

2011 | Economic
Development
Indicators

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Foreword

Economic Development Indicators 2011 is the fourth publication of its kind, and follows on from the previous economic development indicators reports (published in 2003, 2005, and 2007). It is a joint publication by the Ministry of Economic Development, the Treasury, and Statistics New Zealand.

The report draws together a broad range of publicly available data to provide a comprehensive picture of New Zealand's medium-term economic performance. In putting together this edition, we have incorporated a wider range of indicators than in the previous three editions. The additional indicators relate mainly to institutions and the public sector. Also included is a new chapter on the composition of the New Zealand economy. Most indicators in this report are benchmarked against Organisation for Economic Co-operation and Development (OECD) countries. However, a selective set of indicators also compares New Zealand with the Australian states to provide a further perspective on New Zealand's recent economic performance.

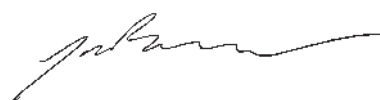
We expect to update these indicators again in around three years, by which time sufficient new information should be available to assess changes in New Zealand's medium-term performance. Building a shared understanding of the New Zealand economy, its drivers, and its performance, is an important foundation for economic policy making. Regular publication will provide a valuable information base against which to monitor progress towards governments' key economic objectives.



David Smol
Chief Executive
Ministry of Economic Development



John Whitehead
Secretary to the Treasury



Geoff Bascand
Government Statistician
Statistics New Zealand

Executive Summary

This inter-departmental report provides a broad range of indicators relevant to New Zealand's economic performance. It has been prepared in order to inform economic debate and policy making.

A growing, open, and competitive economy is a key means of delivering permanently higher incomes and living standards to New Zealanders. Without higher economic growth, the economy will not deliver higher living standards or the quality of life to which New Zealanders aspire.

Government agencies publish a number of sets of indicators relating to a broad range of social, economic, and environmental outcomes. In this report, *Economic Development Indicators 2011*, the Ministry of Economic Development, the Treasury, and Statistics New Zealand report on New Zealand's recent economic development and its contribution to wellbeing. The report updates and expands on three previous reports, published in 2003, 2005, and 2007.

The indicators used in this report vary in quality, timeliness, and robustness due to their different sources. In addition, the causal relationship between the indicators and economic development is complex and not always clear cut. For both reasons, the individual indicators need to be interpreted with care. Nevertheless, we are confident that the overall picture presented by this report is robust.

Wellbeing and Prosperity

Quality of Life

Measures of quality of life assess a range of social, economic, and environmental factors. New Zealand sits in third place in the OECD in the United Nations Human Development Index (UNHDI). This index focuses on life expectancy, education, and income. The Economist Intelligence Unit's quality of life index also gave a relatively high ranking to New Zealand, putting us in 14th place in the OECD in 2005. This index is based on a range of factors: material wellbeing; health; family life; community life; climate and geography; job security; political freedom; and gender equality.

The quality of the environment also impacts on wellbeing. Out of the OECD countries used, New Zealand ranks in 10th place in the Environmental Performance Index (EPI) 2010, which focuses on current outcomes across a core set of environmental issues. New Zealand ranks in ninth place in the OECD in the Environmental Sustainability Index (ESI) 2005, which focuses on the sustainability of environmental performance over time.

Material Standards of Living

On the basis of real GDP per capita, New Zealand ranked 21st in the OECD in 2009, one place higher than in Economic Development Indicators 2007. New Zealand's real GDP per capita has grown a little slower on average than the OECD mean since the 1980s. On the basis of real net national income (NNI) per capita, New Zealand in 2009 ranked 23rd out of the 30 OECD countries used for comparison purposes in this report.

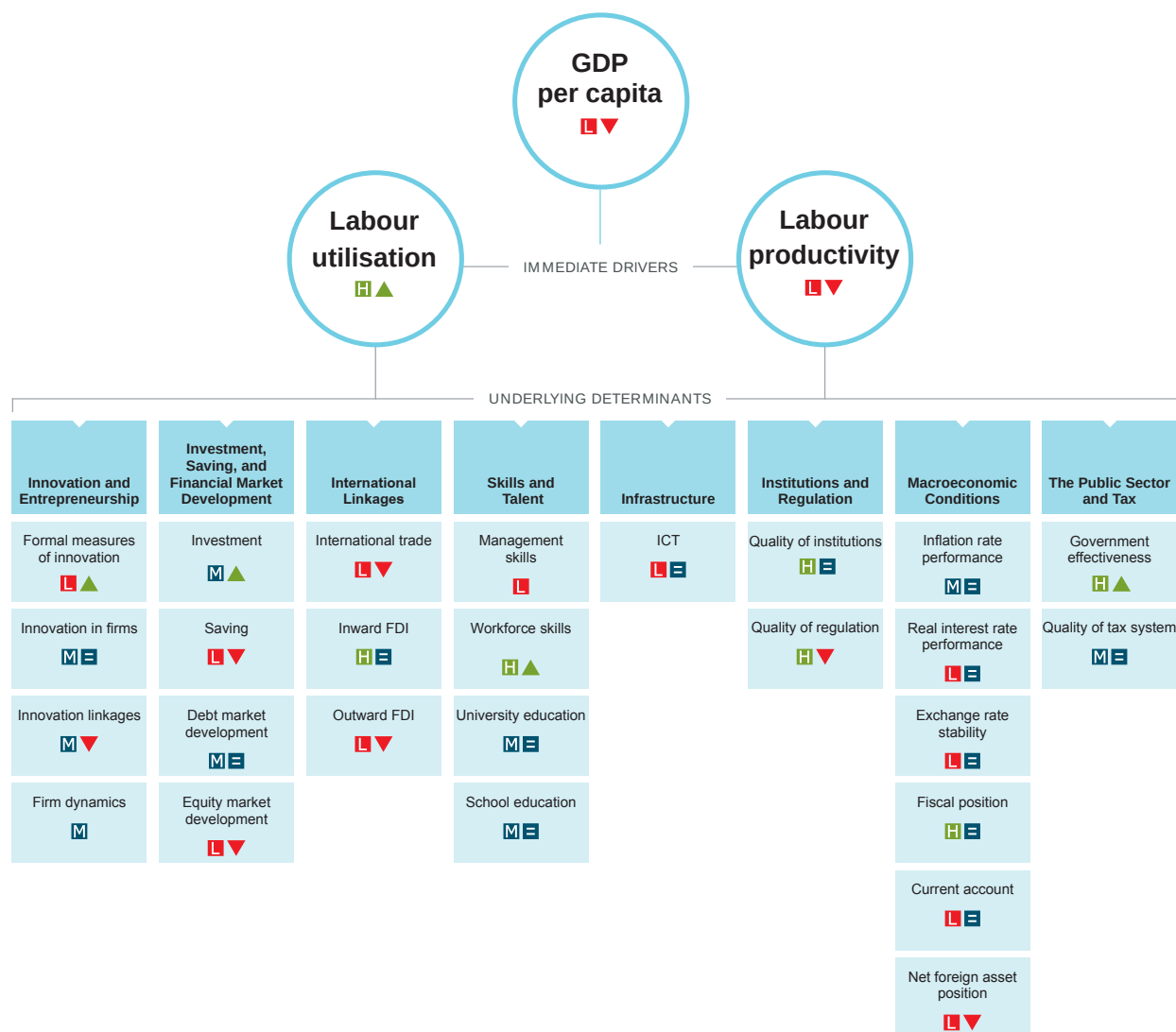
The income gap between New Zealand and the richer OECD countries is reasonably large, and closing it will require a number of years of performance consistently above the OECD mean.

Real GDP per capita can be decomposed into labour utilisation (the number of hours worked per capita per year) and labour productivity (output per hour worked). Increases in GDP per capita can come from either.

Figure 1 depicts how the indicators covered in this report show New Zealand to be performing across a number of key areas, and the recent direction of any change relative to the OECD. New Zealand's performance relative to other OECD countries is low for a number of the indicators presented, which is to be expected given that New Zealand's income per capita is below the OECD mean.

Further discussion on each of the broad areas follows.

FIG

1 New Zealand's performance relative to the OECD against key indicators¹**NZ ranking by OECD standards**

H = High M = Medium L = Low

NZ trend relative to the OECD mean (over the last 10 years)

- ▲ Improving at a faster rate than the OECD mean
- ▢ Improving at about the same rate as the OECD mean
- ▼ Deteriorating compared with the OECD mean

¹ These ratings of performance represent only broad aggregated judgements across a number of indicators. They should be interpreted in conjunction with the fuller picture of performance described in each subsequent chapter.

Immediate Drivers of Income Growth

Labour Utilisation

A substantial part of New Zealand's economic growth in the first half of the last decade reflected high rates of growth in labour utilisation. However, the average hours worked per capita has fallen by around 3 percent since 2005.

New Zealand's labour utilisation rate was higher than four of the five OECD countries that we have chosen to benchmark New Zealand against (the 'comparator' countries²) in 2008, reflecting a combination of high participation rates, low unemployment, and a high average number of hours worked relative to other OECD countries.

It will be possible to increase labour utilisation, but there are limits to the gains that can be achieved. Most future growth in income per capita will need to be sourced from increases in labour productivity.

Labour Productivity

New Zealand's economy-wide labour productivity level (GDP per hour worked) is below the OECD mean. New Zealand's labour productivity growth rate was also below the OECD mean, but similar to Australia's from the 1980s until the onset of the global financial crisis.

New Zealand and Australian statistical agencies report labour productivity across a narrower set of industries called the 'measured sector' of the economy. Under this narrower but more accurate measure, New Zealand's average labour productivity growth has been a little higher than that of Australia's since 1988.

New Zealand's labour productivity reflects its levels of capital per worker and multi-factor productivity (MFP). MFP captures a range of factors that can raise output over and above any increase in inputs of capital and hours worked. New Zealand's capital-labour ratio is low by OECD standards and New Zealand workers do not appear to have had as much physical capital to work with as workers in Australia.³ Estimated MFP growth has been low relative to the OECD over the last 10 years. In the measured sector, however, New Zealand's MFP growth has been about the same as Australia's since 1988.

Labour productivity growth arises from capital accumulation and from innovation; that is, the creation, dispersion, and use of new and valued products and processes. Innovation results in a change in the composition of the economy.

Firms and entrepreneurs are central to driving innovation and hence productivity growth. However, innovation is inherently a risky and uncertain process. The ability and willingness of firms and entrepreneurs to innovate is influenced by the incentives they face, their ability to access knowledge and other resources needed to innovate, and the risk and uncertainty that they face.

This report examines the factors that impact on entrepreneurs' and firms' willingness and ability to innovate and invest.

Composition of the New Zealand Economy

Economic growth involves changes in economic structure. During the last century, major changes have occurred to New Zealand's sectoral structure. The primary sector's share of value added has declined in all the five comparator countries. However, New Zealand still has a much larger share of primary-industry value added relative to the comparator countries.

² Australia, the United Kingdom, the United States, Denmark, and Korea.

³ The Treasury (2008), *Investment, productivity and the cost of capital: Understanding New Zealand's 'capital shallowness'*. New Zealand Treasury Productivity Paper 08/03, pp. 5–7. See <http://www.treasury.govt.nz/publications/research-policy/tp/p/08-03>

Throughout the 1950s and 1960s, New Zealand's exports were concentrated on a few products and on the United Kingdom market. The collapse in the price of wool and the entry of Britain into the European Union (EU) resulted in marked product- and export-market diversification. New Zealand's export-product concentration is still somewhat higher than the OECD mean. New Zealand's export-market concentration, on the other hand, is slightly lower than the OECD mean, reflecting a more diverse range of export markets. New Zealand's merchandise exports are still heavily weighted toward food and beverage exports relative to the comparator countries.

Contrary to popular perception, the New Zealand economy has a lower proportion of employees in small to medium-sized enterprises (19 or fewer employees) than the OECD mean and has a similar proportion of large firms to the OECD mean. However, New Zealand's large firms are smaller than the OECD mean, suggesting that New Zealand has fewer very large firms.

Labour productivity levels differ substantially across the New Zealand industries. GDP per hour paid is highest in: electricity, gas, and water supply; forestry and mining; finance and insurance; and transport, storage, and communication services. New Zealand had higher labour productivity growth rates than Australia in agriculture, forestry, and fishing; electricity, gas, and water supply; retail trade; transport and storage; and communication services.

Underlying Determinants of Productivity Growth

Innovation and Entrepreneurship

Innovation is at the heart of aggregate productivity growth, and entrepreneurship drives innovation. Indicators in this report present a mixed picture for entrepreneurship and innovation in New Zealand.

Overall, New Zealand ranks low relative to other OECD countries on the narrower formal measures of innovation activity, such as aggregate R&D and patenting.

Expenditure on R&D is low by OECD standards. Business R&D (BERD) is particularly low but is growing faster than the OECD mean. However, as a proportion of total industry value added, New Zealand small firms undertake more BERD than small firms in most other OECD countries.

International patenting rates are also well below the OECD mean and are not growing.

New Zealand has a relatively large proportion of R&D personnel in its workforce but they are concentrated in the higher education sector and government.⁴ It produces more science and engineering articles per head than the OECD mean.

On broader measures of innovation, New Zealand firms have higher rates of marketing and product innovation, but relatively lower rates of process and organisational innovation. New Zealand businesses focus their innovation mainly on production for the domestic market rather than international markets, and innovation for international markets is low relative to firms in the EU. The share of medium-high and high-tech products in exports is low, and the sophistication of New Zealand's exports overall is consistent with its per capita income.

There is a high proportion of Crown Research Institute (CRI) research funded by business but a low and declining share of university research. These and other indicators suggest that innovation linkages between CRIs and business are relatively strong but, otherwise, innovation linkages are quite weak.

⁴ Refer to OECD, Main Science and Technology Indicators, May 2010.

Productivity growth is associated with entry of and growth of high-performing firms, and the shrinking and exit of low-performing ones. New Zealand has high rates of firm entry and exit, but a low and declining share of high-growth businesses.

Investment, Saving, and Financial Market Development

New Zealand's gross fixed capital formation as a percentage of GDP is around the OECD mean. Plant and machinery investment has been slightly above the OECD mean in most years since 1970. This is important to New Zealand's growth prospects, since private sector investment in capital equipment is associated with improved firm productivity and profitability. Government investment has increased since 1993 following a sharp decline in the early 1980s, but is below the high rates seen in the 1970s and 1980s.

New Zealand's net national saving (gross national saving minus consumption of fixed capital) as a percentage of GDP currently lies below that of Australia, the United Kingdom, and Denmark, as well as falling well short of the OECD mean. Up until the global financial crisis, this was caused by private (household and business) saving, which has been negative since 2003. However, wealth measures, which also include capital gains, indicate households' net wealth had still been increasing (mainly as a result of increased net housing wealth) at least until the onset of the global financial crisis.

In addition to retained earnings or profits, firms can access investment capital from a number of other sources: banks; the sharemarket; private equity; the venture capital market; and informal capital markets. Improving financial development in these markets can stimulate economic growth. The Milken Institute's Capital Access Index evaluates the ability of business to access capital across all sources. New Zealand is ranked 15th in the OECD on this index, at the OECD mean and below countries such as the United Kingdom, the United States, Denmark, and Australia.

New Zealand's sharemarket capitalisation relative to GDP is smaller than for most comparator countries, and has remained broadly static for a number of years. Similarly, the size of the venture capital market in New Zealand as a percentage of GDP is below that of most of the OECD countries, with the ranking declining to 21st in 2008 from 17th in 2000–2003.

Good availability of bank credit and informal capital can partially but not fully substitute for underdeveloped equity markets. New Zealand's banking sector has been growing since 1990 in line with growth in Australia and Denmark. Informal capital markets are also larger than in most OECD countries relative to GDP.

International Linkages

While New Zealand's economy has low formal barriers to trade, its share of external trade (relative to GDP) is well below that of similar-sized, high-performing OECD countries. Its share of world exports has declined somewhat over the past 15 years, as has the OECD's share of world exports. In particular, since the start of the decade, New Zealand's real exports have not risen as a percentage of GDP, while real imports rose until the recent downturn. This reflects strong domestic demand relative to supply.

Since 1995, the stock of foreign investment as a percentage of GDP in New Zealand has been high (as it is for most small developed countries), and it has been rising in line with the OECD mean. In contrast, the stock of outward foreign direct investment (FDI) as a percentage of New Zealand's GDP has been much lower than the OECD mean and, unlike the OECD mean, has not been rising.

New Zealand has been successful in attracting migrants. While outflows have been high, New Zealand's net inflows remain higher than the OECD mean. As a result, New Zealand has a high proportion of foreign-born residents. The skill levels of migrants leaving and entering New Zealand have been broadly similar. As a result, New Zealand appears to have experienced a 'brain exchange' rather than a 'brain drain'.⁵ Nevertheless, this relies on successfully absorbing new immigrants into the workforce and wider society.⁶

Skills and Talent

High skill and talent levels are crucial for economic success. The skill levels of both the current overall workforce and people entering the workforce from the education system are important.

Management and leadership skills impact substantially on organisational performance. According to the Management Matters study, management practices in New Zealand manufacturing rank 10th of 14 OECD countries covered. People management is particularly weak.

A skilled and educated workforce is also important. The proportion of the population aged 25–64 years with a bachelor's degree in New Zealand has increased rapidly since 2001 and is above the OECD mean. The proportion of the population aged 25–64 years with no qualification has declined. The Adult Literacy and Life Skills (ALL) Survey shows New Zealand's percentage of the adult population with at least basic literacy and numeracy skills is on a par with Australia.

New Zealand's university graduation rates were high by OECD standards in 2007. The Times Higher World University Ranking suggests that New Zealand ranks 19th out of 30 OECD countries in terms of where their top universities score – this being the University of Auckland in New Zealand's case. New Zealand has a high number of science graduates (fourth in the OECD). The number of engineering graduates, however, is close to the bottom of the OECD (22nd in the OECD).

At the secondary school level, the picture is mixed. While 15-year-olds perform well above average on reading, scientific, and mathematics literacy according to the Programme for International Student Assessment (PISA) measure, 13–14-year-olds score a little lower than most European countries on the Trends in International Mathematics and Science Studies (TIMSS) measure. The proportion of students leaving secondary school qualified to enter university is increasing. However, 8.4 percent of New Zealand's 15–19-year-olds were not in education or employment in 2008, the seventh highest rate in the OECD.

Infrastructure

An appropriate level and quality of infrastructure is an important contributor to economic growth. Robust, internationally consistent data on infrastructure quality are difficult to obtain. Whenever possible, objective data have been used but this section still relies on some international surveys of business perceptions of infrastructure quality, which need to be interpreted with caution.

New Zealand is perceived as having lower-quality infrastructure than the OECD mean. In the 2010–2011 Global Competitiveness Report, New Zealand moved from 34th out of 125 countries in 2007 to 45th out of 133 countries (21st in the OECD). Similarly, Mercer rated infrastructure in Auckland 43rd and Wellington 47th out of their annual sample of 215 world cities.

New Zealand's investment in ICT infrastructure is somewhat lower than that of most OECD countries. The advertised speed of broadband in New Zealand is similar to that in many other OECD countries. However, the average monthly subscription prices of broadband and the per-minute call charges on mobile telephones are relatively high.

⁵ Refer to Glass, H. & Choy, W K (2001). *Brain drain or brain exchange?* New Zealand Treasury Working Paper 01/22. Wellington: The Treasury. See <http://www.treasury.govt.nz/workingpapers/2001/twp01-22.pdf>

⁶ Refer to Moody, Cat (2006). *Migration and economic growth: A 21st century perspective*. New Zealand Treasury Working Paper 06/02. Wellington: The Treasury.

The reliability of New Zealand's electricity supply improved from 1995 to 2000, but has not shown any significant improvement in recent years. The national average real electricity price fell by about a quarter between 1979 and 1993, but has since risen to be about the same as it was in 1979.

The available data on transport infrastructure are more limited. As is typical of other sparsely populated OECD countries, New Zealand has a relatively extensive roading network relative to other OECD countries. It also has similar levels of road traffic to the OECD mean.

Institutions and Regulation

New Zealand is near the top of the OECD in terms of the rule of law, control of corruption, and property rights, all of which are important institutions underpinning economic growth.

In terms of their attitudes towards the benefits of work and accumulating wealth, New Zealanders do not differ markedly from respondents from the comparator countries.

New Zealand has a high-quality regulatory environment. It is assessed by the World Bank as being second in the OECD (and third in the world) for overall ease of doing business. However, there is still scope for New Zealand to further improve its performance in certain sub-indicators.

The restrictiveness of product market regulation in New Zealand is now similar to the OECD mean but with variable performance on different components. Ten years ago New Zealand was rated as one of the least restrictive, but other OECD countries have extensively liberalised their product markets in the intervening period.

According to World Bank measures, New Zealand's employment regulation is relatively flexible by OECD standards.

Macroeconomic Foundations

New Zealand has relatively sound macroeconomic foundations, although the global financial crisis has increased its vulnerability to shocks.

Fiscal and price stability are well established, and New Zealand now has relatively lower volatility for both GDP and inflation than in the 1980s, all of which are conducive to investment and economic growth. The Government's financial balance as a percentage of GDP has been above (ie, more in surplus than) the OECD mean, and the Government ran financial surpluses up until the global financial crisis.

However, up until the financial crisis, real exports as a percentage of GDP stagnated while imports continued to rise, leading to the current account deficit trending up as a percentage of GDP. This suggests that the increase in consumption, wealth, and investment associated with rising house prices put substantial pressure on the tradable sector, leading to unbalanced growth.

New Zealand's real interest rate has trended down since the early 1990s, as has the OECD mean. However, it still remains relatively high, which is likely to limit investment. New Zealand has high medium-term exchange rate volatility, which is likely to increase business uncertainty.

For many years, New Zealand has run large current account deficits, which are reflected in a high level of external indebtedness. Since the global financial crisis, public debt has also increased. Both have increased New Zealand's vulnerability to shocks. A number of factors have offset this and limited New Zealand's external vulnerability, including low public debt and a strong risk management culture in New Zealand's financial institutions.

The Public Sector and Tax

The public sector also plays a critical role in enabling the functioning of a market economy. According to the World Bank's Survey of Government Effectiveness, a measure based on perception surveys and expert assessments, New Zealand has the fifth most effective government in the OECD.

New Zealand has by far the largest number of ministries and departments of all OECD countries.

Compared to the OECD mean, the New Zealand Government spends relatively large shares of GDP on education, environmental protection, and public order and safety. It spends relatively small shares on social protection, general government services, defence, and economic affairs.

New Zealand's total tax and government expenditure as percentages of GDP are slightly below the respective OECD means, but higher than Australia's.

The share of total taxes collected from personal and corporate income is higher than the OECD mean. New Zealand does not have any social security taxes on wages and salaries. As a result, New Zealand's tax on wages and salaries (including social security taxes and income tax) is low relative to OECD standards. New Zealand's share of tax on income from capital (corporate income, dividends, interest, rents, etc) is relatively high compared with other OECD countries. International studies have suggested that, on average, taxes on income from capital tend to be most detrimental to growth, followed in turn by taxes on wages and salaries, consumption, wealth, and land.

Across the working population, New Zealand's average marginal tax rate on personal income is relatively low compared with other OECD countries. New Zealand's average tax rate on personal income is also relatively low compared with other OECD countries, even when the combined effect of income tax and goods and services tax (GST) is taken into account.

However, New Zealand taxpayers who are subject to social assistance targeting can face relatively high effective marginal tax rates.⁷ As a result, incentives for individual New Zealanders to work more vary markedly depending on their wage levels and family composition. From 1 October 2010, effective marginal tax rates have been lowered.

New Zealand tax law is relatively easy to comply with. New Zealand is third lowest in the OECD in terms of the average annual time taken for taxpayers to comply with their tax obligations.

New Zealand's Economic Relationship with Australia and its States

There is strong international evidence to suggest that country borders typically reduce levels of economic interaction. Considerable work has been undertaken to reduce the barriers to economic flows between New Zealand and Australia. As a result, and because of the two countries' geographic proximity, New Zealand is now more economically integrated with Australia than with any other country. Australia is New Zealand's largest trading partner, there is extensive trans-Tasman investment, and a significant number of New Zealanders live and work in Australia.

New Zealand's economic performance will be an important determinant of its ability to compete with the Australian states for key resources, such as highly skilled workers and investment. Recent evidence indicates that the growth of jobs in knowledge-intensive services and high-tech manufacturing in Auckland is higher than in all the Australian state capitals.

⁷ Effective marginal tax rates on individuals measure the percentage of a \$1 increase in income that is lost to income tax and abatement of government payments and services.

In 2009, New Zealand's GDP per capita was about 25 percent lower than Australia's. From 2000 to 2008, New Zealand's real GDP per capita grew faster than that of New South Wales and Victoria, but slower than that of the other four Australian states. New Zealand has since been more severely affected by the global financial crisis, so the average growth in real GDP per capita from 2000 to 2010 was slower than all the Australian states.

Australia is a growing destination and the most common one for emigrating New Zealanders, resulting in a large and growing New Zealand diaspora. However, the magnitudes of the net outflows are not a great deal bigger than experienced by some of the Australian states to other parts of that country.

New Zealand is a net importer of a number of high-value services from Australia, although New Zealand has a similar proportion of its workforce in finance and insurance to most Australian states.

Australia accounts for a large and growing proportion of foreign investment in New Zealand, which has led to a large negative net investment position from New Zealand's perspective.

Auckland – An Internationally Competitive City

International evidence suggests that large, outward-facing, global cities play an increasingly important role in economic development as generators and attractors of businesses, skills, and investment. High-value, non-routine, knowledge-intensive activities are increasingly clustering in large (core) cities, while routine activities are being outsourced to peripheral regions. While Auckland is a relatively small city by international standards, it is still New Zealand's largest city.

This document compares Auckland's performance relative to other regions of New Zealand and to international cities, including a small number of 'comparator' cities – Brisbane, Melbourne, Adelaide, Seattle, Vancouver, and Copenhagen.

Auckland's GDP per capita is lower than that of all but one of the set of international comparator cities, but only slightly so in most cases. However, it is substantially lower than the cities (predominantly large) with the highest GDP per capita.

Auckland is assessed as offering a high quality of life by international standards.

Auckland's productivity level (GDP per worker) is lower than the average of a sample of 78 metropolitan regions in the OECD and below most of the comparator cities. The difference in productivity between Auckland and New Zealand as a whole – the Auckland 'premium' – is in the middle of a sample of 78 OECD metro regions, suggesting that Auckland is contributing as might be expected to New Zealand's growth. Its population growth rate is very high compared with other OECD metropolitan regions.

Auckland performance is mixed on underlying factors that influence productivity growth. This is consistent with its relative economic performance. Patent applications per capita are relatively low by OECD standards, as is the proportion of human resources in science and technology. However, Auckland City's share of employment in knowledge-intensive services and medium- and high-tech manufacturing goods is increasing faster than all the Australian state capitals and the other major New Zealand cities.

Introduction

Governments around the world aim to create a better life for their citizens by taking action to improve their economy, society, environment, and way of life.

The New Zealand Government's economic objective is to promote a growing, open, and competitive economy as the best means of delivering permanently higher incomes and living standards for New Zealanders. Its Economic Growth Agenda aims to deliver greater prosperity, security, and opportunities to all New Zealanders by lifting New Zealand's long-term growth rate and reducing the vulnerability of the economy to further economic shocks. It has set aspirational goals to catch up with Australia's income per person by 2025 and to increase exports to 40 percent of GDP.

The Government has identified six 'drivers' of higher economic performance:

1. better, smarter public services
2. an internationally competitive regulatory environment
3. a fair and efficient tax system
4. productive infrastructure investment
5. higher skills
6. support for science, innovation, and trade.

Purpose of Indicators

Economic development indicators assist in achieving this objective in three ways:

1. They are useful in monitoring progress towards economic goals and to benchmark New Zealand's performance against that of other countries. Indicators allow users to track and compare performance both in terms of high-level outcomes (such as income levels) and the underlying factors that may influence these outcomes over time (such as levels of innovation and skills).
2. They help to identify potential issues with the effectiveness of economic policy that can then be investigated in greater depth. Over time the direction or pace of change in a particular indicator or set of indicators can provide information on whether policy is broadly on the right track.
3. They provide information on areas of both strength and weakness within the New Zealand economy. Information on areas where New Zealand performs poorly relative to other countries may help to identify areas for policy consideration or intervention. They do not alone confirm the existence or the nature of a policy problem, but they can help highlight areas that may warrant deeper inquiry.

In short, this report aims to provide a sound foundation on which to base policy advice. However, it does not provide policy advice.

Economic Development Indicators 2011 complements other sets of indicators covering a broad range of social, economic, and environmental outcomes. The Ministry of Social Development's annual publication *The Social Report* provides information on the social health and wellbeing of New Zealand society and is a useful complement to this report. The Ministry for the Environment published *Environment New Zealand 2007* in early 2008 and updates its core environmental indicators regularly on its website. Statistics New Zealand published an overarching assessment of New Zealand's long-term environmental, economic, and social progress in its 2009 publication *Measuring New Zealand's Progress Using a Sustainable Development Approach: 2008*. An update to the 16 key indicators from this publication will be released concurrently with this Economic Development Indicators report.

Although this report focuses on the economic development dimension and its contribution to wellbeing, it does include a small number of key wellbeing and environmental indicators to recognise the interdependence and importance of these various dimensions of wellbeing.

Characteristics of the New Zealand Economy

New Zealand is a small, open economy that is far from most of the world's markets. In common with other advanced industrialised countries, New Zealand has a high share of its economy devoted to services and manufacturing. By OECD standards, New Zealand also has a relatively large agricultural sector, and a substantial proportion of exports based on primary production. A relatively small share of New Zealand's exports come from high-tech sectors such as ICT and pharmaceuticals. New Zealand's economy can also be significantly affected by climatic conditions.

Impact of the Global Financial Crisis

The global financial crisis has brought home to all countries that their economies are interconnected. However, New Zealand's small size and dependence on foreign investment and trade, particularly in commodity markets where New Zealand is often a price taker, usually means that it is particularly affected by developments in the global economy.

At the time of writing, the world economy appears to be slowly recovering from the global financial crisis. Between early 2008 and mid-2009,⁸ this crisis led to the sharpest fall in economic activity (GDP) since the Great Depression for most OECD countries.

These developments have consequences for many of the indicators collected in this report. However, because we need to use internationally comparable historical data for most of the indicators, the biggest impact of the global financial crisis post-dates the data used in some of the indicators in this report.

It is nevertheless possible to anticipate how the global financial crisis will impact on many of the indicators. In particular, all countries affected are likely to see at least a temporary increase in risk aversion and reduction in research and development (R&D), and so suffer a permanent reduction in GDP per capita relative to what it would otherwise have been.

8 OECD (2010). *OECD Factbook 2010*. Paris: OECD Publishing. See www.oecd.org

As with previous financial crises, it is likely that the recovery in the rest of the OECD will be slow and protracted. This will impact on New Zealand's own performance over the next few years. In part, because of their location in the Asia-Pacific region, New Zealand and Australia have been less affected by the crisis than most countries and Australia did not officially enter recession.

The crisis is therefore likely to cause New Zealand to grow more slowly than would otherwise have been expected. It may, however, improve its position relative to most OECD countries, but not Australia.

These conclusions are, however, by no means certain. The outlook for the world economy is more uncertain than usual, and New Zealand is still vulnerable to new shocks.

In our commentary on indicators, we have endeavoured to take account of the longer-term effects of the crisis, but set aside the short-term effects. This is consistent with the purpose of the document, which aims to focus on longer-term trends in New Zealand's performance relative to other OECD countries.

As a result, we consider that this document presents a useful picture of the medium-term performance of the New Zealand economy, notwithstanding the impact of the global financial crisis.

Determinants of Income Growth

To fulfil the purpose outlined above, indicators must be chosen that are relevant to the growth process. However, despite their fundamental importance to a society's wellbeing and much research into them, the factors that collectively cause a country's incomes to grow are not fully understood and remain controversial.⁹

The most important contributor to increasing incomes per capita is increasing productivity, or output per hour worked. Countries can become richer in the short term by increasing the proportion of their population that works, or by encouraging those in the workforce to work longer hours or harder. But these approaches have clear limits. Over the longer term, the only sustainable way to grow income per person is to increase the output that each person in the workforce produces per hour worked – in other words, to grow productivity. Economic evidence suggests that, over the longer term, productivity growth is responsible for all but a small fraction of a country's growth in income per capita. For example, from 1820 to 1998, income per head in the developed world grew about 19 times, after adjusting for inflation.¹⁰ Most, if not all, of this growth has come from improvements in productivity rather than increases in hours worked per person.

The overarching challenge facing policy makers is therefore to better understand the factors that give rise to productivity growth.

Productivity growth arises from innovation – that is, the creation and dispersion of new and valued products and processes. Innovation can result in new products, new technologies, new processes, new organisational forms, and new methods of marketing and distribution. It includes organisational innovation, new business models, and new forms of entrepreneurship. Innovation is the product of knowledge and skills (human capital) and other economic capabilities, and in turn creates new skills and capabilities.

Cumulative innovation has radically changed the productivity of developed countries' workforces. The discovery of electricity in the 18th century, for example, has allowed a number of further inventions (such as electric lighting and computers) that have transformed the way societies function. Similarly, the development of automated production processes has transformed the way

⁹ This section briefly outlines a view about the growth process consistent with this extensive literature and explains why the indicators included in this document are relevant. There is a fuller description of the economic development process in Procter, R (2008). *Inside the black box: Policies for economic growth*. Ministry of Economic Development Occasional Paper 08/08. Other useful references are Commission on Growth and Development, *The growth report: Strategies for sustained growth and inclusive development* (2008), The World Bank; Easterly, W (2001). *The elusive quest for growth: Economists' adventures and misadventures in the tropics*. Cambridge MA: The MIT Press; and Lipsey, R, Carlaw, K, & Bekar, C (2005). *Economic transformations: General purpose technologies and long-term growth*. Oxford: Oxford University Press.

¹⁰ Maddison, A (2001). *The world economy: A millennium perspective*. Paris: OECD.

manufactured goods are produced. New knowledge, and the capabilities needed to exploit it, provides a higher platform for further discoveries and a potential stepping stone to new, higher-value products and processes.¹¹

However, innovation does not always, or immediately, lead to improvements in productivity. Its full impacts take time to eventuate. It often requires waiting for existing equipment to depreciate and for further learning and adaptation of related managerial capabilities, products, and processes. One implication of this is that technological change can take some time to show up in the productivity statistics. Further, the immediate impact of technological change on measured productivity may even be negative. For example, an increase in BERD diverts resources from current production (so reducing measured value added), even though its purpose is to create new and better products and processes in the future.

While the benefits of technological change typically disperse beyond the country where they were first developed, they can only be adopted by other countries that find out about their existence and that have the skills and capabilities needed to absorb and exploit them.

As a result, the full benefits of technological progress have not been equally captured by countries around the world. Some countries, such as Japan and the Republic of Korea (Korea), have been able to rapidly develop their economies, and increase their incomes to developed world levels, through a strategy of adoption and adaptation of existing technologies. However, many less well developed countries have so far failed to successfully emulate this strategy.

Thus, while new knowledge and skills lie at the heart of productivity growth, a broad range of complementary capabilities must be present for growth to occur. These span most aspects of an economy and involve entrepreneurs and businesses, the Government, institutions, 'rules of the game', social norms, and the workforce. Many aspects of a country's broader environment are also important, such as its geographical location and natural resources.

Role of Firms and Entrepreneurs

The role of firms and entrepreneurs is central to this process of discovering a market opportunity and developing and applying new knowledge and skills to develop goods and services to exploit the market opportunity. This process can be complex, time-consuming, and resource intensive, and there can never be a guarantee of success.

The development and application of new knowledge and technologies therefore require the promise of significant financial rewards, both to provide incentives to pursue these new opportunities and to finance the growth of successful firms. They also require a complex mix of skills in the research and business communities and strong innovation systems. High-quality financial markets are also needed: from angel investors and venture capitalists, at one end of the spectrum, to healthy sharemarkets and debt markets at the other. Similarly, a dynamic business environment is required, with the flexibility for new firms to enter and grow, and less successful firms to decline and exit.

Role of Government

Governments play a vital role in creating an environment that is suitable for businesses to succeed and grow. Government is an important sector of the economy and it is important to ensure that its institutions and policies are effective and efficient.

11 Hausmann, R. & Klinger, B (2006). *Structural transformation and patterns of comparative advantage in the product space*. CID Working Paper. Cambridge MA: Center for International Development at Harvard University.

One of the key roles governments play is to establish an appropriate set of incentives to encourage entrepreneurs to focus on the right things (eg, developing new products) and discourage activity on the wrong things (eg, misleading consumers).¹² This requires modern, high-quality policy settings, institutions, and regulation across a wide range of areas. Key examples include tax policies, intellectual and other property rights, company law, competition policy, consumer law, public sector and corporate governance, and international trade and investment policies. The quality of these institutional arrangements and policies impacts on the potential rewards for firms undertaking risky activity, the uncertainty they face in doing so, the pressures they face to adapt and improve, and their ability to access offshore markets, capital, and skills.

By creating a stable macroeconomic environment, governments can help to reduce the level of risk and uncertainty firms face. A low-inflation environment, low interest rates, and a relatively stable exchange rate help firms prosper and grow.

Governments play a pivotal role in the provision of infrastructure. Modern economies require high-quality communications, transport, and energy infrastructures. In all OECD countries, central and local governments take the lead in funding or regulating the maintenance and development of this infrastructure.

Most governments play a major role in the funding and provision of education, training, and R&D. The quality of effort in these areas can have a major long-term impact on the skills and ability of a country's workforce (see below) and the capacity of the business sector to absorb and use new knowledge.

Further, most governments have an industry policy designed to help firms grow and internationalise and to exploit the synergies among firms' activities and between their activities and those of other organisations such as universities.

Role of the Workforce

To grow and succeed, businesses need access to adequate numbers of suitably skilled workers. Managerial and professional skills are important. The successful management of large, internationally focused firms requires specialised skills in a wide range of areas.

Skill levels across the workforce as a whole are also vital. Over recent decades, demand for skills has increased, with the result that the income of skilled people has risen and skill levels have increased. Companies increasingly need high-end science, technology, engineering, and mathematical skills to develop and exploit new knowledge. They also need staff with strong literacy and numeracy skills to undertake increasingly sophisticated tasks, learn new tasks when faced with technological change, and operate complex machinery and computing equipment.

Further, workplace practices are important. Changes in working practices (such as more flexible forms of work organisation, employee involvement, and strategic human resource performance management) can help to increase returns on investment in capital and innovation.

Other Factors

Lastly, a number of broader environmental factors have a strong impact on a country's economic performance.

Some of these factors, such as geographical location and natural resources, are outside a country's control. Despite this, good policy can mitigate and offset the economic impact of these factors when they are adverse and enhance them when they are favourable.

¹² North, D (2008). *Understanding the process of economic change*, p. 76. Princeton NJ: Princeton University Press.

Social norms, social capital, culture, and beliefs will affect what people believe is achievable, what they see as important, and how easy it is to undertake economic activity.

The resource base will also impact on what activity it is feasible to undertake. New Zealand has a natural geography and climate conducive to agriculture, pastoral farming, and forestry. The historical development of these has built up an associated set of capabilities, such as skills in agricultural research, which enable it to exploit this resource base effectively.

The geographical proximity and wealth of a country's trading partners is also important. Both trade and knowledge flows, and as a consequence competition and innovation, fall off with increasing distance from world markets. Distance disproportionately inhibits growth in knowledge-intensive, high value added activities. Information and communication technologies (ICT) and related technologies have reduced the cost of distance for relatively standardised activities. However, the importance of face-to-face contact, and, as a result, the cost of distance, may have increased over time for "high knowledge, high value-added, non-routine and non-standardised activities" because of "increasing speed, variety, customisation, and service quality".¹³ On the other hand, there are also advantages in New Zealand's geographic location, such as better biosecurity, the effects of ocean systems in moderating extreme impacts of climate change, and a low defence burden.

Overall, the OECD estimates that "New Zealand's distance to markets reduces its GDP per capita by about 10%" and that "geographical location may explain up to three quarters of the gap in New Zealand's living standard relative to the OECD average".¹⁴

Australia's strategic and economic importance to New Zealand is in no small part due to its proximity. Its economic success provides many benefits for New Zealand – for example, it creates a higher demand for our exports. But New Zealand also competes with Australia and its constituent states to some degree, such as for skilled workers and as a business investment location.

Large urban areas are also known to be important for innovation and specialisation. They provide easy access to deep and broad markets, which create the spur of competition and enable ready access to appropriate inputs to production. In particular, Auckland's performance is important to the performance of the New Zealand economy as a whole. Yet, with a metropolitan population of just under 1.5 million, Auckland is quite small compared with most successful, high-human-capital cities.¹⁵

Choice of Indicators

This report builds and expands on three earlier economic indicator publications in 2003, 2005, and 2007.¹⁶ It follows a similar framework used in the 2007 report. This report includes a new section on the composition of the New Zealand economy by industry and other sector breakdowns. The previous Tax and Regulation section has been replaced by separate sections on Regulation and Institutions, and the Public Sector and Tax.

¹³ McCann, P (2009). Economic geography, globalisation and New Zealand's productivity paradox. *New Zealand Economic Papers*, 43(3), 279–314.

¹⁴ OECD (2009). *Structural policies to overcome geographical barriers and create prosperity in New Zealand*. Economics Department Working Paper 696. Paris: Author.

¹⁵ Duranton, G, & Diego, P (2003). *From sectoral to functional urban specialization*. CEPR Discussion Paper 2971. Toronto: University of Toronto.

¹⁶ The 2003, 2005, and 2007 reports can be found on MED's website at <http://www.med.govt.nz/indicators>

The indicators used in this report were chosen based on what best helps to understand New Zealand's economic growth and plot its progress. They should ideally also be:

- robust
- objective
- internationally comparable and/or consistent over time
- sufficiently timely
- representative of the story told by any relevant indicators not included
- supported by evidence of how the indicator helps explain economic growth.

It was not always possible to find indicators that meet all these criteria, in which case we made judgements about tradeoffs between the criteria. For example, it has proven difficult to find broad, objective, and consistent indicators of the quality of countries' infrastructure, especially energy infrastructure.

For some of the indicators we could not find recent internationally comparable data. In these cases, we have chosen to incorporate the older indicators that are available. For some indicators showing international comparisons, more recent New Zealand data exist than those shown. As the OECD often makes adjustments to data to allow for more direct international comparisons, it is not possible to include more recent New Zealand data on the same basis for these indicators without full knowledge of the nature of these adjustments.

Benchmarking

This report focuses primarily on how New Zealand's economy has performed relative to the OECD and how this has changed over time, with less of a focus on New Zealand's individual performance over time.

We have used OECD countries, together with an OECD average (mean or median measure), as the comparison group for the majority of the indicators in this report. The OECD, which includes the significant majority of the world's developed countries, is a logical benchmark for New Zealand, given the Government's objective of increasing New Zealand's average per capita income.

Where a ranking is meaningful, we have generally ranked New Zealand with the 30 countries that comprised the OECD prior to the 2010 accessions. This differs from the 2007 Economic Development Indicator report which generally ranked New Zealand against 24 countries that joined the OECD prior to 1994 (which excluded Mexico, Slovak Republic, Hungary, Czech Republic, Korea, and Poland). When we say we are, for example, '14th in the OECD', we normally mean 14th compared with this group of 30 countries.

The 30 OECD countries are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

The convention in this report is to include a simple mean of all of the 30 OECD countries, so as to give equal weight to data for each country. Where data for all 30 countries are not available, a mean has generally been calculated from the data for all available countries. These same countries are presented in the bar graphs and a subset of them is presented in the line graphs. Our calculation of the mean may differ from other published OECD average or total figures. A median has been used in a small number of cases, where a mean has been judged to be inappropriate or adversely affected by outliers.

In comparing changes across time, we often focus particularly on a core set of comparator countries: Australia, the United Kingdom, the United States, Denmark, and Korea, together with an OECD mean or median measure. We have very close connections with Australia, while Denmark is a European country of similar size and industrial structure to New Zealand. The United Kingdom shares a common history and so has similar institutions, while the United States is obviously a much larger economy but (as a world leader in many aspects of growth and innovation) provides a useful reference. Korea, an Asian country with a similar level of GDP per capita to New Zealand but much faster growth, has been used as a comparator for the first time.

The Indicators

The 2011 Economic Development Indicators report is split into seven core chapters:

- Wellbeing and Prosperity
- Immediate Drivers of Income Growth
- Composition of the New Zealand Economy
- Underlying Determinants of Productivity Growth – Firm and Market Performance
- Underlying Determinants of Productivity Growth – Business Environment
- New Zealand's Economic Relationship with Australia and its States
- Auckland – An Internationally Competitive City.

As with the previous economic development indicators, some qualifications need to be made regarding the indicators in the 2011 report.

A Comprehensive Approach is Needed

As a set, these indicators provide a picture of the factors influencing economic growth in New Zealand. Viewed together and over time, they provide useful information about trends, New Zealand's future direction, and how different parts of the growth and innovation system relate to each other. Individually they provide, at best, only an indication of change in a particular area.

It should also be noted that the most recent available international data for some of the indicators provided in this report were earlier than 2009. Therefore, a number of the Government's recent policy changes (such as its tax reforms) are not fully reflected in the indicators.

Visible Change Takes Time

Although this year's report updates many of the indicators in the previous report, three to four years is a short timeframe in economic terms. Many of the efforts of government and businesses to improve New Zealand's economic performance will be clearly apparent in the indicators only over longer periods. For example, the impact of the global financial crisis has interrupted and may even change some long-term trends.

Links Between Overall Performance and Indicators are Complex

We have based our selection of indicators on what theory and empirical evidence tell us about the likely determinants of economic growth. However, the relationship between these underlying factors and overall economic performance is not straightforward. There is not necessarily a simple causal relationship between performance on a particular indicator and aggregate performance. Further, indicators are generally only a proxy for the underlying factor we are interested in. For example, educational attainment is a proxy for, but not a perfect measure of, human capital.

This means it is important to be cautious about drawing policy conclusions from the indicators: while poor performance on a particular indicator may signal the existence of a problem to be addressed through policy, this is not necessarily the case.

Attributing Changes in Indicators to Specific Policies is Difficult

It is difficult to attribute changes in indicators to specific policies, as a variety of government initiatives will act on each indicator. In addition, government policy is only one of a number of factors that influence the behaviour of the indicators and the economy. However, we hope these indicators will help businesses and government identify areas of policy interest, and stimulate further analysis where appropriate. This should enable a greater understanding of how policy action can impact on New Zealand's growth and innovation performance.

Issues Around Measurement, Comparability, and Timeliness

When data are expressed in a common currency in this report, it normally means that the data have been adjusted to the common currency (usually US\$) using purchasing power parity (PPP) exchange rates. Where indicators are expressed as a percentage of GDP, this generally divides a nominal (current price) value as a percentage of nominal GDP.

There are measurement issues associated with many of the indicators used in this report. We have commented on issues with specific data sources throughout the report.

Some of the data are based on surveys of various people's opinions. Since opinions are not necessarily well informed, these data must be interpreted with some caution. People in different countries may also calibrate their perceptions differently; for example, because of cultural differences or the way public debate on particular issues has been framed.

Many of the sources used in this report are subject to revision. The figures reflect the latest data from the stated source at the time the graph was prepared, which varies from figure to figure.

Issues also arise when comparing New Zealand's performance with that of other countries, as different countries' data will reflect the unique characteristics of each country and the nature of the survey undertaken in each country, and there may be some methodological differences in the way those data are collected. For example, some components of some countries' national accounts

are incomplete. This means that the values of some of New Zealand's national accounts statistics may not be strictly comparable with those of other countries. In addition, many indicators will be subject to statistical uncertainty.

The above issues need to be taken into account when interpreting small differences between different countries.

Even with the qualifications discussed above, the authors are comfortable that readers can rely on the overall picture presented by this report.

CHAPTER 1

Wellbeing and Prosperity

Key Points

- A country's wellbeing is determined by a wide range of factors, from its material living standards to the nature and quality of its social and environmental situation.
- New Zealand is above the OECD median on quality of life indicators (which depend on a range of factors, including income), but below the OECD mean on purely economic measures: what New Zealand earns – net national income (NNI) per capita; what it earns before depreciation – gross national income (GNI) per capita; and what New Zealand produces – gross domestic product (GDP) per capita.
- The trend growth rate in GDP per capita has been a little below the OECD mean. The level of real GDP per capita and of real NNI per capita both remain lower than the OECD mean.
- The difference between GDP and NNI is greater in New Zealand than in most other economies in the OECD. This is mostly because income earned by foreigners on their investments in New Zealand greatly, and increasingly, exceeds the income that New Zealanders earn on their overseas investments.
- Household wealth in New Zealand grew from 1998, and particularly strongly from 2002, until the onset of the global financial crisis. It fell slightly between 2007 and 2008 but began to increase again in 2009. The biggest reason for these changes was changes in housing wealth.
- Income inequality among households increased between the mid-1980s and the mid-2000s. This gives New Zealand a higher degree of income inequality than the OECD average.

Introduction

There are a number of ways to gauge the overall wellbeing of New Zealanders, but a key indicator is real income per capita, or material standards of living. Improvement in material standards of living is underpinned by economic development. This increases the variety and quantity of resources available to generate higher household incomes, better quality public services, and a more sustainable environment. However, measuring material standards of living, though important, does not give a complete picture of wellbeing. Assessing wellbeing calls for a set of indicators that account for both financial and non-financial aspects of quality of life.

This section of the report sets out indicators of material living standards, as well as broader quality of life and environmental indicators, to benchmark New Zealand's performance against other OECD economies. It also examines changes in household wealth and the distribution of incomes across households.

Quality of Life

FIG 1.1 AND FIG 1.2

Measures of quality of life both assess social and economic wellbeing and look more broadly than just at material standards of living. Clearly, what constitutes good quality of life is subjective and will differ between individuals. One measure of wellbeing is the United Nations Human Development Index (UNHDI). In 2010, New Zealand was ranked in third place out of a total of 169 countries on the UNHDI and was ranked third in the OECD. The UNHDI focuses on three aspects of human development: life expectancy; education (measured by adult literacy and enrolment at the primary, secondary, and tertiary levels); and PPP income. The Economist Intelligence Unit's quality of life index also gave a relatively high ranking to New Zealand, putting us in 14th place in the OECD in 2005.¹⁷

The quality of the environment also contributes to wellbeing. The ESI 2005 and EPI 2010, produced by Yale and Columbia Universities in the United States, provide measures of environmental quality and sustainability. Both scores are reported, since each index provides different information for policy makers.

The EPI focuses on current outcomes across a core set of environmental issues. In the 2010 EPI, New Zealand ranked 10th in the OECD (15th out of the 163 countries). New Zealand ranked first in the EPI in 2006, but this result is not comparable with the 2010 result due to changes in methodology and underlying data.

The ESI is constructed around the concept of sustainability, tracking the environmental past, present, and future. The ESI has not been updated since 2005 when New Zealand was ranked ninth in the OECD.

The OECD has reported that, while New Zealand has implemented improved environmental policies over the past 10 or so years, it still faces some major environmental pressures. It recommends New Zealand strengthens its national policy guidance and further integrates environmental concerns into economic and sectoral decisions.¹⁸

A key component of most quality of life measures is income per person. Income is important because it provides individuals with consumption choices and finances public services such as health care, education, welfare, environmental protection, and security.

Other aspects of wellbeing are also important, not only in their own right, but also because they contribute to sustained economic development. There are other government agencies that report these other aspects of wellbeing,¹⁹ so they are not considered further here. Instead, the remainder of this report focuses on income per head and the factors underpinning this.

¹⁷ This article was a one-off so has not been updated since 2005. Refer to The Economist Intelligence Unit's quality-of-life index – the world in 2005, available at http://www.economist.com/media/pdf/QUALITY_OF_LIFE.pdf

¹⁸ OECD (2007). *OECD environmental performance reviews: New Zealand*. Paris: OECD Publishing.

Income and Production

FIG 1.3 TO FIG 1.5

GNI is a measure of the total income that accrues to New Zealand residents from domestic and foreign sources. In comparison, GDP is equal to the total income earned from goods and services produced in New Zealand, including those produced by foreign-owned firms operating domestically. NNI is a measure that adjusts GNI by subtracting the depreciation of the capital stock that occurs in the course of a year's production. NNI therefore better measures the income that citizens have available to consume without reducing their future consumption possibilities.

In 2009, New Zealand's GDP per capita ranked 21st and its NNI per capita ranked 23rd in the OECD. New Zealand's GNI per capita was around 15 percent below its GDP per capita in 2009.²⁰ This difference between GDP and GNI reflects the fact that income accruing to foreigners' investments in New Zealand substantially, and increasingly, exceeds the income accruing from the overseas investments by New Zealand residents. New Zealand's investment balance and external position are discussed further in Chapter 4.

Real GDP per capita growth in New Zealand has on average been a little lower than the OECD mean since the 1980s. New Zealand's five-year average annual growth in GDP per capita increased between the mid-1990s and 2003.²¹ This reflects increased labour utilisation and labour productivity during the period (see Chapter 2). Since then the five-year growth rate has fallen somewhat but has on average been close to the growth exhibited by the comparator countries apart from Korea.

The level of GDP per capita remains relatively low as a proportion of the OECD mean. New Zealand's relative GDP per capita increased slightly between 1992 and 1995. It has declined somewhat since and in 2009 was about 16 percent below the OECD mean. This suggests that New Zealand's economic growth will have to lift over a long period, if New Zealand is to significantly improve its position relative to the OECD mean.

Household Wealth and Income Distribution

FIG 1.6 AND FIG 1.7

New Zealanders' material standards of living are affected by their overall wealth as well as their incomes. Wealth not only delivers a stream of future income, but also provides a nest egg for future use and insurance against unforeseen events.

Household wealth in New Zealand fell slightly in 2008 as a result of the global financial crisis, but started to grow in 2009. Previously it had grown from 1998, and particularly strongly from 2002. The biggest increase was in net housing wealth (housing value less mortgages).

¹⁹ The Government reports on a range of aspects that contribute to overall wellbeing. The Ministry of Social Development publishes *The Social Report* annually. In 2007, the Ministry for the Environment published a second five-yearly 'state of the environment' report, *Environment New Zealand 2007* (with a third report to be published in 2012). In July 2009, Statistics New Zealand published *Measuring New Zealand's Progress Using a Sustainable Development Approach: 2008*. This report provides an overarching view of New Zealand's environmental, economic, and social progress based on detailed analysis of 85 indicators.

²⁰ GNI data are available from the OECD Factbook 2010, *Economic and Social Statistics*.

²¹ When comparing the relative growth performance of countries, there is no ideal time horizon over which to calculate an average growth rate. If it is calculated for a short time period, GDP per capita growth rates are likely to fluctuate considerably owing to business cycle effects. If the average growth rate is calculated over a long time period, significant changes in economic performance may not be obvious for some time. We have chosen a five-year average growth rate to compare New Zealand with other OECD countries.

This reflected increasing house prices over the period and a significant increase in housing investment. Net housing wealth (housing value less mortgages) grew particularly strongly over the six years preceding the global financial crisis.

Net financial assets (financial assets less liabilities other than mortgages) grew from 2002 to 2009, but decreased slightly in 2008. This is discussed in Chapter 4, in the context of broader measures of investment and New Zealanders' levels of saving.

The distribution of wealth and income is also an important factor in overall wellbeing. Although average wealth and income have been on the increase, the increase in income has not been spread equally among households. New Zealand's income inequality increased between the mid-1980s and the mid-1990s, and showed little change between the mid-1990s and the mid-2000s. In the mid-2000s, New Zealand had a higher degree of income inequality (as measured by the Gini coefficient) than the OECD average. Income inequality in New Zealand was higher than in Denmark and Australia, about the same as in the United Kingdom, and less than in the United States.

Quality of Life

New Zealand's quality of life, as measured by the UNHDI, is above the OECD median score. In 2010, New Zealand ranked third out of 169 countries and was third in the OECD, the same ranking as in 2005.

FIG
1.1 Score in the UNHDI²²

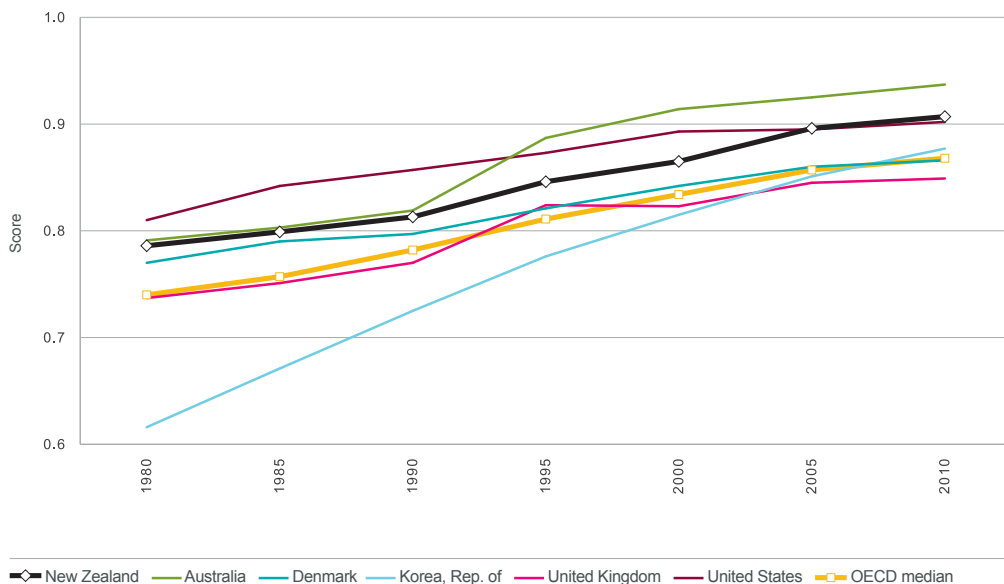
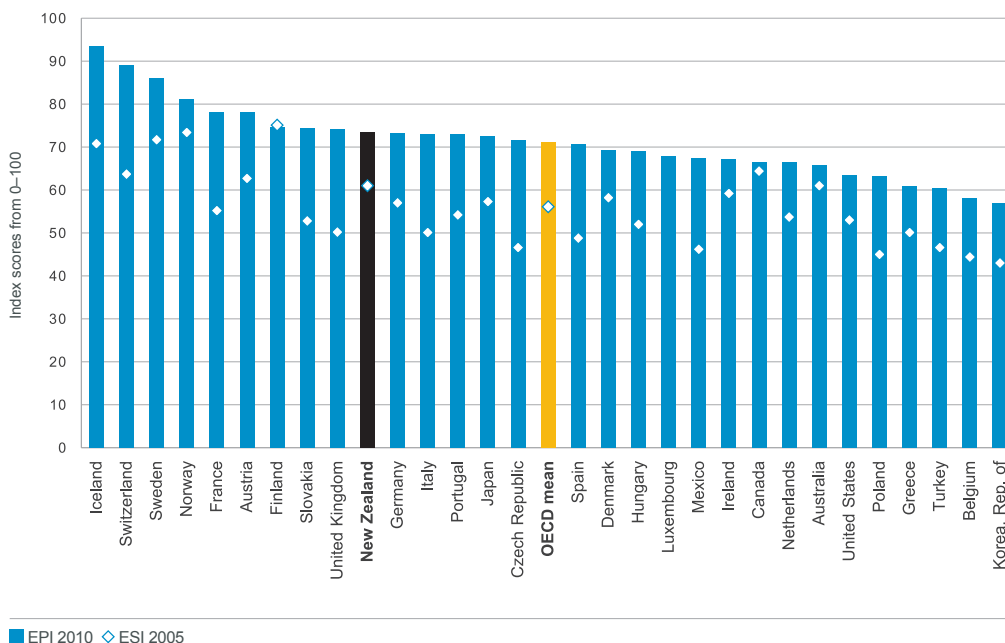


FIG
1.2 EPI 2010²³ and ESI 2005²⁴

New Zealand ranks 10th in the OECD in the EPI, an index based on current outcomes. New Zealand's EPI ranked first in 2006, but this result is not comparable with the 2010 result. ESI, based on past environmental performance and future challenges, has not been updated since 2005, when New Zealand ranked ninth in the OECD.



Sources: Yale Centre for Environmental Law & Policy, Yale EPI 2010; Centre for International Earth Science Information Network (CIESIN), Columbia University, Columbia ESI 2005

²² The United Nations revised its HDI methodology in 2010, and New Zealand's ranking is now significantly higher for all time periods than that published in *Economic Development Indicators 2007*. The HDI still measures progress in health, knowledge, and income, but the knowledge and income measures have been revised.

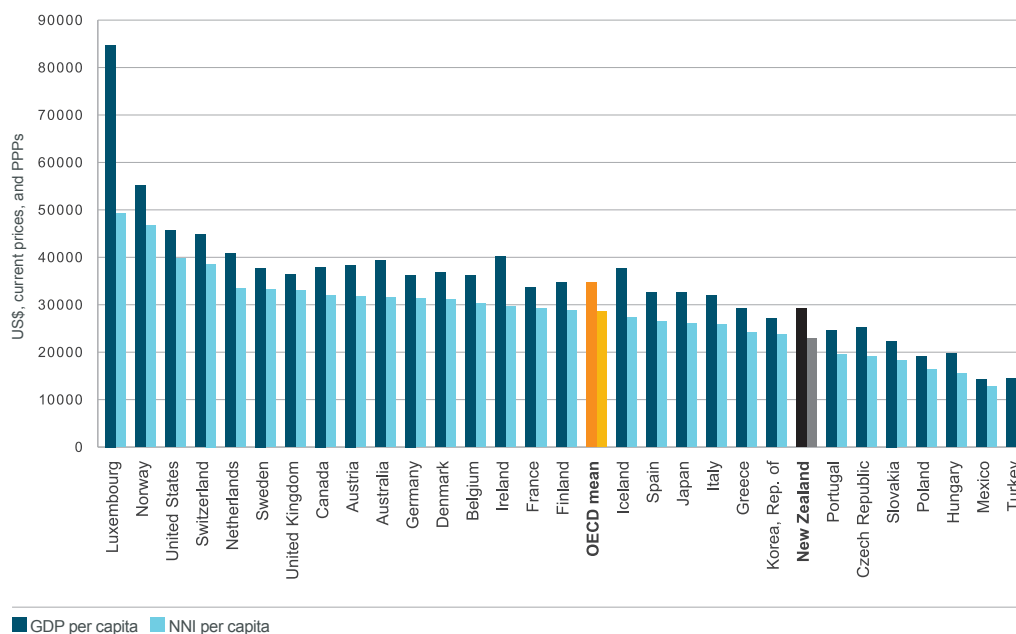
²³ The 2010 EPI measures two broad environmental protection objectives: reducing environmental stresses on human health; and promoting ecosystem vitality. See <http://sedac.ciesin.columbia.edu/es/epl/>

²⁴ The ESI benchmarks the ability of nations to protect the environment over the next several decades. It permits comparison across a range of issues that fall into the following five broad categories: environmental systems; reducing environmental stresses; reducing human vulnerability to environmental stresses; societal and institutional capacity to respond to environmental challenges; and global stewardship. See <http://sedac.ciesin.columbia.edu/es/es/>

Income and Production

FIG

1.3 GDP and NNI per capita (US\$, current prices and PPPs), 2009²⁵

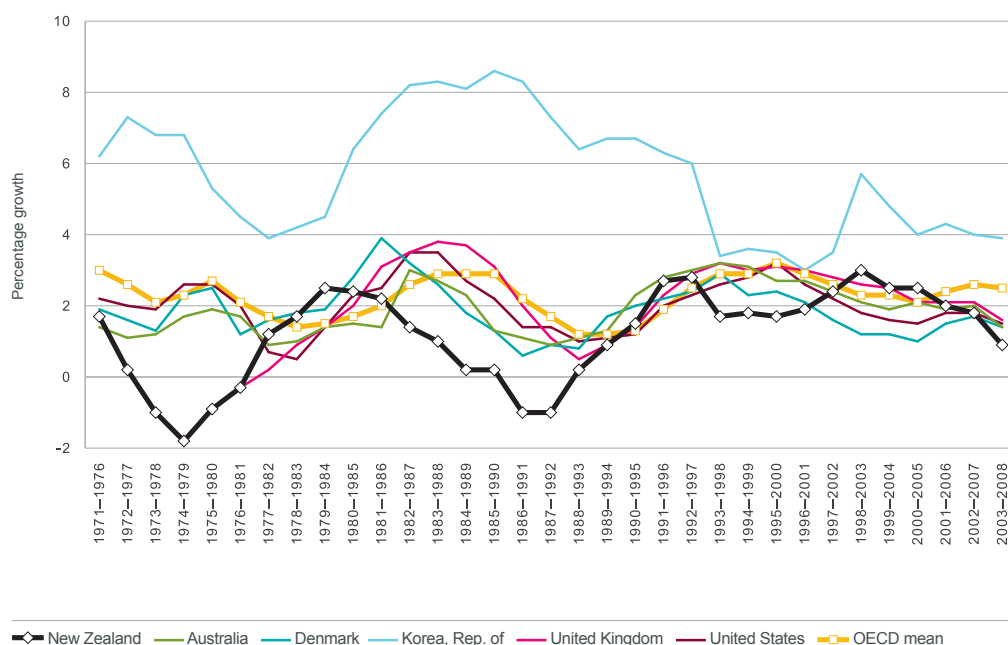


Sources: OECD database, National Accounts, Disposable income and net lending – net borrowing; *ibid*, Gross Domestic Product

In 2009, New Zealand ranked 21st in the OECD in terms of GDP per capita and 23rd in terms of NNI per capita.²⁶

FIG

1.4 Real GDP per capita growth: five-year average²⁷



Sources: OECD Factbook 2010, Real GDP growth; OECD Factbook 2009, Population growth rates

New Zealand's five-year average growth in real GDP per capita was mostly lower than the OECD mean and more volatile than most comparator countries in the 1970s and 1980s. Since then, the five-year average has on average been close to the rate of growth achieved by the comparator countries apart from Korea. Korea displays significantly higher growth rates over the entire period.

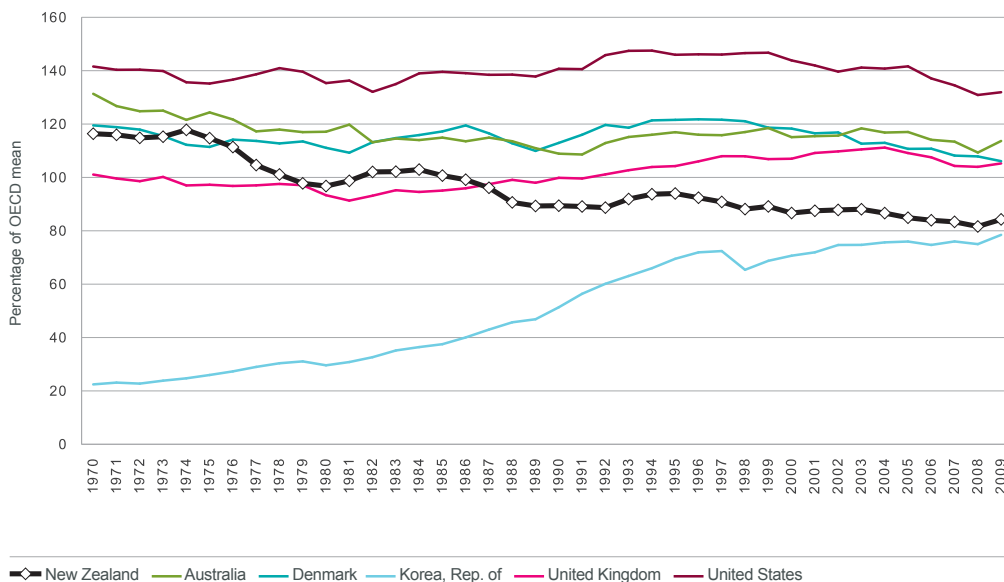
²⁵ The data for Australia, Canada, Japan, Mexico, and New Zealand are estimates. These data are based on SNA 1993.

²⁶ NNI adjusts GNI by subtracting the depreciation of the capital stock over the year. NNI is considered a more appropriate measure of the income of residents than GDP, even though GDP is more widely used. For example, see Stiglitz, J., Sen, A., & Fitoussi, J-P (2009). *Report by the Commission on the measurement of economic performance and social progress*. See http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf

²⁷ The five-year average is calculated as a five-year compound annual growth rate.

New Zealand's GDP per capita expressed as a percentage of the OECD mean trended down until the early 1990s. It improved somewhat thereafter to around 85 percent of the OECD mean until the mid-1990s, after which it fell slowly to around 80 percent of the OECD mean in 2008. This level is lower than that of comparator economies, with the exception of Korea. Korea has been rapidly growing from a lower base, closing the gap with the OECD mean.

FIG 1.5 Nominal GDP per capita as a percentage of the OECD mean (US\$ and PPPs)

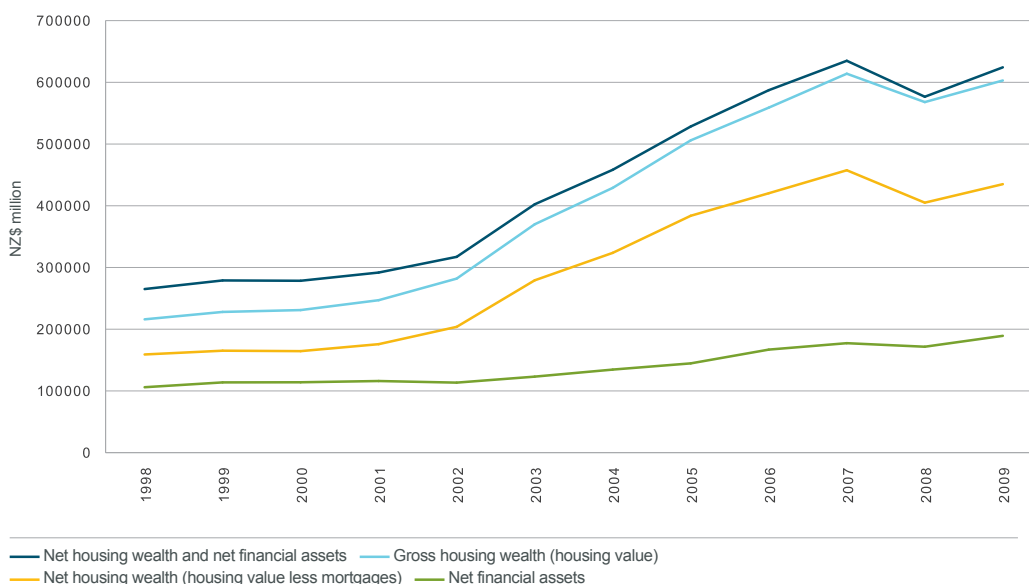


Source: OECD Factbook 2010, GDP per capita

Household Wealth and Income Distribution

Net household wealth is the sum of net housing wealth and net financial assets. Net household wealth increased strongly over the six years preceding the global financial crisis, mainly as a result of increasing house prices and housing investment. The impact of the global financial crisis is evident in the fall in measures of wealth that include housing between 2007 and 2008.

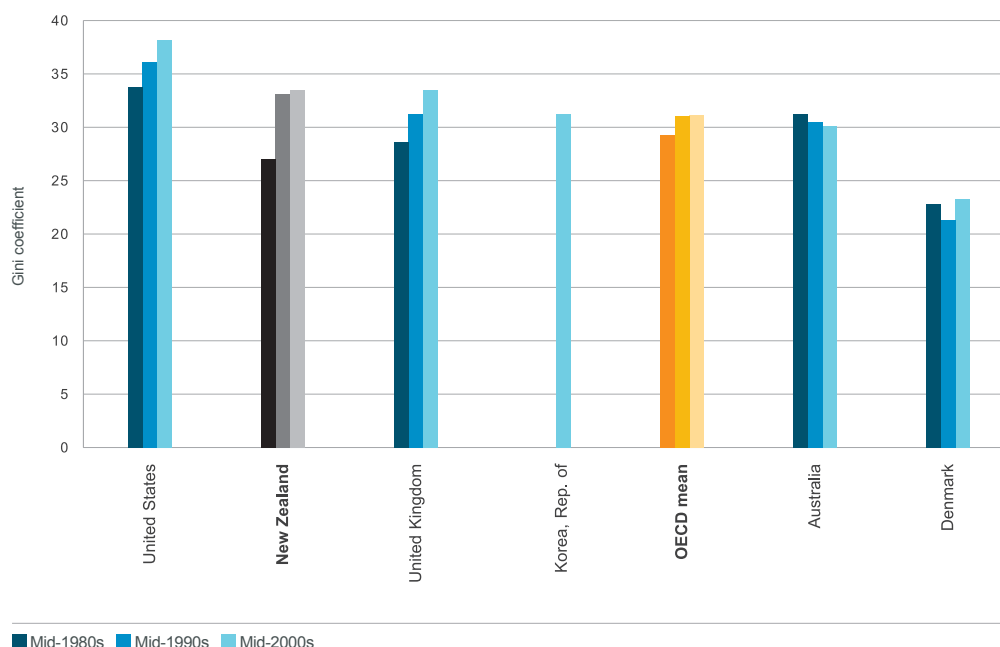
FIG 1.6 Net household wealth and net financial assets and components (NZ\$ million, current prices)²⁸



Source: Reserve Bank of New Zealand, Household Financial Liabilities, Assets, and Housing Values

²⁸ Net housing wealth (net equity in housing) is the value of housing attributed to households less housing loans (mortgages). Household net financial assets is households' total financial assets (equities, directly and indirectly held, and other financial assets) less households' financial liabilities (consumer loans and student loans). Housing loans are not deducted from household financial assets to arrive at the net financial assets figure, having already been accounted for in net housing wealth.

FIG

1.7 Disposable income inequality (measured by Gini coefficients)²⁹

New Zealand's level of income inequality, as measured by the Gini coefficient, increased more than the OECD mean between the mid-1980s and the mid-1990s. It was then relatively stable until the mid-2000s but remained higher than the OECD mean. The Gini coefficient is a common measure of income inequality: a score of zero indicates perfect equality, and a score of 100 indicates complete inequality.³⁰

Sources: OECD Factbook 2010, Income inequality; OECD Factbook 2008, Income inequality

²⁹ Income is defined as household disposable income in a particular year. It consists of earnings, self-employment, and capital income and public cash transfers; income taxes and social security contributions paid by households are deducted. The income of the household is attributed to each of its members, with an adjustment to reflect differences in needs for households of different sizes.

³⁰ For further analysis of income inequality in New Zealand, see Hyslop, D., & Yahanpath, S (2005). *Income growth and earnings variations in New Zealand, 1998–2004*. New Zealand Treasury Working Paper 05/11. Wellington: The Treasury.

CHAPTER 2

Immediate Drivers of Income Growth

Key Points

- Improvements in material living standards (GDP per capita) can be attributed to increases in either labour utilisation or labour productivity (total output generated per hour worked). New Zealand has a relatively high labour utilisation rate compared with its OECD counterparts, but relatively low labour productivity.
- Given the limits to increasing labour utilisation further, future improvements in material standards must come primarily from labour productivity growth.
- The level of labour productivity for the whole economy is below the level of countries in the upper half of the OECD, and is not catching up with them.
- The growth rate in labour productivity for the whole economy has been within the cluster of the comparator countries from the late 1970s, but below the OECD mean.
- This estimate of economy-wide labour productivity – GDP per hour worked – is subject to some measurement difficulties. To circumvent these, some statistical agencies estimate productivity growth for a subset of the total economy where more accurate measures are available. For such a subset (comprising around 63 percent of GDP in both New Zealand and Australia), New Zealand's average growth rate of labour productivity has been similar to that of Australia's since 1988.
- Measured-sector MFP growth has been about the same as Australia's over the last decade. The whole-economy measure of MFP growth remains low by OECD standards. This may in part reflect measurement problems.
- The amount of capital available per hour worked has increased in recent years, but the level of capital-labour ratio appears to be significantly below that of Australia and most other OECD countries.³¹

31 Dupuy, M. & Beard, J (2008). *Investment, productivity and the cost of capital: Understanding New Zealand's 'capital shallowness'*. New Zealand Treasury Productivity Paper 08/03. Wellington: The Treasury.

Introduction

Improvements in material living standards can be attributed to increases in either labour utilisation (the number of paid hours worked per head of population, per year)³² or labour productivity (the amount of output produced for each unit of paid work). Each of these can be further broken down: labour productivity into changes in the capital-labour ratio and MFP; labour utilisation into changes in the proportion of the total population of working age, the participation rate (the proportion of the working-age population in the labour market), the unemployment rate, and hours worked per person employed. This chapter assesses these immediate contributors to income growth for New Zealand, comparing them with past performance and with other comparator economies.

Labour Utilisation

FIG 2.1 TO FIG 2.5

Much of New Zealand's recent economic growth reflects the rise in the labour utilisation rate, which is now one of the highest in the OECD (sixth place using 2008 figures). Improvements in labour utilisation (ie, the total number of paid hours worked per head of population) contribute directly to material living standards and, if caused by reduced unemployment, can also have non-financial benefits, such as better social inclusion.

New Zealand's high rate of labour utilisation results from a combination of a large share of the total population being of working age, high participation rates, low unemployment, and a high average number of hours worked per person employed relative to other OECD countries. However, the average hours worked per person employed has fallen by around 4 percent in the five years to 2009.³³

New Zealand has a slightly lower proportion of its population aged 65 and over relative to the OECD mean.³⁴ A high share of the population of working age means that more workers will

be available for employment, and therefore – other things being equal – aggregate labour utilisation will be higher. The proportion of the population aged 65 and over is expected to increase substantially over the next 40 years in both New Zealand and the OECD.

New Zealand's total labour force utilisation rate rose on average up to 2008. A decrease in hours worked per capita, each week, by males under 55 years has been more than offset by the increase in the average hours worked each week by females over the age of 50 and males over the age of 55. Since 2007, labour utilisation has declined a little (partly due to the effect of the global financial crisis).³⁵

In addition, the unemployment rate for New Zealand fell between the late 1990s and 2007 when it fell to 3.7 percent, its lowest level since the 1980s and also among the lowest in the OECD. The unemployment rate is the proportion of labour market participants not currently employed. Unemployment in many OECD countries has since risen as a result of the global financial crisis.

While labour utilisation has a direct influence on economic growth in New Zealand, economic growth can itself affect labour utilisation rates. In prosperous times, people are likely to find it easier to get jobs, and wages also tend to rise, attracting more people into the workforce.

Given the limits to further increasing labour utilisation, future improvements in material standards must come primarily from labour productivity growth.

Labour Productivity and MFP

FIG 2.6 TO FIG 2.9

Whole Economy

Labour productivity measures how much real output (goods and services) is produced per hour worked, and indicates how effectively labour is being used as a production input in the economy.

³² A considerable amount of work in the economy – for example, a high proportion of childcare and domestic work – is unpaid. This unpaid work is not measured in indicators of labour utilisation and material living standards, although it makes an important contribution to welfare. Paid or unpaid work in the unofficial or 'black' economy is also not always captured in statistics on labour utilisation.

³³ Source: OECD Stat Extracts 2010, Labour Force Statistics, Average annual hours actually worked per worker.

³⁴ Note that 21 percent of the population is under 15 years old and therefore also not of working age. Source: Statistics New Zealand, National Population Estimates 2010 Quarter.

³⁵ The seasonally adjusted participation rate declined from 68.4 percent in December 2007 to 68.0 percent in March 2010. Source: Statistics New Zealand, Household Labour Force Survey.

New Zealand's level of whole-economy labour productivity (GDP per hour worked) is at the lower end of the OECD range (22nd place using 2008 figures). Likewise, New Zealand's labour productivity growth rate has been moderate relative to other OECD countries, and below the OECD mean (but see the qualification in the next section).

MFP measures the amount of output produced after adjusting for inputs of both capital and labour, and may be the best productivity measure of consumer welfare.³⁶ A change in MFP reflects the change in output that cannot be accounted for by increases in inputs of labour or capital.³⁷ It captures a range of other factors that may cause output to increase, such as skills (including management capability), technology, workplace organisation and culture, and economies of scale. New Zealand's average annual MFP growth has been, and still is, low relative to the OECD mean and the comparator countries. Consequently, issues around innovation, regulation, tax, and skills are the focus of a range of government policies.

In the period from 2001 to 2008, employment in New Zealand grew rapidly, including amongst the low skilled. As a consequence, New Zealand's labour productivity grew somewhat more slowly.³⁸

Measured Sector

The figures discussed above take into account labour productivity and MFP across the entire economy. However, it is very difficult to measure productivity in some sectors. For instance, there are only partial output measures in government non-market industries, where services such as health and education are provided free or at nominal charges. For this reason, New Zealand and

Australian statistical agencies report labour productivity and MFP in the 'measured sector'³⁹ of the economy, which can provide a more accurate comparative picture of productivity growth rates.

On average, in the measured sector, labour productivity and MFP have grown similarly in New Zealand and Australia since 1988. This is different from the whole economy where Australia's growth rates have been higher than New Zealand's. Further analysis suggests that part of the difference is real and part is due to differences in measurement methods in the two countries.⁴⁰

Capital and Labour

FIG
2.10

The amount of physical capital in an economy is an important influence on economic growth. Increasing the amount of capital directly influences labour productivity by increasing the quality and quantity of machinery, equipment, and infrastructure available to each worker. In addition, higher levels of MFP encourage capital deepening, further enhancing labour productivity. New Zealand's capital-labour ratio is low by OECD standards and New Zealand workers do not appear to have had as much physical capital to work with as have workers in Australia.⁴¹ However, New Zealand's capital-labour ratio has been trending up since the mid-1990s, with the rate of growth increasing since 2003 (though still less than Australia). This trend indicates an increase in the use of capital in production processes.

36 See Basu, S, Pascalli, L, Schiantarelli, F, & Serveni, L (2009). *Productivity, welfare and reallocation: Theory and firm-level evidence*. NBER Working Paper 15579. See <http://www.nber.org/papers/w15579>

37 For more information, see Lipsey, R, Carlaw, K, & Bekar, C (2005). *Economic transformations: General purpose technologies and long-term growth*. Oxford: Oxford University Press.

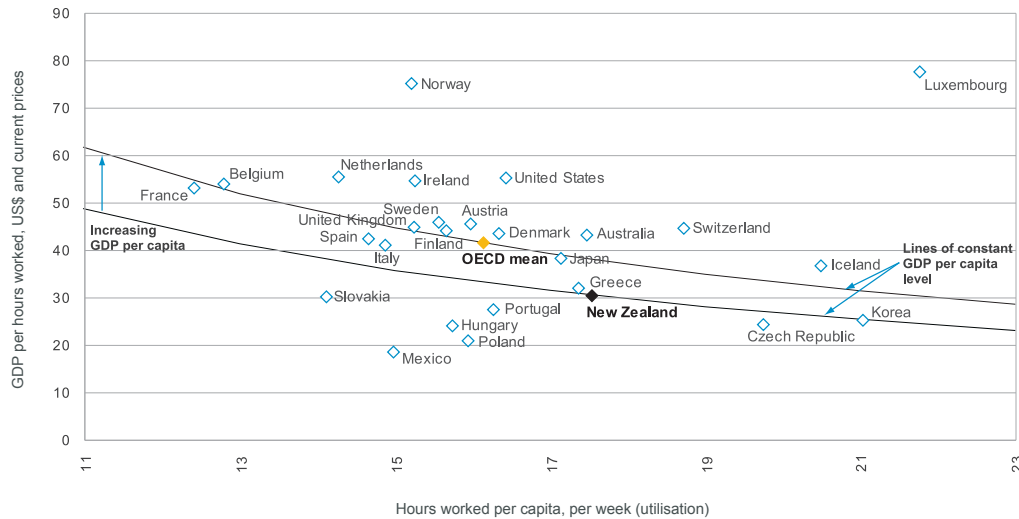
38 See Szeto, K L, & McLoughlin, S (2008). *Does quality matter in labour input? The changing pattern of labour composition in New Zealand*. New Zealand Treasury Working Paper 08/01. Wellington: The Treasury. Also Hyslop, D, & Yahanpath, S (2005). *Income growth and earnings variations in New Zealand, 1998–2004*. New Zealand Treasury Working Paper 05/11. Wellington: The Treasury.

39 The measured sector comprises: agriculture, forestry, and fishing; mining; manufacturing; electricity, gas, and water supply; construction; wholesale trade; retail trade; accommodation, cafés, and restaurants; transport and storage; communication services; finance and insurance; and cultural and recreational services. In New Zealand, business services and personal and other community services are included from 1996 onwards. The data reported here are for the former measured sector, excluding the new sectors added in 1996, because these data are more comparable with Australian data.

40 Fuller analysis of the challenges of measuring New Zealand's productivity and how it compares with Australia's is contained in *Taking on the West Island – How Does our Productivity Performance Stack Up?* Brendan Mai, Statistics New Zealand, Geoff Lewis, John Janssen, and Simon McLoughlin, The Treasury. Paper presented to the NZAE Conference, 2010. See http://www.stats.govt.nz/browse_for_stats/economic_indicators/productivity/taking-on-west-island-nz-labour-productivity.aspx

41 Dupuy, M, & Beard, J (2008). *Investment, productivity and the cost of capital: Understanding New Zealand's 'capital shallowness'*. New Zealand Treasury Productivity Paper 08/03 (see pp. 5–7). Wellington: The Treasury. See <http://www.treasury.govt.nz/publications/research-policy/tprrp/08-03publications/research-policy/tprrp/08-03>

FIG
2.1 Labour productivity and utilisation, 2008

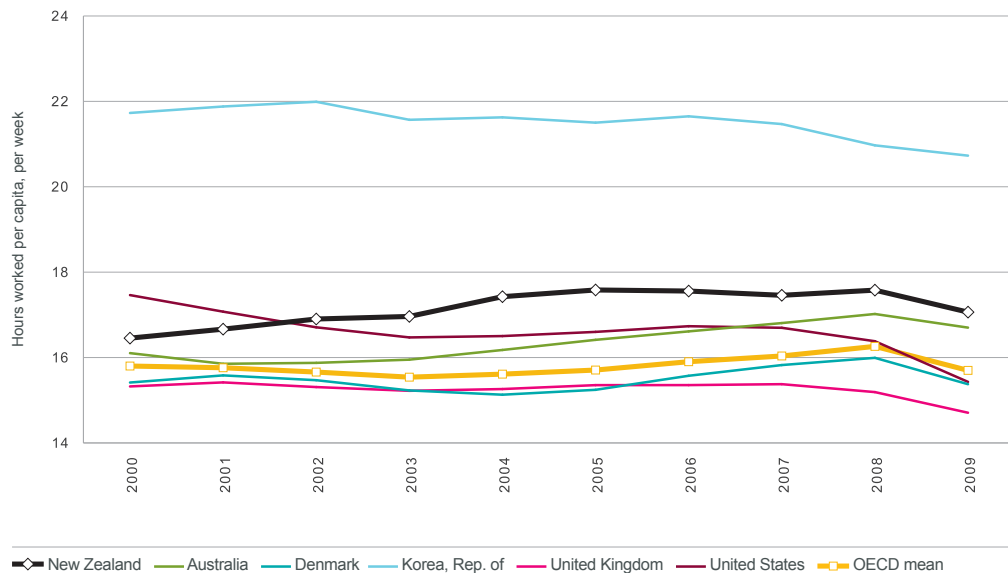


Sources: OECD database, General Statistics, Country statistical profiles 2010; OECD database, Productivity database, Labour Productivity Growth⁴²

Labour Utilisation

New Zealand has achieved its current level of GDP per capita by having a relatively high labour utilisation rate, relative to other countries in the OECD, which partially offsets a relatively low level of labour productivity.

FIG
2.2 Hours worked per capita, per week



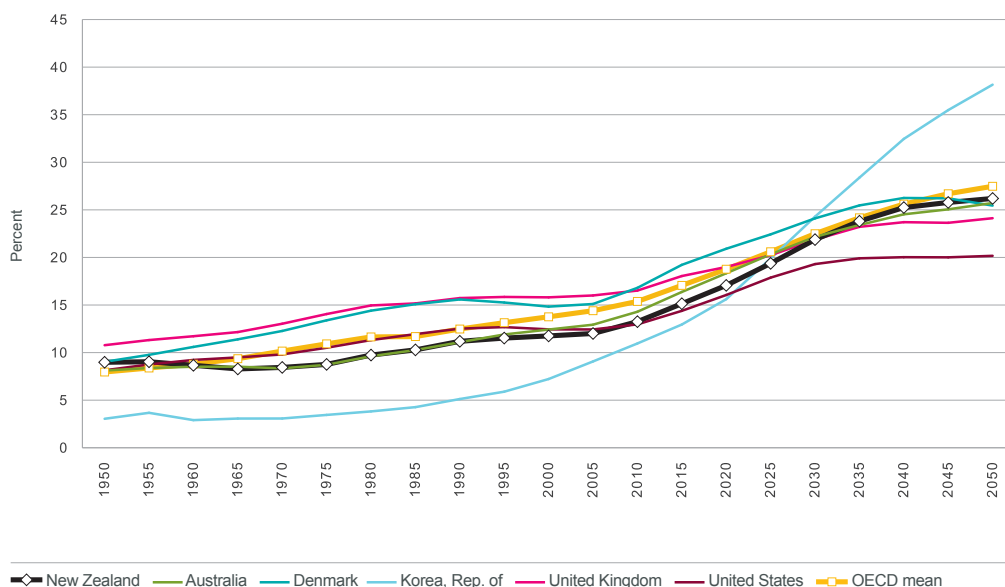
Sources: OECD database, General Statistics, Country statistical profiles 2010; OECD, Productivity database, Labour Productivity Growth

Hours worked per capita, per week, is a measure of labour utilisation. In 2008, New Zealand had a higher rate of labour utilisation than the OECD mean and all of the comparator countries except Korea.

42 All 2008 GDP figures are in current prices and PPPs. Data for 2008 GDP are estimates for Australia, Japan, Mexico, and New Zealand and subject to revision.

New Zealand has a slightly lower proportion of its total population aged 65 and over than the OECD mean. The proportion is expected to increase substantially both in New Zealand and in the OECD.

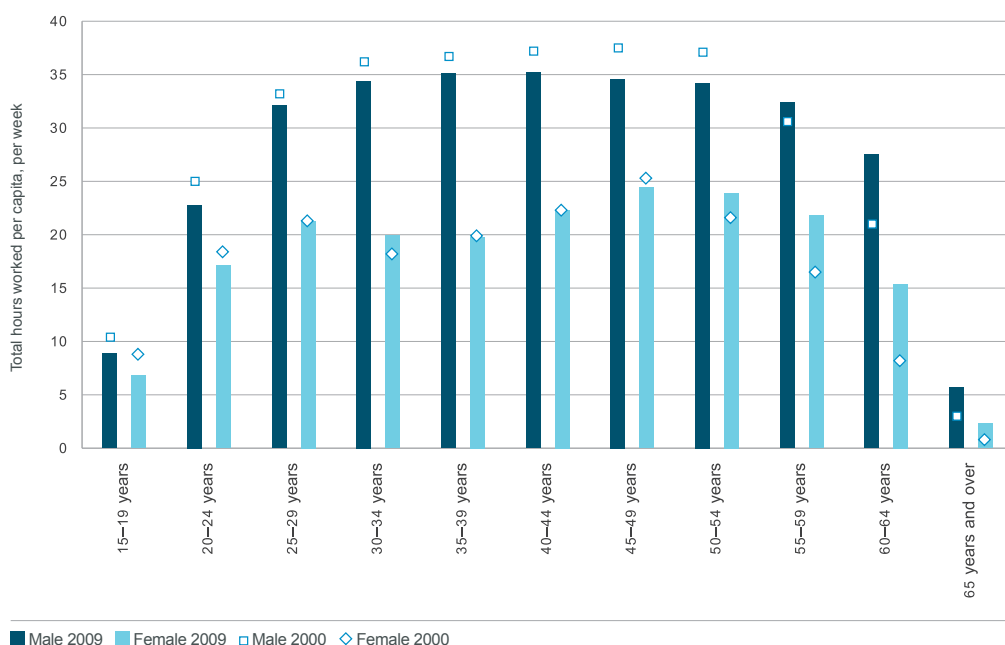
FIG
2.3 Percentage of the population aged 65 and over to the total population



Source: OECD database, General Statistics, Country statistical profiles 2010

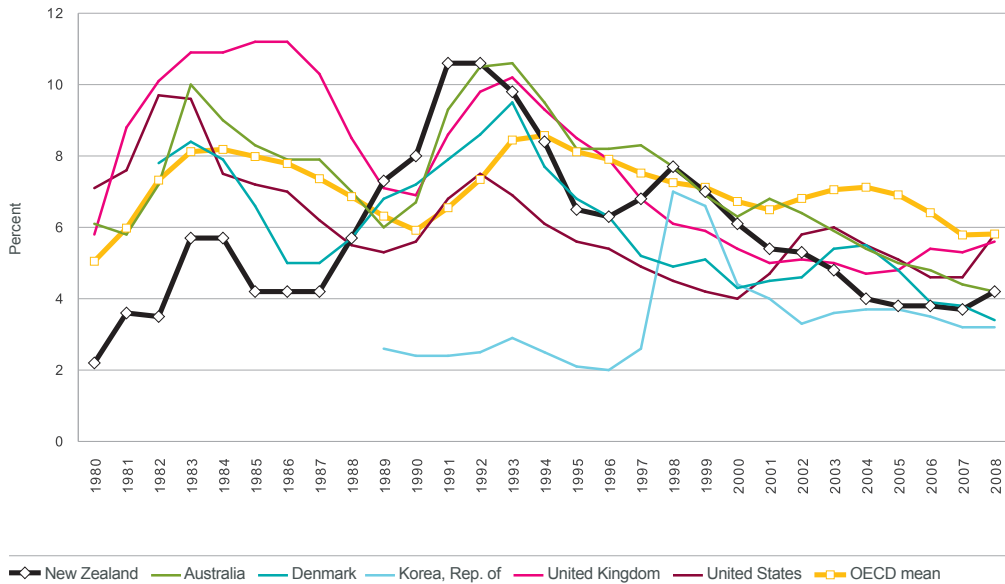
Total hours worked per capita, per week, is a measure of labour utilisation. Between 2000 and 2009, labour utilisation declined for males under the age of 55 but remained relatively static for females in the same age group. In the same period, there was an increase in labour utilisation for males over the age of 55 and females over 50.

FIG
2.4 Labour utilisation by age group and gender for selected years, 2000 and 2009



Sources: Statistics New Zealand, Household Labour Force Survey, customised data request; Statistics New Zealand, Infoshare database, Demography Age Estimates

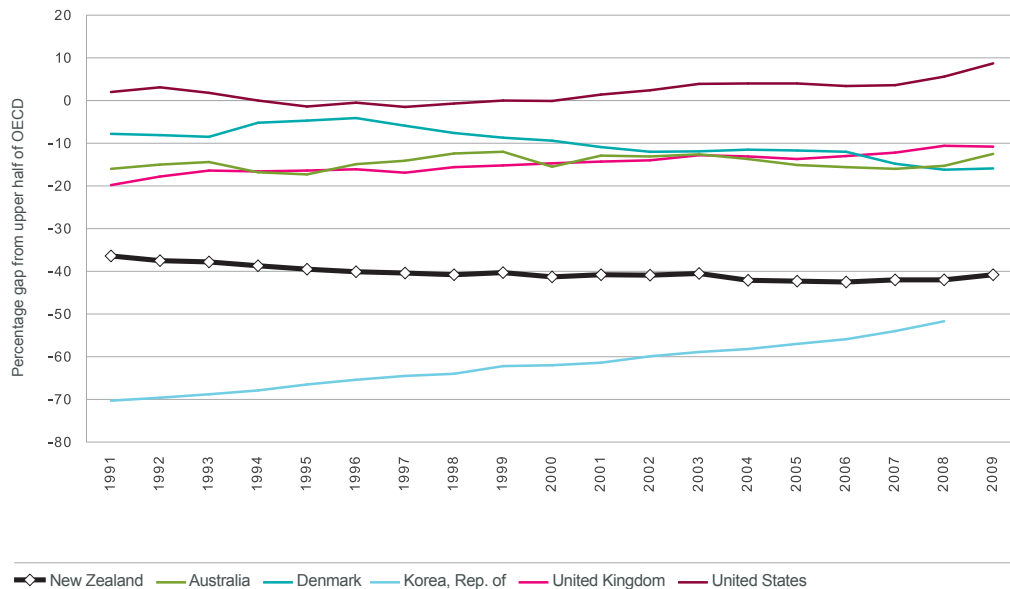
FIG
2.5 Unemployment rate as a percentage of the labour force



The unemployment rate for New Zealand fell to 3.7 percent in 2007. That was the lowest level in 20 years, and among the lowest in the OECD. Unemployment in many countries has risen since, as a result of the global financial crisis.

Source: OECD Factbook 2010, Unemployment rates total

FIG
2.6 Labour productivity levels (GDP per hour worked): gap with respect to average for countries in the upper half of the OECD⁴³



Labour Productivity and MFP

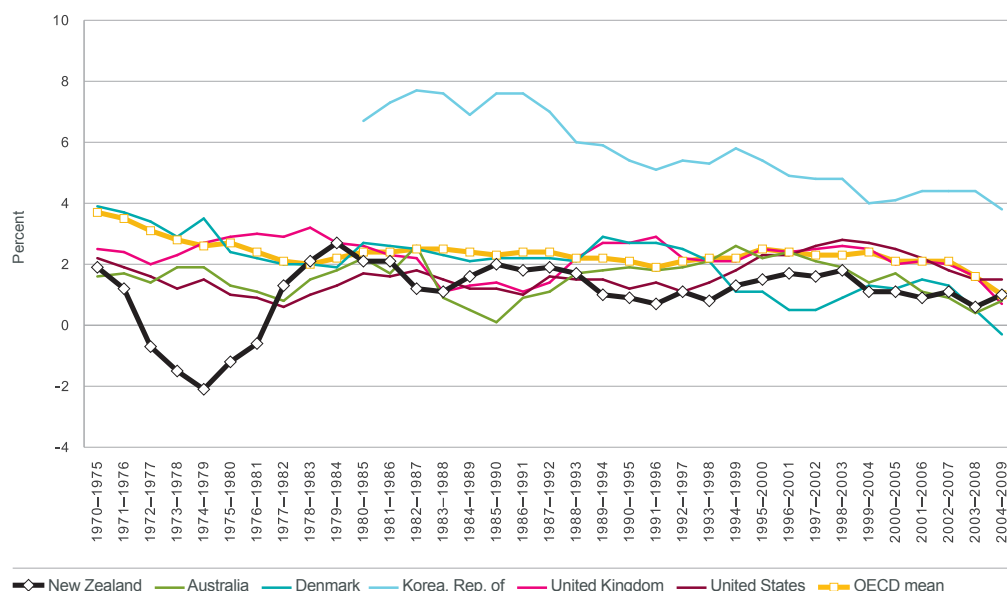
The percentage gap between New Zealand's labour productivity level and the average labour productivity level in the upper half of the OECD has widened since the early 1990s, although the latest figures show a slight narrowing of the gap.

Source: OECD Economic Policy Reforms 2010: Going for Growth, Chapter 3 Country notes

⁴³ This indicator shows the percentage gap with respect to the simple average of the countries in the upper half of the OECD in terms of GDP per hour worked (in constant 2005 PPPs). The gaps for 2009 are OECD estimates, based on the OECD Economic Outlook, No. 86, which may use different GDP data from those used for other indicators in this report.

New Zealand's growth in GDP per hour worked has been within the cluster of comparator economies but largely below the OECD mean from the late 1970s onwards.

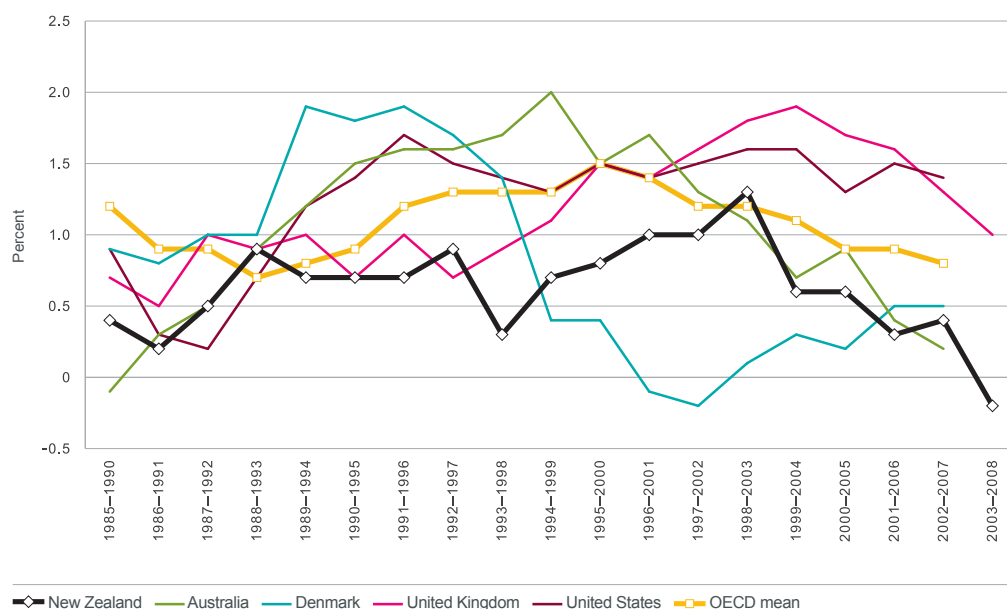
FIG
2.7 Annual growth in labour productivity: five-year average⁴⁴



Source: OECD database, Productivity, Labour productivity growth

New Zealand's average annual growth rate of MFP has remained low relative to most OECD comparator countries and the OECD mean.

FIG
2.8 Annual growth in MFP: five-year average⁴⁴

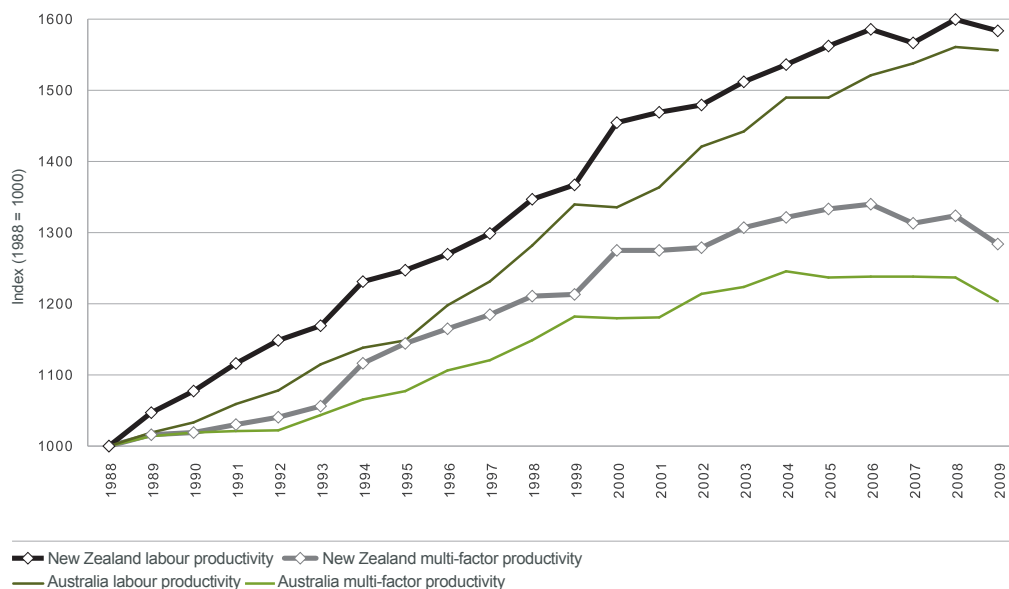


Source: OECD database, Productivity, Multifactor productivity

⁴⁴ The five-year average is calculated as a five-year compound annual growth rate.

FIG

2.9 New Zealand and Australian labour productivity index and MFP index, measured sector (1998 = 1000)⁴⁵

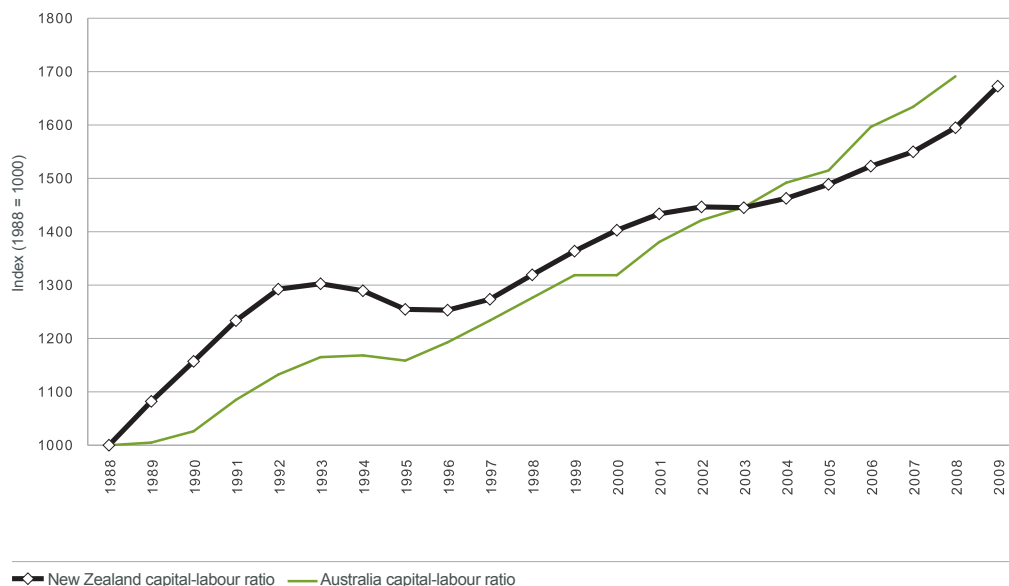


Sources: Statistics New Zealand, Productivity Statistics 1978–2009, former measured sector, Table 1.8; Australian Bureau of Statistics, 5204.0 – Australian System of National Accounts, 2008–09, Table 13 Productivity in the market sector

Over the past 21 years, New Zealand averaged similar labour productivity and MFP growth rates to Australia across the “measured” sectors of their economies. The measured-sector data are more robust than the whole-economy data presented in previous graphs, but are only available for New Zealand and Australia.

FIG

2.10 Index of capital-labour ratio, New Zealand and Australia, measured sector (1998 = 1000)



Sources: Statistics New Zealand, Productivity Statistics 1978–2009, former measured sector, Table 3; Australian Bureau of Statistics, 5204.0 – Australian System of National Accounts, 2007–08, Table 13 Productivity in the market sector

Capital and Labour

The capital-labour ratio index in the measured sector has trended upwards since the mid-1990s. However, Australia's capital-labour ratio has grown faster than New Zealand's over this period. New Zealand's capital-labour ratio is low by OECD standards and New Zealand workers do not appear to have had as much physical capital to work with as have workers in Australia.⁴⁶

⁴⁵ The indicator compares Statistics New Zealand's former measured sector against the new ABS MFP12 (ANZSIC2006) based series. MFP12 is as close as possible to the ABS's old 'market' sector, and goes through until 2009. See footnote 41.

⁴⁶ Dupuy, M. & Beard, J. (2008). *Investment, productivity and the cost of capital: Understanding New Zealand's 'capital shallowness'*. New Zealand Treasury Productivity Paper 08/03 (see pp. 5–7). Wellington: The Treasury. See <http://www.treasury.govt.nz/publications/research-policy/tprp/08-03>

CHAPTER 3

Composition of the New Zealand Economy

Key Points

- Economic growth involves changes in the composition of the New Zealand economy.
- Contrary to popular perception, the New Zealand economy has a slightly lower proportion of employees in small to medium-sized enterprises (19 or fewer employees) than the OECD mean.
- New Zealand has a similar proportion of large firms to other OECD countries and a similar proportion of persons employed in large firms to the OECD mean. However, New Zealand's large firms are smaller than the OECD mean, suggesting that New Zealand has fewer very large firms.
- New Zealand has a much larger share of primary-sector value added relative to the comparator OECD countries. However, the share of value added in the primary sector has declined for New Zealand and the comparator OECD countries.
- Labour productivity levels differ substantially across the New Zealand industries. GDP per hour paid is highest in electricity, gas, and water supply; forestry and mining; and transport, storage, and communication services.
- New Zealand has had higher labour productivity growth rates than Australia in agriculture, forestry, and fishing; electricity, gas, and water supply; retail trade; transport and storage; and communication services. In both New Zealand and Australia, the highest growth in industry labour productivity has been in communication services.
- New Zealand's export-product concentration is somewhat higher than the OECD mean. New Zealand's export-market concentration, on the other hand, is slightly lower than the OECD mean, reflecting a more diverse range of export markets.

Introduction

Economic growth involves changes in the composition of the New Zealand economy.⁴⁷ New businesses spring up, existing businesses restructure, and less successful businesses decline. Likewise, new and improved products appear and some existing ones become uncompetitive. An examination of economic structure can shed light on how the New Zealand economy is changing in response to new knowledge and changes in the business environment, both domestically and globally.

This chapter examines how the composition of the New Zealand economy has changed over time. It also compares New Zealand's economic structure to other countries'.

Firm Structure

Contrary to popular perception, the New Zealand economy has a slightly lower proportion of employees in small to medium-sized enterprises (19 or fewer employees) relative to the OECD mean.

New Zealand's relative lack of large firms has been suggested as a potential reason for New Zealand's lower level of BERD and its comparatively lower economic performance relative to other OECD countries. In fact, New Zealand has a similar proportion of large firms to other OECD countries. However, New Zealand's large firms are smaller on average than the OECD mean, suggesting that New Zealand has fewer very large firms.⁴⁸

New Zealand's lack of very large firms, along with industry composition, may go some way to explaining different patterns of BERD. In contrast to the norm in other OECD countries, New Zealand firms with fewer than 50 employees carry out more BERD as a percentage of total industry value added than larger New Zealand firms (see Figure 4.1.3 in the Innovation and Entrepreneurship section).

Industry Performance

FIG 3.2 TO FIG 3.4

During the last century, major changes have occurred to New Zealand's sectoral structure. As in most other OECD countries, the share of agriculture in GDP has declined for the last 80 years; the share of the goods-producing industry has been declining for about 20 years; while the share of services has expanded.^{49,50} Figure 3.2 shows that this trend continued between 2000 and 2006. However, New Zealand continues to have a much larger share of primary-sector value added relative to the comparator OECD countries.

GDP per hour paid is a proxy for labour productivity. Labour productivity levels differ substantially across New Zealand's industries. GDP per hour paid is highest in electricity, gas, and water supply; forestry and mining; and transport, storage, and communication services. However, difficulties in getting a good measure for labour input prevent the inclusion of other important industries, such as agriculture, in these data.

In June 2010, Statistics New Zealand released new official industry productivity series. There are some marked differences in productivity growth rates at the industry level compared with Australia. In both countries, the highest growth has been in communication services. Industries in which New Zealand outgrew Australia were agriculture, forestry, and fishing; electricity, gas, and water supply; retail trade; transport and storage; and communication services. Industries in which Australia outgrew New Zealand were mining; manufacturing; construction; wholesale trade; accommodation, cafés, and restaurants; and cultural and recreational services. These have been the lowest growth industries in New Zealand, with growth rates below the measured sector average of 2.5 percent.

47 Procter, R (2008). *Inside the black box: Policies for economic growth*. MED Occasional Paper 08/08. Wellington: Ministry of Economic Development.

48 See, for example, Mills, D, & Timmins, J (2004). *Firm dynamics in New Zealand: A comparative analysis with OECD countries*. New Zealand Treasury Working Paper 04/11. Wellington: The Treasury.

49 Easton, B (2004). *The development of the New Zealand economy (I)*. The New Zealand Ministry of Economic Development Seminar Series Paper. See <http://www.eastonbh.ac.nz/?p=509>

50 Easton, B (1996). *Towards a political economy of New Zealand: The tectonics of history*. Wellington: Hocken Library.

A similar pattern emerged between New Zealand's MFP growth rates and Australia's. The top four industries have been the same for both countries: communication services; transport and storage; agriculture, forestry, and fishing; and finance and insurance. In the first three of those, New Zealand outperformed Australia; however, Australia's finance and insurance growth was stronger. Of the remaining industries, New Zealand has had a higher MFP growth rate only in the retail trade industry and then only marginally so.⁵¹

Export Structure

Throughout the 1950s and 1960s, New Zealand's exports were highly concentrated on a few products. In 1966, wool made up over 30 percent of export revenue and 45 percent of all exports went to Britain. Faced with declining relative prices of wool and Britain's entry to the EU, the New Zealand economy began to diversify its export products and markets.

FIG 3.5 AND FIG 3.6

New Zealand's merchandise exports are still heavily concentrated towards food and beverage exports. New Zealand's export-product concentration is somewhat higher than the OECD mean. New Zealand's export-market concentration, on the other hand, is slightly lower than the OECD mean, reflecting a more diverse range of export markets. New Zealand's value of food and beverage exports is similar to Denmark's, but the share of food and beverage exports in Denmark's total exports is much lower because it exports relatively more of other products (see Figure 4.3.3 in the International Linkages section). New Zealand's share of food and beverage exports in total exports increased between 2000 and 2008.

New Zealand's exports have grown slower than world exports since 1985. This partly reflects the concentration of New Zealand's exports in sectors with slower than average world export growth.^{52,53}

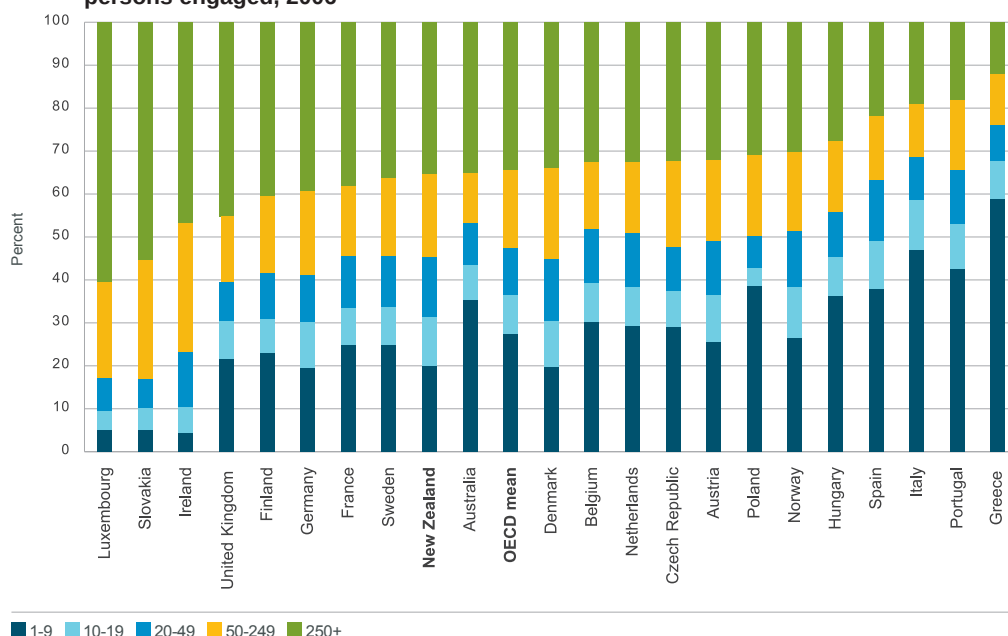
51 Refer to Statistics New Zealand (2010). *Industry productivity statistics 1978–2008*. Wellington: Author.

52 Ballingall, J. & Briggs, P. (2002). *A look at New Zealand's comparative advantage – Updating the porter study's analysis of exports*. Working Paper 2002/04. Wellington: New Zealand Institute of Economic Research.

53 Nesbit (forthcoming). MED Occasional Paper.

FIG

3.1 Number employed by size class of business as a percentage of the total number of persons engaged, 2006⁵⁴



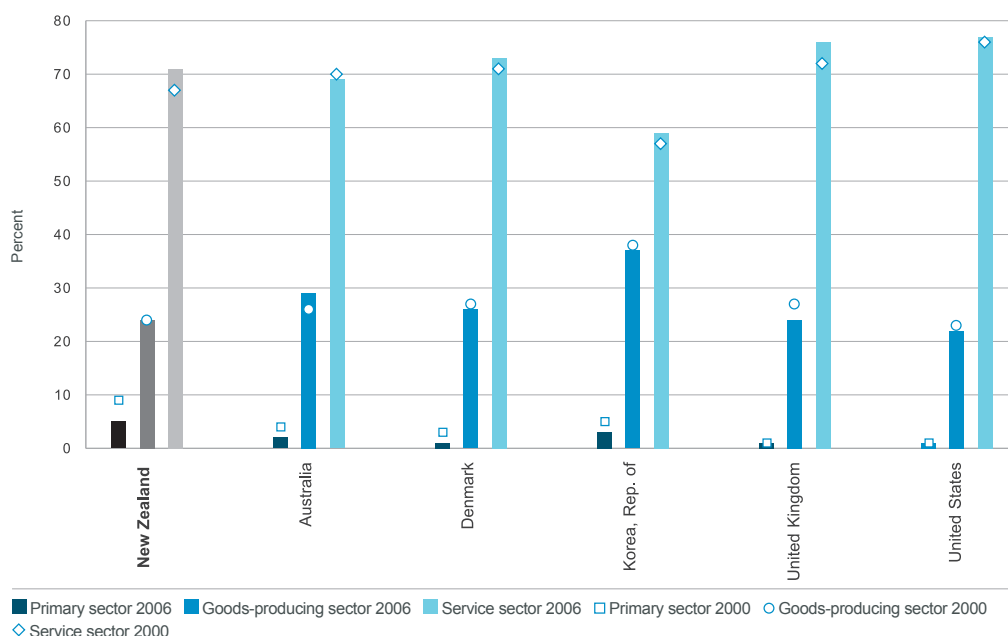
Sources: OECD Measuring Entrepreneurship: A collection of indicators, 2009 edition, Table A.2 Employment; Statistics New Zealand, Customised business demography data

Firm Structure

Contrary to popular perception, New Zealand has a slightly lower proportion of employees in small to medium-sized enterprises (19 or fewer employees) than the OECD mean. However, New Zealand has a similar proportion of people employed in large firms (250 or more employees) to the OECD mean. However, New Zealand's large firms are smaller than the OECD mean, suggesting that New Zealand has fewer very large firms.⁵⁵

FIG

3.2 Sector contributions to nominal value added, 2000 and 2006



Source: OECD database, Industry and Services, STAN database for Structural Analysis

Industry Performance

In 2006, the primary sector's share of value added⁵⁶ was much larger in New Zealand than in the comparator countries. In all these countries, the primary sector's share of value added declined. The service sector increased its share of value added for New Zealand and all comparator countries except Australia. The contribution of New Zealand's goods-producing sector is similar to the contribution in 2000.

⁵⁴ The total number of persons engaged is the total number of persons who worked in or for an enterprise during the reference year. An enterprise is a legal entity, which may consist of one or more local units or establishments corresponding to different production units situated in a geographically separate place and in which one or more persons work for the enterprise. All countries present information using the enterprise as the statistical unit except Japan, Korea, and Mexico, which use establishments. For this reason, these countries have been excluded.

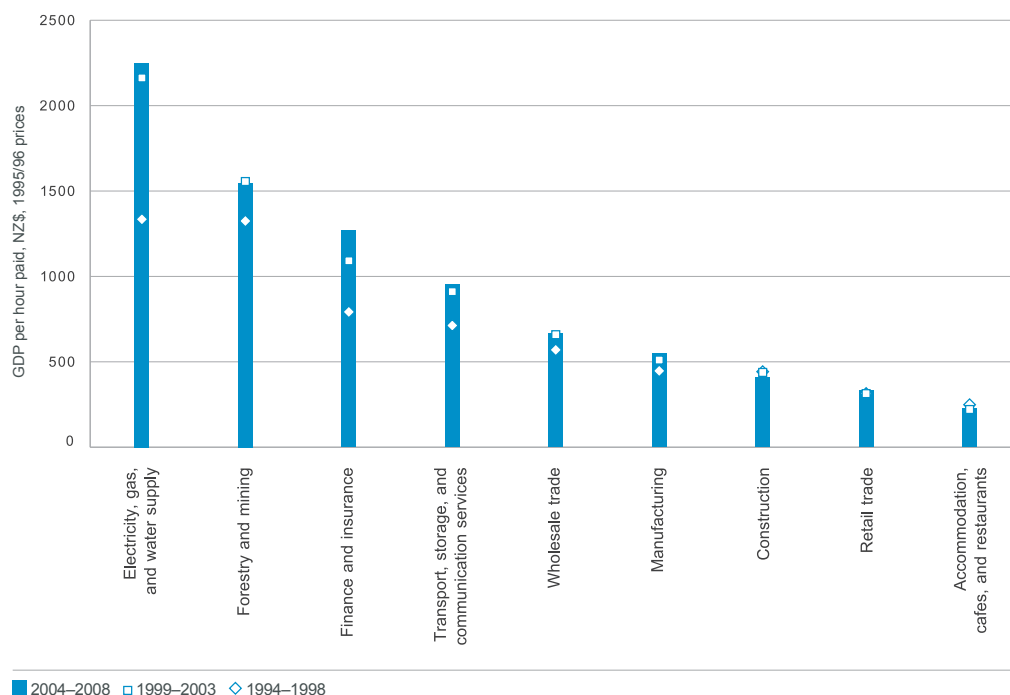
For Ireland, Japan, and Korea the data do not include establishments with fewer than three to five different size class conventions. Data cover the market economy. New Zealand data cover all industries. All other countries' data exclude financial intermediation. Data for Ireland, Luxembourg, and the Slovak Republic include manufacturing sectors only.

⁵⁵ Refer footnote 48.

⁵⁶ Primary sector includes agriculture, hunting, forestry, and fishing. Goods-producing sector includes mining and quarrying, manufacturing, electricity, gas and water supply, and construction. Service sector includes wholesale and retail trade, transport, storage and communications, finance, insurance, real estate and business services, community, social and personal services.

GDP per hour paid is a proxy for labour productivity. Labour productivity levels differ substantially across New Zealand's industries. GDP per hour paid is highest in electricity, gas, and water supply; forestry and mining; finance and insurance; and transport, storage, and communication services.

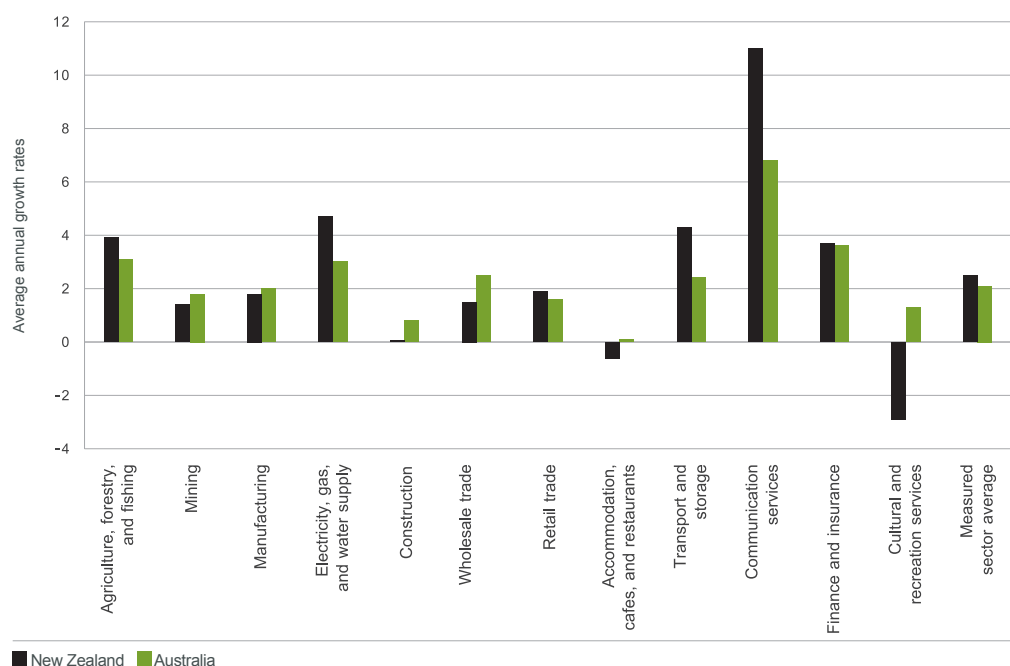
FIG
3.3 GDP per hour paid, by industry, five-year average⁵⁷



Sources: Statistics New Zealand, Quarterly Employment Survey, customised data request; Statistics New Zealand, Infoshare database, National Accounts

In both New Zealand and Australia, labour productivity growth was quite different in different industries. Industries in which New Zealand outgrew Australia were agriculture, forestry, and fishing; electricity, gas, and water supply; retail trade; transport and storage; and communication services.

FIG
3.4 New Zealand and Australia labour productivity, average annual growth rates, 1986–2008⁵⁸



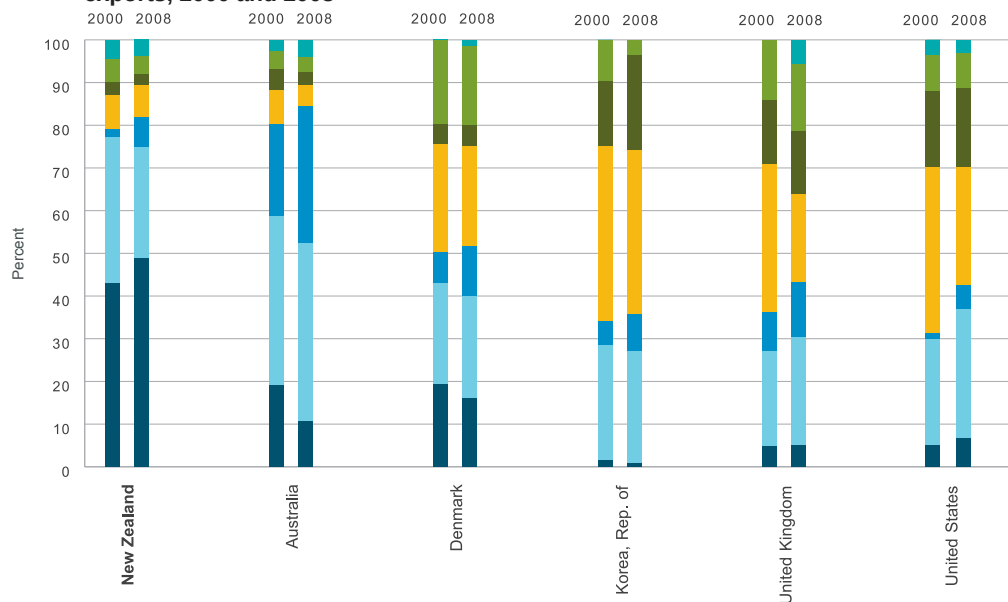
Source: Statistics New Zealand, Industry productivity statistics, customised data request

⁵⁷ These are not official statistics. Difficulties in getting a good measure for labour input prevent the inclusion of other important industries, such as agriculture, in these data.

⁵⁸ In New Zealand, labour input is largely measured by hours paid. In Australia, labour input is largely measured by hours worked. Average annual growth rates are for 1996–2008 in both Australia and New Zealand for cultural and recreational services. The 12 industries measure 65 percent of the New Zealand economy and 62 percent of Australia's, on average. The measured sector excludes property and business services; owner-occupied dwellings; government administration and defence; education; health and community services; personal and other community services.

FIG

3.5 Merchandise exports by broad economic category⁵⁹ as a percentage of total nominal exports, 2000 and 2008



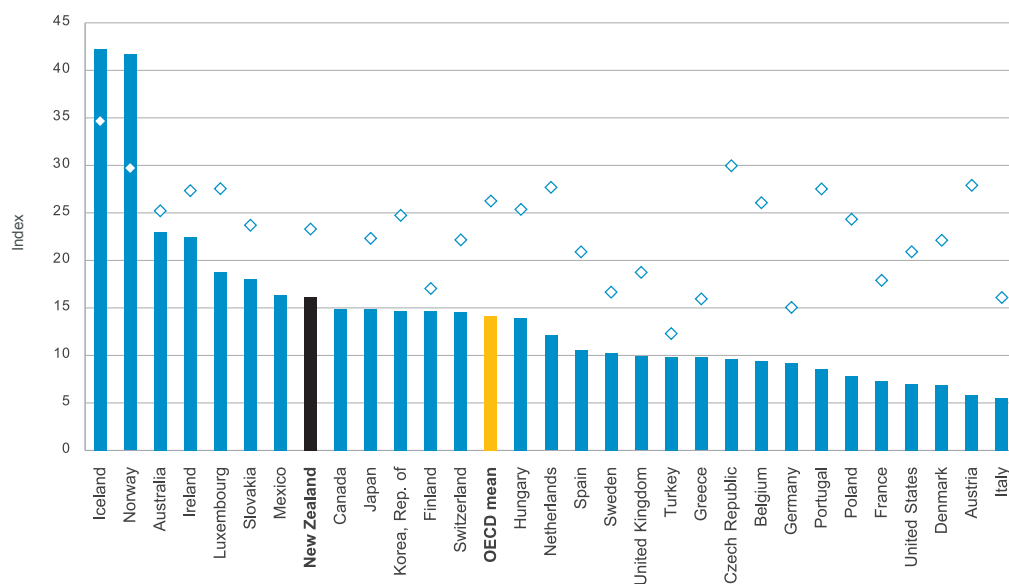
Source: United Nations COMTRADE database, DESA/UNSD

Export Structure

New Zealand's composition of merchandise exports is still heavily weighted toward food and beverage exports, relative to comparator OECD countries. The share of food and beverage exports increased in New Zealand between 2000 and 2008 relative to the shares of other products.

FIG

3.6 Export product and market destination concentration index: higher = more concentrated,⁶⁰ 2006–2009 (or latest available)



Source: World Bank, World Trade Indicators 2009/10

Export product or market concentration shows the spread of a country's export products or markets – a higher concentration indicates a more limited range. New Zealand's export-product concentration and export-market concentration are now not far from the OECD mean. However, New Zealand's merchandise exports are unusual in being heavily concentrated towards food and beverage exports.

⁵⁹ 'nes' refers to not elsewhere specified.

⁶⁰ Canada and Mexico have higher market destination concentration indexes of 76.18 and 71.42 respectively. These indexes have been dropped from the figure in order to expand the scale on the graph.

CHAPTER 4

Underlying Determinants of Productivity – Firm and Market Performance

4.1 – Innovation and Entrepreneurship

Key Points

- Innovation and entrepreneurship are at the heart of productivity growth.
- Indicators in this section present a mixed picture for entrepreneurship and innovation in New Zealand.
- New Zealand's level of gross expenditure on R&D is lower than the OECD mean, but growing somewhat faster. This is largely a consequence of the level of BERD in New Zealand, which is very low but has been growing faster than the OECD mean. Patenting is also low. Compared to other OECD countries, New Zealand has the lowest rate of R&D tax credits, but the level of grants and subsidies for BERD as a percentage of that R&D is above the OECD mean.
- New Zealand has a relatively large proportion of R&D personnel in its workforce but they are concentrated in the higher education sector and government.⁶¹ It produces more science and engineering articles per head than the OECD mean.
- New Zealand firms have somewhat higher innovation rates than EU firms for the domestic market, but innovation for international markets is low.
- The share of high- and medium-tech products in New Zealand's exports is the lowest in the OECD. Proxy measures of collaboration across the innovation system show high levels of R&D performed by government organisations that is funded by business, but low and declining levels of R&D performed by universities that is funded by business.
- New Zealand is at the top end of a range of OECD countries in firm entry and exit rates. However, the proportion of high-growth enterprises in New Zealand has been generally declining between 2004 and 2009.⁶²

⁶¹ Refer to OECD, Main Science and Technology Indicators, May 2010.

⁶² The high-growth firm data are sourced from New Zealand Business Demography Statistics from Statistics New Zealand.

Introduction

Innovation is essential to ongoing labour productivity growth. Innovation is the dynamic and uncertain process through which firms create new economic value by creating, adopting, and adapting knowledge into new or improved products and services, operational processes, organisational and managerial processes, and approaches to marketing, in pursuit of profits.

Entrepreneurship is the human activity of envisaging these profit opportunities and undertaking the work necessary to take advantage of them.

This chapter presents a range of indicators of innovation that together give some insight into how effective innovation is in New Zealand.

Formal Measures of Innovation⁶³

FIG 4.1.1 TO FIG 4.1.6

Two formal and widely recognised but narrow measures of innovation are aggregate R&D and patenting. R&D is an input to innovation activity.⁶⁴ R&D, especially R&D financed by businesses, plays an important role both in generating new knowledge and in facilitating technology transfer and the absorption of knowledge from other countries.

In New Zealand, gross expenditure on R&D is below the OECD mean, but has been growing somewhat faster than the OECD mean. This shortfall in gross expenditure on R&D is largely due to New Zealand's level of business expenditure on R&D. Business expenditure on

R&D (BERD) is much lower than the OECD mean, but it has been growing faster than the OECD mean.⁶⁵ As a percentage of total industry value added, New Zealand's medium-to large-sized firms fund considerably less R&D than their counterparts in other OECD countries, while New Zealand's small firms (less than 50 employees) fund a similar amount to their counterparts.

The number of patents, an intermediate output of the innovation process, is one indicator of the effectiveness of innovation in New Zealand, as patents cover products and processes that are original and expected to have commercial value.⁶⁶ New Zealand's level of patenting is low and has decreased, contrary to the trend in the OECD.

The low level of R&D and patenting rates in New Zealand can be explained by its distance from world centres, small firm size, and an industrial structure weighted towards primary production, but the low level is still a concern.⁶⁷ In contrast to expenditure on R&D, New Zealand has a relatively large proportion of human resources devoted to R&D (mostly in the higher education and government sectors). New Zealand also generates more science and engineering research publications than the OECD mean.

Together these results suggest New Zealand has less expenditure on R&D than other OECD countries, and much less R&D focused on creating the commercial applications that are important to economic growth.

⁶³ For more detailed analysis of New Zealand's innovation performance, see OECD (2007). *OECD reviews of innovation policy: New Zealand*. Paris: OECD Publishing. Information on this review can be found at http://www.med.govt.nz/templates/ContentTopicSummary____29677.aspx

⁶⁴ The Statistics New Zealand Research and Development Survey defines R&D as follows: "Research and experimental development comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge. Any activity classified as R&D is characterised by originality. Investigation is a primary objective."

⁶⁵ Part of New Zealand's observed growth is due to methodological differences. See Statistics New Zealand's *Research and Development in New Zealand* report editions from 2002 to 2008 for further detail on methodological changes over that period.

⁶⁶ Patents do not include plant variety rights and they are not always the most effective way to protect intellectual property rights. This is particularly the case for industries where the rapid commercialisation of innovations and being first to market matter more than the long-term protection of securing a patent.

⁶⁷ See Crawford, R, Fabling, R, Grimes A, & Bonner, N (2007). National R&D and patenting: Is New Zealand an outlier? *New Zealand Economic Papers*, 41, 1.

Innovative Firms

FIG 4.1.7 TO FIG 4.1.12

Innovative firms are more likely to record an increase in market share, profitability, and total sales than non-innovative firms.⁶⁸

New Zealand firms' innovation performance is mixed.

Compared to other OECD countries, New Zealand has high rates of marketing methods innovation, and relatively high rates of product innovation, but relatively lower rates of process innovation and organisational innovation.⁶⁹ A relatively low amount of New Zealand firms' innovation efforts is focused on international markets.

New Zealand industries have proportionally more innovating firms than their corresponding Australian industries in four of 16 industries (wholesale trade, accommodation and food services, administrative and support services, and healthcare and social services), about the same in two industries (manufacturing and construction), and less in the remaining 10 industries.⁷⁰

Another indicator of business innovation is the share of high-tech exports. Technology-intensive exports⁷¹ accounted for much of the growth in trade over the decade to 2005 and grew more rapidly than total manufacturing exports in all OECD countries except Japan.⁷²

New Zealand has the lowest share of high- and medium-high-tech manufactured exports of all OECD countries. In part, this low share is due to New Zealand's concentration on primary sector exports, which are classified as low-tech, even though there is a sophisticated science and technology base underpinning them.

Hausmann and Rodrik have created an outcome indicator of the sophistication of exports. This shows that the sophistication of New Zealand's exports is consistent with its per capita income – good for a resource-based exporter, but well below the most sophisticated exporters.⁷³

Innovation Linkages

FIG 4.1.13 AND FIG 4.1.14

Commercially valuable innovations typically do not arise in isolation, but develop out of ongoing collaboration and interaction between firms, customers, suppliers, employees, universities, government research institutes, and other players. The strength of such linkages is difficult to measure accurately but is an important indicator of the functioning of the innovation system.

One indicator of linkages is the share of R&D financed across sectors and borders.

The private sector in New Zealand appears to be well connected to CRIs and government departments, with 19.5 percent of R&D performed by the Government being financed by business (first of the OECD countries shown). However, a low and declining percentage of R&D performed within New Zealand universities is financed by businesses, compared with the OECD mean.

New Zealand has significantly lower levels of international R&D linkages than the OECD mean. In 2007, only 4.8 percent of total R&D expenditure was financed from overseas, 3.1 percentage points lower than the OECD mean.⁷⁴

68 Statistics New Zealand, *Innovation in New Zealand* 2005.

69 For this survey, innovation is defined as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations". OECD (2005). *Oslo manual: Guidelines for collecting and interpreting innovation data* (3rd ed). Paris: OECD Publishing. Innovation performance is often measured by surveys and is subject to definition and methodology differences. The firm innovation statistics cited here came from Statistics New Zealand's innovation surveys and were compared with similar statistics presented by Eurostat.

70 Data for this indicator came from the innovation surveys conducted by the Australian Bureau of Statistics, which also followed the definition of innovation from the 2005 *Oslo Manual*.

71 The OECD measures high technology by the intensity of R&D undertaken by the exporting industry. This can be misleading where inputs to the industry employ sophisticated R&D.

72 See OECD (2007). *Science, technology and industry scoreboard 2005*, p. 172. Paris: OECD Publishing.

73 Hausmann, R, Hwang, J, & Rodrik, D (2007). What you export matters. *Journal of Economic Growth*, 12, 1–25. Also available at <http://www.cid.harvard.edu/cidwp/pdf/123.pdf>

74 OECD Main Science and Technology Indicators 2010, percentage of gross expenditure on R&D (GERD) financed by abroad. For more information on New Zealand's international linkages, see Section 4.3: International Linkages.

Firm Dynamics

FIG 4.1.15 AND FIG 4.1.16

Firm entry and exit, and growth rates, give an indication of the availability and uptake of business opportunities. Up to 50 percent of labour productivity growth in OECD countries can be attributed to the entry of new and more productive firms and the exit of less productive firms.^{75,76}

New Zealand is toward the top end of the range for firm start-up and closure rates.

High-growth firms (based on the OECD definition⁷⁷) are rare but generate a majority of new jobs.^{78,79} New Zealand is at the bottom of the OECD for the percentage of high-growth firms when growth is measured by turnover, and mid-range when measured by employment. The percentages of high-growth⁸⁰ firms by employment and by turnover have been declining for the five years between 2004 and 2009.⁸¹

75 Stefano, S, Hemmings, P, Tresselt, T, & Woo, J (2002). *The role of policy and institutions for productivity and firm dynamics: Evidence from micro and industry data*. Economics Department, Working Paper No. 329. Paris: OECD.

76 Law, D, & McLellan, N (2005). *The contributions from firm entry, exit and continuation to labour productivity growth in New Zealand*. New Zealand Treasury Working Paper 05/01. Wellington: The Treasury.

77 High-growth firms, as defined by the OECD, are enterprises with average annualised growth rate of more than 20 percent in employees or turnover, over a three-year period, and with 10 or more employees at the beginning of the observation period. Share of high-growth enterprises is compiled as a percentage of the population of enterprises with 10 or more employees.

78 Anyadike-Danes, M, Bonner, K, Hart, M, & Mason, C (2009). *Measuring business growth*. London: NESTA. See www.nesta.org.uk

79 Bartelsman, E, Scarpetta, S, & Schivardi, F (2005). Comparative analysis of firm demographics and survival: Evidence from micro-level sources in OECD countries. *Industrial and Corporate Change*, 14(3), 365–391.

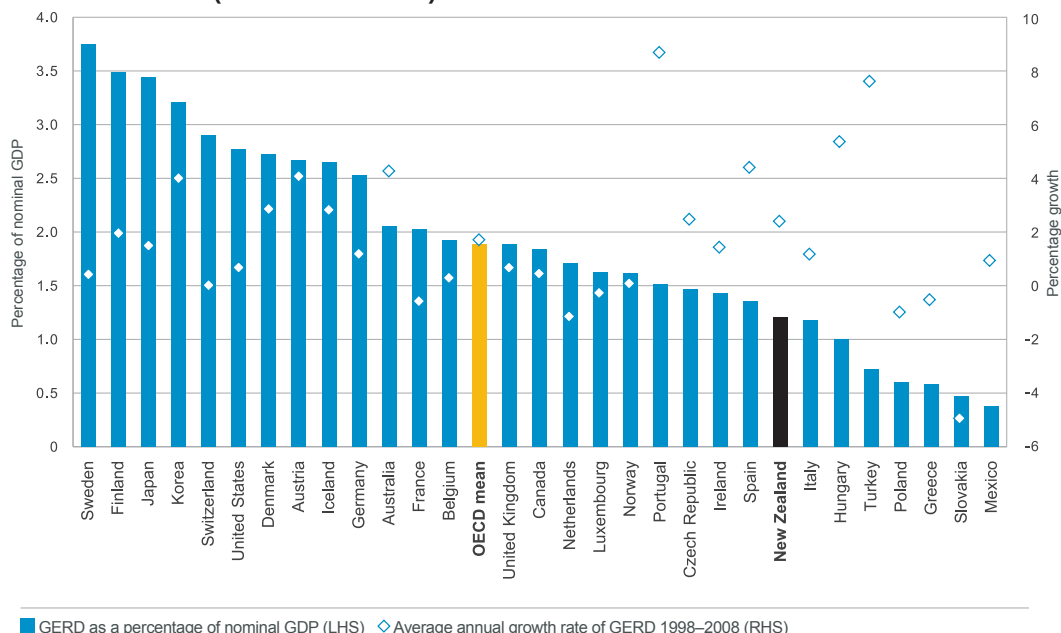
80 New Zealand figures provided by Statistics New Zealand cover all sectors whereas OECD statistics for other countries cover manufacturing and services, notably excluding agriculture, education and health, and social work sectors. This makes little difference to the results. Analysis by Statistics New Zealand has shown the difference to be 0.1 percentage points.

81 See New Zealand Business Demography Statistics from Statistics New Zealand.

Formal Measures of Innovation

New Zealand has a lower level of gross expenditure on R&D (GERD) as a percentage of GDP than the OECD mean (New Zealand is 23rd out of 30 OECD countries). The growth of New Zealand's GERD has been somewhat higher than the OECD mean.

FIG 4.1.1 GERD as a percentage of nominal GDP, 2008; and average annual growth, 1998–2008 (or latest available)⁸²

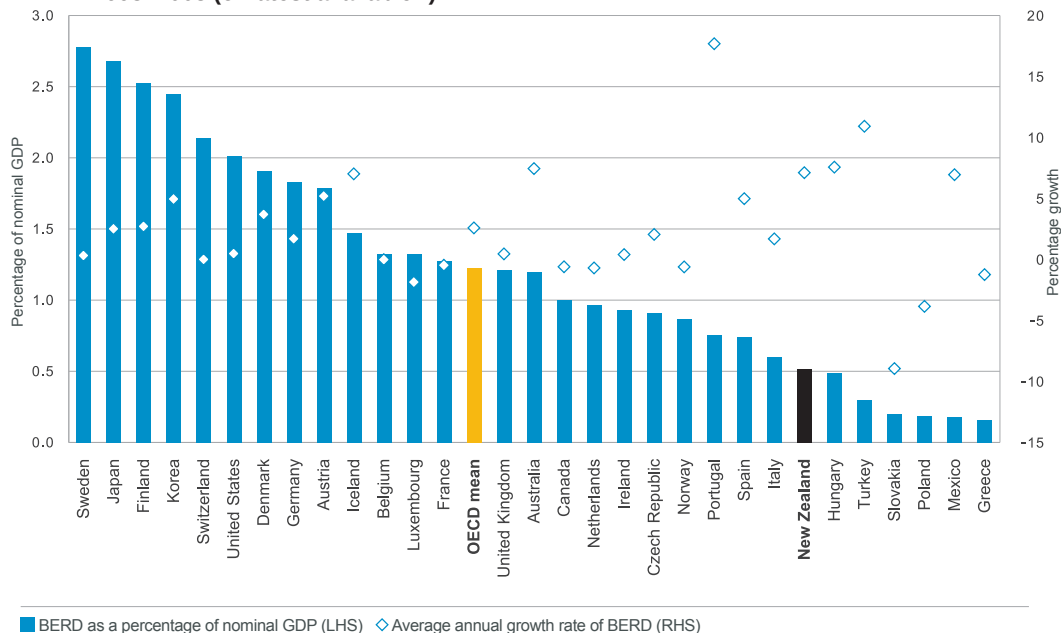


■ GERD as a percentage of nominal GDP (LHS) ◇ Average annual growth rate of GERD 1998–2008 (RHS)

Source: OECD database, Science and Technology Patents, Main science and technology indicators 2009

New Zealand's level of business expenditure on R&D (BERD) as a percentage of GDP is much lower than the OECD mean (New Zealand is 24th out of 30 OECD countries). However, it has been growing faster than the OECD mean.

FIG 4.1.2 BERD as a percentage of nominal GDP, 2008; and average annual growth, 1998–2008 (or latest available)⁸⁴



■ BERD as a percentage of nominal GDP (LHS) ◇ Average annual growth rate of BERD (RHS)

Source: OECD database, Science and Technology Patents, Main science and technology indicators 2009

⁸² The average annual growth rate is calculated as a 10-year compound annual growth rate.

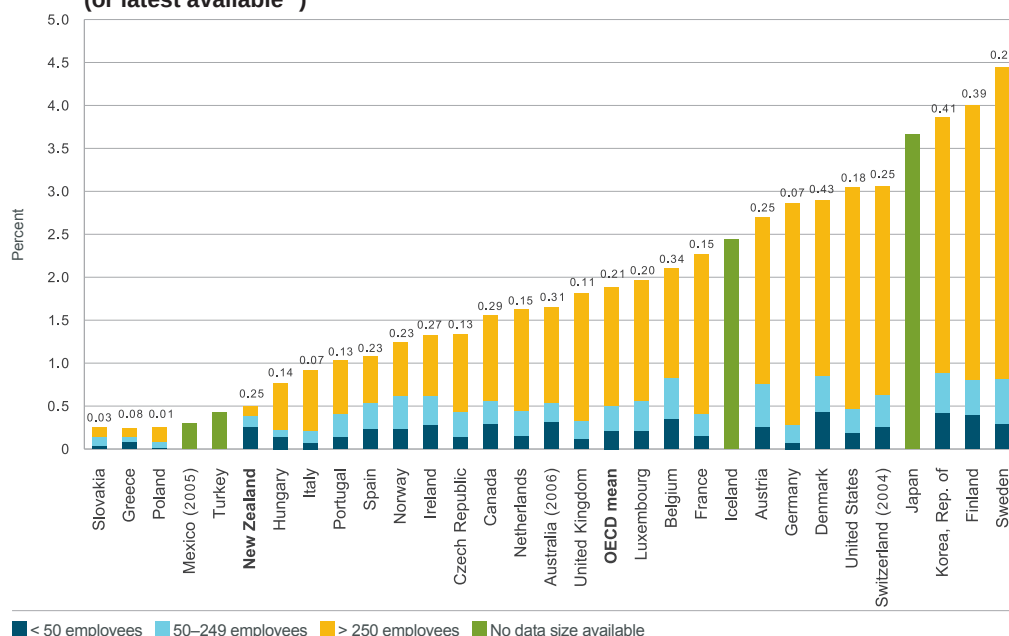
⁸³ Owing to a lack of data, the average annual growth rates for some countries are not for the whole period 1998 to 2008. These are Australia (1998 to 2006 only), Germany (1998 to 2007), Greece (1999 to 2007), Hungary (1998 to 2006), Japan (1998 to 2007), Korea (1998 to 2007), Luxembourg (2000 to 2008), Mexico (1998 to 2007), Netherlands (1998 to 2007), New Zealand (1999 to 2007), Norway (1999 to 2008), Sweden (1999 to 2008), Switzerland (2000 to 2004), and Turkey (1998 to 2007).

⁸⁴ The average annual growth rate is calculated as a 10-year compound annual growth rate.

⁸⁵ Refer to footnote 63.

FIG

4.1.3 BERD by size class of firms as a percentage of total industry value added, 2007 (or latest available⁸⁶)



■ < 50 employees ■ 50–249 employees ■ > 250 employees ■ No data size available

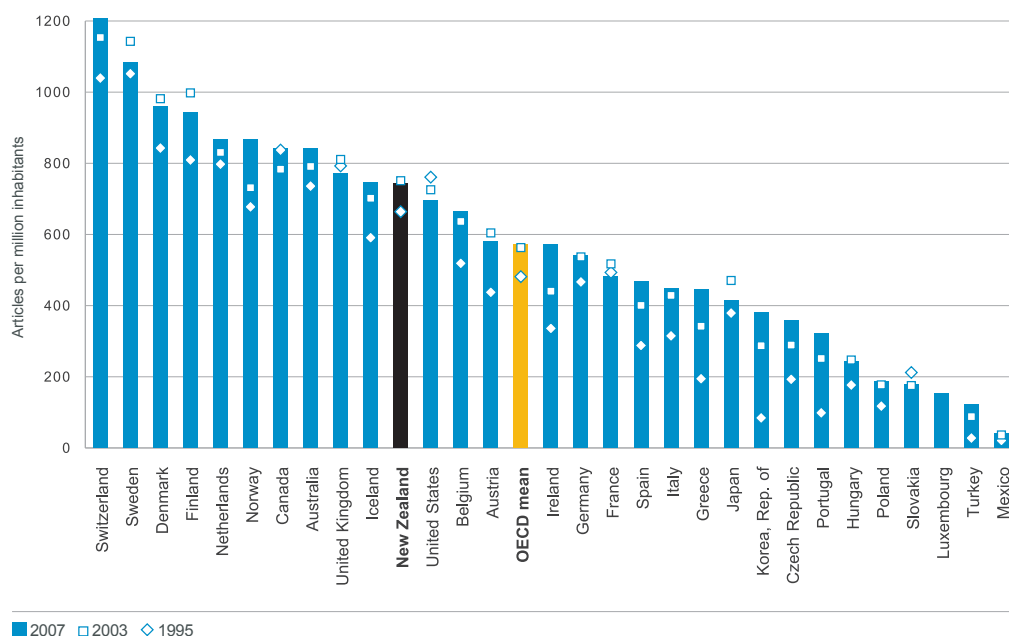
Note: The numbers above the bar reflect values for < 50 employees

Sources: OECD, Measuring Entrepreneurship: A digest of indicators, 2009 edition, Business R&D intensity, by size class of firms; Statistics New Zealand, Research & Development Survey, customised data request; Statistics New Zealand, Infoshare database, national accounts

As a proportion of total industry value added, medium-sized New Zealand firms fund less BERD and large New Zealand firms fund a lot less BERD than the OECD mean. In contrast, New Zealand's small businesses (less than 50 employees) fund a little more. Total industry value added is the sum of value added by small, medium, and large firms.

FIG

4.1.4 Science and engineering articles per million inhabitants, 1995, 2003, and 2007



■ 2007 ■ 2003 ◆ 1995

Sources: US National Science Foundation, Science and Engineering Indicators, S&E articles in all fields, by region/country/economy: 1995–2007; OECD, Main Science and Technology Indicators, December 2009, Annex Table E Population (thousands)

New Zealand publishes more science and engineering articles per million inhabitants than the OECD mean (New Zealand is 11th in the OECD).

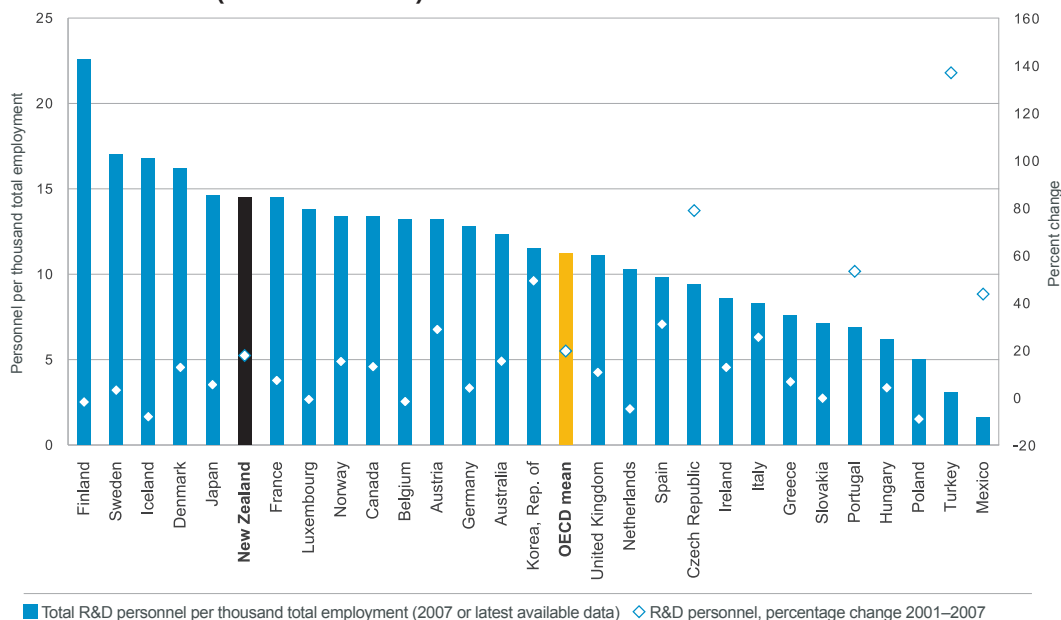
⁸⁶ Statistics New Zealand has calculated these statistics using the same size classes as other countries in the sample; in this definition, SMEs have 10–249 employees; and large firms have >250 employees. Data for New Zealand are for the year 2008. It is from 2006 for Australia and nine other countries, from 2005 for five countries, and from 2004 for Switzerland.

Small firms (fewer than 50 employees): for the United States, 5–49 employees; for Luxembourg, the Netherlands, and Sweden, 10–49 employees. Medium-sized firms (50–249 employees): for Japan, fewer than 299 employees.

No data on size class available for Iceland, Israel, Japan, Mexico, and Turkey.

FIG
4.1.5 Total R&D personnel⁸⁷ per thousand total employment, 2007; and growth, 2001–2007 (or latest available)

The number of full-time equivalent R&D personnel in New Zealand is above the OECD mean (New Zealand is sixth in the OECD). The number of R&D personnel has been growing at a similar rate to the OECD mean, but very quickly for a country with an already high level of R&D personnel.

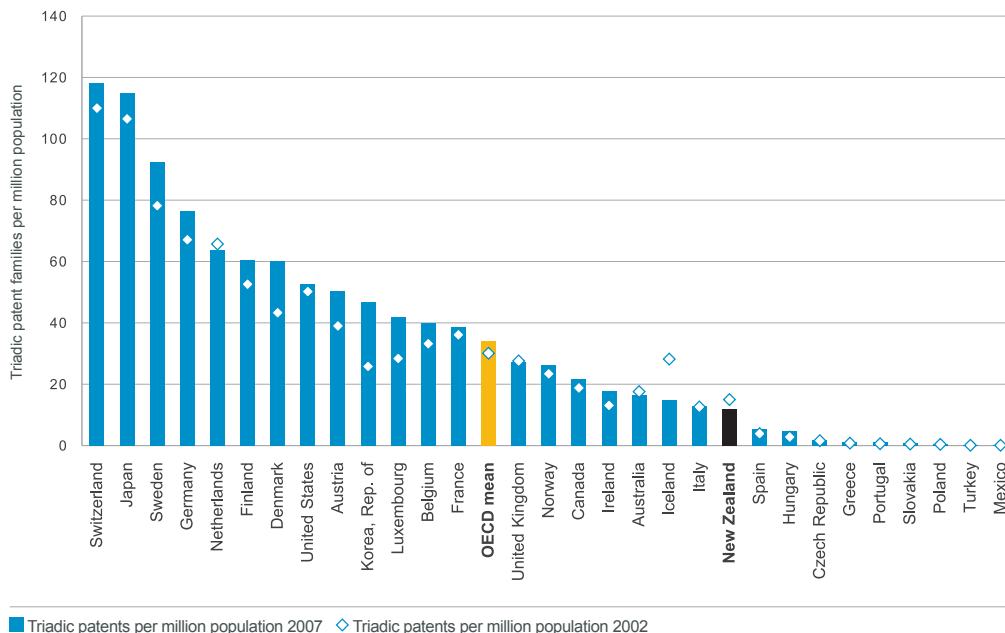


■ Total R&D personnel per thousand total employment (2007 or latest available data) ◆ R&D personnel, percentage change 2001–2007

Source: OECD, Main Science and Technology Indicators, December 2009, Table 10 Total R&D personnel per thousand total employment

FIG
4.1.6 Number of triadic patent families⁸⁸ per million population, 2002 and 2007

New Zealand has a low level of patents per head of population, compared with the OECD mean (21st in the OECD). While New Zealand's ranking did not decrease significantly over the 2002–2007 period, the number of triadic patents per million population in both New Zealand and Australia has fallen, against the dominant OECD trend.



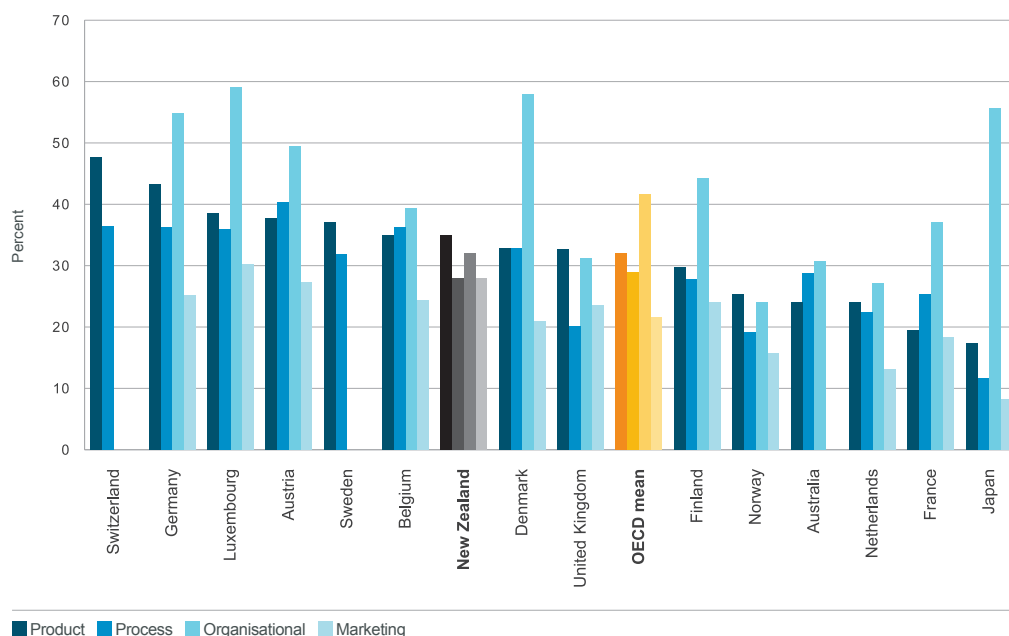
■ Triadic patents per million population 2007 ◆ Triadic patents per million population 2002

Source: OECD, Main Science and Technology Indicators, December 2009, Table 65 Number of triadic patent families (priority year)

⁸⁷ 'R&D personnel' here is defined (Canberra Manual, OECD, and Eurostat, 1995) as all persons employed directly on R&D, as well as those providing related services such as R&D managers, administrators, and clerical staff.

⁸⁸ 'Triadic patent families' are defined by the OECD as a set of patents taken at the European Patent Office (EPO), the Japan Patent Office (JPO), and granted by the US Patent and Trademark Office (USPTO), to protect the same invention.

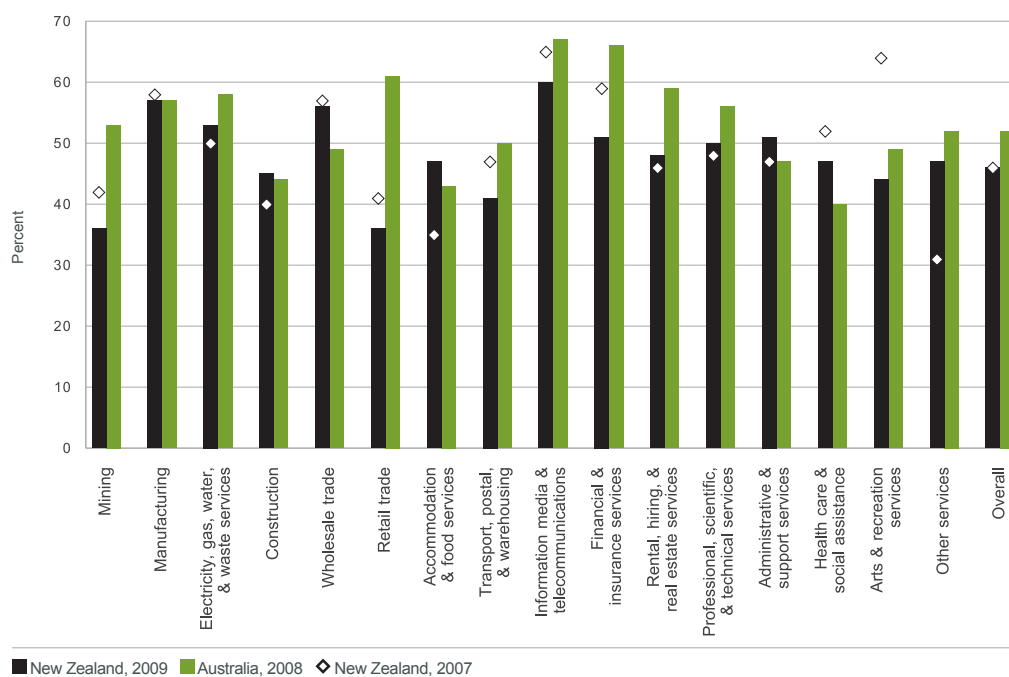
FIG
4.1.7 Rates of innovation activity by type, 2004–2005



Innovative Firms

Compared to other OECD countries, New Zealand has high rates of marketing methods innovation (New Zealand ranks second in the reported OECD countries), and relatively high rates of product innovation (sixth), but somewhat lower rates of process innovation (ninth) and organisational innovation (ninth).

FIG
4.1.8 Percentage of business innovating by industry, 2009 (or latest available)



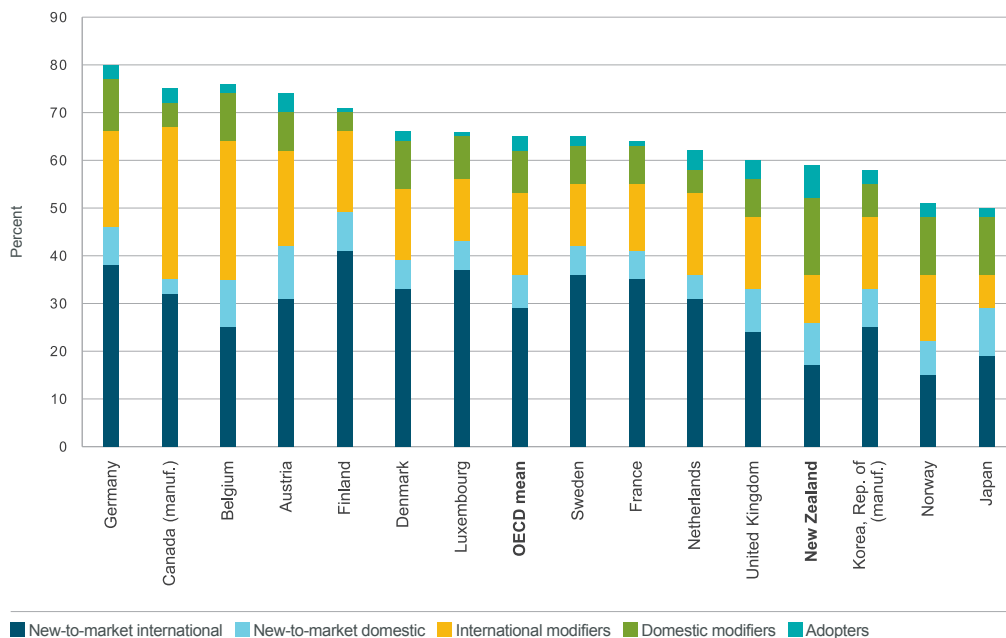
New Zealand industries have proportionally more innovating firms than their corresponding Australian industries in four of the 16 industries (wholesale trade, accommodation and food services, administrative and support services, and healthcare and social services), about the same in two industries (manufacturing and construction), and less in the remaining 10 industries.

Sources: Statistics New Zealand Business Operation Survey Module B,⁸⁹ Innovation activity; Australian Bureau of Statistics, Customised integrated business characteristics data

⁸⁹ New Zealand data collected from Business Operations Survey in 2005, 2007, and 2009 for firms with six or more employees. The most recent Australian data are from 2008, for firms with five or more employees.

FIG
4.1.9 Types of innovation in firms,⁹⁰ weighted by employees, 2002–2004

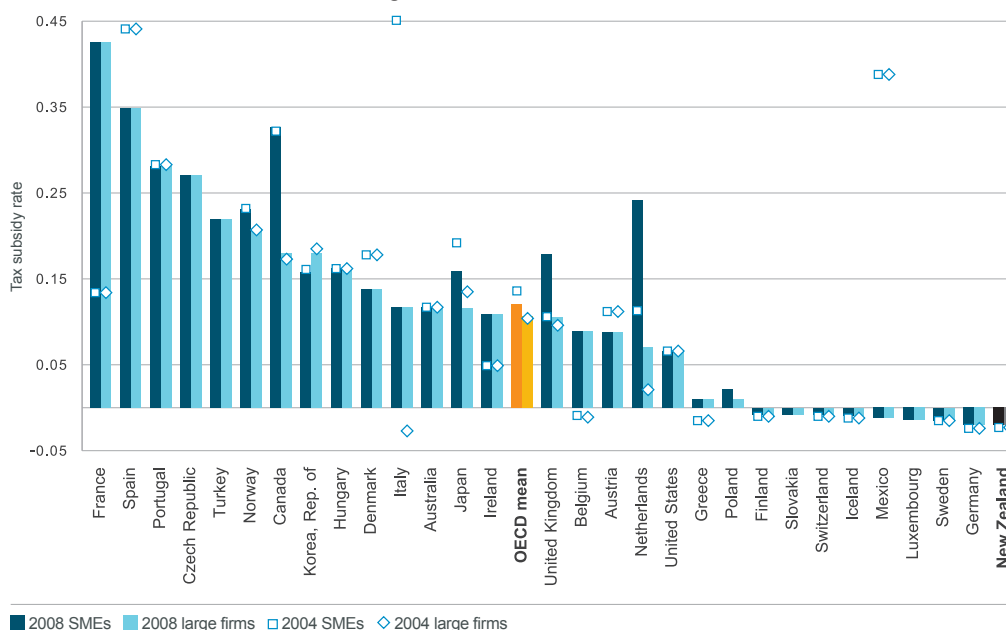
New Zealand businesses innovate for the domestic market at a somewhat greater rate than the OECD mean. However, they innovate less for international markets than businesses in most other OECD countries.⁹¹



Source: OECD Innovation in Firms: A Microeconomic Perspective 2009, Output-based modes, all firms, employment weights

FIG
4.1.10 R&D tax concessions for large firms and SMEs,⁹² 2004 and 2008

New Zealand has the lowest levels of tax concessions⁹³ for BERD in the OECD. In part this reflects that government support for BERD in New Zealand is in the form of grants and subsidies rather than tax concessions (see Figure 4.1.11).



Sources: OECD Science, Technology and Industry Scoreboard 2009, Tax subsidy rate for USD of R&D large firms and SMEs, 2008; OECD Science, Technology and Industry Scoreboard 2005, Rate of tax subsidies for USD of R&D large firms and SMEs, 2004

⁹⁰ The data are based on output-based innovation modes. The definition for output-based modes is provided in OECD (2009). *Innovation in firms: A microeconomic perspective*. Paris: OECD Publishing.

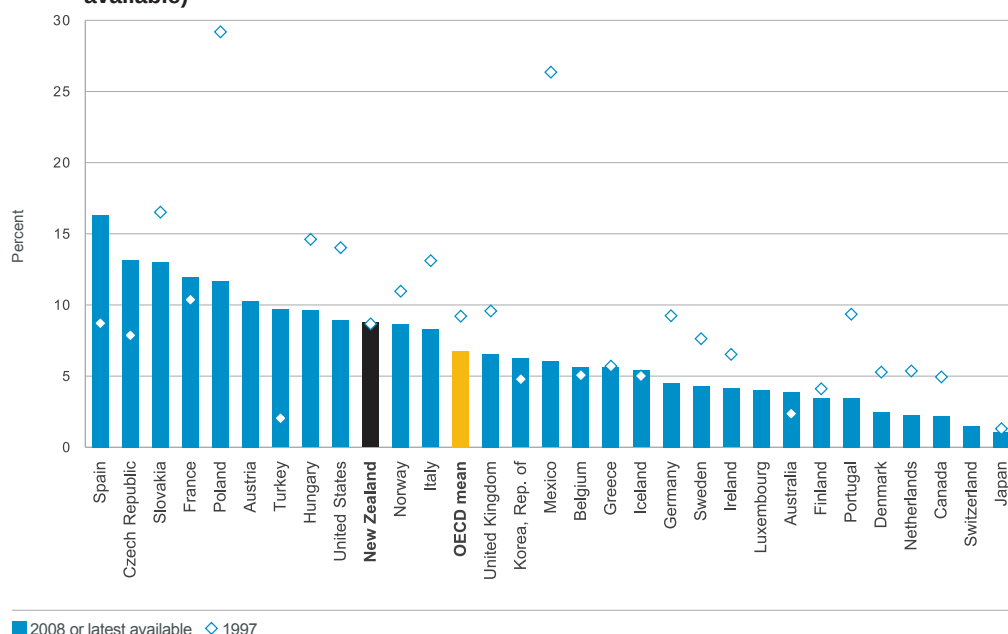
⁹¹ 'New-to-market' implies substantial novelty to a product; 'modifiers' implies some novelty to a product; 'adopters' implies the innovation is adopted from others.

⁹² Large firms have 250+ employees; small to medium-sized enterprises (SME) have 50–249 employees. This definition is from the OECD Science, Technology and Industry Scoreboard.

⁹³ The tax concession is measured as 1 minus the B index. The B index is intended to represent the present value of pre-tax income necessary to cover the initial cost of R&D investment and to pay corporate income tax. So 1 minus the B index represents the proportionate subsidy for R&D expenditure provided by the tax system. The index is calculated using information on the depreciation allowances, tax credits, and other specific allowances in national tax systems.

FIG

4.1.11 Grants and subsidies as a percentage of BERD, 1997 and 2008 (or latest year available)



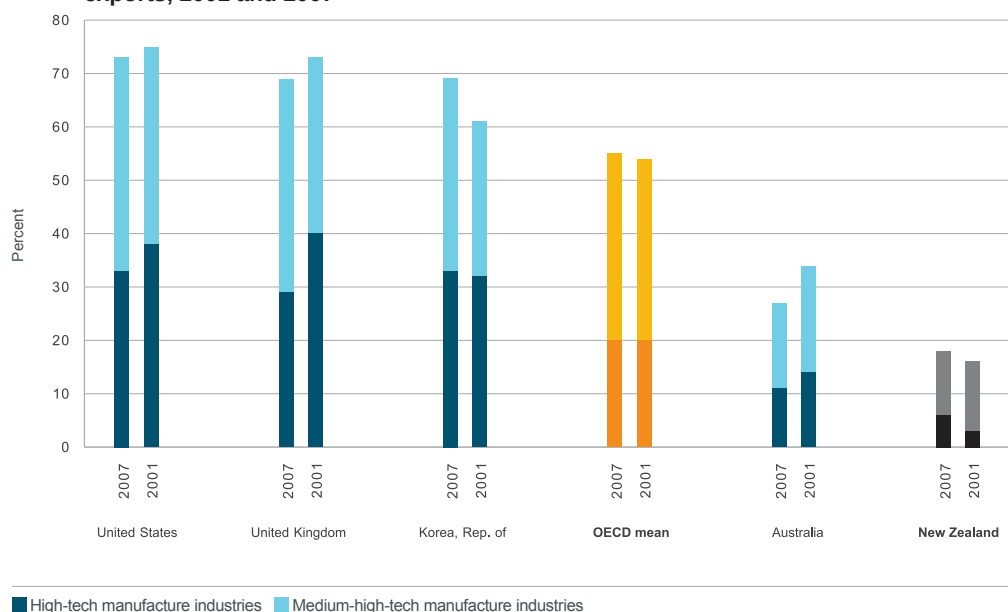
The total of New Zealand government grants and subsidies as a proportion of business R&D is higher than the OECD mean (it is 10th in the OECD). In part, this reflects the low level of R&D tax concessions to business. The level of subsidy will increase as a result of increased funding for BERD as part of the 2010 Budget.

■ 2008 or latest available ◆ 1997

Source: OECD database, Science and Technology Patents, Main science and technology indicators 2009

FIG

4.1.12 Share of products from high and medium-high tech industries in manufacturing exports, 2001 and 2007



New Zealand has the lowest share of products from high and medium-high tech⁹⁴ industries in manufacturing exports compared with other OECD countries. The classifications for 'high', 'medium-high', 'medium-low', and 'low'-tech industries are made according to their aggregate R&D intensities, based on those of 13 countries, not including New Zealand.⁹⁵

■ High-tech manufacture industries ■ Medium-high-tech manufacture industries

Sources: OECD Science, Technology and Industry Scoreboard 2009, Share of high and medium-high-technologies in manufacturing exports, 2007; OECD Science, Technology and Industry Scoreboard 2003, Export shares 2001, Table D.9.2

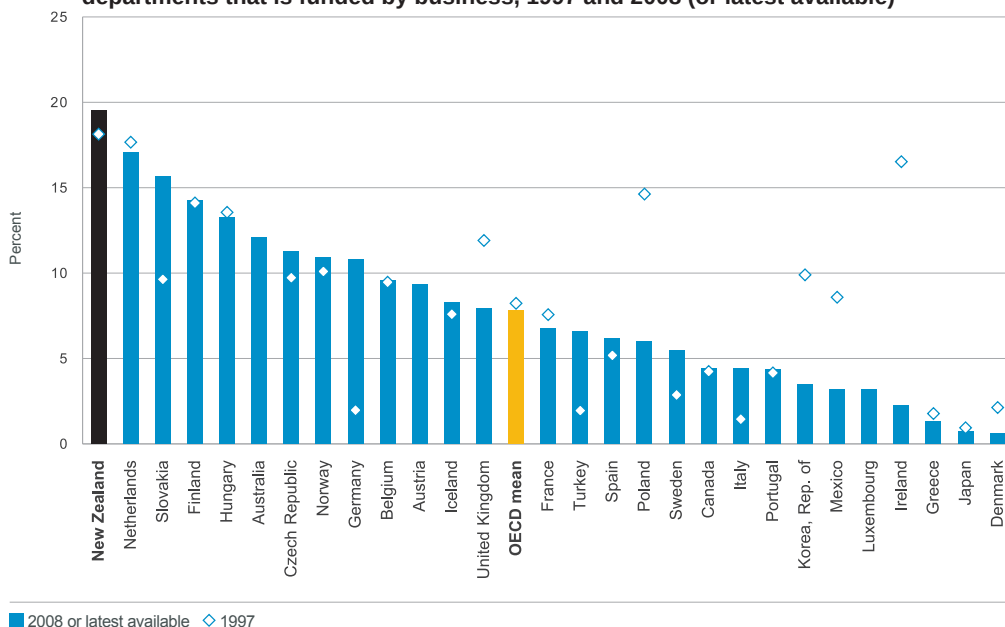
⁹⁴ High-tech industries include: aircraft and spacecraft; pharmaceuticals; office, accounting, and computing machinery; radio, TV, and communications equipment; medical, precision, and optical instruments; electrical machinery and apparatus; motor technology vehicles, trailers and semi-trailers; chemicals excluding pharmaceuticals; railroad equipment and transport equipment; and machinery and equipment.

⁹⁵ Such classifications may therefore not be appropriate for New Zealand. For example, the food and beverage industry is regarded as a low-tech industry, but it has a relatively sophisticated science and technology base underpinning it in New Zealand.

Innovation Linkages

Of R&D carried out by government research organisations and departments, New Zealand has the highest percentage that is funded by business in the OECD.

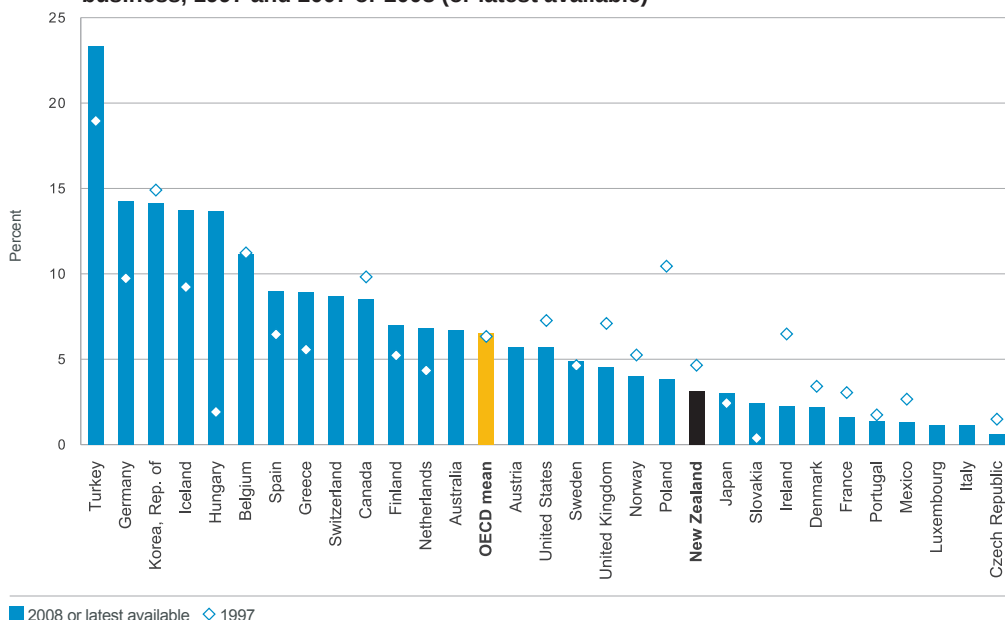
FIG 4.1.13 Percentage of R&D carried out by government research organisations and departments that is funded by business, 1997 and 2008 (or latest available)



Source: OECD database, Science and Technology Patents, Main science and technology indicators

Of R&D performed within New Zealand universities, the percentage that is financed by businesses is low and declining, relative to the OECD mean.

FIG 4.1.14 Percentage of R&D carried out by higher education institutes that is funded by business, 1997 and 2007 or 2008 (or latest available)⁹⁶



Source: OECD database, Science and Technology Patents, Main science and technology indicators

⁹⁶ Data for the Netherlands are for 2003; Greece are for 2005; Australia and Switzerland are for 2006; Canada are for 2009.

⁹⁷ Active enterprises with at least one employee.

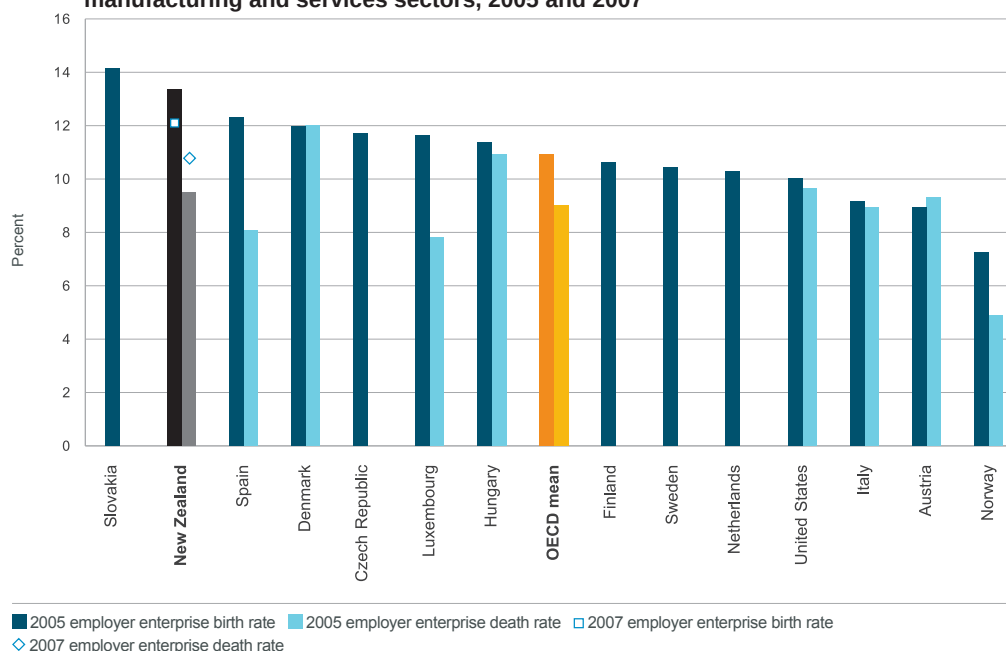
⁹⁸ Data for Sweden and the United States are for the 2006 year.

⁹⁹ The population of employer enterprise births consists of 'new' enterprise births (ie, new enterprises reporting at least one employee in the birth year); and enterprises that existed before the year under consideration but were below the threshold of one employee (and reported one or more employees in the current [ie, birth] year). Symmetrically, an employer enterprise death occurs either as the death of an enterprise or by moving below the threshold of one employee. 'Employer' indicators were found to be more relevant for international comparisons than indicators covering all enterprises, as the latter were sensitive to the coverage of business registers.

Firm Dynamics

FIG

4.1.15 Firm births and deaths as a percentage of the population of active firms⁹⁷ for manufacturing and services sectors, 2005 and 2007⁹⁸

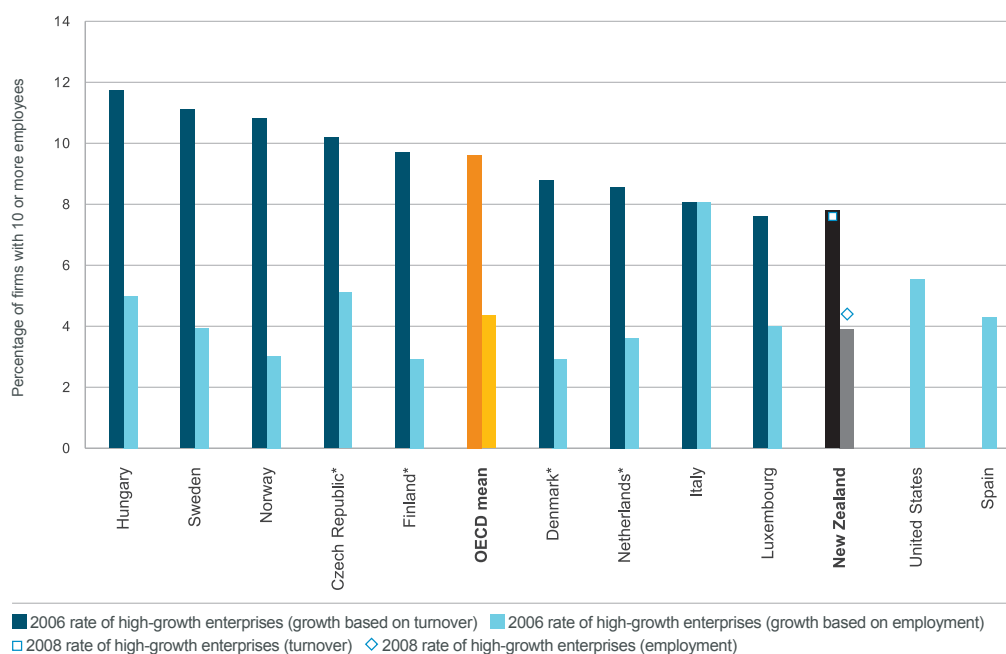


Source: OECD database, Industry and Services, SDBS business demography indicators

New Zealand is at the top end of the range for firm births⁹⁹ from available OECD statistics.

FIG

4.1.16 Rate of high-growth¹⁰⁰ firms by turnover¹⁰¹ and employment, 2006 and 2008¹⁰²



Sources: OECD database, Industry and Services, SDBS business demography indicators; Statistics New Zealand, customised data request

* = 2005

The number of New Zealand high-growth firms (with growth measured by turnover) as a percentage of all firms is at the bottom end of the range of available OECD countries, and has been falling from 2004 to 2009.¹⁰³ The number of New Zealand high-growth firms by employment as a percentage of all firms is mid-range among these countries.

100 The number of firms with an annualised growth rate over 20 percent per annum (measured using growth in turnover or employment) is calculated over a three-year period for firms with 10 or more employees at the beginning of the growth period. The rate is measured as a percentage of all firms that had 10 or more employees at the beginning of the three-year growth period.

101 New Zealand high-growth enterprise statistics based on turnover for 2008 have not been supplied to the OECD. These data have been produced by Statistics New Zealand based on GST data. Caution is needed with these statistics as an attempt is made to remove GST capital spikes from the GST data but any capital component remaining in the GST sales data has the potential to bias the high-growth statistics upwards. Given the lack of a fully robust data source on turnover for all enterprises, Statistics New Zealand has no plans to supply the OECD with high-growth turnover statistics using GST data.

102 New Zealand data cover all sectors. Refer footnote 80.

103 Statistics New Zealand calculation. Refer footnote 100.

4.2 – Investment, Saving, and Financial Market Development

Key Points

- New Zealand's gross fixed capital formation as a percentage of nominal GDP is around the OECD mean.
- Business fixed investment as a percentage of nominal GDP was mostly static from the 1990s through to the global financial crisis in 2008/09.
- Machinery and equipment investment as a percentage of nominal GDP has been slightly above the OECD mean since 2001.
- Housing investment as a percentage of nominal GDP increased during the early 1990s through to the global financial crisis. It has been above the OECD mean since 2002, but below the level in Australia.
- Government investment spending as a percentage of nominal GDP has increased over the past decade.
- Private saving is negative and national saving rates are low. Both have been falling more quickly in New Zealand than in comparator economies from the 2000s until at least the recent global financial crisis. As a result, overseas funds have been needed to supplement domestic saving in financing domestic investment.
- New Zealand's venture capital and sharemarkets are small compared with those found in similar-sized OECD economies. The banking sector, which can partly substitute for weak equity markets, is large and has been growing since the 1990s.

Introduction

Economic growth, as measured by GDP per capita, is generated by high growth rates of labour utilisation and/or labour productivity. Saving and investment – supported by an effective financial system that ensures the efficient allocation of resources to investment projects at a reasonable cost – are important factors that underpin labour productivity growth. This section examines the operation of these factors in New Zealand relative to other OECD economies, and the role they have played in New Zealand's economic growth performance.

Investment

FIG 4.2.1 TO FIG 4.2.4

Physical capital accumulation plays an important role in labour productivity growth. Investment in machinery, equipment, and infrastructure increases the amount and quality of capital available for workers to use in the production process. This investment in turn raises the capital-labour ratio and increases labour productivity. Investment in new capital is also one way of incorporating new technology into the production process.

However, investment can add to prosperity only if it earns sufficient returns to cover its costs. This implies a need for continued attention to factors that may influence the cost of, and returns to, investment, as well as the quality of investment. Well-functioning markets are critical to guiding private investment to the highest returning investment opportunities. For example, improving the regulatory environment is likely to encourage innovation across the economy, leading to higher MPF, which in turn raises returns on investment.

In New Zealand, gross fixed capital formation as a percentage of GDP is around the OECD mean. Investment in machinery and equipment as a percentage of nominal GDP has been slightly above the OECD mean since 2001 and above Australia for most of the period since 1970.

However, the stock of physical capital per worker appears to be low in New Zealand compared with a number of OECD countries. The small size of New Zealand's physical capital stock has been identified as a potential factor contributing to New Zealand's low productivity relative to other OECD countries.¹⁰⁴

New Zealand firms face a somewhat higher cost of capital than their counterparts in other OECD countries, which could be contributing to lower capital intensity than would otherwise be expected by the economy's level of MFP. Moreover, New Zealand's low GDP per worker means that investment per worker is lower than in countries with higher GDP per worker.¹⁰⁵

Business fixed investment as a percentage of GDP has been mostly static since the 1990s. Business fixed investment is important because it is associated with higher firm productivity and profitability.¹⁰⁶

As a percentage of GDP, New Zealand's gross housing investment has increased since 1991, and has been above the OECD mean since 2002.

New Zealand's government investment as a percentage of GDP has increased over the past decade. Appropriate government investment can be important for productivity growth because it can contribute to the economy's infrastructure (supporting private investment), and can support the development of a healthy and educated population.

¹⁰⁴ Dupuy, M., & Beard, J. (2008). *Investment, productivity and the cost of capital: Understanding New Zealand's 'capital shallowness'*. New Zealand Treasury Productivity Paper 08/03. Wellington: The Treasury. See <http://www.treasury.govt.nz/publications/research-policy/tprp/08-03>

¹⁰⁵ *ibid.*

¹⁰⁶ Fabling, R., & Grimes, A. (2006). *Practice makes profit: Business practices and firm success*. Ministry of Economic Development Occasional Paper 06/01. Wellington: Ministry of Economic Development. See <http://www.med.govt.nz/upload/40561/med-op-06-01.pdf>

Saving

FIG 4.2.5 AND FIG 4.2.6

New Zealand's net national saving (government, business, and household saving minus depreciation of fixed capital and excluding capital gains) as a percentage of GDP is positive, but lies below that of Australia, the United Kingdom, and Denmark, as well as falling short of the OECD median.

Net private saving (business and households) as a percentage of GDP¹⁰⁷ has been negative since 2005, indicating that New Zealanders have been 'dis-saving' (ie, overall, New Zealand households and firms have been consuming more than their income, excluding capital gains). However, measures of saving that include capital gains indicate household wealth was still increasing until the onset of the global financial crisis in 2008/09.¹⁰⁸

Until the recent global financial crisis, this private dis-saving had been offset to some extent by higher government saving. However, since then, government saving has dropped sharply and the decline in private saving has reversed. (See Section 5.4: Macroeconomic Foundations for more information.)

Financial Market Development

FIG 4.2.7 TO FIG 4.2.12

In an open economy such as New Zealand's, capital is relatively mobile. If total domestic investment exceeds the amount of domestic saving – which it does in New Zealand – then the balance comes from drawing on the savings of foreigners.

However, domestic and foreign savings are not perfect substitutes,¹⁰⁹ and factors such as distance, language differences, and regulatory differences can affect the type and amount

of capital flow from overseas. In particular, small and start-up companies, and companies with limited collateral (such as those whose competitive strength is based on R&D and innovation), can be disadvantaged if there is a less-developed domestic capital market.

Businesses can access investment capital from a number of external sources: banks; the sharemarket; private equity; the venture capital market; or informal capital markets (ie, borrowing from friends and family or from angel investors). Improving financial development in all these markets can stimulate economic growth.

The Milken Institute's¹¹⁰ Capital Access Index evaluates the ability of new and existing businesses to access capital in countries around the world. In 2009, despite the global contraction in business credit markets, New Zealand ranked 15th amongst OECD countries in the index (behind the United Kingdom, United States, Australia, and Korea).

Sharemarket development can be approximated by the level and growth of market capitalisation as a percentage of GDP. New Zealand's sharemarket capitalisation is low compared to similar countries, and is not growing.

The size of the venture capital market – a relatively small but important source of finance for smaller companies – as a percentage of GDP in New Zealand sits at the lower end of the OECD range.

Good availability of bank credit and informal capital can partly, but not completely, compensate for underdeveloped equity markets. The size of the banking sector relative to the sharemarket suggests that bank credit

107 Net private savings as a percentage of GDP has been substituted for household net saving as a percentage of disposable income measure used in the 2007 Economic Indicators Report, due to measurement problems with the household saving series. Just before this text was finalised, Statistics New Zealand released a fuller set of institutional accounts. This will improve the quality of measures of household, business, and government saving. See Statistics New Zealand (2010). *Institutional sector accounts*. Wellington: Author. See http://www.stats.govt.nz/browse_for_stats/economic_indicators/nationalaccounts/institutionalsectoraccounts_hotp99-08.aspx

108 Scobie, G, & Henderson, K (2009). *Saving rates of New Zealanders: A net wealth approach*. New Zealand Treasury Working Paper 09/04. Wellington: The Treasury.

109 Cameron, L, Chapple, B, Davis, N, Kousis, A, & Lewis, G (2007). *New Zealand financial markets, savings and investment*. New Zealand Treasury Policy Perspectives Paper 07/01. Wellington: The Treasury.

110 The Milken Institute is a non-profit, independent economic think tank based in Santa Monica, California. See www.milkeninstitute.org

is an important source of external finance for firms in New Zealand.¹¹¹ In 2008 and 2009, business credit growth declined sharply in New Zealand and across comparator countries due to the global financial crisis. This decline now appears to have stabilised, but it is too early to say whether this trend will continue. Banking sector assets grew relative to GDP from the 1990s until the global financial crisis, and in 2009 were smaller than Denmark, about the same as Australia, and greater than the United States.

Informal investment also appears to be an important source of funds for new firms in New Zealand. Data from 2004 indicated that, although measurement is uncertain, the informal investment market is larger in New Zealand as a proportion of GDP than in comparator economies. Unlike New Zealand, many high-growth OECD economies tend not to rely on informal investment.¹¹²

Overall, the presence of a strong banking sector and informal sources of capital benefits New Zealand's performance. However, sources of capital that are important in well-performing OECD countries, like the share market¹¹³ and venture capital, are underdeveloped in New Zealand by OECD standards.¹¹⁴

111 Stevens, P (2008). *Just good friends? Relationship banking and access to finance in New Zealand firms*. Presentation to New Zealand Association of Economists Annual Conference, Wellington.

112 Minniti, M, Bygrave, W, & Autio, E (2005). *Global entrepreneurship monitor – 2005 executive report*. London: London Business School.

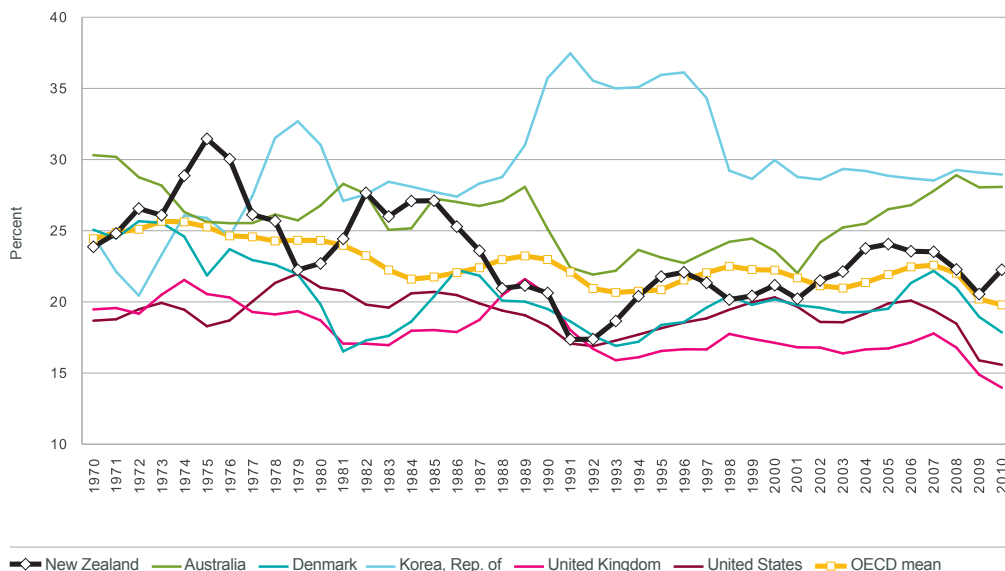
113 Cameron, L (2007). *Investor protection and the New Zealand stock market*. New Zealand Treasury Policy Perspectives Paper 07/02. Wellington: The Treasury.

114 The Government established the industry-led Capital Market Development Taskforce in July 2008 to develop a blueprint for New Zealand's capital markets. It reported to the Government on 16 December 2009.

Investment

The level of New Zealand's gross fixed capital formation as a percentage of GDP is around the OECD mean, although substantially less than Australia and Korea. Gross fixed capital formation is the annual investment in products and structures that are expected to be used in production for several years.

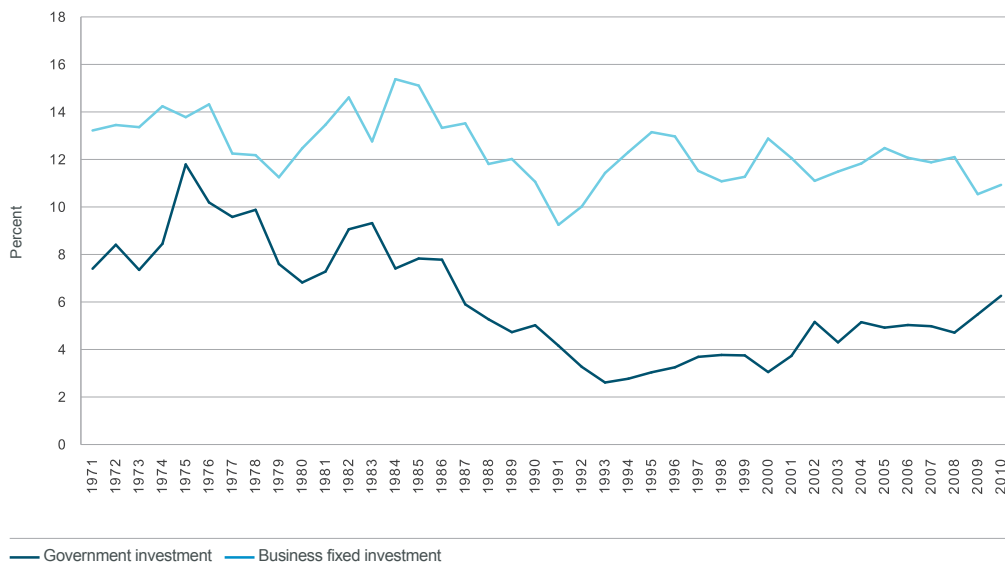
FIG 4.2.1 Gross fixed capital formation as a percentage of nominal GDP



Source: OECD database, Economic Projections, Economic Outlook No. 86. Annual projections for OECD countries

FIG 4.2.2 Gross fixed capital formation by sector as a percentage of nominal GDP

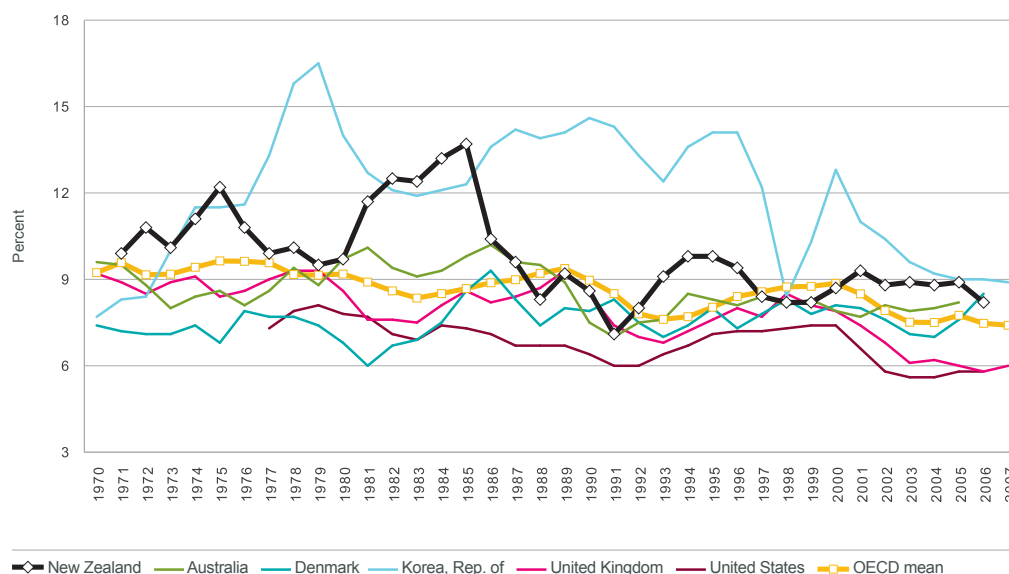
Business fixed investment (private, non-residential gross fixed capital formation) as a percentage of nominal GDP has been mostly static since the 1990s, after declining in the mid-1980s. Government fixed investment as a percentage of nominal GDP was high in New Zealand through to the mid-1980s. It declined through to the early 1990s before rising again.



Source: OECD database, Economic Projections, Economic Outlook No. 86. Annual projections for OECD countries

FIG

4.2.3 Machinery and equipment investment as a percentage of nominal GDP

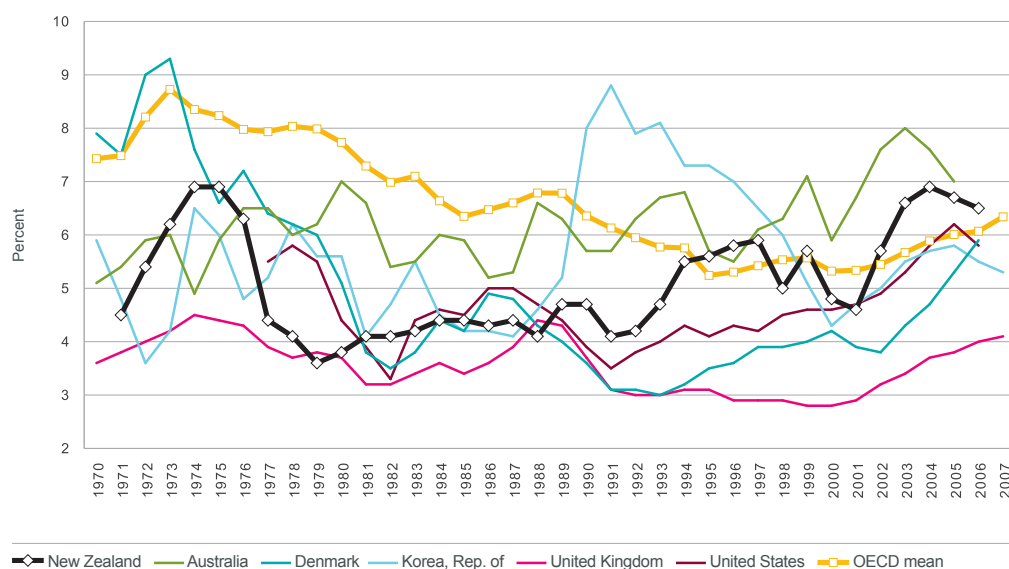


New Zealand's investment in machinery and equipment has been slightly above the OECD mean since 2001. Machinery and equipment investment adds to the physical capital stock. It often embodies new technology and contributes to labour productivity.

Source: OECD Factbook 2009, Gross fixed capital formation in machinery and equipment (data in this figure is not available in the OECD Factbook 2010)

FIG

4.2.4 Housing investment as a percentage of nominal GDP



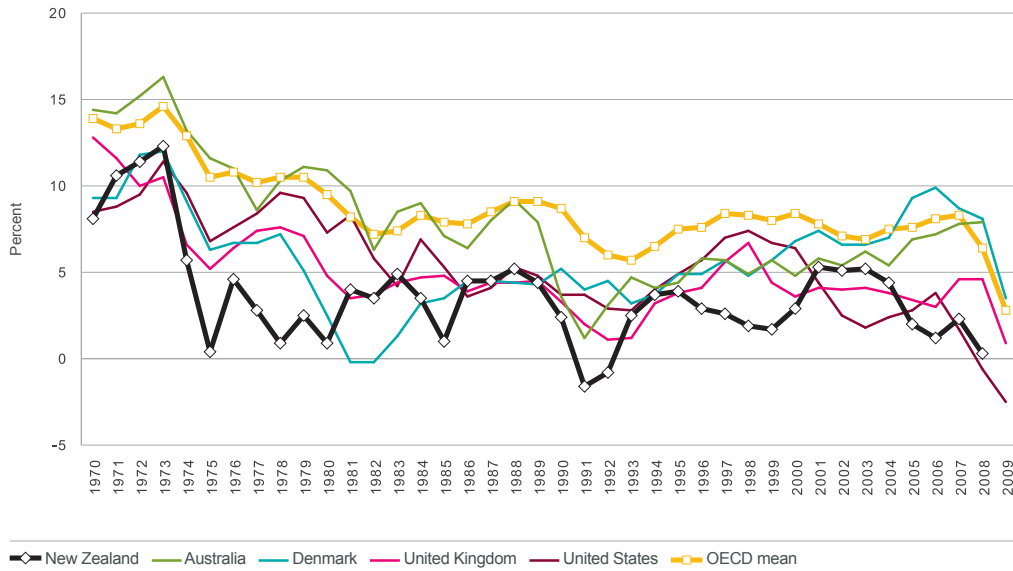
Housing investment as a percentage of nominal GDP in New Zealand increased during the mid-1990s, but has fallen since 2004 as the housing market has cooled. Since 2002 it has been above the OECD mean, but remains less than the level in Australia.

Source: OECD Factbook 2009, Gross fixed capital formation in housing (data in this figure is not available from the OECD Factbook 2010)

Saving

Over the past 40 years New Zealand's net national saving (gross national saving minus depreciation of fixed capital) as a percentage of GDP has been at the bottom end of all of the comparator countries and the OECD mean. It has fallen since 2003. Korea's net national saving has fluctuated between 15 percent and 30 percent of its GDP, substantially above other comparator countries and the OECD mean.¹¹⁶

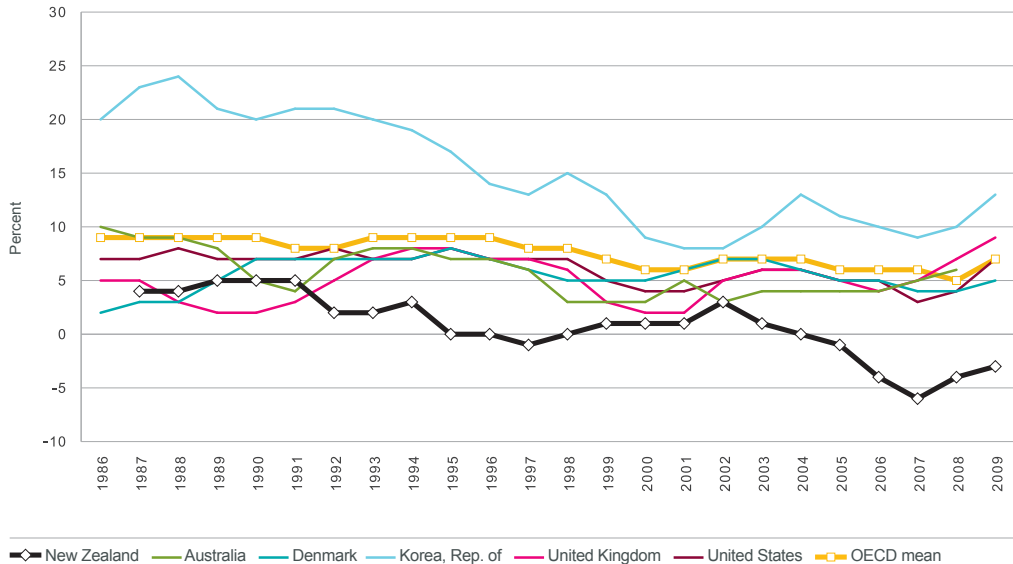
FIG 4.2.5 Net national saving as a percentage of nominal GDP¹¹⁵



Sources: OECD database, National Accounts, Disposable income and net lending – net borrowing; *ibid*, Gross domestic product

FIG 4.2.6 Net private saving as a percentage of nominal GDP¹¹⁷

Net private saving (business and households) as a percentage of nominal GDP has been consistently at the bottom end of all the comparator countries since 1991, and has been negative since the mid-2000s. Since 2005, New Zealand households and businesses have been 'dis-saving' (ie, they have been consuming more than their total income). This measure excludes capital gains.¹¹⁸



Sources: Statistics New Zealand, Infoshare database, National Accounts; *ibid*, National accounts hot off the press, General government sector accounts; OECD database, National Accounts, Disposable income and net lending – net borrowing; *ibid*, National accounts at a glance – 2009 edition; *ibid*, Economic Outlook No. 86 – December 2009

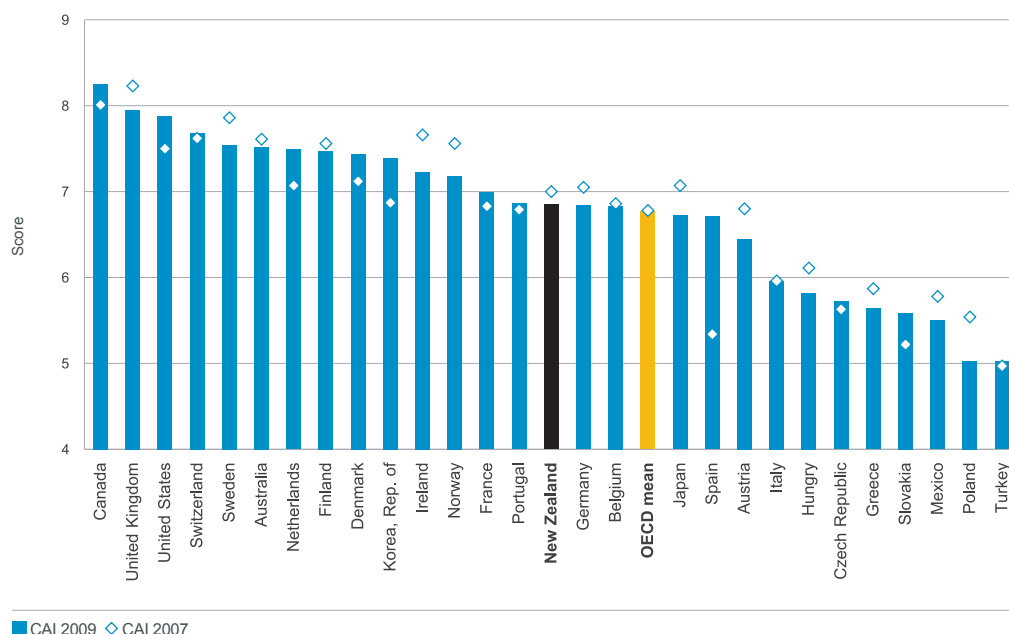
¹¹⁵ Percentages calculated from national currencies and current prices.

¹¹⁶ For this reason, Korea has been omitted from this figure in order to allow the differences between New Zealand and other comparator countries to be displayed more clearly.

¹¹⁷ Percentages calculated from national currencies and current prices. New Zealand data are sourced from Statistics New Zealand's national accounts and differ from the data in the OECD Economic Outlook.

¹¹⁸ Just before this text was finalised, Statistics New Zealand released a complete set of institutional accounts. This will improve the quality of measures of household, business, and government saving.

FIG
4.2.7 Capital Access Index, 2007 and 2009



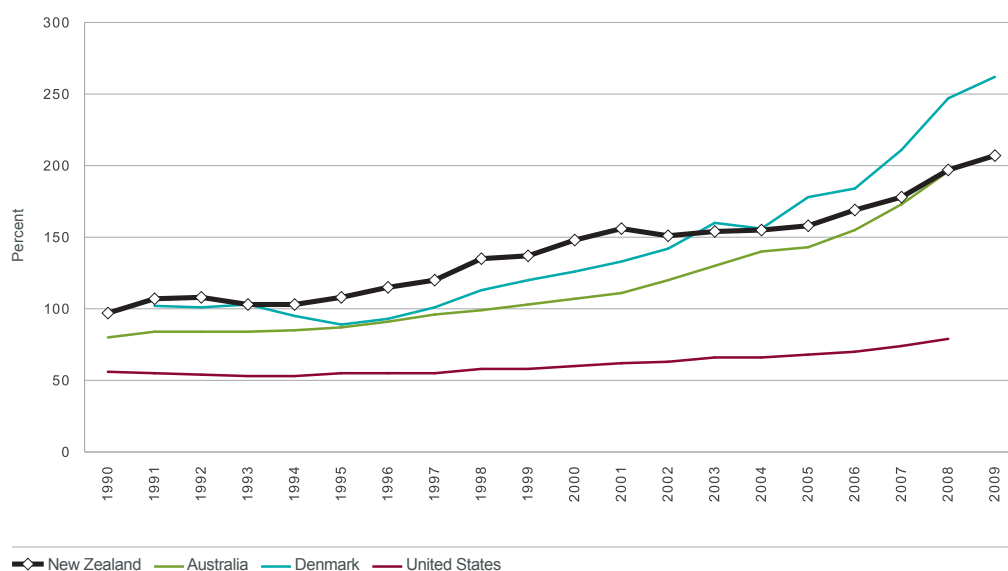
■ CAI 2009 ◆ CAI 2007

Source: Milken Institute, Capital Studies, 2009 Capital Access Index, Table 3 Capital Access Index scores and country rankings 2007–2009

Financial Market Development

The Milken Institute's Capital Access Index (CAI) evaluates the ability of new and existing businesses to access capital in countries around the world, with a higher index indicating capital is easier to access. It incorporates 56 quantitative and qualitative variables from multiple data sources. New Zealand ranks 15th out of the 28 OECD countries surveyed.

FIG
4.2.8 Size of banking sector (measured by bank assets) as a percentage of nominal GDP



◆ New Zealand — Australia — Denmark — United States

Sources: Statistics New Zealand, Infoshare database; Reserve Bank of New Zealand, Bank disclosure information; Statistics Denmark, National Accounts; Statistics Denmark, Money and Capital Market; US Federal Reserve Board, Economic research and data; US Census Bureau, Statistical Abstract, Income expenditure, poverty & wealth; Reserve Bank of Australia, Assets and Liabilities; Australian Bureau of Statistics, 5206.0 National Accounts: National income, expenditure and product

Like the other OECD countries shown, banking sector assets in New Zealand grew relative to GDP from the 1990s until 2009 (2008 for the United States). In 2008, New Zealand's percentage of banking sector assets to GDP was greater than that of the United States, and in 2009 it was at the same level found in Australia, but less than in Denmark.

FIG
4.2.9 Business credit growth

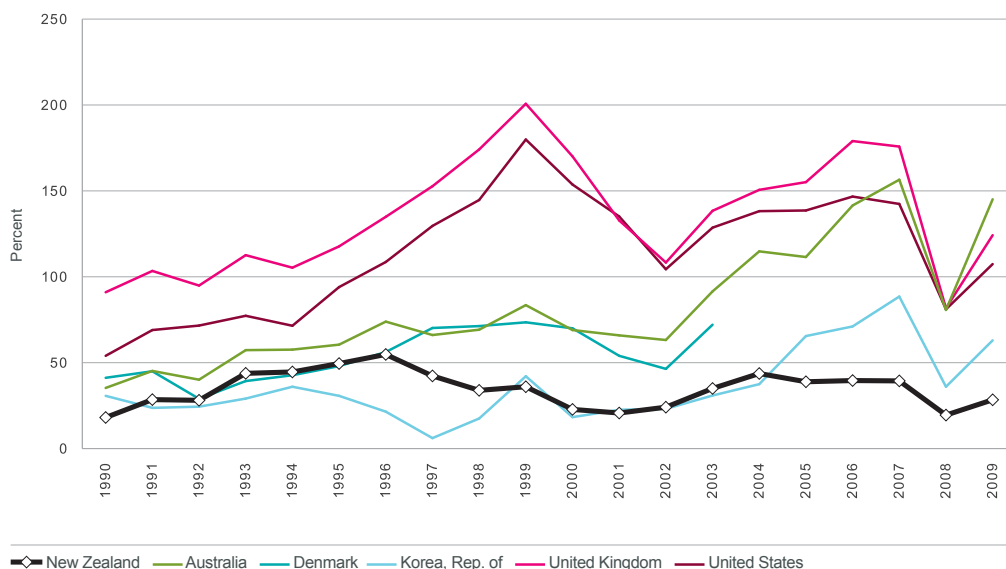
Business credit growth (measured as an annual percentage) increased to high rates in New Zealand from 2004 to 2007, before falling sharply in 2008 and 2009 both here and overseas due to the global financial crisis. Negative credit growth rates appear to have bottomed out in 2010 at between -5 and -10 percent in New Zealand, Australia, and the United States.¹¹⁹



Source: Reserve Bank of New Zealand, customised data request

FIG
4.2.10 Size of sharemarket as a percentage of nominal GDP (PPPs, US\$)

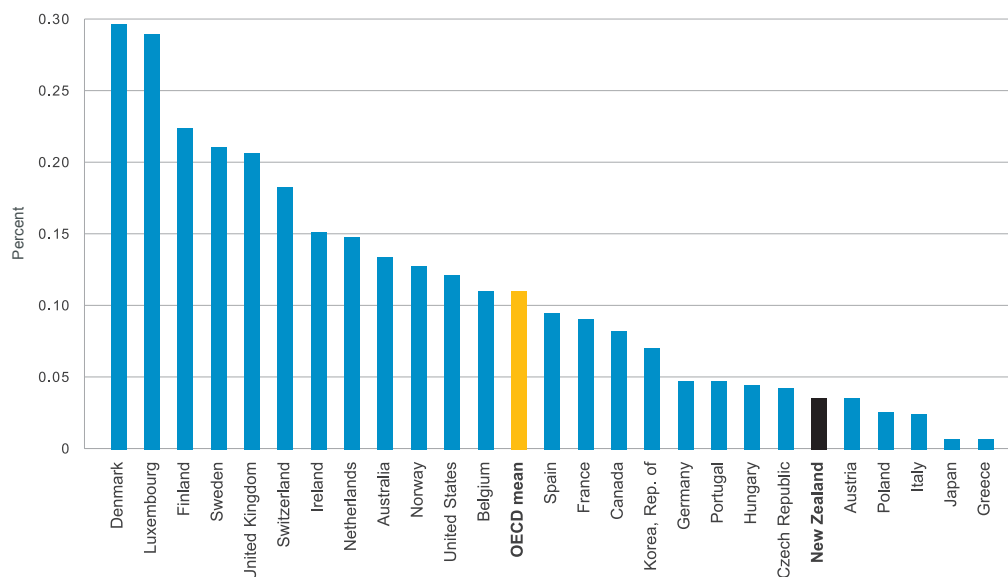
New Zealand's domestic share market capitalisation, measured by market capitalisation as a percentage of GDP, is smaller than that found in comparator countries. In contrast to the generally upwards trend in comparator countries prior to the global financial crisis, New Zealand's sharemarket is also not growing.



Source: OECD database, National Accounts, Gross domestic product; World Federation of Stock Exchanges, Market Capitalization

119 The data for the United States are quarterly, which makes the series smoother. The other series are monthly.

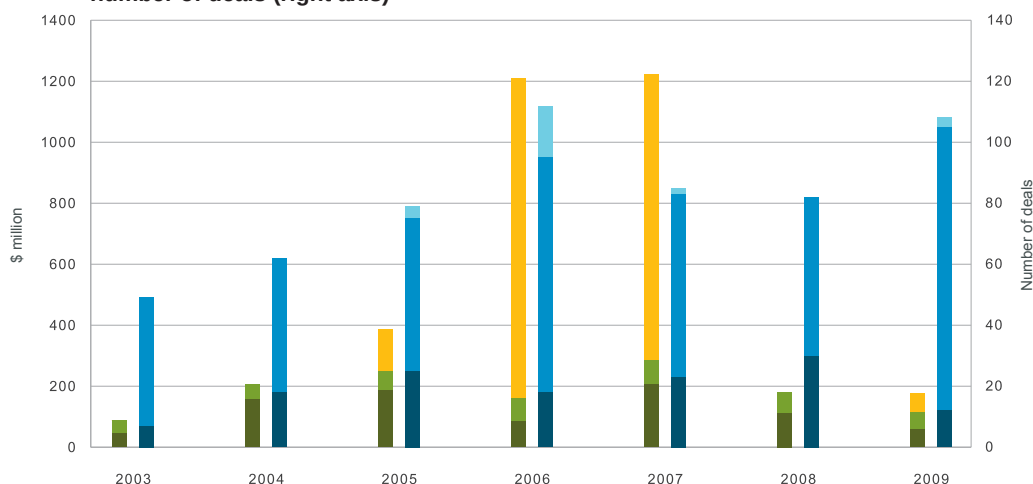
FIG
4.2.11 Investment in venture capital as a share of nominal GDP, 2008¹²⁰



Source: OECD Science, Technology and Industry Scoreboard 2009, Venture capital investment 2008

Venture capital is a relatively small proportion of the economy in most OECD countries, but the size of New Zealand's venture capital market industry relative to GDP is much smaller than most other OECD countries.

FIG
4.2.12 New Zealand private equity and venture capital, 2003–2009 in \$ million (left axis) and number of deals (right axis)



Value of deals:

Mid-market PE Venture capital Top-end/LBO PE

Number of deals:

Mid-market PE deals Venture capital deals Top-end/LBO PE deals

Source: New Zealand Private Equity and Venture Capital Association (NZVCA), NZ Venture Capital Monitor Results 2009 full year results, Activity summary

The combined value of New Zealand private equity (PE) and venture capital (VC) was almost the same in 2009 as in 2008, but with a different mix of VC, mid-market PE, and top-end PE. There was a significant increase in the number of venture capital and top-end PE deals in 2009. The number of deals in each category has fluctuated from year to year.¹²¹

¹²⁰ Data for Japan are for 2006.

¹²¹ Data have been obtained from the New Zealand Private Equity and Venture Capital Survey, which is based on responses from 19 participants in the New Zealand market.

4.3 – International Linkages

Key Points

- International linkages are important for productivity and economic performance. Such linkages support knowledge flows from overseas, help foster business relationships, provide markets for exports and knowledge about these markets, and support the import of technology embodied in new equipment.
- In line with the average OECD country, New Zealand's share in world exports has declined over the last 15 years. As a percentage of GDP, New Zealand's share of exports plus imports has also declined and is among the lowest of similar-sized economies.
- High levels of inward and outward FDI are important for small, open economies like New Zealand's. The stock of New Zealand's inward FDI is high by OECD standards, with 'greenfield' investment about average. Outward FDI is among the lowest in the OECD as a percentage of GDP.
- Flows of people (and their knowledge) also contribute to economic growth in New Zealand. New Zealand's net immigration has been high relative to the other OECD countries, with a significant number of immigrants educated to tertiary level.
- International students are a source of current export earnings, a potential source of future skilled migrants for New Zealand, and an important way of developing international networks. The number of foreign fee-paying students in the university sector has diminished in recent years to around 30,000.

Introduction

The depth of New Zealand's international linkages is a key influence on economic performance. International linkages can impact on productivity by improving knowledge flows, such as knowledge about new market opportunities, new ways of doing things, and new technologies. Trade in particular allows the import of new knowledge and technology embodied in goods and services. International linkages also impact by allowing the exploitation of scale economies, increased domestic competition, and improved resource allocation. Several forms of international linkage are discussed below. Cross-border R&D, discussed in Section 4.1 above, is also important.

Trade and Foreign Investment

FIG 4.3.1 TO FIG 4.3.5

International trade can impact on domestic productivity levels, and vice versa. Entering and competing in international markets can help some types of firms to lift their performance higher than would otherwise be the case. Effective trade connections can also provide some firms with the opportunity to exploit markets for their products, develop economies of scale, and identify and develop new niche products and services.

New Zealand is an outlier, for a small country, in having a small ratio of exports and imports to GDP. Economies of a similar size, such as Denmark and Ireland, have diversified the composition of their exports away from agricultural products. In addition, they have considerably higher levels of trade to GDP. In part, this is likely to be because New Zealand has not managed to overcome the impact of its distance from world markets.

As a share of GDP, New Zealand's real imports rose between 2000 and 2008, while New Zealand's real exports have been relatively stable since around 2001 (see Figure 5.4.8).

New Zealand has a significantly lower percentage of R&D financed from overseas than the OECD mean.¹²²

Important international connections and improvements in productivity and growth can also be forged through inward and outward FDI.¹²³ High levels of FDI are important for and common among small, open economies like New Zealand's. Through its effect on competition, FDI may indirectly enhance the effectiveness of resource use in the host economy. FDI is also associated with a range of potential spillover benefits. These include the transfer and diffusion of technology, information, skills, and management practices.¹²⁴ On the other hand, foreign takeovers of New Zealand companies can lead to a loss of head office and other high-skill activities, and reduce the extent to which businesses internationalise from New Zealand.

Like many small economies, New Zealand has a high stock of FDI relative to GDP. One important type of FDI is 'greenfield' investment. Greenfield FDI refers to investment projects that entail the establishment of new production facilities such as offices, buildings, plants, and factories. When adjusted for population size, the number of greenfield projects in New Zealand fell roughly in the middle of the OECD pack in 2002–2005.¹²⁵

Outward FDI is typically driven by a firm's desire to gain improved access either to the host country's market or to production inputs, including skilled labour, infrastructure, production facilities, or raw materials. Outward FDI also allows a business to benefit from a range of potential spillovers from foreign businesses.¹²⁶ While the stock of New Zealand's *inward* FDI is high by OECD standards, New Zealand's levels of *outward* FDI are among the lowest in the OECD and are not growing.

¹²² See footnote 72.

¹²³ FDI measures the value of cross-border capital transactions, both debt and equity, between enterprises in a direct investment relationship.

¹²⁴ A recent paper suggests that these spillover benefits have not been important in New Zealand. See Iyer, K, Stevens, P, & Tang, K T (2010). *Foreign and domestic ownership: Evidence of productivity spillovers from New Zealand firm level longitudinal data*. Presentation to New Zealand Association of Economists Conference 2010.

¹²⁵ Sourced from UNCTAD, *World Investment Report 2006*; and OECD *Factbook 2007*.

¹²⁶ See footnote 124.

Migration

FIG 4.3.6 TO FIG 4.3.10

In addition to trade and investment, the flow of people (and their accompanying knowledge and ideas) is an important contributor to the strengthening of New Zealand's international linkages. Flows of people can expand and develop international networks, improve the understanding of international cultures, societies, markets, and economies, and facilitate growth in trade flows.

New Zealand's net migration levels (expressed per thousand of the population) have been high relative to comparator economies. However, large net inflows of migrants are insufficient in themselves to ensure improvements in outcomes related to New Zealand's international connections. As with FDI, it is the quality of flows that is important. Flows of appropriately skilled migrants facilitate the transfer of knowledge and ideas, and grow the skilled labour supply required to support New Zealand's ongoing economic development. On the other hand, additional population can require additional investment in public infrastructure.

Data show that, around the year 2000, a high percentage of New Zealand-born people with tertiary qualifications had emigrated to other OECD countries. However, at the same time, a high percentage of New Zealand residents with tertiary qualifications were foreign-born immigrants (both from the OECD and from the rest of the world). New Zealand now has one of the highest proportions of immigrant populations in the OECD.

The net result was largely neutral in terms of the number of people with tertiary qualifications living in New Zealand. This means that New Zealand has experienced more of a 'brain

exchange' than a 'brain drain'.¹²⁷ However, the high level of inflow raises important issues about effective settlements of new arrivals and ongoing social cohesion – dimensions that are important for economic growth and overall wellbeing. Whether the 'brain exchange' has a largely neutral impact depends on how successful New Zealand is at absorbing these new immigrants into the workforce and wider society.¹²⁸

Business and entrepreneurial migrants, particularly high-net-worth individuals, could be a source of capital, knowledge, expertise, and links into international business and investor networks. Business migration has fallen significantly since 2000 and entrepreneur migration since 2006. This fall was due in part to changes in immigration policy, particularly in 2006/07. These changes introduced tighter requirements for applicants around retention of investment funds in New Zealand, increased requirements for residence in New Zealand, and introduced more stringent English language requirements. Changes in immigration policy introduced in 2009 directed at simplifying the requirements, including a more liberal approach to English language requirements, may see a reversal of this trend.

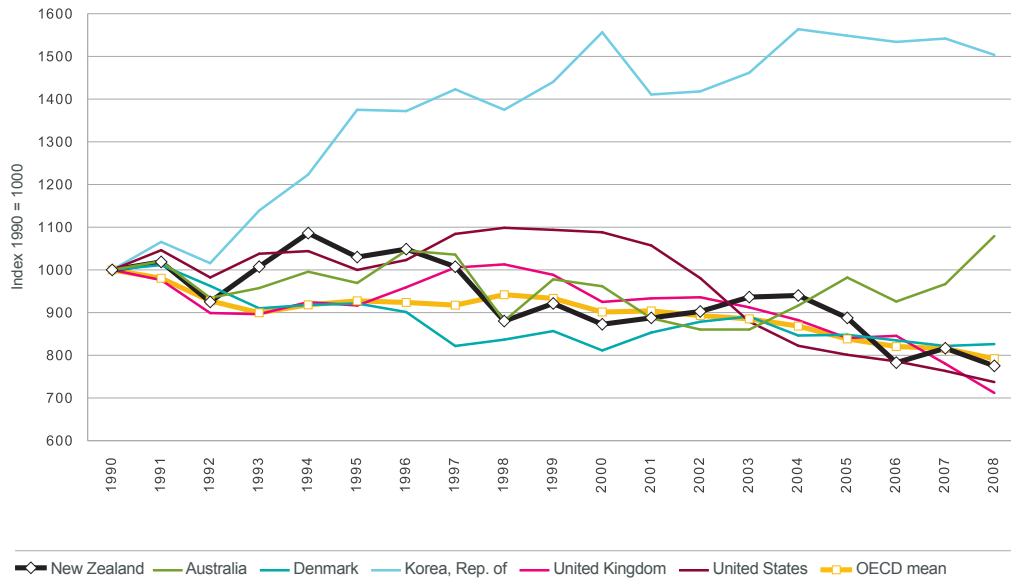
International students are a potential source of future skilled migrants for New Zealand. They also contribute to current export earnings, the transfer of knowledge and ideas, and the expansion of international networks. The number of foreign fee-paying students in tertiary education reached a peak of 41,520 in 2004, with the majority being in the university sector. The number has since fallen to 29,435 in 2009.

¹²⁷ Glass, H, & Choy, W K (2001). *Brain drain or brain exchange?* New Zealand Treasury Working Paper 01/22. Wellington: The Treasury. See <http://www.treasury.govt.nz/workingpapers/2001/twp01-22.pdf>

¹²⁸ Moody, C (2006). *Migration and economic growth: A 21st century perspective.* New Zealand Treasury Working Paper 06/02. Wellington: The Treasury.

FIG

4.3.1 New Zealand's and other countries' share of world exports for merchandise and services



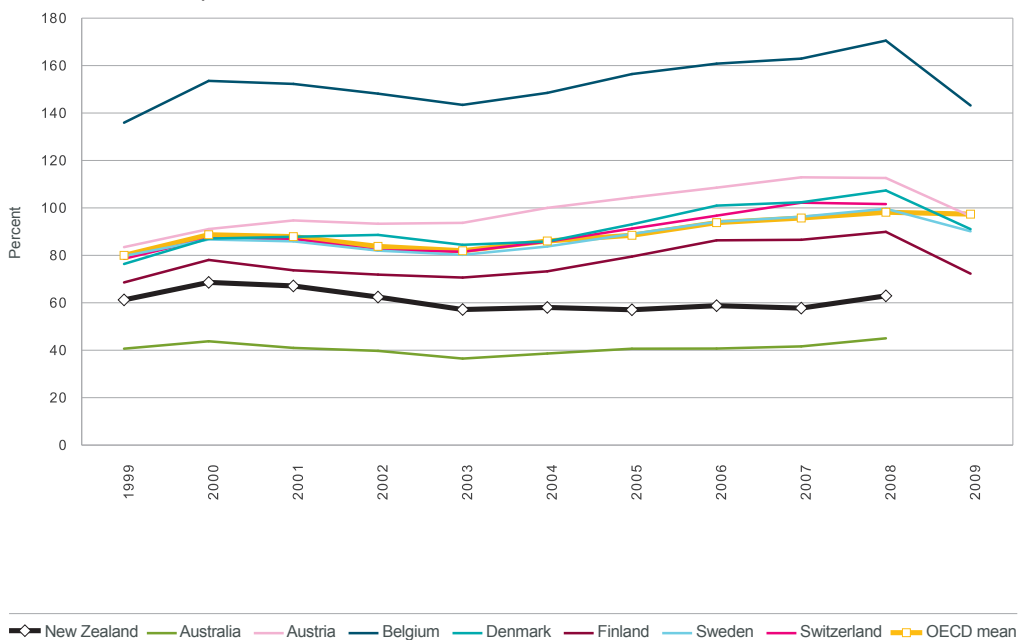
Source: OECD database, Globalisation, Macro trade indicators

Trade and Foreign Investment

New Zealand's share of world exports has declined over the last 15 years. The OECD's mean share of world exports has also declined.

FIG

4.3.2 Total exports plus imports as a percentage of nominal GDP for similar-sized economies, 1999–2009

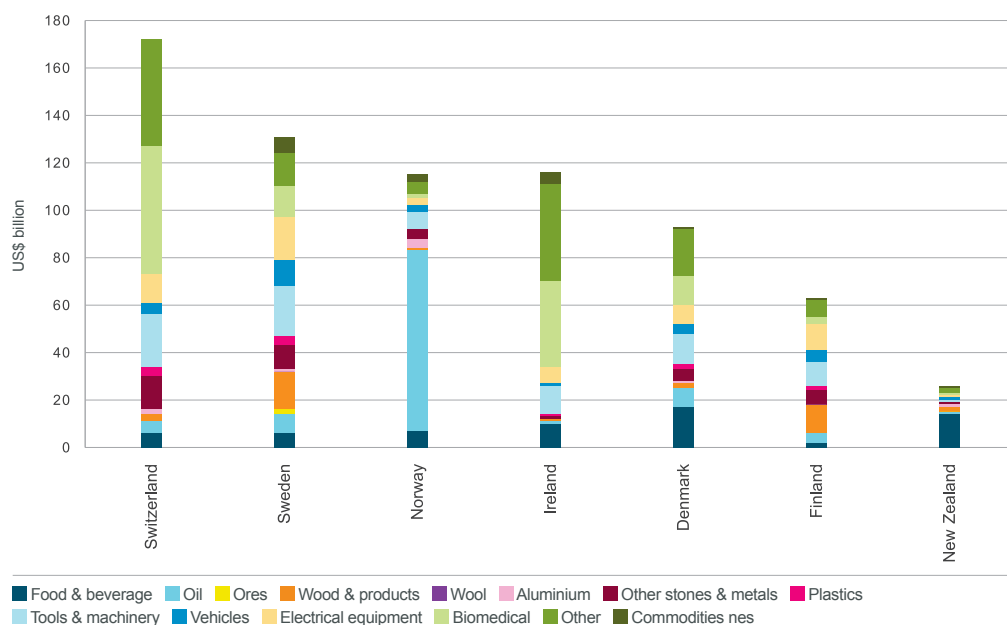


Source: OECD database, Globalisation, Macro trade indicators

New Zealand has a relatively low level of trade (value of exports and imports as a percentage of GDP) given its size. Its level is also not rising, whereas the level of trade was rising for many other small OECD countries until the global financial crisis. Small economies typically have high trade-to-GDP ratios. New Zealand's levels of trade are likely to be affected by its distance from major markets.

Compared to similar-sized economies, New Zealand's exports are dominated by food and beverage. New Zealand's exports of food and beverages are of similar value to those of Denmark (which has a slightly higher population than New Zealand). However, Denmark also exports much more in a range of other products.

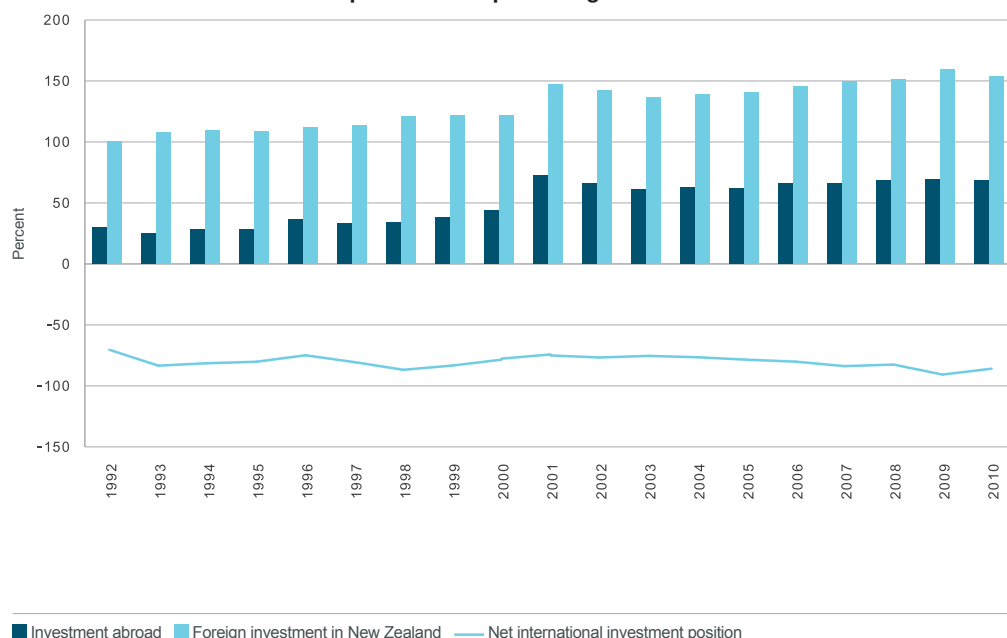
FIG 4.3.3 Products exported by similar-sized economies, 2009¹²⁹



Source: United Nations COMTRADE database, DESA/UNSD, Coriolis calculations

The stock of foreign investment in New Zealand has been consistently much higher than New Zealanders' stock of investment offshore for many years, leading to a consistently large negative net investment stock position.¹³⁰

FIG 4.3.4 The stock of investment abroad, foreign investment in New Zealand, and the net international investment position as a percentage of nominal GDP



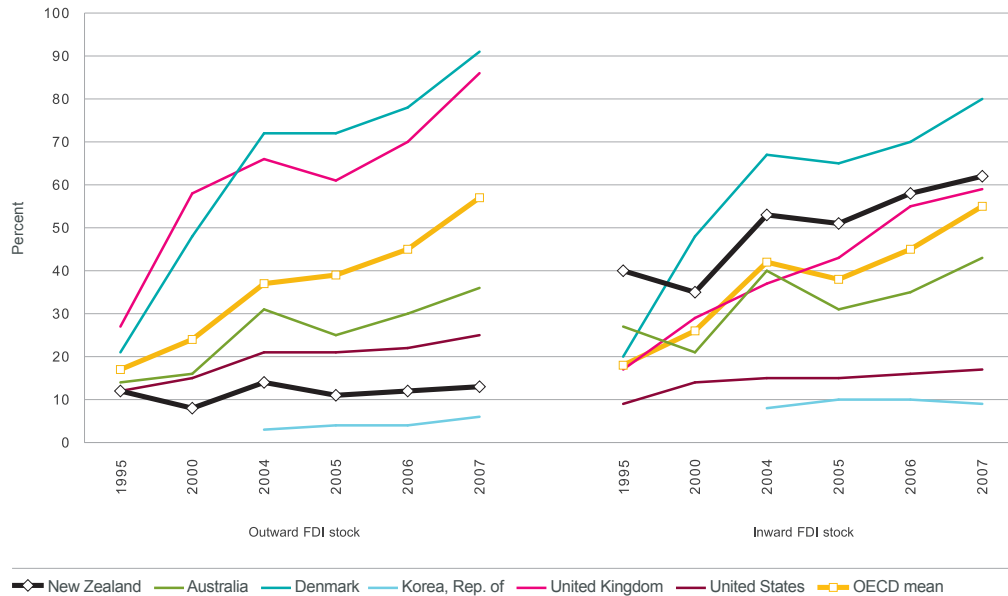
Source: Statistics New Zealand, Infoshare database, Economic Indicators

129 'Commodities nes' includes confidential items. 'nes' means not elsewhere specified.

130 'Investment' includes loans and portfolio investment as well as FDI.

FIG

4.3.5 Inward and outward FDI stock as a percentage of nominal GDP

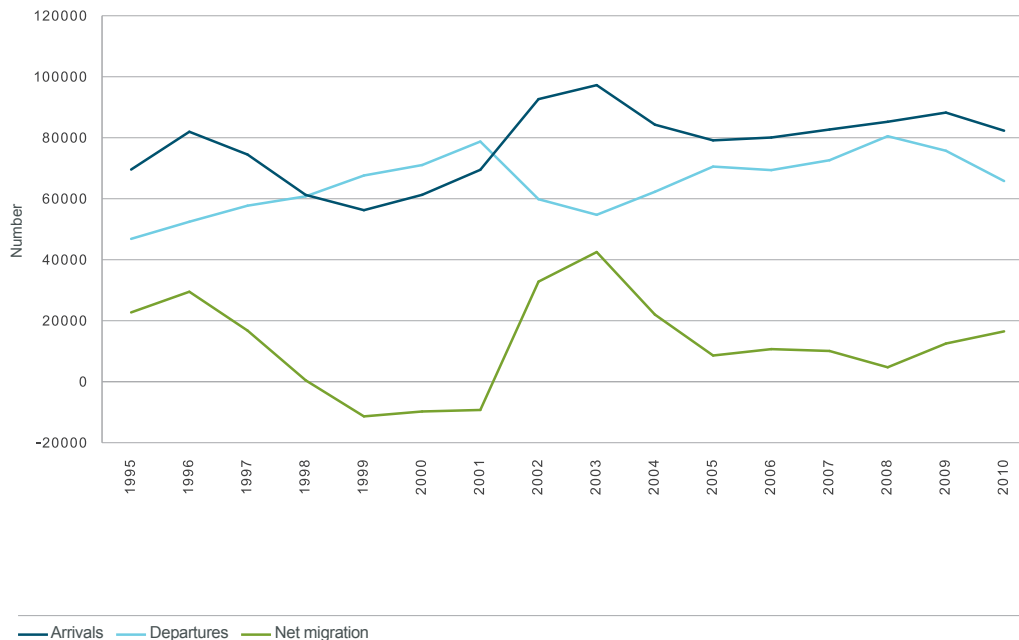


Sources: OECD Factbook 2010, Gross domestic product; *ibid*, Outward and inward FDI stocks

The stock of New Zealand's inward FDI measured as a percentage of GDP is high compared with other comparator countries (except Denmark). However, New Zealand's outward FDI levels are among the lowest among the comparator countries and appear to have plateaued.

FIG

4.3.6 Permanent and long-term arrivals, departures, and net migration, 1995–2010



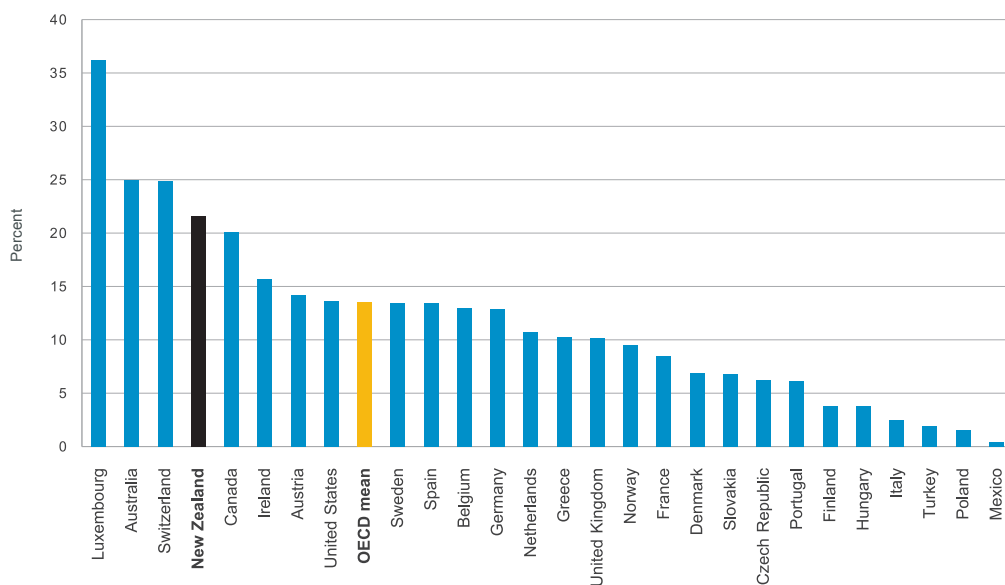
Source: Statistics New Zealand, Infoshare database, International Travel and Migration

Migration

Net permanent and long-term migration has been cyclical. Nevertheless, in each year since 2001, long-term arrivals in New Zealand have exceeded departures.

Within the OECD, New Zealand has one of the highest proportions of immigrants in the population.

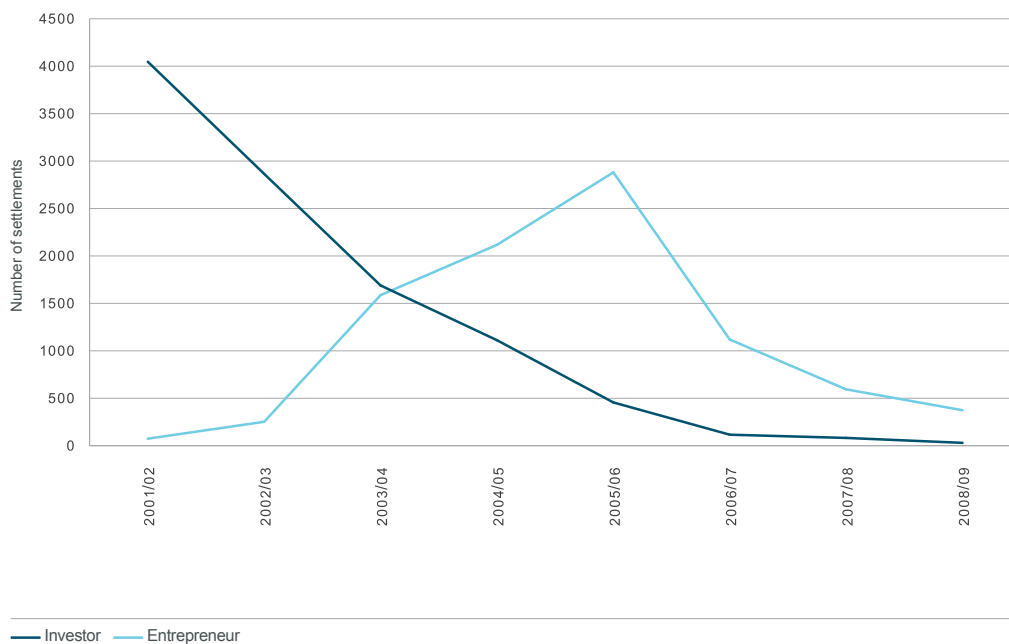
FIG 4.3.7 Foreign-born people¹³¹ as a percentage of total population, 2007 (or latest available)¹³²



Source: OECD Factbook 2010, Foreign born and foreign populations

Immigrants in investor and entrepreneurial categories have fallen, due in part to changes in immigration policy in 2006/07 which limited entry in these categories. A simplified policy introduced in 2009 may reverse this trend.

FIG 4.3.8 Immigration settlements of business people



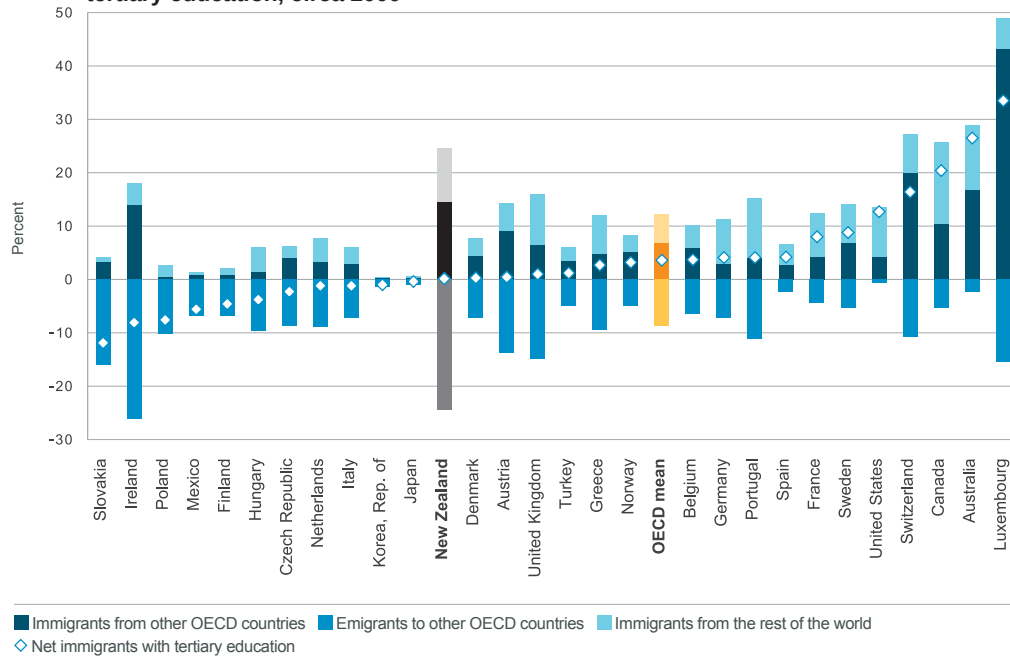
Source: Department of Labour, customised data request – approvals, non-approvals and settlements

131 Some data may be foreign-born and others foreign citizenship. According to Bryant, J. & Law, D (2004), *New Zealand's diaspora and overseas-born population*, New Zealand Treasury Working Paper 04/13. Wellington: The Treasury, Switzerland, Sweden, Germany, Italy, and Portugal's data are based on citizenship rather than birthplace.

132 2003 data for Germany, Greece, Italy, Poland, and Mexico.

FIG

4.3.9 Foreign-born people with tertiary education as a percentage of all residents with tertiary education, circa 2000

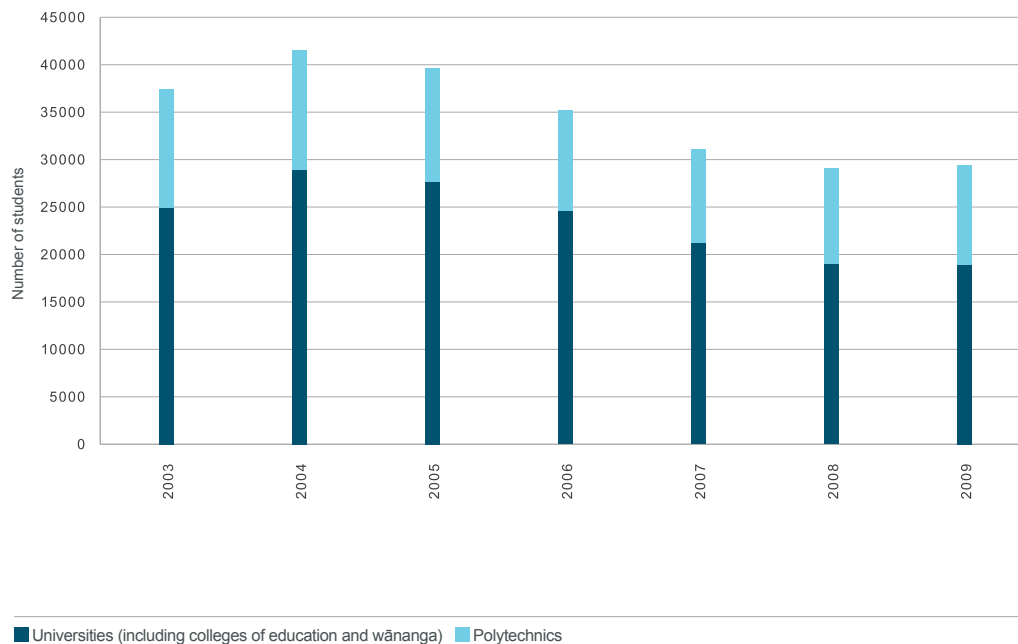


Around 2000 (the year with the latest available internationally comparable data), a high percentage of New Zealand residents with tertiary qualifications had emigrated to other OECD countries. However, a high percentage of New Zealand residents with tertiary qualifications were foreign-born immigrants. The net result was largely neutral in terms of the number of people with tertiary qualifications in New Zealand.

Source: OECD Factbook 2007, Migration of the highly educated, Foreign-born persons with tertiary attainment

FIG

4.3.10 Foreign fee-paying students in tertiary education¹³³



The number of foreign fee-paying students in the tertiary education sector has diminished since 2004. The majority of enrolments are in the university sector.

Source: Ministry of Education, Key Indicators for Export Education Levy for Full Year 2003–2009

133 This graph omits students in private training establishments.

CHAPTER 5

Underlying Determinants of Productivity Growth – Business Environment

5.1 – Skills and Talent

Key Points

- Education levels, skills, and talent are important to economic development, because more educated, skilled, and talented people tend to be more innovative and productive.
- Management capability is an important determinant in enterprise performance and productivity. New Zealand management practices, based on a study of management practices in manufacturing, rank below the United States, Australia, and most of the OECD countries surveyed.
- New Zealand has high education levels with increasing proportions of the population with higher tertiary qualifications. The proportion of New Zealand adults with very low literacy, however, is still significant.
- New Zealand university graduation rates are high and increasing somewhat more slowly than the OECD mean.
- The percentage of the population aged 25 to 64 with bachelor degrees or higher is increasing.
- New Zealand ranks 19th out of 30 OECD countries in terms of how their top universities score on quality.

Introduction

Skills and talent are essential to improving productivity and incomes. People with the right skills are essential to creating, developing, and using new technology, new markets, and new workplace practices.

Skills and talent are influenced by formal learning processes, informal experiences, networking, and social and cultural norms. This chapter provides a general picture of New Zealand's current performance in a number of aspects of skills and talent, including educational achievement, adult literacy, and managerial ability.

Over the last decade or two, the qualifications of the New Zealand workforce have continued to increase, broadly in line with other OECD countries. The proportion of the working-age population with no qualification has declined and that with tertiary qualifications has increased. Most of the latter has come from degree-level qualifications or higher. By international standards, New Zealand has a high level of migration. This is particularly true for people with tertiary education (refer Section 4.3: International Linkages). The large size and fluctuation in this flow will continue to impact the qualifications and skills of the population.

Skills of the Workforce – Management and Leadership

FIG 5.1.1 AND FIG 5.1.2

Management skills have a significant impact on organisational performance. Skilled managers add to productivity and profitability by creating an environment where innovation and skill development can flourish.¹³⁴ The recent Management Matters study¹³⁵ uses survey

responses of managers in the manufacturing sector who were questioned across three broad areas of management practice – operations management, performance management, and people management. Overall management practices in New Zealand manufacturing are weaker than in most of the OECD countries for which data are available – New Zealand ranks 10th of 14 OECD countries covered. A particular weakness identified in New Zealand manufacturing firms is in people management. This is probably indicative of management weaknesses in all parts of the economy. It is also consistent with the International Institute for Management Development (IMD) World Competitiveness Yearbook which ranks perceived availability of management skills in New Zealand lower than in Australia, the United Kingdom, and many OECD countries.¹³⁶

Skills of the Workforce – Advanced

FIG 5.1.3 AND FIG 5.1.4

Highly skilled and educated people are crucial to innovation. They create and embody knowledge and ideas, and they help facilitate the uptake of ideas from overseas and within New Zealand.

The proportion of New Zealanders with bachelor degrees has increased significantly over the last decade, and is now well above the OECD mean. The proportion of the population with a bachelor's degree or higher and the proportion of the population with a tertiary qualification or higher have also both grown over the last decade. The proportion of graduates is affected by the workforce mix shifting from older workers to younger workers who are more likely to have a degree, and the net effect of immigration.

¹³⁴ Fabling, R. & Grimes, A (2007). *HR practices & firm performance: What matters and who does it?* MED Occasional Paper 07/02 and Fabling, R. & Grimes, A (2007). *Practice makes profit: Business practices and firm success.* *Small Business Economics*, 29(4), 383–399.

¹³⁵ University of Technology Sydney and LSE Centre for Economic Performance (2010). *Management matters in New Zealand – How does manufacturing measure up?* Wellington: Ministry of Economic Development. See <http://www.med.govt.nz/upload/72724/Management%20matters.pdf>

¹³⁶ For more detailed information on New Zealand management capability, see Statistics New Zealand's Business Practices Survey, <http://www.stats.govt.nz/store/2006/07/business-practices-survey~2001-hotp.htm?page=para003Master>

Skills of the Workforce – Basic Literacy and Numeracy

FIG
5.1.5

Adult literacy measures the ability of adults to use information effectively. There is a longstanding and extensive literature on the benefits of literacy for employment and earnings.¹³⁷ Improving basic literacy skills is also likely to be important for lifting overall labour productivity.

The adult population with no qualification has steadily decreased since 1991, from 34 percent to 21 percent in 2009 (see Figure 5.1.4).

The Adult Literacy and Life Skills Survey (ALL)¹³⁸ shows that New Zealand ranks above the United States, but below Canada, on prose and document literacy and numeracy, and similar to Canada on problem solving,¹³⁹ when measured at Level 3.¹⁴⁰ New Zealand is similar to Australia across all of these domains. The population of New Zealand adults with very low prose literacy has reduced (from 18 percent of the adult population with the lowest level in 1996 to 13 percent in 2006), but a proportion with low literacy skills still persists.¹⁴¹

New Entrants to the Workforce – Educational Attainment

FIG
5.1.6 TO FIG
5.1.12

The skills of New Zealand's future workforce will depend on the skills of new entrants to the workforce.

New Zealand's university graduation rate is towards the top end of the OECD, seven percentage points above the OECD mean for all students and five percentage points for domestic students. It has been increasing, but not as fast as the OECD mean. New Zealand's graduation rate is pushed up by its higher than average proportions of older students (older than the age group normally completing university degrees) and international student graduates. According to the OECD, 6 percent of the population of New Zealanders over 40 years of age are in full- or part-time education, similar to the 5.8 percent recorded by Australia, but higher than the OECD average of 1.5 percent. In addition, compared to other countries, a relatively high percentage of Australia's and New Zealand's university graduates are international students.

New Zealand exceeds the OECD mean in the number of science graduates, but falls well short in the number of engineering graduates. The number of PhD graduates per million population is less than the OECD mean. Many people graduate in fields that are not obviously connected to productivity growth.

The Times Higher World University Rankings is an internationally comparable measure of university quality. In 2010, a new methodology was used based on outputs (research, teaching, citations), weighted by numbers of academic staff.¹⁴² New Zealand's top scoring university (University of Auckland) ranks 145th out of the top 200 universities, placing New Zealand 19th out of 30 OECD countries, in terms of where their top universities score.

137 For example, see Kapsalis, C (1998). *The connection between literacy and work: Implication for social assistance recipients*. Quebec: Human Resources and Social Development Canada.

138 Adult Literacy and Life Skills Survey (ALL), 2006 was developed by the OECD, Statistics Canada, the National Center for Education Statistics of the US Department of Education, and the Educational Testing Service.

139 Prose literacy, according to the ALL definition, is "the ability to read and understand continuous texts (such as news stories, editorials, brochures and instruction manuals)". Document literacy is "the ability to read and understand discontinuous texts (such as charts, maps, tables, job applications, payroll forms and timetables)". Numeracy is "the ability to read and process mathematical and numeric information in diverse situations". Problem solving is "the ability to reason and think analytically in situations where no routine procedure exists".

140 Typical tasks at Level 3 involve more complex information filtering, sometimes requiring inference, and the facility to manipulate mathematical symbols, perhaps in several stages.

141 Satherley, P, Lawes, E, & Sok, S (2008). *The Adult Literacy and Life Skills (ALL) survey: Overview and international comparisons*. Wellington: Ministry of Education.

142 Previous rankings were based on subjective analysis from academic peer reviews and graduate recruiters.

Achievement at the secondary school level is mixed.

The percentage of school leavers with few or no qualifications has fallen since the introduction of the National Certificate of Educational Achievement (NCEA). The percentage of students achieving NCEA Level 2 (or its equivalent) and university entrance have both increased significantly since 2001. In part, this reflects more students staying at school.

New Zealand secondary school enrolment rates for 15–20-year-olds are below the OECD mean, but improving. However, 8.4 percent of New Zealand's 15–19-year-olds were not in education or employment in 2008, the seventh highest rate in the OECD.¹⁴³

Cognitive skills provide an indicator of the quality of schooling, and underlie its relationship with economic development. New Zealand participates in international studies assessing the quality of compulsory education – the Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Studies (TIMSS).¹⁴⁴ Both of these tests have a broad focus on mathematics and science, and PISA has an additional focus on literacy, although the application and structure of these tests differ.

In PISA, where the emphasis is on understanding and applying knowledge using data and examples, New Zealand 15-year-olds are close to the top of the OECD. In TIMSS, where the focus is on curriculum-based assessment with emphasis on knowledge and reasoning, New Zealand 13- and 14-year-old students were in the bottom half of the OECD countries participating in 2003. Evidence suggests that this difference can be largely explained by the differences in structure and content of the two tests.¹⁴⁵

143 Ministry of Education (2010). *How does New Zealand's education compare: OECD's education at a glance 2010*. See http://www.educationcounts.govt.nz/publications/tertiary_education/81180

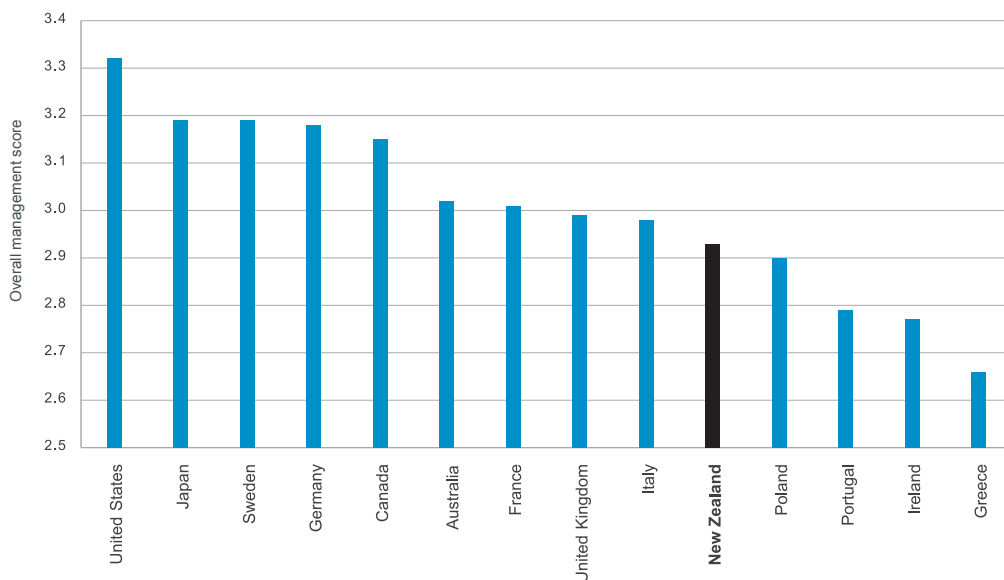
144 TIMSS results have not been included in this publication. Results are available at <http://nces.ed.gov/timss/index.asp>

145 Wu, M (2010). *Comparing the similarities and differences of PISA 2003 and TIMSS*. OECD Education Working Paper No. 32. OECD, Paris.

Skills of the Workforce – Management and Leadership

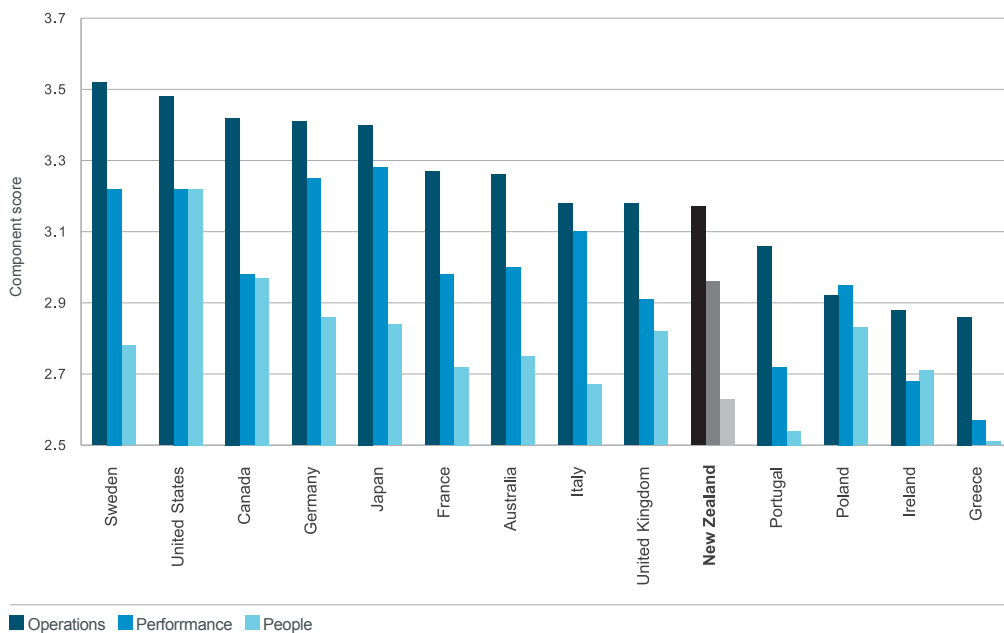
Overall, the quality of management practices in medium- and large-sized¹⁴⁶ New Zealand manufacturing firms is lower than in many OECD countries (New Zealand ranked 10th out of the 14 OECD countries covered). This suggests that New Zealand management practices generally may be poorer than in richer OECD countries.

FIG 5.1.1 Overall management capability – medium and large manufacturing firms, 2009



Source: Ministry of Economic Development (2010), Management Matters in New Zealand – How does manufacturing measure up? Exhibit 16 – Overall management score by country

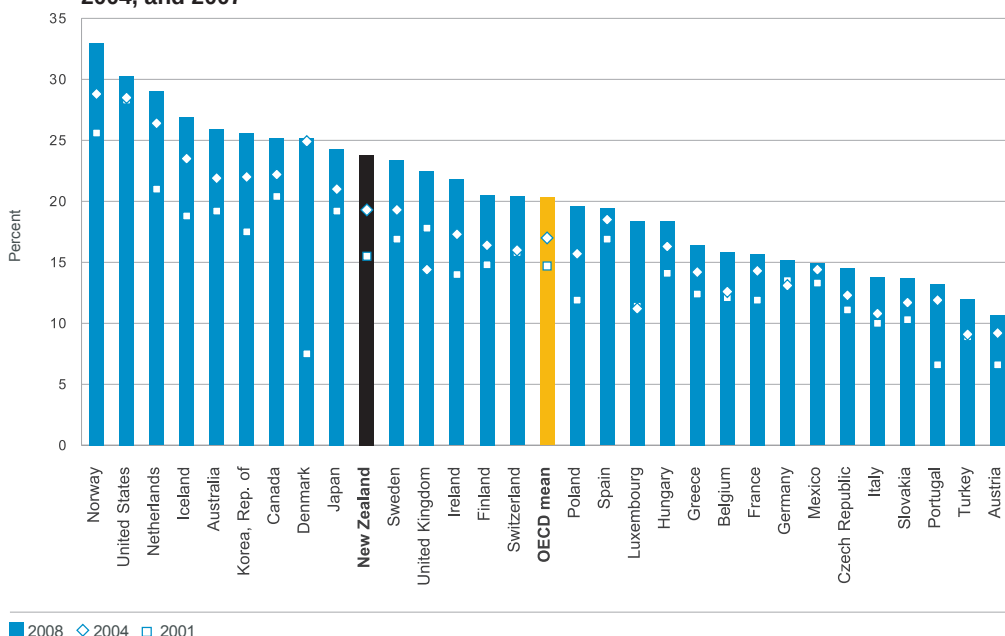
FIG 5.1.2 Components of management capability – medium and large manufacturing firms, 2009



■ Operations ■ Performance ■ People

Source: Ministry of Economic Development (2010), Management Matters in New Zealand – How does manufacturing measure up? Exhibit 18 – Operations management score by country, Exhibit 20 – Performance management score by country, Exhibit 22 – People management score by country

FIG 5.1.3 Percentage of the population aged 25–64 with bachelor's degree or higher,¹⁴⁷ 2001, 2004, and 2007

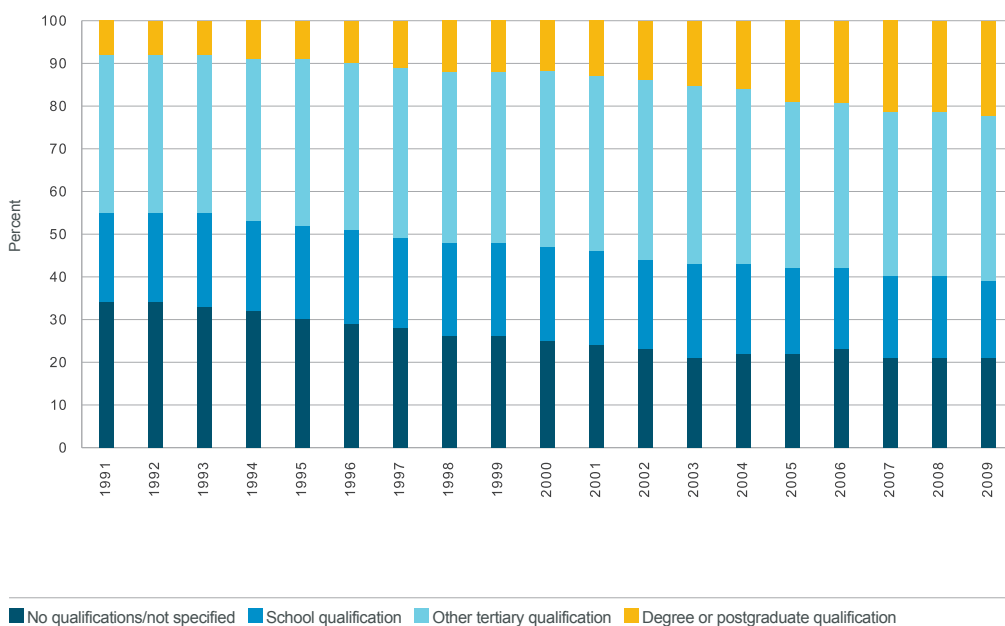


Sources: OECD Education at a Glance 2010, Table A1.1a Educational attainment: adult population (2008); OECD Education at a Glance 2006, Table A1.1a Educational attainment: adult population (2004); OECD Education at a Glance 2002, Table A3.1a Educational attainment of the adult population (2001); Ministry of Education, customised data request

Skills of the Workforce – Advanced

The percentage of New Zealand adults of working age with bachelor's degrees is in the top half of the OECD, having seen a significant increase relative to the OECD mean since 2001. New Zealand is now 10th in the OECD.

FIG 5.1.4 Distribution of New Zealand population aged 25–64 years by highest qualification, 1991–2009



Source: Statistics New Zealand, Household Labour Force Survey, customised data request

The proportion of the adult population with a tertiary qualification has increased, from 52 percent in 1999 to 60 percent in 2009. This growth has come primarily from an increase in the number of degrees and postgraduate qualifications, which has increased from 12 percent in 1999 to 22 percent in 2009.¹⁴⁸

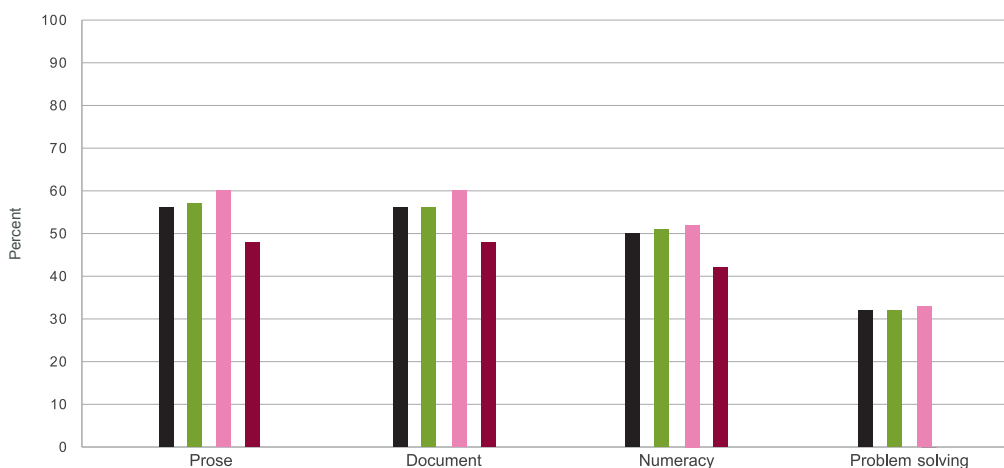
¹⁴⁷ The data are based on Tertiary Type A programmes which are largely theory-based and are designed to provide sufficient qualifications for entry to advanced research programmes.

¹⁴⁸ These figures are based on the highest qualification, so they do not count the number of other tertiary qualifications held in addition to degrees and postgraduate qualification. 'Degree or postgraduate qualification' includes degrees granted by institutions of technology, polytechnics, and wānanga.

Skills of the Workforce – Basic Literacy and Numeracy

New Zealand ranks above the United States, but below Canada, on prose and document literacy and numeracy, and similar to Canada¹⁴⁹ on problem solving, according to the ALL Survey. New Zealand is similar to Australia across all of these domains.

FIG 5.1.5 Percentage of adult population with higher skills (level 3 or above), 2006



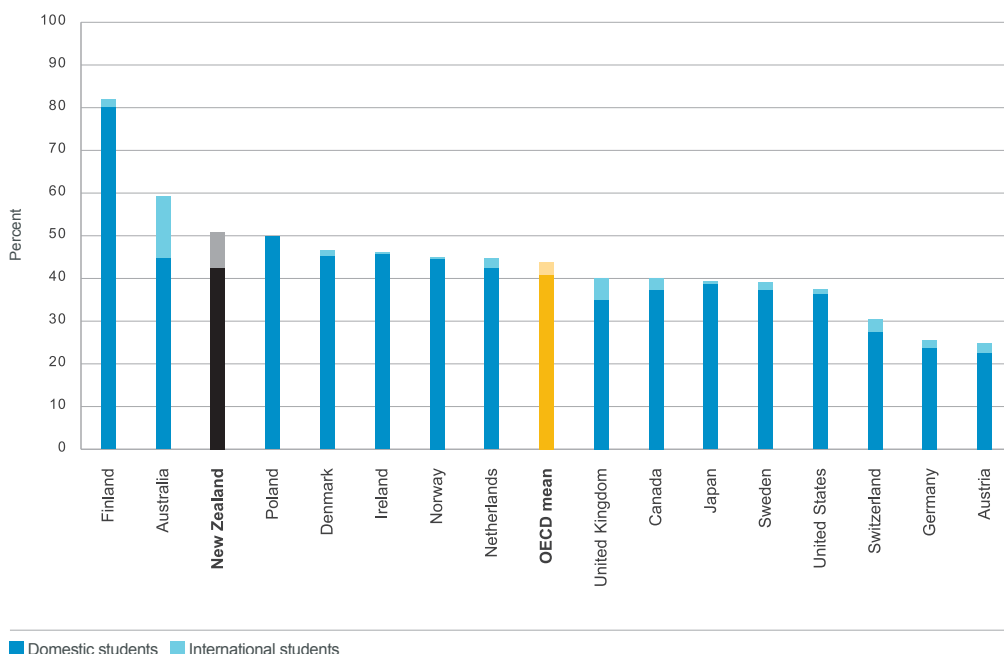
■ New Zealand ■ Australia ■ Canada ■ United States

Source: Satherley, P, Lawes, E, & Sok, S (2008), The Adult Literacy and Life Skills (ALL) survey: Overview and international comparisons. Wellington: Ministry of Education

New Entrants to the Workforce – Educational Attainment

New Zealand's university graduation rate is towards the top end of the OECD. New Zealand also has the second largest proportion of international students for countries where the data are available. If older students (older than the age group normally completing university degrees) and international student graduates were excluded from the data for every country, New Zealand's ranking would likely be lower.¹⁵³

FIG 5.1.6 University graduation rates for first degree,¹⁵¹ 2008¹⁵²



■ Domestic students ■ International students

Source: OECD Education at a Glance 2010, Table A3.3 Graduation rate at different tertiary levels

149 Problem solving was not measured in the United States.

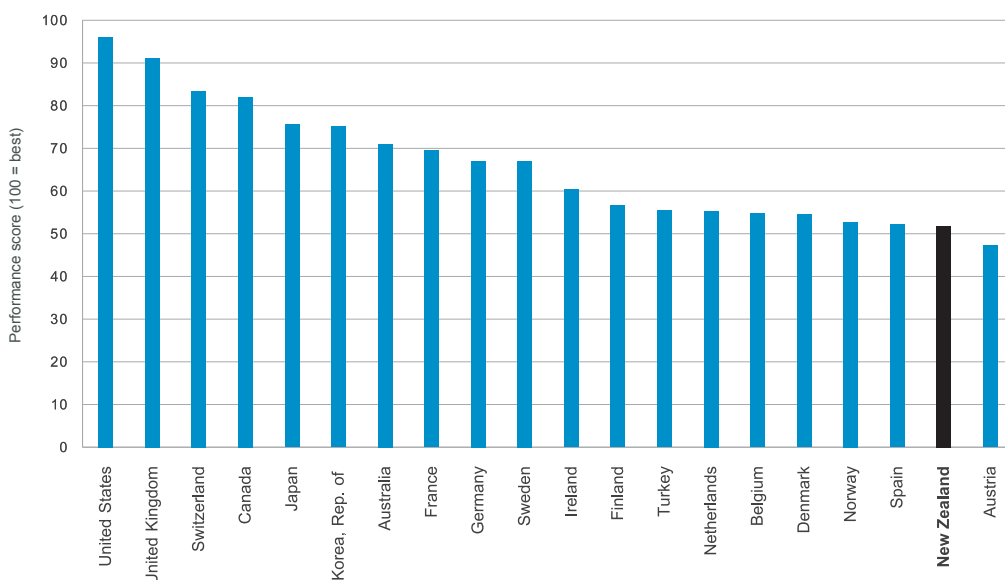
150 Refer footnotes 139 and 140.

151 The data relate to Type A First Degree. See footnote 147 for the definition of Type A. 'University graduation rate' is defined as the number of students completing university degrees for the first time as a percentage of the age group normally completing university degrees in the relevant country.

152 Data for Finland include second degrees; data for Australia and Canada relate to 2006.

153 The relatively large number of older-aged New Zealanders (who do not form part of the age group normally completing university degrees) entering tertiary education for the first time tends to push up the net entry rate.

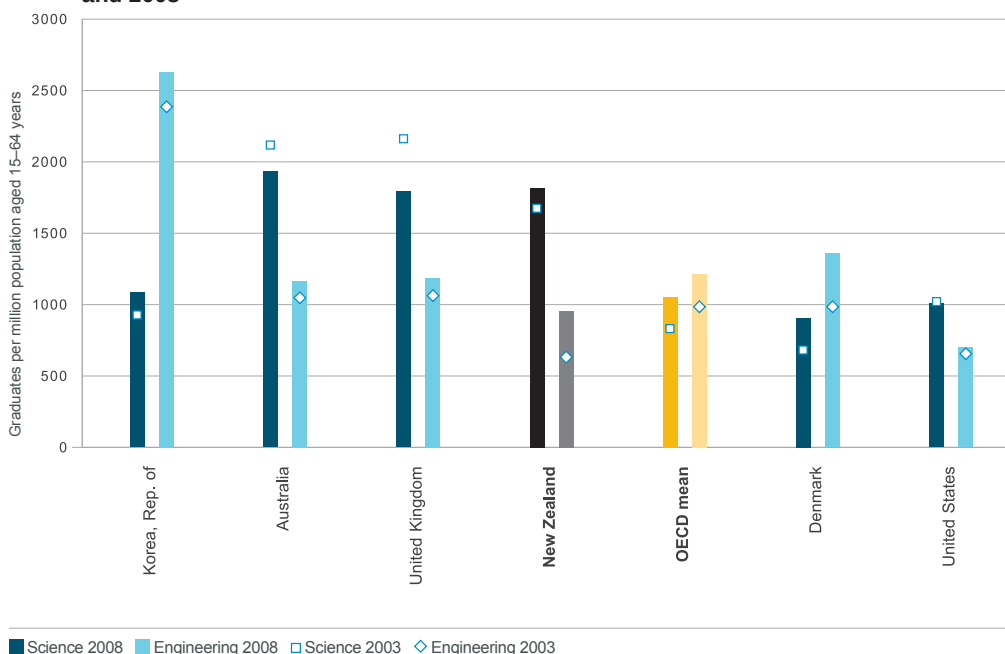
FIG
5.1.7 Quality of leading universities, 2010



The internationally comparable Times Higher World University Rankings scores university quality across a range of dimensions^{154,155} (100 = best). New Zealand's top scoring university (University of Auckland) ranks 145th out of the top 200 universities, placing New Zealand 19th out of 30 OECD countries, in terms of where their top universities score.

Source: Times Higher Education's 2010–2011 World University Rankings

FIG
5.1.8 Science and engineering graduates per million population aged 15–64 years, 2003 and 2008



New Zealand has a high number of science graduates (fourth in the OECD). The number of engineering graduates, however, is close to the bottom of the OECD (19th in the OECD).

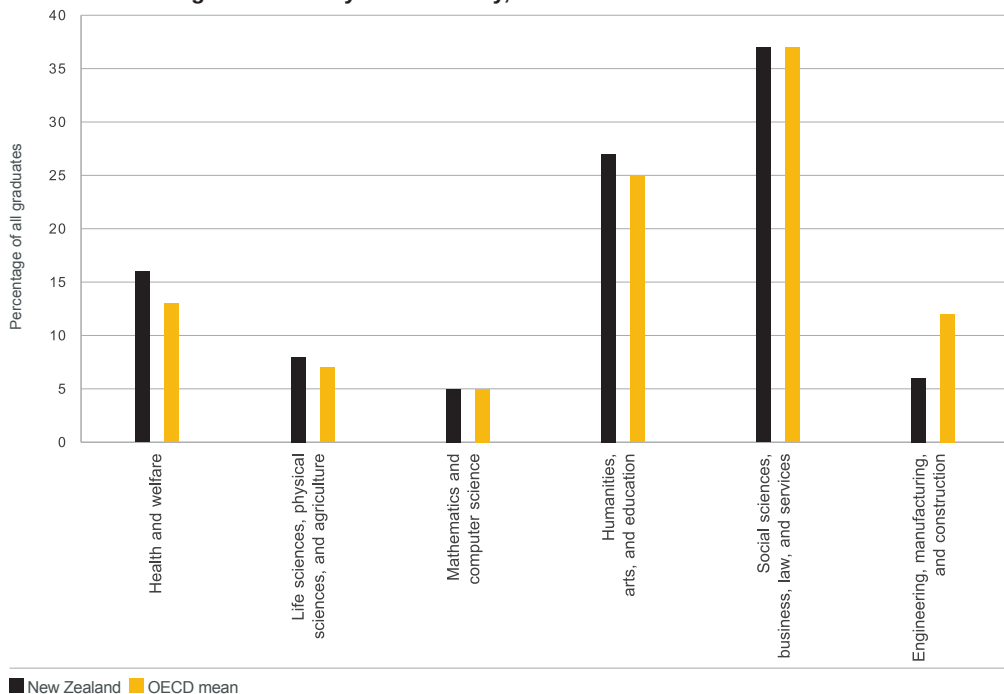
Sources: OECD database, Education and Training, Graduates by field of education; OECD database, Labour, ALFS summary tables

154 The score is awarded based on a weighting of teaching (30 percent), research (30 percent), citations – a measure of research influence (32.5 percent), research income from industry – a measure of innovation and knowledge transfer (2.5 percent), and international mix of staff and students (5 percent).

155 There are criticisms of university rankings systems. A major criticism is that the arrival at a final ranking is based on subjective weightings of the various component measures.

As in most OECD countries, the predominant fields of study of New Zealand graduates are in the social sciences, business, law, and services and the humanities, arts, and education. A substantially smaller proportion than the OECD mean graduate in engineering, manufacturing, and construction. In New Zealand, the figure is 6 percent, while it is 12 percent for the OECD mean.

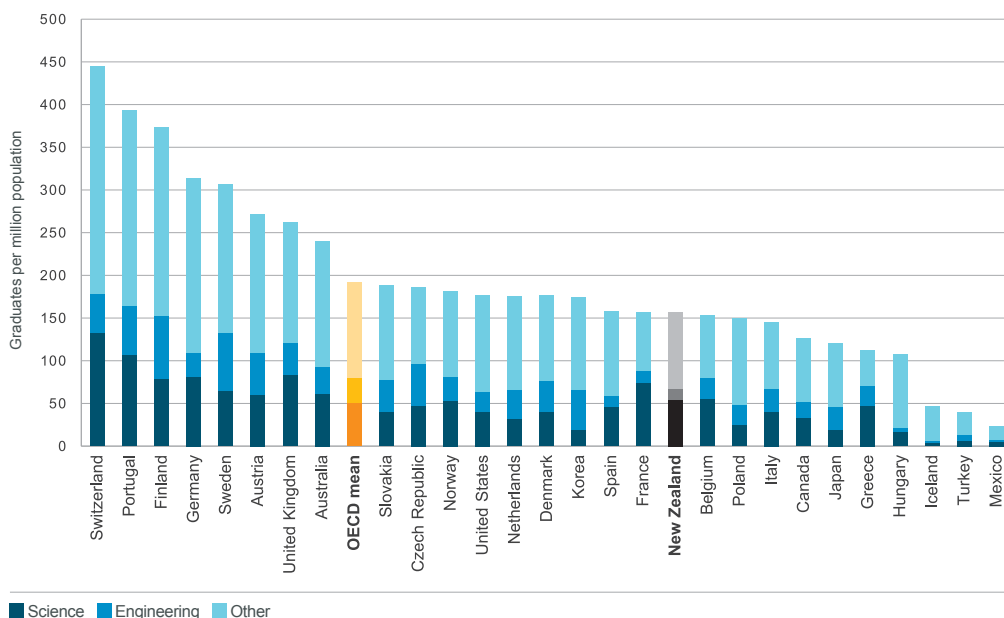
FIG 5.1.9 Domestic graduates¹⁵⁶ by field of study, 2008



Source: OECD Education at a Glance 2010, Table A3.5 Relative distribution of graduates, by field of education (2008)

The number of PhD graduates graduating as a proportion of the population is lower than the OECD mean, and much lower than some other OECD countries (18th in the OECD). New Zealand produces relatively more science PhD graduates (11th in the OECD) and fewer engineering PhD graduates (24th in the OECD).

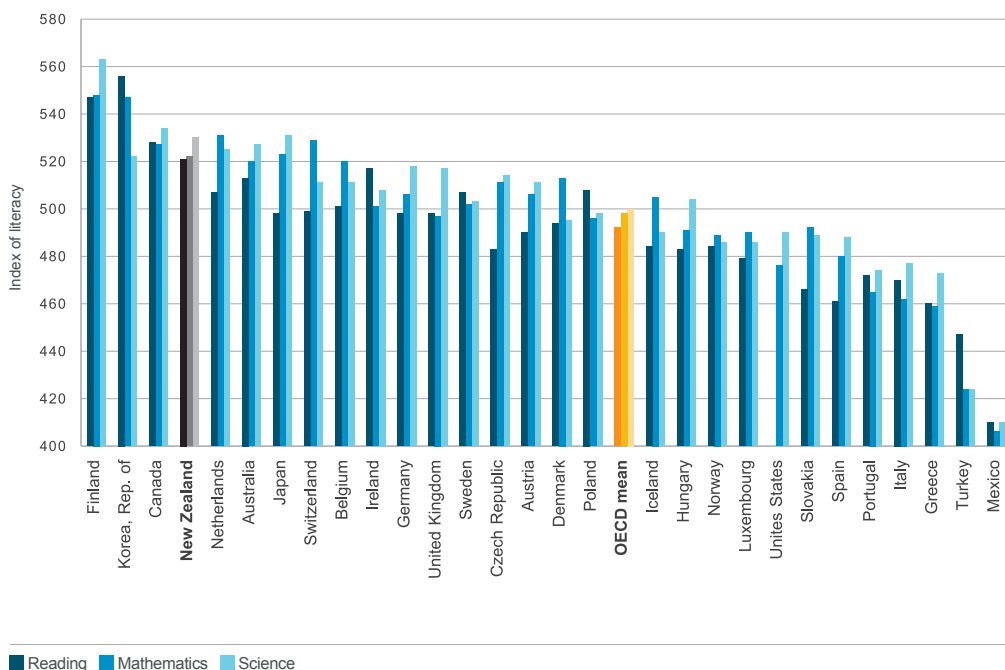
FIG 5.1.10 PhD graduates per million population, 2005



Source: OECD Science, Technology and Industry Outlook 2008, Figure 1.38 PhD graduates in science and engineering and other fields

156 The OECD data include programmes that are theoretically based/research preparatory (history, philosophy, mathematics, etc) or giving access to professions with high skills requirements (eg. medicine, dentistry, architecture, etc). The data also include tertiary programmes that lead to the award of an advanced research qualification.

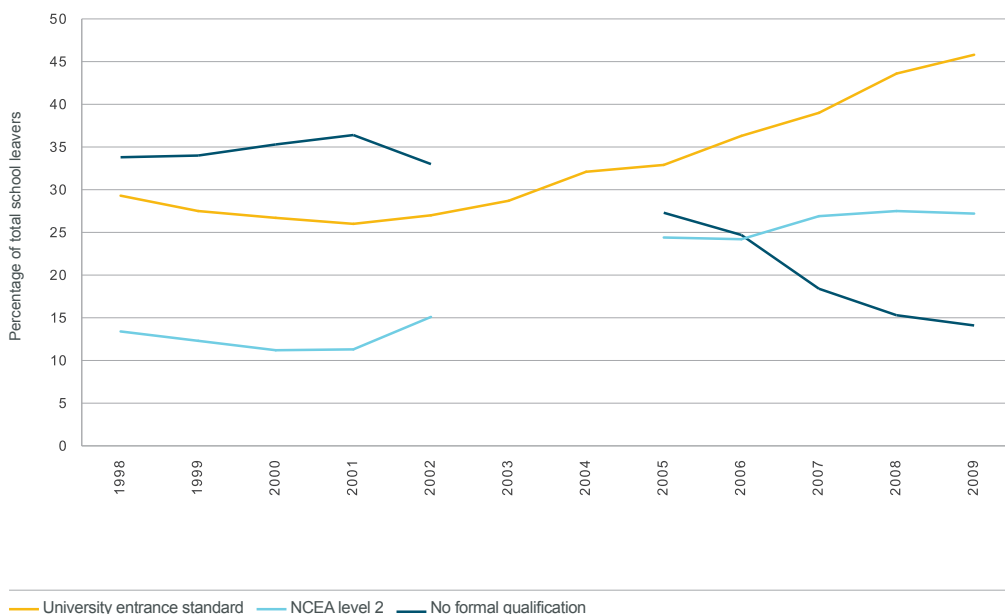
FIG
5.1.11 PISA scientific, mathematical, and reading literacy of 15-year-olds, 2006¹⁵⁷



The performance of New Zealand's 15-year-olds is towards the top of the OECD in terms of reading (New Zealand is fourth in the OECD), science literacy (fourth), and mathematics literacy (seventh), according to PISA.

Source: OECD PISA 2006 Science Competencies for Tomorrow's World Volume 2, Table 2.1c, Table 6.1c, and Table 6.2c

FIG
5.1.12 Percentage of school leavers with university entrance standard, NCEA level 2, and no formal qualification¹⁵⁸



The percentage of school leavers with few or no qualifications has fallen since the introduction of NCEA. The percentage of students achieving NCEA Level 2 (or its equivalent) and university entrance standard have both increased significantly since 2001.¹⁵⁹

Source: Ministry of Education, customised data request

¹⁵⁷ PISA results for the three domains (reading, mathematics, and science) are shown on one graph for convenience, but PISA is not designed for comparisons across domains. For example, PISA does not tell us whether New Zealand is better at science than reading or mathematics.

¹⁵⁸ Owing to difficulties in comparing data associated with changing from the School Certificate qualification to NCEA, estimates of the percentages obtaining NCEA Level 2 and leaving school with no formal qualification (less than NCEA Level 1) in 2003 and 2004 have been omitted.

¹⁵⁹ Qualification levels have been on the increase since the implementation of NCEA in 2002–2004. Students accumulate enough credits to reach various levels of NCEA qualifications rather than relying solely on an end-of-year exam.

5.2 – Infrastructure

Key Points

- Appropriate infrastructure has a positive effect on the economy by contributing to increased productivity levels and maintaining New Zealand as an attractive country in which to do business.
- The OECD suggests investment in infrastructure – particularly network infrastructure such as transport and communications – boosts long-term economic output more than other kinds of physical investment.¹⁶⁰
- International comparisons show that while New Zealand has made some progress since the 2007 Economic Development Indicators report, there is some distance to go if New Zealand is to compare favourably with the top tier of countries for infrastructure.
- New Zealand's expenditure on ICT infrastructure is lower than the OECD mean; however, the number of broadband subscriptions per 100 inhabitants has increased faster than the OECD mean since 2006. New Zealand is in the middle of the OECD pack for average advertised broadband download speeds, but the cost of accessing ICT appears to be relatively high compared with other OECD countries.
- The reliability of New Zealand's electricity supply improved from 1995 to 2000, but has not shown any significant improvement in recent years.
- New Zealand's total roading network length per person is longer than the OECD mean, and similar to other countries with relatively sparse populations. Road traffic volumes per 1,000 population have remained relatively constant between 2000 and 2007.

160 OECD, *National infrastructure plan, economic policy reforms: Going for growth 2009*, p.10. Paris: Author.

Introduction

The services provided by infrastructure are essential for economic and social development. Infrastructure provides the foundation for virtually all modern day activities, constitutes a major economic sector in its own right, and contributes significantly to raising living standards.

The economic benefits of infrastructure have been the subject of debate for a number of decades. A broad consensus now exists that an appropriate level of public infrastructure increases productivity, in both the short and long term. Evidence suggests that, over the long term, public investment in infrastructure encourages a greater level of private investment.

The quantity and quality of infrastructure affects firms and the functioning of the wider economy in a number of ways.

Well-chosen and operated infrastructure can bring benefits that extend for many generations. But infrastructure can be expensive to build and maintain. Whether there are positive returns to extra investment, and the size of those returns, depends on what infrastructure is already in place and the quality of the investment contemplated.¹⁶¹

This chapter provides a picture of the overall quality of New Zealand's infrastructure, including its transport, ICT, and energy infrastructure, as well as water usage.

Many of the perception-based indicators (including perceived quality of port, air transportation, telephone, and fax infrastructure) used in the last Economic Development Indicators report have been removed. Two perception-based indicators remain (perceived overall infrastructure quality and perceived quality of energy infrastructure), while others have been replaced with more objective, quantitative measures, particularly those produced in recent OECD publications and the latest version of the World Bank's World Development Indicators (WDI).

Overall Performance

FIG
5.2.1

Overall, New Zealand is perceived to have lower quality infrastructure than most OECD countries. The 2009–10 Global Competitiveness Index prepared by the World Economic Forum (WEF), ranks New Zealand 21st in the OECD (and 48th out of 139 countries globally). The 2009 Mercer Index for city infrastructure quality places Auckland 43rd and Wellington 47th in their annual survey of 215 world cities, much lower than each city's overall quality of living ranking recorded in the same survey.

ICT

FIG
5.2.2 TO FIG
5.2.8

New Zealand's expenditure on ICT as a percentage of GDP is lower than the OECD mean and the gap is widening.

The number of broadband subscribers per 100 inhabitants in New Zealand increased between 2006 and 2009, closing the gap with the OECD mean. While this rate has increased, the average cost of a monthly subscription remains high compared to other OECD countries. Average advertised broadband download speeds are similar to most other OECD countries.

Mobile telephone subscription costs (including rates for prepaid cards) remain above the OECD mean. Mobile telephone cost increases are also higher than the OECD mean.

161 de la Fuente, A (2010). *Infrastructures and productivity: An updated survey*. Instituto de Análisis Económico, CSIC. See <http://pareto.uab.es/wp/2010/83110.pdf>

Energy

FIG 5.2.9 TO FIG 5.2.11

The International Institute for Management Development's (IMD) *World Competitiveness Yearbook 2010* suggests that the perceived quality of New Zealand's energy infrastructure remains relatively low (and lower than the OECD average) compared with previous years. While the average number of supply interruptions New Zealand electricity users experience each year has declined since the mid-1990s, the average length of those interruptions has increased slightly.

Since 2006, residential electricity prices have steadily increased, commercial prices have trended downwards, and industrial prices have stayed relatively constant.

Transport

FIG 5.2.12 TO FIG 5.2.14

New Zealand has a relatively extensive roading network compared with other OECD countries.

New Zealand still airfreights a high distance-weighted tonnage of cargo internationally relative to GDP compared with other OECD countries. However, this tonnage reduced significantly over the period 2000–2008.

We have not been able to find internationally comparable indicators on the quality of transport infrastructure. According to WEF's Global Competitiveness Index, New Zealand's transport quality is perceived to be similar to the OECD mean and below the comparator countries.¹⁶²

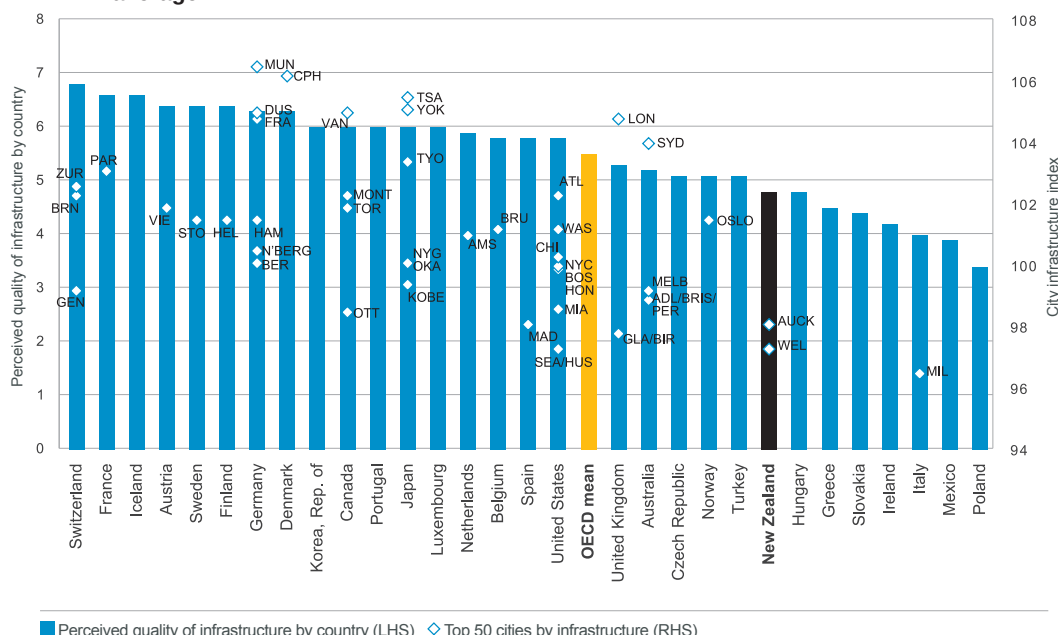
Water

FIG 5.2.15 AND FIG 5.2.16

New Zealand has a relatively low unit price for household water and sanitation services when compared with the OECD mean. Agricultural water use increased substantially in New Zealand between the period 1990–1992 and the period 2002–2004. This growth coincides with a doubling in dairy production between 1990 and 2005.

¹⁶² World Economic Forum, Global Competitiveness Index Analyser (2009–2010). *Rankings, A.02.01 A, Transport Infrastructure*. See <http://gcr.weforum.org/gcr09/>

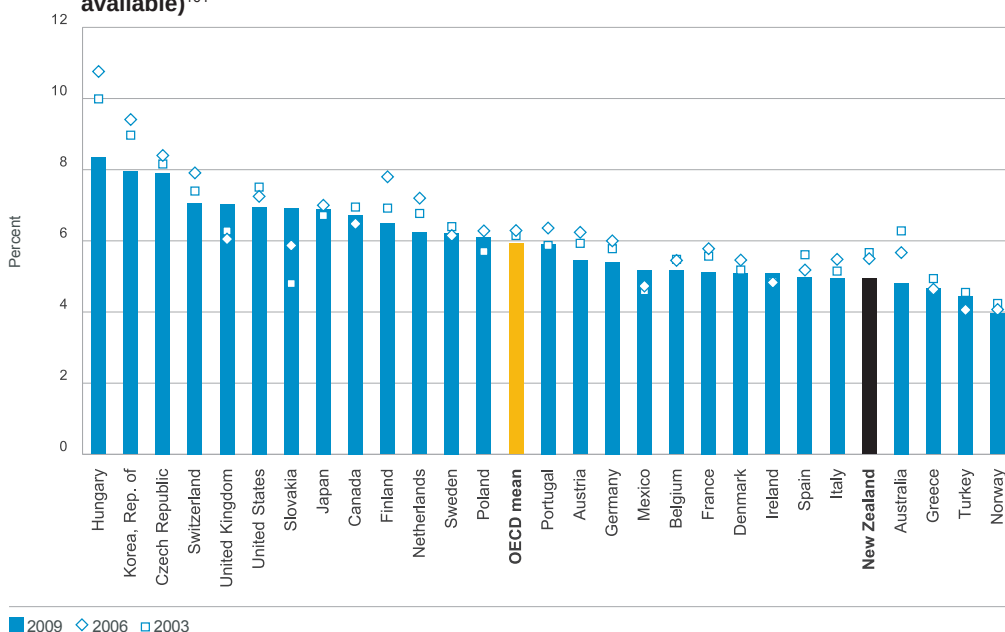
FIG 5.2.1 Perceived country and Mercer city infrastructure quality, 2009–2010 weighted average



Overall Performance

This graph shows the perceived quality of infrastructure in OECD countries as measured by the Global Competitiveness Report, and the quality of infrastructure in cities within those countries as measured by the Mercer survey. The perceived quality of New Zealand's infrastructure is in the bottom half of the OECD (21st out of 30). The Mercer index for city infrastructure quality places Auckland 43rd and Wellington 47th in 2009 out of their annual sample of 215 world cities.

FIG 5.2.2 ICT expenditure as a percentage of nominal GDP, 2003, 2006, and 2009 (or latest available)¹⁶⁴



ICT

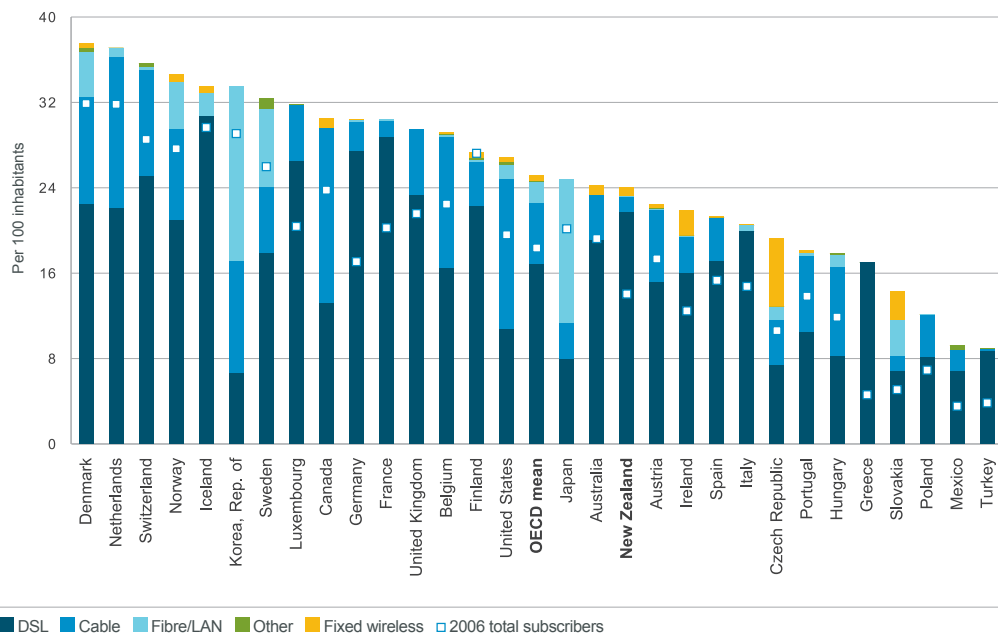
New Zealand's ICT expenditure as a percentage of GDP is lower than the OECD mean. Since 2003, it has fallen more than the OECD mean and all OECD countries apart from Australia, Korea, and Hungary.

¹⁶³ The abbreviations stand for: Zurich (ZUR), Bern (BRN), Geneva (GEN), Paris (PAR), Vienna (VIE), Stockholm (STO), Helsinki (HEL), Munich (MUN), Dusseldorf (DUS), Frankfurt (FRA), Hamburg (HAM), Nurnberg (NBERG), Berlin (BER), Copenhagen (CPH), Vancouver (VAN), Montreal (MONT), Toronto (TOR), Ottawa (OTT), Tsukuba (TSA), Yokohama (YOK), Tokyo (TYO), Nagoya (NYG), Osaka (OKA), Kobe (KOB), Amsterdam (AMS), Brussels (BRU), Madrid (MAD), Atlanta (ATL), Washington (WAS), Chicago (CHI), New York City (NYC), Boston (BOS), Honolulu (HON), Miami (MIA), Houston (HUS), Seattle (SEA), London (LON), Birmingham (BIR), Glasgow (GLA), Sydney (SYD), Melbourne (MELB), Adelaide (ADL), Brisbane (BRIS), Perth (PER), Oslo (OSLO), Auckland (AUCK), Wellington (WEL), Milan (MIL).

¹⁶⁴ Latest data for Switzerland are for the year 2008.

FIG
5.2.3 Broadband subscribers per 100 inhabitants, 2006 and 2009

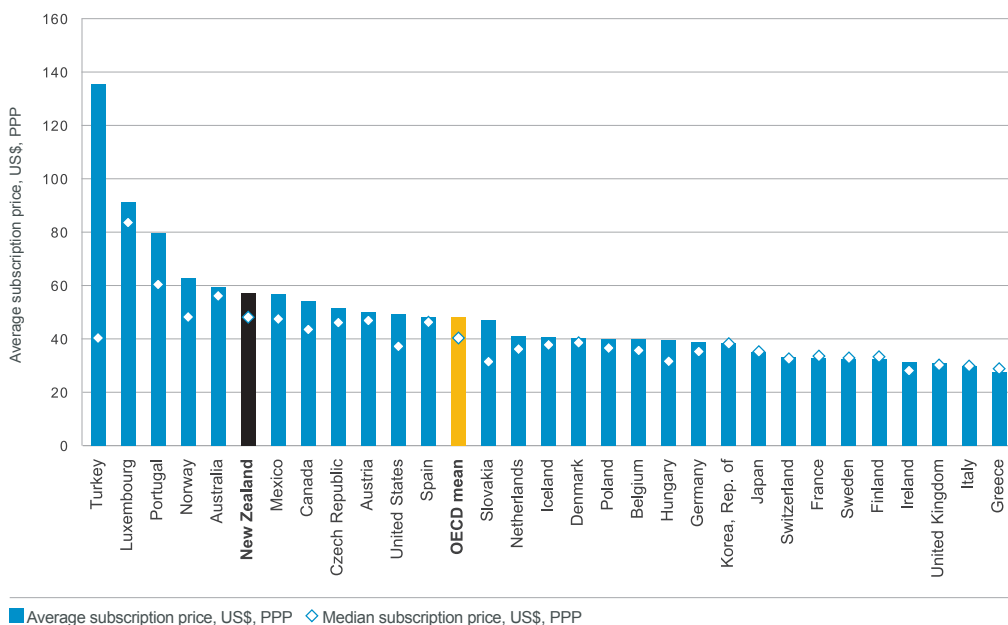
The number of New Zealand broadband subscribers per 100 inhabitants increased between 2006 and 2009, closing the gap with the OECD mean, and lifting New Zealand to 18th in the OECD. The level of uptake for faster forms of broadband, such as cable, is towards the bottom of the OECD.



Source: OECD, Broadband Statistics 2009, Table 4a Broadband subscribers per 100 inhabitants in OECD countries, December 2006 and December 2009

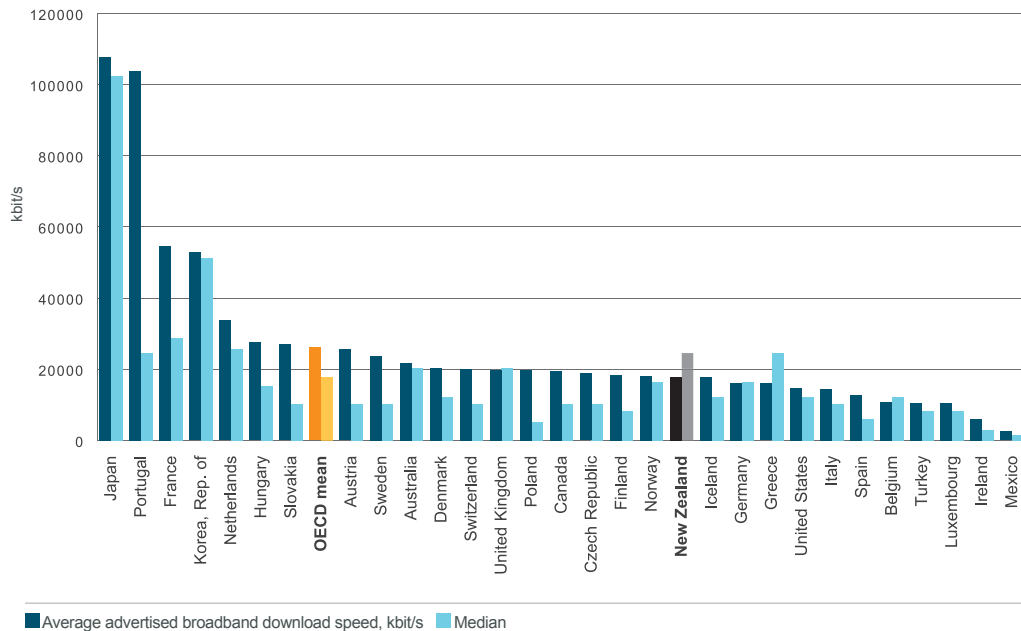
FIG
5.2.4 Broadband average monthly subscription price, October 2009, US\$, PPP

New Zealand's broadband average monthly subscription price (as a mean of all advertised broadband offers at all speeds/caps) is relatively high compared with most other OECD countries.



Source: OECD, Broadband Portal, Table 4e Average broadband monthly subscription price, Oct 2009, US\$, PPP

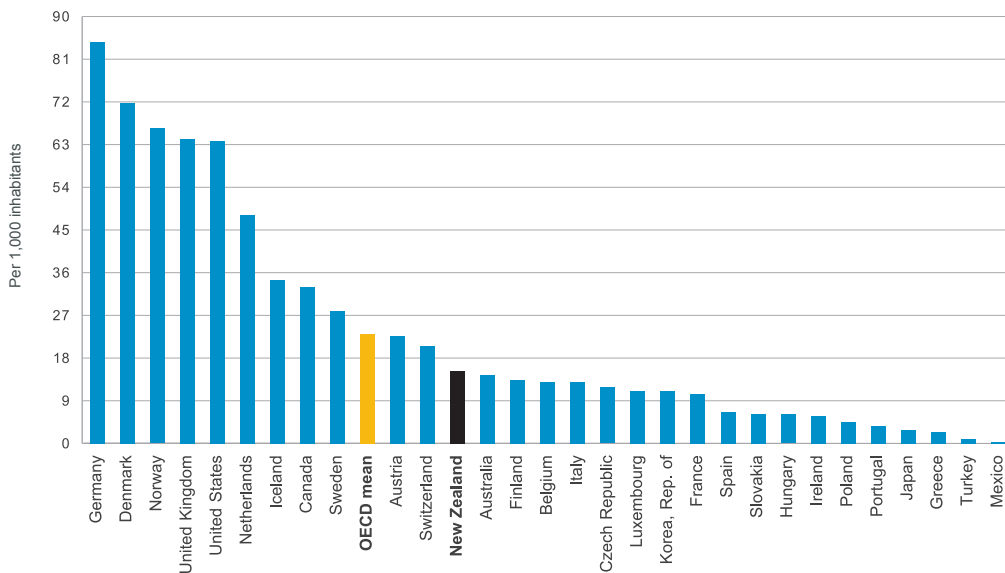
FIG

5.2.5 Average advertised broadband download speed by country, kbit/s, 2009¹⁶⁵

Average advertised broadband download speeds are similar to most other OECD countries, though much slower than the fastest (Japan and Portugal).¹⁶⁶

Source: OECD, Broadband Portal, Table 5a Average advertised broadband download speed, by country, kbit/s, October 2009

FIG

5.2.6 Number of websites per 1,000 inhabitants, 2002

The number of websites per 1,000 inhabitants (based on location, not owner) in New Zealand is greater than in some other nations such as Australia, Finland, and Ireland (New Zealand is 12th in the OECD). However, it is significantly lower than in high-scoring countries such as Denmark.

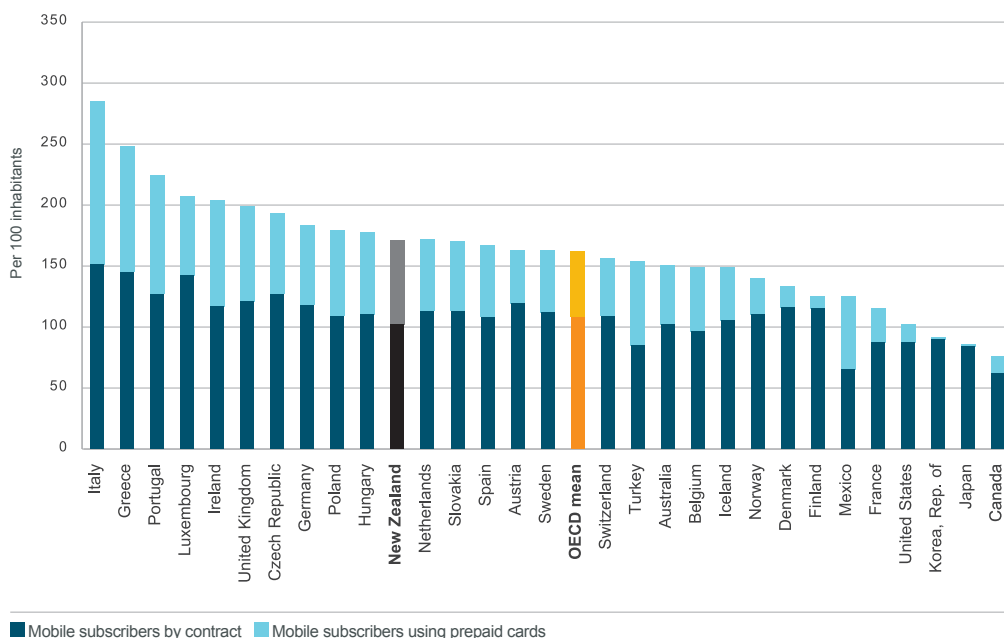
Source: OECD Communications Outlook 2003, Table 5.6 Web sites (servers) by country, 2000–2002

¹⁶⁵ Advertised speeds are typically the theoretical maximum for the employed technologies. Users commonly have lower actual speeds. Also, often only parts of the country have been upgraded to the fastest speeds. New Zealand's download speeds are not typically advertised. Figures were imputed using technological maximum speeds for ADSL 2+.

¹⁶⁶ New Zealand prices broadband by volume, while many other countries price by speed.

At 172 subscribers per 100 inhabitants, New Zealand is higher than the OECD mean of 162. This measure includes both prepaid and contract mobile subscribers.

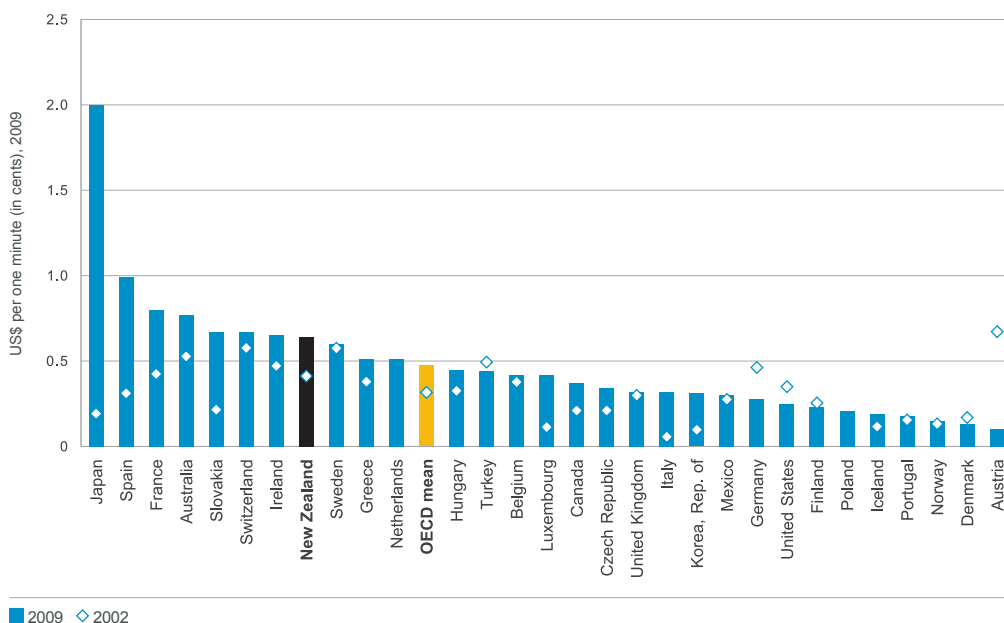
FIG
5.2.7 Total mobile phone subscribers per 100 inhabitants, 2007



Source: OECD, Key ICT Indicators 2009, Table 2 Mobile subscribers in total/per 100 inhabitants for OECD, 2007

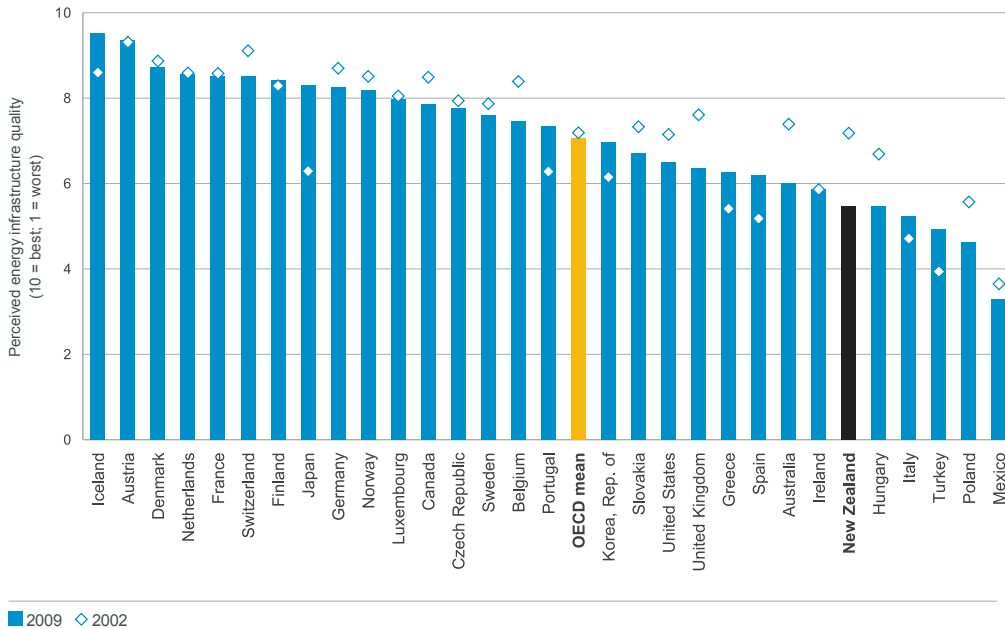
New Zealand's prepaid mobile costs (calculated at 2009 exchange rates) are above the OECD mean, but slightly cheaper than in Australia and Ireland.

FIG
5.2.8 Mobile telephone costs (prepaid), 2002 and 2009



Sources: IMD, World Competitiveness Yearbook 2010, Table 4.2.05 Mobile telephone costs; IMD, World Competitiveness Yearbook 2004, Table 4.2.05 Mobile telephone costs

FIG
5.2.9 Perceived quality of energy infrastructure, 2002 and 2010

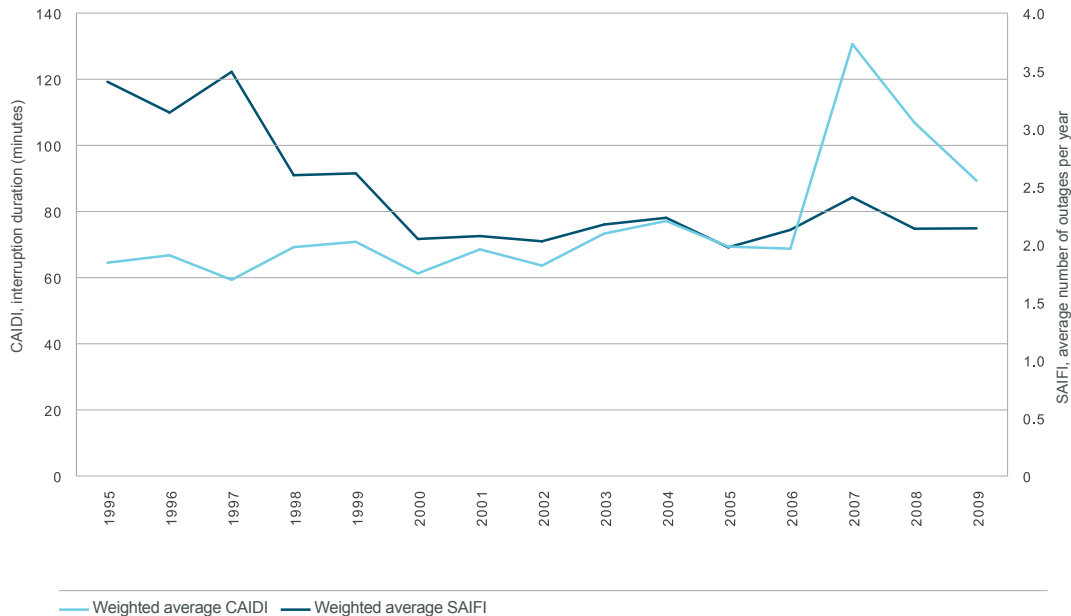


Sources: IMD, World Competitiveness Yearbook 2010, Table 4.1.18 Energy infrastructure; IMD, World Competitiveness Yearbook 2002, Table 4.1.15 Energy infrastructure

Energy

New Zealand is ranked 25th in the OECD for perceived adequacy and efficiency of energy infrastructure.

FIG
5.2.10 System Average Interruption Frequency Index (SAIFI) and Customer Average Interruption Duration Index (CAIDI), 1995–2009

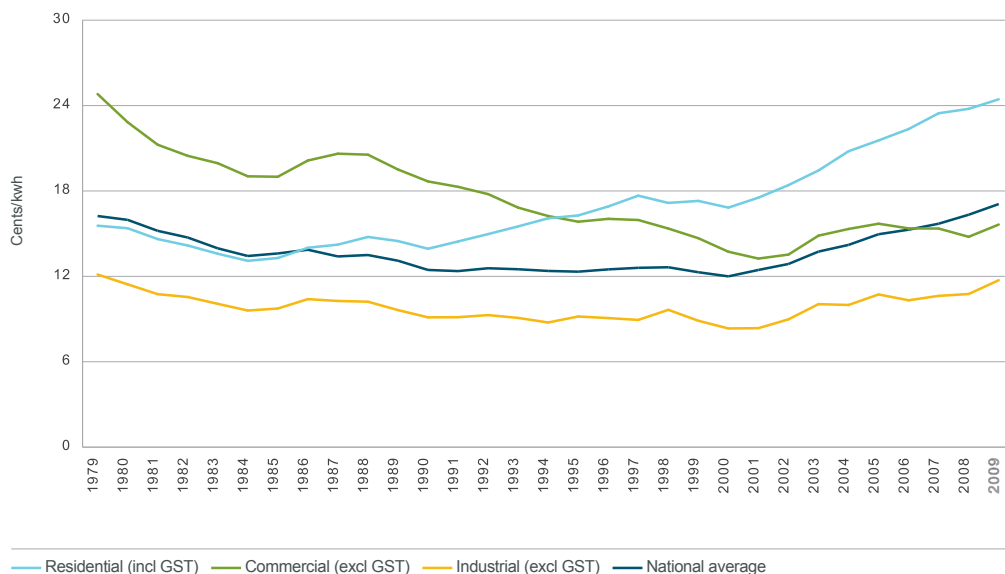


Source: Ministry of Economic Development, New Zealand Energy Indicators 2009, customised data request

The SAIFI indicates how often an electricity customer, on average, experiences an outage during the course of a year. After decreasing from 1995 to 2000, the SAIFI remained flat over the past decade. The CAIDI indicates the duration of these interruption periods. Apart from a spike around 2007, this indicator has increased slowly since 1995.

FIG
5.2.11 Electricity prices in New Zealand (real 2009 prices)

Over the past 15 years, real residential electricity prices have increased, commercial prices have decreased, and industrial prices have remained relatively flat. Average real prices increased only marginally over that period.

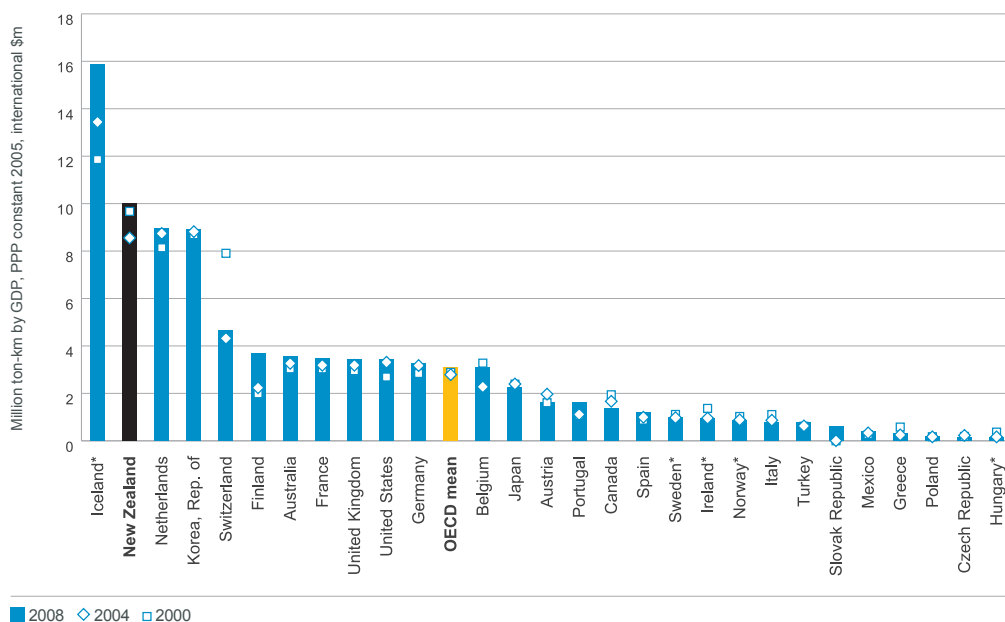


Source: Ministry of Economic Development, New Zealand Energy Data File 2009, Table 2 Electricity prices (real 2009 prices)

Transport

In 2008, New Zealand ranked second in the OECD for distance-weighted tonnes of air freight carried internationally (divided by GDP). Air freight includes the quantity of freight, express, and diplomatic bags carried on each flight stage (from arrival to departure), measured in metric tons multiplied by kilometres travelled.

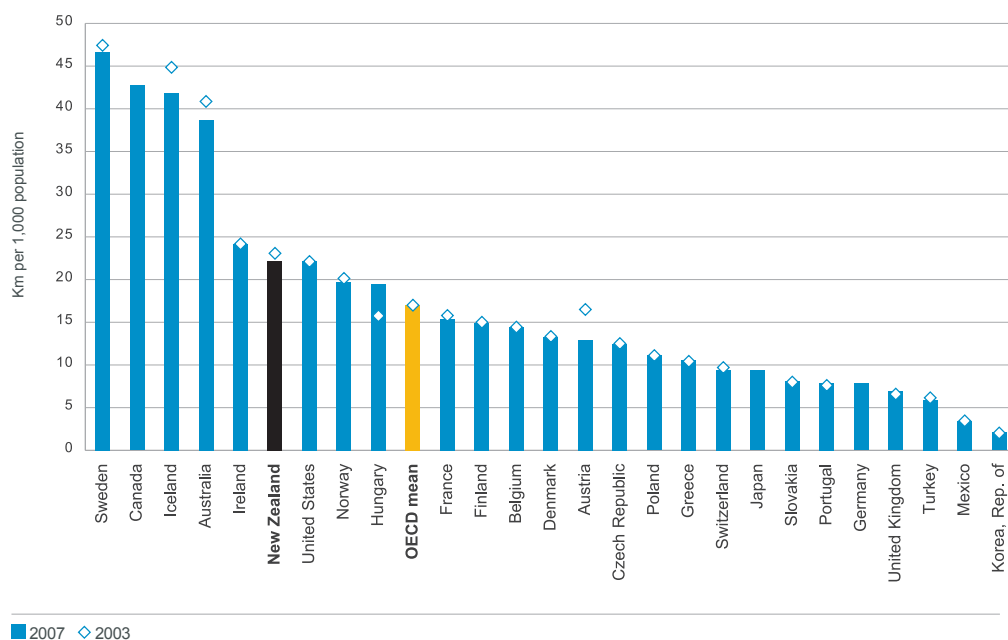
FIG
5.2.12 Air freight carried, 2000, 2004, and 2008 (or latest available)¹⁶⁷



Source: World Bank databank, World Development Indicators, Air transport, Freight (million ton-km) and GDP, PPP constant prices

¹⁶⁷ 2008 data for Iceland, Hungary, and Ireland are 2006 actuals, and 2008 data for Sweden and Norway are 2004 actuals. These countries are marked with an asterisk.

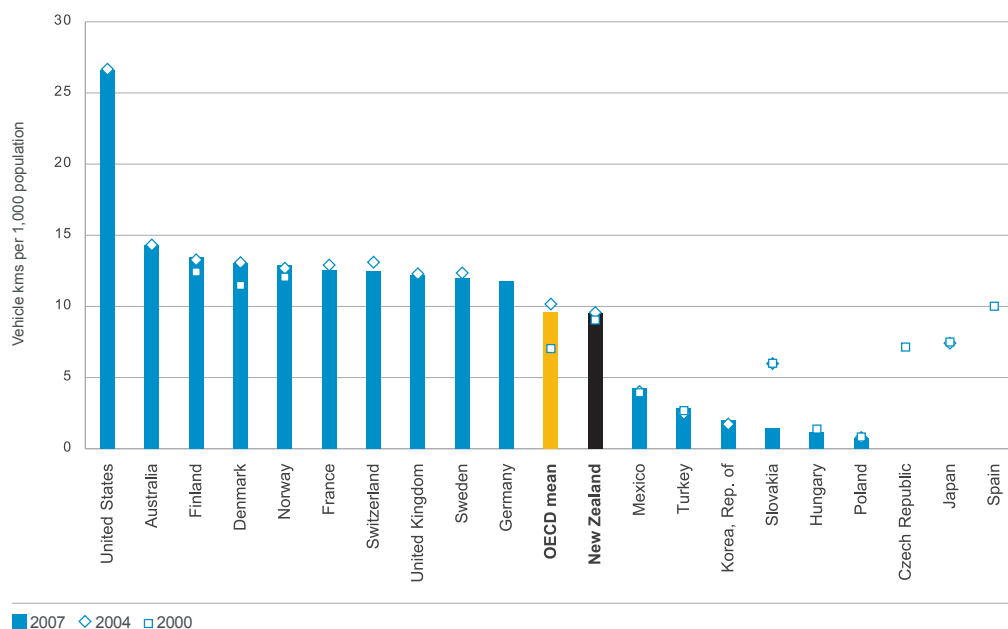
FIG
5.2.13 Road network per 1,000 inhabitants, 2003 and 2007 (or latest available)



Source: World Bank databank, World Development Indicators, Road network and population

New Zealand currently ranks sixth in the OECD for total roading network length per person. Like most OECD countries, New Zealand's position remained the same between 2003 and 2007. Less densely populated countries tend to have higher roading network lengths per person.

FIG
5.2.14 Road traffic, 2000, 2004, and 2007 (or latest available)



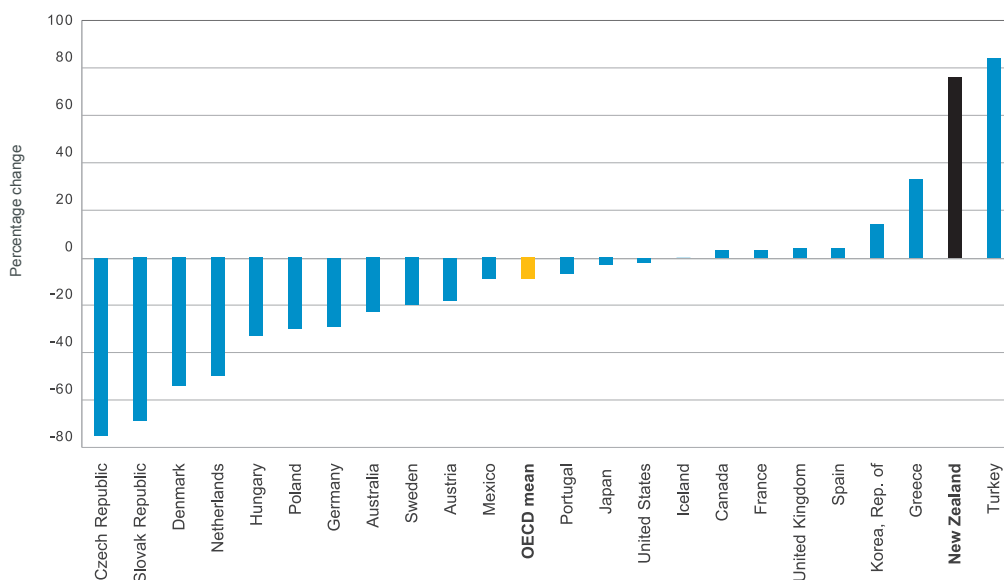
Source: World Bank databank, World Development Indicators, Road traffic and population

New Zealand's road traffic (measured by vehicle kilometres per 1,000 inhabitants) remained relatively constant between 2000 and 2007, and was similar to the OECD mean in 2007.

Water

New Zealand's agricultural water use has increased significantly between the period 1990–1992 and the period 2002–2004 (second only to Turkey). This has approximately coincided with the doubling in dairy production (measured as kilograms of milk solids) over the period 1990–2005.¹⁶⁸

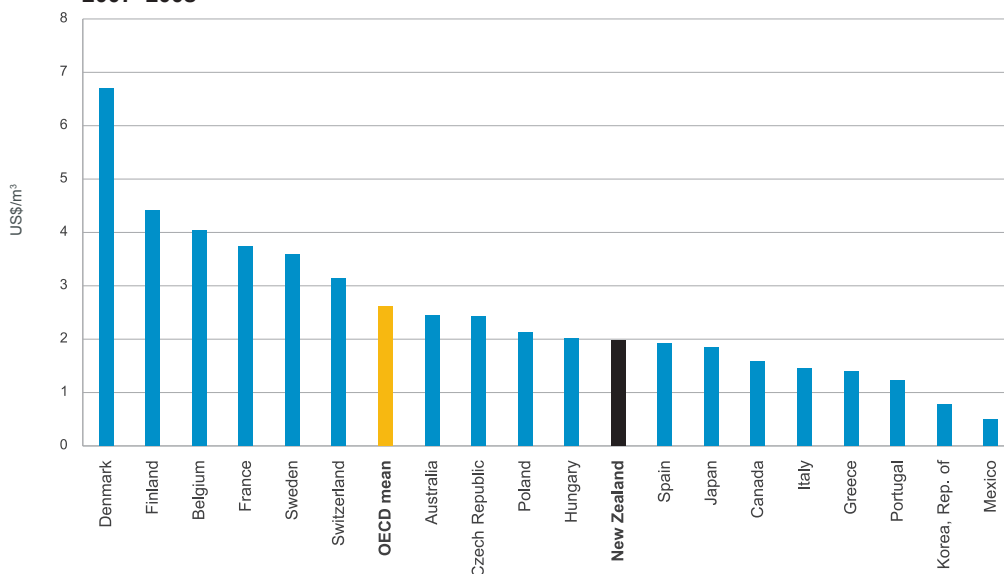
FIG 5.2.15 Percentage change in total agricultural water use, 1990–1992 to 2002–2004



Source: OECD, Water – The Right Price Can Encourage Efficiency and Investment, Figure 4 Agricultural water use: % change in total water use, 1990–1992 and 2002–2004

New Zealand has a lower unit price of water sanitation services to households than the OECD mean (ninth lowest in the OECD in 2007–08).

FIG 5.2.16 Unit price of water sanitation services to households, including taxes (US\$/m³), 2007–2008



Source: OECD, Water – The Right Price Can Encourage Efficiency and Investment, Figure 2 Unit price of water and sanitation services to households incl. taxes (US\$/m³)

5.3 – Institutions and Regulation

Key Points

- The quality of New Zealand's institutions and regulatory settings (including social norms, property rights, and business law) underpins long-run economic growth. It influences the incentives businesses and individuals have to locate in New Zealand, and the ability they have to undertake innovative and socially productive economic activity.
- New Zealanders' responses to the World Values Survey (WVS) show they have positive attitudes towards the benefits of work and the potential to acquire wealth. In terms of these values, New Zealand does not differ markedly from key comparator countries.
- New Zealand ranks above the OECD mean in relation to indicators of the rule of law, control of corruption, and property rights, all of which are important fundamental institutions underpinning economic growth.
- New Zealand ranks top in the OECD and third in the world for overall ease of doing business. However, there is scope for further improvement in certain sub-indicators.
- The restrictiveness of product market regulation in New Zealand is now similar to the OECD mean. Ten years ago New Zealand was rated as one of the least restrictive, but other OECD countries have extensively liberalised their product markets in the intervening period.

Introduction

A country's institutions – broadly conceived – include all the formal rules and informal conventions or norms that shape the political, economic, and social behaviours of members of society.

Fundamental institutions, such as social norms, property rights, and the rule of law, underpin long-run economic growth by shaping the economic and regulatory environment in which businesses and individuals operate. They help sustain the trust necessary to support sophisticated economic exchanges between people who may not know each other well by reducing the likelihood of corruption, expropriation, and people avoiding their legal obligations.

Other specific institutions include legislation and regulations that support the activities required to produce goods and services, and to undertake transactions, in different markets. These institutions contribute to economic success by reducing negative externalities (where people do not have to take account of the full costs of their actions), opportunistic behaviour (where people exploit power imbalances or information not available to others), and other sources of transactions costs.

The quality of New Zealand's institutions and regulatory settings influences the incentives for businesses and workers to locate or undertake additional economic activity in New Zealand. It is important for New Zealand to maintain strong institutions and internationally competitive regulatory policies in order to attract and encourage globally competitive firms and skilled workers.

Regulation matters for innovation, productivity, and growth, because it directly affects how markets, and the firms in those markets, operate and allocate resources. Market regulation can support the effective operation of markets and reduce anti-competitive practices. Regulation can also help to achieve public health and safety objectives and to secure desirable social and environmental outcomes.

Poor-quality regulation can constrain growth by creating incentives for socially unproductive activities and by increasing the costs of doing business.

Values and Attitudes to Work and Wealth Accumulation

FIG
5.3.1

Informal institutions such as values and customs can influence social behaviour and economic activity in various ways, including by affecting aspirations and the expectation of rewards associated with different behaviours and activities.

The WVS is a worldwide investigation of changing values and their impact on social and political life. It is conducted by a network of social scientists at universities around the world, coordinated by a central body, the World Values Survey Association. Survey participants are from the general population of the relevant country. Each country survey is conducted by a local field organisation and is supervised by academic researchers. Survey methods include face-to-face interviews and postal questionnaires.

New Zealanders' responses to the WVS show they hold positive attitudes towards the benefits of work and the potential to acquire wealth – at levels similar to those found in comparator countries.

Rule of Law and Control of Corruption

FIG
5.3.2 AND FIG
5.3.3

The World Bank's Worldwide Governance Indicators project draws together hundreds of variables from many different data sources to measure six broad dimensions of governance for over 200 countries. Data are gathered from a number of survey institutes, think tanks, non-governmental organisations (NGOs), and other international bodies. The indicators aggregate the views on governance of public sector, private sector, and NGO experts, as well as from survey responses from thousands of citizens and firms worldwide.

The World Bank defines 'governance' as the traditions and institutions by which authority in a country is exercised. Since objective data are difficult to obtain for many of the key dimensions of governance, there are few alternatives to subjective or perceptions-based measures.

One dimension of governance is the rule of law, viewed as the extent to which people have confidence in, and abide by, the rules of society. This includes the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Another dimension is the control of corruption, or the extent to which public power is exercised for private gain. This encompasses both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests.

New Zealand ranks at the upper end of the scores achieved by OECD countries for each of these measures.

Property Rights

FIG
5.3.4

The most suitable indicator we have found of property rights is one of 10 components of the Heritage Foundation's Index of Economic Freedom. The index is based on the authors' assessment of the strength of property rights in a country as measured against a number of criteria. It reflects the degree to which a country's laws protect private property rights and the extent to which its government enforces those laws. The index also assesses the likelihood that private property will be expropriated and analyses the independence of the judiciary, the existence of corruption within the judiciary, and the ability of individuals and businesses to enforce contracts.

New Zealand has a high level of certainty of property rights, scoring first equal with Sweden on the measure reported here. They are closely followed by a group of 12 OECD countries, including Australia.

Ease of Doing Business

FIG
5.3.5 TO FIG
5.3.7

Well-designed business regulation aims to improve the flexibility and functioning of markets while reducing uncertainty and imposing the lowest possible compliance costs on firms.

Through its *Doing Business* reports, the World Bank provides quantitative benchmarks for 183 countries against which to measure the level of regulation and red tape experienced by domestic small-to-medium-size firms. Information for the nine topic areas that make up the index¹⁶⁹ is fact-based and sourced from standardised survey results completed through interactions with a range of local experts in each country, and which are then tested by World Bank staff for robustness.

According to the World Bank index, New Zealand has a very business-friendly regulatory environment. New Zealand performs very well overall, and scores highly in some but not all of the nine topic areas.

Employment regulation in New Zealand also appears to be relatively flexible by world standards.

169 Figure 5.3.6 shows results by topic area.

Restrictiveness of Product Market Regulation

FIG 5.3.8 AND FIG 5.3.9

Regulation also affects the performance of the wider economy. For example, the OECD argues that more intense competition in product markets tends to boost economic growth.¹⁷⁰

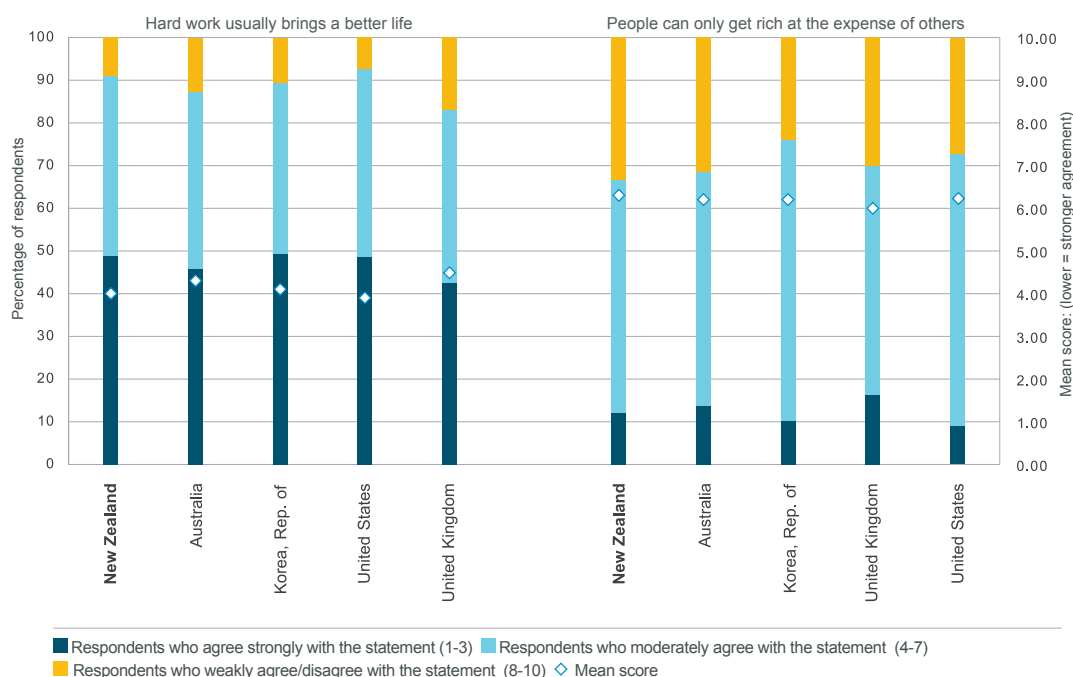
The OECD's integrated Product Market Regulation (PMR) indicators turn qualitative data on laws and regulations that may affect competition in product markets, into quantitative indicators. The qualitative data are drawn from responses by OECD member countries to multi-choice questions in the OECD's Regulatory Indicators Questionnaire, supplemented by data from OECD and other publications – notably of the European Commission and the internet sites of national governments.

The indicators reflect the stringency of regulatory policy on a scale from 0 to 6, with higher numbers associated with policies that are more restrictive to competition. The overall PMR indicator is a simple composite of seven mid-level indicators, which themselves are built up from 18 low-level indicators covering three broad areas: the degree of state control; barriers to entrepreneurship; and barriers to trade and investment.

The overall PMR indicator suggests that, in 2008, New Zealand was close to the middle of the OECD pack. This contrasts with the position in 1998, when New Zealand PMR was amongst the least restrictive in the OECD. The change has occurred because other OECD countries have extensively liberalised their product markets in the intervening 10 years.

170 Wölfl, A, Wanner, I, Kozluk, T, & Nicoletti, G (2009). *Ten years of product market reform in OECD countries – Insights from a revised PMR indicator*. OECD Economics Department Working Paper No. 695, ECO/WKP(2009)36. Paris: OECD. See <http://www.oecd.org/dataoecd/21/20/44538108.pdf>

FIG 5.3.1 Beliefs about work and wealth creation^{171,172}, 2006 (or latest available)

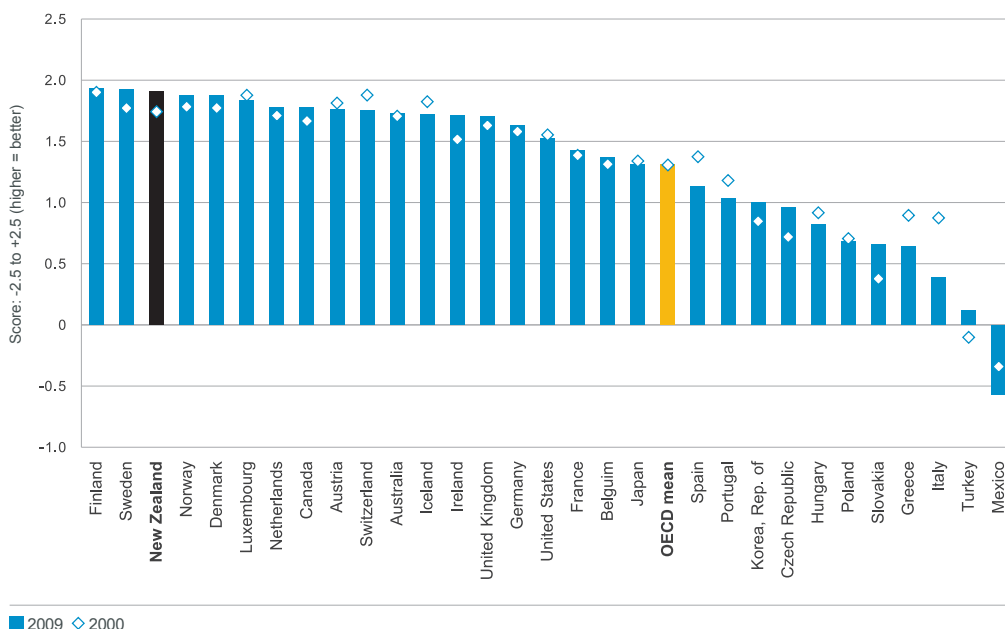


Source: WVS, V120 Hard work brings success and V121 Wealth accumulation

Values and Attitudes to Work and Wealth Accumulation

The percentage of New Zealand respondents in the WVS who agree with the statements that “hard work usually brings a better life”, and that “people only get rich at the expense of others”, is similar to levels found in comparator countries. This indicates that New Zealanders are about as likely as people in other countries to believe that hard work brings success and that getting rich is not normally at the expense of others.

FIG 5.3.2 Rule of law (higher = better), 2000 and 2009



Source: World Bank, Worldwide Governance Indicators database 2009

Rule of Law and Control of Corruption

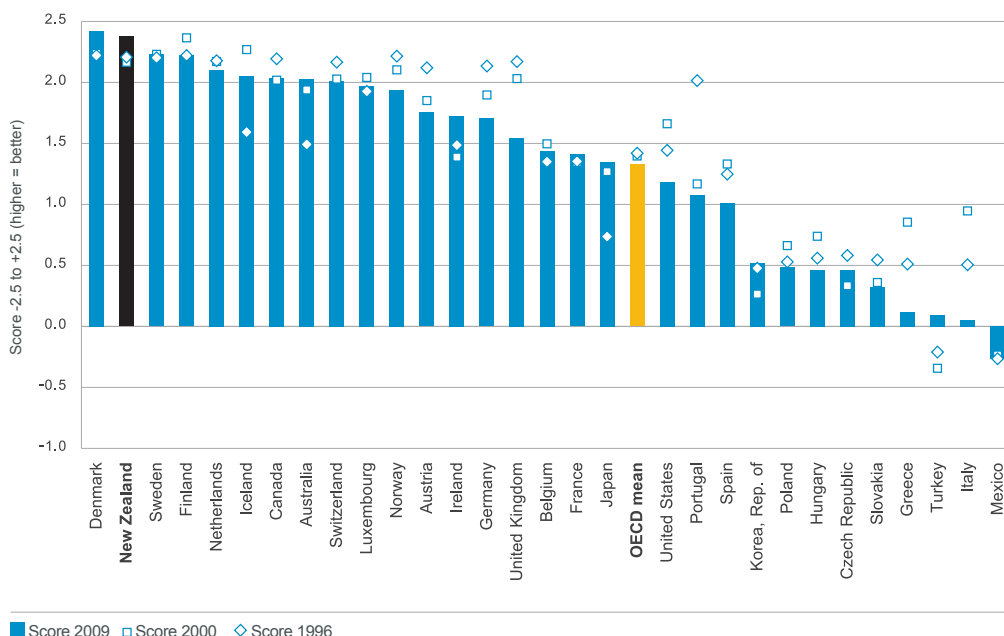
New Zealand shows strong adherence to the rule of law. In 2009, its score was the third highest – close to the top-ranked OECD countries.

171 Respondents chose answers from 1 to 10, where complete agreement to the first statement of the proposition = 1 and disagreement or agreement with the alternative statement = 10. A high mean score on “hard work usually brings a better life” means a person strongly agrees with the contrary statement of “it’s more luck and connections”. A high mean score on “people only get rich at the expense of others” means a person strongly agrees with the contrary statement of “wealth can grow so there’s enough for all”.

172 Australia (2005), United Kingdom (2006), New Zealand (2005), Korea (2005), United States (2006).

New Zealand had the second highest score for control of corruption in 2009 – very close to the highest score for OECD countries.

FIG 5.3.3 Control of corruption (higher = better), 1996, 2000, and 2009

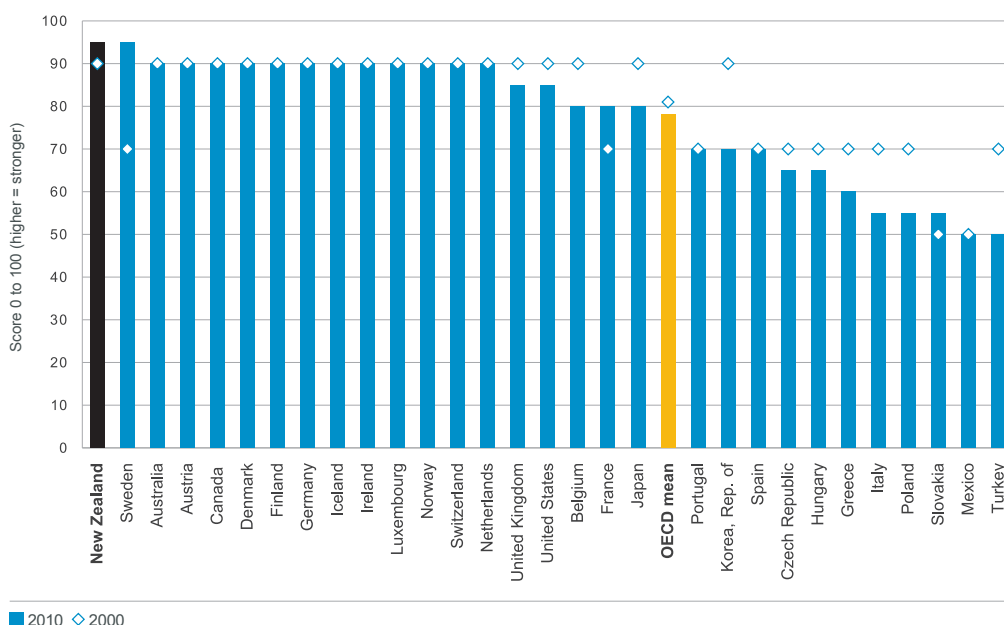


Source: World Bank, Worldwide Governance Indicators database 2009

Property Rights

New Zealand has a high level of certainty of property rights as measured by this indicator. It sits first equal with Sweden and is closely followed by a group of 12 OECD countries, including Australia.

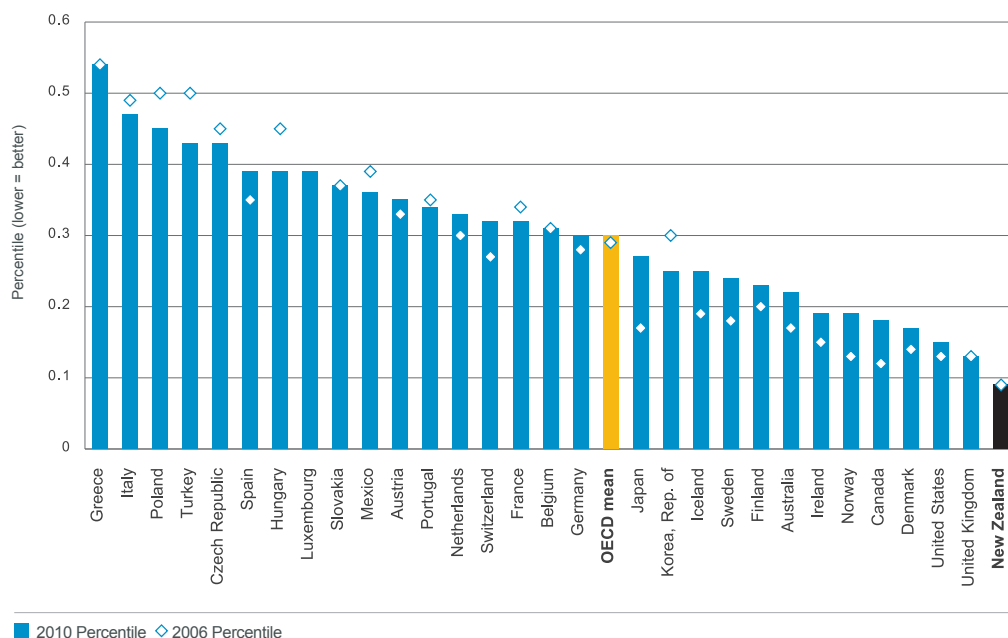
FIG 5.3.4 Strength of property rights¹⁷³ (higher = stronger), 2000 and 2010



Source: The Heritage Foundation, 2010 Index of Economic Freedom

173 The index is based on the following sources for information on property rights, in order of priority: Economist Intelligence Unit (Country Profile, Country Report, and Country Commerce), 2005–2009; U.S. Department of Commerce, Country Commercial Guide, 2005–2009; U.S. Department of State, Country Reports on Human Rights Practices, 2005–2009; and various news and magazine articles.

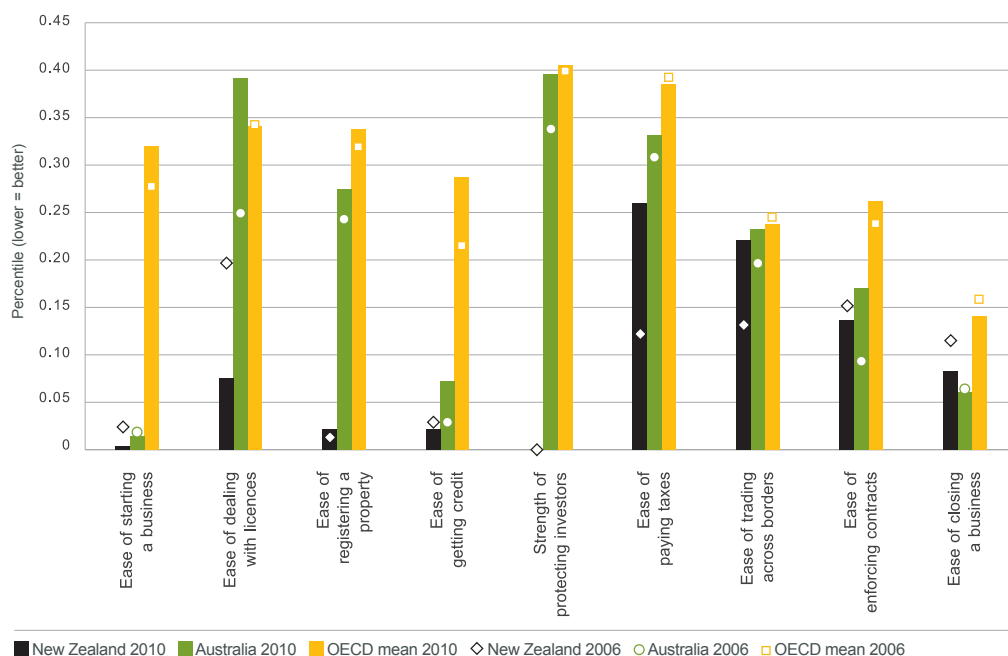
FIG
5.3.5 Ease of doing business index (0–1) (lower = better), 2006 and 2010



Ease of Doing Business

New Zealand ranks top in the OECD and third in the world (behind Singapore and Hong Kong) for overall ease of doing business in the World Bank's annual *Doing Business* reports.¹⁷⁴

FIG
5.3.6 Ease of doing business, nine-category breakdown (0–1) (lower = better), 2006 and 2010

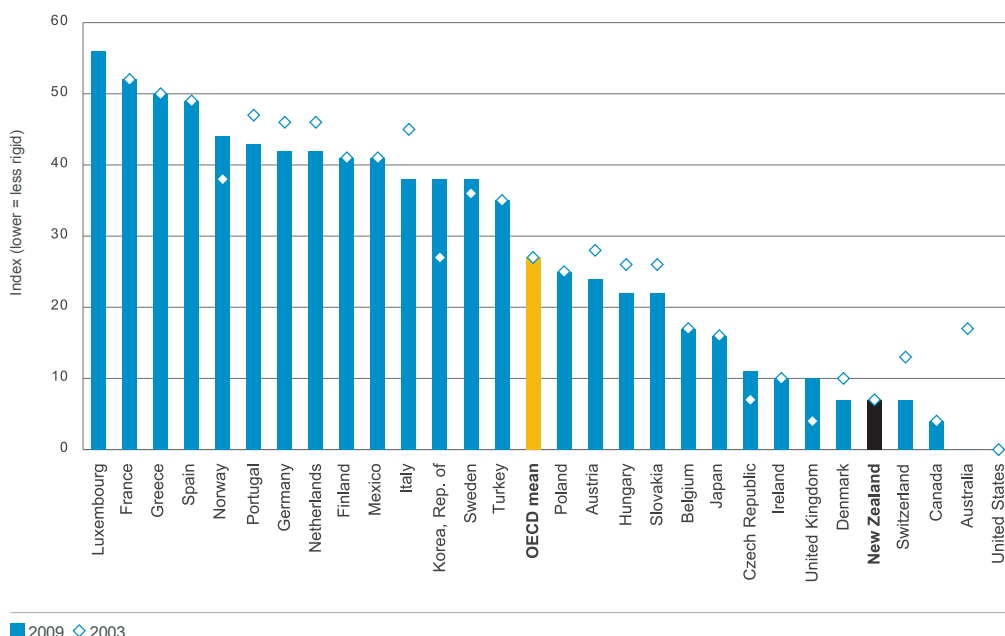


Of the nine sub-categories making up the World Bank's ease of doing business index, New Zealand is the top OECD performer in four: ease of starting a business; ease of registering property; ease of getting credit; and strength of protecting investors. New Zealand does not score as well as some other OECD countries in the other categories.

174 Compared with previous annual World Bank *Doing Business* reports, the 2010 report has dropped one of the 10 components of the overall ease of doing business index (the 'ease of employing workers' component). There were revisions to the data in 2009 but not to the 2006 data. For consistency with the 2010 data, we have re-calculated the 2006 score as the simple average of the remaining nine components.

In 2009, the World Bank ranked New Zealand fourth equal (with Switzerland and Denmark) in the OECD for its flexible employment regulation. The index is a composite indicator of three employment regulation indexes reported in the Doing Business survey: the difficulty of hiring; termination; and changing work hours.¹⁷⁵

FIG 5.3.7 Rigidity of employment regulation index (0–100) (lower = less rigid), 2003 and 2009

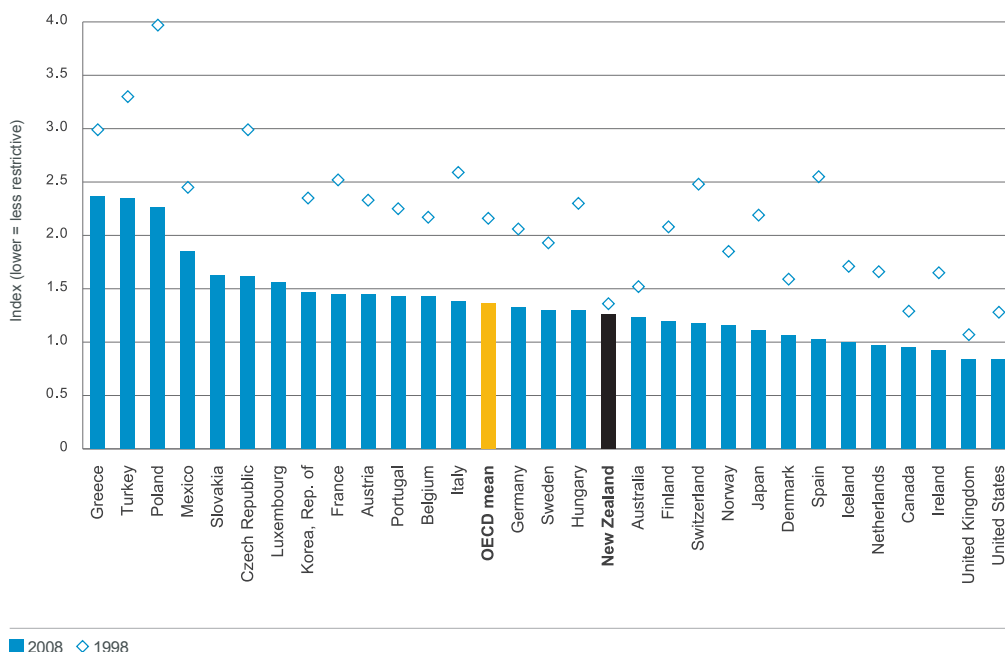


Source: Doing Business 2010 and 2004, Rigidity of employment index

Restrictiveness of Product Market Regulation

The restrictiveness of product market regulation in New Zealand is now similar to the OECD mean (14th out of 30 countries). In 1998 New Zealand was rated as one of the least restrictive, but its overall performance has not changed significantly in the ensuing 10 years compared with other OECD countries, many of which have aggressively liberalised their product markets.

FIG 5.3.8 Product market regulation index (0–6) (lower = less restrictive), 1998 and 2008

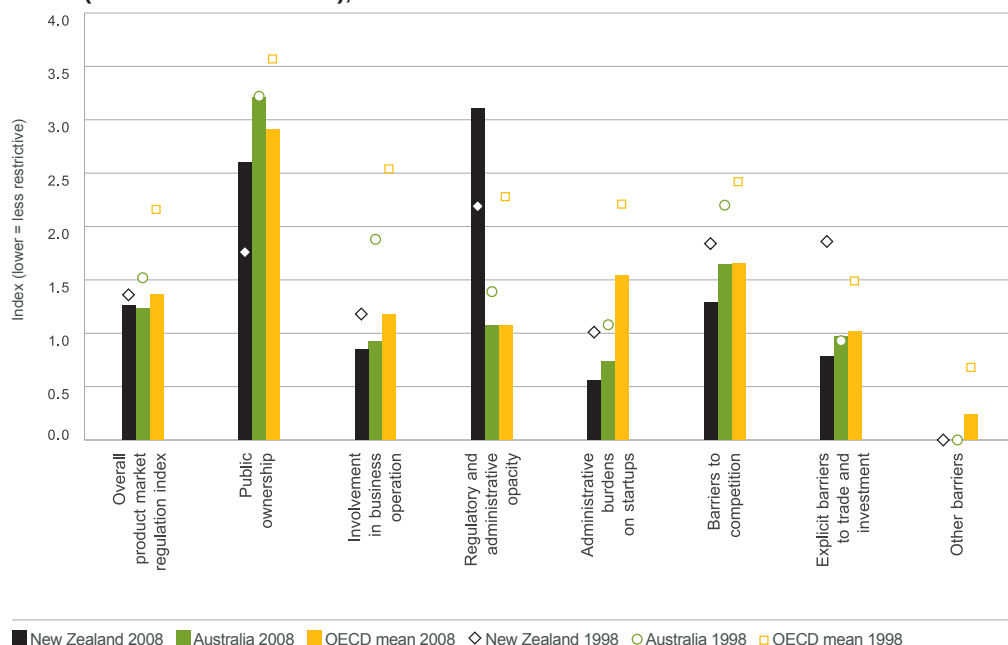


Source: OECD Indicators of Product Market Regulation 2008 and 1998, Table: Product market regulation high-level

175 The World Bank has cautioned that this composite indicator should not be used as a policy target or indicator of policy success as it captures only one dimension of employment policy.

FIG

5.3.9 Product market regulation index, seven-category breakdown (0–6)
(lower = less restrictive), 1998 and 2008



New Zealand is rated as having less restrictive regulation than either Australia or the OECD mean across six of the seven mid-level indicators that underpin the OECD's integrated PMR indicator. For regulatory and administrative opacity, however, New Zealand rates as significantly more opaque, due to the absence of both 'one-stop shops' and 'silence is consent' rules in New Zealand for granting licences or permits.¹⁷⁶

Source: OECD Indicators of Product Market Regulation 2008 and 1998, Tables: Product market regulation, State control, Barrier to entrepreneurship, Barrier to trade and investment

176 The PMR defines 'one-stop shops' as single contact points for getting information on, issuing, or accepting, notifications and licences. The 'silence is consent' rule implies that licences are issued automatically if the licensing office has not acted by the end of the statutory response period.

5.4 – Macroeconomic Foundations

Key Points

- The global financial crisis has resulted in a simultaneous fall in GDP growth and inflation in the OECD. For New Zealand, GDP volatility has decreased since the 1980s, although it remained higher in New Zealand than in comparator countries.
- Inflation has been low and stable for the last 20 years.
- There has been a decline in government surpluses and more recent emergence of deficits as a result of the global financial crisis. These are likely to persist for some time, so the New Zealand Government will no longer provide as much of an offset for low rates of private saving and will not have the same scope to provide a buffer against shocks.
- New Zealand's real long-term interest rate has generally been reducing, along with global interest rates, since the early 1990s, but is still higher than all of the comparator economies and the OECD mean.
- New Zealand's real exchange rate, which is relatively volatile, has fallen somewhat from the 30-year high experienced in 2005.
- New Zealand's terms of trade for goods and services have increased over the last decade, adding to national income.
- New Zealand has run persistent current account deficits since the 1980s that are larger than those in all of our comparator economies. This reflects a lower level of national savings than investment. After increasing over the last decade, the current account deficit has narrowed as a result of the 2008/09 recession.
- The ongoing current account deficits have left New Zealand's external liabilities at the high end of the OECD as a percentage of GDP.

Introduction

Policies that ensure stable and sustainable macroeconomic conditions are important for economic growth.¹⁷⁷ Macroeconomic instability creates uncertainty for businesses and households, and can make long-term planning difficult, with adverse impacts on investment, saving, and labour productivity. Conversely, well-designed fiscal and monetary policies can facilitate growth by reducing uncertainty, lowering interest rates, and improving resilience to shocks.

Macroeconomic stability can be measured by the degree of peak-to-trough cyclicity in key macroeconomic variables, such as GDP growth, inflation, interest rates, and the exchange rate.¹⁷⁸ Sustainability is often associated with the levels of certain macroeconomic variables, such as spending, external indebtedness, and current account deficits, and whether these levels can persist without inhibiting long-term growth.

Medium-term Volatility in GDP Growth

TABLE 1 AND FIG 5.4.1

Medium-term volatility in GDP growth (cyclical fluctuations in GDP growth rates) may increase investor uncertainty, with negative consequences for the trend growth in GDP per capita. Furthermore, under volatile conditions, job turnover tends to be higher, reducing the opportunity for workers to accumulate skills and knowledge on the job.

The annual standard deviation of average GDP growth is an indicator of its medium-term volatility. Since the 1980s, GDP growth volatility has decreased for New Zealand, as well as for the OECD overall. However, New Zealand's growth volatility still remains somewhat higher than the OECD median. This is likely to reflect the fact that New Zealand is a small, open, commodity exporting economy.

TABLE

1 Summary of key macroeconomic indicators

	New Zealand		OECD Median (1)	
	1990–1999	2000–2009	1990–1999	2000–2009
Real GDP growth (2)	2.93%	2.72%	2.52%	2.40%
Standard deviation (of annual variation)	2.60%	1.92%	2.10%	1.42%
Inflation rate	2.11%	2.68%	2.78%	2.45%
Standard deviation (of annual variation)	1.75%	0.64%	1.78%	1.03%
Real interest rate (3)	5.88%	3.35%	5.01%	2.23%
Standard deviation (of annual variation)	1.04%	0.73%	1.19%	1.09%
Real effective exchange rate (1990 = 100)	97.59	100.31	101.90	103.99
Standard deviation (of annual variation)	7.405	11.706	5.679	5.654
Current account balance (% of GDP) (4)	-4.46%	-5.85%	-0.04%	-1.52%
Financial balance (% of GDP) (5)	0.86%	2.54%	-3.70%	-1.19%

(1) The OECD median standard deviation is the median of the individual OECD countries' standard deviations, not the standard deviation of the OECD median. The annual standard deviation of the macroeconomic variables shown is an indicator of the medium-term volatility of these variables.

(2) Real GDP growth data only available up to 2008, so the second period is for 2000–2008.

(3) Interest rate data prior to 2000 are not available for Czech Republic, Greece, Hungary, Mexico, Iceland, Italy, Korea, Luxembourg, Poland, Portugal, and Slovak Republic, but data for these countries are included in the 2000–2009 column.

(4) Current account balance data prior to 1995 are not available for Czech Republic, Greece, Hungary, Iceland, Luxembourg, Poland, Portugal, and Slovak Republic, but data for these countries are included in the 2000–2009 column.

(5) Financial balance data are only available from 1992, so median has been calculated from 1992–1999.

Until the onset of the global financial crisis, house prices rose substantially in New Zealand and many other Western economies. This stimulated substantial demand pressures, and contributed to macroeconomic imbalances, pressure on the tradable sector, and foreign borrowing.

177 Buckle, B. & Drew, A. (Eds) (2006). *Testing stabilisation limits in a small open economy*. Wellington: The Treasury and the Reserve Bank of New Zealand, is a good source of further reading on New Zealand's macroeconomic policy framework.

178 In Table 1 and elsewhere, we have used the annual standard deviation as an indicator of this peak-to-trough cyclicity in the absence of a readily available measure of cyclicity. We use the term 'volatility' to describe the peak-to-trough cyclicity in what follows.

The global financial crisis in late 2008 resulted in a substantial shock to GDP levels in most countries, as is evident in simultaneous drops in real GDP growth in 2009. The New Zealand economy was already in a domestic recession in early 2008. However, the impact of the global downturn on New Zealand, while greater than on Australia, was smaller than for most developed nations.

Inflation and Inflation Volatility

TABLE 1 AND FIG 5.4.2

Inflation is commonly measured by the annual percentage change in the CPI. Low and stable inflation means consumers and producers can depend on prices to reflect economic value, reducing uncertainty. As a result, lower inflation may also result in higher and more stable output growth.

Over the past decade, most OECD countries have achieved low and less volatile rates of inflation, and New Zealand is no exception. With the onset of the global financial crisis, inflation has fallen world-wide. The average rate of inflation in New Zealand's non-tradable sector has been considerably higher than in the tradables sector.¹⁷⁹

Fiscal Aggregates

TABLE 1 AND FIG 5.4.3 TO FIG 5.4.5

The fiscal balance represents the difference between current government spending and revenue. Over much of the 2000s, New Zealand experienced higher financial surpluses¹⁸⁰ than most of the benchmark OECD economies and the OECD mean.

The sustained period of fiscal surpluses has resulted in the New Zealand Government's gross liabilities as a percentage of GDP trending down over the past 15 years. They are now the second lowest of the comparator countries.

The global financial crisis has seen fiscal balances and government accounts in almost all OECD economies considerably worsen in

2009, including in New Zealand. As a result, the government accounts are less able to help offset low rates of private saving. The recent deterioration will also contribute to rising government debt levels, reducing the capacity of governments to respond to future shocks. The peak in New Zealand government debt levels is, however, likely to be much lower than in most other countries.

This low government debt, relative to other OECD countries, has helped to reassure the market that the probability of New Zealand defaulting on its sovereign debt is very low. This is reflected in the low cost to insure against default, as measured by the current credit-default-swap spread on New Zealand government debt, and the New Zealand Government's relatively high sovereign credit ratings.

Interest and Exchange Rates

TABLE 1, FIG 5.4.6 AND FIG 5.4.7

Investment and trade are sensitive to interest and exchange-rate movements. While these movements can help an economy to adjust to economic shocks, excessive medium-term exchange-rate and interest-rate volatility may reduce domestic activity and international trade.

New Zealand's real long-term interest rate has generally been declining, along with global interest rates, since the early 1990s. However, it remains higher than the OECD mean.

New Zealand's real effective exchange rate¹⁸¹ has shown greater medium-term volatility than the OECD median. It increased significantly from a low in 2001 to a 30-year peak in 2005. This reflected ongoing demand pressures associated with the pre-2008 boom in the housing market. While the real effective exchange rate has now eased from the level in 2005, it is still at a higher level than has prevailed over the majority of the last two decades.¹⁸²

179 Beneš, J., Binning, A., Fucač, M., Lees K., & Matheson, T. (2009). *K.I.T.T.: Kiwi Inflation Targeting Technology* (p. 6). Wellington: Reserve Bank of New Zealand.

180 The financial balance includes the operating balance and net investment expenditures, whereas the fiscal balance reported in the Crown accounts and budget documents is simply the operating balance. Thus, the financial balance presented here for New Zealand will be less positive than the headline fiscal balances.

181 The nominal effective exchange rate (NEER) is a weighted average of major bilateral nominal exchange rates, with weights based on the trade shares, reflecting the relative importance of each currency in the effective exchange rate basket. The real effective exchange rate is obtained by adjusting the NEER for inflation differentials between the countries whose currencies are included in the basket.

182 The Economist (2009). *A dizzy descent*. See http://www.economist.com/node/13348622?story_id=13348622

Trade

FIG 5.4.8 AND FIG 5.4.9

Since the start of the decade, internal demand pressures and the resulting appreciating real exchange rate acted as a constraint on many exporters, notwithstanding an overall increase in export prices and the terms of trade. As a result, the volume of exports as a percentage of GDP stagnated, while the volume of imports continued to rise.

New Zealand's terms of trade for goods and services have increased, particularly over the past few years. This has been driven by both strong demand and international supply constraints for New Zealand's primary exports. An increase in the terms of trade means the price of exports has risen relative to the price of imports, which raises national income.

The global financial crisis contributed to a period of considerable volatility for commodity prices. Prices for New Zealand's commodity basket fell sharply, but more recently have surpassed the pre-crisis peaks at an aggregate level. In comparison, Australia's terms of trade have increased dramatically in recent years.

Overall External Position

TABLE 1, FIG 5.4.10 AND FIG 5.4.11

New Zealand has run continual current account deficits since the 1980s. A current account deficit arises when a country spends more than it earns, or (equivalently) when it saves less than it invests. This difference needs to be financed by a net inflow of capital, which can be associated with higher interest rates and a higher exchange rate.

Internal demand pressures resulted in an increase in New Zealand's current account deficit between mid-2001 and 2005, giving it the largest deficit of the benchmark economies used in this study. New Zealand's current account deficit remained high for the next three years. The 2008/09 recession resulted in some rebalancing of the economy towards saving

from consumption and investment, resulting in the deficit narrowing over 2009 to 3 percent of GDP.

The continual current account deficits must be financed by foreign borrowing, resulting in an ongoing increase in net external liabilities (net equities held by and debt owed to foreigners). As a percentage of GDP, this stock of liabilities is now greater than each of the benchmark economies, leaving New Zealand at the most indebted end of the OECD.

Components of GDP

FIG 5.4.12

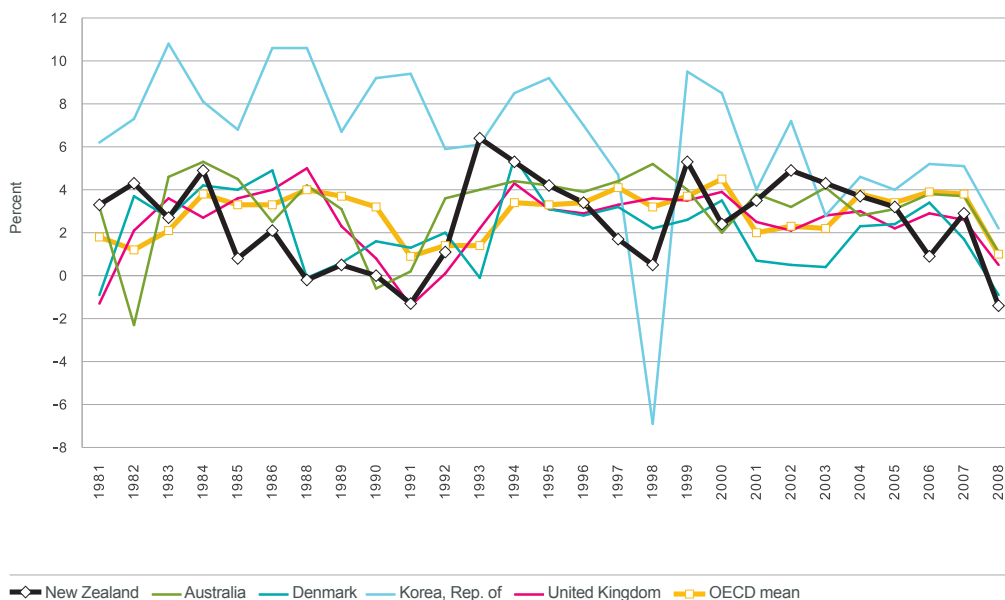
GDP can be measured as the sum of private consumption, government consumption, investment, and net exports (the difference between exports and imports). Gross national expenditure (GNE) is defined as the sum of the first three components of GDP, listed in the previous sentence. The difference between GDP and GNE is the goods and services balance (exported goods and services minus imported goods and services).

There has been very little change to the shares of the components of GNE.

Medium-term Volatility in GDP Growth

New Zealand's real GDP growth has exhibited greater medium-term volatility than for most comparator countries from 1981 to 2008. However, medium-term volatility is not as great as it was in the 1980s and early 1990s. Average GDP growth is similar to that of benchmark OECD economies.

FIG 5.4.1 Real GDP growth

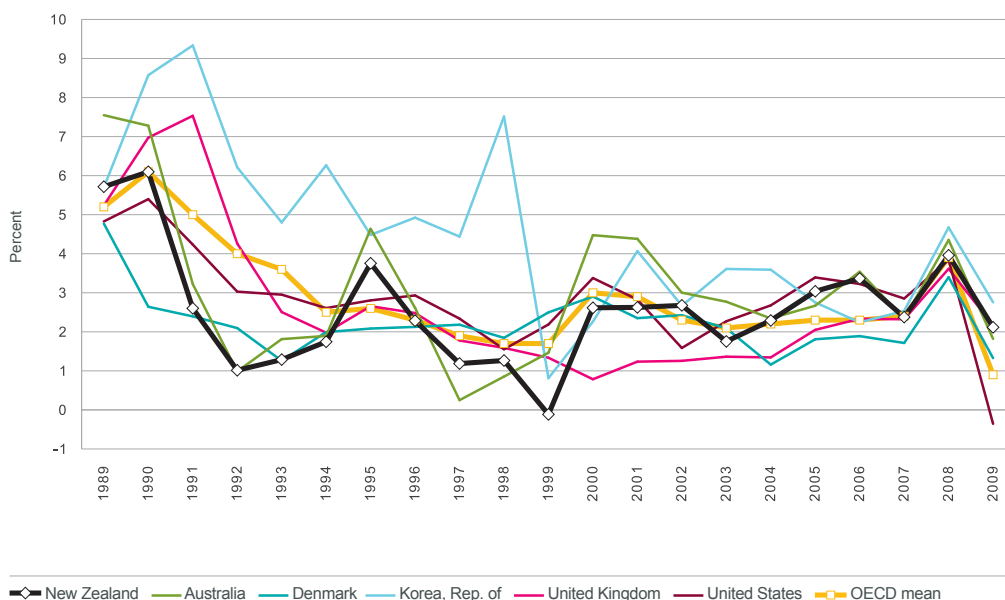


Source: OECD database, National Accounts, Gross domestic product

Inflation and Inflation Volatility

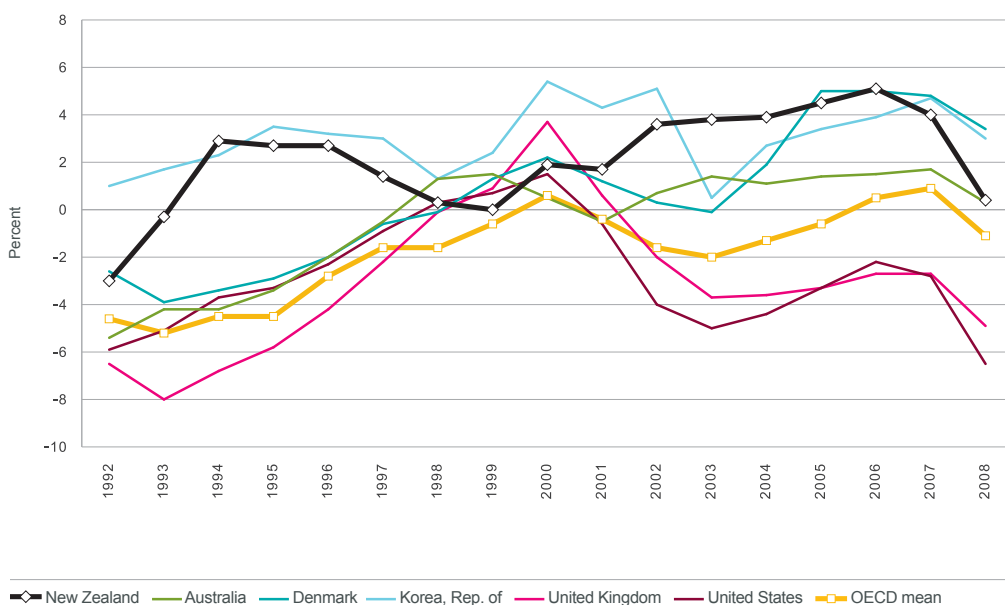
In recent years, New Zealand and most OECD countries have achieved low inflation. Furthermore, medium-term inflation volatility has reduced in New Zealand and in benchmark economies. Recent volatility has been driven by increases in the price of food and oil, and then the impact of the global financial crisis.

FIG 5.4.2 Consumer inflation – annual growth rate of CPI



Source: OECD database, Monthly Economic Indicators, Main economic indicators publication

FIG
5.4.3 General government financial balance as a percentage of nominal GDP

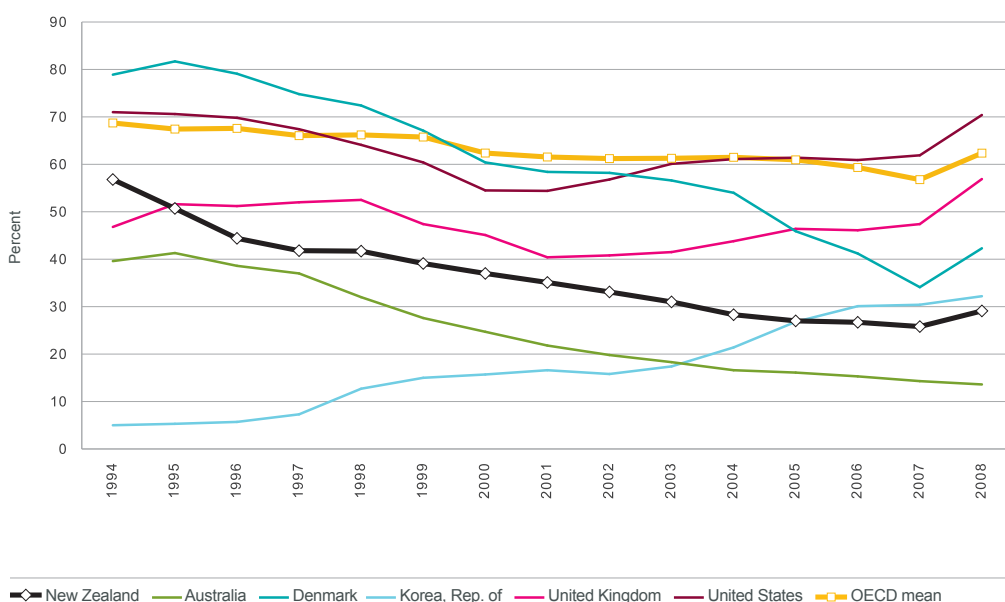


Source: OECD Economic Outlook No. 87, Annex Table 27 General government financial balances

Fiscal Aggregates

New Zealand had higher financial surpluses than most benchmark economies from 2001 to 2007, and has consistently been above the OECD mean. These surpluses helped to contribute to economic resilience and national savings. The deterioration of the financial balance in 2008 was partly driven by the domestic and global recession.

FIG
5.4.4 General government gross liabilities as a percentage of nominal GDP

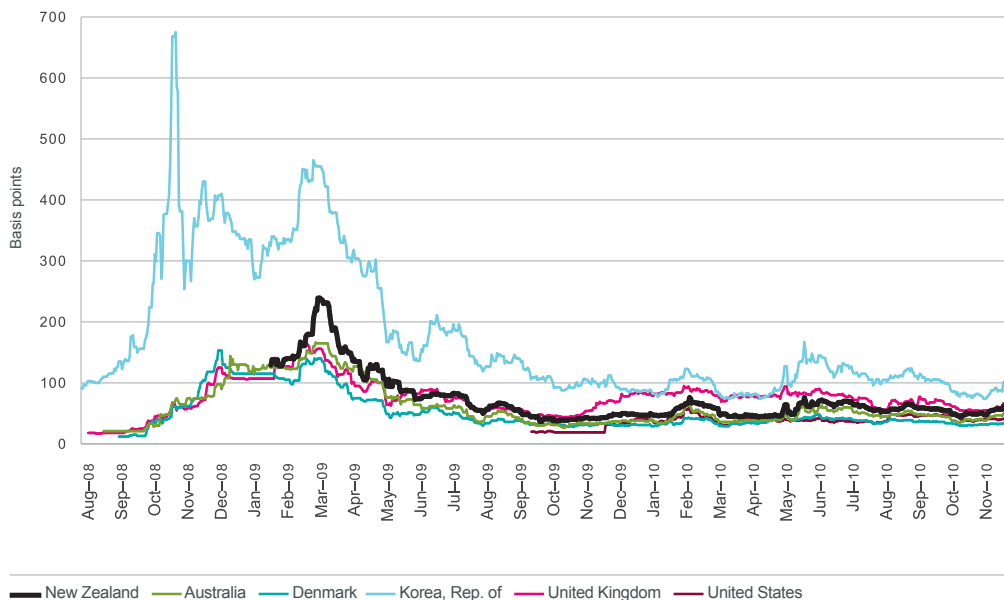


Source: OECD Economic Outlook No. 87, Annex Table 32 Gross financial liabilities

New Zealand's gross general government debt fell steadily from the early 1990s to 2007. The OECD mean also fell for much of this time. New Zealand's government debt level is amongst the lowest in the OECD but, as in other countries, New Zealand's debt has increased following the global financial crisis.

New Zealand's low government debt has helped to reassure the market that the probability of New Zealand defaulting on its sovereign debt is very low. This is reflected in the low cost to insure against default, as measured by the current credit-default swap¹⁸³ spread on New Zealand government debt.

FIG
5.4.5 Perception of sovereign risk – five-year credit-default swap contracts

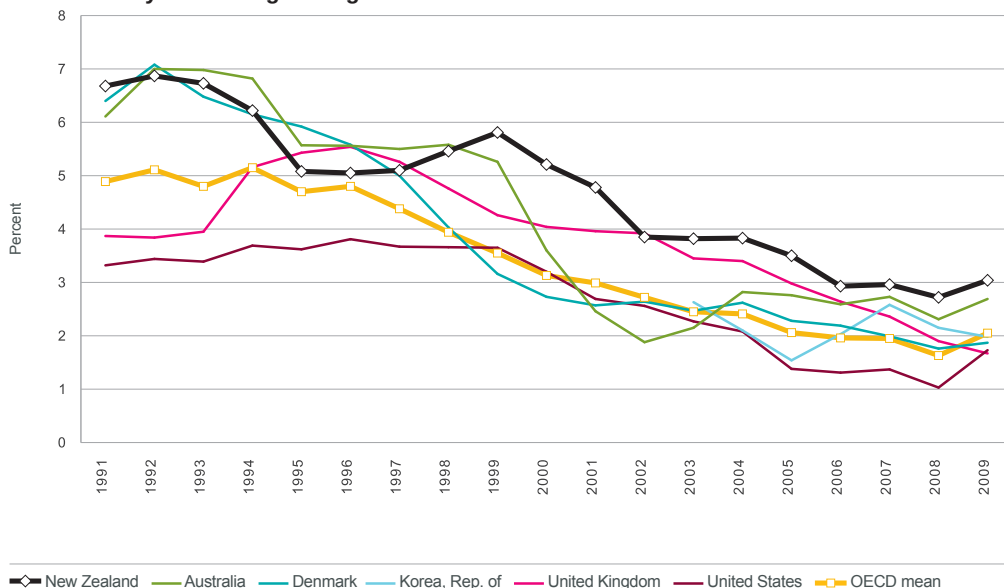


Source: Bloomberg

Interest and Exchange Rates

Between 1990 and 2008, New Zealand's real interest rate declined as it has in the benchmark economies. However, New Zealand's real interest rate is still relatively high.

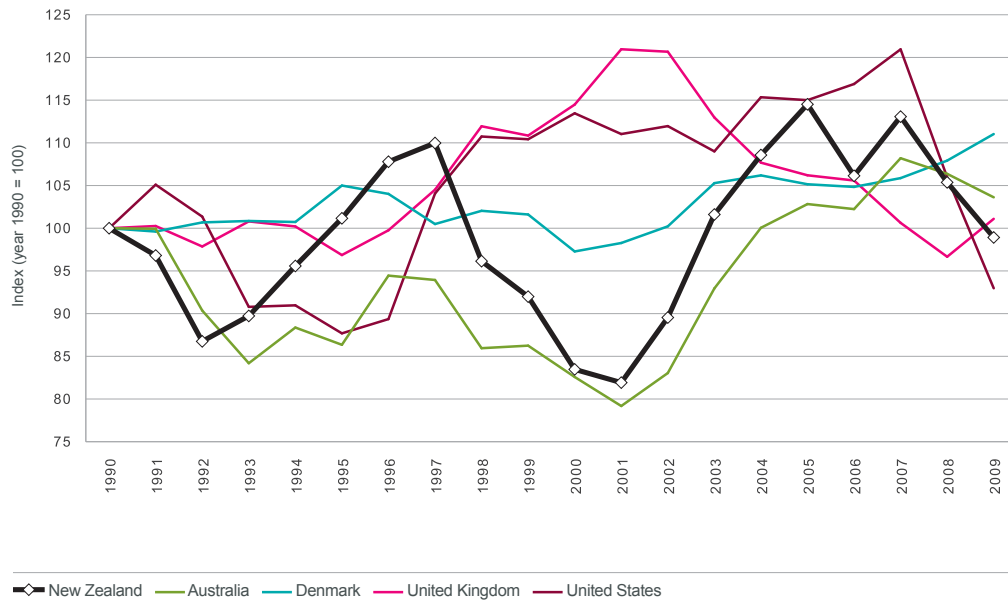
FIG
5.4.6 Real interest rate (10-year annual government bond yield less inflation rate) – three-year moving average



Sources: OECD database, Finance, Financial Indicators (MEI); OECD database, Monthly Economic Indicators, Main economic indicators publication

183 A credit-default swap is a contract that allows a lender to transfer to a third party the credit risk they face from a borrower. For example, a foreign lender to the New Zealand Government faces a default risk (however small). The party that takes on this risk in the credit-default swap does so by insuring the foreign lender against this risk in exchange for regular periodic payments from the lender (essentially a series of insurance premia).

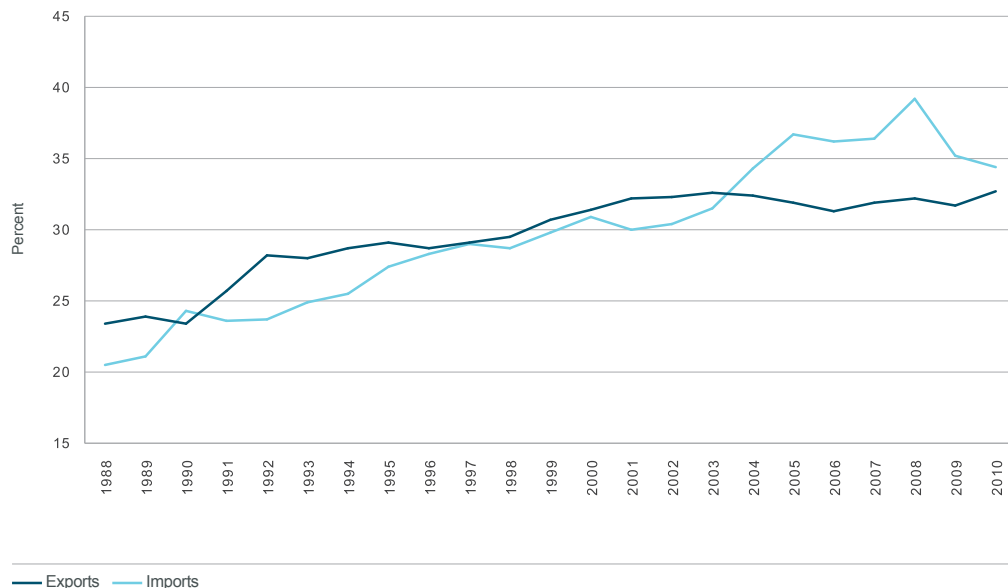
FIG

5.4.7 Real effective exchange rate index

New Zealand's real effective exchange rate undergoes more pronounced cycles than the OECD median and some other OECD countries.

Source: IMF stats database, International Financial Statistics (2005 = 100) based on relative consumer prices

FIG

5.4.8 Real exports and imports as a percentage of real GDP

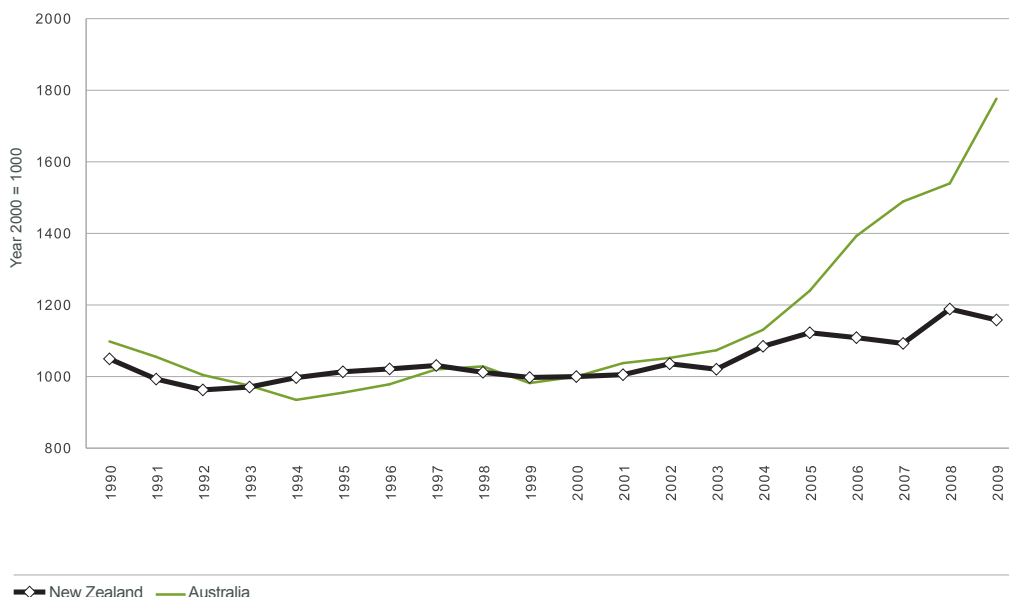
Source: Statistics New Zealand, Infoshare database, National Accounts

Trade

Strong domestic demand (ie, consumption, investment, and government expenditure) has been reflected over the decade to 2008 in a growing volume of imports as a share of GDP but a relatively stable share of exports in GDP. Exports and imports relative to GDP in the OECD as a whole continued to grow through this period. Since that time, imports and exports have been impacted by the effects of the global financial crisis.

New Zealand's terms of trade for goods and services have increased in recent years. In other words, there has been an increase in export prices relative to import prices.¹⁸⁴ Australia has experienced a far greater increase since 2003.

FIG
5.4.9 Terms of trade for goods and services

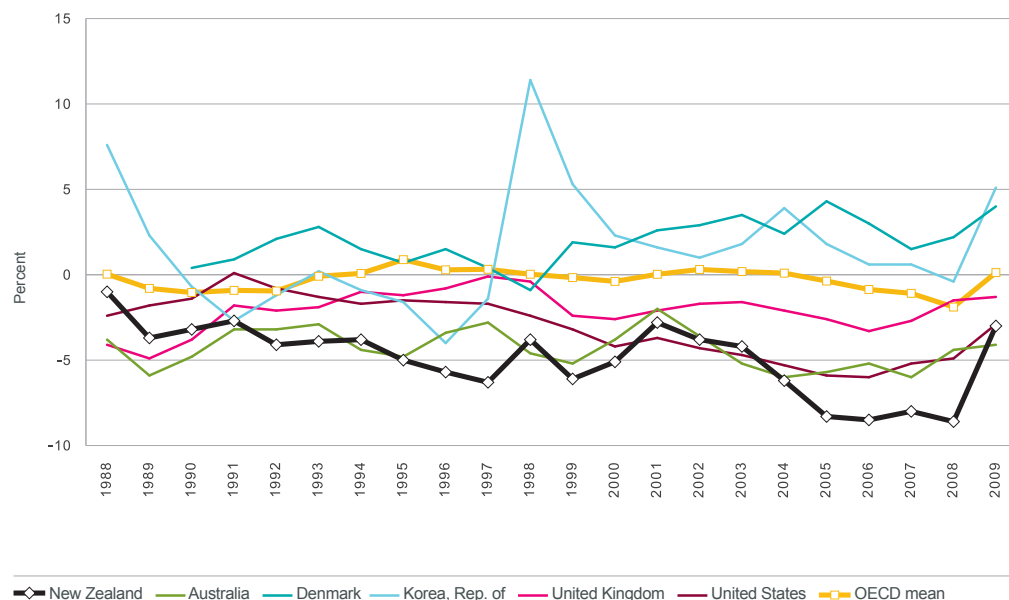


Sources: Statistics New Zealand, Customised data request; Australian Bureau of Statistics, 5206.0 – Australian National Accounts: National Income, Expenditure and Product, June 2010

Overall External Position

The current account balance is the difference between exports and imports of goods and services, plus the country's investment-income balance. Equivalently, it is the difference between savings and investment. New Zealand's current account deficit was larger than that of all the benchmark economies between 2004 and 2009. The recent narrowing of the current account deficit reflects the 2008/09 recession.

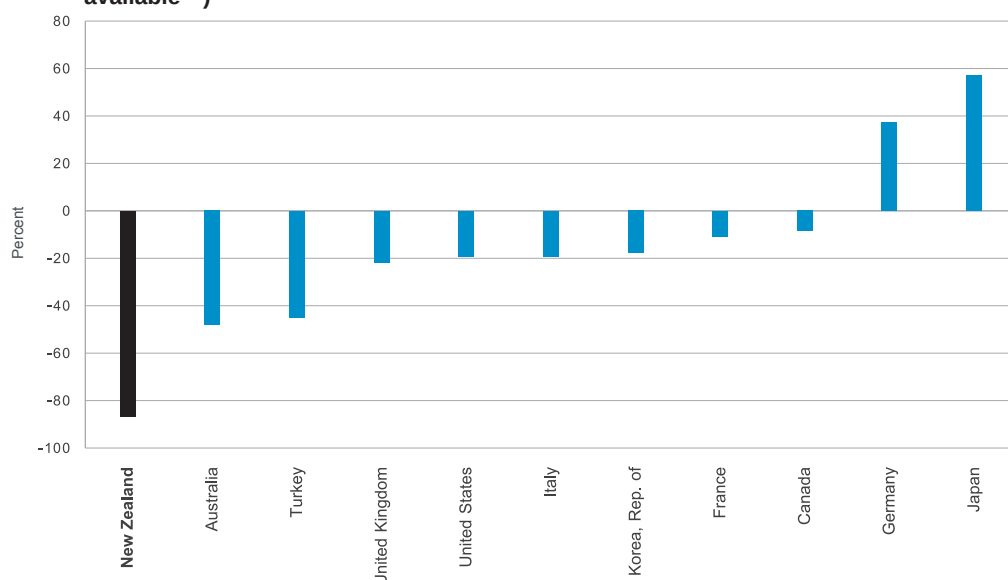
FIG
5.4.10 Current account balance as a percentage of nominal GDP



Source: OECD database, General Statistics, Key short-term economic indicators

184 These terms of trade indexes are calculated using implicit price deflators for merchandise and services exports and imports, and differ from official terms of trade indexes published by Statistics New Zealand.

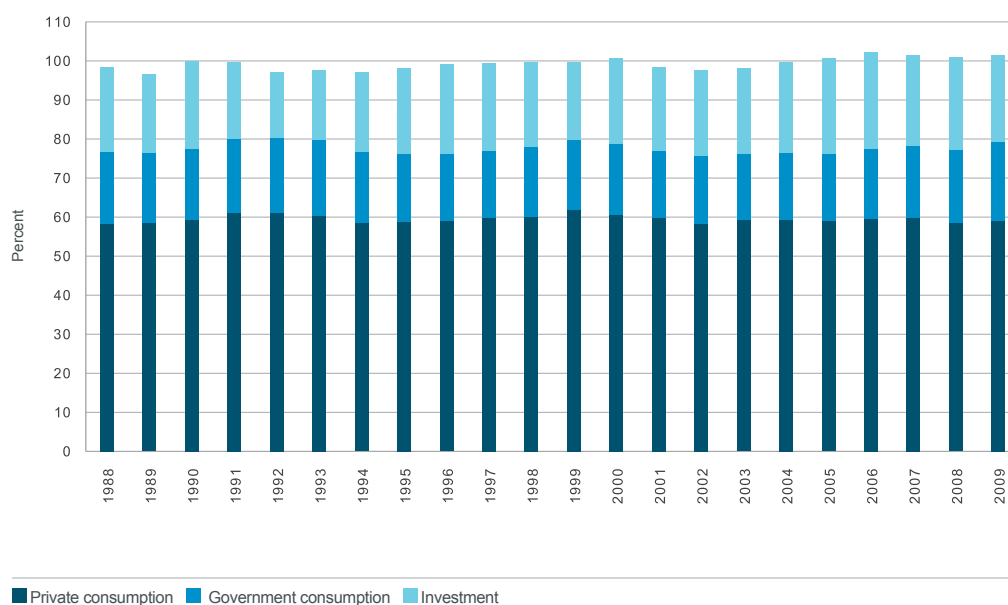
FIG 5.4.11 Net international investment position as a percentage of nominal GDP, 2009 (or latest available)¹⁸⁵



Sources: International Monetary Fund database, Principal Global Indicators, International investment position (IPP) – net; Statistics New Zealand, Balance of Payments and International Investment Position: June 2010 quarter, Table 14 Balance of payments ratios

New Zealand's net external liabilities are among the highest in the OECD, reflecting the cumulative effect of large current account deficits over many years.¹⁸⁶ This is the result of many years of relying on foreign creditors to bridge the gap between domestic investment and saving.

FIG 5.4.12 Components of nominal GNE as a percentage of nominal GDP



Source: Statistics New Zealand

Components of GDP

One measure of GDP is the sum of private consumption, government consumption, investment, and net exports (the difference between exports and imports). GNE is defined as the sum of the first three components of GDP, which are shown above. The goods and services balance is in deficit (ie, imports exceed exports) when GNE exceeds GDP. This was the case between 2005 and 2009.

¹⁸⁵ The latest data available for Australia are for 2008. New Zealand data for the year ended in December 2009.

¹⁸⁶ The net external position, given by the difference between total external assets and total external liabilities, measures the net creditor or debtor position of a country vis-à-vis the rest of the world. (See Lane & Milesi-Ferretti (2006). Examining Global Imbalances. *Finance and Development*, 43(1) at <http://www.imf.org/external/pubs/ft/fandd/2006/03/lane.htm>) A current account surplus reduces net foreign liabilities (or adds to net foreign assets) whilst a deficit adds to net foreign liabilities (or reduces net foreign assets).

5.5 – The Public Sector and Tax

Key Points

- New Zealand is perceived to have the fifth most effective government in the OECD.
- New Zealand tax and expenditure as a percentage of GDP is a little below the OECD mean, but higher than Australia's.
- Compared to the OECD mean, the New Zealand Government spends relatively large shares of GDP on education and environmental protection and a relatively small share on social protection.
- New Zealand has among the lowest shares of government employment and the highest proportion of goods and services purchased from the private sector in the OECD.
- The New Zealand Government's production costs as a proportion of GDP grew by 1.3 percentage points between 1995 and 2005, with the increase almost entirely due to increases in goods and services purchased from the private sector.
- New Zealand has by far the largest number of government ministries and departments of all OECD countries.
- New Zealand's share of total taxes collected on income from capital (corporate income, dividends, interest, rents, etc) is relatively high compared with other OECD countries, and the tax on income from labour is relatively low.
- New Zealand's corporate tax rate is high relative to some small economies but is similar to rates in Australia and the United Kingdom. The rate is set to reduce from April 2011.
- New Zealand's taxes are among the easiest in the OECD to comply with.

Introduction

Government is one means society uses to achieve its economic and social objectives. In particular, it plays a critical role in enabling the functioning of a market economy, and so encouraging economic growth, raising productivity, and improving living standards. If the Government is to achieve those objectives, the effectiveness and efficiency of government institutions and policies is important. Given that raising taxes can discourage economic activity, it is important that taxpayers' money makes the greatest possible contribution to achieving the Government's economic and social objectives.

It is difficult to find objective and internationally comparable indicators that truly measure the output and outcomes of the public sector. Internationally there is still an extensive debate about how to measure outputs, outcomes, and productivity in the public sector, and even leading countries in output and outcome measurement follow different paths.¹⁸⁷

Sooner or later, most government expenditure must be financed by taxation. Beyond their fundamental purpose of raising revenue, modern tax systems aim to support economic growth and to be equitable and simple.

The tax data shown in this publication generally do not reflect the tax changes announced in Budget 2010. Broadly, these changes fund tax rate reductions in personal income tax, savings vehicles, and company tax rates by increasing GST, and a range of income tax base-broadening and integrity measures.

Government Effectiveness

FIG
5.5.1

The World Bank produces a government effectiveness indicator by aggregating a range of expert-opinion and survey results which measure the quality of public services, the quality of the civil service, its degree of independence from political pressures,

the quality of policy formulation and implementation, and the credibility of the Government's commitment to such policies.¹⁸⁸

According to this indicator, the New Zealand Government is considered to be among the most effective in the OECD (fifth in the OECD in 2009). Like about half of the OECD countries, it is more effective than it was in 1998.

Government Expenditure and Production Costs

FIG
5.5.2 AND FIG
5.5.3

Government expenditure as a share of GDP indicates the size of government and the tax burden it imposes. It reflects historical and current political decisions about the state's role in providing goods and services (such as health and education) and in redistributing income (such as income support).

Total government expenditure in New Zealand, as a share of GDP, is lower than the OECD mean. However, a number of countries have expenditure levels that are lower than New Zealand, including Australia, the United States, and Korea. Government spending ranged between 30 percent and 55 percent in OECD countries in 2006 (with the exception of Mexico), while it was 40 percent in New Zealand in 2005.¹⁸⁹

In 2005, New Zealand spent 7.4 percent of GDP on education, which is significantly more than the OECD mean (5.6 percent). New Zealand also spends more than the OECD mean on environmental protection and public order and safety. In contrast, New Zealand's expenditure on social protection (10.3 percent of GDP) is significantly below the OECD mean (15.2 percent). New Zealand also spends less than the OECD mean on general public services, defence, and economic affairs.

These numbers must be treated with caution, since part of the variation in expenditure to GDP across countries reflects different

187 OECD (2009). *Government at a glance*. Paris: Author. See page 16.

188 Its perception-based nature means this indicator should be approached with caution. It assumes consistency of perceptions across countries and indicators, so is likely to have a high margin of error. The indicator is developed using an unobserved components model to aggregate a range of individual data sources. The data sources include perceptions from surveys of firms and individuals, as well as assessments by commercial risk rating agencies, non-governmental organisations, a number of multilateral aid agencies, and other public sector organisations. Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). *Governance matters VIII: Aggregate and individual governance indicators, 1996–2008*. World Bank Policy Research Working Paper No. 4978. See http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1424591

189 2005 is the latest year for which internationally comparable New Zealand figures are available.

190 OECD (2009). *Government at a glance*. Paris: Author. See page 52.

approaches to delivering goods and services and giving social support, rather than true differences in resources spent.¹⁹⁰ For example, if social support is provided via tax breaks rather than via direct expenditure, expenditure to GDP ratios will be relatively lower even though the economic burden of the policy is relatively similar.

In 2005, New Zealand's general government¹⁹¹ production costs were 22 percent of GDP or just over half (55 percent) of total government expenditure. Production costs are a subset of total government expenditure, which attempt to measure the cost of providing government-funded goods and services. The remainder of government expenditure includes benefit transfers and other payments not provided in exchange for a good or service, investment (except depreciation costs), and interest paid on government debt.

Of this 22 percent, the New Zealand Government spent 11 percent of GDP or half of total production costs on goods and services purchased from the private sector (seventh highest in the OECD). Even in sectors where the Government remains the major producer or provider, some aspects of the production process are outsourced, such as cleaning in hospitals, rental of buildings, and the construction of state housing and roading.

New Zealand's total production costs in general government as a percentage of GDP increased between 1995 and 2005. This was almost entirely due to increases in total production costs on goods and services purchased from the private sector. The percentage of GDP spent on compensation of government employees was relatively static between 1995 and 2005. Fixed capital consumption also remained relatively stable over this period.

Government Employment and Structure

FIG 5.5.4 AND FIG 5.5.5

In 2005, the proportion of New Zealand's total labour force in general government employment (12.7 percent) was lower than the OECD mean of 14.5 percent and was among the lowest in the OECD. It was also slightly lower than in 1995.

The Government and private sector compete for the same labour force. The Government requires suitably skilled staff for its operations, but, as labour is a scarce resource, the Government needs to ensure that the labour employed in the public sector is used productively.

According to New Zealand census data from 2001, public sector employees on average are likely to be older, better qualified, and have higher incomes than the rest of the labour force.¹⁹²

Governance structures are an important driver of the effectiveness of government coordination.¹⁹³ The structure of central government varies widely. New Zealand has 35 ministries and departments, which is the largest number among the OECD countries. The countries with the next highest number of ministries and departments include the United Kingdom (26) and Canada (25). At the other end of the scale, Switzerland has only seven.

In countries with federal and state systems (such as Australia and the United States) many of the activities coordinated by New Zealand's central government are managed by state governments and therefore are not captured in these figures. However, the number of ministries and departments does not appear to be correlated with the degree of centralisation of government. Neither does the number of ministries and departments appear to be correlated with size as measured by population or GDP.

191 The general government sector comprises all levels of government (central, state, local, and social security) and includes ministries, agencies, and non-profit institutions controlled by government. As such, it includes public sector health and education sector employees.

192 This information can be found on the Statistics New Zealand website through the Census 2001 page or through the following link: <http://www.stats.govt.nz/census/2001-census-data/2001-census-work.aspx>. Tables 31, 34, and 35 provide the relevant information.

193 OECD (2009). *Government at a glance*. Paris: Author. See page 37ff, Current and future public governance challenges.

Total Tax Burden

FIG
5.5.6

New Zealand's total tax burden, measured by its tax-to-GDP ratio (around 35 percent), is a little below the OECD mean.

Tax Structure

FIG
5.5.7 TO FIG
5.5.9

The structure of tax revenue is important to economic performance. International studies have suggested that, on average, taxes on income from capital tend to be more detrimental to growth than taxes on wages and salaries, consumption, wealth, and land.¹⁹⁴

The share of total taxes collected from personal and corporate income in New Zealand is high by OECD standards. New Zealand does not have a social security tax on wages and salaries or other forms of taxation common in other countries, such as stamp duties.¹⁹⁵ As a result, by OECD standards, New Zealand's share of tax on wages and salaries (including social security taxes and income tax) is relatively low, whereas New Zealand's share of tax on income from capital (taxes on corporate profits, interest, dividends, etc) is relatively high. The recently announced tax changes are likely to shift the tax burden from personal tax to goods and services tax (GST) and corporate income.

New Zealand's share of revenue from consumption taxes, including GST, is around the OECD mean. However, in New Zealand, a higher proportion of consumption tax is raised from GST compared with other OECD countries. GST's comprehensive coverage makes it an efficient way to raise revenue without distorting saving decisions.

New Zealand's current corporate tax rate (30 percent) is similar to rates in Australia and the United Kingdom. It is about four percentage points above the OECD mean, well below the United States' rate but above that of other small economies such as Denmark (25 percent) and Korea (24.2 percent). The New Zealand rate will reduce to 28 percent from April 2011.

Across the working population, New Zealand's average marginal tax rate on personal income is relatively low compared with other OECD countries. High marginal tax rates are of concern because they can discourage work and because labour is internationally mobile. New Zealand taxpayers subject to social assistance targeting can face relatively high effective marginal tax rates.¹⁹⁶ From 1 October 2010, personal income tax rates reduced several percentage points, lowering both average and effective marginal tax rates.

Taxes are Easy to Comply With

FIG
5.5.10

New Zealand's tax law is relatively easy to comply with. *Paying Taxes 2010*¹⁹⁷ places New Zealand third shortest in the OECD in terms of annual time taken for taxpayers to comply with tax obligations on corporate income taxes, sales taxes, and labour taxes (including payroll taxes and social security contributions). At 70 hours, New Zealand is only slightly longer than the 59 hours achieved by the OECD country requiring the shortest time, Luxembourg. The time is slightly less than one-third the OECD mean of 213 hours.

194 Kneller, R, Bleaney, M, & Gemmell, N (1999). Fiscal policy and growth: Evidence from OECD countries. *Journal of Public Economics*, 74, 171–190. Also Johansson, A, Heady, C, Arnold, J, Brys, B, & Vartia, L (2008). *Taxes and economic growth*. OECD Working Paper 620. Paris: OECD Publishing.

195 New Zealand has a small Accident Compensation Commission (ACC) levy on wages and salaries. In terms of OECD classification criteria, this is a user charge for accident insurance cover rather than a tax.

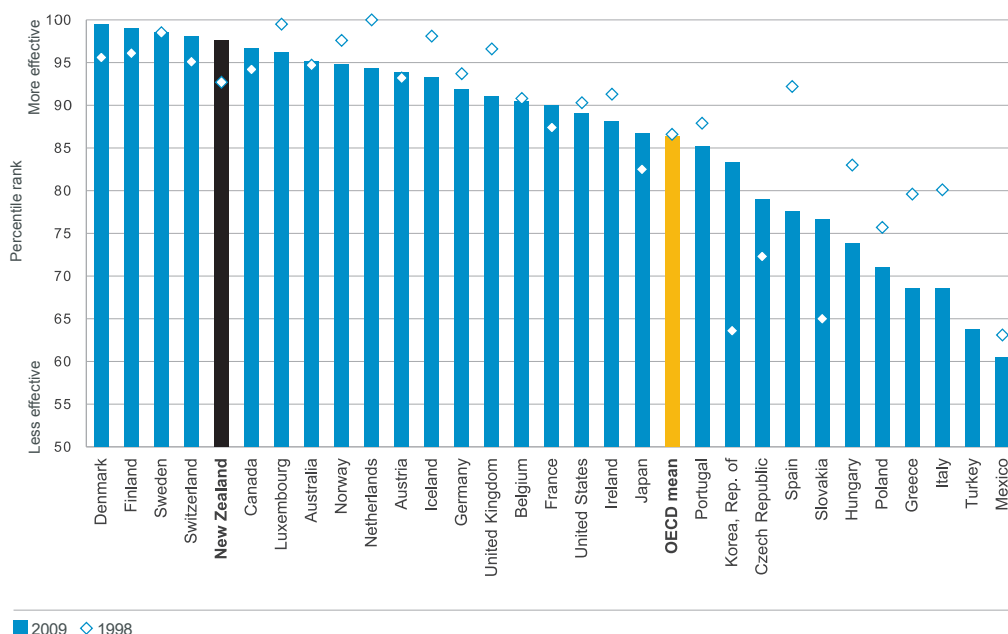
196 Effective marginal tax rates on individuals measure the percentage of a \$1 increase in income that is lost to income tax and income tests on government payments and services.

197 *Paying Taxes 2010*, International Financial Corporation (World Bank) and PricewaterhouseCoopers, pp. 83–85. See <http://www.doingbusiness.org/documents/FullReport/2010/Paying-Taxes-2010.pdf>

Government Effectiveness

The New Zealand Government is considered to be among the most effective in the OECD (fifth in the OECD in 2009). The government effectiveness indicator is an aggregate indicator of a range of survey results of perceptions and expert assessments (see footnote 188).¹⁹⁸

FIG 5.5.1 Government effectiveness score, 1998 and 2009

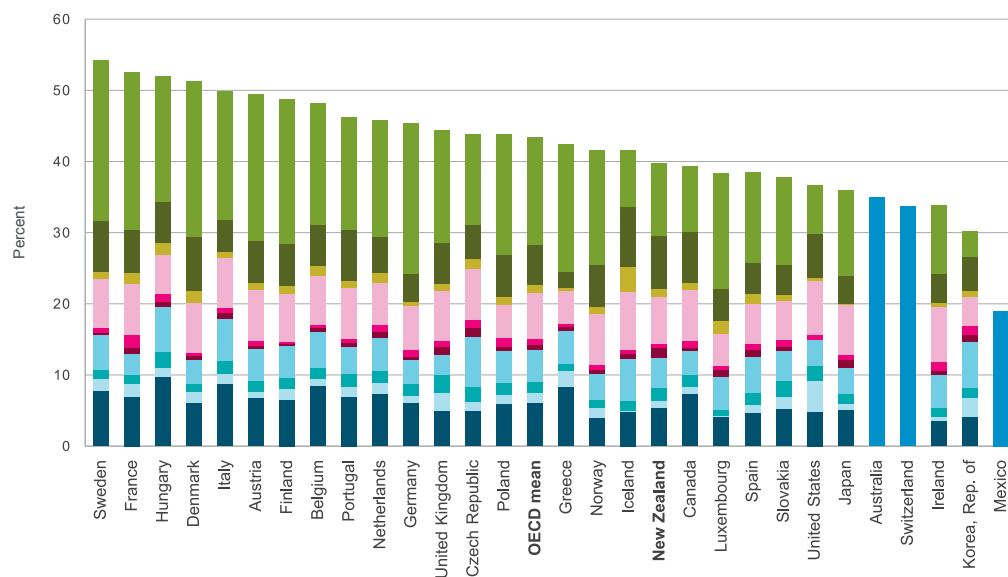


Source: World Bank, Worldwide Governance Indicators database 2009

Government Expenditure and Production Costs

New Zealand's total government expenditure as a share of nominal GDP is lower than the OECD mean. There are variations in the type or function of government expenditure between New Zealand and other OECD countries, with New Zealand's Government spending a relatively large share of GDP on education and a relatively small share on social protection.

FIG 5.5.2 General government expenditure by function as a percentage of nominal GDP, 2006¹⁹⁹



Source: OECD (2009), Government at a Glance, Table 5.1 General government expenditures by function as a percentage of GDP (2006)

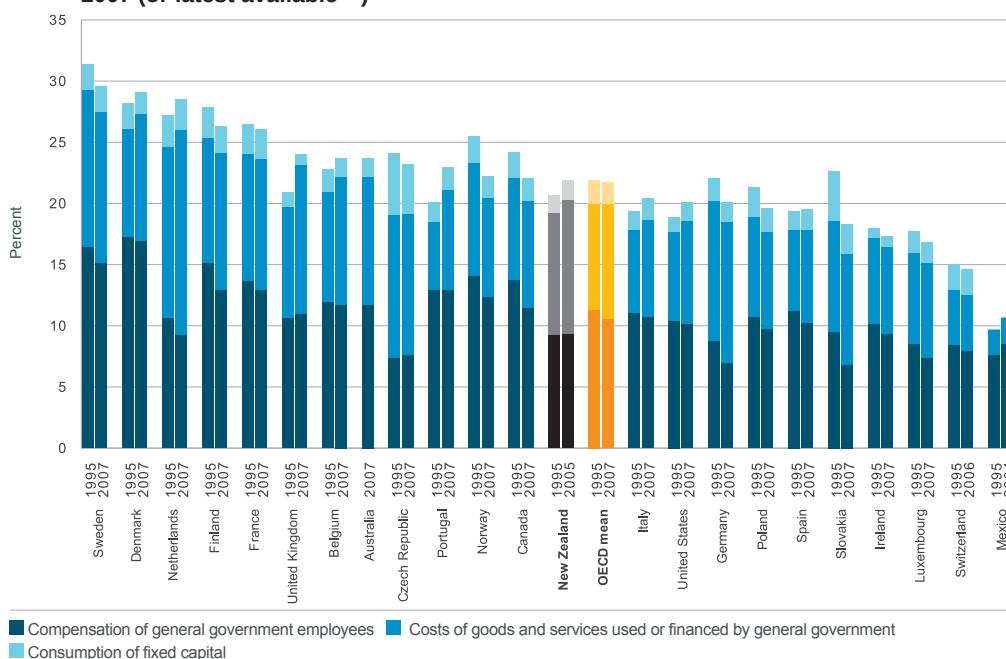
198 The indicator is based on surveys of firms and individuals, and expert assessments including assessments from commercial risk rating agencies, non-governmental organisations, a number of multilateral aid agencies, and other public sector organisations.

199 Data for New Zealand, Norway, and the United Kingdom are for 2005.

FIG

5.5.3

General government production costs as a percentage of nominal GDP, 1995 and 2007 (or latest available²⁰⁰)



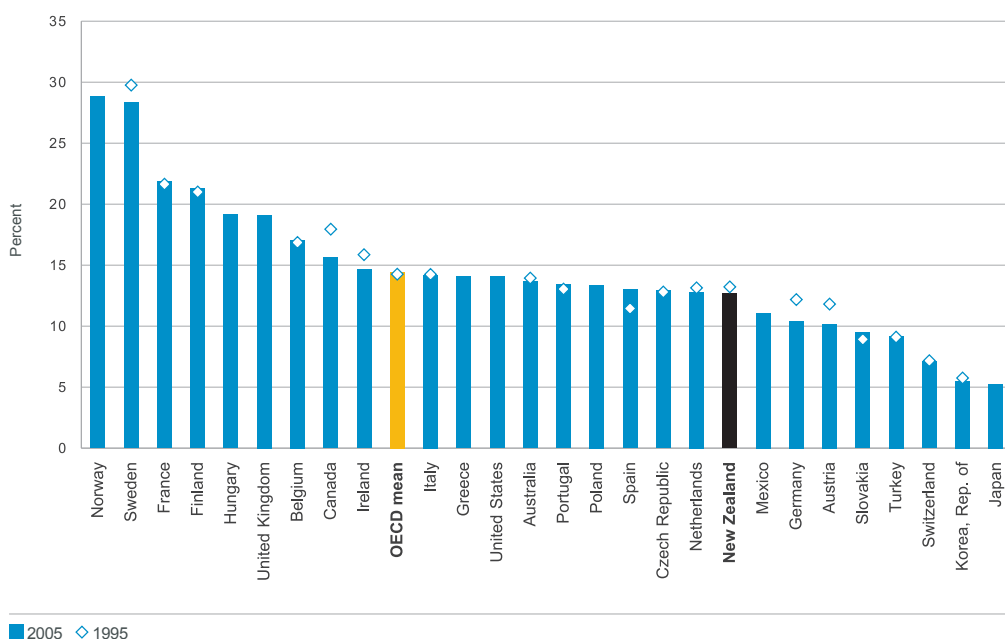
In 2005, the New Zealand Government spent 22.0 percent of GDP, or about half of total government spending, on producing or procuring goods and services, compared with the OECD mean of 21.7 percent. Compensation of employees was 9.3 percent of GDP, compared to the OECD mean of 10.5 percent. Total production costs rose to 22.0 percent from 20.7 percent in 1995, and compensation of employees rose from 9.2 percent.

Source: OECD (2009), Government at a Glance, Table 8.2 Production costs in general government; Australia Government at a Glance Country Note²⁰¹

FIG

5.5.4

Employment in general government as a percentage of the labour force, 1995 and 2005



Government Employment and Structure

The New Zealand Government employed 12.7 percent of the total labour force (employed and unemployed) in 2005, which is slightly lower than it employed in 1995. Employment in general government is lower than the OECD mean (14.5 percent).

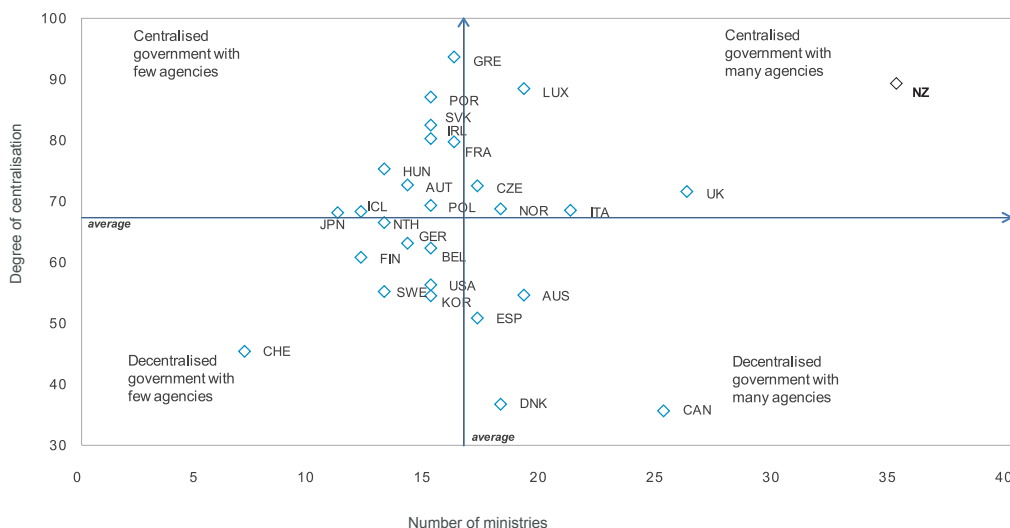
Sources: OECD (2009), Government at a Glance, Table 9.1 Employment in general government and public corporations; State Services Commission, customised data request; Statistics New Zealand, Infoshare database, Household Labour Force Survey

²⁰⁰ New Zealand data are from 2005, Switzerland data are from 2006, and Mexico data are from 2004.

²⁰¹ There are no 1995 data available for Australia, Greece, Hungary, Iceland, Japan, Korea, and Turkey. These countries have been excluded from the OECD mean for both years.

FIG 5.5.5 Structure of central government – centralisation and number of ministries and departments²⁰²

New Zealand has 35 ministries and departments, by far the most in the OECD.²⁰³ The number of ministries and departments across the OECD does not appear to be correlated with the degree of centralisation or the country size as measured by either population or GDP.

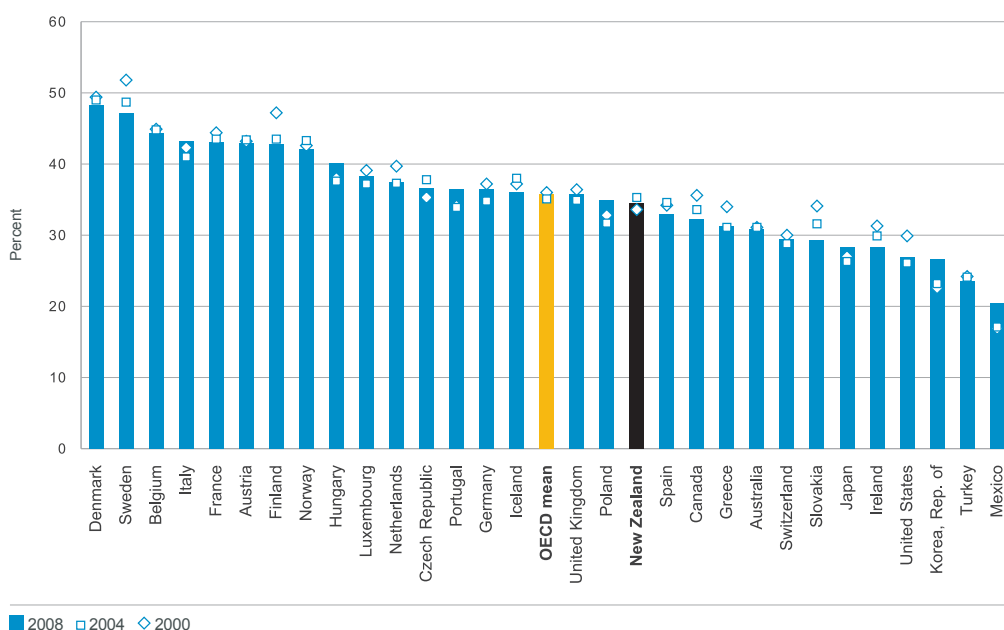


Sources: OECD (2009), Government at a Glance, Figure 2 Number of departments or ministries and ministers at the central level; *ibid*, Figure 6.1 Distribution of general government expenditures by level of government

Total Tax Burden

New Zealand's total tax burden, measured by its ratio of tax to GDP (about 35 percent), is slightly lower than the OECD mean.

FIG 5.5.6 Total government tax revenue²⁰⁴ as a percentage of nominal GDP, 2000, 2004, and 2008 (or latest available)



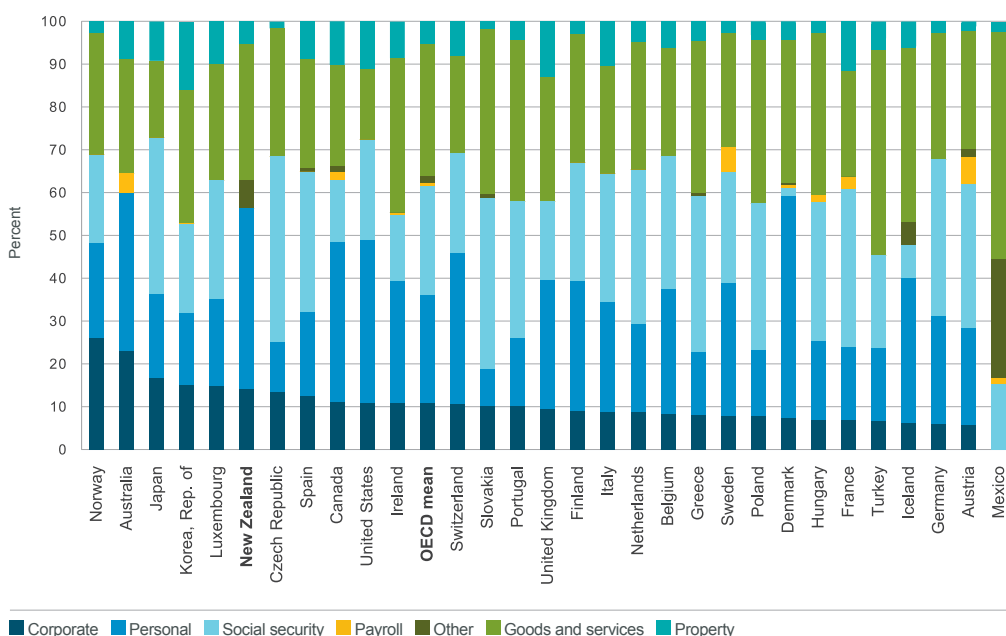
Source: OECD database, Public Sector Taxation and Market Regulation, OECD Revenue Statistics – OECD member countries

202 The degree of centralisation of governments is measured by the proportion of government expenditure that is managed and distributed by central government.

203 A large proportion of government activity in New Zealand (89.3 percent of government spending) is managed and distributed by New Zealand's central government.

204 Includes revenue of supranational government, federal or central government, state/regional government, local government, and social security funds.

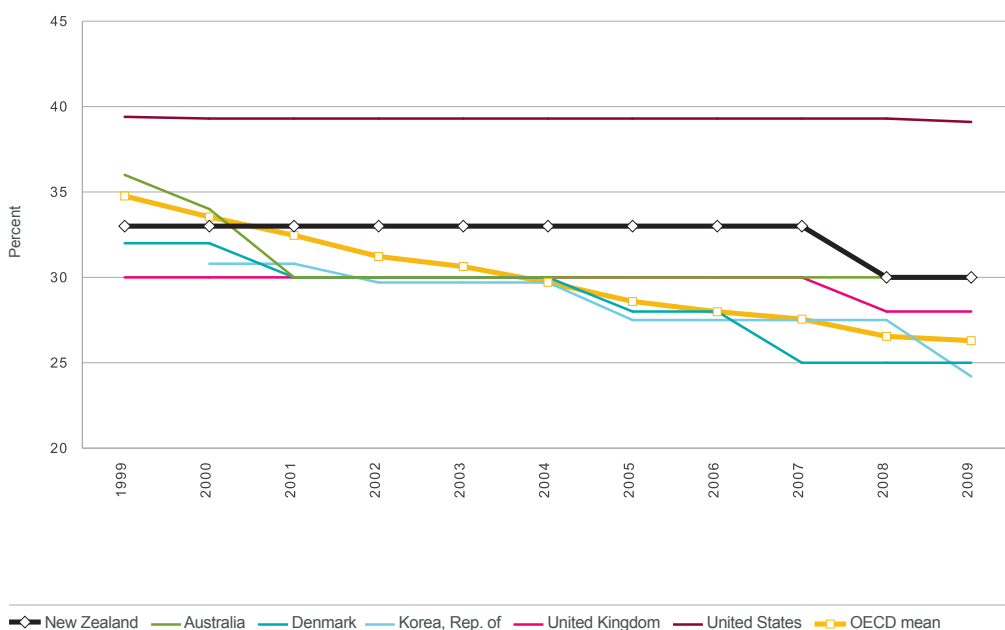
FIG
5.5.7 Breakdown of tax revenue by source, 2007



Tax Structure

New Zealand's share of total taxes collected from personal and corporate income is high by OECD standards. New Zealand's tax on wages and salaries (including social security taxes and parts of income tax) is relatively low, whereas its share of tax on income from capital (corporate profits, dividends, interest, etc) is relatively high. The share of revenue from consumption taxes, including GST, is around the OECD mean.

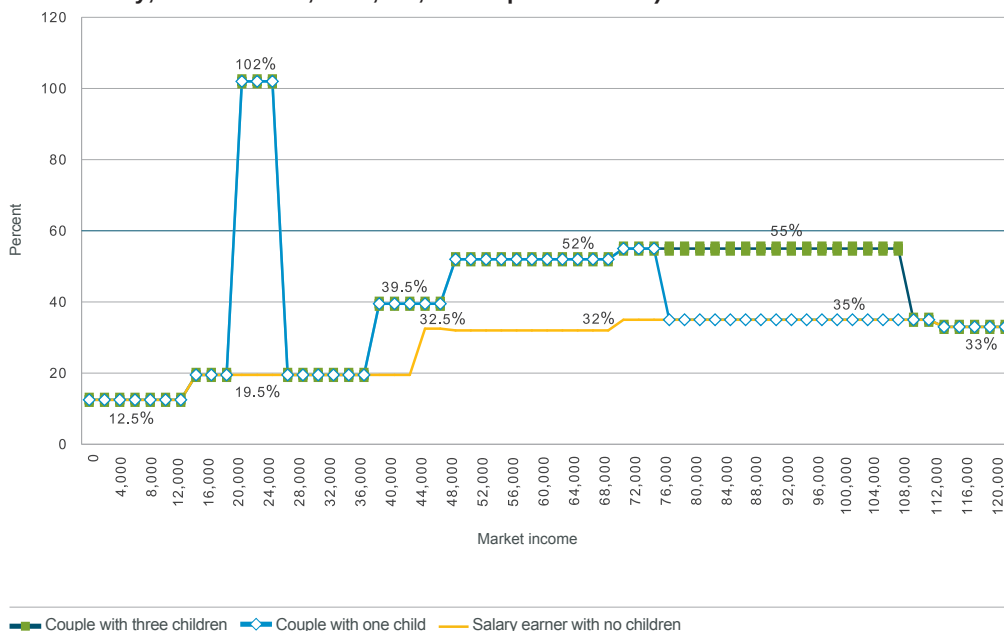
FIG
5.5.8 Corporate tax rate, total of central and sub-central



New Zealand's current 30 percent corporate tax rate is about four percentage points above the OECD average. It is well below the United States' rate, similar to rates in Australia and the United Kingdom, and above that of other small economies such as Denmark (25 percent) and Korea (24.2 percent). The Government has legislated that the rate will reduce to 28 percent from the 2011/12 income year.

Across the working population, New Zealand's average tax wedge on personal income is relatively low compared with other OECD countries. From 1 October 2010, personal income tax rates reduced by several percentage points, lowering average and effective marginal tax rates. These changes in effective marginal tax rates are reflected in the graph.

FIG 5.5.9 Effective marginal tax rates from 1 October 2010 (non-beneficiary single earner family; includes WFF, IETC, tax, earner premium^{205,206})

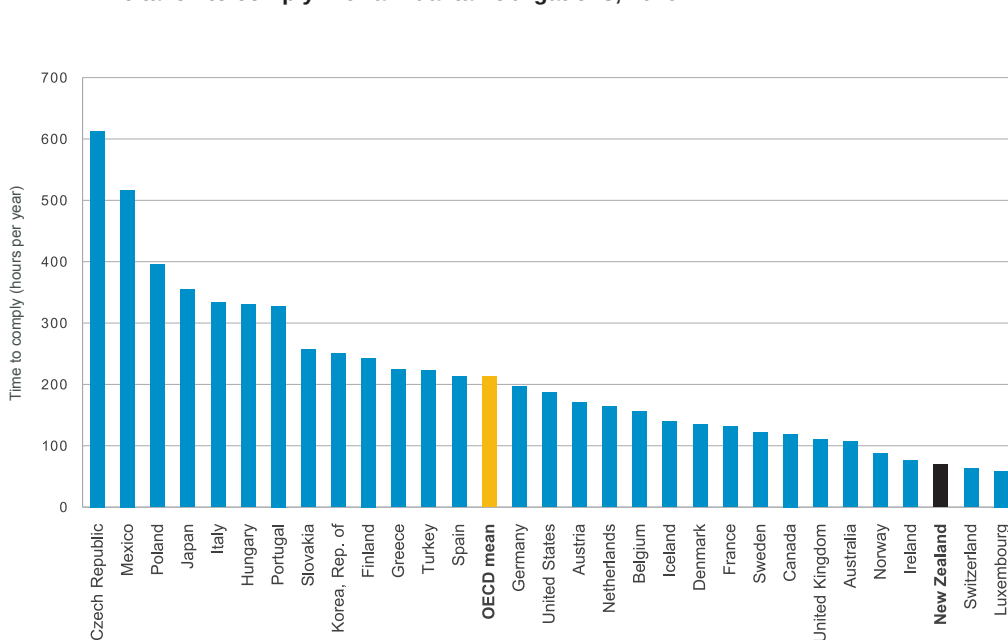


Source: Inland Revenue Department, customised data request

Taxes are Easy to Comply With

New Zealand is third lowest in the OECD in terms of annual time taken for taxpayers to comply with tax obligations on corporate income taxes, sales taxes, and labour taxes (including payroll taxes and social security contributions). At 70 hours, New Zealand's reported time is a little behind the 59 hours for the highest ranked country, Luxembourg, and about one-third of the OECD mean of 213 hours.

FIG 5.5.10 Time taken to comply with annual tax obligations, 2010



Source: Doing Business, Paying Taxes 2010: The global picture, Appendix 1.3 Time to comply (hours per year)

205 WFF – Working for Families. IETC – a new independent earner tax credit from 1 April 2009. Earner premium – an ACC earner premium paid by all employees to cover the cost of non-work-related injuries.

206 Assumes earner premium unchanged from April 2010 rate.

CHAPTER 6

New Zealand's Economic Relationship with Australia and its States

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Key Points

- New Zealand appears to be more economically integrated with Australia than with any other country, but is still less integrated than the Australian states are with each other.
- New Zealand's economic performance will be an important determinant of its ability to compete with the Australian states for key resources, such as highly skilled workers and investment.
- OECD figures for 2009 indicate the New Zealand's GDP per capita was about 25 percent lower than Australia's.
- The number of people employed in the medium-high-tech manufacturing and knowledge-intensive sectors in Auckland is increasing faster than in the largest Australian and other New Zealand cities.
- Australia is now an important destination for emigrating New Zealanders, home for a large and growing part of New Zealand's diaspora. However, the magnitudes of the net outflows are not a great deal larger than those experienced by some of the Australian states to other parts of that country.
- New Zealand is a large net importer of a number of business services from Australia. This group of services may be a proxy for high-value services. However, New Zealand has a similar proportion of its workforce in finance and insurance to those of most Australian states.
- Australia accounts for a large and growing proportion of foreign investment in New Zealand, which has led to a large negative net investment position from New Zealand's perspective.

Introduction

Strong international evidence suggests that country borders typically reduce levels of economic integration. For example, trade between geographically close regions in the United States and Canada is much less than trade between distant provinces within Canada.²⁰⁷

Considerable work has been undertaken to reduce the barriers to economic flows between New Zealand and Australia. The Australia-New Zealand Closer Economic Relations Agreement (ANZCERTA) was signed in 1983, and was accelerated after a review in 1988. Since then, the two countries have entered into a range of agreements and taken a number of initiatives, with the intention of further reducing the barriers to trade, investment, and the movement of people in registered occupations. Underpinning the relationship is the Trans-Tasman Travel Arrangement (TTTA), a long-standing arrangement allowing for the free movement of people between the two countries.

As a result of these measures, and of New Zealand's geographic proximity to Australia, New Zealand now appears to be more economically integrated with Australia than with any other country. It is New Zealand's largest trading partner, there is considerable trans-Tasman investment, and a significant number of New Zealanders live and work in Australia.

The reduction of border effects, and the resulting economic integration, offers the opportunity of increasing trade and investment, and creates a larger product and labour market. Modern literature on economic geography suggests that, as New Zealand and the Australian states become more integrated, high-value, non-routine knowledge-intensive activities will increasingly cluster in large (core) cities, while more routine low-value activities will be outsourced to peripheral regions. As a result, New Zealand's relative performance will determine its ability to compete with Australia in key areas (for example, highly skilled workers, investment, and firm location).

Therefore, in addition to assessing the degree of integration between New Zealand and Australia and comparing their relative economic performance, we have also compared the two countries in relation to the underlying determinants of performance as proxies for New Zealand's competitiveness.

New Zealand's Economic Performance Compared to the Australian States

FIG 6.2 AND FIG 6.3

People working in New Zealand continue to be paid less on average than people working in Australia.

In the 2007 Economic Development Indicators report, New Zealand GDP per capita was compared with Australian state GDP per capita (in volume terms). In the current Economic Development Indicators report, the comparison of GDP per capita levels by state is not presented. This is because Australia was the first country in the world to move to a new international standard for its National Accounts (SNA 2008).

Given the different statistical standards currently in use in estimating Australian and New Zealand GDP, it is not valid to compare the respective levels. Statistics New Zealand plans to release GDP estimates on a comparable basis, which will again allow for valid comparisons of levels, in due course. However, growth rates are less affected and we continue to present them.

The new international standard has resulted in an increase in the measured level of GDP for Australia, and for Tasmania in particular.

From 2000 to 2008, New Zealand's real GDP per capita grew faster than that of New South Wales and Victoria, but slower than that of the other four Australian states. New Zealand has since been more severely affected by the global financial crisis, so the average growth in real GDP per capita from 2000 to 2010 was slower than all the Australian states. In contrast, the 2007 Economic Development Indicators edition indicated that New Zealand's

207 McCallum, J (1995). National borders matter: Canada-US regional trade patterns. *The American Economic Review*, 85(3), 615–623.

GDP growth was in the middle of Australian states and GDP per capita in 2006 was lower than that of all Australian states other than Tasmania.

As noted in Chapter 2, most of the difference between the average New Zealand and Australian growth rates (and so the Australian states on average) is due to differences in the growth of that part of the economy that is not included in the 'measured sector'. It is unclear how much of that difference is real and how much due to different data sources and methodologies.

One indicator of New Zealand's performance relative to the Australian states is given by trends in employment in high-value activities. This is discussed further under the heading 'Trade and Industry' below.

How Integrated are New Zealand and Australia?

Migration

FIG 6.4 TO FIG 6.6

Australia has become important for New Zealand's outward migration in the past 40 years, and is now the destination for a substantial majority of emigrating New Zealanders. This migration has accumulated to form a considerable part of the New Zealand diaspora. The 2006 Australian Census counted 389,000 New Zealanders in Australia, the equivalent of 10.1 percent²⁰⁸ of the New Zealand population in 2006.²⁰⁹ Migration of Australians to New Zealand has also grown, but at a much slower rate and in much lower numbers.

One indication of the level of integration between New Zealand and Australia is the degree to which migration between the two is comparable to migration between the Australian states. As a percentage of its population, New Zealand has experienced large net outflows of people to Australia for a number of years, but not substantially larger than the share of populations of New South Wales and South Australia flowing to other

Australian states. However, the gross level of trans-Tasman migration was much smaller than gross migration between the states.

Trade and Industry

FIG 6.7 TO FIG 6.10

Changes in both the volume of trade and export/import composition are evident in service areas such as legal, accounting, and management consulting services; and computer and information services. Exports of legal, accounting, and management consulting services to Australia have increased on average since 2003. Imports of these services from Australia have increased significantly over the same period. A similar pattern is evident in computer and information services, and (to a lesser extent) financial services.

Increased trade can be expected from liberalisation at and behind the border, and this may be more marked in areas where each country has its own specialisations.

In fact, neither the percentage of its merchandise imports that New Zealand imports from Australia nor the percentage of its merchandise exports that it exports to Australia have not shown a dramatic change since 1992.²¹⁰

However, these aggregate data are likely to disguise more significant changes at the sectoral level.

For example, food and beverage trade has grown between New Zealand and Australia in the last decade; the nominal value of New Zealand's food and beverage exports to Australia has trebled and the nominal value of such exports from Australia has more than doubled.²¹¹

International evidence indicates that as countries and regions become more integrated, economic activity is increasingly drawn to the most productive areas, with high-value activities in particular being drawn to large cities.²¹² Accordingly, trends in employment in high-value activities provide an indicator both of how integrated New Zealand is with the Australian states, and how well it is performing compared to them.

208 ABS (2010). *New Zealanders in Australia*. Australian Social Trends (4102.0), September 2010. Canberra: Australian Bureau of Statistics.

209 This is based on comparable, but understated, numbers. See footnote 225.

210 Statistics New Zealand, Infoshare database, Merchandise Exports and Imports.

211 United Nations COMTRADE database, DESA/UNSD, Coriolis calculations.

212 Fujita, M, Krugman, P, & Venables, A J (Eds) (1999). *The spatial economy, cities, region and international trade*. Cambridge, Mass. MIT Press.

The number of people employed in the medium-high-tech manufacturing (HTM) and knowledge-intensive services (KIS) sectors in Auckland is increasing faster than all the other Australian and New Zealand cities shown, whether measured by annual percentage growth or by the proportion of the total workforce employed. The proportion of the total workforce employed in HTM and KIS in the other New Zealand cities shown (Christchurch, Hamilton, Wellington, and Dunedin) is growing more slowly than in any of the Australian cities.

Finance and insurance services, and professional, scientific, and technical workers are two classes of relatively skilled workers. The number employed in finance and insurance services as a percentage of total employment is some distance behind New South Wales and Victoria, but is similar to South Australia and ahead of the other Australian states. The number of professional, scientific, and technical workers as a percentage of total employment in New Zealand is at the top end of the Australian states and growing.

New Zealand's Economic Performance Relative to Australia

Figure 6.1 depicts how the indicators covered in this report show New Zealand to be performing across a number of key areas, and the recent direction of any change, relative to Australia. New Zealand's performance relative to Australia's is low-to-similar for a number of the indicators presented, which is to be expected given that New Zealand's income per capita is below Australia's.

OECD figures for 2009 indicate that New Zealand's GDP per capita was about 25 percent lower than Australia's.²¹⁴

Investment

FIG 6.11 AND FIG 6.12

Australia is an important source of investment into New Zealand, contributing 35 percent of the stock of total inward investment as at March 2010.²¹³ Investment is investment in financial instruments. Financial instruments are split into equity (shares) and debt instruments. Debt instruments include tradable debt instruments such as bonds and notes, loans, deposits, trade credit and debits.

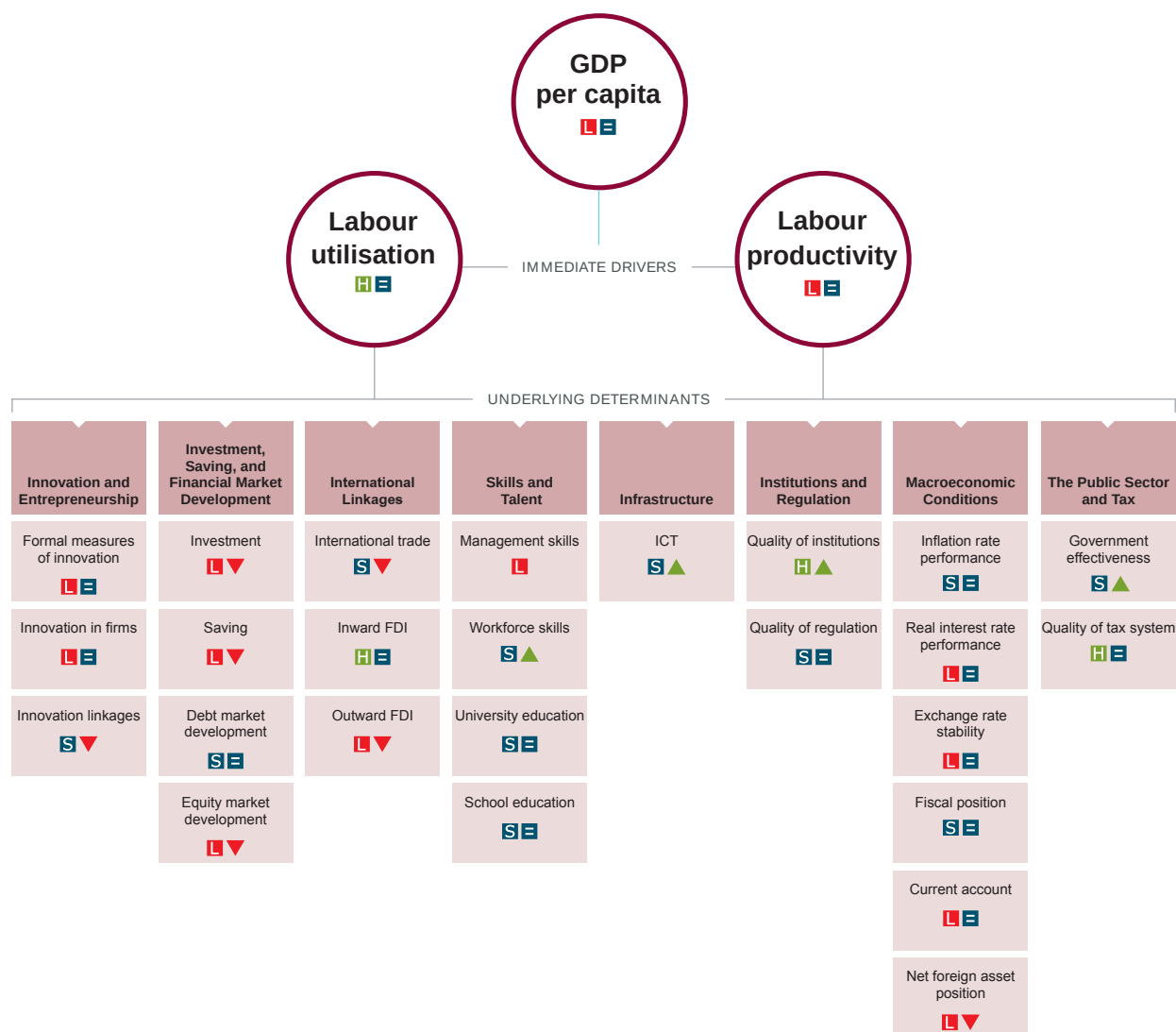
New Zealand has had high but fluctuating net investment flows from Australia as a percentage of New Zealand's GDP. This has led to a large negative net investment position from New Zealand's perspective. Both inward and outward gross investment flows have reduced over the last three years.

213 Statistics New Zealand, *Balance of Payments and International Investment Position: Year ended 31 March 2010*. See http://www.stats.govt.nz/browse_for_stats/economic_indicators/balance_of_payments/investment-by-country.aspx

214 See figure 1.3. OECD data are based on SNA 1993 and use PPP indexes to achieve international comparability.

FIG

6.1 New Zealand's performance relative to Australia's against key indicators



NZ ranking by Australian standards

H = High S = Similar L = Low

NZ trend relative to Australia (over the last 10 years)

- ▲ Improving at a faster rate than Australia
- E Improving at about the same rate as Australia
- ▼ Deteriorating compared with Australia

New Zealand firms innovate less than Australian firms (excluding very small firms)²¹⁵ and rates lower than Australia on formal measures of innovation, including gross expenditure on R&D as a proportion of GDP. That being said, New Zealand's BERD is increasing at about the same rate as Australia's.²¹⁶

New Zealand's savings rate and equity market development are low compared with Australia, and New Zealand is getting relatively worse. Instead, New Zealand attracts more inward FDI than Australia as a percentage of GDP.²¹⁷ FDI is an important source of capital for small economies, and can provide a partial substitute for both domestic saving and raising capital on the sharemarket. It can also achieve technology and broader knowledge transfer to the host country.

As a percentage of GDP, gross fixed capital formation is higher in Australia than New Zealand, while investment in plant and machinery is about the same.²¹⁸

With the exception of inward FDI, New Zealand would appear to be less connected internationally than Australia, and New Zealand is becoming relatively less connected. This is indicated by a decline relative to Australia in New Zealand's share of world exports for merchandise trade and services and outward FDI.²¹⁹

New Zealand has lower overall management capabilities than Australia, but has similar basic workforce skills.²²⁰

New Zealand's ICT infrastructure as a percentage of GDP is comparable to Australia's and is growing relative to Australia. The New Zealand Government is currently prioritising investment in roading, energy, and broadband initiatives.

The quality of New Zealand's regulation is similar to or better than Australia's.²²¹

New Zealand's tax system is broadly similar in overall structure to Australia's. New Zealand's public sector is also comparable in terms of effectiveness, but its effectiveness is deteriorating relative to Australia's.

The role of the central bank in both New Zealand and Australia is to target inflation. New Zealand's inflation rate is similar but its real interest rate has tended to be slightly higher than Australia's.

New Zealand's exchange rate displays similar volatility to Australia's.²²²

On average, New Zealand's current account deficit has been higher than Australia's as a percentage of GDP. This higher average current account deficit is reflected in New Zealand's higher net foreign liability position relative to Australia's.²²³

Summing Up

New Zealand performs as well as Australia on many of the underlying determinants of growth. However, overall, it has more weaknesses than strengths relative to Australia. This is consistent with New Zealand's GDP per capita, which continues to be lower than Australia's.

215 Refer to Figure 4.1.3 in the section on Innovation and Entrepreneurship.

216 See Section 4.1: Innovation and Entrepreneurship for more details.

217 Refer to Figure 4.3.5 in the section on International Linkages.

218 Refer to Figure 4.2.3 in the section on Investment, Savings, and Financial Market Development.

219 See Section 4.3: International Linkages for more details.

220 See Section 5.1: Skills and Talent for more details.

221 See Section 5.3: Institutions and Regulation for more details.

222 Mabin, G G (2010). *New Zealand's exchange rate cycles: Evidence and drivers*. New Zealand Treasury Policy Perspectives Paper. Wellington: The Treasury.

223 See Section 5.4: Macroeconomic Foundations for more details.

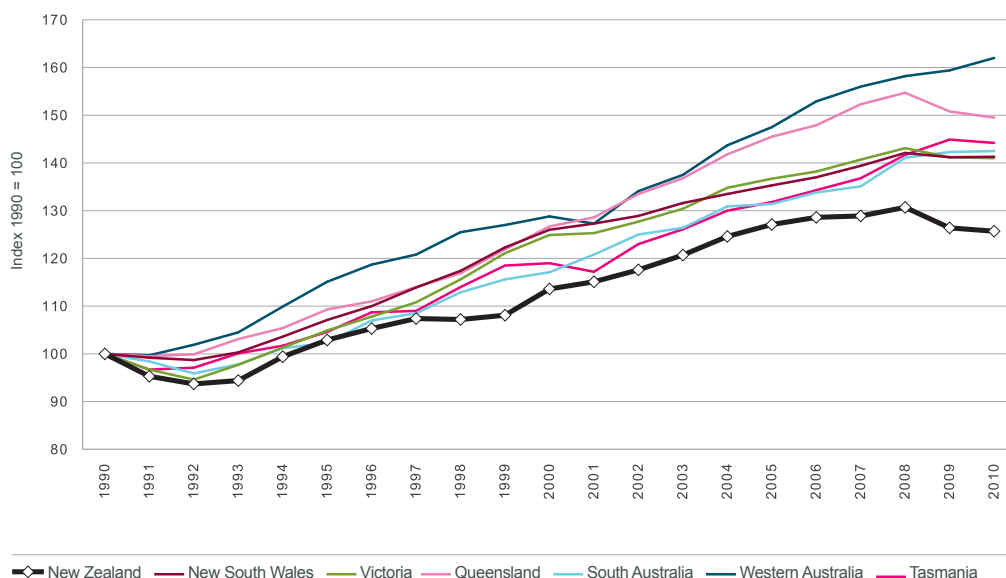
New Zealand's Economic Performance Compared to the Australian States

From 2000 to 2008, New Zealand's real GDP per capita grew faster than that of New South Wales and Victoria, but slower than that of the other four Australian states. New Zealand has since been more affected by the global financial crisis, so its average growth from 2000 to 2010 was slower than all the Australian states. The Australian GDP data has been recently revised upwards, in part due to its adoption of updated international National Accounts standards.

New Zealand salary and wage earners continue to be paid less than Australian salary and wage earners on average.

FIG

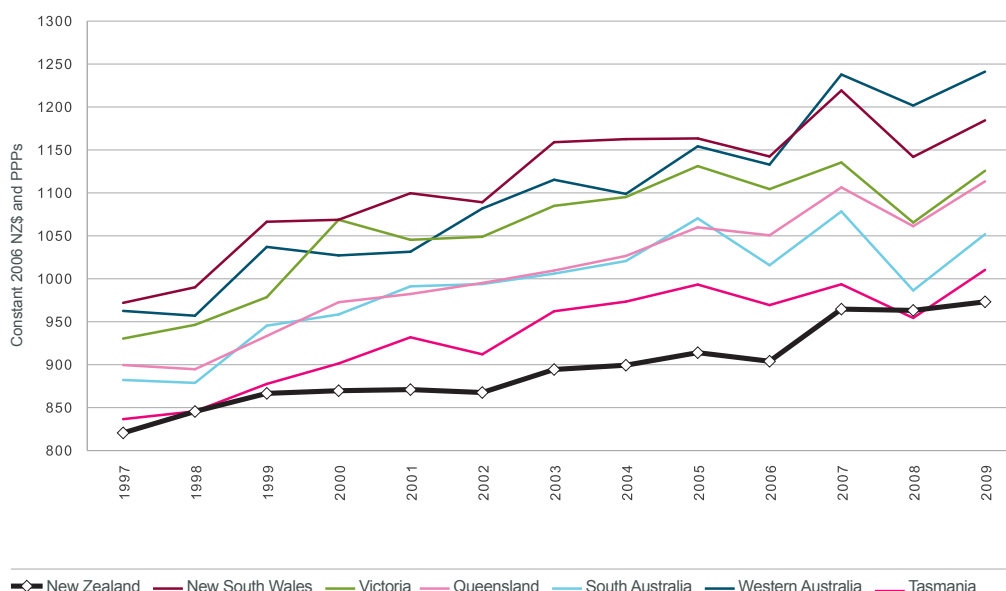
6.2 Index showing real GDP per capita growth (1990 = 100)²²⁴



Sources: Statistics New Zealand, Infoshare database, National Accounts; *ibid*, Demography Population Estimates; Australian Bureau of Statistics, 5220.0 – Australian National Accounts: State Accounts, Table 1 Gross state product, Chain volume measures and current prices

FIG

6.3 Mean full-time weekly salary and wage income



Sources: Statistics New Zealand, Customised New Zealand income survey data; Statistics New Zealand, Infoshare database, National Accounts; Australian Bureau of Statistics, 6310.0 – Employee Earnings, Benefits and Trade Union Membership, Australia, Employee Earnings Mean Time Series, Table 3; *ibid*, 6401.0 – Consumer Price Index, Tables 1 and 2, CPI: All Groups, Index Numbers and Percentage Changes; OECD database, National Accounts, PPP exchange rate

224 The graph shows real GDP per capita indexed so that 1990 = 100 for New Zealand and each of the Australian states. The slope of each graph indicates the growth rate in real GDP per capita.

FIG
6.4 New Zealanders living in Australia and Australians living in New Zealand



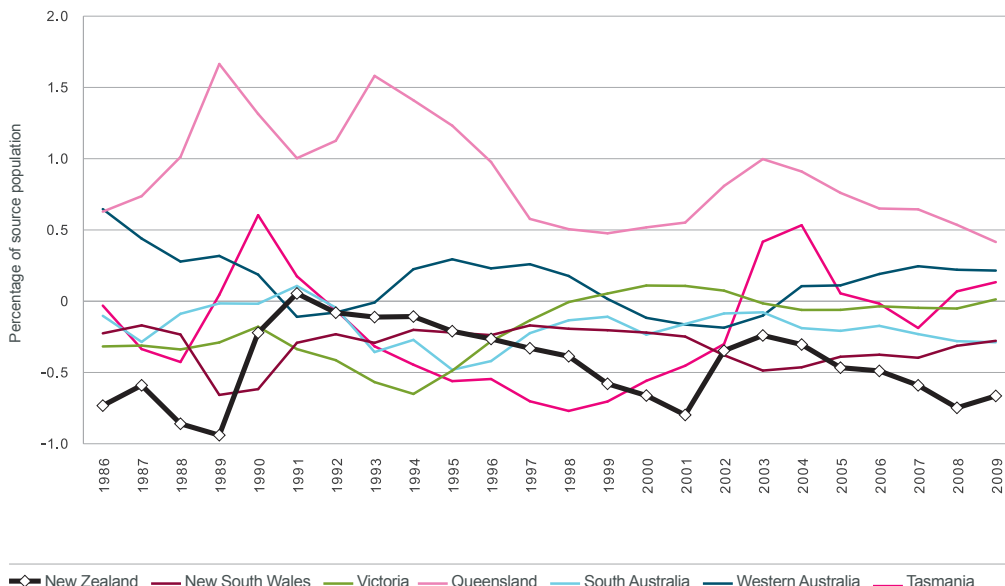
Sources: Statistics New Zealand, Census tabular reports 1971–2006; Australian Bureau of Statistics, 3105.0.65.001 – Australian Historical Population Statistics, Tables 9.15–9.22

How Integrated are New Zealand and Australia?

Migration

The number of New Zealand-born people living in Australia has increased since 1971. In 2006, the Australian Census counted over 389,000 New Zealanders in Australia – 2.8 percent of the Australian population and the equivalent of 10.1 percent of the New Zealand population.²²⁵ In 1971, the corresponding percentages were 0.7 percent of the Australian population and 2.8 percent of the New Zealand population.

FIG
6.5 Annual net migrations between Australian states and between New Zealand and Australia



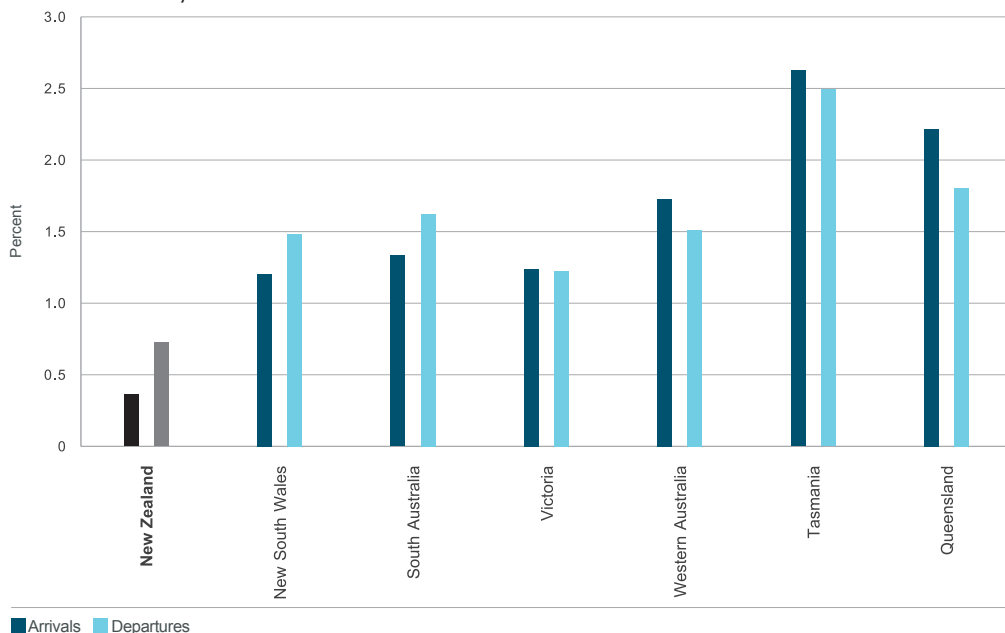
Sources: Statistics New Zealand, Infoshare database, International Travel and Migration; Statistics New Zealand, Historical population estimates; Australian Bureau of Statistics, 3101.0 – Australian Demographic Statistics; *ibid.*, 3201.0 – Population by Age and Sex, Australian States and Territories

As a percentage of its population, New Zealand has experienced large net outflows of people to Australia for a number of years, but not substantially larger than the share of populations of New South Wales and South Australia flowing to other Australian states.

²²⁵ This figure shows the number of New Zealand-born people counted in the Australian Census and the number of Australian-born people counted in the New Zealand Census. These numbers are comparable, but understated, and both agencies make adjustments for census undercoverage by making population estimates. The 2006 Australian Census counted 389,463 New Zealand-born people, but the June 2006 population estimates (which are adjusted for undercoverage) showed 463,331 New Zealanders in Australia. Statistics New Zealand analysis has found that new migrants, highly mobile populations, and young adults (who are more likely to emigrate) are less likely to be counted in a population census.

In 2009, New Zealand's gross migration flows, measured as permanent or long-term arrival and departure rates to and from Australia as a percentage of New Zealand's population, were substantially smaller than Australian states' gross migration flows as a percentage of their populations and significantly weighted in favour of departures.

FIG 6.6 Gross migration flows between Australian states and between New Zealand and Australia, 2009

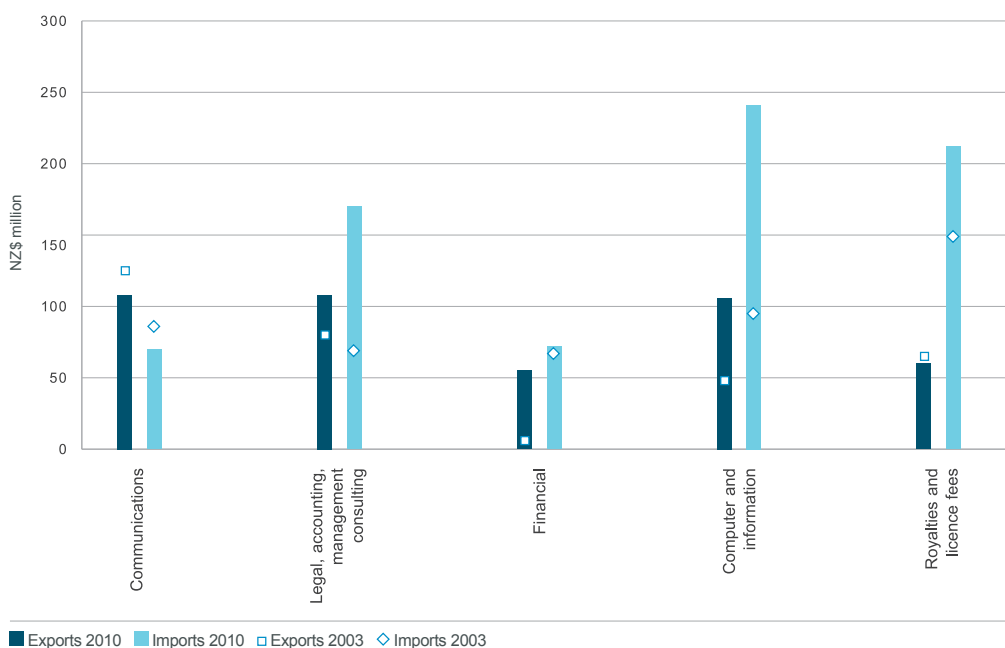


Sources: Statistics New Zealand, Infoshare database, International Travel and Migration; *ibid*, Historical Population Estimates; Australian Bureau of Statistics, 3101.0 – Australian Demographic Statistics; *ibid*, 3201.0 – Population by Age and Sex, Australian States and Territories

Trade and Industry

Overall, exports of the services shown from New Zealand increased between 2003 and 2010. Overall imports of such services to New Zealand have increased more, but with significant variability between the different categories of services. These categories of services may be a useful proxy for high-value services.

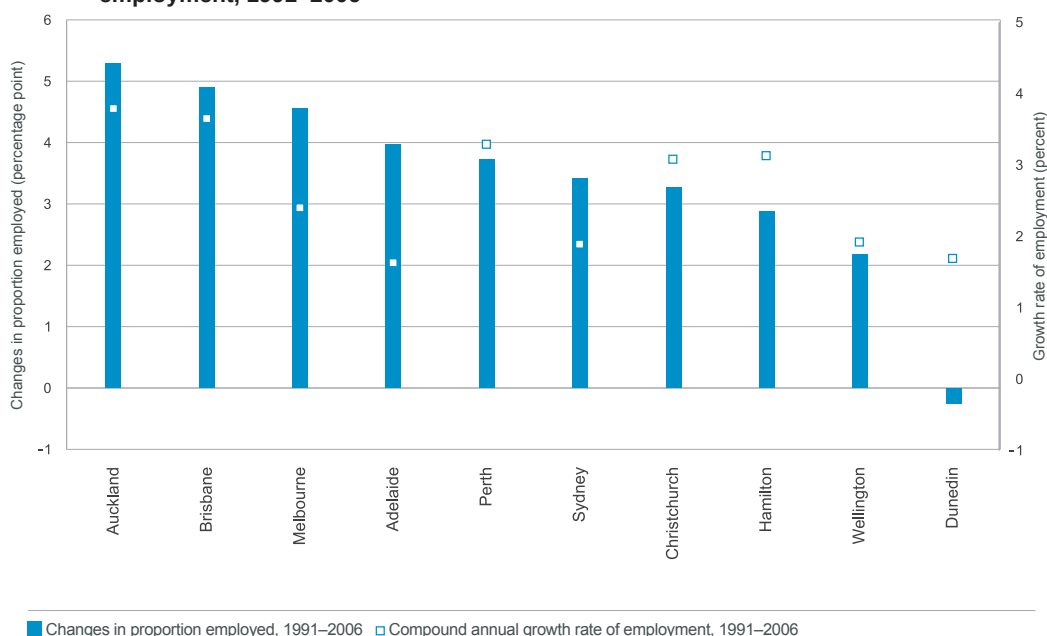
FIG 6.7 Value of trade with Australia in selected business services, 2003 and 2010



Source: Statistics New Zealand, Customised balance of payments data

FIG

6.8 Changes in medium-high-tech manufacturing and knowledge-intensive services employment, 1991–2006



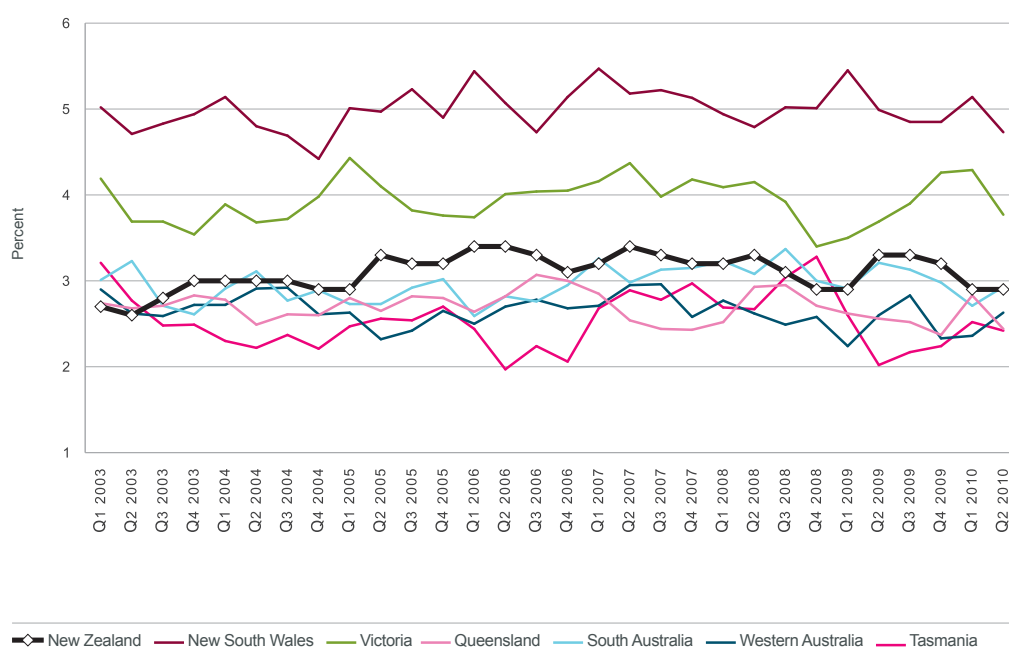
The number of people employed in the high-tech manufacturing and knowledge-intensive services sectors in Auckland is increasing faster than all the other Australian and New Zealand cities shown, whether measured by annual percentage growth or by the proportion of the total workforce employed. The proportion of the total workforce employed in high-tech manufacturing and knowledge-intensive services in the other New Zealand cities shown is growing more slowly than in the Australian cities.

■ Changes in proportion employed, 1991–2006 □ Compound annual growth rate of employment, 1991–2006

Source: Customised data used in the following report: Grimes, A (2010). *Is Auckland a knowledge economy?* Auckland Public Policy Seminar Series, May. Auckland: Motu Economic and Public Policy Research

FIG

6.9 Finance and insurance services employment as a percentage of total employment, 2003–2010

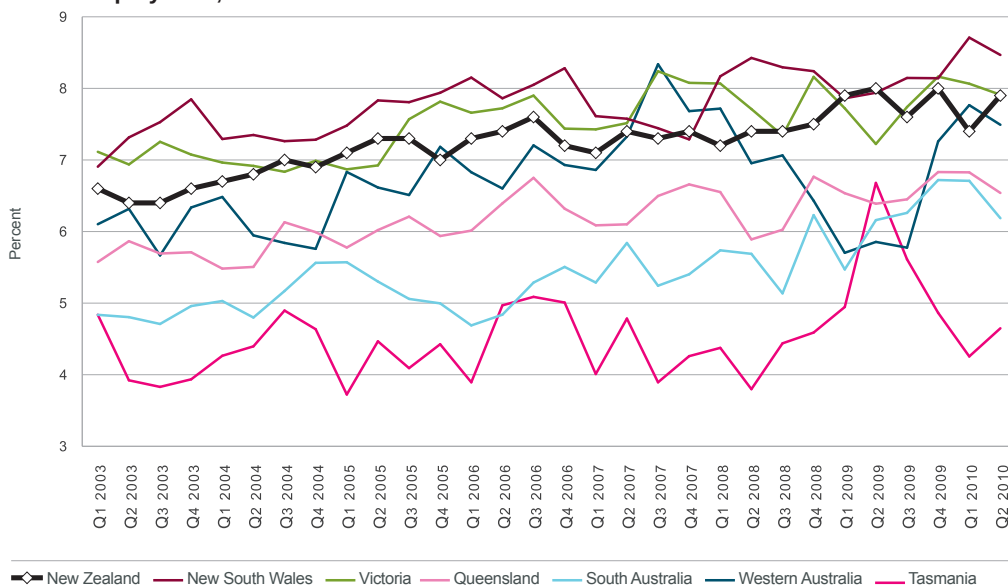


The relatively high percentage of people engaged in finance and insurance employment in New South Wales and Victoria reflects the importance of these states as financial centres. New Zealand is some distance behind these states, but is equal to South Australia and ahead of the other Australian states.

Sources: Statistics New Zealand, Customised household labour force survey data; Australian Bureau of Statistics, 6291.0.55.003 – Labour Force Australia Detailed Quarterly Nov 2009, Table 5 Employed persons by state and industry

Economic forces tend to attract relatively skilled workers, like professional, scientific, and technical workers, to larger, more successful regions. The number of professional, scientific, and technical workers in New Zealand as a percentage of total employment is at the top end of, and growing with, the top Australian states.

FIG 6.10 Professional, scientific, and technical services employment as a percentage of total employment, 2003–2010

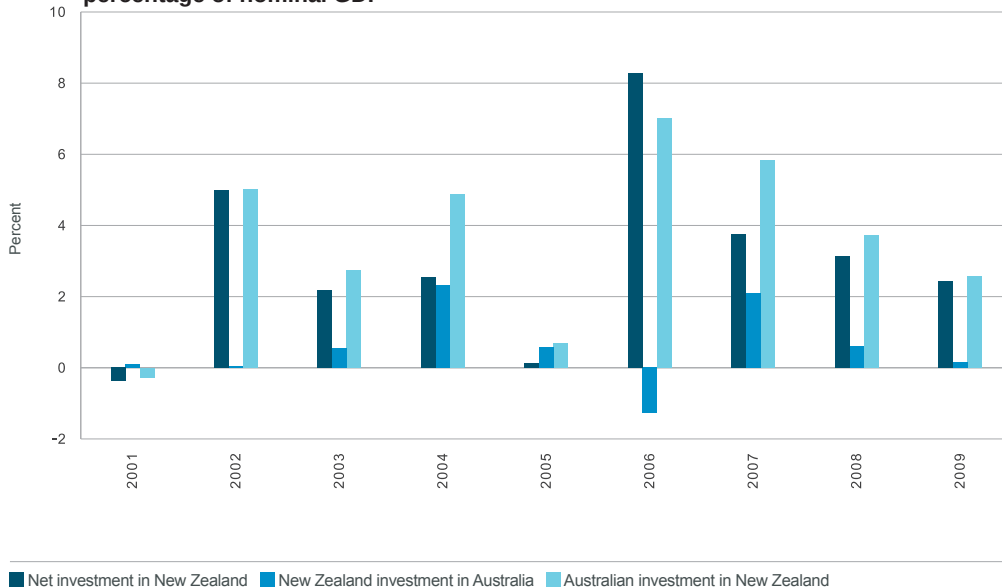


Sources: Statistics New Zealand, Customised household labour force survey data; Australian Bureau of Statistics, 6291.0.55.003 – Labour Force Australia Detailed Quarterly Nov 2009, Table 5 Employed persons by state and industry

Investment

New Zealand has had high, but fluctuating, net investment flows from Australia (as a percentage of New Zealand's nominal GDP) since 2002. Both inward and outward gross investment flows have reduced over the past three years.

FIG 6.11 The flow of nominal investment²²⁶ between Australia and New Zealand as a percentage of nominal GDP

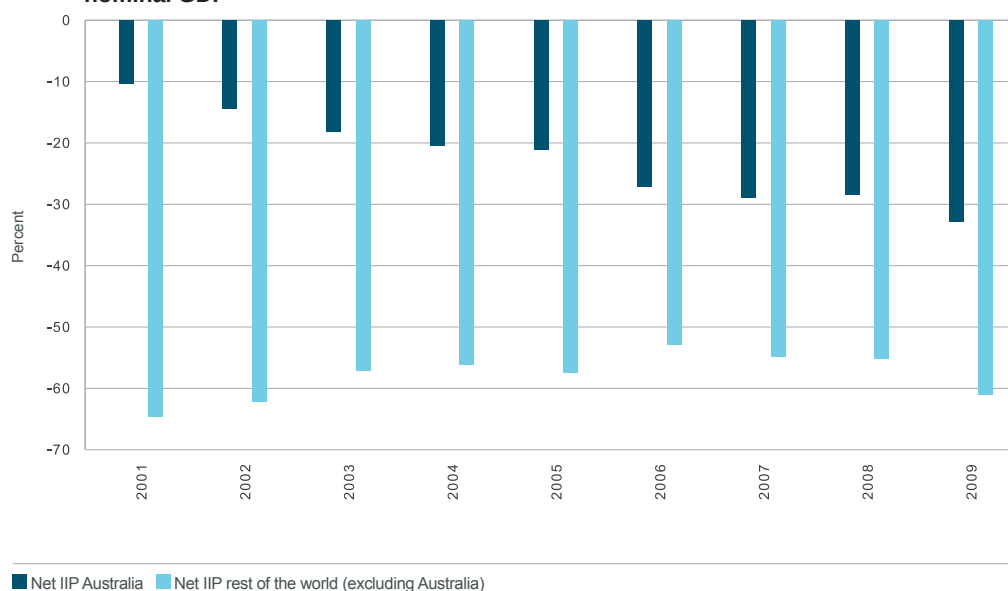


Sources: Statistics New Zealand, Customised balance of payments data; *ibid*, Infoshare database, National Accounts

²²⁶ Investment is investment in financial instruments. Financial instruments comprise equity (shares) and debt instruments. Debt instruments include tradable debt instruments such as bonds and notes, loans, deposits, trade credit, and trade debits.

FIG

6.12 6.12 New Zealand's net international investment²²⁷ position as a percentage of nominal GDP



Sources: Statistics New Zealand, Customised international investment position data; *ibid*, Infoshare database, National Accounts

New Zealand's net international investment position as a percentage of GDP with both Australia and the rest of the world is large and negative. Since 2001, Australia has made up a growing proportion of New Zealand's net foreign liabilities.

²²⁷ The net nominal international investment position is the difference between the stock of foreign investment in New Zealand (liabilities) and the stock of New Zealand's investment abroad (assets).

CHAPTER 7

Auckland – An Internationally Competitive City

Key Points

- Cities are playing an increasingly important role in innovation and economic development as generators and attractors of businesses, skills, and investment.
- Auckland's GDP per capita is slightly lower than most of the international comparator cities chosen.²²⁸ It is substantially lower than the (predominantly large) cities with the highest GDP per capita.
- Auckland is assessed as offering a high quality of living by international standards.
- Auckland's productivity (GDP per person) is lower than the average of a sample of 78 metropolitan regions in the OECD and below most comparator cities.
- The difference in productivity between Auckland and New Zealand as a whole – the Auckland 'premium' – is in the middle of a sample of 78 OECD metropolitan regions, suggesting that Auckland is contributing as might be expected to New Zealand's productivity.
- Auckland's population growth rate is relatively high by OECD standards, driven in part by high levels of inward international migration. As a result, a high proportion of Auckland's population was born overseas.
- With regard to the underlying factors that influence productivity growth, Auckland's performance, like New Zealand's, is mixed:
  - Auckland's levels of patent applications per million population are relatively low by OECD standards, as is its proportion of human resources in science and technology.
  - Auckland's share of employment in knowledge-intensive services is in the middle of the European cities, and above the Australian cities and most other New Zealand cities, but its share of employment in the manufacture of medium- and high-tech goods is relatively low.
  - Congestion in Auckland is the highest of all New Zealand urban areas, but lower than most Australian capital city areas. A relatively high number of people use a car to get to work.

228 The comparator cities chosen for this chapter are Brisbane, Melbourne, Adelaide, Seattle, Vancouver, and Copenhagen.

Introduction

International evidence suggests that large, outward-facing, global cities are playing an increasingly important role in driving economic development.^{229,230} With more mobile populations, national economic fortunes increasingly depend on competition between cities for highly talented people, smart firms, and investment.

Cities are associated with higher output per capita and productivity. This stems from a number of factors, such as thick labour markets, the concentration of suppliers of intermediate inputs, the availability of specialised infrastructure, and greater competition. The Auckland region has approximately 44 percent greater average labour productivity (with a premium of 139 percent in the Auckland CBD) than the rest of New Zealand.²³¹ Other cities around the world exhibit similar 'productivity premia'. For example, London is 41 percent more productive than the national United Kingdom average, while inner London has a productivity premium of 152 percent.²³²

Cities appear to foster innovation. The importance of face-to-face contact for innovation and knowledge-intensive activities has increased.²³³ Cities enable easier face-to-face contact and so allow knowledge flows to occur more freely. University and research institutions in cities are important generators of knowledge and expertise for innovation and productivity improvements in local businesses.

Cities are not automatically synonymous with success. OECD analysis shows that cities such as Berlin, Fukuoka, Lille, Naples, and Pittsburgh perform below their respective national averages for income, productivity, skills, and employment.²³⁴

Auckland is a relatively small city by OECD standards. In 2006, its estimated population was 1.4 million,²³⁵ or a third, of New Zealand's. Projections suggest that by 2031 this will reach almost 2 million, or 38 percent of New Zealand's population.²³⁶ This contrasts with other OECD metropolitan regions, like London with 13 million people and Tokyo with almost 35 million. However, it appears likely that Auckland is the only city in New Zealand that has the size necessary to provide the benefits that large cities can offer.²³⁷

It is therefore useful to assess the extent to which Auckland is acting as an engine of growth for the New Zealand economy and demonstrates the characteristics of a successful city – such as high levels of productivity, income, specialisation, and skills.

This chapter examines Auckland's performance relative to the other regions of New Zealand and to international cities, including a small number of benchmark cities – Brisbane, Melbourne, Adelaide, Seattle, Vancouver, and Copenhagen.²³⁸ These cities are useful comparators for Auckland, as they are mostly similar in size, density, and economic make-up. The more successful cities also provide examples of what Auckland could aspire to.

229 OECD (2006). *OECD territorial reviews: Competitive cities in the global economy*. Paris: Author.

230 Parkinson, M, Hutchins, M, Simmie, J, Clark, G, & Verdonk, H (2004). *Competitive European cities: Where do the core cities stand?* London: Office of the Deputy Prime Minister.

231 Maré, D C (2008). *Labour productivity in Auckland firms*. MED Occasional Paper 08/09. Wellington: Ministry of Economic Development.

232 ONS (2007). *Regional, sub-region and local gross value added*. London: Office of National Statistics.

233 See McCann, P (2009). Economic geography, globalisation and New Zealand's productivity paradox. *New Zealand Economic Papers*, 43(3), 279–314, for a discussion of globalisation and its associated impacts on increased spatial transaction costs for face-to-face contact and high-value goods, and the complexity of knowledge that is generated and manipulated, which requires even more face-to-face contact.

234 OECD (2006). *OECD territorial reviews: Competitive cities in the global economy*. Paris: Author.

235 Statistics New Zealand, Infoshare database, Estimated Resident Population for Subnational Areas, at 30 June.

236 Statistics New Zealand (2010). *Subnational population projects: 2006(base)–2031 update*. Wellington: Author.

237 OECD (2006). *OECD territorial reviews: Competitive cities in the global economy*. Paris: Author. This has a discussion on metropolitan area definitions and size.

238 Where any of these cities are excluded from the graph, it is because we have been unable to find comparable data. In those cases, we have compared Auckland to the subset of cities for which data are available.

The Royal Commission on Auckland Governance concluded that the then local government arrangements in Auckland had resulted in weak and fragmented regional governance and decision-making capability. Following its recommendations, the Government established a single unitary authority, in place of the previous eight local authorities. This was completed in November 2010.

However, the statistics used in this chapter are based on the old Auckland regional definitions. Unless otherwise stated, city-regions in this chapter are named and defined by the metropolitan region definitions used by the OECD. This includes Auckland, where the OECD data provided refer to the greater Auckland area, defined as the area within the boundaries of the old Auckland Regional Council (now superseded by the new Auckland Council). City-regions will be labelled by their main city (for example, Christchurch and Dunedin).²³⁹

Wellbeing and Prosperity

FIG 7.1 AND FIG 7.2

Measures of wellbeing and quality of life provide good overall indicators of city performance.

Auckland's GDP per capita level was lower than five of the six benchmark cities, the exception being Adelaide, in 2005. The gap was relatively small for all those cities other than Seattle.

In terms of quality of life, Auckland compares very favourably with most other metropolitan cities internationally. The Mercer Worldwide Quality of Living Survey ranked Auckland fourth equal out of 221 cities, and higher than all of the comparator cities other than Vancouver. This quality of living indicator is a broad-based composite measure, taking account of 39 factors in the 10 areas of: political and social environment; economic environment; sociocultural environment; medical and health considerations; schools and education; public services and transport; recreation; consumer goods; housing; and the natural environment. The other more recently developed and cited quality of living indicator is The Economist Intelligence Unit's Liveability Survey which ranks Auckland relatively highly, but not as highly as Mercer, at number 10 in 2010.²⁴⁰

While a high quality of life is not in itself sufficient for Auckland to become increasingly internationally competitive, it suggests that Auckland has a solid foundation to build on.

²³⁹ See OECD (2006). *OECD territorial reviews: Competitive cities in the global economy*. Paris: Author, Table A.2.1 for the definitions and the corresponding TL3 units which relate to each metropolitan region.

²⁴⁰ The Economist Intelligence Unit's (EIU) Liveability Survey assigns ratings based on over 30 qualitative factors across five broad categories – stability, healthcare, culture and entertainment, education, and infrastructure. EIU uses similar methodology to Mercer, relying on external data sources as well as qualitative judgements. EIU qualitative ratings are based on the judgements of in-house country analysts and a field correspondent based in each city, whereas Mercer's ratings are based on a questionnaire distributed to major multinational companies and other experts in the field.

Underlying Determinants of Income Growth

FIG 7.3 TO FIG 7.7

As noted in Chapter 2, improvements in material living standards can be attributed to increases in either labour utilisation (the number of hours worked per head of population, per year) or labour productivity (the amount of output produced for each unit of paid work).

Auckland's labour productivity (output per worker) was below the average productivity of the sample of 78 OECD metropolitan regions, and lower than all of the comparator cities other than Vancouver, in the early 2000s. While Auckland's overall economic performance is comparable with that of a number of mid-range OECD cities, it also appears to have considerable scope for improvement.

Auckland's productivity 'premium' relative to New Zealand as a whole is in the middle of the sample of 78 OECD metropolitan regions. These data again suggest that, while Auckland's productivity levels are low relative to the comparator cities, it is contributing as might be expected to productivity within New Zealand.

Auckland has experienced high rates of population growth over recent years. Relative to its total population, Auckland has experienced a low net outflow of people to other parts of New Zealand over recent years. Auckland's population growth rate has been supported by high levels of inward international migration compared with other international cities. As a result, a high proportion of its population was born overseas, third only to Toronto and Vancouver in a sample of metropolitan regions. Levels of migration are indicators of skill transfers into and out of cities, and of the international connectedness and desirability of Auckland.

Underlying Determinants of Productivity Growth

FIG 7.8 TO FIG 7.13

International evidence suggests that a number of factors underpin most successful and competitive cities.²⁴¹ In this chapter, we focus on Auckland's performance in the areas of innovation, skilled human capital, economic diversity, and transport infrastructure.

Auckland's performance on these factors is mixed. Its level of patent applications per million population is below most of the comparator cities and relatively low by OECD standards. Its core human resources in science and technology activities as a share of the employed population is relatively low compared to European cities. In more narrowly defined areas of knowledge-intensive occupations, such as science and engineering professionals, Auckland's share is higher than that of Adelaide, Brisbane, Melbourne, Perth, and Sydney.²⁴² Its share of employment in medium- and high-tech goods is lower than most of the European cities shown but in the middle of the Australian ones. Its share of employment in knowledge-intensive services is broadly in the middle of European cities and ahead of the Australian cities.

Road congestion (travel delay per kilometre travelled) in Auckland is lower than the Australian state capital city areas. However, use of public transport, walking, and cycling is low compared to international cities.

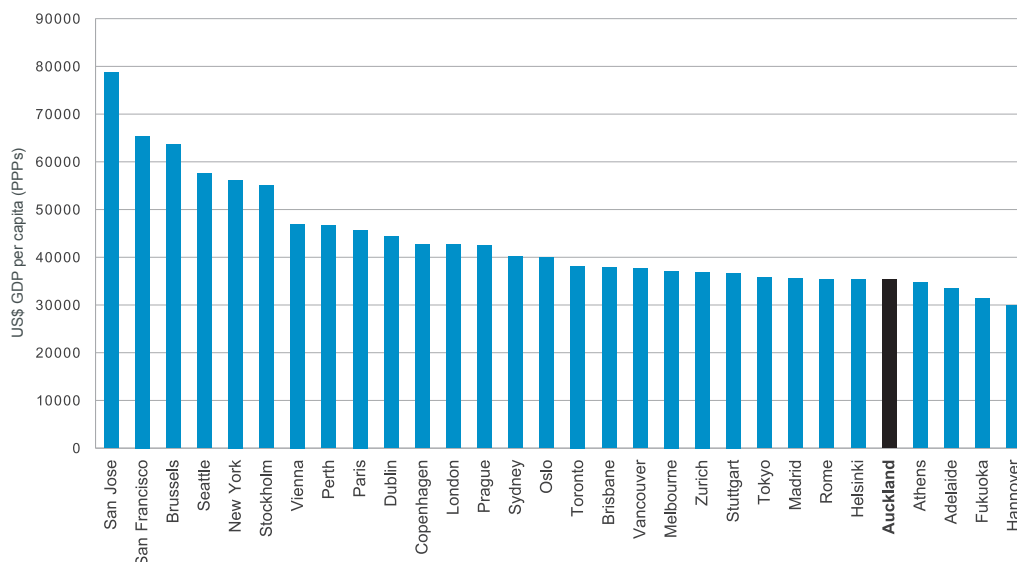
241 Parkinson, M, Hutchins, M, Simmie, J, Clark, G, & Verdonk, H (2004). *Competitive European cities: Where do the core cities stand?* London: Office of the Deputy Prime Minister.

242 Grimes, A, Le Vaillant, J, & McCann, P (forthcoming). *Auckland's knowledge economy: Australasian and European comparisons*. MED Occasional Papers. Wellington: Ministry of Economic Development.

Wellbeing and Prosperity

Auckland's GDP per capita is below that of most of the comparator cities (Brisbane, Vancouver, Melbourne, Copenhagen, and Seattle), but higher than Adelaide. Overall, Auckland's ranking for this indicator is 84th of 100 metropolitan regions.²⁴³ Auckland's GDP per capita is high relative to other New Zealand regions.²⁴⁴

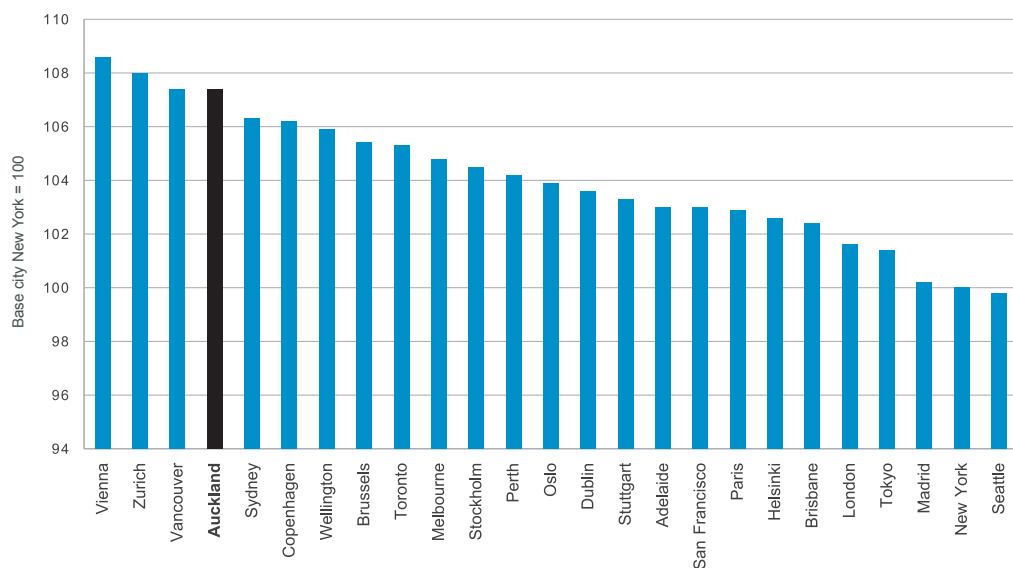
FIG 7.1 Ranking of metropolitan regions by income (US\$, GDP per capita in PPPs), 2005



Source: Demographia, GDP per Capita: Top 100 World Metropolitan Areas

Auckland's quality of living has been in the top five cities in the world for the last five years, according to the Mercer Quality of Living Survey. This indicates that, overall, Auckland offers a good lifestyle with high-quality amenities.

FIG 7.2 Quality of living (base city: New York, USA = 100), 2010

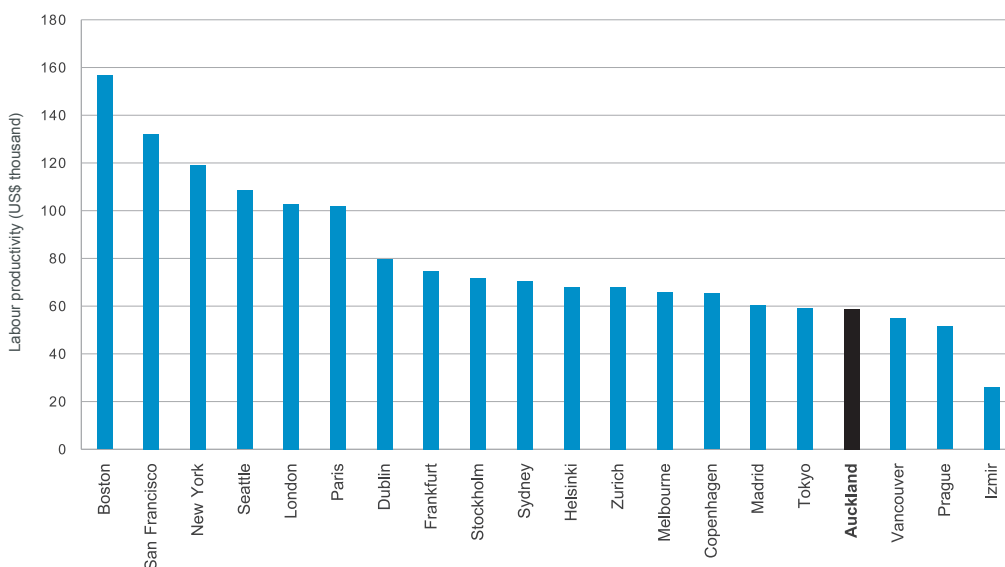


Source: Mercer, Quality of Living Worldwide City Rankings 2010, Table: Worldwide top 50 cities: Quality of living ranking

243 While the figures present data for a selected subset of cities, the rankings provided in this chapter show Auckland's ranking for all available cities.

244 Ministry of Economic Development analysis using Infometrics' regional GDP dataset and Statistics New Zealand sub-national population estimates.

FIG
7.3 Labour productivity, 2002²⁴⁵

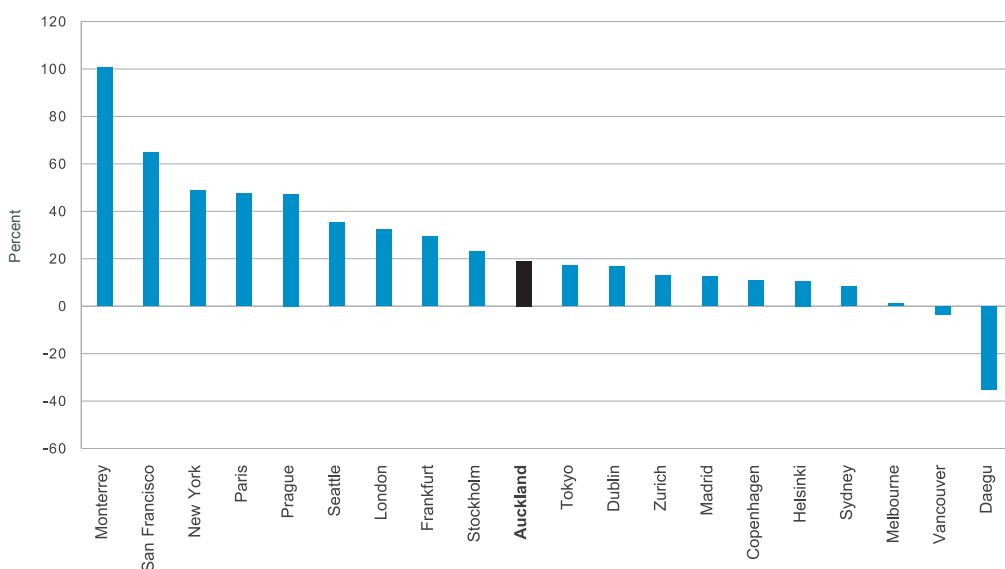


Source: OECD Territorial Reviews: Competitive Cities in the Global Economy, 2006, Table 1.1 Metropolitan database, Ranking by GDP per capita

Underlying Determinants of Income Growth

Auckland's labour productivity is lower than most cities in the sample of metropolitan regions, and lower than all of the comparator cities other than Vancouver (Auckland is 54th out of 78 OECD metropolitan regions).

FIG
7.4 Productivity differences between the metro-regions and their national level, 2002²⁴⁶



Source: OECD Territorial Reviews: Competitive Cities in the Global Economy, 2006, Table 1.22 Productivity differences between the metro-regions and their national level (2002), Sample of 78 metro-regions in the OECD

Auckland has high labour productivity, compared with other New Zealand regions^{247,248} and the New Zealand national average. Internationally, Auckland's productivity relative to the national average is in the middle of the cities included (Auckland is 38th out of 78 OECD metropolitan regions). This suggests that it is contributing as might be expected to productivity within New Zealand.

245 For most metropolitan regions, the reference year is 2002. For Australian and New Zealand regions, the reference year is 2004. Japan's reference year is 2000.

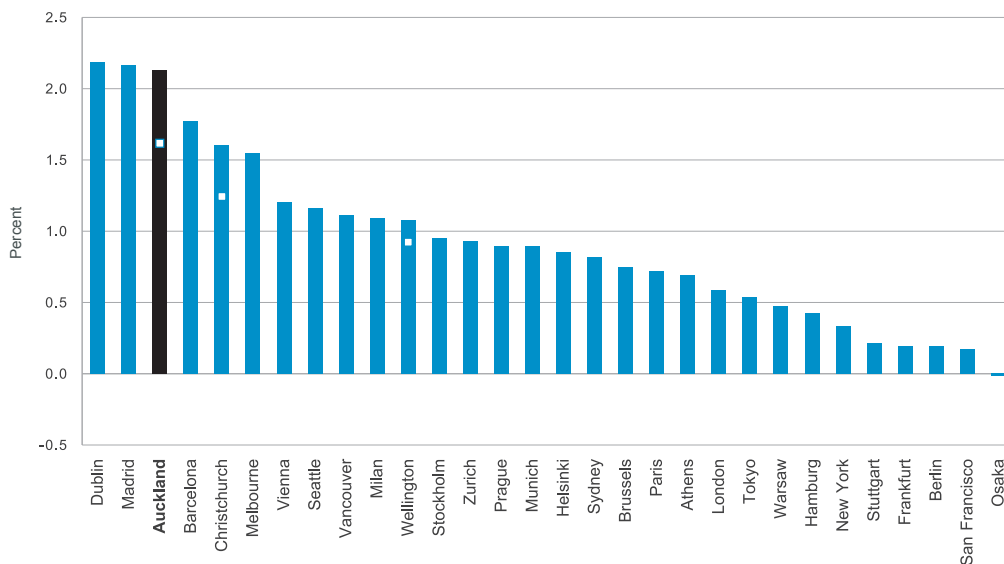
246 Refer to footnote 245.

247 Statistics New Zealand (2006). *Research report on regional gross domestic product*. Wellington: Author.

248 Maré, D C (2008). *Labour productivity in Auckland firms*. Ministry of Economic Development Occasional Paper 08/09. Wellington: Ministry of Economic Development.

Auckland had a relatively high average annual population growth rate between 2005 and 2010, at 1.6 percent. Between 2002 and 2007, Auckland had the third highest average annual population growth rate of the sample of 78 OECD metropolitan regions.

FIG 7.5 Average annual population growth rate²⁴⁹ (sample of metropolitan regions), 2002–2007 and 2005–2010

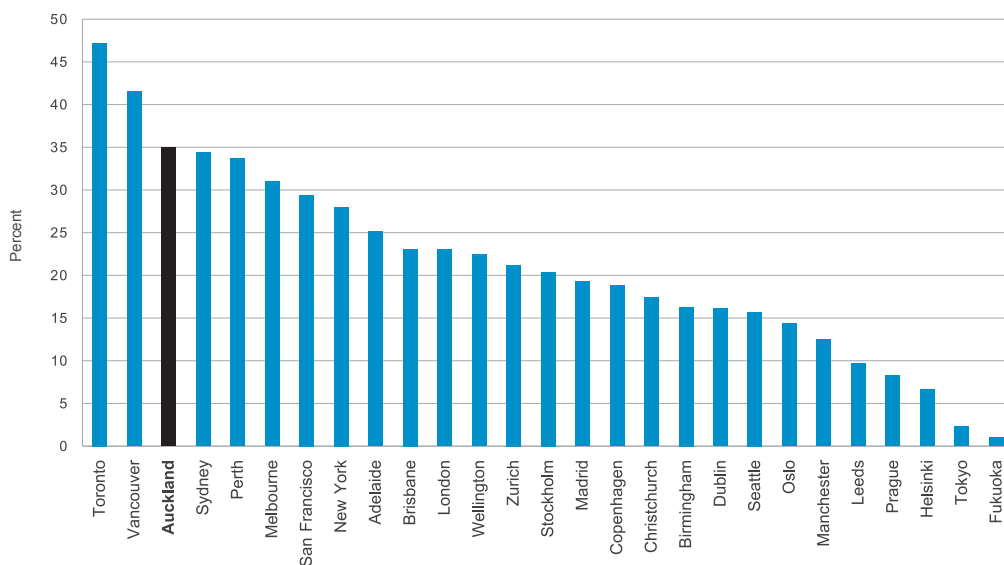


■ 2002–2007 □ 2005–2010

Sources: Statistics New Zealand, Infoshare database, Demography and Population Estimates – DPE; OECD database, Regional Statistics, Metropolitan Regions

Auckland has one of the highest proportions of its population comprised of overseas-born residents, just behind Toronto and Vancouver.

FIG 7.6 Overseas born as a percentage of total population, 2006 (or latest available)

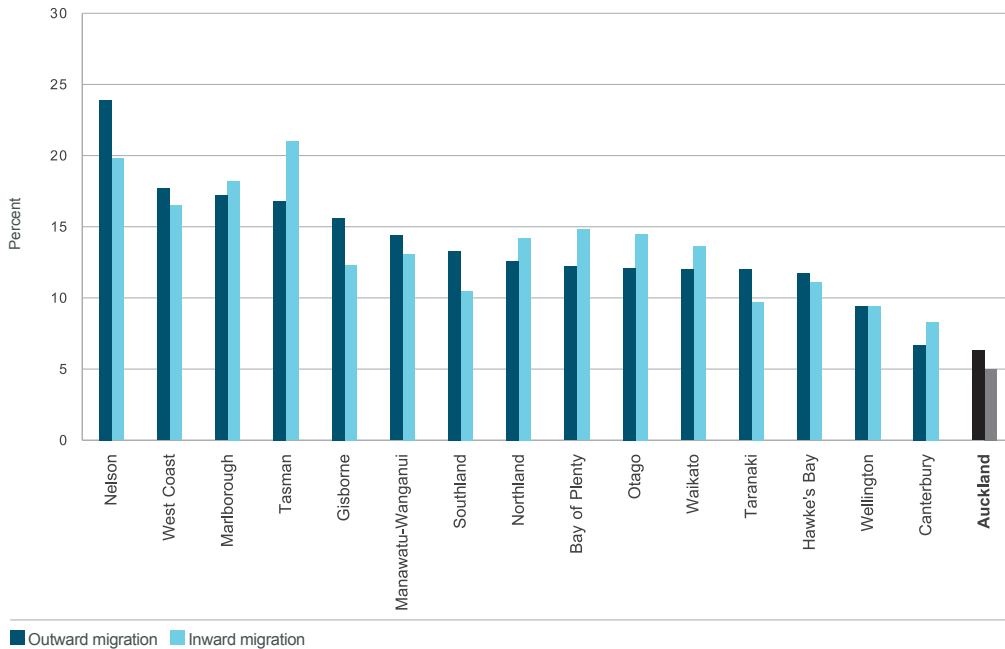


Sources: Statistics New Zealand, 2006 Census Data; Statistics Sweden, Spain National Statistics Institute; Japan Statistics Bureau; Australian Bureau of Statistics; Statistics Canada; Statistics Denmark; Czech Statistical Office; Statistics Finland; US Census Bureau; Swiss Federal Statistics; Central Statistics Office Ireland; UK National Statistics; Statistics Norway

249 The five-year average is calculated as a five-year compound annual growth rate.

FIG

7.7 Proportion of the population moving into and out of New Zealand regions, 2006 census

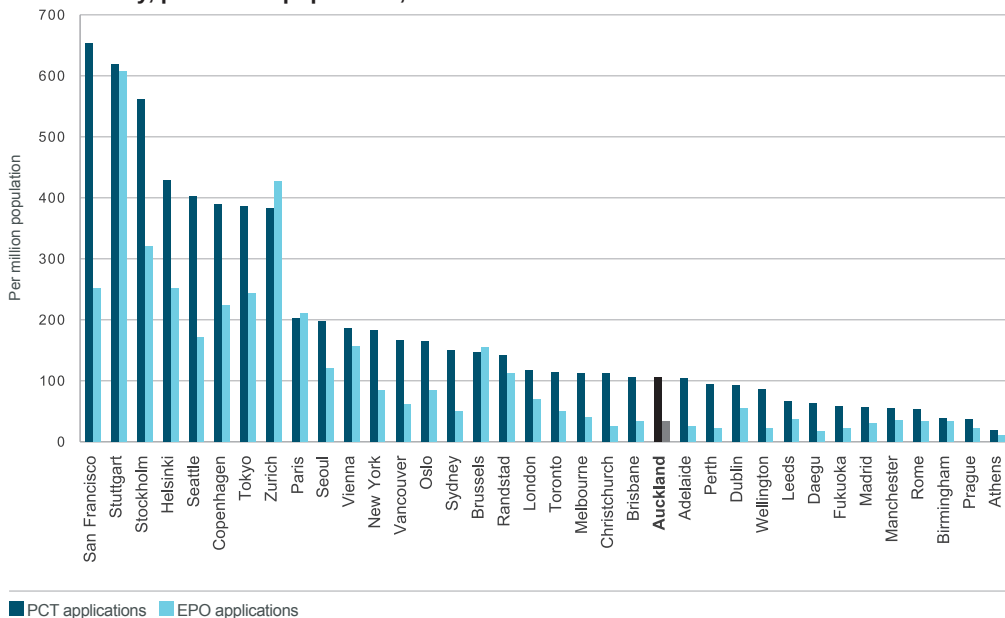


Source: Statistics New Zealand, Internal Migrants as a Percent of Regional Populations

Auckland had the lowest proportion of population of any New Zealand region moving out of the region to other parts of New Zealand, and the lowest proportion moving in. In addition, it is the only region having a major city where outward migration to other parts of New Zealand exceeds inward migration. Despite this, Auckland continues to grow at a faster rate than the rest of New Zealand because it has high international net immigration compared with other New Zealand regions.

FIG

7.8 Patent applications to the European Patent Office and under the Patent Cooperation Treaty, per million population, 2007



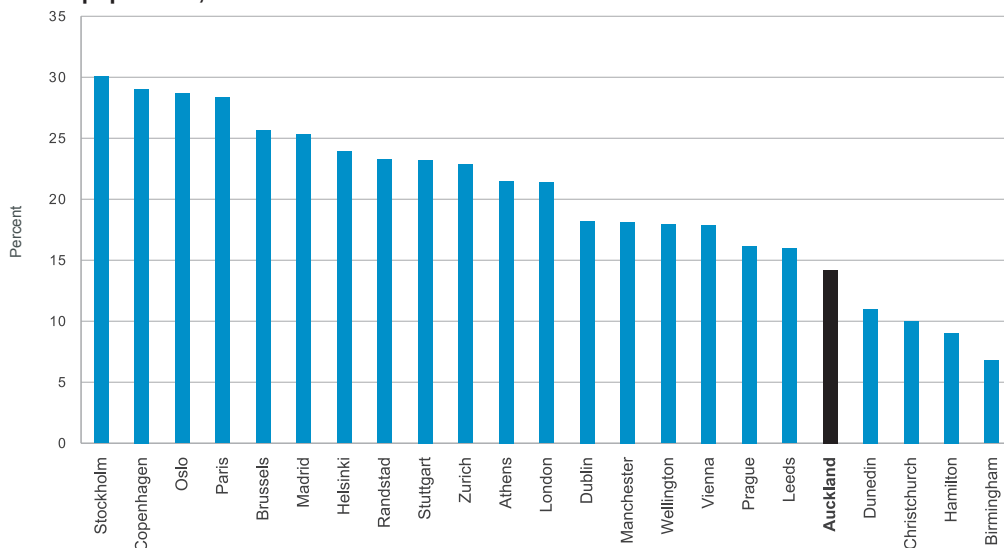
Sources: OECD database, Science, Technology and Patents, Total patents by TL3 regions; OECD database, Regional Statistics, Small regions demographic statistics

Underlying Determinants of Productivity Growth

Auckland is near the lower end of 36 OECD metropolitan regions shown on number of patent applications filed per capita to the European Patent Office (EPO) and under the Patent Cooperation Treaty (PCT). Christchurch had a similar number of applications per capita to Auckland, while Wellington had fewer, and most of the comparator cities had higher rates than Auckland.

Core human resources in science and technology has been defined as individuals who have successfully completed a university education and who are employed in a science and technology occupation as a professional, technician, or associate professional.²⁵¹ Auckland's core human resources in science and technology as a percentage of the employed population is low compared to the 18 European cities shown.

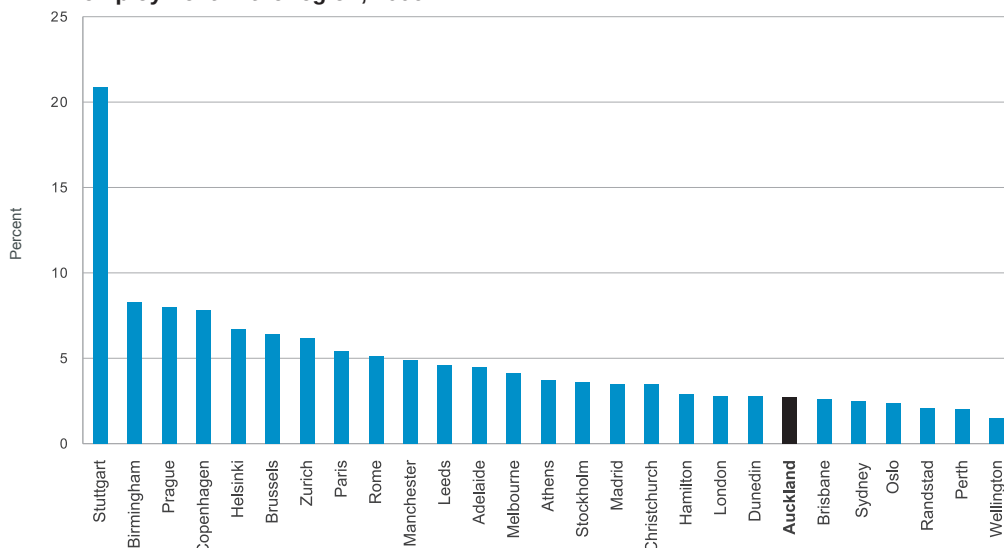
FIG 7.9 Core human resources in science and technology as a percentage of the employed population, 2006²⁵⁰



Sources: Eurostat database, General and Regional Statistics, Annual data on human resources in science and technology and sub-groups; *ibid*, General and Regional Statistics, Employment by sex and age, at NUTS levels 1 and 2; Ministry of Research, Science and Technology, customised data request

Auckland²⁵² has relatively low employment in the manufacture of medium- and high-tech goods (as a percentage of total employment) by OECD standards.

FIG 7.10 Employment in medium- and high-tech manufacturing goods as a percentage of total employment in the region, 2006



Source: Customised data used in the following report: Grimes (2010), *Is Auckland a Knowledge Economy?* Auckland Public Policy Seminar Series, May, Auckland. This uses data from Statistics New Zealand and Australian Bureau of Statistics Census data, and Eurostat database

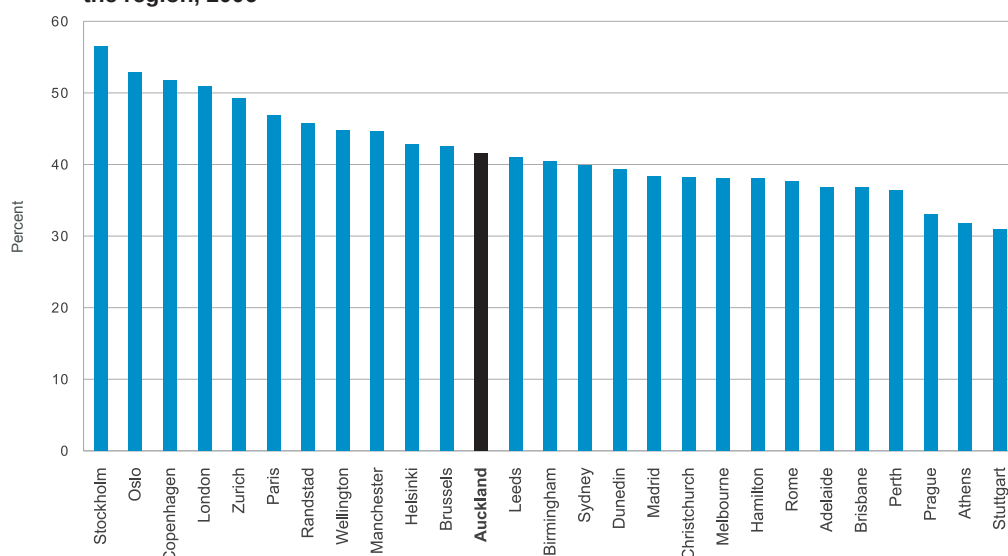
250 Copenhagen's data are for 2007.

251 OECD (1995). *The measurement of scientific and technological activities: Manual on the measurement of human resources devoted to S&T* 'Canberra Manual'. Paris: Author.

252 For this figure, the New Zealand cities refer to main urban areas (very large urban areas centred on a city or major urban centre with a minimum population of 30,000) rather than regional council areas. Auckland comprises the areas formerly known as Auckland City, North Shore City, Papakura District, and urban parts of Waitakere City, Manukau City, Franklin District, and Rodney District.

FIG

7.11 Employment in knowledge-intensive services as a proportion of total employment in the region, 2006

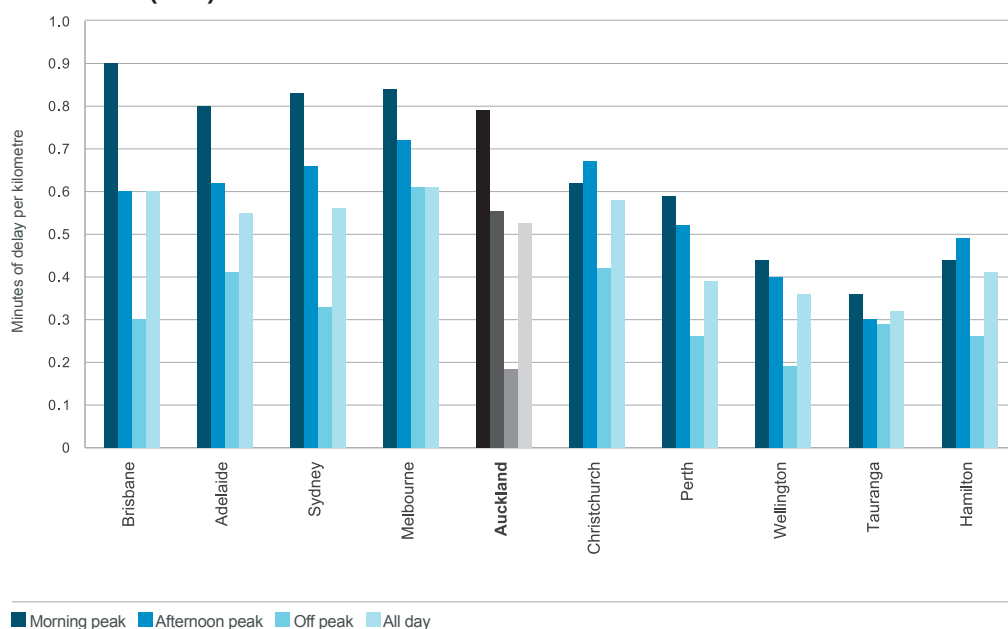


Auckland's²⁵³ employment in knowledge-intensive services, as a percentage of total employment in the region, is in the middle of the European cities shown, and above the Australian cities and most other New Zealand cities.

Source: Customised data used in the following report: Grimes (2010), *Is Auckland a Knowledge Economy?* Auckland Public Policy Seminar Series, May, Auckland. This uses data from Statistics New Zealand and Australian Bureau of Statistics Census data, and Eurostat database

FIG

7.12 Congestion²⁵⁴ in Australian capital city areas (2008–2009) and New Zealand urban areas (2009)



Compared with most Australian capital city areas, Auckland has shorter travel delays per kilometre travelled. Auckland has shorter off-peak delays than all of the other Australian and New Zealand cities shown.

■ Morning peak ■ Afternoon peak ■ Off peak ■ All day

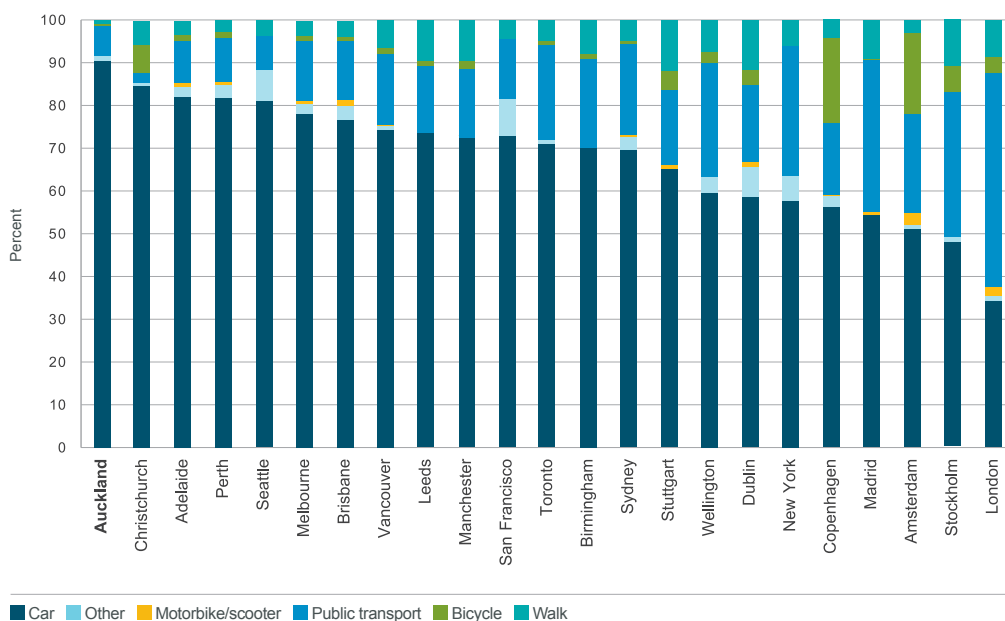
Sources: Austroads, National Performance Indicators, Congestion indicator (urban); Ministry of Transport, 2010, NR002 – Network Reliability: Speed and Variance of Travel Time

253 Refer to footnote 252.

254 Average delay per kilometre in minutes.

Auckland's and Christchurch's use of cars for the journey to work were the highest of all the comparator cities, and all cities in the sample.

FIG 7.13 Transport mode share for journey to work, 2008–2009 (or latest available)



Sources: NZ Ministry of Transport, customised data request; US Census Bureau, American Factfinder database; Statistics Canada, Community Profiles from the 2006 Census; UK Department for Transport, Regional tables on personal travel; Mees, P, Sorupia, E, & Stone, J (2007), *Travel to Work in Australian Capital Cities, 1976–2006: An Analysis of Census Data*; Eurostat, derived indicators for larger urban zones