth is assumed to rise gradually over the medium term to the long run average. Weakening WAP growth translates into a declining contribution from labor input growth, while the contribution of capital input is assumed to remain steady at around 1¼ percent.

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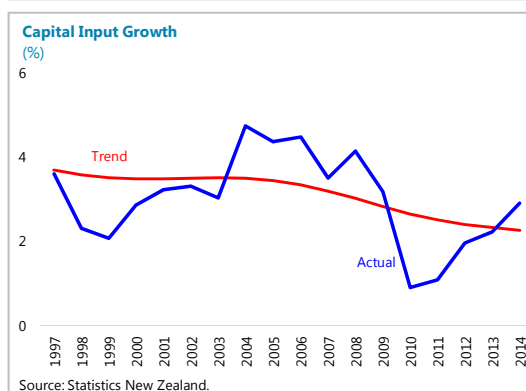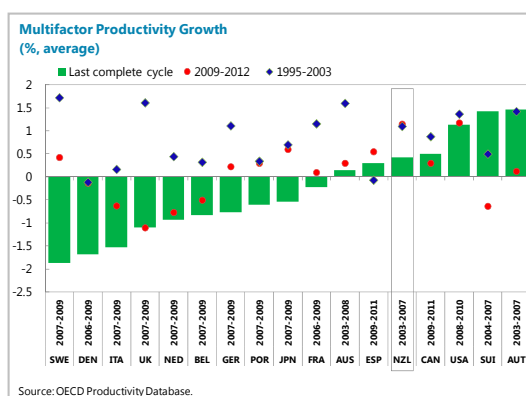[4] This is in line with a recent Treasury estimate; see Treasury Working Paper 14/01.

[5] These results are in line with Treasury estimates of potential growth (see 2012 Half Yearly Economic and Fiscal Update, and steady growth assumptions in Treasury Working Paper 13/18).

| Table 1: Potential Growth Estimates | | | | | |
|---|---|---|---|---|---|
| | 2016 | 2017 | 2018 | 2019 | 2020 |
| Potential growth | 2.6 | 2.5 | 2.5 | 2.5 | 2.5 |
|   TFP | 0.5 | 0.5 | 0.6 | 0.7 | 0.7 |
|    Labor (contribution) | 1.0 | 0.8 | 0.7 | 0.6 | 0.6 |
|    Capital (contribution) | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| Labor input growth | 1.7 | 1.4 | 1.1 | 1.0 | 1.0 |
| Capital input growth | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| WAP growth | 2.0 | 1.2 | 1.3 | 0.8 | 0.8 |
| LFPR | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 |
| Unemployment | 5.7 | 5.6 | 5.5 | 5.4 | 5.2 |
| Sources: Statistics New Zealand, and IMF staff estimates. | | | | | |

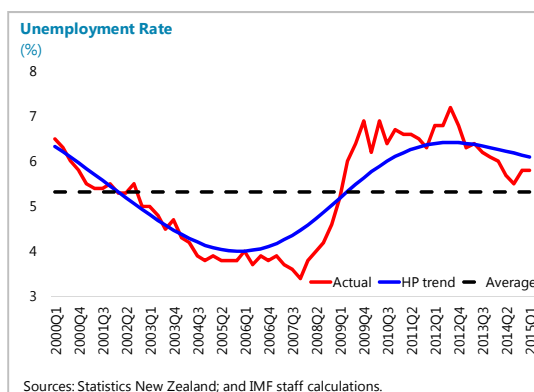**12.     The assumptions underlying the production function estimates are follows.**

- **TFP.** TFP growth has slowed over the last complete cycle – as in several other OECD economies – relative to higher growth rates in the past. Over 2003-07 (the last complete cycle), TFP growth averaged 0.4 percent, compared to around 1 percent over 1995-2003, and 0.4 percent over 2008-12. The long run average is 0.6 percent over 1995-2012. Compared with other OECD countries, New Zealand's TFP growth performance compares favorably, particularly considering large negative growth rates recorded among several countries in the period encompassing the GFC. In our baseline we assume that TFP growth averages 0.6 percent, rising gradually from 0.5 percent (as recorded in 2014 by Statistics New Zealand) to 0.7 percent over the medium term.[6]



Multifactor Productivity Growth
(%, average)

Source: OECD Productivity Database.

- **Capital input.** Trend growth in capital input (HP filtered) averages around 3 percent in New Zealand, over 1997 - 2014. Capital input growth slowed after the GFC, but has since recovered to nearly 3 percent. For baseline estimates of potential growth we assume that capital stock growth



Capital Input Growth
(%)

Source: Statistics New Zealand.

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[6] The data for cross-country comparison use OECD statistics for the sake of comparability. Statistics New Zealand's estimates produce a similar long run average TFP growth of 0.7 percent (over 1997-2012), and indicate that the slightly different cycle over 2003-08 produced average TFP growth of 0.6 percent, and 0 percent over 2009-12 (an incomplete cycle).
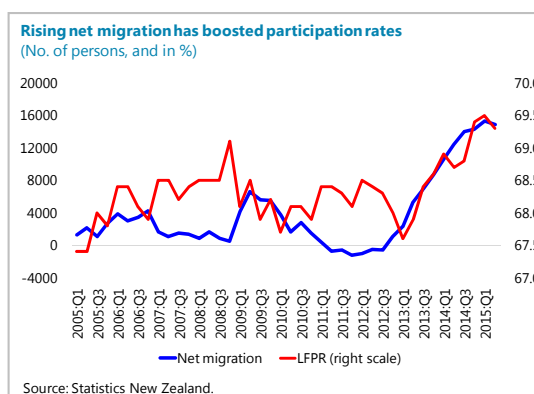
averages around 3 percent over the medium term in line with its historical growth rate. The growth of capital *stock* over a longer period (1950 – 2011) has averaged 3.4 percent, but closer to 3 percent over 1970-2011.[7]

- **Labor input.** Projected labor input growth may be decomposed into growth in working age population (WAP), labor force participation rates (LFPR), and the underlying rate of unemployment (NAIRU).



Unemployment Rate (%)

Sources: Statistics New Zealand; and IMF staff calculations.

  - **Average unemployment** over 2000Q1-2015Q1 is 5¼ percent. The baseline estimates assume that unemployment declines from 5.7 percent (recorded over 2014) gradually to this average rate.

  - **LFP rates** have increased markedly since 2013Q1, reflecting a strong increase in net migration. Given the difficulties in projecting migration flows over the medium term, a simplifying assumption is made that LFPR stays constant at nearly 69 percent recorded in 2014 (though it has risen slightly above this figure in 2015).



Rising net migration has boosted participation rates (No. of persons, and in %)

Source: Statistics New Zealand.

  - **WAP growth** assumptions are derived from Statistics New Zealand National Population Projections (base 2014) data. Of the several population growth (by age cohort) scenarios in this database, the baseline scenario is based on median fertility and mortality projections, and cyclic migration that fluctuates over a 10-year cycle between -10,000 and 35,000 each year over the projection period.[8]

**13.     There are significant risks to this baseline scenario.** Given the known difficulties is projection TFP growth, and uncertainties around the labor input projections, particularly around estimates of NAIRU, difficulties in projecting migration, and hence in projection WAP and LFPR, the estimates are subject to uncertainty. Some risks could push potential growth above or below the 2.5 percent mark:
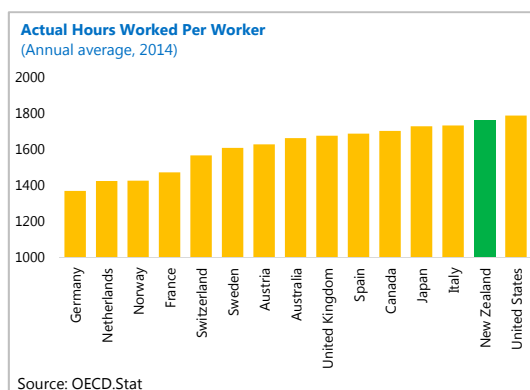
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[7] Federal Reserve of Saint Louis data (sourced from UC Davis and University of Groningen).

[8] This assumption appears plausible when compared to historical annual net migration, except in 2014 when net migration exceeded 51,000. While net migration appears to have peaked since then, this is subject to uncertainty.
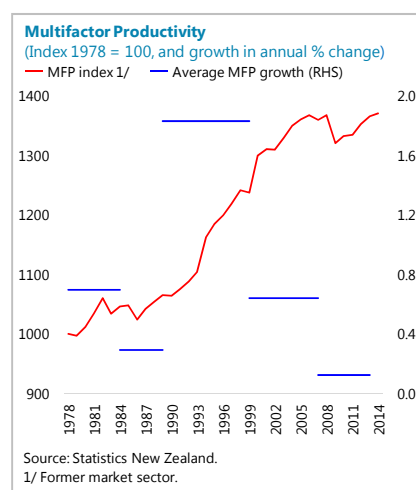
- Upside risks may arise for instance due stronger than historical net migration into New Zealand. For example, Statistics New Zealand's "very high migration" scenario for population growth would yield potential growth estimates higher by about ¼ of a percentage point than the baseline in the outer years of the projection.[9]

- On the downside, absence of the gradual improvement in TFP growth would take off about ¼ percentage point from growth – a scenario which may be triggered by the general slowdown in productivity growth among advanced economies. Trend capital stock growth has been slowing; continued weaker capital stock growth of around 2-2¼ percent as estimated for recent periods would also subtract ¼ - ½ percentage point from growth. LFPR rates are at historical highs. A 1 percentage point reduction in LFPR over the medium term relative to baseline would reduce potential growth to 2¼ percent. A combination of weaker TFP growth and weaker capital stock growth would imply potential growth around 2 percent over the medium term.

## C.  Boosting Living Standards: Productivity and Capital Deepening

**14.      Raising productivity levels in New Zealand is important to raise income levels and address the savings-investment imbalance.** New Zealand has very high LFPR rates and is the second most intensive in terms of hours worked among major OECD economies, which has been declining over time like in the rest of the OECD. Future growth would have to rely on greater capital deepening and relatedly, on higher productivity, the ultimate driver of living standards.



Actual Hours Worked Per Worker
(Annual average, 2014)

Source: OECD.Stat

**15.      New Zealand implemented far-reaching economic reforms in the late 80s and early 90s which boosted productivity.** These reforms encompassed macroeconomic policy frameworks (adoption of a floating exchange rate and inflation targeting, implementation of the Fiscal Responsibility Act and comprehensive tax reforms generally moving to broad based and flat rates, and extensive privatization),trade liberalization, and labor market reform (moving to individual contracts).[10] Evidence on TFP growth suggests that the post-reform decade over 1990-2000 saw a marked pick-up. Subsequently TFP growth has fallen off, particularly sharply after the GFC.



Multifactor Productivity
(Index 1978 = 100, and growth in annual % change)
— MFP index 1/      — Average MFP growth (RHS)

Source: Statistics New Zealand.
1/ Former market sector.

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[9] In the high migration scenario, population growth in the 15-39 age group is 1.3 percent per year over a 5-year period (2018-2023), compared to 0.4 percent per year in the baseline case, and slightly higher than the baseline in the 40-64 cohort (with no difference in 65+ cohort). Based on the share of these cohorts in the projected WAP size, and assuming a labor coefficient of 0.6, the additional growth amounts to about ¼ percent.
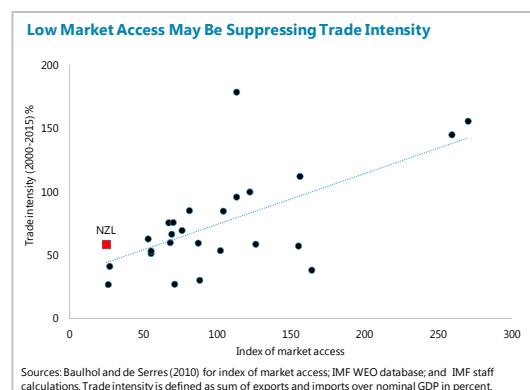
[10] See "New Zealand's Radical Reforms," OECD 1997.

**16.     There are few if any low hanging fruit in terms of reforms.** With generally high quality policy settings, globally competitive institutional features, there are few if any major economic reforms of the type implemented in the 1980s and 1990s left. The World Bank Doing Business indicators show New Zealand was the 2nd best country in overall ranking in 2015, and occupies the frontier among several dimensions.

**New Zealand remains among the best places to do business...**
(Distance from frontier; 100 = frontier 1/)

1/ Source: World Bank Doing Business database. Country sample includes Austria, Australia, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, U.K., and U.S.

**17.     However, there may be targeted areas for improvement.** According to the World Economic Forum's Global Competitiveness Report (2014-2015), though New Zealand ranks high at 17 in overall competitiveness (up from 25 in 2011-12), and the top spot in the subcomponent of institutions, it ranks much lower in terms of infrastructure, innovation and sophistication factors, and technological readiness. The top constraints cited by business in New Zealand include infrastructure, innovation capacity, access to finance, and workforce skills.

**18.     New Zealand is handicapped by its long distance from markets and its small market size, limiting incomes and productivity.** Based on structural policy settings, New Zealand's per capita income should be 20 percent above the OECD average, not 20 percent below.[11] Distance from markets can impact on productivity through limits on the potential to exploit scale economies and agglomeration effects, higher transport and distribution costs, etc. Large distance to markets may be suppressing New Zealand's trade intensity, may

**Low Market Access May Be Suppressing Trade Intensity**

Sources: Baulhol and de Serres (2010) for index of market access; IMF WEO database; and IMF staff calculations. Trade intensity is defined as sum of exports and imports over nominal GDP in percent.

explain a sizeable portion of the productivity gap (more than half), and has been estimated to cost around 12 percent of GDP relative to other developed countries.[12] Other narratives have ascribed weak productivity to slowing pace of economic reforms, and to the nexus of low savings and high relative interest rates, and consequently low investment, productivity and exports.[13]

**19.     Increasing New Zealand's international exposure is a major aspect of productivity oriented reforms.** While physical distance is immutable, its impact can be lessened with policies to

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[11] See "An International Perspective on New Zealand's Productivity Paradox," New Zealand Productivity Commission Working Paper 2014/01.

[12] See "Have developed countries escaped the curse of distance?," Journal of Economic Geography 2010 (10).

[13] See "Holding on and Letting Go," Treasury 2014.

encourage a greater competitive and outward-oriented focus for New Zealand firms. Some of the key drivers of productivity growth that are considered important areas to address are shown in Table 2, as detailed in a series of Treasury papers investigating productivity growth options.

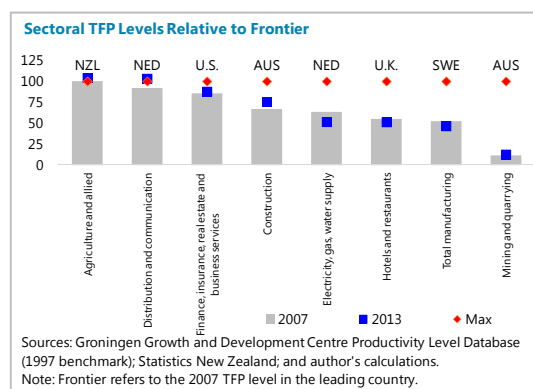| Table 2. Policy Considerations for Boosting Key Productivity Drivers | |
| --- | --- |
| Enterprise | Promote competition, including with greater integration of New Zealand markets with international goods and factor markets. Domestic policy settings may have to keep an international perspective; given few obvious barriers to trade, capital flows, etc. |
| Innovation | Increase R&D expenditure, which still lags behind OECD levels (0.5 percent of GDP compared to 1.5 percent OECD average in 2006-7). Promote international linkage to widen beyond domestically sourced innovation to increase absorption. Leverage public sector innovation with stronger market-facing focus and responsiveness to firms' needs. |
| Skills | Improving educational outcomes of disadvantaged groups, increasing completion rates in secondary and tertiary levels, and enhancing market-facing skills to match firms' needs. |
| Investment | Enhance integration with global markets to increase opportunities for innovation. |
| Natural resources | Being a natural resource dependent economy, ensuring sustainable and productive use of natural resources balancing environmental considerations with economic benefits. In this regard, clarifying the role and relationships of central and regional governments. |
| Sources: Various Treasury Productivity Papers; 2008. | |

- A key aspect of the policy considerations to promote drivers of productivity growth is greater integration with and exposure to global markets. This would help enhance competition, and provide opportunities for more investment by increasing the size of markets.

- A second aspect is policies to directly enhance innovation through greater expenditure on R&D, which is appears on the low side compared to the OECD (though the data only refer to 2006-07), and increasing the market interface of public research. Innovation would in turn help to promote investment.

- A third aspect is the emphasis on increasing labor productivity through education, particularly in raising the attainments of hitherto disadvantaged groups of the population, though gains have been made in education in recent times.

**20.     Addressing infrastructure bottlenecks would help boost competitiveness.**  Measures include (i) implementing infrastructure demand management strategies to reduce urban road congestion (ii) diversifying infrastructure funding, including by expanding user charges; (iii) more
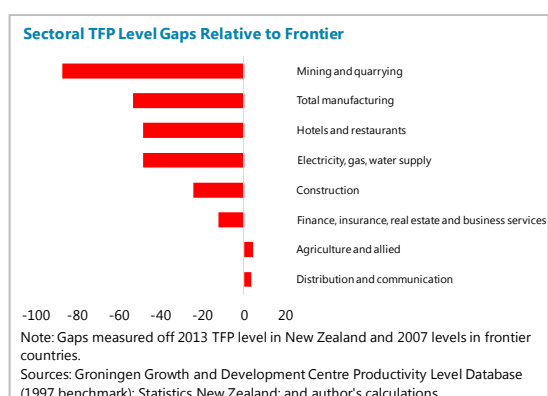
frequently update immigration targets and skill shortage categories to reduce labor market bottlenecks.[14]

**21.     There is space for TFP to catch up to the frontier in several sectors.** Based on Groningen Growth and Development Centre (GGDC) data on sectoral TFP levels (which does not include New Zealand and only extends to 2007), and NZStat data on sectoral TFP in New Zealand (which extends up to 2013), it is possible to compare TFP levels relative to the 2007 frontier, and the extent to which the gap has closed or widened. While somewhat dated (the frontier may have moved since 2007), this may still be useful to identify potential sectors for further targeted reforms.



Sectoral TFP Levels Relative to Frontier

Sources: Groningen Growth and Development Centre Productivity Level Database (1997 benchmark); Statistics New Zealand; and author's calculations.
Note: Frontier refers to the 2007 TFP level in the leading country.

- In 2007, TFP levels in New Zealand were well distant from the frontier in a number of sectors, including mining, manufacturing, hotels and restaurants, utilities, and construction. By contrast it was at or very near the frontier in financial intermediation and business services, distribution and communication, and was the foremost in agriculture.



Sectoral TFP Level Gaps Relative to Frontier

Note: Gaps measured off 2013 TFP level in New Zealand and 2007 levels in frontier countries.
Sources: Groningen Growth and Development Centre Productivity Level Database (1997 benchmark); Statistics New Zealand; and author's calculations.

- By 2013, the gap from the frontier in 2007 narrowed somewhat in construction, distribution and communication, and finance and business services. Levels remained broadly unchanged relative to the frontier in other sectors. Overall, sizeable TFP level gaps remain across most sectors barring agriculture, and distribution and communication, in 2013.[15]

- Bridging these productivity level gaps can have a sizeable impact on the level of income. Closing the sectoral TFP level gaps would imply an increase in the level of aggregate value added (GDP) by 19 percent.[16] This would serve to bridge a large part of the income gap relative to higher income OECD countries.

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[14] OECD 2015 Economic Review – New Zealand.

[15] Qualitatively similar results are found by Steenkamp (2015); average TFP levels over 2000-10 lag U.S. levels substantially in most sectors, including mining and agriculture, albeit with methodological differences in the measurement of capital stock.

[16] The estimate varies depending on whether the TFP levels in a given sector and country are weighted by its share in value added in that country, or not. Measuring the gap without weighting in the above manner produces a smaller estimated impact on aggregate value added (11 percent).

**22.    Targeted reforms in the services sector could be usefully implemented.** The Productivity Commission has identified enhancing competition in services, and boosting investment in ICT as areas that could yield sizeable productivity gains. The degree of competition is relatively weak in finance and insurance, rental, hiring and real estate, retail, and in professional, scientific, and technical services. ICT investment per capita is also lower than in other advanced economy peers. Measures to increase competition include further lowering barriers to trade, reducing search and switching costs for consumers, and improving the current competition law. ICT adoption is hindered among other factors by restrictions of market size and distance, but also due to shortage of IT-skilled workers. Greater emphasis on job-ready tertiary education, and improved workforce management practices would help to increase the take-up of ICT technology by firms.
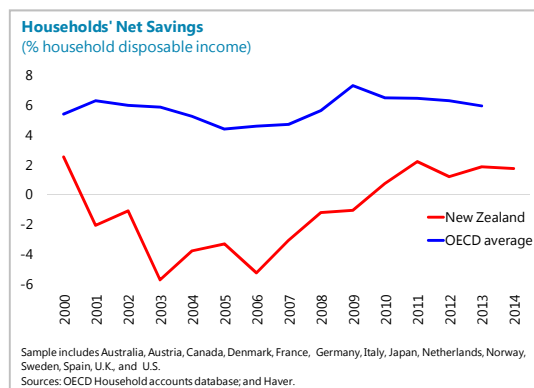
**Nominal rates and S-I balance**

Notes: 1. Sample includes Australia, Austria, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, New Zealand, Norway, Sweden, Spain, U.K., and U.S. 2. Average over 1970 - 2014.
Sources: IMF WEO Database, and Haver.

**23.    Increasing capital deepening – also relatively low by OECD standards – will also help boost living standards.** A high cost of capital would reduce incentives to increase investment, other things equal, and lead to lower capital intensity. Across developed countries, long term interest rates appear to be related to the size of the S-I balance – wider gaps tend to be associated with higher interest rates. Compared to other OECD countries, New Zealand has experienced relatively low rates of savings, while investment rates are not particularly high. Partly as a result of the wide S-I imbalance, interest rates in New Zealand have prevailed higher. The higher cost of capital in New Zealand may be driven not only by the low savings rate, but also by factors including the large existing external debt stock (requiring a higher premium for additional borrowing), and a banking dominated financial system with relatively shallow capital markets, combining to depress levels of capital intensity.[17]

**Nominal rates and saving/GDP**

Notes: 1. Sample includes Australia, Austria, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, New Zealand, Norway, Sweden, Spain, U.K., and U.S. 2. Average over 1970 - 2014.
Sources: IMF WEO Database, and Haver.

**Real rates and investment/GDP**

Notes: 1. Sample includes Australia, Austria, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, New Zealand, Norway, Sweden, Spain, U.K., and U.S. 2. Average over 1970 - 2014.
Sources: IMF WEO Database, and Haver.

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[17] According to recent estimates, capital intensity in New Zealand is around 60 percent that of Australia (in 2009; see Mason 2013), and 50 percent the levels in the U.S. (in 2005; see "Investment, Productivity and Cost of Capital: Understanding New Zealand's "Capital Shallowness"," Treasury Productivity Paper 08/03). A good description of the impact of New Zealand's savings-investment imbalance on interest rates and investment (and the exchange rate) and can be found in Reddell (2013).

**24.      Maintaining a strong pace of investment without running up ever larger external debt at high interest rates requires an increase in domestic savings.** The envisaged path of fiscal consolidation is a helpful policy to raise national savings, reversing the deterioration in fiscal balances following the GFC. Household savings have also increased over the past few years after declining steadily from 1998. At around 2% of GDP, however, the rate of savings is much lower than that of other leading OECD countries, which average closer to 6 percent (with some including France, Germany, and Sweden saving closer to 10 percent of household disposable income).  Even in Australia, household savings rate has risen markedly following the GFC, prevailing around 8 percent.

**25.      Tax policies may also have an impact on the form of savings and investment**. New Zealand households appear to show a greater preference for saving in housing rather in other assets that may fund directly productive capital.[18] New Zealand's tax system may favor investment in housing assets. The returns on owner-occupied housing are not taxed at all (though interest payments on mortgages are not tax-deductible), while returns on rental housing are effectively taxed more lightly than those on financial assets, including shares, debt instruments, and bank



**Households' Net Savings**
(% household disposable income)

Sample includes Australia, Austria, Canada, Denmark, France,  Germany, Italy, Japan, Netherlands, Norway, Sweden, Spain, U.K., and  U.S.
Sources: OECD Household accounts database; and Haver.

accounts. Boosting savings may require increasing uptake of Kiwisaver including through incentives or through compulsory participation, and other reforms to the tax system more widely that may help boost domestic savings and reduce incentives to invest in housing.[19]

**26.      In conclusion, policy efforts to boost living standards have to address multiple fronts.** With no obvious liberalization policies at hand, efforts would have to be made to exploit opportunities for greater international integration in order to boost competitiveness and overcome the disadvantage of distance. Lifting productivity levels would also help boost incentives to invest; but to do so sustainably without exacerbating the high external debt level requires efforts to increase domestic savings. New Zealand's world class institutions and strong macroeconomic track record have supported high debt levels, but the New Zealand economy is not immune to adverse events globally. Thus, pursuing sustainable improvements in living standards would also help reduce vulnerabilities and increase the economy's resilience to future adverse events.

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[18] It has been estimated that almost 90 percent of household wealth is held in the form of housing in New Zealand, compared to between half and three-quarters of total household wealth among other OECD countries (2007 figures). See "Savings in New Zealand – Issues and Options" (Treasury September 2010).

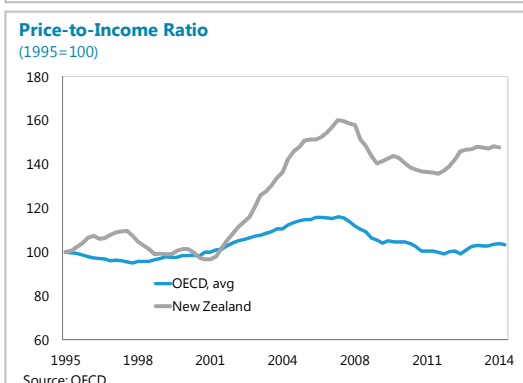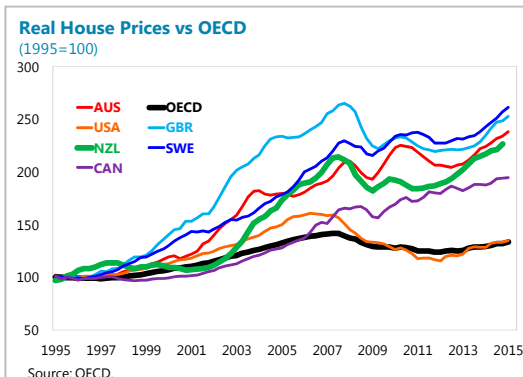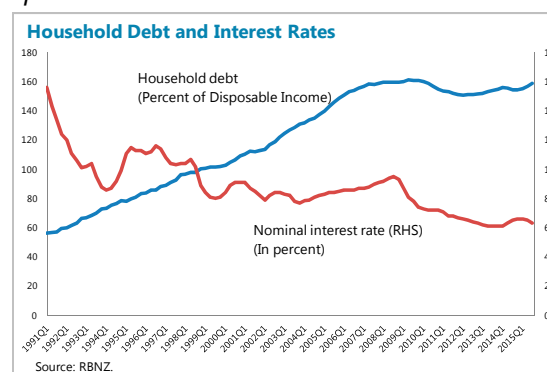[19] See Chapter on "New Zealand: Options for Tax Policy Reform".

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# HOUSE PRICES, HOUSEHOLD DEBT, AND FINANCIAL STABILITY RISKS IN NEW ZEALAND[1]

*House prices and household debt have increased rapidly in New Zealand over the past two decades. This paper traces the evolution of New Zealand house prices and household debt in an international perspective, analyzes long-term fundamental determinants of house prices and assesses macroeconomic risks stemming from the rapid increase in house prices and household debt.*

**1.    Over the past 25 years, house prices have increased strongly in New Zealand.** As house prices have increased faster than disposable income, household indebtedness as percent of disposable income has increased from 56 percent in 1990 to 154 percent in 2014 (chart). House prices have risen faster than the OECD average but broadly in line with comparator countries (chart).
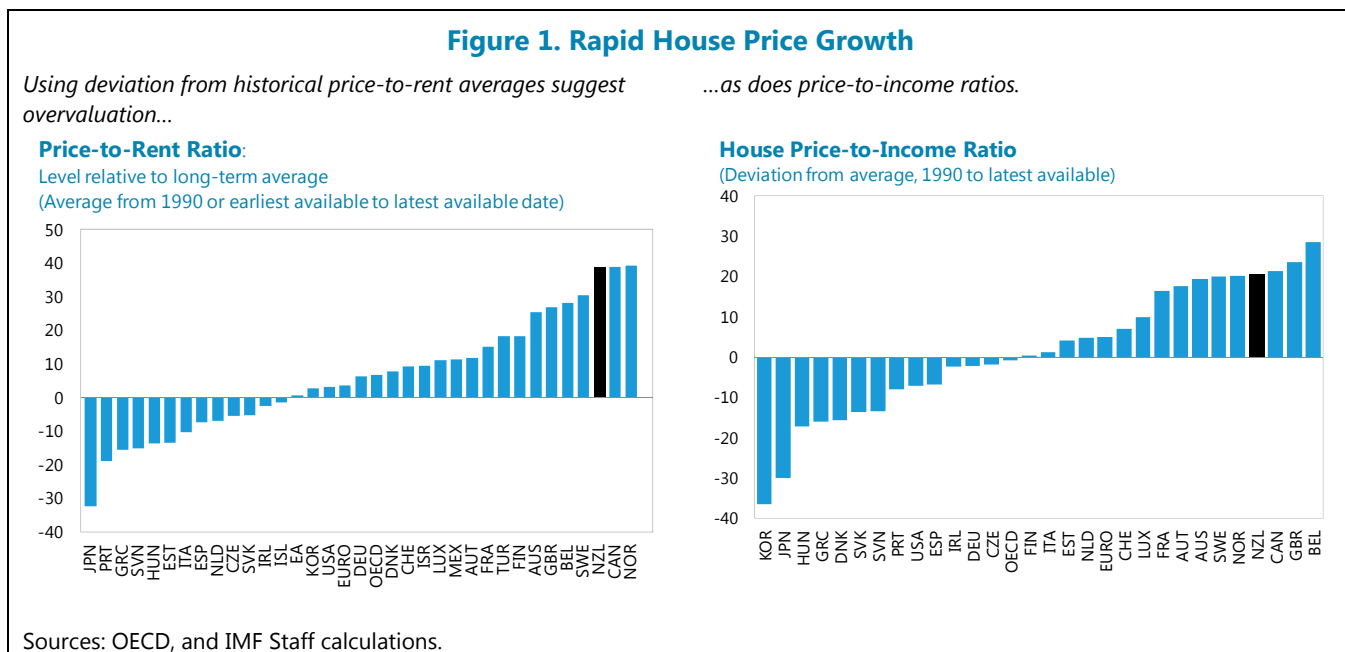
**2.    Rising house prices and household debt have implications for financial stability and macroeconomic risks.** In view of the strong price increases, many common measures of housing valuation based on deviation from long-run historical trends, such as price-to-rent and price-to-income ratios, suggest overvaluation of about 20-40 percent (see Figure 1 and OECD, 2015; IMF Housing Watch, 2014). While international comparisons of house prices are fraught with difficulty, the household debt-to-income ratio is a key variable from a financial stability and macroeconomic risk perspective as this reflects the risks borne by households and the possible amplification of house price declines to the macro economy through wealth, investment, bank balance sheet and confidence effects (see Hunt, 2014, 2015 and Debelle, 2004).[2]

**Household Debt and Interest Rates**



Source: RBNZ.

**Real House Prices vs OECD**
(1995=100)



Source: OECD.

**Price-to-Income Ratio**
(1995=100)



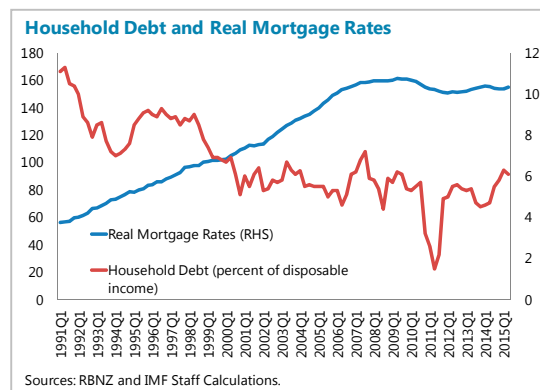Source: OECD.

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[1] Prepared by Dan Nyberg.

[2] Using differences from averages across countries to derive estimates of over- or under-valuation can be problematic. One reason is that it assumes that the starting period was an equilibrium.  Moreover, comparisons of price-to-income ratios are difficult owing to different national definitions of housing coverage and household disposable income.

3.      **This paper analyzes long-run trends in house prices and household debt in New Zealand.** The key findings are that economic fundamentals such as financial liberalization, lower interest rates, demographics and supply constraints are important factors in the large run up in house prices. Although higher house price and household debt can largely be explained, it still has implications for financial stability. The paper also discusses the macroeconomic risks arising from higher house prices and debt.

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### Figure 1. Rapid House Price Growth

*Using deviation from historical price-to-rent averages suggest overvaluation...*

**Price-to-Rent Ratio:**
Level relative to long-term average
(Average from 1990 or earliest available to latest available date)

*...as does price-to-income ratios.*

**House Price-to-Income Ratio**
(Deviation from average, 1990 to latest available)



Sources: OECD, and IMF Staff calculations.

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## What Explains the Rise in House Prices and Household Debt?

4.      **Financial liberalization and disinflation have impacted equilibrium levels of house price and household debt.** Following the structural reform in the 1980s, financial liberalization, lower inflation and interest rates have facilitated easier access to credit. Lower interest rates have also increased the serviceability of higher levels of debt, leading to higher levels of indebtedness and higher house prices relative to incomes. As nominal (and real) interest rates have declined over a sustained period, household debt as a share of disposable income has increased (see chart). Housing demand has also been



**Household Debt and Real Mortgage Rates**

— Real Mortgage Rates (RHS)

— Household Debt (percent of disposable income)

Sources: RBNZ and IMF Staff Calculations.

boosted through lower interest margins of mortgage banks, and increased finance availability. For instance, OECD (2011) finds that 30 percent of the house price increases in OECD countries can be attributed to financial deregulation (e.g. lower down payment requirement is associated with higher homeownership among previously credit constrained households). In the context of Australia, Ellis (2005, 2013) argues that financial deregulation led to greater mortgage market competition and product innovation.
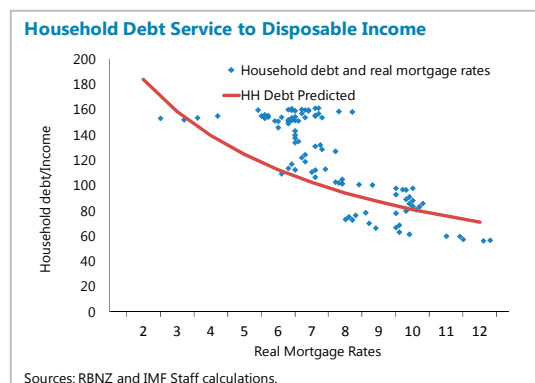
**5.      House prices and economic fundamentals.** An analytical way of looking at the equilibrium level of house prices is to model and estimate the main driving sources of house prices in a period where the transition to lower interest rates was largely complete (e.g. 2000-14). This approach can include both fundamental economic demand and supply factors, and then calculate the gap between the actual house prices and their predicted values from the economic model.

**6.      Analytical approaches to assess the level of house prices.**

- **Economic fundamentals.** Using time-series data, changes in equilibrium real house price changes are modeled as a function of real disposable income, working-age population, equity prices, and the level of short- and long-term interest rates, aiming to capture major demand factors (see Igan and Loungani, 2012, and Appendix 1 for further details). As discussed above, housing and financial markets have changed significantly over this period owing to structural reform in the 1980-90s, making property market developments in the 1970-80s less informative. A more appropriate time period for estimation, arguably, is using data from 2000 onwards, a period where the transition to lower interest rates and financial liberalization has been completed. Using this shorter time frame suggests that house prices are around 18 percent stronger than consistent with these economic fundamentals.

- **User cost approach**. Another method to assess house prices is to apply the concept of user cost of housing. The user cost approach compares the relative costs of owning a home versus renting it by adding up the discounted costs of each alternative over the period for which a house is expected to be owned (see Appendix 2 for details). User costs are affected by a range of factors, including the direct cost of owning a home such as the real interest rate (after tax deductions), operating and maintenance costs, property taxes. The cost of owning a home is also affected by expectations of future house prices, but also significantly by the tax system treatment of housing. In New Zealand, housing is a tax-advantaged asset and owner-occupied housing is exempt from the capital gains tax and the tax treatment of investment in rental property, and particularly from highly geared investment, also imply significant incentives for housing investment (see Spencer 2015, and Selected Issues Paper on Tax Reform). Largely following the calibration in Fox and Tulip (2014), the user cost approach results in overvaluation of around 3 percent. However, the results of the user cost model are very sensitive to changes in the assumption of real mortgage rate variability and expectations of future house price increases.
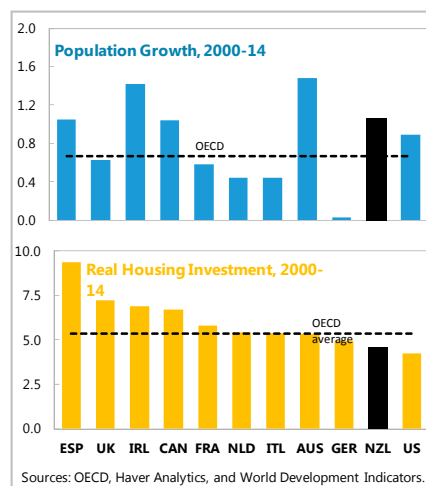


**Household Debt Service to Disposable Income**

Sources: RBNZ and IMF Staff calculations.

**7.      How can one relate household debt to house prices?** The link between the real interest rate and the debt/income ratio can be illustrated in a general equilibrium framework (see, for example Walentin, 2013), where lower real rates support a higher debt ratio. One can also extend the user cost model, discussed above, to illustrate the effects of lower real interest rates on

household debt (see chart and Appendix 2 for details). Using this approach, a permanent decline in real interest rates of one percent suggests a change in the debt ratio in the range of 10-20 percent although the effects are non-linear (see chart). Thus, in this highly stylized context, the real interest rate assumption has considerable implications for the equilibrium level of indebtedness (see also Ellis, 2005).

**8.      The trends of lower interest rates, higher house prices and household debt are closely interrelated.** However, the fact that higher house prices and household debt can largely be explained does not imply that it is sustainable in the long term. Sustainability would depend on the evolution of variables such as the real interest rate, income growth and expectations of real appreciation.
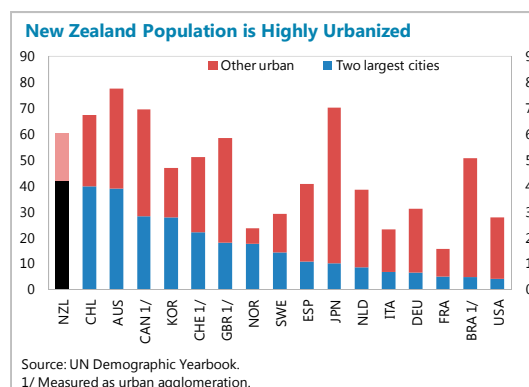
## Population growth and housing supply

**9.      Supply factors are important in house price dynamics in New Zealand and housing supply has not kept up with demand** (see RBNZ, 2011; Spencer, 2015). New Zealand's population has grown rapidly since 2000, and much faster than the OECD average. However, residential investment has remained stable below 5 percent of GDP for much of the past decade, and below OECD average (see text chart).

**10.      New Zealand's population is highly urbanized, with 40 percent in the two largest cities.** As city prices are typically higher than rural, countries with high degrees of urbanization tend to have higher house prices on average (see Ellis and Andrews, 2001). Supply of housing tends to be



Sources: OECD, Haver Analytics, and World Development Indicators.

inelastic as geographic conditions, such as limited available land for high density housing and lack of infrastructure can restrict housing supply in certain areas, causing house prices to increase rapidly. This is particularly the case in Auckland, where the population-to- dwelling ratio is higher than the rest of the country. The supply response to higher house prices has also been relatively slow in New Zealand (see OECD, 2011), but there are signs that housing completions have increased recently.

**11.      Reflecting rapid population growth and geographical constraints that limit the supply response, property prices in Auckland have risen sharply.** Through December 2015, property prices increased by 22.5 percent in Auckland, compared with 14.2 percent for the country as a whole (Corelogic, 2016). Investor activity has been a key driver of house market activity (see Skilling, 2015) and new investor loans have grown strongly recent years, with low interest rates and strong competition among lenders



Source: UN Demographic Yearbook.
1/ Measured as urban agglomeration.

stimulating investor lending growth, especially in Auckland. Parker (2015) lists planning
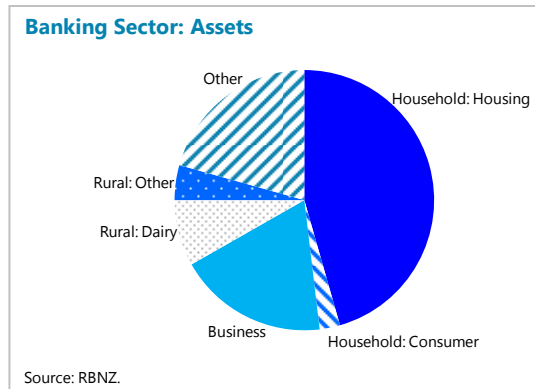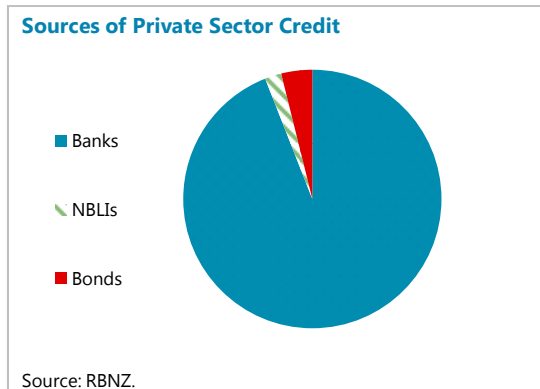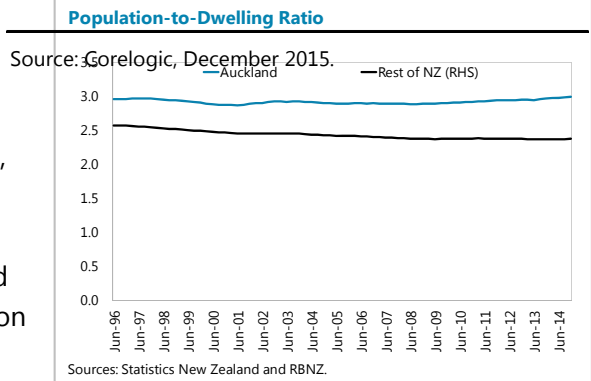
requirements, fragmented ownership, cost of construction, and infrastructure as factors that have limited the supply response. Net migration and foreign demand for housing in Auckland is also a factor that may have supported house price increases and rising price-to-income ratios (see Spencer 2015).

**12.    A slow supply response to rising demand in some areas mitigates house price overvaluation concerns, but does not rule out large adjustments.** While supply constraints do suggest that equilibrium property prices have risen, they do not rule out that demand is excessive, nor that it could fall sharply.  House prices in New Zealand have varied by more than can be explained by the relatively stable deviation between population and housing supply. The UK, for example, had little supply response in the housing boom of the 2000s, but still saw a 20 percent fall.

**New Zealand. House Prices, December 2015**

|  | Year-on-year percent change | Average value (NZ dollars) |
| --- | --- | --- |
| Auckland region | 22.5 | 933,264 |
| Christchurch | 2.6 | 484,043 |
| Wellington | 5.1 | 476,634 |
| Queenstown | 12.1 | 776,671 |
| New Zealand | 14.2 | 558,146 |

Source: Corelogic, December 2015.

**Population-to-Dwelling Ratio**



Sources: Statistics New Zealand and RBNZ.

**Sources of Private Sector Credit**



Source: RBNZ.

**Banking Sector: Assets**
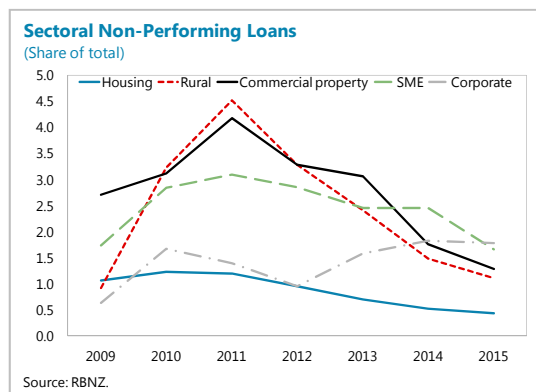


Source: RBNZ.

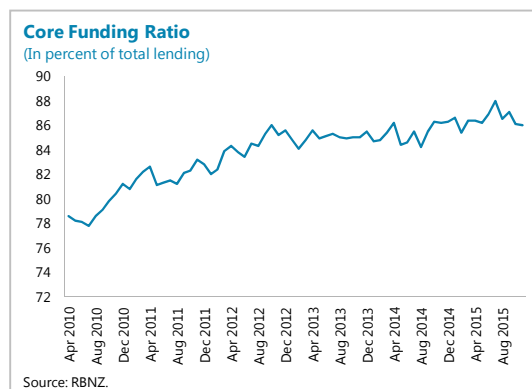*Can the banking system withstand a housing downturn?*

**13.    The banking system is concentrated, with housing loans as the largest asset**. Private sector credit is primarily intermediated via the banking system, especially the big-4 banks. The largest four banks provide 87 percent of the total banking sector credit. Housing credit constitute nearly half of total assets.

## 14.    Asset quality

- **Asset quality remains strong.** Non-performing  housing loans have been historically, and remain, low (chart). Mortgage loans are full-recourse, which implies that the mortgage holder is legally responsible for the loan amount regardless of default or repossession of the property by the lender.

**Sectoral Non-Performing Loans**
(Share of total)



Source: RBNZ.

- **High LTV ratios have declined.** The average loan-to-value ratio stands at about 55 percent and it has been declining from 60 percent of the past decade. With the introduction of LTV measures in 2013, the proportion of high LTV lending has declined (Figure 2).  Dunstan and Skilling (2015a) discuss financial stability risks related to commercial property in New Zealand and find that risks have declined since the GFC owing to less leverage.

- **Households have built up substantial wealth** with net financial wealth amounting to 300 percent of disposable income, although a large fraction of the wealth is concentrated in housing.

**15.    Funding.** Although the core funding ratio has increased since the GFC, the banking system remains dependent on (offshore) wholesale funding. Given the prevalence of floating rate loans (see Figure 2), higher wholesale funding costs would be passed on to mortgage holders (see discussion of implications in stress tests below).

**Core Funding Ratio**
(In percent of total lending)



Source: RBNZ.

**16.    There is no sign of a generalized credit boom and estimates of credit gaps are small.** Using financial gap estimates from the Borio et al. (2013) methodology, yield small gaps, although in some specifications, house prices appear to have an impact on the output gap measures – (see chart). However, some specific areas of concern have emerged as investor credit has picked up sharply lately, largely focused in Auckland (see Skilling, 2015b; Spencer 2015).
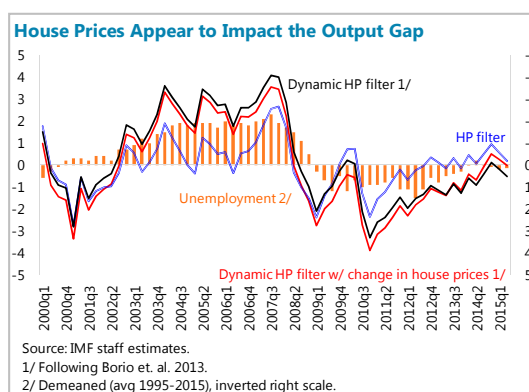
**House Prices Appear to Impact the Output Gap**



Source: IMF staff estimates.
1/ Following Borio et. al. 2013.
2/ Demeaned (avg 1995-2015), inverted right scale.

## Figure 2. Financial Sector and Household Balance Sheets

*The share of high LTVs has declined*

**Share of High Loan-To-Value Loans**
(Percent of total loans)

Source: RBNZ.

*... bank capital has been rising.*

**Bank Capital Ratios**
(In percent)

Source: RBNZ.

*Low aggregate impaired assets...*

**Impaired Assets/Gross Lending**
(In percent)

Source: RBNZ.

*Increasing fraction of fixed rates*

**Average Number of Months to Mortgage Rate Reset**
(In Months)

Source: RBNZ.

*Household wealth is high and concentrated in housing*

**Household Financial Wealth**
(In percent of disposable income)

Source: RBNZ.

*Rapid Investor lending is a pocket of concern*

**New Investor Lending: Loan-to-Value Ratios**
(In NZ$bn)

Source: RBNZ.

**17.      In collaboration with the Australian Prudential Regulatoion Authority, RBNZ conducted a severe stress test of the New Zealand banking system, focused on housing and higher interest rates (see RBNZ, 2014)**.

- **House price bust (Scenario A)**. A housing market decline, prompted by a sharp slowdown in China, where New Zealand GDP growth declines to -4 percent, unemployment increases to over 13 percent and house prices fall by a cumulative 40 percent, with a marked fall in Auckland.

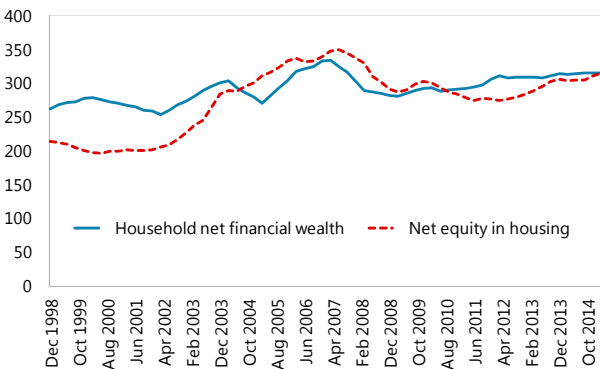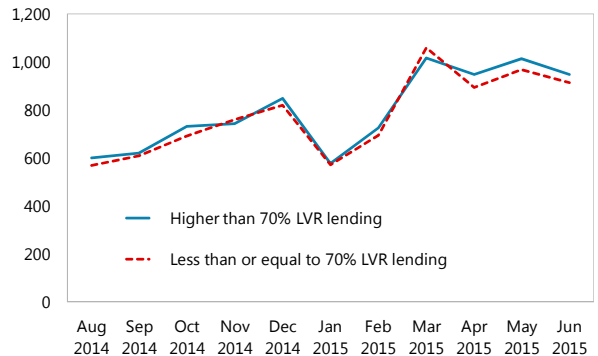- **Higher interest rates (Scenario B)**. In the face of strong growth and emerging inflation, the RBNZ raises the cash rate significantly. Global growth subsequently weakens and a sharp drop in commodity prices leads to increased uncertainty and volatility in financial markets. This leads to higher unemployment and higher borrowing in New Zealand and a significant fall in house prices. Rising global bank funding costs increase lending rates by a further 200 basis points, resulting in floating mortgage rates peaking at 11-12 percent.

**18.      The banking sector would remain solvent, but unlikely to function well.** In each scenario banks face an increase in funding costs, decline in credit quality and credit losses, with a significant adverse impact on profitability and declines in capital ratios. Losses on residential mortgages accounted for around one-third of total credit losses. These aggregate losses contributed to a material decline in the capital ratio of the banking system. While all banks remained above the minimum CET1 capital requirement, almost all banks would use capital conservation buffers and face constraints on dividend and bonus payouts. In such circumstances banks would face funding constraints and likely curtail lending. This would likely exacerbate an already extremely difficult macroeconomic situation.

**19.      Even abstracting from the impact on banks, a sharp fall in house prices would likely have major macroeconomic effects.**  This would operate through many channels (see Hunt, 2015 and Debelle, 2004). For example:

- Wealth effects: households would cut consumption as their housing wealth falls. Smith (2007) finds wealth effects in New Zealand primarily among older households. Dvornak and Kohler (2003) find wealth effects of around 3 cents on the dollar in Australia.[3]

- Investment: Investment and employment in housing would decline. Although average dwelling investment has been range bound, between, 4-5 percent of GDP over the past decades, a slowdown would be expected to have an adverse impact economic activity.

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[3] Windsor et. al (2013) find that the removal of credit constraints (consumption rises with home prices due to households' ability to borrow more, given more valuable collateral), and the related buffer-stock savings argument (higher home prices act as a form of precautionary savings for low-saving households, allowing them to increase spending) are key channels through which house prices affect spending

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# Appendix 1. Time-Series Model using Economic Fundamentals

Following Igan and Loungani (2012), real house price changes are modeled as a function of changes in affordability, real disposable income per capita, working-age population, equity prices, and the level of short- and long-term interest rates. The following quarterly regression is estimated for the period 2001-2014:

$$\Delta HPI_t = \alpha + \beta_1 A_{t-1} + \beta_2 \Delta YPC_t + \beta_3 \Delta WAP_t + \beta_4 EQ_t + \beta_5 i_t^s + \beta_6 i_t^l + \varepsilon_t$$

where ΔHPI is the change in real house prices over the last quarter (capital cities), A is affordability level of housing in the previous period, measured by (the log of) the ratio of house prices to income per capita; ΔYPC is the change in real income per capita over the last quarter; Δ WAP is the change in working-age population over the past year; Δsp is the change in stock prices over the year before last and $i_t^s$ and $i_t^l$ are short and long-term interest rates, respectively.[4] The periods over which the changes are calculated are chosen such that the transmission of changes in these variables would have enough time to have an impact on house prices.

The regression equation is estimated using ordinary least squares (OLS).

| Source | SS | df | MS | | Number of | 60 |
|--------|-----|----|-----|---|-----------|-----|
| | | | | | F( 6, 53) | 17.73 |
| Model | 0.018762 | 6 | .003126999 | | Prob > F | 0 |
| Residual | 0.009349 | 53 | .00017639 | | R-squared | 0.6674 |
| | | | | | Adj R-squa | 0.6298 |
| Total | 0.028111 | 59 | .000476452 | | Root MSE | 0.01328 |

| hpi | Coef. | Std. Err. | P>t | [95% Conf. Interval] | |
|-----|-------|-----------|-----|-----|-----|
| lnafford1 | -0.03204 | .0112834 | 0.006 | -0.05468 | -0.00941 |
| dlnypc | 0.641772 | .2077524 | 0.003 | 0.225073 | 1.05847 |
| stir | 0.000678 | .0012612 | 0.593 | -0.00185 | 0.003207 |
| ltir | -0.00881 | .0032192 | 0.008 | -0.01527 | -0.00236 |
| dlneq1 | 0.027749 | .0132794 | 0.041 | 0.001114 | 0.054384 |
| dlnwap | 3.379174 | .4448133 | 0 | 2.486991 | 4.271357 |
| _cons | -0.6307 | .2165094 | 0.005 | -1.06496 | -0.19644 |

The explanatory variables generally have the expected sign and are statistically significant. Affordability is negatively related to the change in prices and change in income per capita enters the equation with a positive sign. There is also a positive and significant relation between house price changes, equity prices, construction costs, and population growth. On the interest rates, there is a positive coefficient on short term interest rates and a negative sign on long-term interest rates. A

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[4] Data sources are described in Igan and Loungani (2012).

positive relationship may emerge if higher short-term term rates signals an improved economic outlook which may stimulate housing markets.

To arrive at an estimate of overvaluation, it is assumed that house prices were in equilibrium in 2000 (after the transition to lower inflation and interest rates) the house price index is set to 100. Using the predicted house price changes from the regression analysis, index values are computed from that date onward. To assess whether house prices are in line with the economic fundamentals of the model, the actual index value is compared to the predicted one and the difference between the two values labeled as the estimated price gap.

# Appendix 2. User Cost and Household Debt

User cost equilibrium in the housing market occurs when the expected cost of owning a house equals that of renting. In this context, overvaluation is defined by the actual price being greater than that calculated with the user cost. In equilibrium (using the definitions in Fox and Tulip, 2014):

$$P^* = \frac{Rent}{(r + c + d + s - \pi)},$$

where P* is the "fundamental" value of housing; r is the real interest rate; c is running costs such as repairs and insurance as proportion of price; s is transactions costs averaged over the period of ownership as proportion of price and $\pi$ is the expectation of real appreciation on a constant quality basis.

**New Zealand: User Cost of Housing and Household Debt**

Model parameters

| | | | | |
|---|---|---|---|---|
| M | Rental payments as a share of income | 0.2 | Source: | Fox and Tulip (2014) |
| LTV | Average loan-to-value ratio | 0.56 | Source: | RBNZ |
| c | Running costs such as repares insurance as a percentage of price | 0.015 | Source: | Fox and Tulip (2014) |
| d | Depreciation | 0.011 | Source: | Fox and Tulip (2014) |
| s | Average transaction costs | 0.007 | Source: | Fox and Tulip (2014) |
| pi | change in constant quality prices | 0.017 | Source: | Fox and Tulip (2014) |
| r | Real mortgage rate | [0.02-0.14] | | |

Following the approach in Alsterlind et al (2014), one can link the user cost model to household debt, $\frac{D_t}{Y_t^d}$, where D is debt and Y is disposable income. Manipulating the household debt-to-income ratio identity by the price-to-rent ratio and the inverse:

$$\frac{D_t}{Y_t^d} = \frac{Rent}{Y_t^d} \times \frac{D_t}{P_t} \times \frac{P_t}{Rent}$$

Assuming households aim to maintain a constant loan to value ratio, $\frac{D_t}{P_t}$, one can obtain a link

between the price-to-rent ratio and the debt ratio:

$$\frac{D_t}{Y_t^d} = k \frac{P_t}{Rent},$$

where k=$\frac{Rent}{Y_t^d} \times \frac{D_t}{P_t}$.

With the user cost model, one can obtain a link between user cost and the long-term debt ratio:

$$\frac{D_t}{Y_t^d} = \frac{k}{(r + c + d + s - \pi)},$$

The chart in Figure 3 is computed with the assumption that renters spend about 20 percent of their income on housing, and an average loan-to-value ratio of 56 percent.

# NEW ZEALAND—OPTIONS FOR TAX POLICY REFORM[1]

*New Zealand's low national savings rate—a longstanding feature of the economy—is a source of vulnerability and likely contributes to relatively high interest rates needed to attract foreign capital. Moreover, some features of New Zealand's tax system also underpin high demand for housing and can amplify price movements, resulting in high prices and the danger of a self-reinforcing spiral. This paper explores options for tax reform to address both issues.*

## A.  Introduction

**1.      New Zealand's economy has performed well in the aftermath of the global financial crisis (GFC).** Growth rebounded quickly, supported by strong economic policy fundamentals, rising terms of trade, reconstruction after the 2010-11 Canterbury earthquakes, and more recently high net immigration. However, in 2014, the terms of trade have begun to decline, and growth has started to slow. Nonetheless, house price inflation in Auckland continues at high levels.

**2.      A large saving-investment gap has been a long-standing feature of New Zealand's economy.** With low public debt, fiscal consolidation broadly on track and high public sector savings, it is the saving deficit of the private sector that is leading to persistent current account deficits, which are covered to a significant extent by bank borrowing. Net international liabilities have declined but, at 65 percent of GDP in 2014, remain high and are projected to increase again.

**3.      Low saving is a source of vulnerability and raises borrowing costs.** New Zealand's economy is dependent on international investor confidence, making it susceptible to swings in international financial markets, and leading to higher capital costs (Brook 2014). Indeed, interest rates in New Zealand tend to be higher than in other advanced economies. Moreover, the composition of household savings—largely invested in real estate—tends to drive up house prices and amplify price movements, with attendant risks of a self-reinforcing spiral, and may crowd out business investment.

**4.      New Zealand's persistent saving-investment gap cannot be explained by macroeconomic policy settings.** Previous cross-country studies (IMF 2013) show large one-sided residuals when attempting to explain New Zealand's current account deficit and private saving rate by factors such as per capita income, population growth, age dependency ratio, terms of trade, expected income, social insurance, the budget balance, and others. This implies that idiosyncratic structural factors are the main determinants of New Zealand's low saving rate and high current account deficits.

**5.      This paper analyzes elements of New Zealand's tax and benefit system that could help explain low private savings and their composition, and offers reform options.** In particular, the
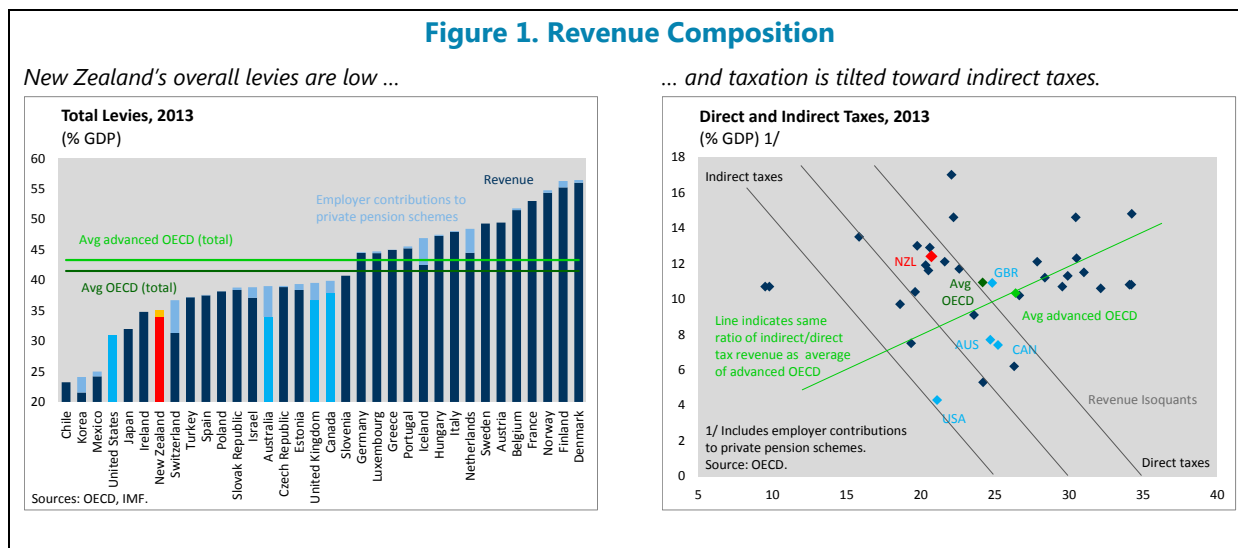
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[1] Prepared by Alexander Pitt.

impact of the voluntary Kiwisaver scheme, New Zealand's pension ('superannuation') system, and the structure of the tax system are examined. The paper then offers interrelated reform options. The remainder of this paper is organized as follows: Section B discusses salient features of New Zealand's tax and benefit system; Section C offers three reform modules, each comprising a number of individual measures; and Section D concludes.

## B.   Taxes and Benefits

### General Observations

*New Zealand's tax system is simple and efficient, and imposes an overall smaller burden on the economy than in most other advanced economies.*

**6.      New Zealand's overall burden of government levies, at 35 percent of GDP, is very low, and revenues are skewed toward more efficient indirect taxes** (Figure 1).[1] Its total levy-to-GDP ratio is 8¼ percentage points lower than the average of advanced-economy peers (Figure 1). The overall level of indirect taxes on goods and services as a percentage of GDP is somewhat higher than in other OECD economies, while revenue from direct taxes is low.



**Figure 1. Revenue Composition**

**7.      Three taxes generate over 90 percent of total tax revenue** (Tax Working Group, 2010). The largest revenue earners are the personal income tax (53 percent), the goods and services tax (GST; 21 percent), and the corporate income tax (17 percent).

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[1] Excludes local government revenues (consolidated fiscal accounts are not available). Local tax and other revenue amounts to another 3 percent of GDP. Nonetheless, even taking this into account, New Zealand's level of taxation and other levies remain low.

**8.      New Zealand's tax system epitomizes the principle of 'broad base and low rate' taxation.**

- *The personal income tax is only moderately progressive* (Figure 2). There is no tax-free threshold, the introductory marginal rate is 10.5 percent, and the maximum rate is 33 percent. This puts New Zealand close to the average of peers' tax rates at that income level, but the absence of a tax-free threshold is fairly unique (though low-income households can receive tax credits and transfers that more than offset their tax burden). While relatively efficient in terms of reducing disincentives to work, it also does little to reduce inequality, in particular given the relatively small size of the state and hence redistributive capacity through benefits (see below).
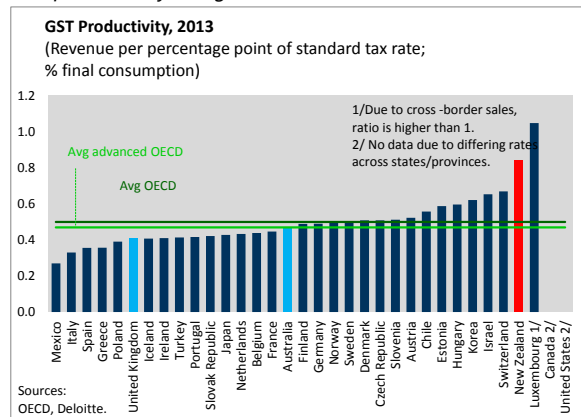
**Figure 2. Income Tax Progressivity**

*Taxation of income starts at the first earned dollar, and rates are only moderately progressive …*

*… and overall low rates help reduce the tax wedge across all wage levels..*



- *The GST rate is relatively low, but its productivity is extremely high* (Figure 3). Introduced in 1986 at a single rate of 10 percent, it was later increased to 12.5 percent (1989) and 15 percent (2010). It has almost no exemptions. Most notably, food is included at the full rate, leading not only to a broad base but also to reduced compliance and administration costs, as definitional issues that afflict more complex systems are avoided. As a result, New Zealand has the highest sales tax productivity in advanced economies (with the exception of Luxembourg, where significant cross-border sales boost VAT productivity). On the other hand, the taxation of food at the full rate (which most peer countries avoid) puts a relatively high burden on lower-income households who spend relatively more on such items.

- *Corporate taxation is low.* While the corporate income tax rate, at 28 percent, is above the OECD average, compulsory contributions to employee savings (through the Kiwisaver scheme)—the incidence of which, in any event, is likely to fall largely on employees—are small, rendering the overall tax burden on corporates low.

## Figure 3. GST and Corporate Taxes

*GST productivity is high …*



**GST Productivity, 2013**
(Revenue per percentage point of standard tax rate;
% final consumption)

1/Due to cross-border sales, ratio is higher than 1.
2/ No data due to differing rates across states/provinces.

Avg advanced OECD
Avg OECD

Sources:
OECD, Deloitte.

*… and taxation of corporations low.*



**Taxation of Corporations, 2013**
(% GDP)

Social security contributions, payroll taxes, and contributions to private pension schemes

Corporate income tax
(in NZL: includes fringe benefits tax)

Avg adv OECD (total)
Avg OECD (total)

Source: OECD and Australian authorities.

**9.      Despite these features, inequality in New Zealand is moderate and has declined over the past ten years** (Figure 4). While broad bases at low rates are efficient economically, they tend to weaken the redistributive mechanism as the difference in taxation between high- and low-income earners is limited (though this can be counterbalanced through increased transfers to low-income earners). However, New Zealand's inequality outcomes, while higher than in European countries, on the whole do not appear to bear this out. To a significant extent, this is due to the relatively low pre-tax/transfer inequality, implying that to reach a given level of post-tax inequality, the redistributive effort can be smaller. Also, New Zealand spends a relatively large portion of its budget on social policies, though its efficiency in reducing inequality is limited.
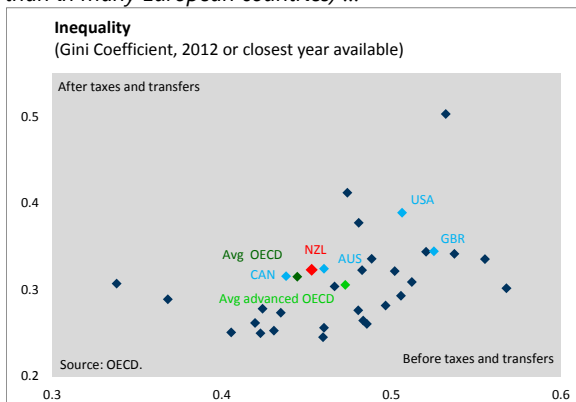
## Taxation of Saving

**10.      There are two broad concepts for taxing savings.** In principle, the 'expenditure tax' system, where either savings or withdrawals of savings are taxed, is neutral between current and future consumption, while the 'comprehensive income tax' system in which returns to savings are also taxed is neutral between current consumption and saving (treating saving like any other form of consumption), which provides a (relative) disincentive to save (Whitehouse 1999).[2] However, in practice, the effect on saving behavior and tax revenue depends on the progressivity of the income tax regime, the tax rates applied to contributions, returns, and/or withdrawals, and elasticities.
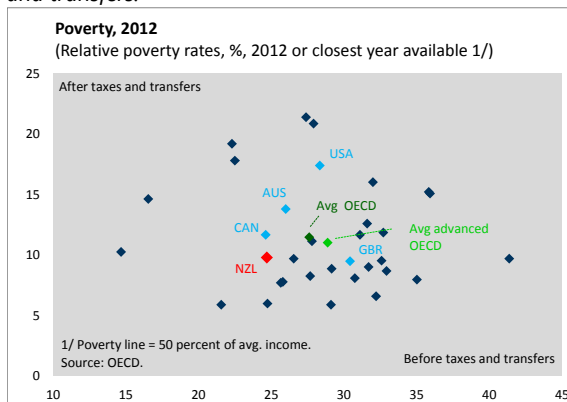
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[2] Corresponding to the three points at which savings can be taxed (at the contribution stage, when investment income and capital gains accrue to the fund, and when payouts are made), systems are classified as TEE (contributions are **T**axed, earnings are **E**xempt, payouts are **E**xempt), EET, TTE, or ETT.
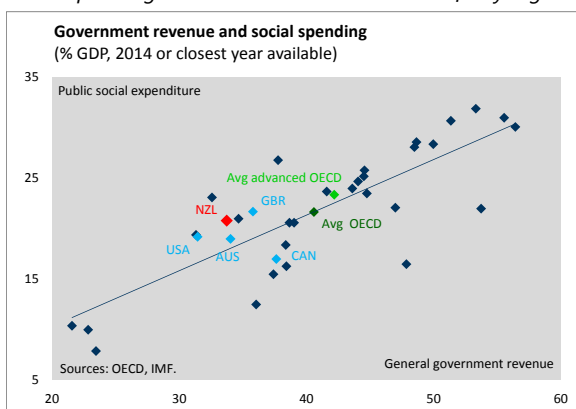
**Figure 4. Inequality**

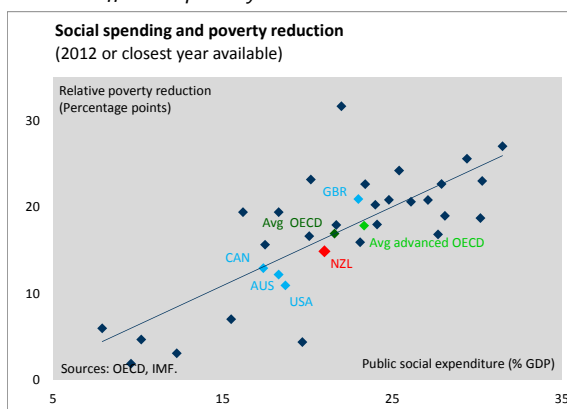*Inequality is close to the OECD average (though higher than in many European countries) ...*

**Inequality**
(Gini Coefficient, 2012 or closest year available)

After taxes and transfers

Source: OECD.

Before taxes and transfers

*... and relative poverty is lower, both before and after taxes and transfers.*

**Poverty, 2012**
(Relative poverty rates, %, 2012 or closest year available 1/)

After taxes and transfers

1/ Poverty line = 50 percent of avg. income.
Source: OECD.

Before taxes and transfers

*Social spending—relative to total revenue—is fairly high ...*

**Government revenue and social spending**
(% GDP, 2014 or closest year available)

Public social expenditure

Sources: OECD, IMF.

General government revenue

*... but its effect on poverty reduction modest.*

**Social spending and poverty reduction**
(2012 or closest year available)

Relative poverty reduction
(Percentage points)

Sources: OECD, IMF.

Public social expenditure (% GDP)

**11.    New Zealand's tax system comes close to a comprehensive income tax system, and provides comparatively few incentives to save.** Almost all OECD countries provide some incentives to increase private (retirement) savings: mostly contributions to specific pension funds are tax exempt, up to certain limits, (Yoo and de Serres, 2004) while some others (e.g., Australia) apply concessional tax rates to contributions, returns and/or payouts. In contrast, in New Zealand savings come out of after-tax income, and the returns to savings are taxed. However, the 'Kiwisaver' scheme provides some incentives for savings, including limits on the taxation of returns and some matching contribution (Box 1).
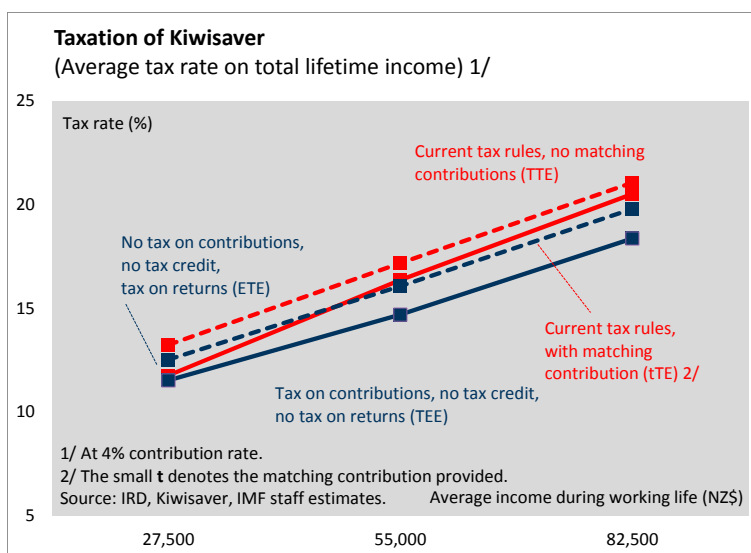
## Box 1. The Kiwisaver Scheme

**In 2007, New Zealand launched the 'Kiwisaver' saving scheme, in an effort to raise low private saving rates.** The scheme is voluntary, and incentives are provided. As of mid-2015, 2.5 million New Zealanders, or 69 percent of working-age adults, were enrolled in Kiwisaver. The main parameters are:

- Enrolment for new employees is automatic, but opting out is possible.

- Employees contribute 3, 4, or 8 percent of their income (self-employed or unemployed persons can contribute amounts agreed with their Kiwisaver providers). Contributions are taxed.

- Employers compulsorily contribute 3 percent of the employee's wage/salary. These contributions, while deductible for the employer, are taxed at the marginal income tax rate of the employee; hence the net benefit to the employee is smaller.

- The government provides a 50 percent matching contribution in the maximum amount of NZ$521.43 per year, which is credited to the Kiwisaver account.

- Prior to May 2015, to encourage uptake, the government also provided a one-time NZ$1,000 credit for new Kiwisaver members.

- Funds from Kiwisaver accounts can generally be accessed upon reaching retirement age (65) at which the universal pension is paid. However, there are other circumstances under which Kiwisaver funds can be withdrawn: buying a first home, moving overseas, suffering significant financial hardship, or in case of a serious illness. Withdrawals are not taxed.

- Kiwisaver members with incomes below NZ$80,000 (NZ$120,000 per couple) are also entitled to a 'home start grant' of up to NZ$5,000 for buying a first home (NZ$10,000 for newly constructed houses).

**Overall, the financial incentives provided through Kiwisaver are significant, but could be higher.** As a result of the capped matching contributions and the limit on the top marginal tax rate, the incentive is similar to an exemption of contributions (at a 4 percent contribution rate—with a higher contribution rate, the incentive becomes smaller). Moreover, the matching contribution is more favorable for lower-income earners, who are more likely to add—as opposed to reallocate—savings (this depends critically on regular adjustment of the tax credit to keep pace with earnings). At the same time, the capping of the tax rate on returns favors higher-income earners. Overall, an exemption of savings returns (but taxation of contributions) would provide a higher incentive.



**Taxation of Kiwisaver**
(Average tax rate on total lifetime income) 1/

Tax rate (%)

Current tax rules, no matching contributions (TTE)

No tax on contributions, no tax credit, tax on returns (ETE)

Current tax rules, with matching contribution (tTE) 2/

Tax on contributions, no tax credit, no tax on returns (TEE)

1/ At 4% contribution rate.
2/ The small **t** denotes the matching contribution provided.
Source: IRD, Kiwisaver, IMF staff estimates.

Average income during working life (NZ$)

27,500     55,000     82,500

**12.      The evidence on the impact of tax incentives on saving is mixed.** In principle, tax incentives for saving, since they raise the relative cost of consumption now against the cost of consumption in the future, should lead to higher saving. On the other hand, lower saving now is needed to reach a given level of wealth (and future consumption path), which could reduce saving. Moreover, if tax incentives are provided only for specific saving vehicles such as Kiwisaver they could lead to a reallocation of savings without increasing the overall amount. The empirical literature on this is inconclusive. While some studies (e.g., Gale and Scholz, 1994; and Attanasio et al, 2004) have found that tax incentives largely reallocate savings, others (e.g., Ayuso et al, 2007; Gelber, 2011) conclude that tax incentives create new saving, thus raising total saving. At the same time, there appears to be some evidence that tax incentives are most effective for lower- and middle-income households (e.g., Engen and Gale, 2000), though a significant—though smaller—contribution can also come from older high-income households (Ayuso et al, 2007).

**13.      Financial saving in New Zealand is disadvantaged compared to saving in the form of housing** (see below). The returns on owner-occupied housing are not taxed at all (though interest payments on mortgages are not tax-deductible), while returns on rental housing are effectively taxed more lightly than those on financial assets, including shares, debt instruments, and bank accounts (Brook, 2014). Moreover, inflation has a different effect on real effective tax rates on different classes of investment, with housing again the most preferred.

## Taxation of Housing

**14.      Many countries provide special tax regimes to support homeownership.** While there may be good socio-political and economic reasons (e.g., promotion of homeownership as a social goal) for such policies, such special treatment can create significant economic distortions (some of which are indeed intended, though others are not), and are often costly in terms of foregone tax revenue. While estimates of distortions and the amount of tax expenditure are often of limited reliability due to the difficulty in quantifying behavioral responses to changes in policy, they can be substantial. However, beyond the direct fiscal cost effect, the support for homeownership also has an impact on the real estate market.

**15.      New Zealand's tax and benefits system incentivizes investment in real estate.** Both owner-occupiers and investors receive significant support relative to other forms of investment.

- *For owner-occupiers,* investment in real estate is preferable to financial investments since no taxable income stream is generated—only potential capital gains that are not taxed. While demand for the overall number of dwellings might be only little affected (since people who do not own homes would have to rent), it is likely to lead to overinvestment in housing, and thereby drives up the value of dwellings. This in turn has potentially negative implications for housing affordability, equity, and financial stability.

- *For investors,* interest payments and maintenance expenses are deductible from taxable income from other sources (though rental income is taxed). Moreover, there is no capital gains tax (CGT). While this treatment is not different from that of other investments (though uncommon

internationally), it creates incentives to invest in real estate if capital gains are expected: when an investor expects capital gains, a property investment may be worthwhile even if rental income does not cover interest costs and maintenance expenses ('negative gearing'). In an environment of rapidly rising real estate prices, the incentives for this form of investment increase, since untaxed expected capital gains increase. Negative gearing thereby acts as an amplifier of price movements in the real estate market and encourages investments that generate negative income streams but positive capital gains. At the same time, higher prices likely do not trigger a significant supply response, which is largely determined by more fundamental factors such as zoning regulations and infrastructure availability. While this tax treatment could subsidize rents, since at a given dwelling price it makes a lower rent acceptable to landlords, it also increases dwelling prices, with the net impact not clear.

**16.      Taxes on land ('council rates') are above the OCED average.** They are levied by local authorities, and account for about half of all local government revenue (about 2 percent of GDP).
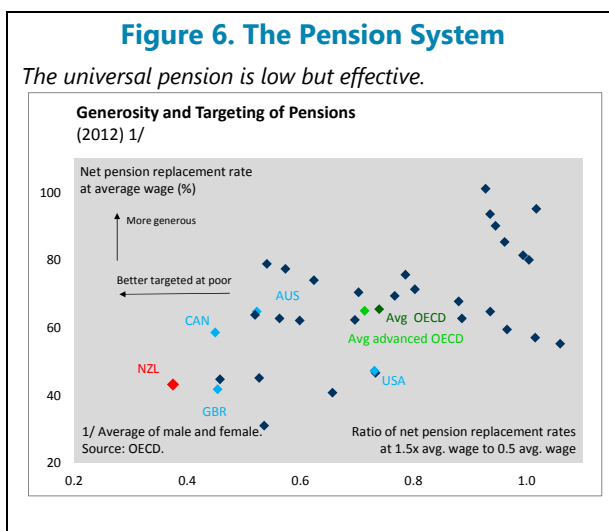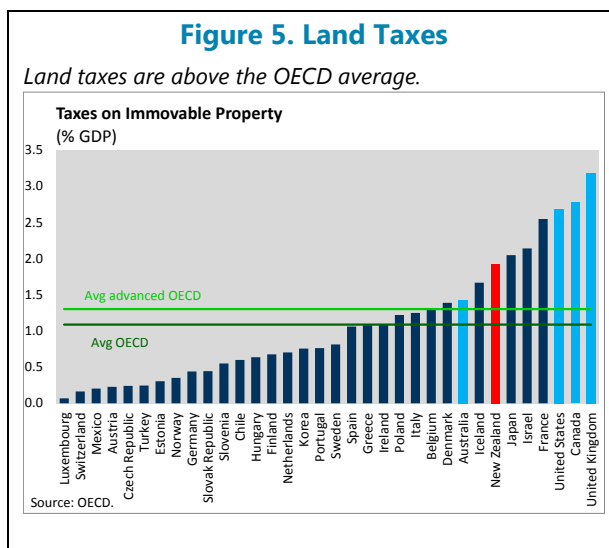
Land taxes are most efficient, since they lead to virtually no distortions in economic behavior. While New Zealand's revenue from land taxes are above average, those of some of its peers, including Canada, the United States, and the United Kingdom, are higher (Figure 5).



**Figure 5. Land Taxes**

*Land taxes are above the OECD average.*

**The Pension System**

**17.      New Zealand's pension system is simple.** The first pillar is the taxpayer-funded universal 'NZ Superannuation', which is paid to every eligible resident from age 65 onward. The second pillar consists of voluntary savings schemes, including Kiwisaver. In 1997, a proposal for complementing the first pillar with a compulsory retirement savings scheme (similar to Australia's superannuation system) was overwhelmingly rejected in a referendum.

**18.      Superannuation is low but effective in supporting lower-income households** (Figure 6). It provides a uniform—i.e. not means-tested—income to everyone eligible (essentially, New Zealand residents over 65 years of age). The superannuation payments are about 40 percent of the average wage, which is fairly low by international standards. However, since the amount paid to pensioners is independent of previous (or current) earnings, while replacing about 80 percent of pre-retirement earnings of lower



**Figure 6. The Pension System**

*The universal pension is low but effective.*

income earners, it replaces only a small portion of those of high earners, implying that they have to have additional savings to maintain their living standard after retirement.

## C.   Reform Options

*Reforms to the tax and benefits system to support a rise in private saving and skew investment away from real estate, while also preserving adequate revenue, requires a comprehensive reform package.*

**19.      New Zealand's tax system is overall relatively efficient and simple; more so than many of its peers'.** The 'broad base, low rate' approach pursued by the authorities has served the economy well, while New Zealand's social benefits, though not very generous, broadly appear to contain inequality at levels close to the OCED average.

**20.      Any reform of New Zealand's tax and pension system will need to reconcile competing objectives.** Overall, the reform should (i) boost overall national saving, thus promoting higher growth and incomes in the long run (even though it may come at some expense to growth in the short run); and (ii) at least preserve, if not improve, socio-economic equality while maintaining or strengthening incentives for work and productive investment. Also, administrative costs for the state and compliance costs for taxpayers should be minimized. This requires a package approach consisting of simultaneous changes to several taxes, as well as transfers and Kiwisaver parameters. However, some elements could be introduced gradually to avoid penalizing existing interests which are the result of decisions made under the current tax system, and thereby increase social and political acceptability. Moreover, a package approach is needed to maintain at least budget neutrality so as to avoid offsetting higher private savings with lower public savings.

**21.      Not all reforms are equally critical.** Some desirable changes may be politically more difficult than others to implement; therefore this paper presents a modular approach in which different options across and within modules can be combined. Nonetheless, key elements are linked, either because they are needed to balance revenue/expense additions and subtractions, or because they compensate for adverse effects of other policies. Some reforms are key building blocks without which not much else can be accomplished, while others are more of an auxiliary nature. Also, not all measures are tax measures; there are other options to tilt incentives toward higher saving. Table 1 provides an overview of reform options. Estimates (Table 1) are for the budgetary impact; the impact on the saving rate will depend on the combination of policies, as well as, critically, behavioral variables.

**22.      A more comprehensive package is possible.** Further shifting taxation toward indirect taxes, and lowering income taxes and company taxes, accompanied by compensating measures to protect low-income households would further increase the efficiency of the tax system. However, this paper concentrates on measures to address the most critical issues, namely raising savings, and making investment in non-housing assets more attractive.

**Table 1. Impact of Tax Reform Options 1/**

| Measure | Impact on budget (% GDP) |
|---|---|
| | Total |
| **Module 1: Strengthening Kiwisaver** | |
| *Nonfinancial measures* | |
| Changing default settings (higher employee contribution rate, eliminating the lowest contribution rate option, reducing the duration of 'contribution holidays') | -- |
| Limiting access to funds before retirement | -- |
| Promotion of a wider variety of investment options | -- |
| Enrolment campaign | -- |
| Increase Kiwisaver employer contributions by 2 percentage points 2/ | 0.3 |
| Reduce company tax by 2 percentage points (to compensate employers) | -0.4 |
| *Financial incentives* | |
| Exempting Kiwisaver returns | -1.2 |
| **Module 2: Other savings incentives** | |
| Reduce taxation of financial returns more broadly (-) | n/a |
| Introduce means-testing for NZ superannuation 3/ | 0.8 |
| Introduce estate tax | 0.1 |
| **Module 3: Reducing investment demand for housing** | |
| Ringfencing housing losses (+) | n/a |
| Widening the applicability of income tax on profits from property sales (+) | n/a |
| Raising land taxes by one-third | 0.7 |
| **NET IMPACT** | 0.0 |

1/ IMF staff estimates based on 2012/13 data from Treasury, Kiwisaver, Statistics New Zealand, and OECD data. Estimates are for first-round effects only.
2/ Does not accrue to budget.
3/ Expenditure measure.
(+) = net revenue gain or expenditure reduction (not quantified).
(-) = net revenue loss or expenditure increase (not quantified).

**Boosting savings**

**23.      Raising private savings should be the centerpiece of any reform effort.** While there is some ambiguity on the effectiveness of tax incentives to raise private savings, short of the introduction of a compulsory savings scheme there are no alternatives to providing incentives. This implies that they need to be carefully designed to maximize their impact. Overall, it may be worthwhile to concentrate efforts to increase saving on the Kiwisaver scheme, since this is relatively widespread, simple, and the ability to ring-fence it can be used to reduce possible unintended distortions that may arise from broader policies, such as a general reduction of the taxation of financial returns. To reduce the reallocation effect of a preferred savings scheme (where higher-income household do not increase savings but reallocate them to tax-preferred vehicles), caps on contributions/exemptions can be introduced (akin to the existing cap on the Kiwisaver matching contribution). Options include:

*Module 1: Strengthening Kiwisaver*

**24.      *Non-financial measures.*** Not all incentives need to be financial. Changing key parameters in Kiwisaver could also achieve an increase in contributions and savings. For example:

- *Default settings.* A higher employee contribution rate could be set as a default to 'nudge' participants toward saving more, while maintaining the option of reducing it. In addition, eliminating the lowest contribution rate option (currently 3 percent) would raise the floor of minimum contributions. Also, the duration of 'contribution holidays' could be reduced (while allowing to renew them), or the option eliminated.

- *Access to funds:* Currently, Kiwisaver funds can be accessed before retirement in a number of circumstances, most notably for buying a first home. This could be reduced, while maintaining the 'home start grant' for low-income earners.

- *Increase compulsory employer Kiwisaver contributions.* Current levels (3 percent) are exceptionally low compared to other countries. While a general compulsory Kiwisaver scheme may be politically difficult to achieve, an increase in the contribution rate for employers could achieve significant increases in saving (though some employees may, in response, reduce their own contribution). Such a measure—while its incidence would likely fall largely on employees— would tilt companies' incentives toward lower employment and more use of capital. Nonetheless, the overall tax burden on companies would remain low (but could still be compensated for by reducing the company tax—see below). In addition, this could be counterbalanced by the overall macroeconomic effect of higher savings, cheaper capital, and more capital deepening. The cost for employers would amount to about 0.3 percent of GDP.

- *Investment options.* Upon retirement, instruments to invest Kiwisaver funds are limited; e.g., there are almost no annuity products. Promotion of a wider variety of investment options could make saving and financial investment more attractive for individuals, and help deepen capital markets.

NEW ZEALAND

- *Enrolment campaign.* While the majority of the workforce is already enrolled in Kiwisaver, a one-off campaign of automatic enrolment (with the possibility of opting out) could draw additional participants into the system.

- *Reducing company tax.* To offset higher Kiwisaver contribution rates, the company tax could be lowered by 3 percentage points, bringing New Zealand's company tax rate to the OECD average of 25 percent. This would more than counterbalance the increase in employer Kiwisaver contributions, though not eliminate the incentive to substitute capital for labor, and higher land taxes (see below) which would particularly affect farms. However, higher investment in response to higher saving would raise productivity and incomes. This would reduce revenue by about 0.4 percent of GDP.

**Financial incentives.** While non-financial incentives—in particular those that have a compulsory element such as raising minimum contribution rates—can have a significant effect on savings, financial incentives can complement these, in particular given that taxation of savings in New Zealand is relatively high.

- *Exempting Kiwisaver returns.* The incentives under the current system of matching contributions and a cap on the top tax rate on returns for Kiwisaver members already closely mimics a system whereby contributions to the savings scheme are not taxed but returns are (ETE), and it benefits low-income earners more than those on higher incomes.[3] Since most of the wealth in long-term savings accounts accumulates through compound returns and less from contributions (Savings Working Group, 2011), this system could be strengthened by exempting the returns on Kiwisaver accounts from taxation (TEE). This would, however, accrue mostly to middle- and higher income earners; to preserve the tilt toward stronger support for lower-income Kiwisaver participants, the matching contributions could continue to be paid while the exempted returns are capped. In a model calculation (with no caps on exempted returns), this would reduce middle- and high-earning individuals' lifetime tax burden by between 1¾ and 2¼ percentage points (at 4 percent contribution rate; with higher contribution rates, the reduction would be higher), and for lower-income earners by 1 percentage point. The fiscal cost of exempting Kiwisaver returns depends crucially on the parameters chosen (i.e. with or without cap) and the current contribution rates of savers; the estimated cost could be about 0.9 -1.6 percent of GDP. Capping exempted returns would reduce this cost commensurately.

**Module 2: Other savings incentives**

- *Reducing taxation of financial returns more broadly.* A broader reduction of taxation of saving could be achieved through the extension of the tax treatment of Portfolio Investment Entities

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[3] At a 4 percent personal contribution rate. With a higher rate, the incentive smaller relative to that provided by an ETE or a TEE system.

**40**   INTERNATIONAL MONETARY FUND

(PIEs) to other forms of investment (all interest and dividends), as recommended by the Savings Working Group (2011). This would move New Zealand's tax system away from the comprehensive income taxation model and toward the dual-taxation model prevalent in Nordic countries. While this would go some way to reduce the effectively higher taxation of financial savings on account of inflation, it would tend to benefit in particular high-income households whose saving decisions can be expected to be less responsive to incentives.[4] As a result, it would require an overall higher redistribution effort to reduce the income inequalities arising from lower taxation of capital, as in Nordic countries that have adopted dual-taxation models.

- *Introducing means-testing for NZ Superannuation.* The benefit of the universal pension for high-income households is relatively small. Means-testing NZ superannuation with a view of reducing payments for top income earners could provide an (albeit small) additional savings incentive for this income group, while saving public resources. If NZ Superannuation were to be reduced by 20, 40, and 75 percent to the top three income deciles, respectively, the fiscal savings would amount to about 0.8 percent of GDP.

- *Introducing an estate tax.* An estate tax could increase saving to the extent that people take intergenerational welfare into account. In addition, it would improve equality of opportunity, reduce the intergenerational transmission of inequality, and incentivize work for the beneficiaries of inheritances. To avoid circumvention of the tax through gifting, time limits for the non-taxation of gifts could be used. However, the yield would likely be modest—data from other OECD economies suggest yields of about 0.1 to 0.2 percent of GDP (though some countries raise 03.-0.4 percent of GDP).

**Reducing the supply-demand imbalance in housing**

**25.    Reducing the preferential treatment of real estate would have multiple benefits.** High investment in housing is not the same as real investment in housing, i.e. an increase in supply that would address shortages. Instead, high demand for housing has led to a spiraling of prices in the Auckland area, where one-third of New Zealand's population lives, and amplifies price movements in the real estate market. To the extent that this demand is fueled by incentives in the tax/benefit system, the elimination or at least reduction of these incentives is desirable. In addition, a reduced allocation of savings to housing could free up savings for productive investment. Options include:

*Module 3: Housing—reducing demand an increasing supply*

- *Ringfencing housing losses.* To reduce scope for negative gearing and speculating on capital gains and thus incentives for over-investment in housing, the deductibility of net losses from property investment from unrelated other taxable income should be abolished. However, to

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[4] See also IMF (2015) on the effect on different income groups of concessional taxation of superannuation contributions and returns in Australia. Australia's system disproportionately benefits high-income savers.

avoid distortions across asset classes, deductibility of interest costs from other taxable income when making financial investments should also be abolished.

- *Widening the applicability of income tax on profits from property sales.* The recent introduction of a 'bright-line' test for levying income tax on profits from property sales for individuals—it is assumed that if a property is resold within two years, the intent of the initial purchase was to profit from a higher resale price and those profits are therefore taxable—is a step in the right direction. Extending the timeframe beyond two years would further reduce incentives to buy real estate as an investment opportunity (though not to the extent that the income stream is the primary goal of the investment). However, if the timeframe is lengthened, some form of indexation to avoid taxing purely nominal capital gains arising from inflation would need to be considered.

- *Raising land taxes.* Taxes on an inelastic base—i.e. land—are most efficient. In addition, such taxes would, by increasing the recurrent cost of holding land encourage its development which would help alleviate housing supply shortages. However, an increase in land taxes would have distributional consequences: there would be a one-off loss in land value, which would be borne by the current owners. Therefore, a gradual increase may be desirable. An overall increase by one-third would bring New Zealand close to the top of OECD countries' revenue from land taxes, and would yield about 2/3 – ¾ percent of GDP, though a lower increase could be envisaged depending on the fiscal impact of other, unquantified, measures outlined above.

## D.   Conclusions

*Reforms to raise saving and reduce the bias of investment in housing can have multiple benefits, but these can be achieved only in a package.*

**26.      The potential benefits of reform are significant.** A comprehensive package aimed at boosting saving and making investment in housing relatively less attractive would (i) reduce external vulnerabilities arising from the large savings-investment gap; (ii) reduce domestic vulnerabilities by cooling the housing market in Auckland; and (iii) reduce capital costs and thereby boost New Zealand's growth potential.

**27.      Reforms need to be pursued in a package.** While not all reforms are equally critical, measures to increase saving as well as reduce incentives to invest in real estate, are important. Some changes, such as an estate tax, superannuation means-testing, or increases in land taxes, are likely politically controversial. Such measures need to be counterbalanced by other changes that may be easier to implement, such as exempting Kiwisaver returns or company tax reductions.

**28.      The reform package should be designed to be broadly fiscally neutral.** Protecting the fiscal position and the public balance sheet is important to preserve New Zealand's buffers; and if an increase in private savings is offset by a reduction in public savings, little is gained at the national level. However, the effects of reform on specific population groups (as well as overall) need to be analyzed more thoroughly. The fiscal impact estimates presented in this paper are relatively imprecise and need to be complemented by an analysis of the impact on saving.

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# Appendix—Technical Notes

*This appendix provides technical explanations for the assumptions and calculation methods underlying the charts shown as well as the reform options discussed.*

## 1. Figures

**Figure 1, panel 1 (total levies):** General government revenue (IMF data) plus employer contributions to autonomous pension funds (OECD data). 2013 or latest available data.

**Figure 1, panel 2 (direct and indirect taxes):** Direct taxes = total tax revenue minus taxes on goods and services plus employer contributions to autonomous pension funds (OECD data); indirect taxes = taxes on goods and services (OECD data). 2013 or latest available data.

**Figure 2, panel 1 (personal income tax progressivity):** OECD data on tax rates, GNI per capita based on IMF data. 2013 or latest available data.

**Figure 2, panel 2 (tax wedges):** OECD data on tax wedges, with employer contributions to autonomous pension funds (in percent of compensation of employees; OECD data). 2013 or latest available data.

**Figure 3, panel 1 (GST/VAT productivity):** Calculation based on OECD revenue data, and IMF final consumption data. 2013 or latest available data.

**Figure 3, panel 2 (taxation of corporations):** Corporate income tax (OECD data) plus social security contributions and employer contributions to private pension funds (OECD data) plus payroll taxes (OECD data). For Australia: subtraction of resource rent taxes; addition of royalties and resource rent taxes in separate series (state and Commonwealth budget data). For Canada, added royalties received by Alberta (Canadian authorities data). 2013 or latest available data.

**Figure 4, panels 1-4 (inequality):** OECD data.

**Box 1:** Modeled in real terms (excluding the effect of inflation). *Assumptions:* 35 years contribution, earnings increase at 2 percent per year; average lifetime earnings as indicated on x-axis; 20 years constant withdrawal to end balance of Kiwisaver account at zero. Kiwisaver returns: 4 percent per year.

**Figure 5:** OECD data.

**Figure 6:** OECD data.

## 2. Estimation of Impact of Reform Options:

**Module 1**

- *Exempting Kiwisaver returns.* Calculated average income tax rates for each income decile (assumed to earn at average of income bracket); reduces them by percentage points indicated by calculations for Figure 7. Then calculates total income tax revenue without change, with change in effective income tax rate at 8 percent Kiwisaver contributions, and at 4 percent Kiwisaver contributions. The difference in income tax revenue between the average of the 4 and 8 percent contribution scenarios and income tax revenue without change is the estimated cost of the proposed policy.

- *Increase Kiwisaver employer contributions by 2 percentage points.* Multiplies current contributions (from Kiwisaver data: http://www.kiwisaver.govt.nz/statistics/annual/) by 2/3.

- *Reduce company tax by 3 percentage points.* Multiplies current company tax revenue (from Treasury data) by 2/28.

**Module 2**

- *Introduce means-testing for NZ Superannuation.* Calculates superannuation payments (from Treasury data) by income decile (assumes even distribution across top 8 deciles), then applies reduction indicated (20 percent for 3rd decile; 40 percent for 2nd decile, 75 percent for 1st decile).

- *Introduce estate tax:* estimate based on other OECD economies' estate tax revenue.

**Module 3**

- *Raising land taxes by one*-third: Multiplies current land tax revenue by 1/3.