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OVERVIEW

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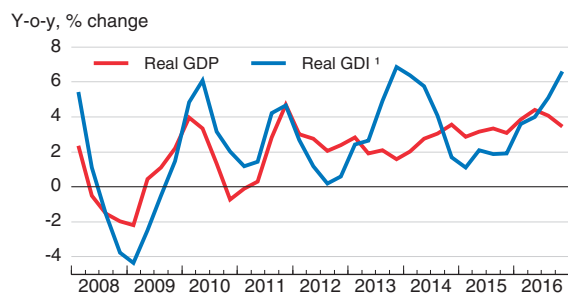
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Executive summary

- *New Zealand continues to enjoy a strong, broad-based economic expansion*
- *Productivity remains well below that of leading OECD countries*
- *Employment has been shifting towards high-skilled occupations*

New Zealand continues to enjoy a strong, broad-based economic expansion

Economic growth is robust



1. Real GDI equals real GDP adjusted for changes in the terms of trade.

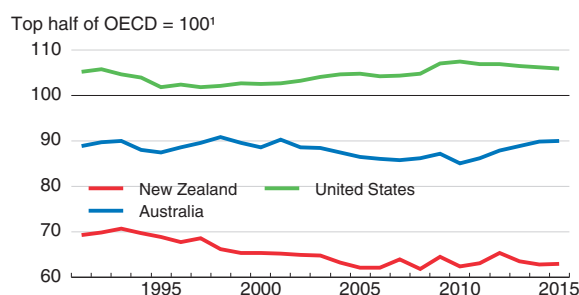
Source: OECD, Economic Outlook Database.

StatLink <http://dx.doi.org/10.1787/888933497083>

Strong economic growth is being driven by booming tourism, strong net inward migration, solid construction activity, and supportive monetary policy. The fiscal position is sound, with low public debt and a balanced budget. The major vulnerability facing the economy is high levels of household debt associated with rapid house price increases, particularly in Auckland. New Zealand is also exposed to protectionist trade policies abroad and to slowing Chinese economic growth. While the short-term economic outlook is strong, there are long-term challenges from low productivity growth and a changing labour market.

Productivity remains well below that of leading OECD countries

Labour productivity continues to lag



1. Population-weighted average for the top 17 OECD countries for labour productivity, calculated using 2010 purchasing power parity exchange rates.

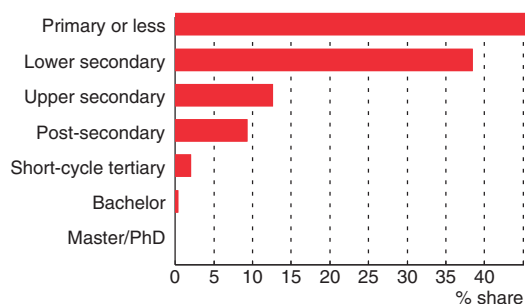
Source: OECD (2017), *Economic Policy Reforms: Going for Growth 2017*.

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Labour productivity is well below leading OECD countries, restraining living standards and well-being. Productivity is held back by a lack of international connections, agglomeration economies and scale; weak competitive pressures; low rates of capital investment; and meagre research and development activity. Opportunities to address these factors include reducing barriers to foreign direct investment, lowering the corporate tax rate, expanding infrastructure funding options to increase housing supply (preferably through densification), reviewing the insolvency regime and the current provisions for misuse of market power, and increasing support for business innovation.

Employment has been shifting towards high-skilled occupations

NZ workers with high automation potential,¹ 2015



1. Workers are in jobs at high risk of automation if at least 70% of their tasks are automatable.

Source: OECD calculations based on the Survey of Adult Skills (PIAAC) (2015).

StatLink <http://dx.doi.org/10.1787/888933497100>

Employment has shifted towards high-skilled occupations, a trend that is likely to continue with further diffusion of digital technologies, including Artificial Intelligence. New Zealand has high levels of skills but also high levels of mismatch between jobs and qualifications. As in other countries, people will need to acquire more initial education in fields in demand and upgrade or reorient their skills during their working lives. Improving education achievement in mathematics would provide more young people with good job prospects in fields such as engineering and computing. With more workers likely to be displaced over the next 10-20 years, there may be a need to strengthen New Zealand's limited arrangements for supporting displaced workers.

MAIN FINDINGS	KEY RECOMMENDATIONS
Making growth more sustainable and greener	
High household debt and rapid growth in house prices raise financial system risks.	Add a debt-to-income limit to the Reserve Bank's macro-prudential instruments to increase the resilience of bank balance sheets, with attention to benefits exceeding costs.
The government budget is balanced, and net debt is low. The government intends to reduce net core Crown debt to 10-15% of GDP by 2025.	Gradually reduce net public debt in line with the government's fiscal strategy. Increase spending that enhances well-being and reduce taxes within the constraints of this strategy.
The age of eligibility for public pensions will rise by six months each year from 2037, reaching 67 by 2040.	Bring forward this increase, lengthen the transition period, and then index the pension age to life expectancy.
Strong growth in primary industries may jeopardise environmental quality. Pollution from farming and urbanisation is reducing water quality, and water scarcity is an increasing concern.	Develop a long-term vision for a transition towards a low-carbon, greener economy. Introduce pollution charges or cap-and-trade measures. Expand water trading and pricing to ensure scarce water goes to its best use.
Greenhouse gas emissions are high and continue to grow. While half of emissions come from agriculture, total transport and industry emissions are rising fastest.	Increase the price of carbon to a level consistent with New Zealand's intended transition to a low-carbon economy. Adopt alternative pricing or regulatory measures to reduce biological emissions. Support research in new mitigation technologies, especially for farming.
New Zealand has one of the world's largest shares of threatened species.	Intensify protection of species by continuing to develop a National Policy Statement on biodiversity.
Improving productivity	
Poorly targeted screening reduces productivity benefits from foreign direct investment.	Progressively narrow screening of foreign investment. Continue to reduce compliance costs and boost predictability for investors.
A high corporate tax rate reduces capital investment.	Undertake a tax review that considers corporate and personal income tax settings and potential new tax bases.
Limitations on the ability and incentives for local governments to fund land transport and water infrastructure has restricted housing supply.	Enhance councils' incentives to accommodate growth, for example by sharing in a tax base linked to local economic activity. Apply user charging more broadly for infrastructure, including congestion charging.
Significant price-cost margins and survival of less productive firms suggest that competition could be sharpened.	Review the merits of refocusing competition law on the effects of potentially anti-competitive conduct, as opposed to its intent. Provide the Commerce Commission with the power and resources to undertake market studies.
Expenditure on R&D is low as a share of GDP, most notably in the business sector. Collaboration between firms, education and research institutions is low.	Increase fiscal support for business research and development. Maintain or increase long-term support for successful collaboration between research institutions and industry.
Adapting to the changing labour market	
Weaknesses in mathematics teaching and variability in students' exposure to the mathematics curriculum undermine the acquisition of core mathematics skills at school, precluding access to some higher-skilled fields.	Improve competence to teach mathematics by supporting professional development and evidence-informed teaching and raising initial teacher education quality and entry standards. Review minimum numeracy requirements for school qualifications and the minimum education required by all school leavers. Help schools to make more effective use of ability grouping strategies.
Many New Zealanders are over-qualified for their jobs. They earn less than people who are not over-qualified. Most over-qualified people work outside their field of training.	Merge Careers New Zealand into the Tertiary Education Commission, as the government has proposed, to increase the extent to which young people choose study fields in demand and tertiary institutions adapt their programmes to employer requirements.
Housing supply restrictions hinder the allocation of workers to jobs.	Increase infrastructure investment needed to support better housing. Allow greater urban densification.
Displaced workers bear most of the burden of being laid off. Most do not qualify for the means-tested unemployment benefit, half do not receive redundancy pay and few benefit from activation measures.	Consider introducing unemployment insurance or, alternatively, longer notice periods and mandatory notification of layoffs. Also consider expanding training, guidance and counselling for displaced workers.

Assessment and recommendations

- *New Zealand is enjoying a strong, broad-based economic expansion*
- *Ensuring price and financial stability*
- *Adjusting fiscal policy to enhance growth and prepare for future shocks and population ageing*
- *Improving productivity*
- *Adapting to the changing labour market*
- *Making growth more environmentally sustainable*

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, east Jerusalem and Israeli settlements in the West Bank under the terms of international law.

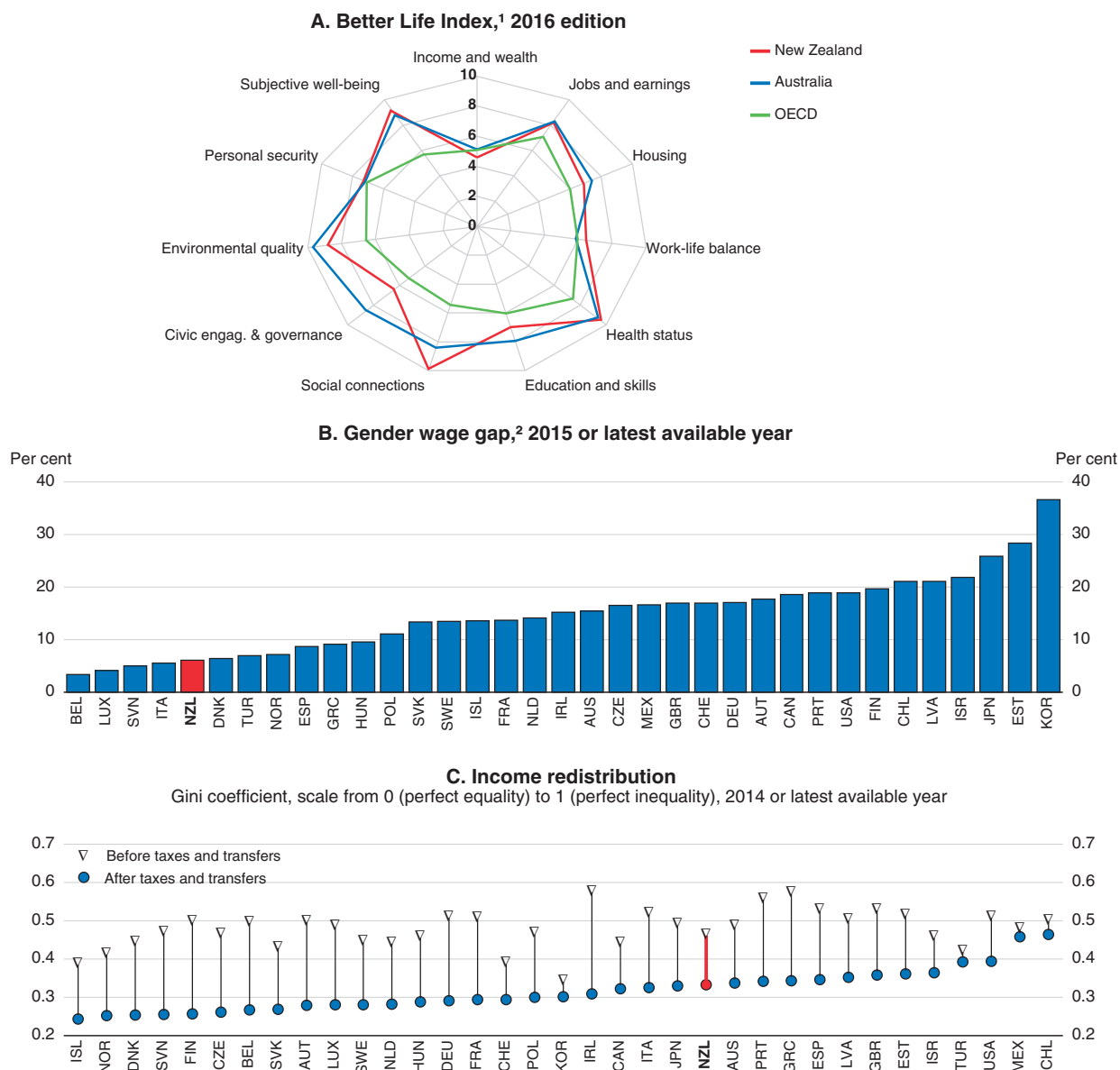
New Zealand has experienced robust economic growth since 2012, buoyed by record levels of inward migration and strong terms of trade. Employment has expanded vigorously, reversing much of the increase in unemployment since the onset of the global financial crisis. Inflation has been very low for some time but is on track to return sustainably to 2% by the end of 2018. The government budget is near balance, and external deficits are considerably smaller than in past expansions.

New Zealanders enjoy high living standards, with all components of the Better Life Index stronger than the OECD average except household disposable income and wealth (Figure 1, Panel A). New Zealand substantially outperforms most other OECD countries on social connections, health status and overall environmental quality. High living standards are also reflected in a superior subjective measure of well-being. They are underpinned by robust institutions, good governance, generally best-practise policy settings, a stable macroeconomy and a high-quality education system. New Zealand also performs well on gender inclusiveness, with one of the smallest gender wage gaps in the OECD (Panel B). However, disposable income inequality is above the OECD average, reflecting less-than-average redistribution through taxes and transfers (Panel C), and the child poverty rate, which is around the OECD average, is more than double the rate in the best performing OECD countries. Living standards and economic growth also vary considerably ethnically and geographically.

GDP per capita is below the OECD mean owing to low labour productivity (Figure 2), and improving productivity growth is a major long-term challenge for improving inclusiveness and living standards. Growth in GDP per capita over the past two decades has been in line with other OECD countries (Figure 3), which is an improvement on previous decades' performance. Low multi-factor productivity growth and weak capital investment account for New Zealand's poor productivity performance (Figure 2). Key issues to address in this domain include a lack of international connections and agglomeration, high rates of qualification and skills mismatches, muted competitive pressures, and low rates of capital investment and research and development activity. There are opportunities to address inequality and weak productivity growth through win-win policies that deliver improved inclusiveness as well as productivity growth (OECD, 2016a). For example, removing barriers to foreign investment, facilitating exit by non-viable firms, boosting support for collaboration between research institutions and industry, and sharpening competitive pressures have the potential to increase wages, reduce wage dispersion and provide benefits to consumers through lower prices.

New Zealand also faces the common worldwide challenge of adapting to changes in the labour market caused by technical progress. As elsewhere, digitalisation has been increasing the demand for high-skilled workers but has been creating more difficult labour-market conditions for their low-skilled counterparts. These pressures are likely to grow, especially in light of progress in areas such as automation and artificial intelligence. As technological advances continue, workers will need to acquire complementary skills.

Figure 1. Inclusiveness and well-being



1. Each dimension is measured by one to four indicators from the OECD Better Life Index (BLI) set. Normalised indicators are averaged with equal weights. Indicators are normalised to range between 10 (best) and 0 according to the following formula: $(\text{indicator value} - \text{minimum value}) / (\text{maximum value} - \text{minimum value}) \times 10$. The OECD aggregate is weighted by population. Please note that the OECD does not officially rank countries in terms of their BLI performance.

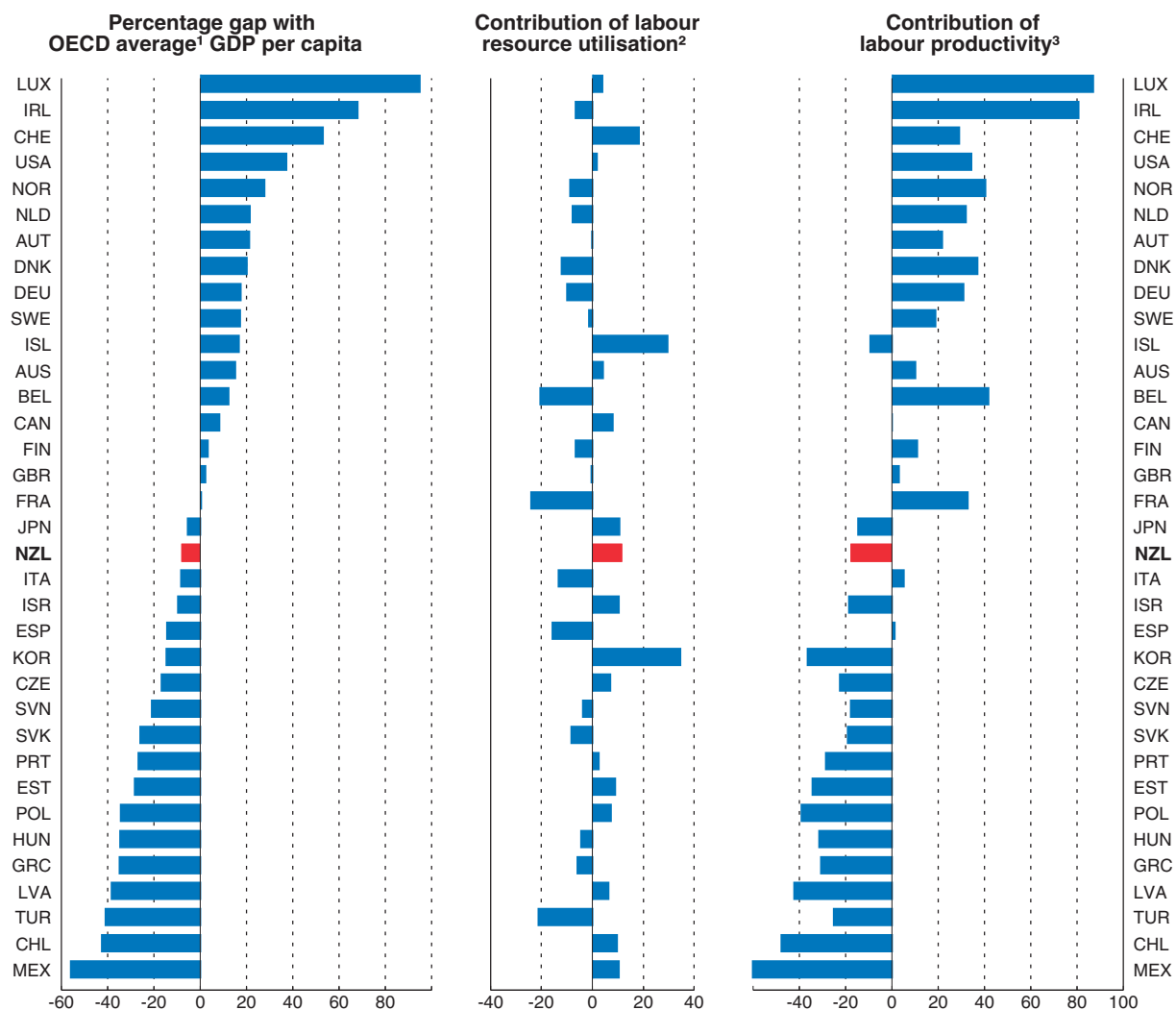
2. Defined as the difference between median wages of men and women relative to the median wages of men.

Source: OECD (2016), *OECD Better Life Index*, www.oecdbetterlifeindex.org; OECD, Labour Earnings Database; OECD, Income Distribution Database.

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The young will need to continue their education to higher levels than in the past and acquire skills that are more highly valued in the labour market, and it will be necessary to pursue more lifelong learning. For this upskilling to occur, the education system must become more responsive to demands emanating from the labour market. Insofar as automation worsens labour-market outcomes for low-skilled workers, it may be appropriate to increase redistribution through the tax-transfer system to meet societal goals for fairness as determined through the political process.

Figure 2. Sources of real income differences across OECD countries, 2015




1. The OECD GDP per capita is a population-weighted average of nominal GDP converted using 2015 purchasing power parities. Note that the population of Luxembourg is augmented by cross-border workers and Norway GDP refers to the mainland.

2. Labour utilisation is measured as total number of hours worked per capita.

3. Labour productivity is measured as GDP per hour worked.

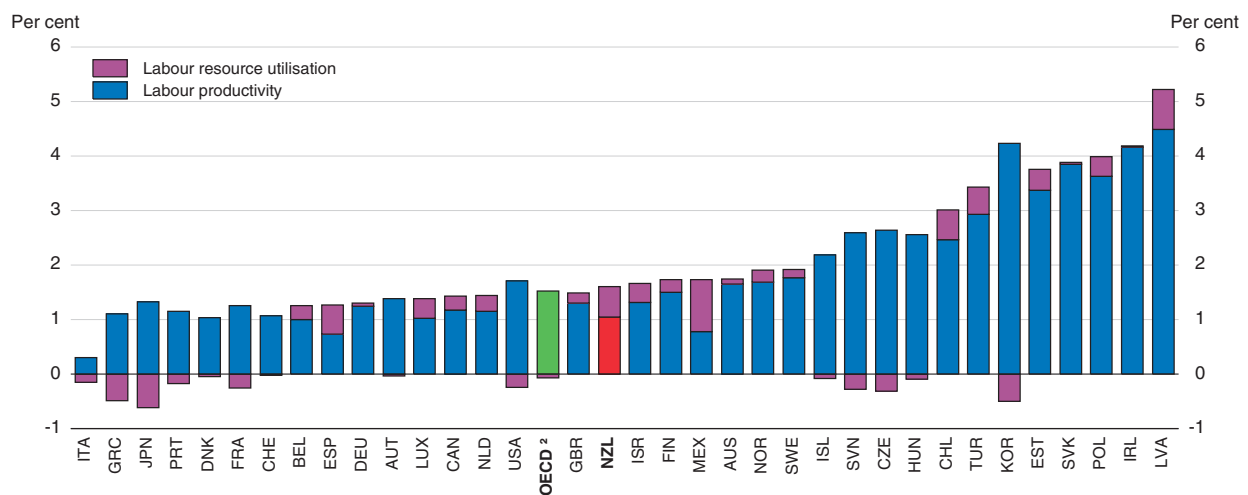
Source: OECD (2017), *Economic Policy Reforms: Going for Growth 2017*.

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New Zealand ranks highly overall on environmental outcomes. However, its water quality has deteriorated (mainly due to expansion of intensive dairy farming), biodiversity is threatened, and its greenhouse gas emissions, which are high per capita and per unit of GDP, continue to grow. Declining water quality and species diversity have the potential to detract from economic growth by undermining the “clean green” image so important for the tourism industry.

Against this background, the main messages of this Survey are that:

- The economy is growing strongly, and the well-being of New Zealanders is high on almost all dimensions. A wide range of reforms to boost productivity would improve this performance further.

Figure 3. Breakdown of GDP per capita growth, 1995-2015¹

1. 2000-15 for Estonia.

2. Population-weighted average.

Source: OECD (2017), National Accounts and Labour Market Statistics Databases.

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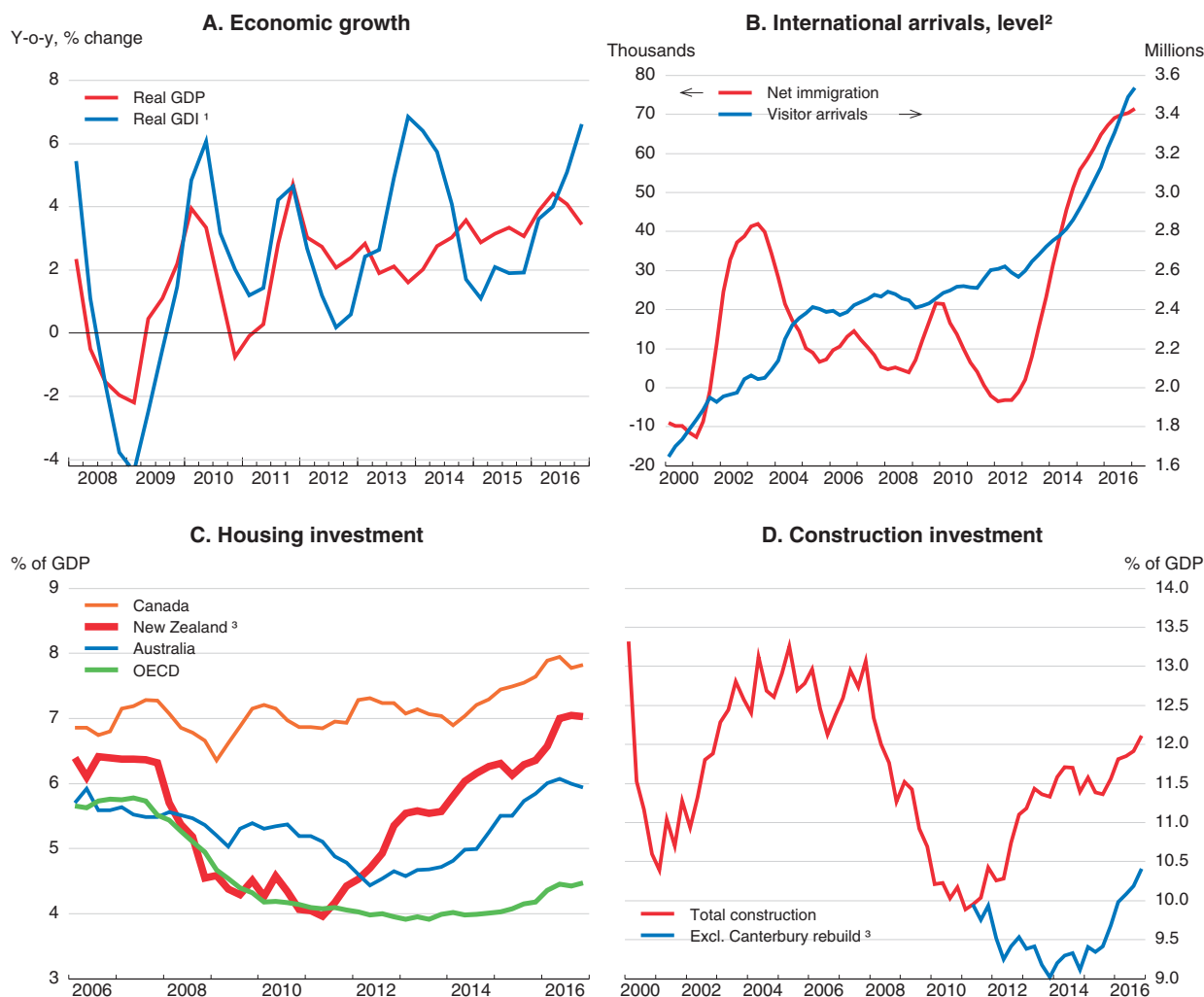
- Continuously upskilling the labour force, facilitating the acquisition of skills in demand in the labour market and, if necessary, addressing any adverse distributional consequences that may result from technical progress would help New Zealanders adjust to labour-market changes.
- Monitoring and managing the effects of natural-resource-based activities on the environment, including by stronger price signals on resource use and pollution through market-based instruments, would help to maintain New Zealand's highly-valued environmental quality.

New Zealand is enjoying a strong, broad-based economic expansion

Economic growth has averaged around 3% over the past three years (Figure 4, Panel A) and is projected to remain strong through 2018 (Table 1). Wage growth has been subdued, however, although this has sustained international competitiveness (Figure 5, Panel A). Until very recently inflation remained below the mid-point of the target range, and inflation expectations have been well anchored (Figure 6, Panels A-C). Several key factors are driving this expansion:

- Net immigration has increased to over 70 000 per year (1.5% of the population) (Figure 4, Panel B). In the year to 30 June 2016, 52 000 people were approved for permanent residence visas: 30 000 under the skilled/business stream, 18 000 under the family stream and 4 000 under the international/humanitarian stream (MBIE, 2016a). China, India, the United Kingdom and the Philippines are the major source countries for residence visas; Australia is also an important source country but Australians do not require a visa to live and work in New Zealand. Net immigration is likely to fall gradually (to 60 000 in 2017 and 51 000 in 2018) as the Australian economy strengthens (encouraging more NZ residents to emigrate and fewer New Zealanders resident in Australia to return), recent policy changes to reduce the number and increase the skill requirements of permanent residents begin to take effect and recent increases in long-term temporary arrivals are followed by an increase in departures when most of these people go home.

Figure 4. Factors driving the economic expansion



1. Real GDI equals real GDP adjusted for changes in the terms of trade.

2. Cumulative data for the past four quarters.

3. Excluding RBNZ estimates of the direct impact of the rebuild on construction expenditure.

Source: OECD, Economic Outlook Database; A. Wood et al. (2016), "The Canterbury Rebuild Five Years on from the Christchurch Earthquake", RBNZ Bulletin, Vol. 79, No. 3, February; Statistics New Zealand.

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- Rising real estate prices (see below) have increased household wealth and consumption. They have also stimulated residential construction activity (Panel C), particularly in Auckland. Following a lull in 2015, activity has surged at double-digit rates in recent quarters. Continued growth will depend on the extent to which approaching capacity limits constrain activity.
- While the 2010-11 Canterbury earthquakes destroyed a considerable amount of public and private capital, the rebuild has supported GDP growth. The rebuild has now peaked (Panel D) and is expected to slow gradually. Expenditure on the November 2016 Kaikōura earthquake rebuild will be much smaller but is expected to reach 1-3% of GDP.
- Tourism has boomed in recent years, with particularly large increases from Asia (especially China).

Table 1. Macroeconomic indicators and projections
Annual percentage change unless specified, volume (2009/10 prices)

	2013 Current prices (NZD billion)	2014	2015	2016	2017	2018
Gross domestic product (GDP)	227.7	2.8	3.1	3.9	3.1	3.1
Private consumption	132.8	3.1	2.9	4.3	4.1	3.3
Government consumption	42.8	3.3	2.6	2.3	2.7	1.9
Gross fixed capital formation	48.1	8.4	2.1	5.6	5.9	4.9
Housing	12.9	9.9	1.3	9.6	3.8	4.8
Business	22.6	6.1	0.8	6.1	7.4	5.8
Government	12.7	10.7	5.4	0.8	4.3	3.1
Final domestic demand	223.7	4.3	2.6	4.2	4.3	3.4
Stockbuilding ¹	1.8	0.0	-0.5	0.6	0.2	-0.1
Total domestic demand	225.6	4.2	2.2	4.7	4.5	3.3
Exports of goods and services	64.8	3.1	6.8	1.6	0.7	3.6
Imports of goods and services	62.6	7.9	3.6	4.2	6.1	4.5
Net exports ¹	2.2	-1.3	1.0	-0.7	-1.4	-0.2
Other indicators (growth rates, unless specified)						
Potential GDP		2.6	2.8	2.9	2.9	2.8
Output gap ²		-0.6	-0.4	0.7	0.9	1.2
Employment ³		3.5	2.3	4.6	3.9	1.9
Working-age population (15-74)		1.7	2.0	2.0	1.8	1.6
Labour force		3.1	2.2	4.3	3.5	1.7
Unemployment rate ⁴		5.4	5.4	5.1	4.7	4.5
GDP deflator		2.3	0.2	1.6	2.7	2.1
Consumer price index		1.2	0.3	0.6	2.4	1.8
Core consumer prices		1.4	1.1	1.3	1.7	1.8
Household saving ratio, net ⁵		-1.5	-2.2	-0.7	-0.6	-0.6
Terms of trade		5.1	-4.7	3.1	2.0	-0.1
Current account balance ⁶		-3.2	-3.3	-2.7	-3.4	-3.4
General government financial balance ⁶		0.3	0.0	0.0	0.3	0.8
Underlying general government fiscal balance ²		0.7	0.1	-0.4	-0.2	0.2
Underlying government primary balance ²		1.5	0.9	0.3	0.4	0.7
General government gross debt ^{6, 7}		40.7	40.8	39.7	39.1	38.2
General government net debt ^{6, 7}		5.3	5.0	4.9	4.4	3.4
Three-month money market rate, average		3.4	3.2	2.3	1.9	2.1
Ten-year government bond yield, average		4.3	3.4	2.8	3.5	4.2

1. Contribution to changes in real GDP.

2. As a percentage of potential GDP.

3. Employment growth in 2016 affected by a change in methodology for Statistics New Zealand's Household Labour Force Survey that increased the number of people identified as being employed.

4. As a percentage of the labour force.

5. As a percentage of household disposable income.

6. As a percentage of GDP.

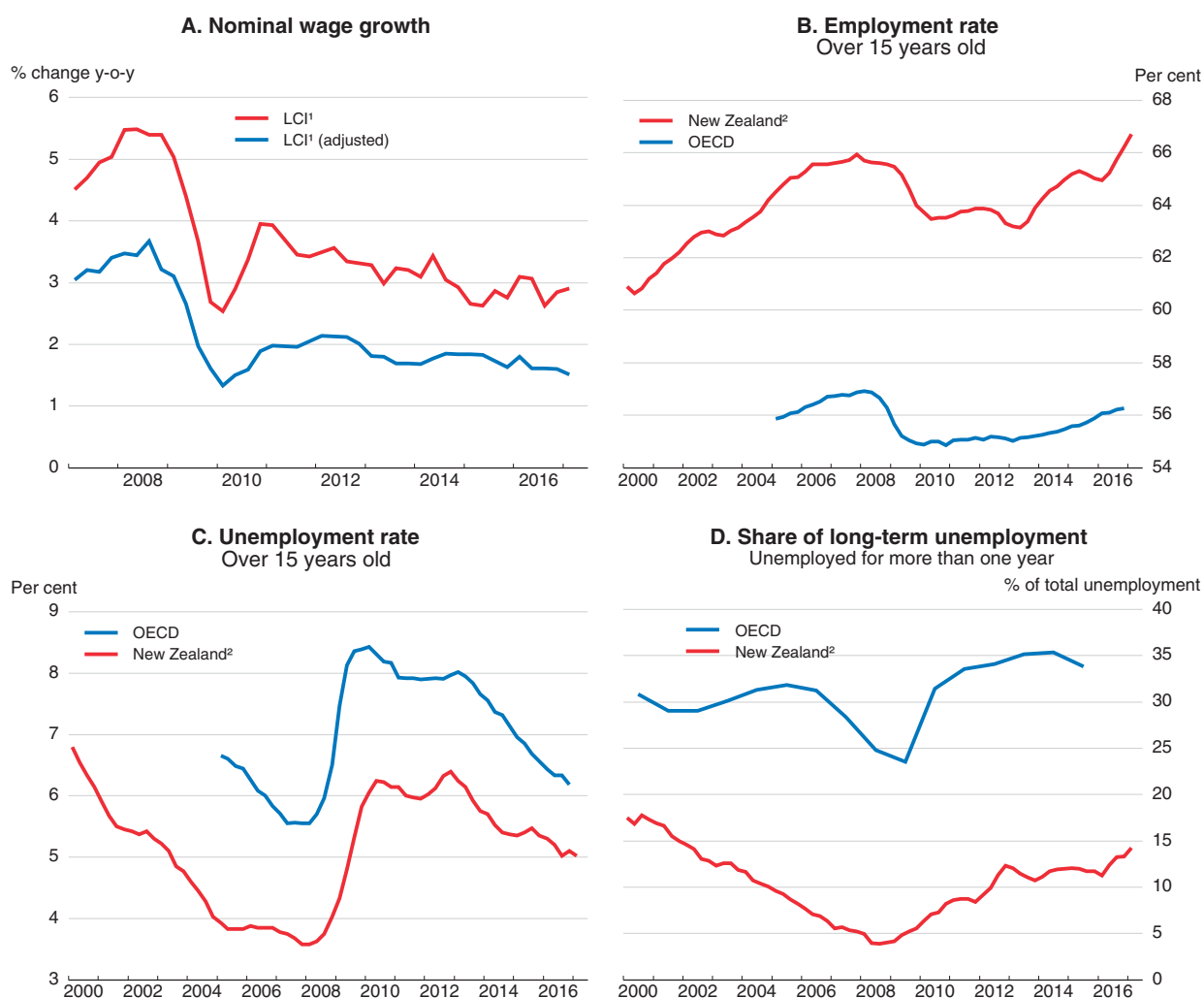
7. NA basis excluding unfunded liabilities of government-employee pension funds.

Source: OECD (2017), OECD Economic Outlook 101 Database.

- The terms of trade have improved since late 2015 (partly due to a 35% rebound in dairy prices) and are high by historical comparison. This has boosted incomes and should support faster demand growth once farmers have reduced their debt to more sustainable levels.
- Monetary policy has been very supportive (see below).

Employment and the labour force are growing strongly and the employment rate is higher than in most OECD countries (Figure 5, Panel B). The unemployment rate has fallen

Figure 5. Labour market developments



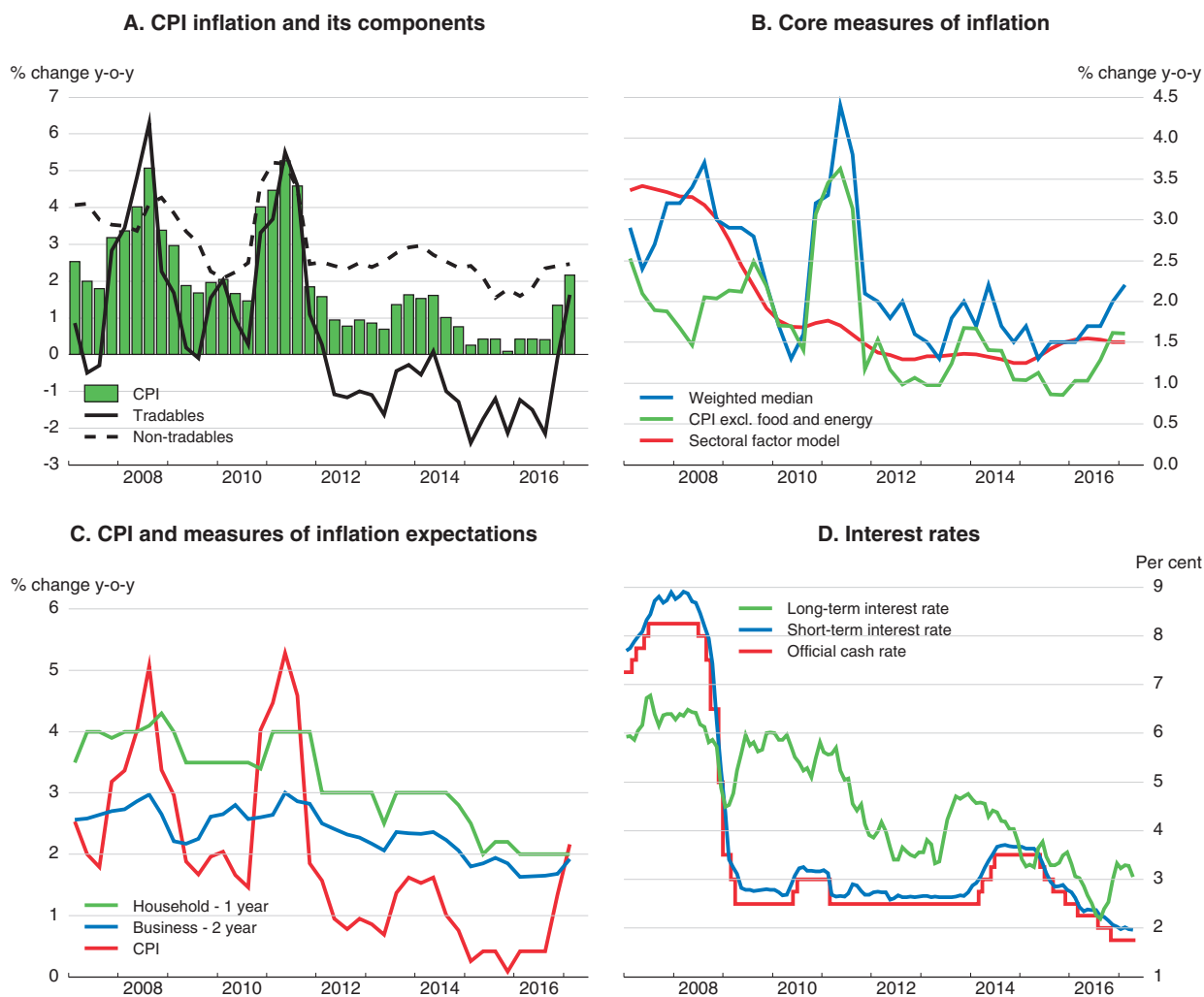
1. Labour Cost Index of private-sector wages. The adjusted LCI excludes increases in wages attributable to productivity improvements.
2. Four-quarter moving average series.

Source: Statistics New Zealand, Work Income and Spending; OECD, Labour Force Statistics Database.

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to around 5%, which is still higher than it was before the global financial crisis (Panel C), and varies regionally from 2.8% to 8.0%. While the share of long-term unemployment (more than one year) is low by international comparison, it increased following the crisis and has not yet begun to fall back to pre-crisis levels (Panel D). In the 1990s, when unemployment last was high, the longer-term share started to decline two to three years after the unemployment rate began to fall and reached its low point only three to four years after the unemployment rate bottomed out. The introduction of job-search requirements for certain categories of long-term welfare beneficiaries (see Chapter 2) may have delayed the fall in the longer-term unemployment share. Labour underutilisation, which includes the under-employed and people available to start work but not actively seeking work as well as the unemployed, also remains higher than pre-crisis levels.

The terms of trade have risen back to the peak reached in late 2013, reflecting a partial recovery in commodity prices, notably for dairy products (Figure 7, Panels A and B), and a

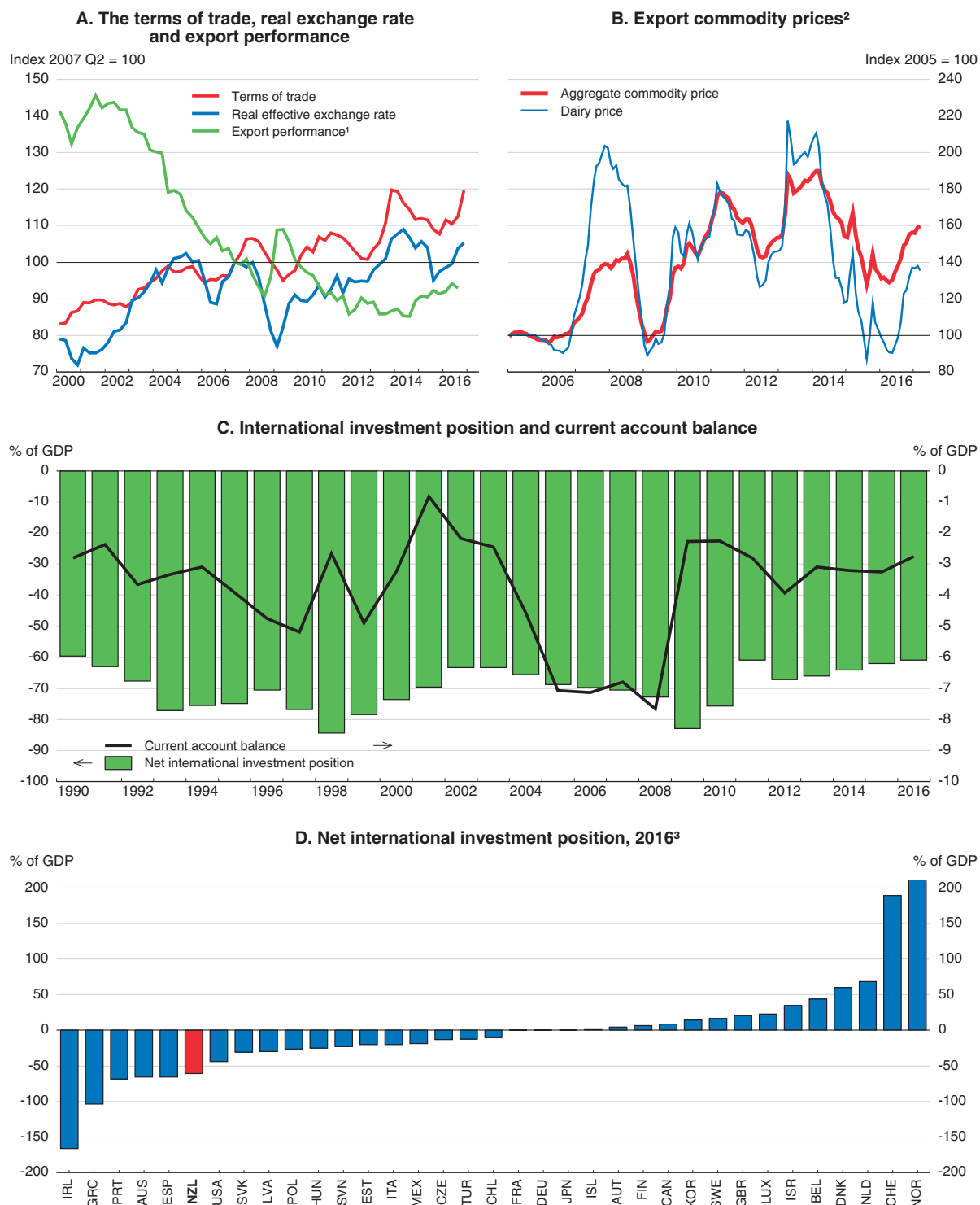
Figure 6. **Expected and actual inflation and interest rates**

Source: Statistics New Zealand; Reserve Bank of New Zealand; OECD, Economic Outlook Database.

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decline in oil prices. The real exchange rate has strengthened but remains below the peak reached in 2014. Even so, the currency may be slightly overvalued, partly owing to New Zealand's more advanced stage in the business cycle – and hence need for earlier policy rate increases – than many other advanced countries. In contrast to the last period of strong economic growth (leading up to the recession), the current account deficit has fallen to less than 3% of GDP, instead of increasing (Panel C), and it is projected to remain below 3 ½ per cent through 2018. This performance mainly reflects declining debt-service costs. The projected current account implies that net international liabilities will stay around the current level of 60% of GDP, which is high by international comparison (Panel D). New Zealand has not suffered major difficulties during the last two global financial crises, despite these net liabilities having been at least as large in relation to GDP, because of its good public policy settings, including the floating exchange rate and low government debt, and the absence of currency mismatches on banks and other agents' balance sheets.

Figure 7. External sector indicators



1. Export performance is measured by the evolution of the ratio of exports of goods and services to export market (defined as the trade-weighted average of trading partners' imports) volumes.

2. USD series.

3. 2015 for Chile and Italy.

Source: OECD, Economic Outlook Database; ANZ Bank; Statistics New Zealand; IMF, Balance of Payments Statistics database.

StatLink <http://dx.doi.org/10.1787/888933497175>

Growth is projected to ease to around 3% in 2017-18, as slower net immigration curtails both consumption and residential construction, and the wind-down in the Canterbury earthquake rebuild curbs construction expenditure, more than offsetting the boost from the Kaikōura earthquake rebuild and the recently announced increases in infrastructure spending. Solid export growth should continue, driven by strong tourism demand from Asia and increases in dairy exports. The unemployment rate is expected to edge down to 4½ per cent by the end of 2018 and wage growth to rise moderately. Consumer price inflation is likely to rise sustainably to 2% by the end of 2018 as the effects of oil price falls pass and capacity constraints bite.

The biggest downside risk to these projections is a disorderly housing market correction, described along with other extreme but inherently unquantifiable potential shocks in Table 2. Global inflation and interest rates could also be lower than assumed, which would delay the return of inflation to the mid-point of the target band and prolong exceptionally low interest rates in New Zealand, adding to house price tensions. The main upside risks are that net immigration does not drop to the assumed extent, sustaining robust growth in consumption and construction spending, and that dairy price rises continue, strengthening exports and disposable incomes. A key external risk concerns global trade, which could be stronger than assumed, boosting growth, or weaker, depressing activity.

Table 2. **Possible extreme shocks affecting the New Zealand economy**

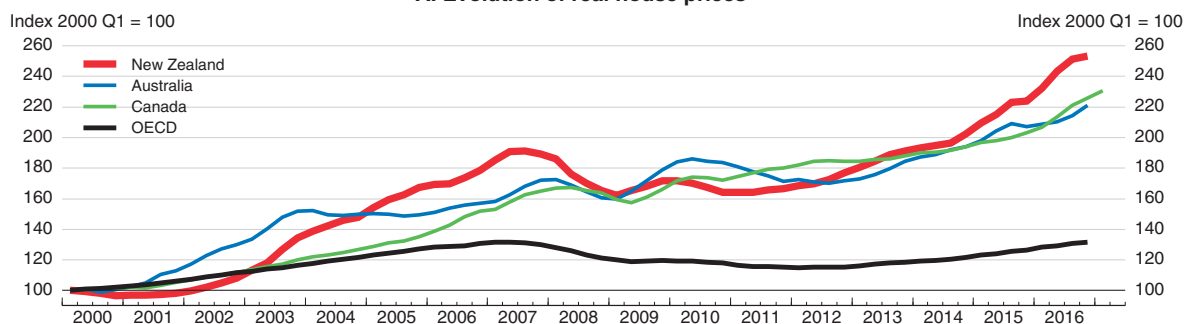
Shock	Possible impact
Disorderly housing market correction	House prices are high in relation to fundamentals, especially in Auckland, and household debt relative to disposable income has reached levels that are lofty by both historical and international comparisons (Figure 8; Box 1). The median house price is now six times median household income, up from three times in the early 1990s (Demographia, 2017). A large fall would depress household consumption and housing investment.
Rising trade restrictions	Trade tensions have been rising, and if protectionism continues to spread, the effects on countries like New Zealand, without large domestic markets, would be particularly harmful.
Financial-sector crisis in China	Such a crisis would reduce global trade and growth. Demand for New Zealand's exports would be hit both directly by reduced Chinese demand and indirectly, through lower Chinese demand for exports from New Zealand's main trading partners, notably Australia.
Natural disasters	The probability of large aftershock earthquakes remains elevated in regions affected by the 2016 Kaikōura and 2010-11 Canterbury earthquakes. Natural disasters can cause significant loss of life, disruption of economic activity and high public and private costs of reconstruction.

Ensuring price and financial stability

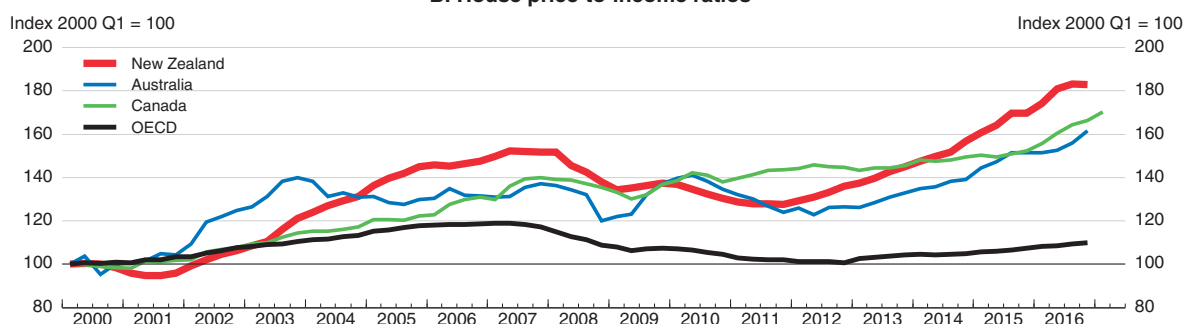
The Reserve Bank of New Zealand (RBNZ) reversed course in June 2015, initiating a series of cuts in official interest rates from 3.5% to 1.75% in November 2016 to push the inflation rate up to the middle of the 1-3% target range over the medium term (Figure 6, Panel D). The RBNZ was concerned that if inflation were to remain well below the mid-point of the target range for an extended period, inflation expectations could decline, making an eventual return to the target more difficult. For the time being, medium-term inflation expectations remain well anchored at around 2%. The RBNZ expects inflation to increase sustainably to around 2% by early 2019 and to begin to increase the official cash rate in the second half of 2019. On the basis of its projections, current monetary policy settings are appropriate, although such low interest rates do have the downside of fuelling increases in house prices and household debt, as in many other countries. The OECD projects a somewhat earlier sustainable increase in inflation to around 2% (late 2018) and beginning of the monetary policy tightening cycle (late 2018), as do most other forecasters.

Figure 8. **House prices**

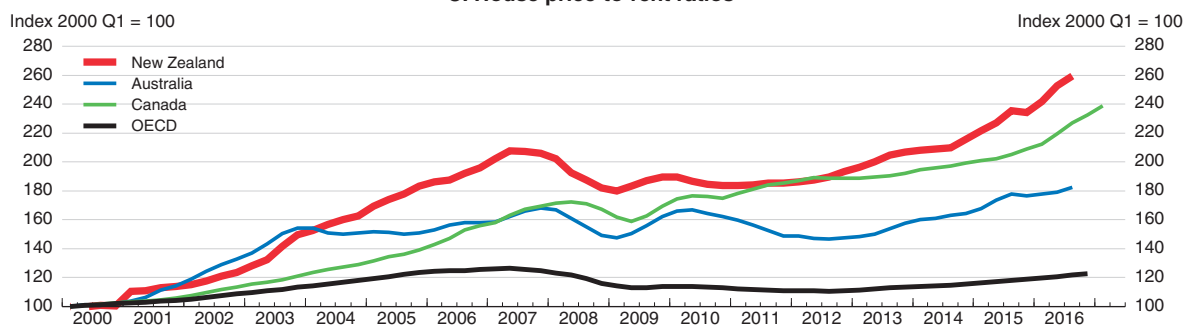
A. Evolution of real house prices¹



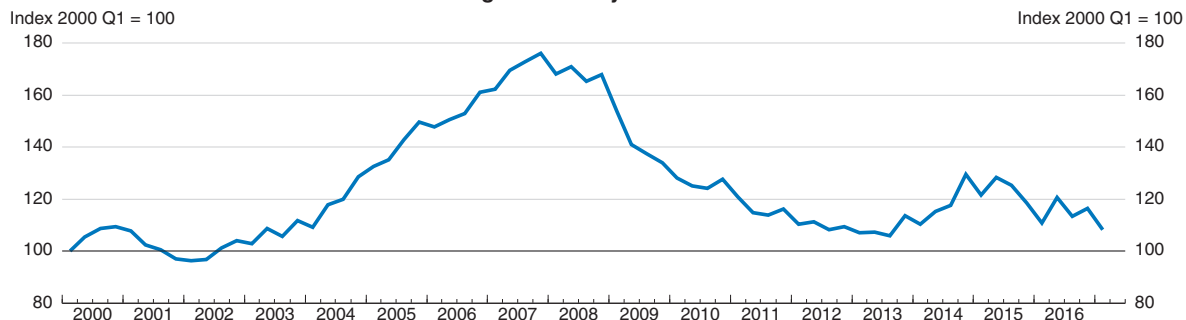
B. House price-to-income ratios



C. House price-to-rent ratios



D. Housing affordability in New Zealand²



1. Nominal house prices deflated by the private consumption deflator.
 2. The affordability index defined by the Massey University Real Estate Analysis Unit takes the ratio of the weighted mortgage interest rate as a percentage of median selling price to the average wage. The lower the index, the more affordable the housing.
 Source: OECD, Housing Prices Database; Massey University Real Estate Analysis Unit, *Home Affordability Report*, various quarterly reports, www.massey.ac.nz/massey/learning/colleges/college-business/school-of-economics-and-finance/research/mureau.cfm.

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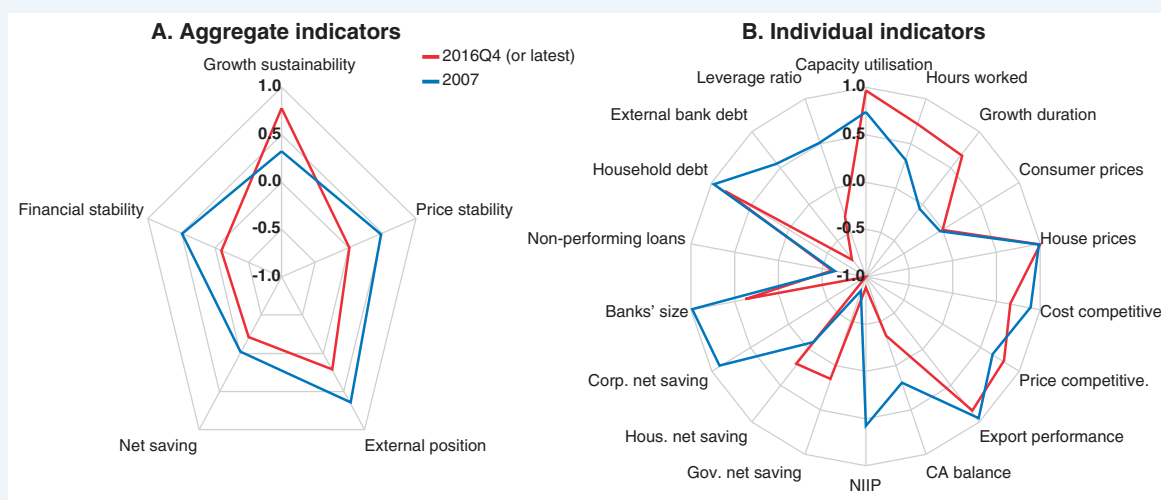
Box 1. Macro-financial vulnerabilities

Potential macro-financial vulnerabilities are mapped in Figure 9 in terms of deviations of indicators from their long-term averages, denoted by zero, with the largest deviations (those closest to +1) representing the greatest potential vulnerability. Selected indicators are derived from recent OECD work on vulnerability indicators (Röhn et al., 2015) and on the linkages between finance and economic growth (Cournède and Denk, 2015).

Macro-financial vulnerabilities are generally lower than at the end of the last expansion in 2007, with high house prices and associated high levels of household debt remaining the major sources. The external position remains a risk, with relatively weak cost and price competitiveness and export performance, but all have improved since 2007, as has the current account balance and net international investment position. Financial stability has shown the greatest improvement, as tightened regulation has reduced external bank debt and leverage. The worsening in the indicator of growth sustainability is due to strong capacity utilisation combined with a relatively long period of expansion (23 quarters) since the last downturn.

Figure 9. Evolution of macro-financial vulnerabilities since 2007

Deviations of indicators from their real long-term average (0)¹



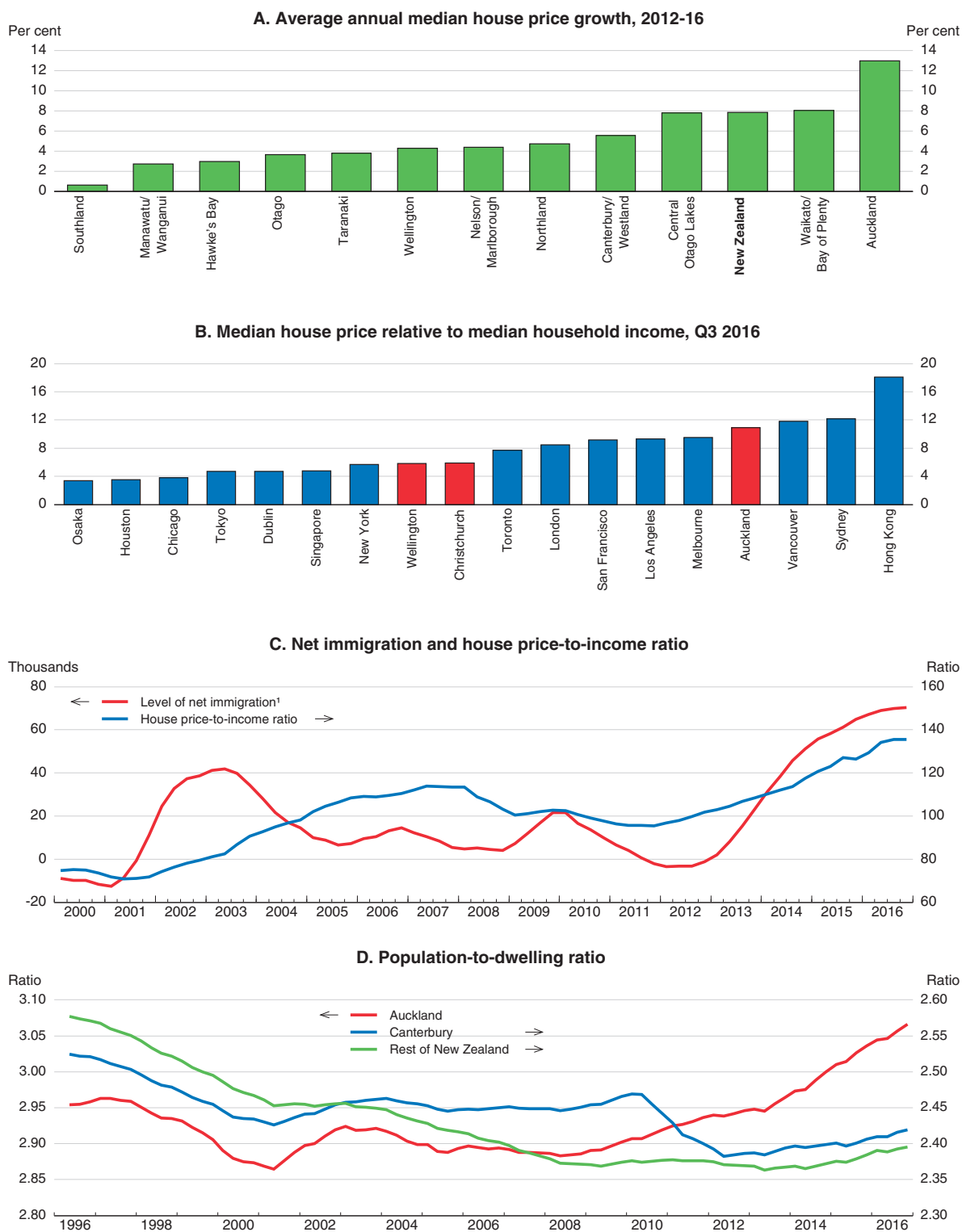
1. With the highest deviations representing the greatest potential vulnerability (+1) and the lowest deviations representing the smallest potential vulnerability (-1). Each aggregate macro-financial vulnerability indicator is calculated by aggregating (simple average) normalised individual indicators. Growth sustainability includes: capacity utilisation rate in the manufacturing sector, total hours worked as a proportion of the working-age population (hours worked), and an indicator combining the length and strength of expansion from the previous trough (growth duration). Price stability includes: an indicator combining the absolute value of the deviation of core inflation from target and the gap between total and core inflation (consumer prices), the average of the house prices-to-rent ratio and the house prices-to-income ratio (house prices). External position includes: the average of unit labour cost-based real effective exchange rate, and consumer price-based real effective exchange rate (cost competitiveness), relative prices of exported goods and services (price competitiveness), export performance, current account balance and net international investment position as a percentage of GDP. Net saving includes: government, household and corporate net saving, all expressed as a percentage of GDP. Financial stability includes: banks' size as a percentage of GDP, non-performing loans as a percentage of gross lending, household debt as a percentage of disposable income, registered banks' external bank debt as a percentage of bank total liabilities, and capital and reserves as a proportion of total liabilities (leverage ratio).

Source: OECD calculations based on Thomson Reuters; OECD, Economic Outlook Database; Reserve Bank of New Zealand; Statistics New Zealand.

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House prices have risen sharply in real terms and relative to income and rents, especially since 2012, and are now well above long-term averages (Figure 8, Panels A-C). However, earlier declines in mortgage interest rates offset much of the associated pressures on affordability at the national level (Panel D), although not in Auckland (Massey University,

Figure 10. House prices and population pressure



1. Cumulative data for the past four quarters.

Source: Real Estate Institute of New Zealand; Demographia (2017), 13th Annual Demographia International Housing Affordability Survey: 2017; Statistics New Zealand; OECD, Economic Outlook Database; Reserve Bank of New Zealand (2015), Financial Stability Report, May, Figure 4.3 updated.

2016). Price increases have been particularly large in Auckland (Figure 10, Panel A), far outstripping median household income growth. The house price-to-income ratio in Auckland is now comparable to or higher than in many much larger foreign cities (Panel B). A major factor boosting house prices in Auckland has been high net immigration, especially since 2012 (Panel C), in a context of weak housing-supply responsiveness. Approximately half of all immigrants settle in Auckland, above its (one-third) share in the population, and new housing supply has not kept pace with demand in the city (Panel D).

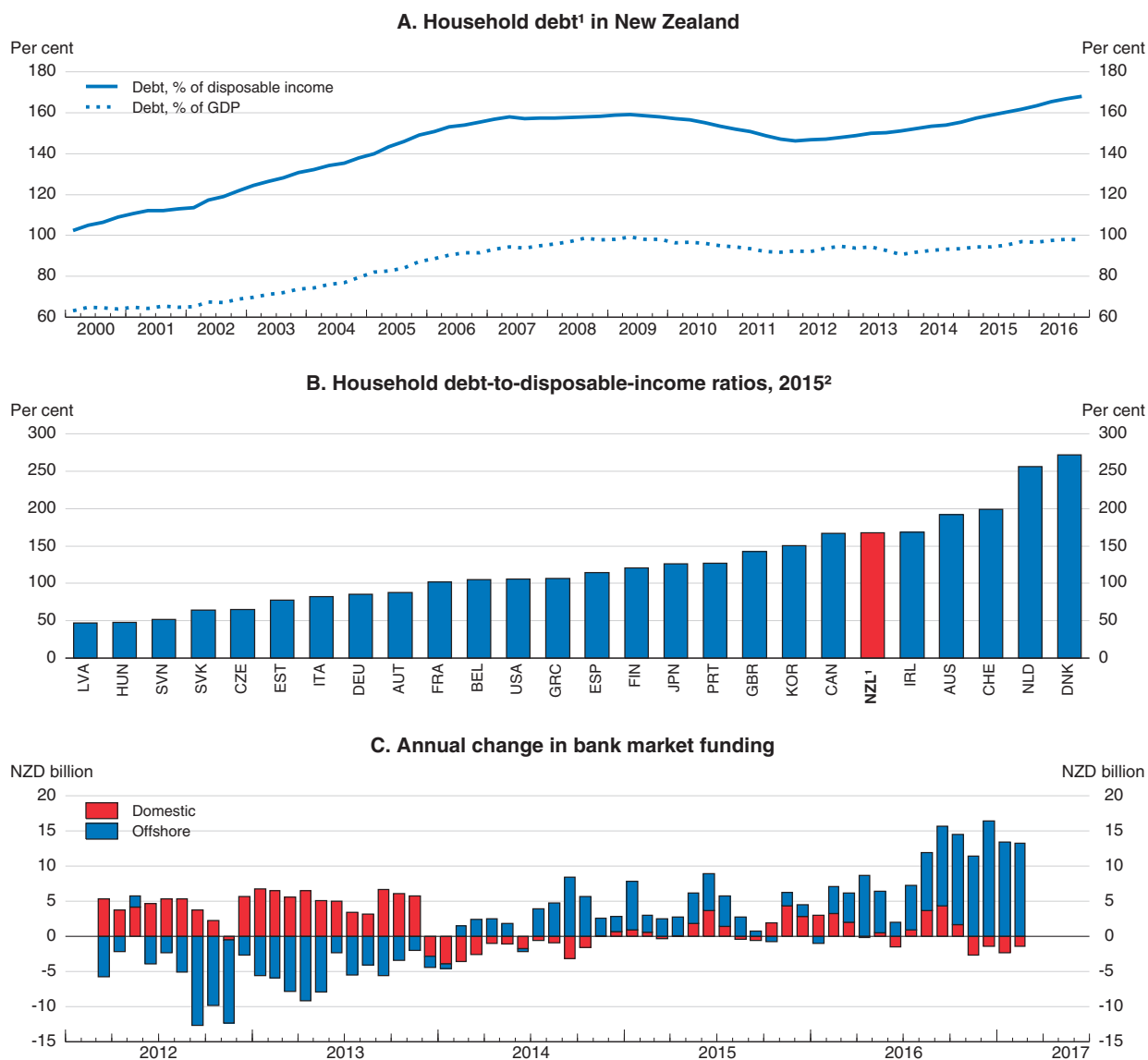
The supply response has been constrained by restrictive and complex land-use regulations, infrastructure shortages and insufficient growth in construction-sector capacity (see below; Chapter 1). Strong demand growth has fed into expectations of further price increases, which in turn has pushed up demand and prices further. This cycle may be spreading to other parts of New Zealand. Prices outside Auckland have also picked up sharply of late, even in the apparent absence of especially high population growth or housing shortages. As discussed in the 2015 *Survey* (OECD, 2015a), the high cost of housing is particularly harmful for low-income households. Affordability has been aggravated by a shift in new housing supply from lower-cost to high-end housing since the early 1990s. Housing costs averaged 54% of income for the bottom fifth of households by income in 2015, up from less than 30% in 1990 (Perry, 2016).

After declining in the aftermath of the crisis, household debt as a share of disposable income resumed an upward trend in 2012 and is now slightly higher than in 2007 (Figure 11, Panel A). Debt is also high by international comparison (Panel B). Moreover, households are highly exposed to interest rate risk – almost 70% of outstanding mortgages by value are scheduled to be re-priced within the next two years. Total bank lending and housing credit have accelerated from 3% per annum over 2011-13 to 7% per annum over 2014-16 (RBNZ, 2016c). The financial stability risks arising from increased household debt and house prices are magnified by recent growth in offshore bank funding, which has boosted banks' exposure to global liquidity shocks (Panel C). Offshore bank funding has risen as non-bank capital inflows have declined, reflecting the fall-off in earthquake-related insurance flows. The other key financial stability risk is dairy sector indebtedness, which accelerated during 2015 but the rate of increase has slowed following recent price increases (RBNZ, 2016b).

The RBNZ has sought to limit financial stability risks by imposing restrictions on loan-to-value ratios since 2013, as recommended in past *Surveys* (Table 3). In October 2015 tightened loan-to-value restrictions were introduced for loans to purchase property in the Auckland area, on the grounds that Auckland house prices exceeded levels that could be explained by fundamental factors such as housing shortages, high immigration and low interest rates. While more detailed analysis is needed, the effectiveness of region-specific restrictions appears to have been undermined because they prompted some investors to shift their purchases outside Auckland. House price increases in the rest of New Zealand soon exceeded those in Auckland, with significantly higher price- and investor activity increases just outside Auckland's boundaries (RBNZ, 2016a). In October 2016, regional variation in loan-to-value restrictions was removed, as tighter Auckland restrictions were extended to the rest of the country, along with further tightening for investors.

The RBNZ has highlighted rapid loan growth at high ratios of debt to income (DTI) and requested the addition of DTI limits to its *Memorandum of Understanding* on prudential policy with the government (RBNZ, 2016b), although it does not intend to impose them unless they are needed. Before making a decision on whether to give it this power, the

Figure 11. Household debt and bank market funding



1. Including debt on rental properties.

2. 2013 for Korea; 2016 for New Zealand, Portugal, Sweden and United Kingdom.

Source: OECD, National Accounts – Financial Dashboard Database; Reserve Bank of New Zealand (2016), *Financial Stability Report*, November, Figure 3.12 updated and Statistics on Households.

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Table 3. Past OECD recommendations on price and financial stability

Recommendations in previous Surveys	Action taken since previous Survey (June 2015)
While recognising the current strength of the financial system, contain emerging systemic stability risks with tighter prudential policy settings, including the deployment of new macro-prudential policy instruments. Consider implementing bank leverage ratios, permanent deposit insurance and higher capital requirements for too-big-to-fail banks.	Tightened restrictions on high loan-to-value mortgages for loans to purchase property in the Auckland area from October 2015 were extended to the rest of the country from October 2016, along with further tightening for investors. Following these changes, no more than 10% of lending to owner occupiers can be at a loan-to-value ratio above 80% and no more than 5% of lending to investors can be above a 60% ratio. The Reserve Bank has requested that debt-to-income limits be added to its prudential tool kit.

government has requested that it undertake a full cost-benefit analysis including public consultation. Even if the power is attributed to the Bank, it would have to inform the Treasury and consult with registered banks if it wished to make use of this tool.

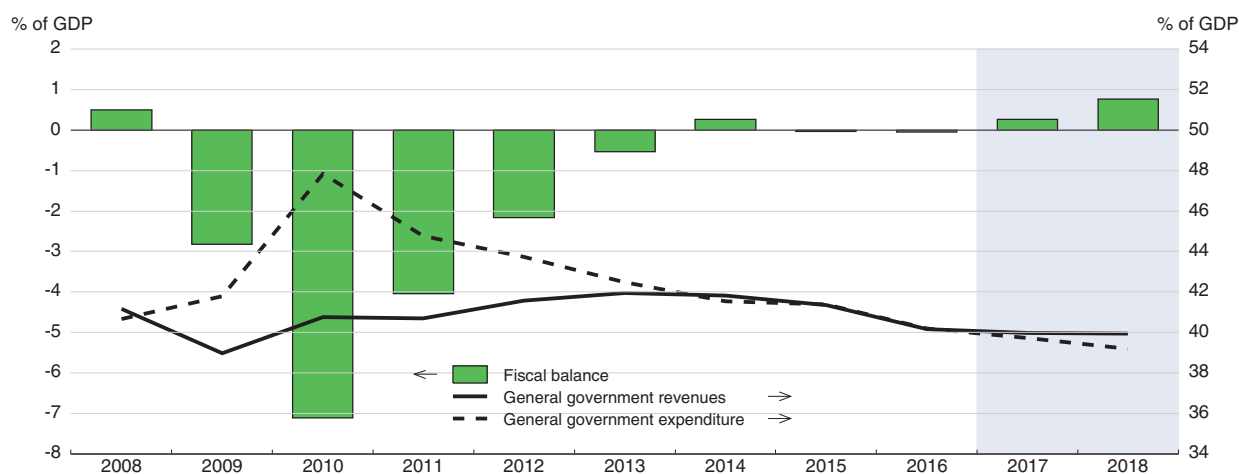
DTI controls complement loan-to-value restrictions by limiting further debt as house prices rise and allowing more precise and effective targeting of policy. Both have been shown to reduce housing credit growth and seem to be more effective than other macro-prudential tools already available to the Bank, such as counter-cyclical capital buffers (Kuttner and Shim, 2013; Cerutti et al., 2015). Nevertheless, the effects of adding DTI limits should be studied, as the use of multiple instruments makes calibration harder and may inadvertently result in over-regulation (Gadanecz and Jayaram, 2016). Distributional implications also need to be considered, as DTI restrictions place the tightest credit constraints on the poor. Subject to DTI limits meeting good regulatory process requirements, including design issues, and paying attention to benefits exceeding costs, they should be promptly added to the Reserve Bank's macro-prudential instruments. In any case, analysis should not be so drawn out that it would delay the implementation of DTI limits, were they to be needed to reinforce financial stability. Indeed, it should occur in parallel with required system development that the banks will have to carry out for their implementation.

Adjusting fiscal policy to enhance growth and prepare for future shocks and population ageing


Considerable progress has been made in lowering the general government budget deficit from a post-recession high of 7.1% of GDP in 2010 to near balance since 2014 (Figure 12). This reduction was achieved mostly by cutting expenditure as a share of GDP back to around the levels prevailing before 2010. An important factor in the rise and subsequent fall in spending was the Canterbury earthquake, which caused an increase in expenditure (net of reinsurance receipts) of 4.4% of GDP in FY 2010-11 (fiscal years end 30 June); such spending fell to only 0.3% of GDP in FY 2015-16. The government's preferred fiscal measure is the total Crown operating balance before gains and losses, which includes operating activities of state-owned enterprises and the Reserve Bank but excludes local government, rather than the more typical international definition of general government. The NZ measure returned to surplus in FY 2014-15 from a peak deficit of 9.2% of GDP (4.6% excluding earthquake expenses) in FY 2010-11 and remained in surplus in FY 2015-16 (Table 4). General government net debt fell to only 5% of GDP in 2015 (Table 1).

After remaining broadly unchanged in FY 2016-17, despite costs related to the Kaikōura earthquake (NZD 1 billion, 0.4% of GDP), the total Crown operating balance (before gains and losses) is officially projected to increase progressively from a surplus of 0.6% of GDP in FY 2016-17 to 2.2% of GDP in FY 2020-21. The Treasury estimates that the fiscal policy stance (fiscal impulse) will be expansionary in both FY 2017-18 and FY 2018-19 and contractionary in each of the subsequent two years. The pause in consolidation in the earlier years of the projection period mainly reflects measures in the May 2017 budget, including adjustments to personal income tax brackets to offset the effects of individuals moving into higher tax brackets in recent years as their incomes have grown (fiscal drag), especially for earners around the middle of the income distribution, and increases in transfers to low-income households and infrastructure spending. The projected consolidation reflects a decline in the expenditure-to-GDP ratio. Based on information available prior to the 2017 budget, the OECD projected a strengthening in the general government position from balance in 2016 to a surplus of 0.8% of GDP in 2018 (Figure 12), with three-quarters of this increase being

Figure 12. Fiscal indicators



Source: OECD, Economic Outlook 101 Database.

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structural (as indicated by the change in the cyclically-adjusted budget balance). Updating for the 2017 budget would eliminate the increase in the structural budget balance, leaving a modest cyclical increase in the budget balance to a small surplus.

As a small economy highly exposed to global shocks and natural disasters, it is crucial for New Zealand to continue to have low levels of government net debt. To this end the government's fiscal strategy is to reduce net core Crown debt to 10-15% of GDP by 2025. It should be possible to finance the various spending measures recommended in this Survey – increased outlays on infrastructure and business R&D subsidies, which net of proposed additional revenues (road user charges, development contributions and targeted rates) amount to less than 0.5% of GDP – without materially compromising this fiscal strategy. Additional fiscal room could be used to fund further tax cuts. A cut in the corporate tax rate has the potential to boost productivity, but a holistic tax review would be worthwhile to consider other changes (see below).

There is currently no effective mechanism for independent assessment of opposition parties' policy proposals. The Treasury has operational independence in forecasting and policy analysis, and New Zealand has highly regarded strict fiscal accounting and transparency requirements (Ter-Minassian, 2014). However, the Treasury does not currently cost or assess opposition parties' policy proposals. Consideration should be given to strengthening New Zealand's institutional framework in this regard, possibly by allocating that responsibility to an existing agency, such as the Treasury. Another option, which might enhance the perception of independence of the evaluations, would be for a new fiscal council to provide such cost estimates, as is done by the Parliamentary Budget Office in Australia and the Central Planning Bureau in the Netherlands. As of May 2017, 26 OECD countries had some form of independent fiscal institution.

Assuming unchanged policies and the current demographic outlook, the Treasury (2016) projects that the primary balance would fall from a surplus of 0.5% of GDP in 2015 to a deficit of 6.3% of GDP in 2060, due in part to increased old-age pension outlays. The government announced in March 2017 that it will raise the pension eligibility age by two years to 67 over the years 2037-40, thereby shielding the current population aged 45 and over from this

Table 4. Fiscal consolidation is set to continue
Per cent of GDP (except where noted)

Year to June	Actual 2015-16	Projections				
		2016-17	2017-18	2018-19	2019-20	2020-21
Core Crown revenue	30.1	30.0	29.7	29.5	29.7	29.8
Core Crown expenditure	29.2	28.8	28.6	28.1	27.7	27.5
of which: Social assistance	9.6	9.5	9.4	9.3	9.1	9.0
Social assist. related to NZ Super	4.8	4.9	4.9	4.8	4.9	4.9
Capital spending	1.8	1.8	2.1	2.1	1.9	2.4
Core Crown balance^{1,2}	0.9	1.2	1.2	1.4	2.0	2.3
Total Crown balance^{1,2}	0.7	0.6	1.0	1.4	2.0	2.2
Cyclically-adjusted balance ³	1.3	1.4	1.3	1.2	1.8	2.2
Fiscal impulse (core Crown + entities)⁴	-0.3	0.0	0.4	0.5	-1.0	-0.6
Net core Crown debt ⁵	24.4	23.2	22.8	22.1	20.6	19.3
Gross core Crown debt	34.3	33.0	29.8	28.4	26.9	24.3
General government balance	0.0	0.4	0.3	0.5	1.4	1.8
equal to: central government net lending ⁶	0.0	0.5	0.3	0.5	1.5	1.9
+ local government net lending ⁷	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
<i>Memorandum items (Treasury projections)</i>						
Real GDP growth (production based)	2.7	3.1	3.5	3.8	2.9	2.4
Nominal GDP growth (expenditure based)	4.2	6.2	4.8	5.4	5.0	4.2
CPI (annual per cent change)	0.4	1.8	1.6	2.1	2.2	2.1
Ten-year government bond (per cent)	2.7	3.1	3.6	4.0	4.2	4.3

1. The core Crown includes government departments, offices of parliament, the New Zealand Superannuation Fund and the Reserve Bank of New Zealand. The total Crown consists of the core Crown plus Crown entities (such as the Accident Compensation Commission, the Commerce Commission and Callaghan Innovation) and State-owned enterprises
2. Based on operating balance before gains and losses.
3. Core Crown balance adjusted for the cyclical position of the economy.
4. Excluding Earthquake Commission and Southern Response payments and receipts related to the Canterbury and Kaikōura earthquakes.
5. Excludes assets of the New Zealand Superannuation Fund, which were 12.2% of GDP in 2015.
6. Based on National Accounts estimates from Statistics New Zealand (for the year ended March 2016) and Government Financial Statistics projections from the 2017 budget (for 2016-17 to 2020-21).
7. Estimates based on a continuation of the 2015-16 deficit as per the latest available Government Financial Statistics and National Accounts data for local government.

Source: Treasury (2017), *Budget Economic and Fiscal Update*; OECD calculations based on Statistics New Zealand (2016), *Government Finance Statistics (General Government): Year Ended June 2016*, Statistics New Zealand (2016), National Accounts (Income and Expenditure): Year Ended March 2016 and Treasury (2017) *Budget Economic and Fiscal Update*.

change. This is a very gradual adjustment, especially as life expectancy at 65 is projected to rise from 22 years in 2015 to 25 years in 2040 (Statistics New Zealand, 2016). Starting sooner than 2037 and stretching the adjustment over a longer period (while finishing no later than in 2040) would better contain costs and would distribute the burden of adjustment more evenly across cohorts. In any case, to depoliticise future pension eligibility decisions, the pension age should be indexed to life expectancy (as some other OECD countries have done).

The biggest projected long-term public spending pressure is in health care, which is expected to jump from 6.2% of GDP in 2015 to 9.7% of GDP in 2060 owing to both population ageing and the expectation of expensive new treatments. Cost increases would be attenuated by implementing health-care recommendations made in past *Surveys* (Table 5). Preventive health initiatives could deliver long-term fiscal savings while increasing inclusiveness, as the prevalence of key health risks including obesity, physical inactivity and smoking is much higher among Māori, Pasifika and people living in socioeconomically deprived areas (Ministry of Health, 2016).

Table 5. Past OECD recommendations on policies to prepare for future shocks and population ageing

Recommendations in previous <i>Surveys</i>	Action taken since previous <i>Survey</i> (June 2015)
Implement fiscal consolidation measures to reduce net core Crown debt as planned, while continuing efforts to improve well-being of the most vulnerable members of society. Allow the automatic stabilisers to operate fully.	Ongoing. Net debt is falling as a percentage of GDP. A child material hardship package was implemented on 1 April 2016 that included a lift in core benefit rates for families with children. The 2016 budget included additional funding for its social investment programme, including the establishment of a new Ministry for Vulnerable Children. The 2017 budget included additional funding for family incomes through changes to tax thresholds, family tax credits and accommodation supplements.
Target the Working for Families programme more tightly on the working poor by lowering upper income thresholds and increasing abatement rates.	Upper income thresholds for Working for Families Tax Credits were lowered for FY 2016-17: the upper threshold for parents with one child fell from an annual pre-tax income of NZD 110 530 to NZD 84 314. The abatement rate for Working for Families tax credits was increased by 1.25 percentage points to 22.5%. The 2017 budget included measures to increase payments for families with young children and lift the abatement rate for Working for families Tax Credits from 22.5% to 25% and reduce the abatement threshold from NZD 36 350 a year to NZD 35 000 a year. This means that assistance is more targeted to lower income families.
Raise the pension eligibility age from 65 to 67.	The government announced in March 2017 that it will raise the New Zealand Superannuation eligibility age by six months each year from 2037 to reach 67 by 2040.
Grant District Health Boards greater spending autonomy, resolve their conflicts of interest, allow capitation payments to better follow the patient, widen private health insurance coverage, and determine doctors' salaries within hospitals' budget envelopes set by the output-based payment system.	No action taken.
Adopt a comprehensive approach to reducing obesity, covering personal behaviour, factors that influence physical activity and nutritional practices, and improved obesity management through primary care.	The government launched an obesity strategy in 2015 with voluntary measures based around education and exercise. There is scope to strengthen cross government governance and accountability and consider the range of regulatory options other countries are exploring.
Reduce further the costs (including transport and childcare) of access to primary health care for the poor.	The government introduced, from 1 July 2015, free GP visits for under 13s, and in 2016 commissioned a review of primary care funding. Its recommendations have not yet been implemented.

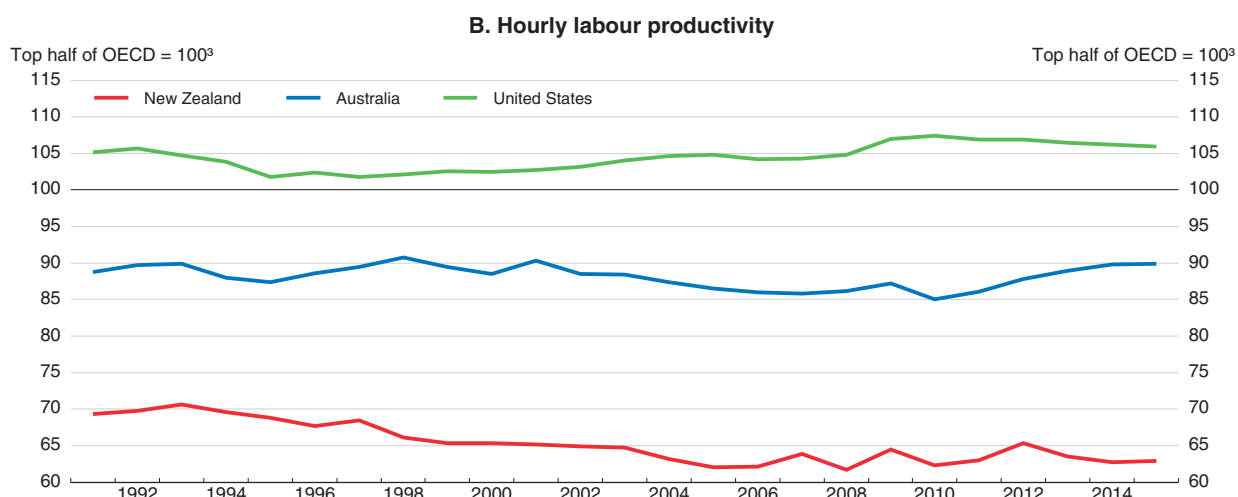
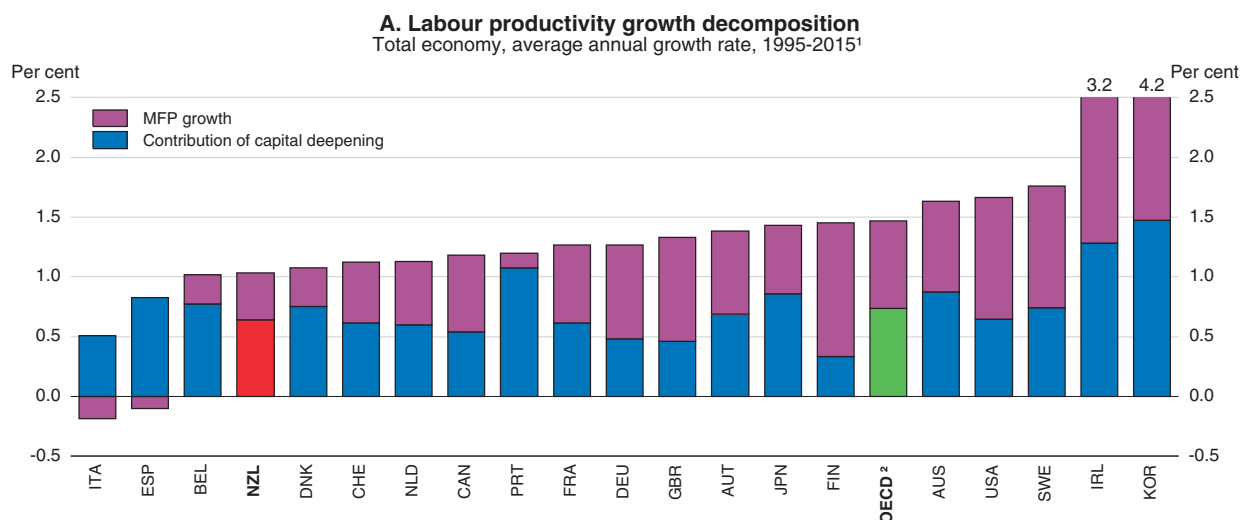
Improving productivity in New Zealand's economy

New Zealand's productivity is low relative to top OECD performers and growth has lagged behind that in most other OECD countries over the past two decades (Figure 13), despite generally productivity-friendly policies (de Serres et al., 2014). Disappointing labour productivity outcomes are partly attributable to low capital intensity, resulting from a high labour force growth rate and persistently weak investment: non-residential capital formation per person in the labour force is less than 75% of the OECD average, after removing the Canterbury earthquake rebuild (Figure 14). Labour productivity growth in the traded sector outperformed that in the non-traded sector by about 50% between 1996 and 2015.

Several key factors contribute to New Zealand's poor productivity performance:

- *Lack of international connection and scale:* An economy's ability to benefit from innovation at the global frontier rises with international connectedness (Saia et al., 2015). New Zealand's lack of scale and geographical remoteness constrain labour productivity benefits from agglomeration and international connections (McCann, 2009).
- *Weak competitive pressures:* High price-cost margins and the survival of laggard firms with poor productivity and management practices suggest that competition is not as strong in New Zealand as in some other advanced countries (NZPC, 2014; MBIE, 2016b).

Figure 13. Labour productivity



1. 1996-2015 for Austria; 1995-2014 for Australia, Ireland, Japan, Portugal and Spain.

2. Average of the 20 countries for which data are available.

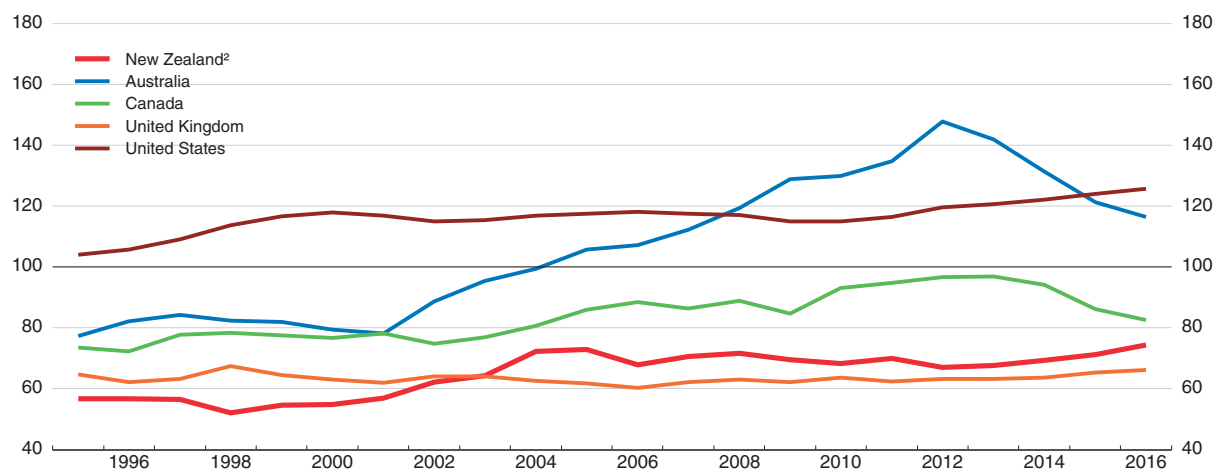
3. Population-weighted average for the top 17 OECD countries for labour productivity, calculated using 2010 purchasing power parity exchange rates.

Source: OECD (2017), Productivity Database; OECD (2017), *Economic Policy Reforms: Going for Growth 2017*.

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- **Low rates of capital investment (Figure 14):** A higher cost of capital than in most other advanced economies contributes to low capital investment. As national saving has persistently fallen short of investment, New Zealand has accumulated substantial foreign liabilities, and international investors may require a premium to invest there (Rose, 2009; McDermott 2013). Also, owing in part to its small size, New Zealand has thin venture capital, stock and bond markets. Low rates of capital investment depress wages, with negative consequences for income distribution and inclusiveness.
- **Low R&D activity:** New Zealand's R&D expenditure, especially by the business sector, is low (Figure 15).

Figure 14. **Gross fixed non-residential capital formation**
Per person in the labour force, OECD = 100¹

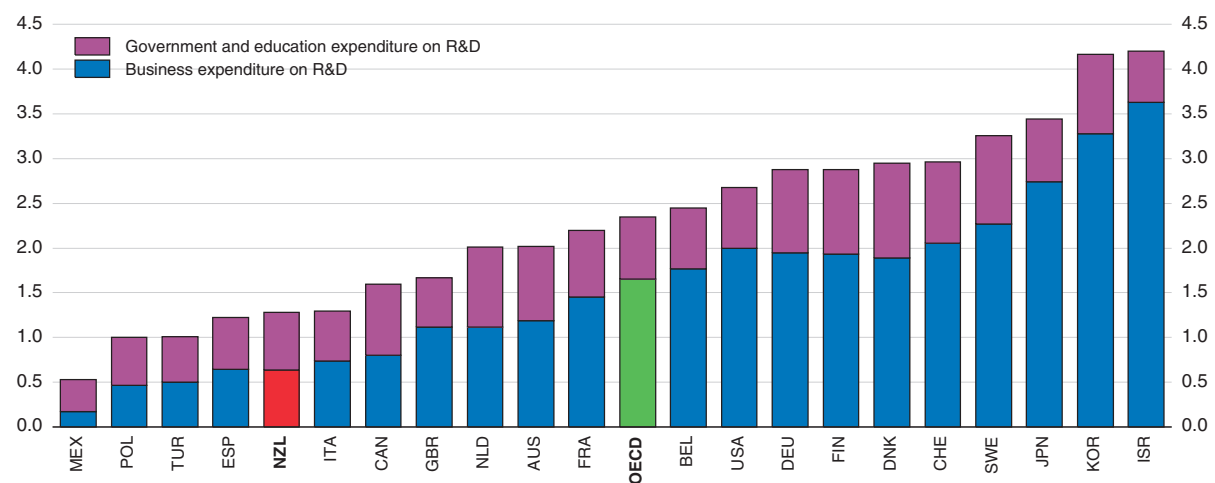


1. Data for gross non-residential capital formation are in current prices and were converted into a common currency using 2010 purchasing power parity exchange rates. The labour force includes only people aged 15-64. Data for the OECD exclude Chile, the Czech Republic, Estonia, Greece, Hungary, Iceland, Israel, Latvia, Luxembourg, Mexico, Norway, the Slovak Republic, Slovenia and Turkey.
2. Excluding investment related to the Canterbury earthquake rebuild.

Source: OECD, Economic Outlook and Labour Force Statistics Databases; A. Wood et al. (2016), "The Canterbury Rebuild Five Years on from the Christchurch Earthquake", RBNZ Bulletin, Vol. 79, No. 3, February.

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Figure 15. **Expenditure on research and development**
As a percentage of GDP, 2015 or latest year available



Source: Statistics New Zealand; OECD, Main Science and Technology Indicators Database, <http://oe.cd/msti>.

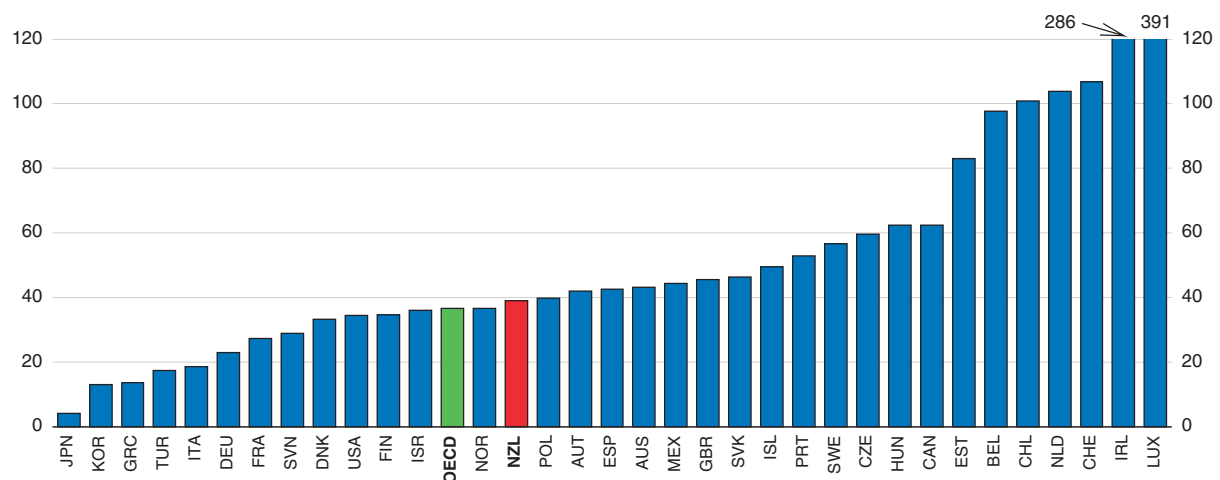
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Increasing international connections by reducing barriers to foreign direct investment

Foreign direct investment boosts recipient countries' productivity by providing capital to fund capital formation, opening up access to global supply chains and markets and promoting local competition. These benefits are particularly important for small countries such as New Zealand that lack a large domestic market. Compared to portfolio investment, direct investment is more likely to be associated with a lasting relationship and thus to lead to technological, skills and managerial quality transfers, and less likely to lead to financial crises (Caldera Sanchez and Gori, 2016).

New Zealand's inward direct investment stocks are substantially lower than in a number of other small, high-income OECD countries (Figure 16). It retains a comprehensive foreign investment screening process, something that has not substantially changed in several decades and does not exist in many other countries. Moreover, there are further barriers in some industries, in particular in fisheries and telecommunications. While few investment proposals are blocked, the screening process is poorly targeted: it applies to foreign investment in all businesses valued at more than NZD 100 million and to “sensitive land”, defined to include all non-urban land over five hectares as well as smaller sites that adjoin certain types of land, such as local parks and reserves. Screening imposes a higher threshold for approval than required to address community concerns (Treasury, 2009). For potential investors, it creates delays, significant compliance costs and uncertainty, which is heightened by ministerial discretion as well as the inability to get a non-binding preliminary opinion on whether an investment will be blocked. Fortunately, compliance costs were reduced in 2016 for some transactions, but further steps could be taken in this direction. Through restricting foreign entry, screening is one of the key horizontal policy measures increasing New Zealand's Services Trade Restrictiveness Index (OECD, 2017e).

Figure 16. **Inward direct investment stock**
As a percentage of GDP, 2016 or latest available data



Source: OECD, Foreign Direct Investment Database.

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In line with OECD guidelines on foreign direct investment and national security concerns (OECD, 2009), screening should be progressively narrowed. This could be done by incrementally removing screening requirements on specific sectors that do not raise national security issues (such as construction and retail trade) and where foreign direct investment offers the greatest potential benefits to New Zealand. Such a staged approach would provide an opportunity to demonstrate tangible benefits from reducing restrictions, as was important in building the case for foreign direct investment in Korea (Nicolas et al., 2013). Establishing a public register of foreign direct investment (informed by mandatory notification) could also help to alleviate community concerns, as would emphasising that the NZ government retains sovereign control over activities taking place on NZ land, irrespective of ownership.

Exploiting benefits from agglomeration by reforming urban planning and infrastructure funding

Agglomeration economies generated by cities and industrial clusters are an important source of productivity growth (Glaeser, 2010). New Zealand's small population limits such economies. Even so, the urban planning system and a lack of land transport and water infrastructure have been barriers to agglomeration by preventing increases in housing supply from meeting demand, boosting housing costs and inhibiting people from moving into economically successful, highly productive urban areas. Land prices inside Auckland's urban boundary are nearly 10 times higher than outside, while a suite of complex and restrictive land-use rules (including maximum building heights, minimum lot sizes and parking requirements) has made development more difficult and expensive (OECD, 2017c), although many of these practices have been reduced or removed through the Auckland Unitary Plan (as described below). Rapid population growth due to high immigration is placing additional pressures on infrastructure. The inability of water supply infrastructure to keep pace with demand has restricted developers' ability to deliver new housing in a timely manner (NZPC, 2017a), and transport congestion is likely to worsen (Auckland Transport Alignment Project, 2016).

The recent Auckland Unitary Plan will allow greater densification and some expansion of urban development limits. It represents a major step forward in spatial planning, integrating land use, housing, transport, infrastructure and other urban planning issues. Nevertheless, permitted housing density follows a U-shape, with a fall in density in areas close to the city centre but higher density further out, which contrasts with the more usual linear decline in density as distance from the centre increases. This form is partly the result of insufficient infrastructure in areas close to the city centre. Large investments are being made to rectify this problem, which should permit the Plan to be revisited in the future to permit greater densification, provided that opposition from vested interests can be overcome.

While infrastructure investments have been stepped up in Auckland, they still appear to be lagging behind the requirements of such a rapidly growing population. A major problem is that the Auckland Council, like others in New Zealand, has weak incentives to invest in amenities to facilitate growth, as local ratepayers bear much of their cost, but the fiscal benefits flow mainly to central government. To mitigate this problem a number of avenues for diversifying revenue sources should be considered, as discussed in the 2015 Survey (Table 6). These include: making greater use of tolls to fund local and national roads and of Public-Private Partnerships where that could increase efficiency (see Chapter 1); introducing volumetric charges for water outside the few councils, such as Auckland, that already have them; ensuring that housing development contributions (one-off levies imposed by local authorities on developers to finance parts of the capital costs associated with new development) reflect costs; and increasing the Council's debt-servicing capacity so that it could issue more debt to finance infrastructure. Options for increasing this capacity include sharing in a revenue base linked to local economic activity, such as GST, and using targeted rates to tax the windfall gains that accrue to local landowners from the provision of new amenities. Property owners should lose underground property rights that unnecessarily add to the costs of infrastructure provision, as with Auckland's underground rail line.

Table 6. **Past OECD recommendations on improving productivity**

Recommendations in previous <i>Surveys</i>	Action taken since previous <i>Survey</i> (June 2015)
Improve the house price supply response: <ul style="list-style-type: none"> • Adopt spatial planning for all urban areas • Reform the Resource Management Act to better incorporate urban development needs. • Reduce the scope for vested interests to thwart rezoning and development that would be in the wider public interest. 	The Auckland Unitary Plan largely became operative in November 2016. The report of the Productivity Commission inquiry into urban planning was released in March 2017. The report relates closely to spatial planning, Resource Management Act reform and balancing wider against vested interests.
Limit the tax deductibility of losses from rental property investments by allowing them to be offset only against future rental income.	No action taken.
Implement a capital gains tax and boost environmental and property or land taxes to facilitate a more efficient and equitable tax structure.	Capital gains on investment properties bought and sold within two years have been subject to income tax since 2015.
Consider diversifying revenue sources for infrastructure funding. Implement infrastructure demand management strategies to reduce urban road congestion, notably congestion charging.	The Auckland Transport Alignment Project between central and local government has looked at options for variable network pricing on Auckland roads. Central and local government submitted a report in September 2016. The Government and the Auckland Council are developing a work programme to look at options for congestion pricing.
Expand the use of <i>ex post</i> evaluations of Commerce Commission decisions to assess performance.	<i>Ex post</i> evaluations are undertaken on an <i>ad hoc</i> basis.
To address equity financing gaps, shift the allocation of the NZ Venture Investment Fund to provide greater support for early-expansion-stage firms.	No action taken.
Move towards privatisation of state-owned enterprises (SOEs), and consider reducing local government ownership of port assets to bring more market discipline to the sector.	No action taken.

Leveraging the productivity potential of regional and Māori economies

Regions are important in understanding New Zealand's productivity performance. Some regions have relatively lower GDP per capita and poor productivity performance (OECD, 2016b). Regional economic development based on partnership between central government agencies and local stakeholders can enhance productivity in different types of regions by better integrating and adapting public investments and service provision to local conditions. The NZ government has recently initiated a series of regional economic surveys, followed by action plans led by local governments. This approach is consistent with the OECD's regional development policy framework, which emphasises the importance of partnership across levels of government (OECD, 2016b). Regional policy should continue to focus on effectively meeting the specific needs of all regions, rather than redistribution and subsidies for lagging regions, which can impede productivity growth. A key driver of several regional economies in New Zealand is Māori economic development. Māori represent 15% of the NZ population and, on average, are younger, have lower incomes and poorer social and health outcomes than non-Māori. A new Action Plan under New Zealand's strategy for boosting Māori economic performance – the Crown-Māori Economic Growth Partnership – will be released this year with the objective of growing a more productive, innovative and internationally connected Māori economic sector. It will be important that quantifiable targets be established for government actions in partnership with Māori and that this initiative be integrated with wider regional development efforts such as the Regional Growth Programme.

Enhancing competition and firm dynamics

Boosting competition offers potential productivity improvements through resource reallocation to the most productive firms, greater diffusion of existing technologies to

laggards and increased incentives for innovation. It can also offer distributional benefits through placing downward pressure on prices, which benefits consumers over generally wealthier shareholders. As noted above, there are indications that weak competition is an issue in New Zealand. While there has been a strong rate of job creation by new firms – which contributes to a relatively young population of small businesses – analysis suggests that there are long-run impediments in the process of productivity-enhancing re-allocation of labour and capital (Conway, 2016).

Lowering trade barriers would boost competition and increase international connections. While New Zealand has few trade restrictions, there would be benefits from cutting remaining tariffs, improving trade facilitation measures, removing trade barriers in telecoms and, for services more generally, giving stronger consideration to recognising foreign licenses to practise when those licences are based on equivalent or better standards than their NZ counterparts.

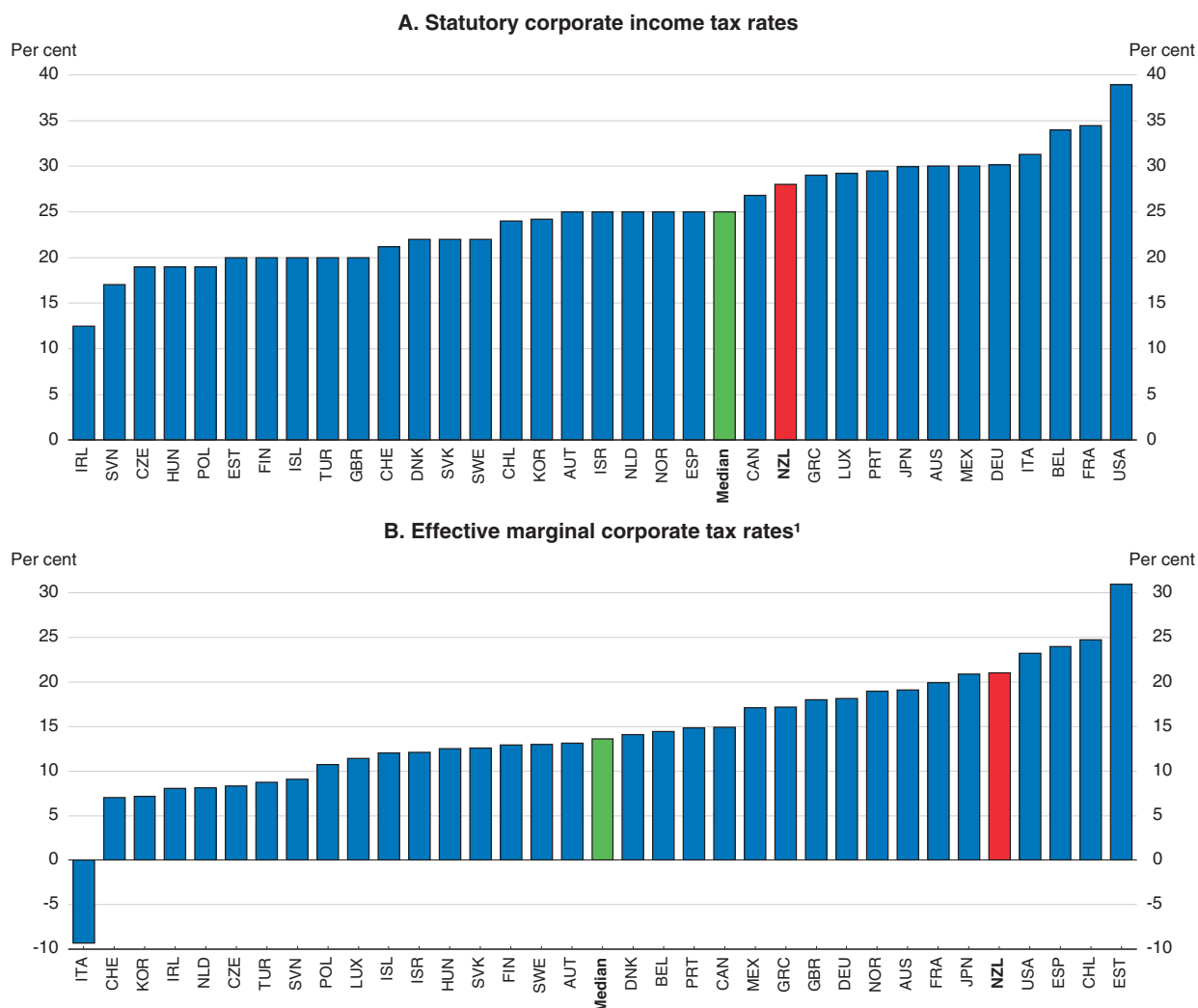
Allowing the Commerce Commission to undertake market studies is currently under consideration and could help markets work better, especially when obstacles and distortions to competition are not caused by competition law violations. In addition, the legislative prohibition against misuse of market power should be reviewed to consider whether the current requirement to prove the intent or purpose of behaviour is working and examine whether a test focused instead on the effects of business conduct, as in most other OECD countries, would be more beneficial.

New Zealand scores close to the OECD average on the OECD's indicator of the efficiency of insolvency regimes, leaving some room for improvement. Improving the efficiency of New Zealand's insolvency regime would strengthen productivity by facilitating reallocation of resources to the most productive firms and restructuring rather than liquidating viable businesses. It takes much longer to resolve an insolvency case in New Zealand than in leading countries such as Japan, Ireland, Canada, Belgium and Finland (World Bank, 2016). New Zealand's regime may impede continued trading of viable firms after commencement of insolvency proceedings, because it does not give priority to new financing ahead of pre-existing unsecured creditors, as is international best practice. Consideration should also be given to introducing separate insolvency regimes for SMEs and large firms. Facilitating the exit of non-viable firms can be expected to reduce productivity disparities across firms, which is associated with less labour income inequality (OECD, 2016c).

Increasing capital investment through tax reform


The authorities could increase the attractiveness of investing in New Zealand by cutting the corporate tax rate, which at 28% exceeds the OECD median of 25% (Figure 17, Panel A). The effective marginal corporate tax rate, which is more relevant for investment decisions, is considerably less competitive (Panel B). In contrast to most other countries, the effective tax rate is not much lower than the nominal rate in New Zealand owing to its relatively broad corporate income tax base. As having a broad tax base reduces the efficiency cost of taxation, the focus of measures to reduce the effective corporate tax rate should be on lowering the nominal rate. High effective corporate tax rates increase the user cost of capital and thus reduce aggregate investment, foreign direct investment and entrepreneurial activity (Djankov et al., 2010), with substantial negative implications for economic growth (Johansson, 2016; Bartolini et al., 2017). While distance from major markets might insulate New Zealand to some extent, it is difficult to see how it can resist the global trend to lower corporate tax rates without losing out on foreign investment. Any cut in the corporate tax

Figure 17. Corporate income tax rates, 2016



1. The effective marginal corporate tax rate is the percentage increase in the cost of capital of a marginal investment – that is, an investment that pays just enough to make the investment worthwhile – as a result of the corporate income tax rate and tax base.

Source: OECD, Tax Database; Oxford University Centre for Business Taxation, CBT tax database.

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rate would need to be assessed in the context of a holistic review of the tax system, including personal taxes and the option of expanding the number of tax bases to include land (which is immobile and therefore non-distortionary; Brook, 2014), capital gains and negative environmental externalities (see below). There are trade-offs between cuts to different taxes, and one downside of a corporate tax cut is that some of the benefits accrue to foreign investors. Yet, benefits for foreigners are the price to be paid for attracting foreign capital.

Increasing national saving could also contribute to an expansion in investment and indeed is necessary if investment is not to be financed through a wider current account deficit. The NZ government has a strong record on saving, but not the private sector. Removing regulatory and infrastructure barriers to the expansion of housing supply would reduce capital gains on property, obliging households to save more out of current income to meet their consumption objectives in retirement. The 2011 *Survey* advanced a number of

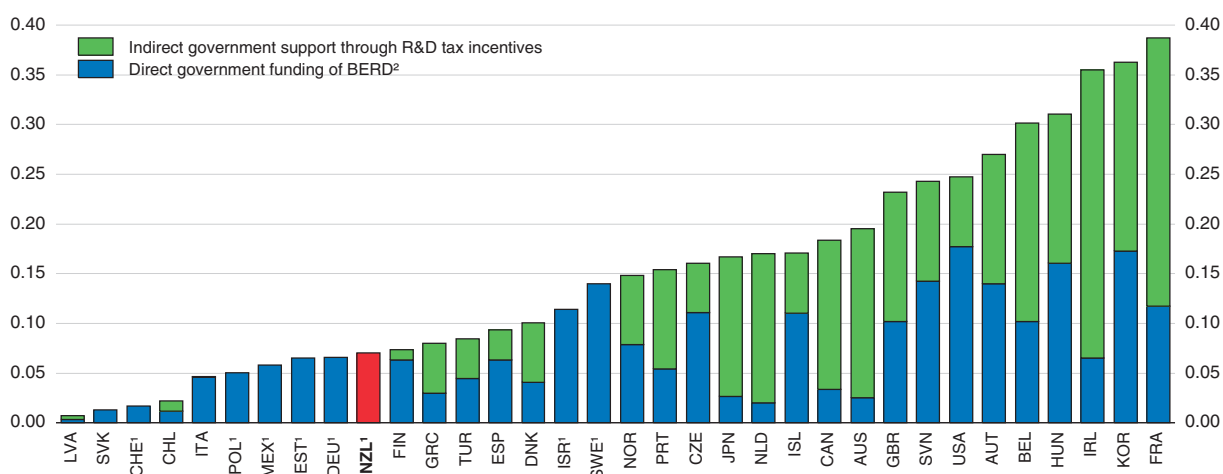
policy options to address low private saving, including extending automatic enrolment in the national retirement savings scheme (Kiwisaver) to all employees and considering an increase in the default contribution rate, as well as decreasing taxation of returns on non-housing saving vehicles (OECD, 2011). Reducing the tax rate on saving would require other revenue-raising changes as mentioned above.

Increasing innovation through support for R&D and industry linkages

Innovation, including through R&D, can boost firm productivity, but there can also be spill-over benefits beyond individual firms, which, along with difficulties finding external finance, provide a rationale for fiscal support for R&D (OECD, 2016d). New Zealand's support for R&D is provided predominantly through grants administered by Callaghan Innovation. Government support for business R&D in New Zealand is unusual among OECD countries in terms of both its low quantum and the absence of R&D tax incentives that provide an enhanced (i.e. greater than 100%) allowance for eligible expenses (Figure 18). There is also a low level of collaboration between firms and higher education and research institutions, in particular by small firms, which account for a large share of New Zealand's output and stand to gain the most from this type of collaboration (Figure 19).

Figure 18. **Direct and indirect funding of business R&D by governments**

As a percentage of GDP, 2014 or latest available data



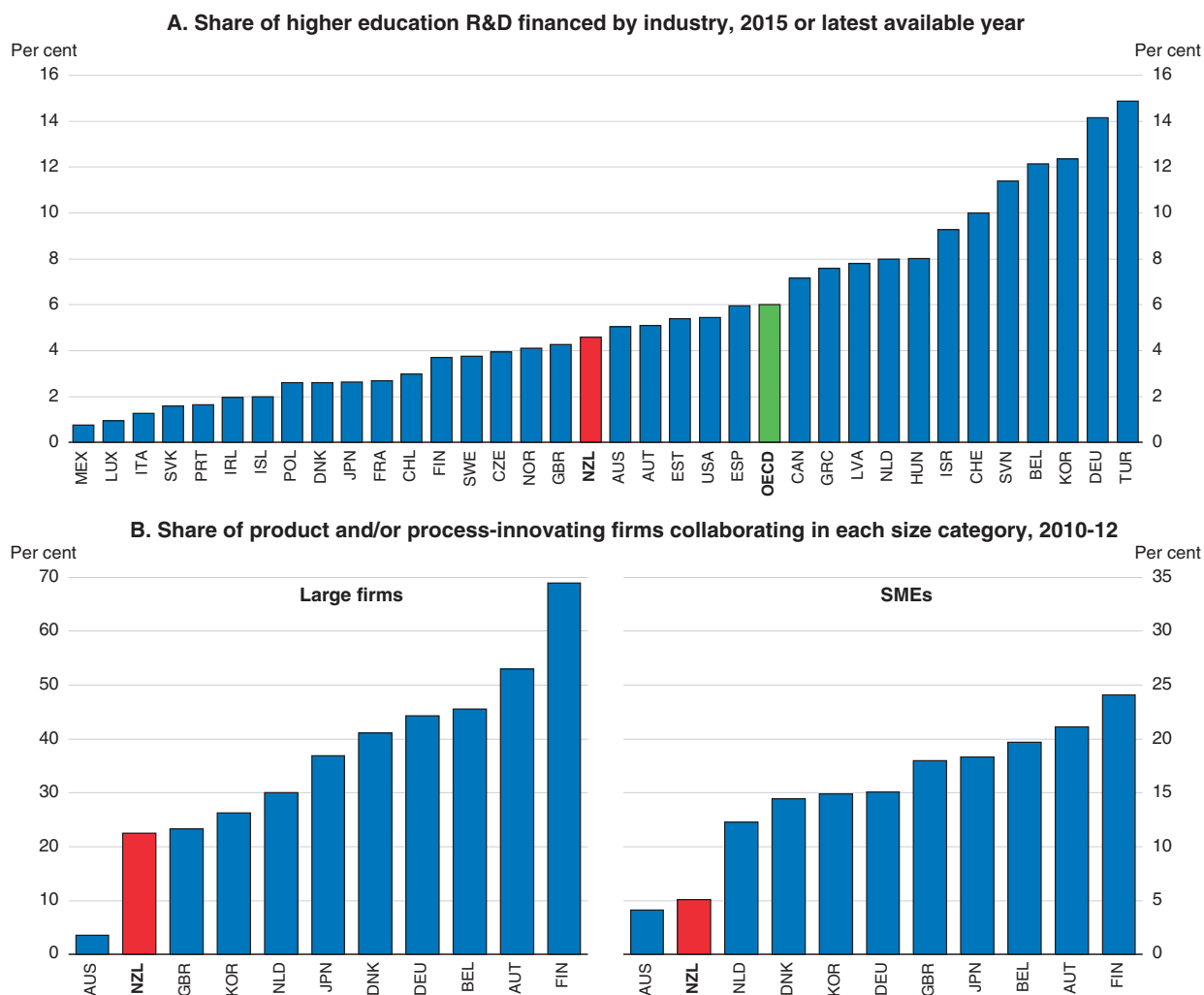
1. Estonia, Germany, Mexico, New Zealand and Switzerland did not provide any indirect government support through R&D tax incentives. For Israel, the R&D component of incentives cannot be identified separately at present. No data on the cost of expenditure-based R&D tax incentive support are currently available for Poland and Sweden. Data on direct government support for New Zealand are for the year to March 2016.

2. Business enterprise expenditure on R&D.


Source: OECD (2017), R&D Tax Incentive Indicators, <http://oe.cd/rdtax> and Main Science and Technology Indicators, <http://oe.cd/msti>; Statistics New Zealand.

StatLink <http://dx.doi.org/10.1787/888933497282>

The NZ government should increase its support for innovation by increasing R&D grants or re-introducing an R&D tax credit. R&D grants are capped at NZD 25 million per year, a limit that may discourage firm growth. Removing it could increase R&D, especially by larger firms, delivering greater spill-over benefits. Long-term support for successful collaboration between research institutions and industry should also be maintained or increased, and financial incentives for research institutions to develop industry linkages should be strengthened.

Figure 19. **Firms collaborating on innovation with higher education or research institutions**

Source: Statistics New Zealand; OECD, *Main Science and Technology Indicators Database*; OECD (2015), *OECD Science, Technology and Industry Scoreboard 2015*, Figure 3.3.1.

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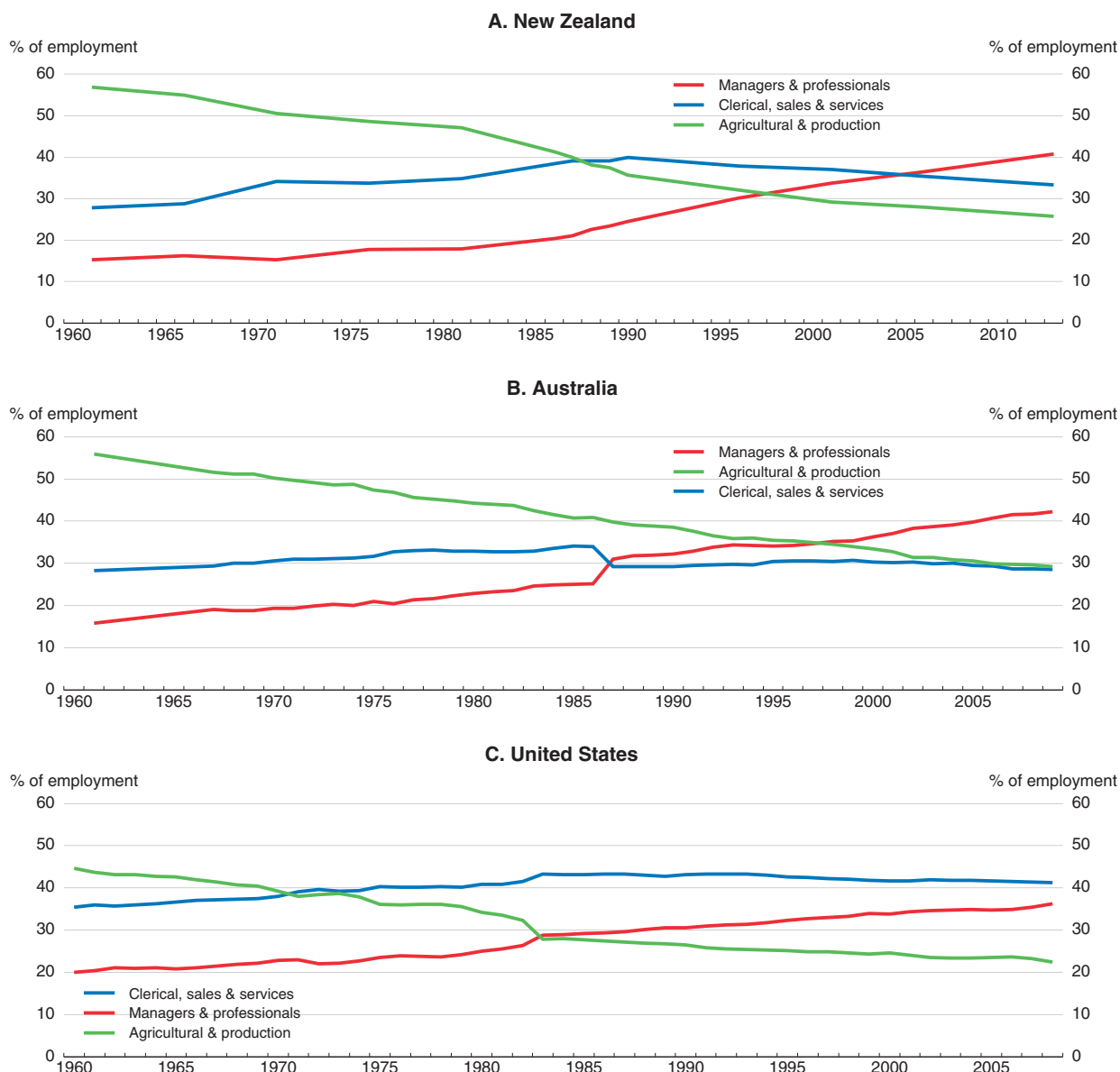
Adapting to the changing labour market

Technical progress continues to favour high-skilled workers

Technical change has long been increasing the productivity of, and hence the demand for, more highly skilled workers relative to others. This has led to a rising share of workers employed in high-skilled occupations, such as professionals and managers, and a declining proportion in low-skilled occupations, such as production and related workers (Figure 20, Panel A). Similar patterns hold in other countries too, albeit less pronounced in some than in New Zealand (Panels B and C).

Since the 1980s digitalisation has been the dominant form of technical change. It has automated many repetitive tasks, a process referred to as routine-replacing technical change. This has most affected middle-skilled jobs. By contrast, high-skilled jobs have many abstract tasks, and many low-skilled jobs, such as personal carers, require motor skills, judgement and/or social interaction (Autor et al., 2003). Routine-replacing technical change

Figure 20. Long-run broad occupational employment shares



Source: M. Handel (2012), "Trends in Job Skill Demands in OECD Countries", *OECD Social, Employment and Migration Working Papers*, No. 143; Statistics New Zealand, 2013 Census QuickStats about work and unpaid activities, Table 11.

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is hypothesised to lie behind the rise in employment shares of high- and low-skilled occupations in Europe and the United States in recent decades and falling shares of middle-skilled occupations, a phenomenon known as polarisation or "hollowing out" (Autor, 2015; Goos et al., 2014). New Zealand's high-skilled occupation employment shares rose markedly over 1991-2011, whether classified on the basis of earnings or average years of education, but fell for middle-skilled and low-skilled occupations, especially the former (Table 7).

Bessen (2016) finds that in the United States computerisation increases the productivity of workers who use computers more intensively than others, the more so the more highly skilled they are. Over time occupations that use computers intensively substitute for

Table 7. Levels and changes in occupational employment shares in New Zealand, 1991-2011

	Average employment share in 1991	Percentage point change in employment share, 1991-2011
Occupations ¹		
High paid	19.5	7.3
Middle paid	50.2	-5.5
Low paid	30.3	-2.5
High education	35.4	9.5
Middle education	48.6	-7.1
Low education	16.0	-2.5

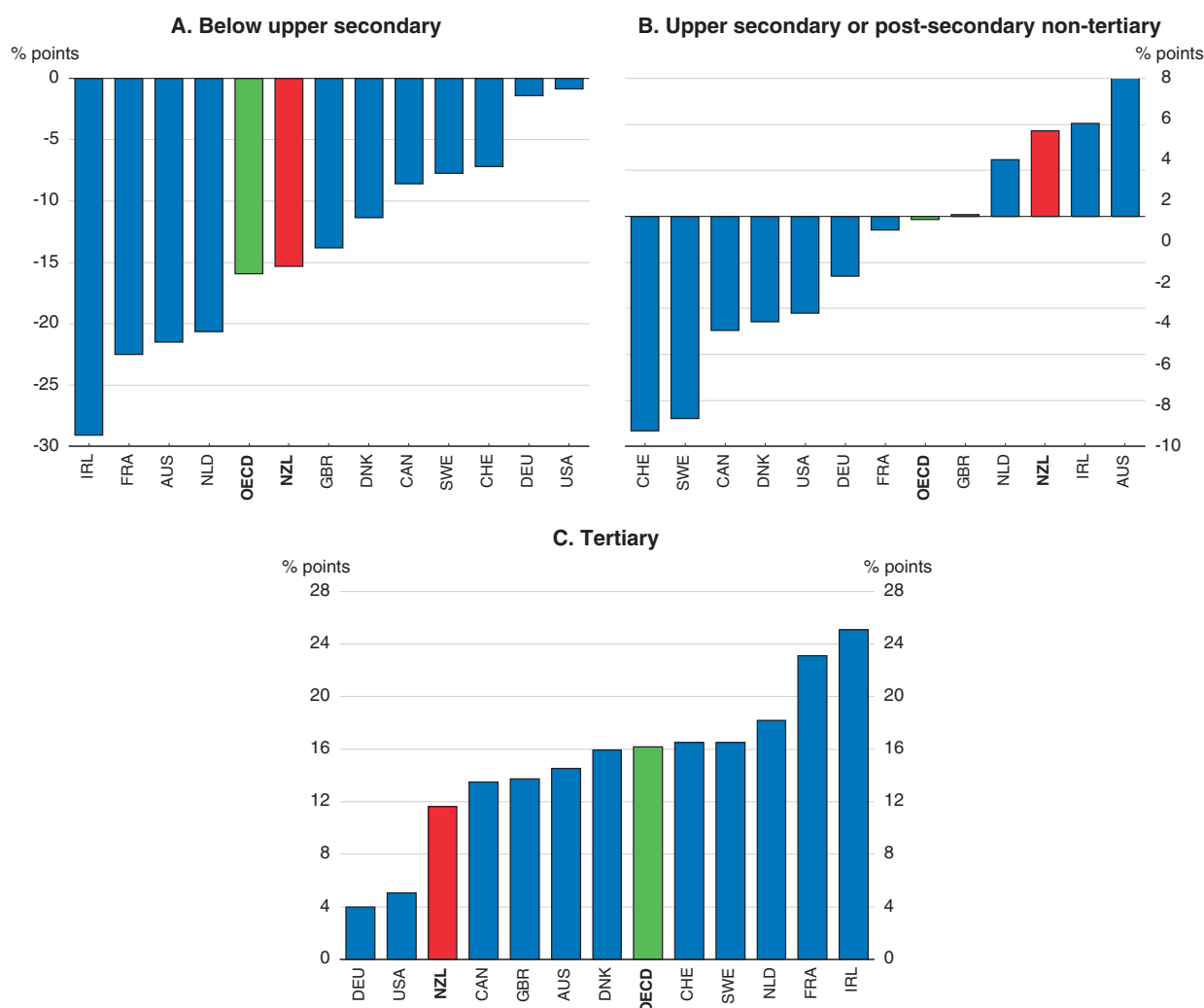
1. Occupations are defined at the two-digit level of the classification system in use up until 2011. High-paid (low-paid) occupations have median earnings one standard deviation above (below) the all-occupation average, while middle-paid occupations have median earnings within one standard deviation of the all-occupation average. High-education occupations typically require tertiary education. They include teaching professional, other professionals, life science professionals, science professionals, life science associate professors, public administration, science associate professors, other associate professors and corporate managers. Middle-education occupations typically call for upper secondary attainment. They include office clerks, customer service, building trades, metal and machinery trades, precision trades, agriculture and fisheries personal services, sale persons and other trades. Low education occupations have limited educational requirements. These occupations include industrial plant operators, building and related occupations, machine operators, elementary occupations and drivers.

Source: Statistics New Zealand, *Household Labour Force Survey*.

others in employment. Rising computer use is associated with growth in well-paid jobs and shrinkage in others. To shift to these well-paid occupations workers need to learn new complementary skills, which are costly or difficult to acquire, so only some workers do so. This leads to greater wage inequality within occupations.

Stronger demand for high-skilled workers in New Zealand has been met by workforce upskilling. The proportion of the population with less than upper secondary education attainment is lower for 25-34 year-olds than for 55-64 year-olds, and a much higher share of 25-34 year-olds have tertiary education than 55-64 year-olds (Figures 21 and 22); however, increases in attainment have been greater in most other countries, and attainment levels are higher abroad for the younger age group than in New Zealand. International migration has made a significant contribution to this upskilling. Immigration net of emigration has contributed a much larger share of the population with higher educational attainment than the falling share with lower levels of attainment (Table 8). In April 2017 the government announced a series of changes, including adding remuneration thresholds for the Skilled Migrant Category (residence), which should result in higher-skilled immigrants. While data on permanent and long-term migration continue to show a preponderance of net immigration in generally higher-skilled occupations, it should be borne in mind that these data do not capture short-term migration flows, which mostly entail low-skilled work, and that migrants may undertake less skilled work in New Zealand than in their home country.

Unfortunately, it is difficult to judge whether increases in the supply of skills have been well calibrated to growth in demand for skills in New Zealand over the long term owing to a lack of data on earnings by level of education attainment. Over the period 2005-16, for which data are available, earnings premiums point to relative demand for workers with short-cycle tertiary qualifications or post-secondary non-tertiary qualifications running ahead of supply (Table 9). The timing of these gains suggests that the Canterbury rebuild was an important factor. The decline in the share of the population with such qualifications also contributed to the shortage (Table 10). Earnings premiums for higher tertiary qualifications display no clear

Figure 21. **Educational attainment gap between young and old,¹ 2015**

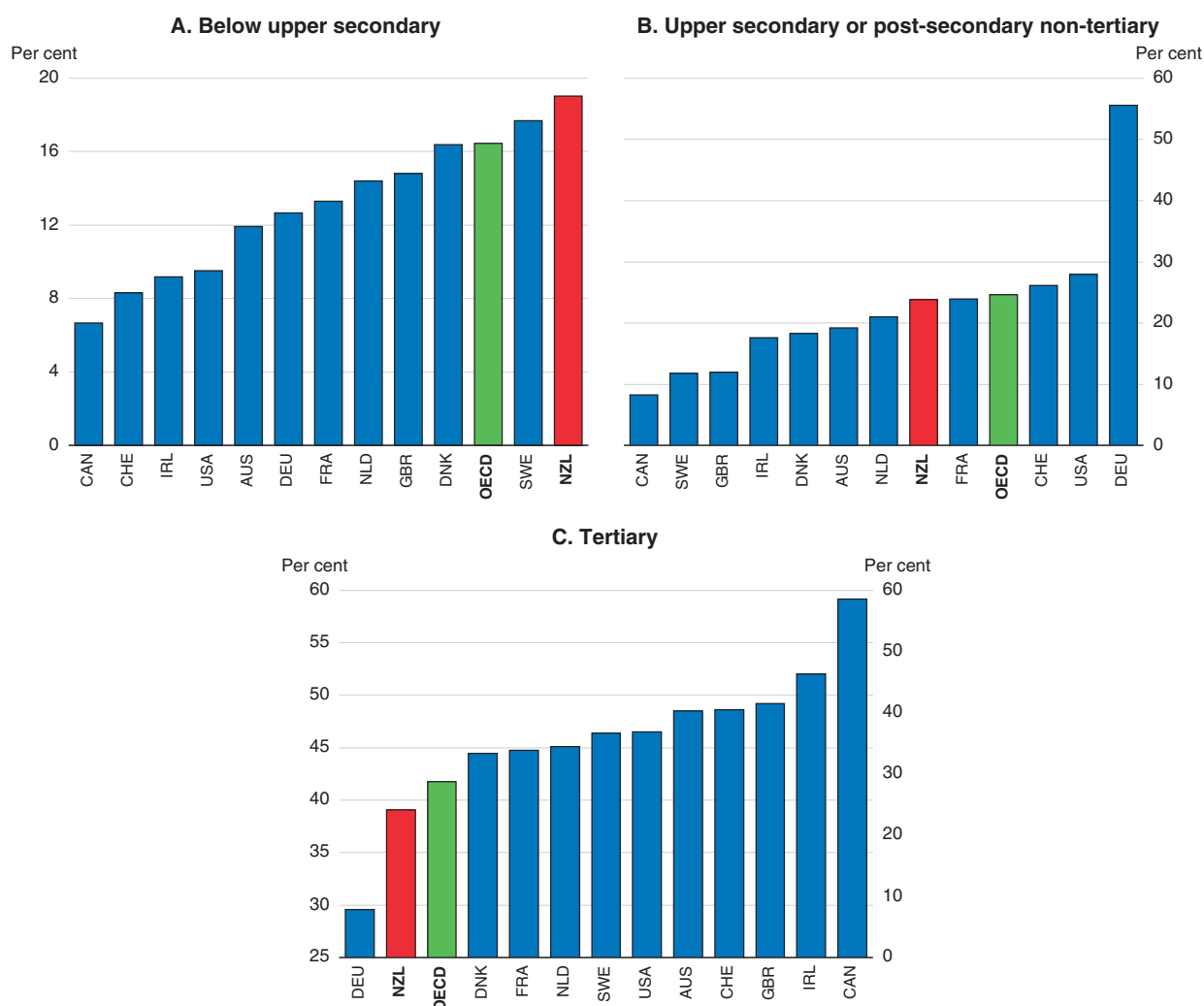
1. The young are defined as the 25-34 year-olds age group and the old as the 55-64 year-olds age group.
Source: OECD (2016), *Education at a Glance 2016: OECD Indicators*, Table A1.3.

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trend, suggesting that relative demand broadly increased in line with relative supply. Short-cycle tertiary earnings premiums are higher than in Australia and the United States while premiums for people with bachelor's or higher qualifications are higher than in Australia but much lower than in the United States (OECD, 2016e).

The Manpower Group survey of employers indicates that skills shortages in New Zealand are greater than in most other countries (Figure 23, Panel A). These shortages increased markedly following the Canterbury earthquakes but have been declining since 2014 (Panel B). NZ firms report that the hardest jobs to fill are for skilled tradespersons and engineers (Panel C). Wage rises in the construction sector, where many of them work, have outpaced those in other sectors in recent years. All of these factors are partly related to post-earthquake reconstruction and increases in the housing and construction industries.

The diffusion of digital technologies is expected to continue to favour high-skilled workers over their low-skilled counterparts. Using the data from the PIAAC study on tasks

Figure 22. **Level of educational attainment of the young,¹ 2015**

1. The young are defined as the 25-34 year-olds.

Source: OECD (2016), *Education at a Glance 2016: OECD Indicators*, Table A1.3.

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that workers report using, Arntz et al. (2016) estimate that 35% of NZ jobs are at risk of automation (meaning that more than 50% of tasks could be automated) over the next 10-20 years, with 9% at high risk (more than 70% of tasks are automatable) (Figure 24). These proportions are near the OECD average. As in other countries, low-skilled and low-income workers are much more likely to have their jobs automated than high-skilled, high-income workers (Figure 25).

Workers will need to upgrade their skills in fields in demand

NZ workers have strong information-processing skills, especially in literacy and problem solving in a technologically rich environment (Figures 26 and 27), putting them in good stead to adapt to change, such as workplace reorganisation to use digital technologies more productively. While skills for older workers are lower than for younger workers, the drop off with age is smaller than in most other countries, with the result that older

Table 8. **Impact of net migration on the skills of the population**

	Immigration	Emigration	Net migration
Education level¹	Stocks (thousands), 2010		
High education	332.6	174.7	157.9
Low-middle education	551.6	340.5	211.1
Total	884.2	515.2	369.0
	% of population aged 15 and over, 2010		
High education	55.3	29.1	26.3
Low-middle education	23.0	14.2	8.8
Total	29.5	17.2	12.3
Occupation²	% share, 2011-16		
Professionals	37.4	33.9	52.2
Managers	9.8	10.1	8.9
Clerical and administrative workers	6.9	7.2	5.6
Technicians and trade workers	17.4	16.2	22.4
Community and personal service workers	13.7	14.0	12.4
Sales workers	6.1	7.9	- 1.6
Labourers	5.6	6.5	1.8
Machinery operators and drivers	3.0	4.1	- 1.8
Total of above occupations (thousands)	243.1	196.3	46.8

1. Low education refers to lower secondary education; medium education corresponds to upper secondary education and post-secondary non-tertiary education; and high education refers to tertiary education.

2. Occupations of permanent and long-term migrants ranked by decreasing years of education.

Source: Statistics New Zealand; OECD (2015), *Connecting with Emigrants – A Global Profile of Diasporas 2015*.

Table 9. **Earnings premiums for NZ workers¹
by level of educational attainment**

Upper secondary education = 100

	2005	2010	2011	2012	2013	2014	2015	2016
Below upper secondary education	82	83	82	82	92	94	93	91
Post-secondary non-tertiary education	102	107	107	99	113	113	118	115
Tertiary education	124	129	122	121	136	146	145	140
Short-cycle tertiary education	105	104	101	102	114	127	128	124
Bachelor's or equivalent education	141	143	134	132	133	145	139	133
Master's, Doctoral or equivalent education	174	176	177	166

1. Earnings of full-time, full-year workers aged 25-64.

Source: OECD (2016), "Education and earnings", *Education at a Glance* (database); Statistics New Zealand.

Table 10. **Educational attainment by highest level of qualification**

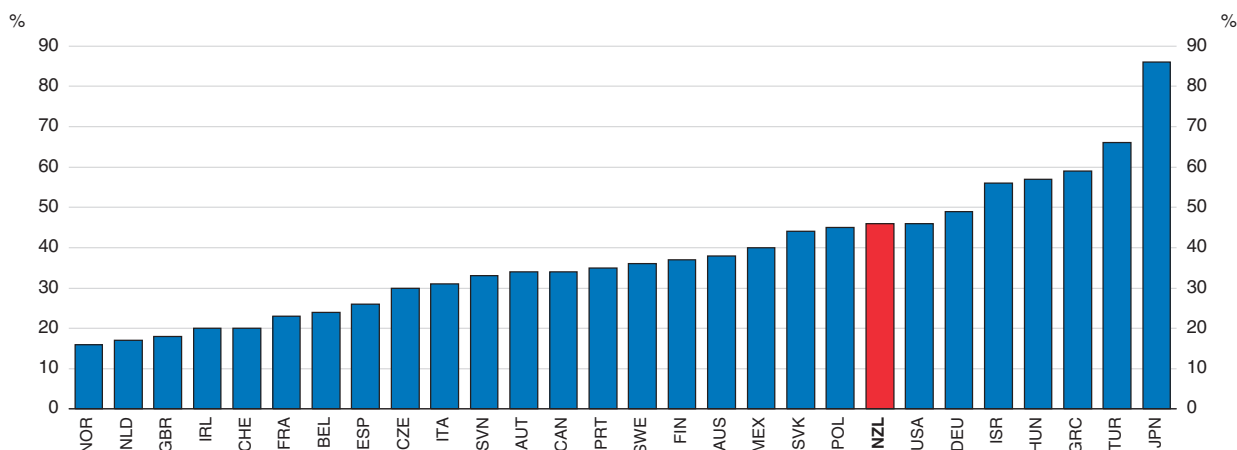
Population aged 15 years and over, per cent of all qualifications

	2005	2010	2011	2012	2013	2014	2015
No qualifications or not stated	26.3	25.6	24.5	24.2	24.4	22.7	22.2
School qualification	25.0	23.6	24.5	23.9	25.8	26.0	25.7
Tertiary diplomas/certificates	34.2	33.1	33.6	33.7	29.8	29.7	30.7
Bachelors degree or higher	14.5	17.7	17.4	18.3	20.0	21.5	21.4

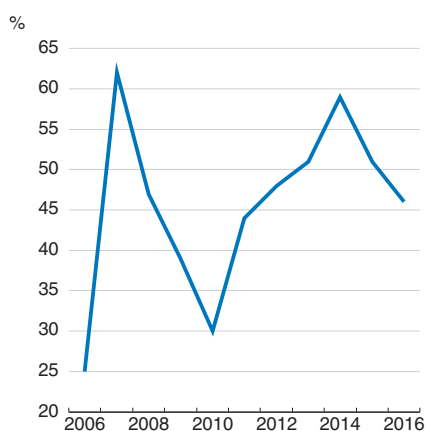
Source: Ministry of Education, *Education Counts*.

Figure 23. **Firms facing skills shortages**¹
As a percentage of all firms with ten or more employees

A. Skills shortages across countries, 2016

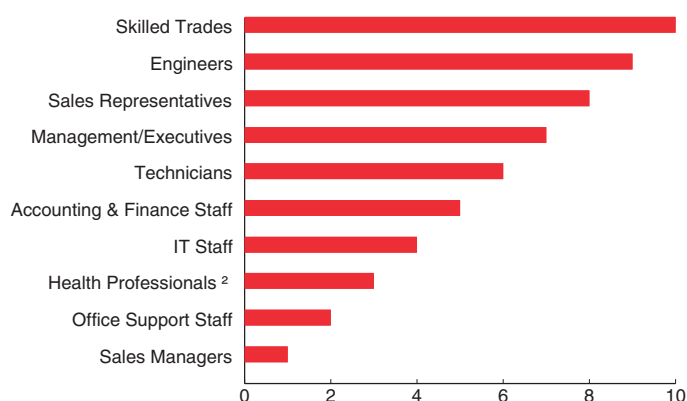


B. Skills shortages in New Zealand



C. Hardest skills to find in New Zealand

Jobs ranked by decreasing order of difficulties to find, 2016



1. Survey based. Firms are classified as facing a skills shortage if they report having difficulties filling jobs.

2. Doctors and other non-nursing.

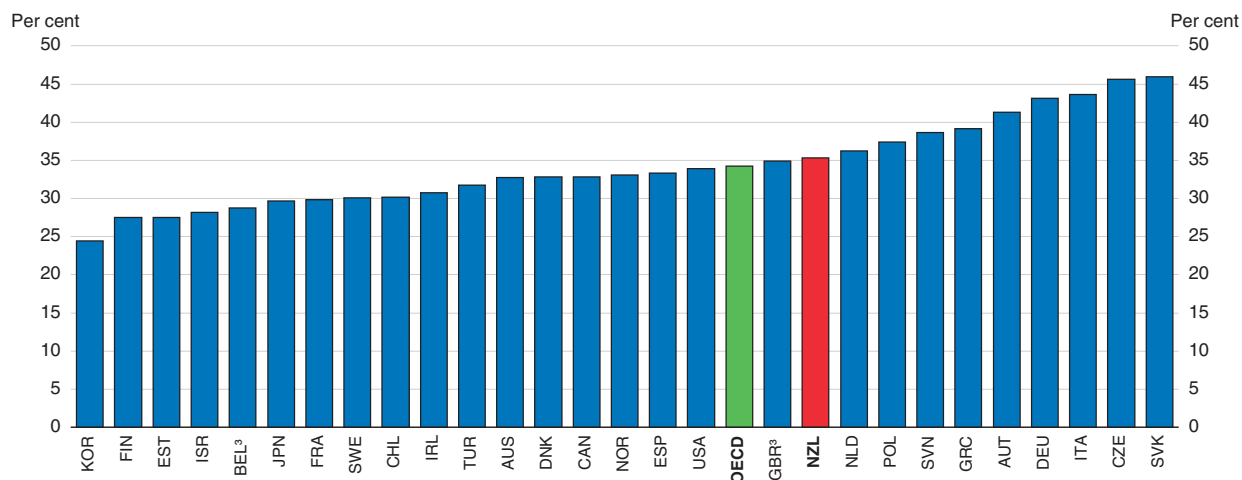
Source: ManpowerGroup, *Talent Shortage Survey*, various years.

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workers' skills in New Zealand are amongst the highest in the countries that participated in the PIAAC study (OECD, 2016f; see Chapter 2). Hanushek et al. (2016) find that returns to information-processing skills are higher when there is more economic change. They estimate that a one standard deviation increase in numeracy skills is associated with 19% higher earnings in New Zealand, slightly below the pooled estimate for the 32 countries in the PIAAC study.

Even so, young people will need to continue their education to higher levels than in the past and in fields that are in demand to adapt to changes in the labour market induced by technical change. For more young people to be able to succeed in post-secondary education, achievement by the secondary level will need to improve – performance at the secondary level is a strong predictor of success at the tertiary level (OECD, 2016e). The OECD PISA study shows that while achievement stabilised between 2012 and 2015 at levels

Figure 24. **Risk of job automation**
Jobs at risk of automation,¹ 2012 and 2015²



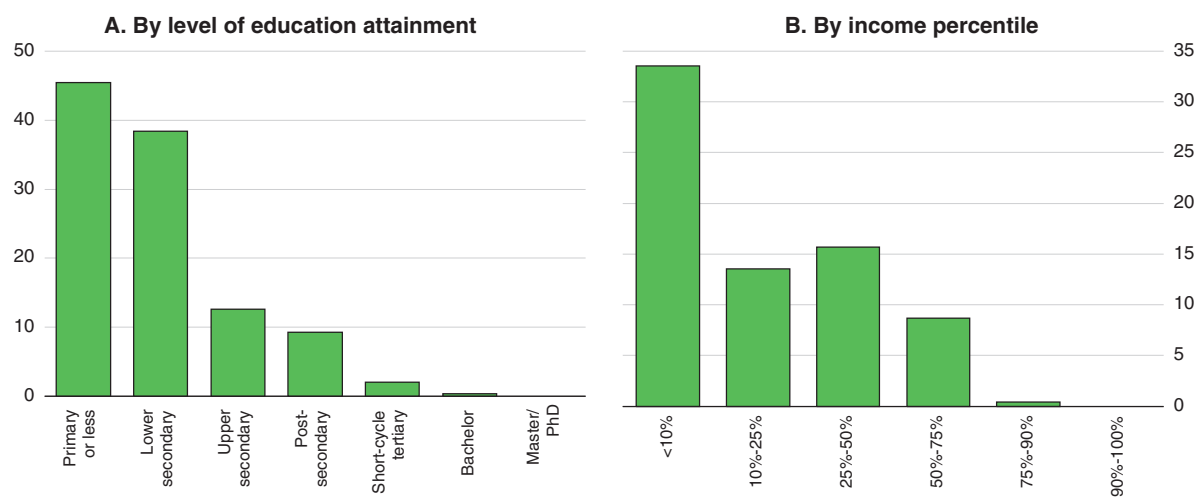
- Jobs are at risk of being automated if at least 50% of their tasks are automatable.
- Data correspond to 2012 for countries participating in the first round of the Survey of Adult Skills: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Japan, Korea, Netherlands, Norway, Poland, Slovak Republic, Spain, Sweden, United States and United Kingdom. Data correspond to 2015 for countries participating in the second round of the Survey of Adult Skills: Chile, Greece, Israel, New Zealand, Slovenia and Turkey.
- Data for Belgium correspond to Flanders and data for the United Kingdom to England and Northern Ireland.

Source: OECD calculations based on the Survey of Adult Skills (PIAAC) (2012, 2015); M. Arntz et al. (2016), "The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis", OECD Social, Employment and Migration Working Papers, No. 189, <http://dx.doi.org/10.1787/5jlz9h56dvq7-en>.

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Figure 25. **Share of NZ workers with high automation potential by education attainment and income level**

Share of workers in jobs at high risk of automation,¹ 2015

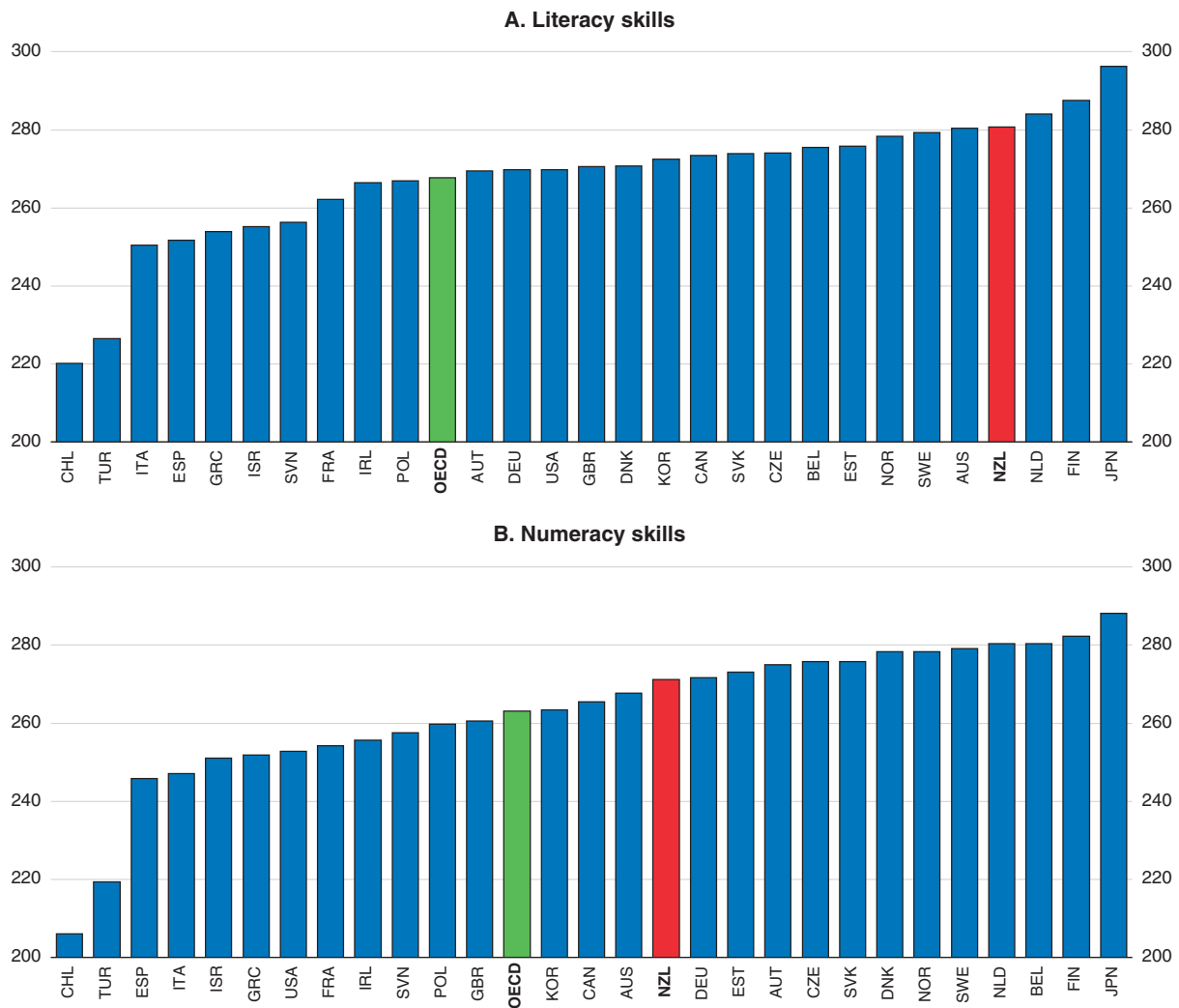


- Workers are at high risk of automation if at least 70% of their tasks are automatable.

Source: OECD calculations based on the Survey of Adult Skills (PIAAC) (2015); M. Arntz et al. (2016), "The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis", OECD Social, Employment and Migration Working Papers, No. 189, <http://dx.doi.org/10.1787/5jlz9h56dvq7-en>.


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Figure 26. **Information-processing skills**
2012 or 2015¹



1. For the exact year of reference of the data, see footnote 2 in Figure 24. Data indicated as Belgium correspond to Flanders; the United Kingdom is an average of England and Northern Ireland.

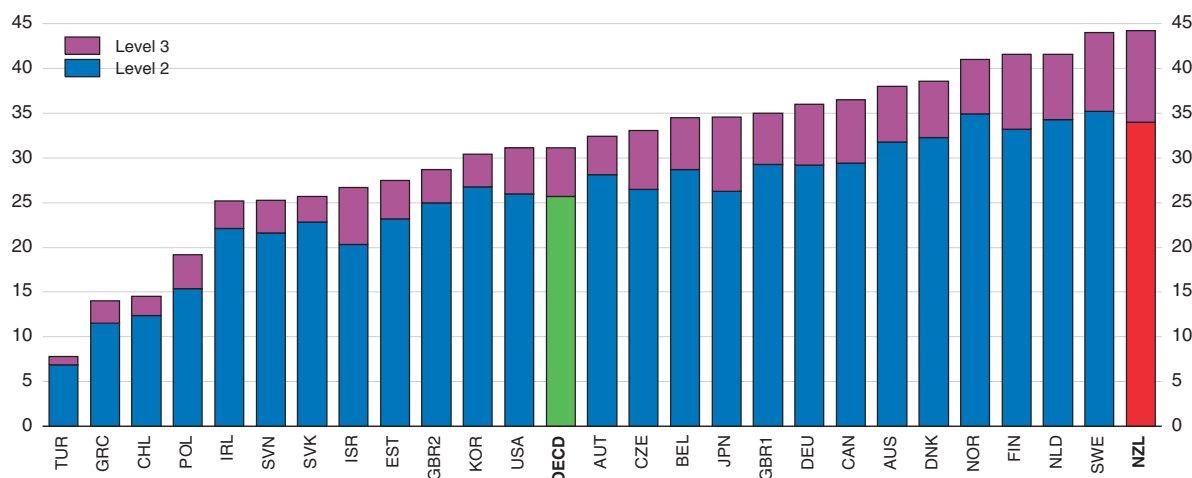
Source: OECD Survey of Adult Skills (PIAAC) Database (2012 and 2015).

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above the OECD average, it had declined markedly since the earlier years (Figure 28), and in the TIMSS study mathematics achievement is below average (Mullis et al., 2016). The decline reflects an increased share of low performers and a reduced share of high performers (Figure 29). It is not clear why these changes have occurred. Possible explanatory factors include significant changes in the curriculum and qualifications framework, changes in teacher training and development and other factors affecting teaching and learning, such as increases in the use of ability grouping.

Māori and Pasifika achievement remains below that of the rest of the population (Figures 28 and 30), and the influence of socio-economic background on outcomes remains higher than in many countries (Figure 31). A cornerstone of successive NZ governments' strategies for accelerating the progress of Māori and Pasifika students and of those from low socio-economic backgrounds is to ensure that all pre-school children have access to

Figure 27. Proficiency in problem solving in technology-rich environments among adults
Percentage of 16-65 year-olds scoring at each proficiency level, 2012 or 2015¹

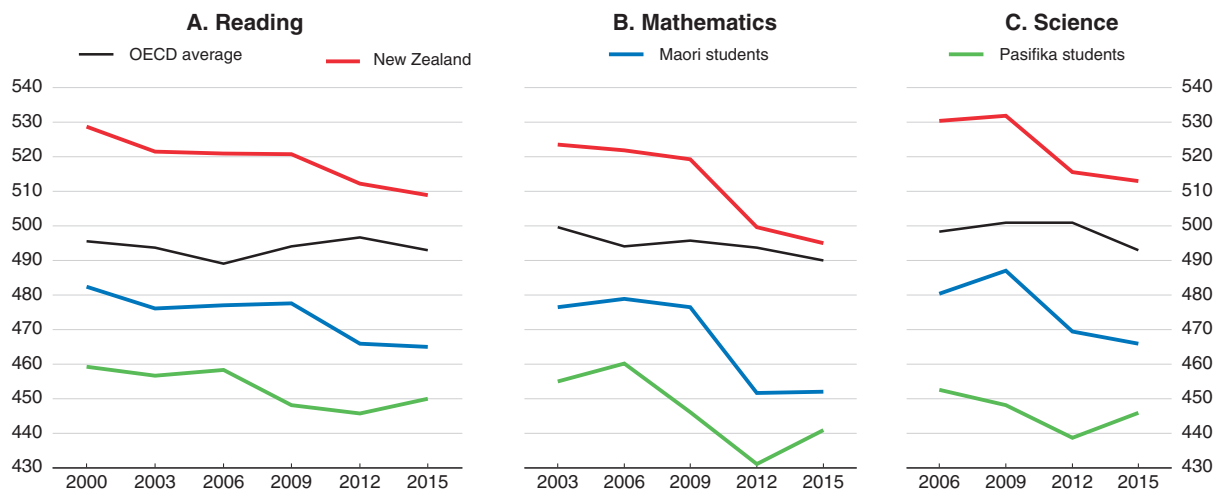


1. For the exact year of reference of the data, see footnote 2 in Figure 24. Data indicated as Belgium correspond to Flanders; GBR1 = England and GBR2 = Northern Ireland.

Source: OECD (2016), *Skills Matter: Further Results from the Survey of Adult Skills*, Table A2.6; OECD Survey of Adult Skills (PIAAC) Database (2012 and 2015).

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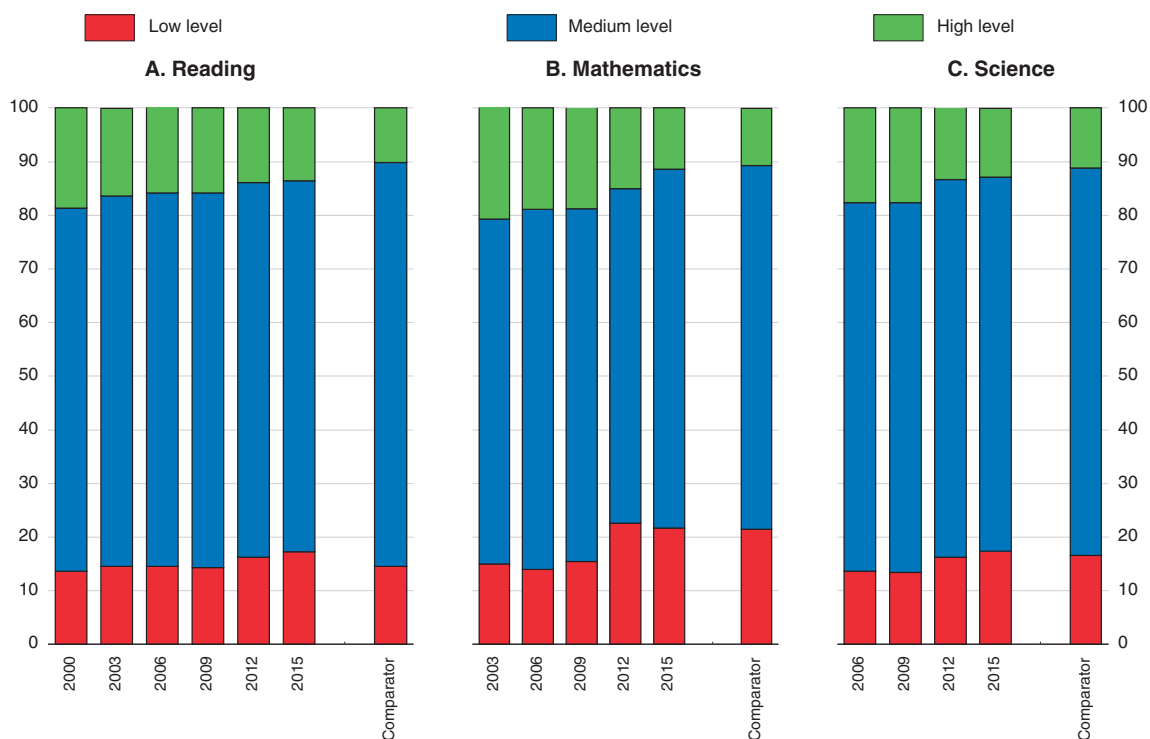
Figure 28. New Zealand's average PISA scores have fallen



Source: OECD, *PISA Results*, various years; S. May, J. Flockton and S. Kirkham (2016), *PISA 2015 – New Zealand Summary Report*, Ministry of Education.

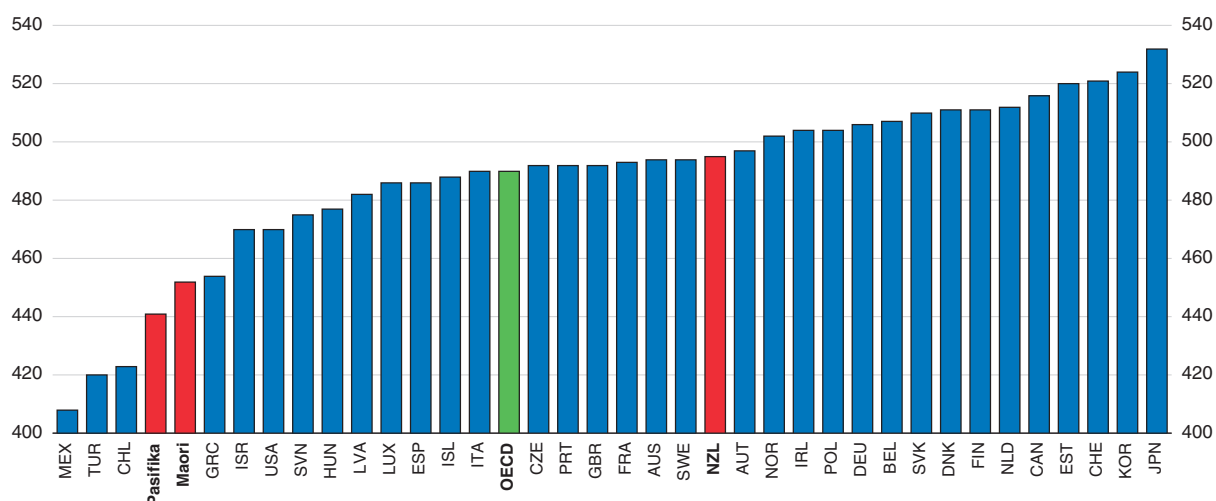
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high-quality early childhood education. Progress has been made in reducing non-participation rates for Pasifika and Māori children, from 24% and 17%, respectively, in 2000 to 9% and 6% in 2016. As discussed in the last Survey, the government needs to monitor outcomes for disadvantaged children and, if necessary, move to ensure that increased participation is delivering improved educational outcomes for them (Table 11). There have also been improvements in the rates of students, including Māori and Pasifika, obtaining National Certificate of Educational Achievement (NCEA) Level 2 or above qualifications (NCEA Level 2 qualifications are considered to be the minimum necessary to give people reasonable opportunities in terms of further education and employment).

Figure 29. **Percentage of students at each proficiency level¹**Trends in New Zealand over time and 2015 comparison with the average of countries with similar performance²

1. Low level is defined as the combination of below level 1/1b, level 1b/1a/1; medium level as the sum of level 2, level 3 and level 4; and high level as level 5 plus level 6.
2. Countries for which scores are not significantly different from New Zealand's are: for reading, Germany, Japan, Korea, Macao (China), Netherlands, Norway, Poland and Slovenia; for mathematics, Australia, Austria, Czech Republic, France, Portugal, Russian Federation, Sweden, United Kingdom and Viet Nam; and for science, Australia, Germany, Korea, Netherlands, Slovenia, United Kingdom and Beijing-Shanghai-Jiangsu-Guangdong (China).

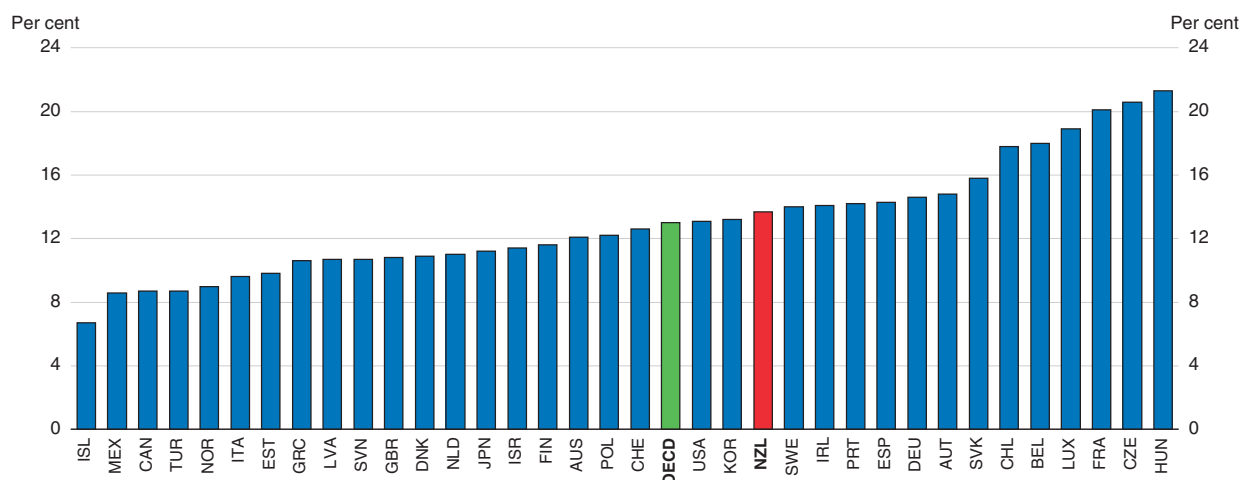
Source: OECD, PISA Results, various years.

StatLink  <http://dx.doi.org/10.1787/888933497395>Figure 30. **PISA performance in mathematics, 2015**

Source: OECD (2016), PISA 2015 Results: Excellence and Equity in Education, Annex B1, Chapter 5; S. May, J. Flockton and S. Kirkham (2016), PISA 2015 – New Zealand Summary Report, Ministry of Education.

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Figure 31. **Influence of socio-economic background on PISA scores in mathematics**
Variation in student performance explained by socio-economic background,¹ 2015



1. PISA index of economic, social and cultural status.

Source: OECD (2016), *PISA 2015 Results: Excellence and Equity in Education*, Vol. I, Table I.6.3c.

StatLink  <http://dx.doi.org/10.1787/888933497411>

Table 11. **Past OECD recommendations on adapting to the changing labour market**

Recommendations in previous <i>Surveys</i>	Action taken since previous <i>Survey</i> (June 2015)
Meet the 98% participation target for early childhood education. Ensure that the education provided is of high quality, includes programmes to enhance the involvement of parents and focuses more on the outcomes of children from disadvantaged backgrounds.	The 2016 target will largely be achieved: the early childhood education participation rate was 96.7% for the 12 months to September 2016. The number of children not attending early childhood education is now fewer than 800 short of the 98% target. The national early childhood curriculum, Te Whāriki, has been updated to better reflect developments in educational thinking and practice. The Ministry of Education is engaging with the families of the hardest-to-reach children, with a specific focus on raising participation in early childhood education for Māori, Pasifika and low socio-economic communities, particularly for three and four year-old children.
Boost financial support to recruit and retain effective teachers and school leaders for schools with high concentrations of children at risk of under-achievement.	An additional NZD 359 million is being invested over four years (from 2014/15, and an on-going NZD 155 million per year) to establish Communities of Learning Kāhui Ako, a Teacher-Led Innovation Fund, and a Principal Recruitment Allowance. Communities of Learning Kāhui Ako are intended to bring schools and other education providers together to: identify shared achievement challenges; draw on new teaching and leadership roles to lift teaching effectiveness in response to these challenges; and build more coherent student pathways through the education system. Leadership and teaching roles within Communities of Learning receive an additional allowance. The Principal Recruitment Allowance provides for an allowance to support the recruitment of highly effective principals to the most high-need schools.
Continue to make education more job relevant by: i) provision of better information to students about labour market outcomes to enable them to make study choices via high-quality and relevant professional careers counselling at secondary and tertiary levels; and ii) increasing transparency and accountability in the system about programme quality and outcomes (completion rates; employment outcomes).	There has been a greater focus on better information provision to assist learners with their study choices. MBIE's "Occupation Outlook" internet site and mobile app provides information about market prospects in different fields. Provider-level employment outcomes are being published. The government is proposing to transfer Careers New Zealand's functions into the Tertiary Education Commission to improve the provision of careers information.
Increase tertiary-sector responsiveness to labour market needs by formalising linkages between providers and employers, and directing funding to projected areas of skills shortfall, including better targeting of course offerings by providers and merit- and needs-based scholarships.	The government has raised the number of student places in engineering in tertiary institutions and increased the tuition subsidy.
Consider boosting practical training components within engineering degrees through support for tertiary education institutions located near engineering clusters.	The Engineering e2e (education to employment) programme was established to achieve the official target of an additional 500 engineering graduates annually. It brings together engineering employers and institutes of technology and polytechnics, supported by the Tertiary Education Commission.

Raising teaching effectiveness is the most important lever for enhancing learning (OECD, 2015b; Schleicher, 2016). A range of initiatives is underway to improve teaching quality, including the creation of communities of learning in 2014. These are intended to enhance collaboration and improve teaching and leadership expertise in New Zealand's highly devolved school system. These communities of learning should help to ease achievement problems by enhancing primary school teachers' pedagogical capabilities and confidence in mathematics teaching.

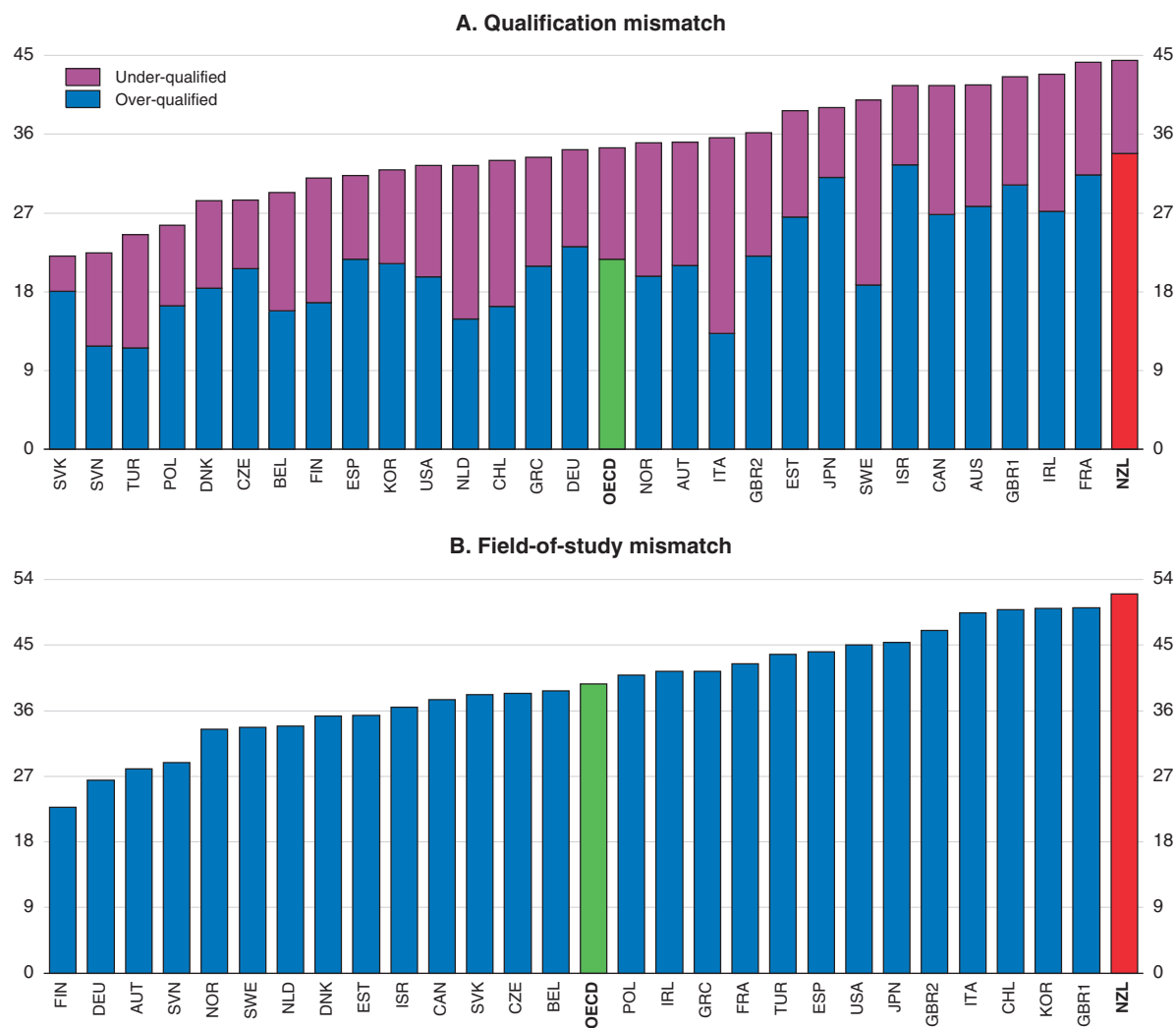
To lift outcomes in the long term, a systemic approach is necessary to improve the effectiveness of mathematics teaching in primary and intermediate schools. Key elements of such an approach include: raising initial teacher education quality and entry standards (current minimum entry standards for teaching programmes are relatively low); supporting professional learning and development that lifts the capability of the current workforce to teach mathematics; and supporting school leaders to lead a collaborative, data- and evidence-informed teaching culture that emphasises all aspects of the mathematics curriculum.

Options should also be explored to ensure that every pathway through the schooling system enables students to gain at least the minimum skill level needed to support further study and labour market participation in higher-skilled occupations. One of the unintended consequences of a highly devolved education system may be that it is less likely to consistently deliver a core set of skills to each student. In this respect, options should be investigated to reduce over-reliance on same ability grouping (i.e. the streaming of students for all classes, some subjects, or different forms of a subject) and variability in students' levels of exposure to the mathematics curriculum. This could include reviewing minimum numeracy requirements for school qualifications and the minimum education required by all school leavers as well as examining options for schools to access guidance and professional learning and development on the effective use of mixed ability grouping strategies.

Adapting to technical change entails not just acquiring higher levels of education and skills, but obtaining those that are in demand in the labour market. New Zealand appears to have some problems in this regard. As noted above, skills shortages are relatively widespread. Moreover, qualifications and field-of-study mismatches, which occur when workers have qualifications that are greater or less than required for their jobs or in a different field, are more common than for any other participant in the PIAAC study (Figure 32). As in other countries, most qualifications mismatch is over-qualification. According to econometric evidence presented in OECD (2016f), workers employed in small firms or part time are more likely to be overqualified than workers in large firms or employed full time, with the effect being particularly strong for small-firm employment. Given the preponderance of employment in small firms in New Zealand, small-firm employment appears to be the major factor accounting for its relatively high rate of over-qualification, followed by part-time work, which is also more prevalent in New Zealand than in most other countries. OECD (2016f) also found that part-time employees are more likely to be field-of-study mismatched in New Zealand than full-time employees, but that small-firm employment is not a significant explanatory factor of field mismatch.

Most overqualified workers are also field-of-study mismatched. Sometimes, workers who are field-of-study mismatched hold qualifications in fields where the labour market is relatively oversupplied, obliging them to settle for a job outside their field of study that requires a lower qualification than they hold (Montt, 2015). In New Zealand, such mismatch could also be attributable to the low level of specialisation in a small labour market.

Figure 32. **Qualifications and field-of-study mismatch**¹
 Percentage of mismatched workers, by type of mismatch, 2012 and 2015²



1. Qualifications mismatch occurs when a worker has a higher or lower level of qualification than is required for his/her job. Field-of-study mismatch occurs when a worker has a qualification in a different field than required for his/her job.
2. For the exact year of reference of the data, see footnote 2 in Figure 24. Data indicated as Belgium correspond to Flanders; GBR1 = England and GBR2 = Northern Ireland.

Source: OECD (2016), *Skills Matter: Further Results from the Survey of Adult Skills*, Figure 5.7; OECD Survey of Adult Skills (PIAAC) Database (2012 and 2015).

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Overqualified workers in New Zealand earn 14% less than their well-matched counterparts with the same qualifications and skills proficiency, the same hourly earnings penalty as the average for OECD countries (OECD, 2016f). Once qualification mismatch is taken into account, field-of-study mismatch does not have an additional earnings penalty, in contrast to the OECD average result.

While New Zealand is always likely to have a high incidence of overqualified workers owing to its small size and the preponderance of employment in very small firms, steps could be taken to reduce such mismatch. Given that most over-qualified workers are also field mismatched, reducing field mismatches could help to reduce over-qualification

mismatches. Relative to the OECD average, New Zealand's mismatches are particularly high in "teacher training and education science" and in "humanities, languages and arts" and are especially low in "agriculture and veterinary" (Table 12). This could be a sign that, relative to other countries, too many workers in New Zealand have qualifications in the former two fields and not enough in the latter in relation to labour market demand. The fact that in New Zealand the overall mismatch rate (52.0%), which is a weighted average of field mismatches, is close to the simple average of field mismatches (52.7%), whereas the overall mismatch rate for the OECD average (41.9%) is well below the simple average of field mismatches (48.2%) indicates that the distribution of workers across fields in New Zealand is more weighted towards those with high mismatch rates than in other countries.

Table 12. **Prevalence of field-of-study mismatch by field**

Field-of-study mismatch by field of study, per cent									
Overall rate	Teacher training and education science	Humanities, languages and arts	Social sciences, business and law	Science, mathematics and computing	Engineering, manufacturing and construction	Agriculture and veterinary	Health and welfare	Services	
New Zealand	52.0	56.3	90.7	27.3	79.5	36.2	55.8	32.8	43.9
England (UK)	50.1	40.6	87.3	27.3	76.7	37.5	83.4	24.7	57.9
Korea	50.1	33.7	72.9	26.3	84.0	44.1	85.9	39.4	22.9
Chile	49.9	40.9	83.6	22.0	73.9	41.7	39.9	43.4	42.7
Italy	49.4	48.2	75.6	18.8	76.9	34.0	82.2	25.1	47.3
Northern Ireland (UK)	47.0	40.5	87.4	20.3	74.5	41.6	90.7	22.3	63.1
Japan	45.3	72.1	85.8	27.0	59.5	38.2	79.6	24.1	32.1
United States	45.0	49.7	73.6	24.5	71.7	33.2	71.4	35.1	46.1
Spain	44.1	40.1	80.7	26.8	71.3	37.6	43.2	30.4	35.1
Turkey	43.8	24.3	76.4	33.6	80.8	41.5	48.8	32.6	40.5
France	42.5	37.6	68.5	25.6	72.9	35.9	64.6	35.0	40.9
Country average	41.9	46.3	76.5	23.5	71.2	34.4	70.9	30.5	38.6
Greece	41.4	36.1	75.0	16.8	68.6	44.4	78.1	37.8	16.6
Ireland	41.4	29.1	76.5	23.1	79.5	31.0	83.1	28.6	34.3
Poland	40.9	38.2	65.6	19.0	79.6	34.4	65.6	24.8	47.0
Flanders (Belgium)	38.7	28.5	76.3	20.8	68.1	32.1	90.2	31.1	25.1
Czech Republic	38.3	35.9	77.9	22.5	69.7	32.2	77.4	39.4	52.2
Slovak Republic	38.2	26.9	80.1	21.0	66.0	28.3	84.1	22.8	36.3
Canada	37.5	30.0	77.1	19.2	62.6	26.0	57.3	32.2	41.3
Israel	36.5	34.9	69.2	23.6	46.0	35.7	55.9	30.2	60.0
Estonia	35.3	30.9	61.5	23.7	47.5	32.4	75.8	23.5	40.7
Denmark	35.2	40.0	71.7	19.9	51.0	29.0	63.7	19.8	41.8
Netherlands	33.9	30.0	72.7	17.4	59.1	39.2	69.4	32.6	37.1
Sweden	33.7	27.7	71.1	30.8	54.7	30.6	64.9	23.8	27.2
Norway	33.5	21.6	71.0	19.6	66.1	35.2	91.9	21.7	27.4
Slovenia	28.8	19.2	44.3	20.0	51.6	29.6	63.9	16.3	32.8
Austria	28.0	25.9	60.8	21.8	49.3	28.6	76.5	14.7	25.6
Germany	26.4	31.9	55.6	17.4	51.6	29.2	54.5	23.2	18.0
Finland	22.8	31.2	52.7	16.7	41.5	21.1	55.0	14.7	18.1

Source: OECD calculations based on the Survey of Adult Skills, PIAAC (2012 and 2015).

Field mismatches could be lower if more NZ students sought qualifications in less crowded fields, where job prospects are better. The government has recently created several Internet sites (e.g. Compare Study Options) to help students become better informed about

labour market prospects in different fields of study, although this information would be more accessible if the sites were consolidated (NZPC, 2017b). These services need to be complemented by better careers education and guidance in schools that enables students to develop the skills and knowledge necessary to make good choices about their study options and careers pathways (NZPC, 2017b). Following a comprehensive review, the government is proposing to transfer Careers New Zealand's functions into the Tertiary Education Commission to exploit its ability to work with tertiary providers and employers so that they can provide better careers information to schools regarding the skills needs of the labour market. In this context, the authorities are also exploring how to make it easier to share careers resources and expertise across schools and Communities of Learning.

It may also be worth reviewing New Zealand's career-focused education, as is happening in many other countries, to ensure that it is in tune with the changing labour-market demands resulting from digitalisation. In the United States, for example, the manufacturing sector requires many more workers who know how to use robotics equipment and can navigate across a variety of technologies than are in the education pipeline (Giffi et al., 2015). To help to bridge these skills gaps, career-focused education is being developed. An example is the six-year high school-community college programme founded by IBM in 2011 in which 300 partner companies work with 60 local schools to shape curricula that will educate students up to a two-year associate's degree. More generally, having the skills to work with new technologies is likely to be critical to access good jobs. Increasingly, students will need to graduate with a mix of soft skills, such as problem solving and communication, and basic technical skills such as technology and mathematics.

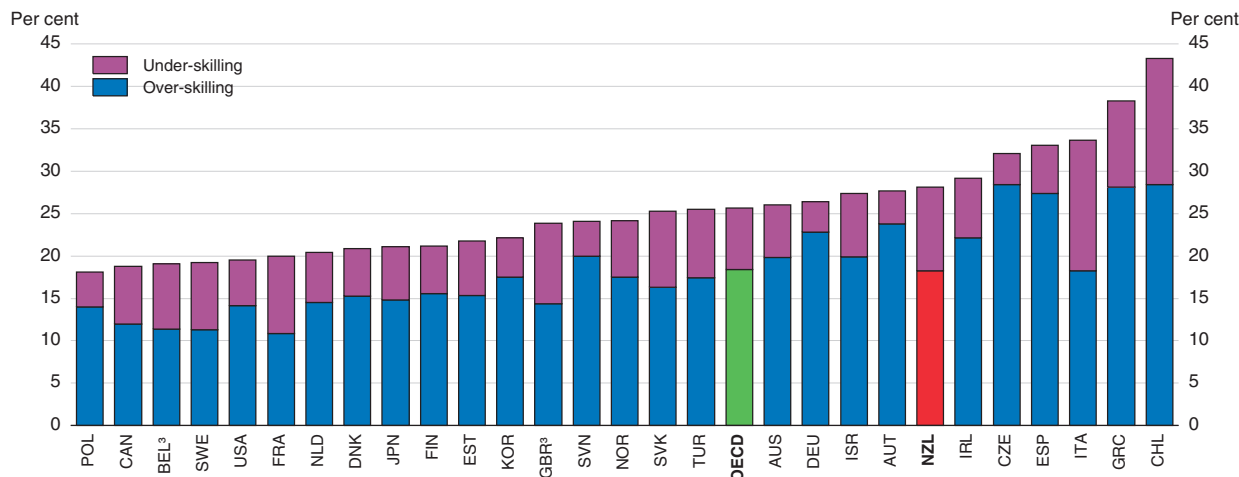
People need to acquire new skills throughout their working lives to meet evolving labour market needs. New Zealand has the highest adult participation rate (aged 25-64) in formal and non-formal education among the countries that participated in the PIAAC study, reflecting high participation in both the formal and non-formal components (OECD, 2016e). Moreover, the gap between the high participation rates of those with high education attainment, information-processing skills and frequency of skill use and those with the opposite characteristics is smaller than in most other countries. Factors that contribute to high participation in formal education include open access to tertiary education for those aged over 20, highly subsidised courses, student support (loans and income-tested allowances) and low income tax rates, which boost after-tax returns on education investments.

However, the provision of training is uneven across different professions, with those in lower skilled jobs less likely to receive learning and development opportunities. Employers (particularly of lower-skilled workers) may underinvest in training that builds transferable skills for fear that their employees leave before training investments have been amortised. This problem is likely to be more so in small firms, which have smaller internal labour markets, are more credit constrained and less well-managed than larger companies. If such training investments enhance workers' labour-market prospects, the government will benefit through lower social benefit costs and higher tax revenues. In these circumstances, there may be a role for government subsidies or regulatory interventions to increase such investments towards the socially optimal level. This will be all the more so if faster rates of technical change result in more people having to upgrade skills to remain in employment. Among best practices for such incentives, OECD (2017a) recommends that they should minimise administrative burdens, focus on the least skilled and SMEs (to minimise deadweight losses), be flexible, result in certified learning outcomes and be regularly monitored and evaluated.

Reducing skills mismatches could increase productivity and wages


Literacy skills mismatches in New Zealand also exceed the OECD average (Figure 33). This reflects higher levels of under-skilling. Adalet McGowan and Andrews (2017), find, for example, that reducing literacy skills mismatch in New Zealand to the best practice level could raise labour productivity by 7% (Figure 34). Most NZ public policies affecting skills mismatch that were examined by Adalet McGowan and Andrews are near best practice, but housing is a notable exception (Figure 35). The biggest problem is that housing supply does not react much to shortages (Andrews et al., 2011), which has had a clear impact on house prices in recent years, making it more difficult for workers to move to a better matched job where they would be more productive. If responsiveness were increased to best practice levels (found on average in the United States), NZ labour productivity could rise by 2¼ per cent as a result of reduced mismatches (Figure 35). As discussed above, these problems mainly reflect restrictive land-use policies and inadequate infrastructure provision.

Figure 33. **Percentage of workers with literacy skills mismatch¹**
2012 and 2015²



1. The figure shows the percentage of workers who are either over- or under- skilled, for a sample of 11 market industries: manufacturing; electricity, gas, steam and air conditioning supply; water supply; construction; wholesale and retail trade; transportation and storage; accommodation and food service activities; information and communication; real estate activities; professional, scientific and technical activities, and administrative and support service activities. In order to abstract from differences in industrial structures across countries, the 1-digit industry level mismatch indicators are aggregated using a common set of weights based on industry employment shares for the United States. Skills mismatch occurs when a worker's skills are higher than the 90th percentile or lower than the 10th percentile of workers with self-reported well-matched skills.
2. For the exact year of reference, see footnote 2 in Figure 24.
3. Data for Belgium correspond to Flanders and data for the United Kingdom to England and Northern Ireland.

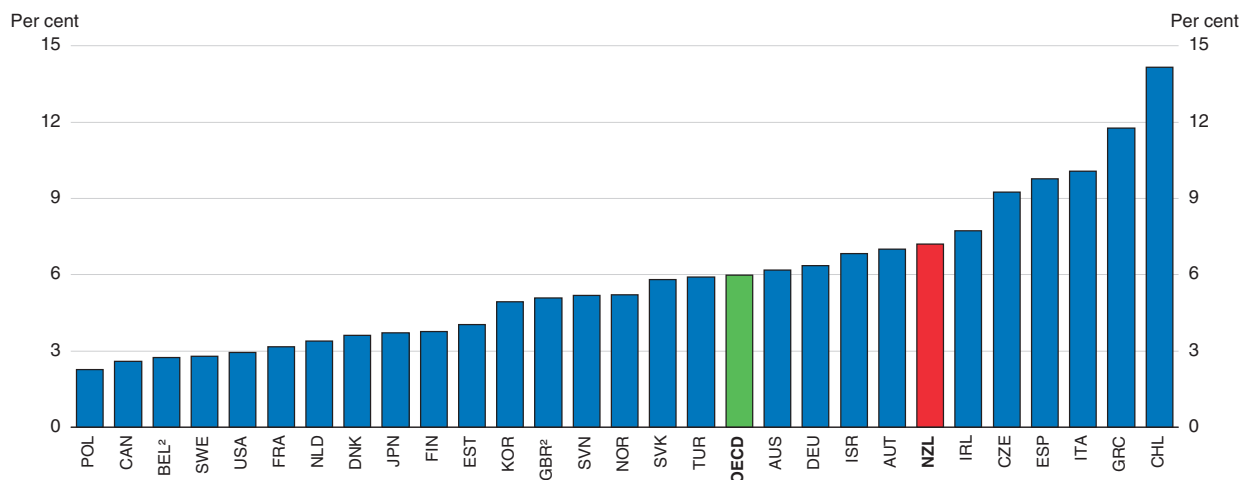
Source: Adalet McGowan, M. and D. Andrews (2017), "Skills Mismatch, Productivity and Policies in New Zealand: Evidence from PIAAC", OECD Economics Department Working Papers (forthcoming); OECD calculations based on the Survey of Adult Skills (PIAAC) (2012 and 2015).

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Greater support for displaced workers could reduce lay-off costs they face


More rapid technological change also increases the risk of workers being displaced, although there is no strong evidence of such effects in New Zealand having become greater than in the past. In New Zealand, the stock of displaced workers (i.e., those who report being displaced due to structural and technical change) is about 1.1% of the total workforce, which is comparable to the scale in other OECD countries but higher than the pre-global financial crisis level (OECD, 2017b). However, the re-employment rate after two years is high (84%),

Figure 34. **Counterfactual productivity gains from reducing skills mismatch¹**
 Simulated gains to allocative efficiency from lowering skills mismatch to the best practice



1. The chart shows the difference between the actual allocative efficiency and a counterfactual allocative efficiency based on lowering the skills mismatch in each country to the best practice. 1-digit industry level mismatch indicators are aggregated using a common set of weights based on the industry employment shares for the United States. The estimated coefficient of impact of mismatch on productivity is based on a sample of 19 countries for which both firm level productivity and mismatch data are available. The estimated gains to allocative efficiency for the other countries should be interpreted with caution to the extent that they are not included in the econometric analysis due to insufficient productivity data.
2. Data for Belgium correspond to Flanders and data for the United Kingdom to England and Northern Ireland.

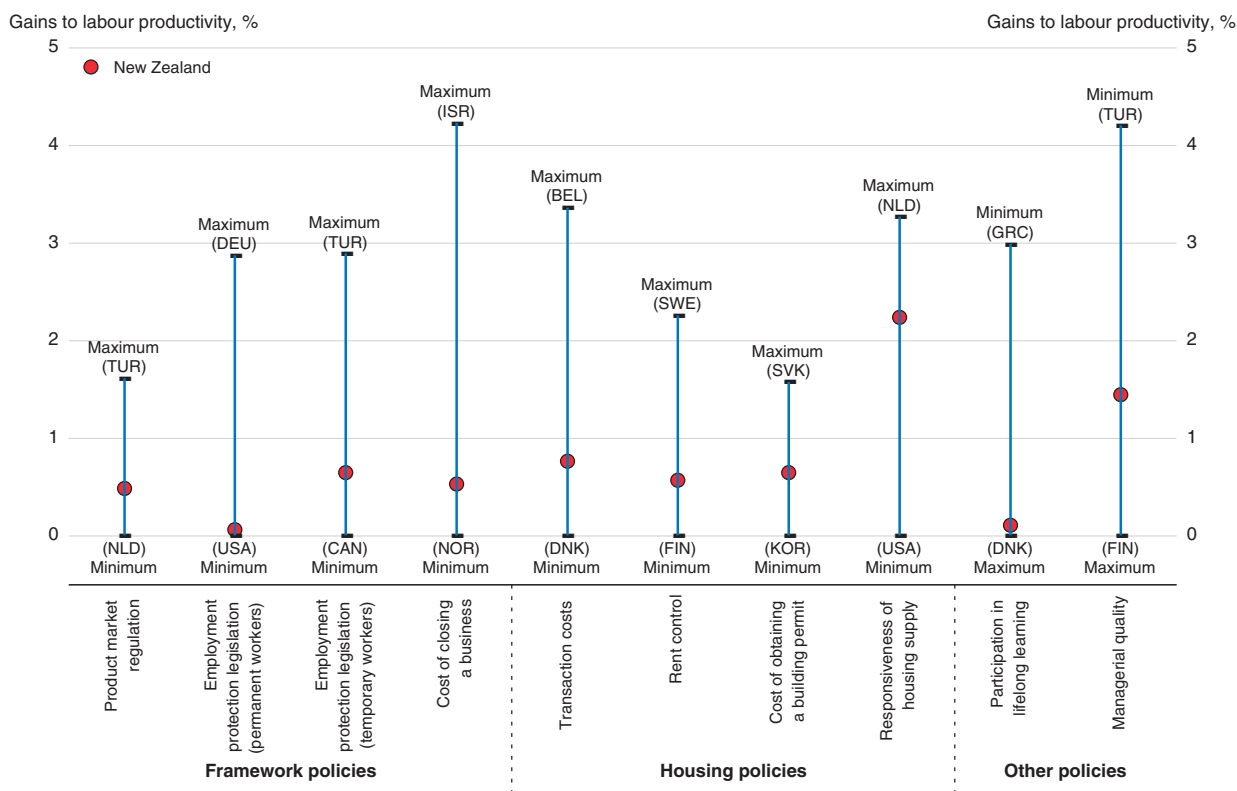
Source: Adalet McGowan, M. and D. Andrews (2017), "Skills Mismatch, Productivity and Policies in New Zealand: Evidence from PIAAC", OECD Economics Department Working Papers (forthcoming); OECD calculations based on the Survey of Adult Skills (PIAAC) (2012 and 2015).

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on a par with rates in the Nordic countries and higher than in many other OECD countries – concomitantly, only 0.18% of the workforce are displaced workers who have not been re-employed after two years.


Although small in proportion to the overall workforce, the effects of displacement may be significant for some households. Displaced workers and their families in New Zealand bear the bulk of costs of being laid off. Notice periods are short by international comparison, reducing costs for employers but giving displaced workers little time to find a new job while still employed. Only around one half of displaced workers in New Zealand receive redundancy pay, with an average payment equal to 34 weeks of wages (Dixon and Maré, 2013; OECD 2017b). This level and coverage of redundancy pay are comparable to those in other OECD countries but may lead to inequalities between workers as arrangements tend to be less favourable for low-skilled workers than for high-skilled workers. The biggest difference in comparison with most other countries is that there is no public unemployment insurance. Instead, New Zealand has a means-tested unemployment benefit, which few (30%) displaced workers receive because most have household incomes that are too high (usually because they have a working partner). For those who do qualify for the benefit, net replacement rates initially tend to be below the OECD average but are higher after long periods of unemployment, when the unemployed in most other countries are no longer eligible for insurance benefits and instead receive lower (means-tested) social assistance benefits; for example, for a single-earner couple with two children previously earning the average wage the net replacement rate in New Zealand is 58% compared with an OECD average that is initially 69% but falls to 55% for the long-term unemployed (OECD Tax-Benefit model). Moreover, the authorities generally do not assist displaced workers to find a new job unless

Figure 35. **Estimated gains to labour productivity from adopting best-practice policies to reduce skills mismatch¹**



1. The red circle is the probability to have mismatch evaluated at the level of the policy in New Zealand and individual characteristics, which include age, marital and migrant status, gender, level of education, firm size, contract type, a dummy for working full-time and working in the private sector. The distance between the minimum/maximum and the red circle is the change in the probability of skills mismatch associated with the respective policy change. Estimates are based on logit regressions of probability of mismatch controlling for age, marital and migrant status, gender, level of education, firm size, contract type, a dummy for working full-time and working in the private sector and OLS regressions of labour productivity on skills mismatch.

Source: Adalet McGowan, M. and D. Andrews (2017), "Skills Mismatch, Productivity and Policies in New Zealand: Evidence from PIAAC", OECD Economics Department Working Papers (forthcoming); OECD calculations based on the Survey of Adult Skills (PIAAC) (2012 and 2015).

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they are eligible for social welfare benefits. With the exception of redundancy pay arrangements, which are comparable to those in other countries, all of these factors contribute to displaced workers incurring larger earnings losses when re-employed than in most other countries (OECD, 2017b). These factors may also contribute to the poor job matching observed in the labour market despite flexible labour market regulations, which improve matching.

A solution to reduce the burden on displaced workers would be to introduce public unemployment insurance, as in all other OECD countries except Australia and Mexico (excluding Mexico city, which has unemployment insurance), and expand the coverage of active labour market policies to those qualifying for unemployment insurance benefits to help this group to transition quickly to good (well-matched) new jobs. In most cases, this would just entail expanding the coverage of public employment services, such as enforcing job-search obligations, counselling and providing labour exchanges. In some cases, where individuals have greater difficulty finding a new job, it might entail active labour market programmes, such as training schemes or short-term employment subsidies. Such

arrangements would help displaced workers search for better job matches than currently, both by giving them the wherewithal to prolong search to find a better job and providing them with services that facilitate job search and, where necessary, enhance their skills and employability, thereby reducing their earnings losses in re-employment. They would also preserve the advantages of flexible labour market regulations. As in other countries, unemployment insurance entitlements (to income-related benefits) would only be for a limited period for people with the necessary contributions record, after which time the unemployed would fall back on the current means-tested benefit. Careful study would be required before embarking on such a reform to ensure that its design enhances social well-being. Ideally, unemployment insurance should be experience rated, so that it does not subsidise employers and industries with high lay-off rates at the expense of others.

If a public unemployment insurance scheme cannot be introduced in New Zealand, the next best solution to ease the financial burden on displaced workers and help them to transition to better jobs would be to introduce a minimum statutory notice period and mandatory notification of redundancies, as recommended in OECD (2017b). These reforms would reduce the loss of earnings for displaced workers and give them more time to search for a job while still in work, when they can benefit more from their professional network and avoid the stigma sometimes associated with unemployment. Work and Income, New Zealand's public employment service, would also have more time to organise support. At the same time, Work and Income's objectives could be expanded to include helping displaced workers not eligible for welfare benefits transition to a new job; under the current investment approach, Work and Income has no incentive to help such workers find a new job as this does not reduce benefit expenditures. The major drawback of mandatory notice periods is that they could reduce labour market turnover, which would adversely affect skill matching in the labour market. Careful study would be required before embarking on such a reform to ensure that it delivers more benefits than costs. Improving careers advice and training guidance for adult workers, which is limited, and recognition of skills acquired on the job would also improve job-to-job transitions.

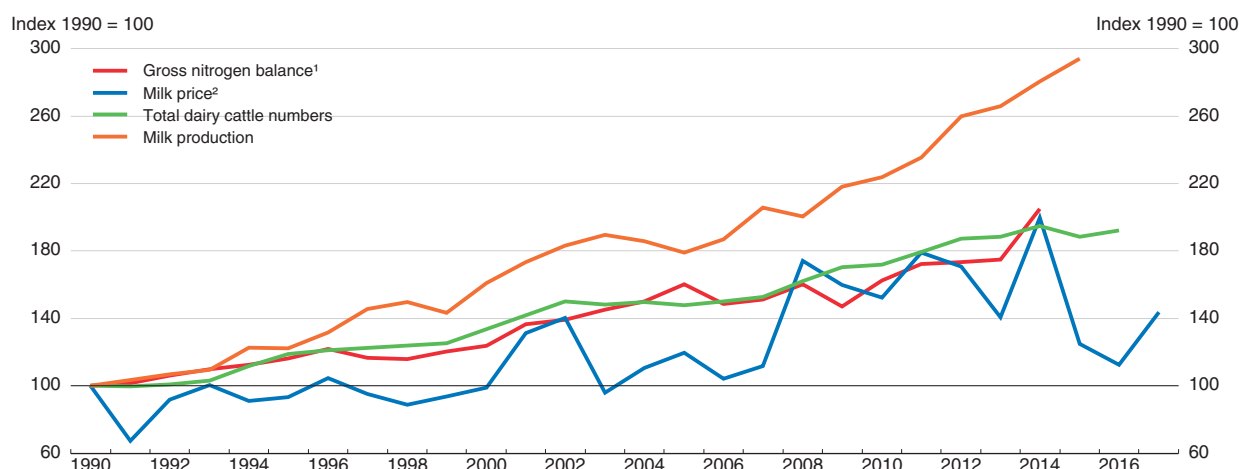
Making growth more environmentally sustainable

Economic and population growth has led to environmental degradation and will continue to do so in the absence of policy development that systematically integrates environmental objectives and strong policy measures to protect the environment. Expansion of primary production, in particular dairy farming, has increased freshwater contamination, greenhouse gas emissions and threats to biodiversity. Initiatives that drive large increases in production, such as the goal to double real primary industry exports between 2012 and 2025 and government grants and concessional financing for irrigation projects, are potentially in conflict with the need to maintain and improve the quality of the environment. To decouple growth in primary production from natural resource depletion, it will be important to ensure environmental limits are clear, to make producers pay for the environmental damage they cause and for New Zealand to continue to lead international research efforts to find solutions that mitigate greenhouse gas emissions and water pollution from agriculture. Currently nearly 10% of government research spending targets environmental research, the highest share in the OECD (OECD, 2017c). High rates of population growth are also placing pressure on the environment, particularly in urban areas where additional sewerage and storm-water infrastructure is needed to reduce overflows of untreated water into watercourses and harbours.

Addressing water quality and quantity challenges

As discussed in past *Surveys*, New Zealand faces increasing water-quality challenges from diffuse sources of pollution. The biggest problems relate to nutrients, pathogens and sediments (OECD, 2017c). The Resource Management Act has not been effective at dealing with diffuse-source pollution: the increase in the nitrogen balance per hectare was the worst in the OECD over the two decades to 2014 (OECD, 2017d) primarily due to expansion of intensive dairy farming (Figure 36). While New Zealand has an abundance of fresh water overall, water scarcity is an increasing concern in key agricultural areas. Water is not always consumed, or available, in its highest value use (economic, social and environmental) primarily due to over-allocation in some regions, a “first-in, first-served” approach to issuing resource consents for water abstractions and preferences for renewal of existing water resource consents.

Figure 36. Growth of nitrogen balances and milk production in New Zealand



1. Kg of nitrogen per hectare of total agricultural land. The gross nitrogen balance calculates the difference between the nitrogen inputs entering a farming system (i.e. mainly livestock manure and fertilisers) and the nitrogen outputs leaving the system (i.e. the uptake of nitrogen for crop and pasture production).
2. Producer price at farm gate. Data refer to the year ending in May. From 2015, the OECD series is extended based on the Fonterra farm-gate milk price.

Source: OECD/Eurostat Agri-Environmental Indicators Database; OECD Aglink Database, www.agri-outlook.org; Statistics New Zealand; UK-Milk Development Council – LTO NEDERLAND.

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The National Policy Statement on Freshwater Management is an important instrument to address water-quality and -quantity challenges. It requires that overall freshwater quality within a region be maintained or improved, existing over-allocation phased out and further over-allocation avoided. The Clean Water Package 2017 builds on the National Policy Statement by proposing a target that 90% of rivers and lakes be swimmable by 2040, stock be excluded from waterways by 2030 and the creation of NZD 100 million freshwater improvement fund. Regional councils are likely to need additional support to manage water within ambitious quality and quantity limits and to implement effective collaborative governance (OECD, 2017c). As recommended in past *Surveys* (Table 13) and the recent *OECD Environmental Performance Review of New Zealand* (OECD, 2017c), the use of economic instruments such as pricing and permit trading should be expanded (subject to resolving iwi/Māori rights), as that is the most efficient way to ensure that scarce resources are allocated

Table 13. **Past OECD recommendations on making growth more environmentally sustainable**

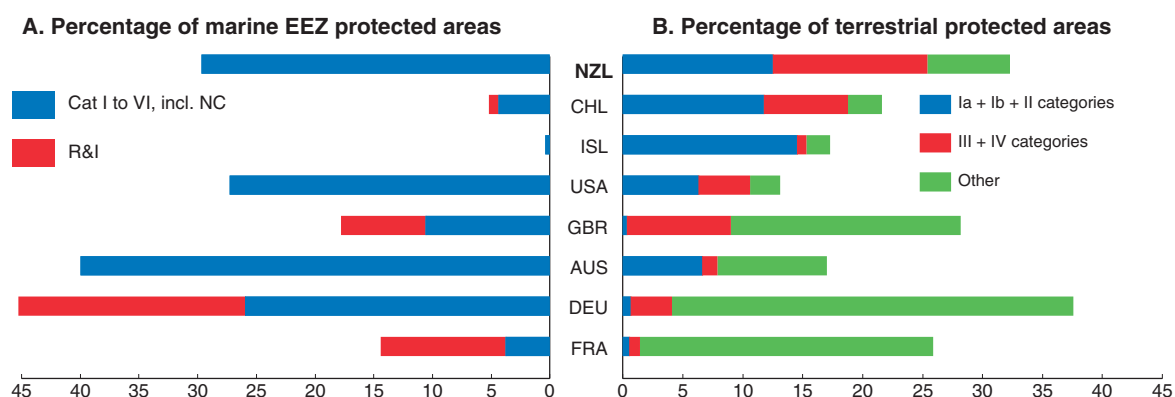
Recommendations in previous <i>Surveys</i>	Action taken since previous <i>Survey</i> (June 2015)
Improve the measurement of water abstraction and quality via evolving national guidelines. Continue to encourage the development of market-based mechanisms where possible to manage the supply and quality of fresh water. Allow water consents to be tradable.	The National Policy Statement on Freshwater Management directs all regional councils to set objectives for, limits on, and introduce methods to achieve desired water quality and quantity outcomes in all water bodies by 2025 or 2030 at the latest. Under the Policy Statement, Councils are required to identify methods to encourage efficient use of water. The introduction of new national water metering regulations also ensured the measurement and reporting of significant water consumption.
Improve horizontal and vertical co-ordination of sustainable development policy. Central government should set national environmental standards and provide national policy statements and technical training for local authorities.	Collaboration across government agencies has improved through the work of the Natural Resources Sector but there remains a lack of institutional coordination on aquaculture, fisheries, marine biodiversity and urban development.
Strengthen price signals within the Emissions Trading Scheme by phasing out transitional arrangements that halve the number of emission permits (and hence their price) needed by emitters and allow free allocations to emissions-intensive, trade-exposed activities.	The one-for-two arrangement is being gradually phased out.
Develop a strategy to cut agricultural emissions of greenhouse gases efficiently through a combination of pricing, regulation and R&D.	The third review of the Emissions Trading Scheme, launched in 2015, did not consider bringing biological emissions back within the scheme. In September 2016 the government announced the establishment of the Biological Emissions Reference Group to study the matter. The government has commissioned a study from the Productivity Commission on how New Zealand can maximise the opportunities and minimise the costs and risks of transitioning to a lower carbon economy. The report is due by June 2018.

to their highest value use. Economic instruments are commonly used internationally to relieve water shortages, but can also address water quality issues through pollution charges or by capping discharges of pollutants in a catchment (i.e. watershed) and allowing trade in discharge permits, as in the Lake Taupo Nitrogen Market. Different catchments are likely to need to take different approaches in the use of economic instruments to address water issues, depending on their size and other characteristics.

Addressing threats to biodiversity

New Zealand has a unique wealth of biodiversity, with one of the world's highest rates of endemic flora and fauna species. It also has one of the world's largest shares of threatened species, accounting for about a quarter of native mammals, a third of birds, fish and reptiles, and 60% of amphibians (OECD, 2016c). Almost three-quarters of its native freshwater fish species are classified as at risk or threatened with extinction (Goodman et al., 2014). The main threats to biodiversity are biological invasion (predators, weeds, pests and diseases), reduced habitat and pollution. Deteriorating water quality is a particular threat to freshwater biodiversity, with reduced invertebrate-species richness concentrated in farming regions where there have been increases in nitrogen pollution (Larned et al., 2016).

New Zealand is a global leader in species-recovery programmes and pest-control methods such as the Predator Free New Zealand 2050 initiative; efforts for species recovery have increased significantly since 2000. Terrestrial protected areas covered almost one-third of New Zealand's land area in 2016, and it has the highest share of strictly managed terrestrial protected areas in the OECD (Figure 37). The network of marine areas under some form of protection has expanded over the last decade to cover about 30% of New Zealand's marine area. However, many ecosystem types are represented in the marine protected area only to a limited extent (Brown, 2015). Subject to analysis of economic, social and

Figure 37. **Marine and terrestrial protected areas, selected OECD countries**¹

1. Countries are ranked by terrestrial area protected in IUCN categories Ia to IV, where Ia = strict nature reserve; Ib = wilderness area; II = national park; III = natural monument or feature; IV = habitat/species management area. The item "other" covers category V (protected landscape/seascape), VI (protected area with sustainable use of natural resources), NC (no IUCN category) and R&I (area additionally protected under regional or international designations).

Source: OECD (2016), "Indicators on Terrestrial and Marine Protected Areas: Methodology and First Results", Working Party on Environmental Information, ENV/EPOC/WPEI(2016)2.

StatLink  <http://dx.doi.org/10.1787/888933497477>

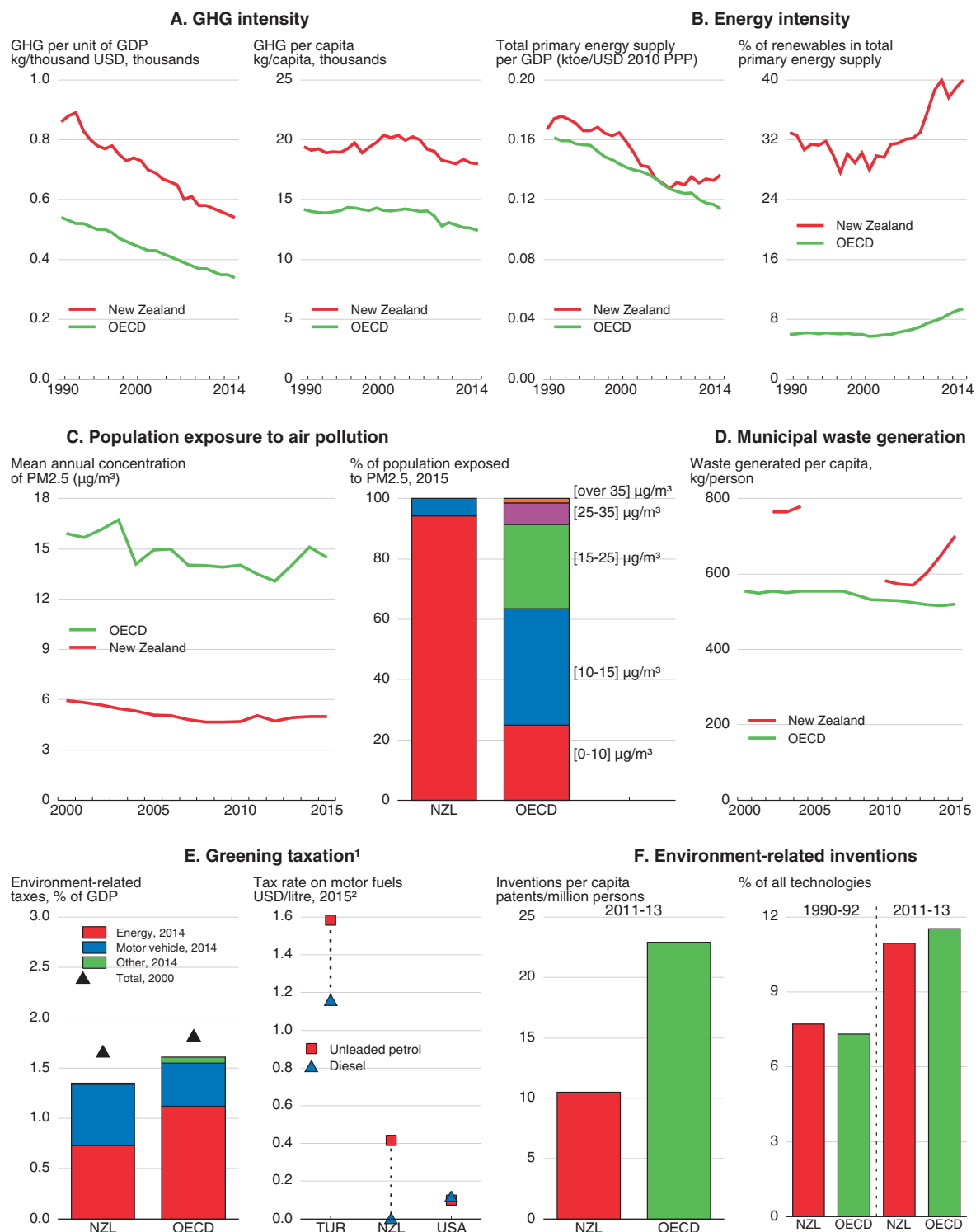
environmental tradeoffs, the network of marine areas should be expanded to represent more ecosystem types, and water-quality issues need to be addressed (as discussed above) to address threats to freshwater biodiversity. Developing a National Policy Statement on biodiversity, which is underway, is now a priority (OECD, 2017c).

Reducing greenhouse gas emissions

Greenhouse gas emissions continue to rise, with agriculture, road transport and industry being the main sources. While emissions have grown more slowly than the economy and the GDP, New Zealand's gross greenhouse gas emissions per capita and per unit of GDP remain among the five highest in the OECD (Figure 38, Panel A). New Zealand pledged to reduce its greenhouse gas emissions by 30% below the 2005 level by 2030 (equivalent to 11% below 1990 levels) at the 2015 Paris climate conference and ratified the Paris Agreement in October 2016. Reducing emissions is challenging, because half are from agriculture, where there are few inexpensive abatement options, and 80% of electricity generation is already from renewable sources.

The New Zealand Emissions Trading Scheme, which is the cornerstone of the country's climate change mitigation policy, has not been very effective because carbon prices have been very low and coverage limited (Leining and Kerr, 2016). Despite rising emission allowance prices since mid-2015, the carbon price component of energy prices remains negligible, well below a conservative estimate of the social cost of carbon (EUR 30 tCO₂) and too low to influence behaviour (OECD, 2016g; Royal Society of New Zealand, 2016). Biological emissions from agriculture have been indefinitely excluded. The Emissions Trading Scheme should be reformed to ensure a carbon price consistent with New Zealand's intended transition to a low-carbon economy, and a date for the inclusion of biological emissions from farming should be announced or alternative pricing and regulatory measures taken to enforce emissions reductions (OECD, 2017c). These measures should be complemented by the introduction of fuel efficiency and emissions standards for imported vehicles to terminate the importation of old, fuel-inefficient vehicles. Better urban planning, including

Figure 38. Environmental indicators



1. Includes taxes at both central and lower levels of government.

2. 2014 for the United States.

Source: OECD (2017), OECD Environment Statistics Database (Green Growth Indicators: Exposure to Air Pollution, Patents: Technology Development, Municipal Waste); OECD National Accounts Database; IEA (2017), IEA World Energy Statistics and Balances database; IEA Energy Prices and Taxes database.

StatLink <http://dx.doi.org/10.1787/888933497485>

by coping more systematically with increases in energy consumption from urban expansion, and a shift in the share of land transport subsidies from roads (currently 90%) towards public transport and infrastructure for cycling and walking would also help.

Another way of ensuring appropriate incentives to protect against environmental degradation is to green the tax system (i.e., tax polluting activities more). New Zealand has room for improvement in this domain: environment-related taxes have fallen more since 2000 as a share of GDP than in the rest of the OECD (Panel E), though this excludes the Emissions Trading System, which functions like a tax. For example, the lack of a tax on the use of diesel in urban areas beyond the cost of road use implies distorted incentives to avoid emitting fine particles and nitrogen oxides (NO_x), causing local air pollution.

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ANNEX

Progress in structural reform

This Annex reviews actions taken on recommendations from previous Surveys that are not covered in tables within the main body of the Assessment and Recommendations. Recommendations that are new in this Survey are listed at the end of the relevant chapter.

Product market competition

Recommendations	Action taken since previous <i>Survey</i> (June 2015)
Abolish the government's "Kiwi share" in Telecom, which is used to impose foreign-ownership restrictions, coverage obligations, price caps for certain residential services and a "free local calling" rental option. Make coverage obligations contestable by other telecommunications companies and technologically neutral.	The Kiwi Share was abolished following Telecom's 2011 split into two companies: Spark and Chorus. The government continues to hold a small number of shares in Chorus for similar regulatory reasons to the Kiwi share. Foreign-ownership restrictions remain, as do coverage obligations (under the Telecommunications Service Obligation).
To promote a high-performance ICT infrastructure, clarify the competition policy framework for the broadband market, and adjust regulations to ensure consistent pricing strategies for copper and fibre networks.	The regulatory review referred to in the previous <i>Survey</i> is continuing, with several consultation phases completed.
Review air service agreements to ensure capacity limits are not restricting trade growth, especially with Asian countries where limits have been reached.	The government seeks open-skies agreements with no limits on routes and capacity and is not aware of any specific cases where an airline is looking to offer services to New Zealand but is unable to do so owing to restrictions in New Zealand's air service agreements.

Housing markets

Recommendations	Action taken since previous <i>Survey</i> (June 2015)
Treat KiwiSaver withdrawals for first-home purchases as interest-bearing loans, or limit them to low-income members.	No action taken.
Raise the supply of social housing for low-income households. Increase targeted housing subsidies for low-income households that are not in social housing.	The Social Housing Reform Programme, which seeks to increase the supply of social housing, was subject to review in 2015, leading to a number of changes in its implementation. The Ministry of Social Development became the lead agency, an investment approach to social housing was adopted, a broader range of financial assistance and support services was introduced, and more flexible funding arrangements were implemented to provide needed social housing faster. The Government announced that it aims to increase the number of social houses from 66 000 in 2017 to 72 000 by mid-2020. Budget 2017 changes include increases to the Accommodation Supplement, which is a partial rent subsidy paid to low-to-middle income people.
Begin regular tenancy re-assessments for all occupants of social housing, accompanied by increased efforts to help tenants achieve financial independence and self-sufficiency.	All current and future tenants can have their eligibility reviewed. The Ministry of Social Development prioritises reviewing eligibility for social housing for tenants paying market rents, or within NZD 50 of market rents, and for larger social housing properties (4+ bedrooms) or social housing properties that are underutilised. There are currently 3 000 reviews undertaken per year.
Evaluate whether state housing tenants requiring more permanent housing provision, such as the elderly and disabled, may benefit from placement in specialised long-term housing facilities better adapted to their needs.	The Social Housing Reform Programme is driving a shift towards a diverse market with a broad range of providers that can provide more targeted services to support better outcomes for particular groups. The government has also funded registered charities that provide supported housing options for older people. Some local authorities are also active in the provision of pensioner housing.
Remove water rate subsidies to tenants paying market rents.	Some social housing tenants are charged for water usage, depending on the region of New Zealand they live in and the social housing provider they are renting from. The decision to charge tenants for their water usage is made by the social housing provider. Housing New Zealand Corporation (the government provider of social housing) currently absorbs the costs of all water charges.

Labour markets

Recommendations	Action taken since previous <i>Survey</i> (June 2015)
Draw lessons from the Canterbury Skills and Employment Hub (a labour-market matching scheme), trial it elsewhere, and, with good results, roll it out country-wide.	In April 2016, following lessons learned from the Canterbury Skills and Employment Hub, a front-loaded labour market test – whereby an employer must first engage with the Ministry of Social Development to see whether a suitable or trainable beneficiary client is available to fill the vacancy before engaging with Immigration New Zealand – was rolled out across the country.
More frequently update immigration skills shortage categories to reduce labour market bottlenecks.	Work is underway to review the process for determining skills shortages in the NZ economy. The government will examine how they may be better defined and how that information can be more effectively employed across the economy and skills system, with the aim of incentivising the employment of New Zealanders and informing their skills development, while still ensuring that sectors and regions facing genuine shortages can access the workers they need.

Skills development

Recommendations	Action taken since previous <i>Survey</i> (June 2015)
Devolve funding for a greater share of overall school costs, including teacher pay, providing schools with more flexibility to allocate resources and boost performance.	A broad review of education system funding is underway, examining how the funding system can best support student progress and equitable student outcomes. A proposal to devolve greater flexibility to schools to allocate resources was considered but was not adopted after sector engagement.
Carefully promote quality-improving school competition and innovation, curbing any tendency toward school segregation by imposing strong social service obligations in exchange for government support, with objective evaluation of pilot projects in this sphere.	Publicly available information on student achievement and school performance has been improved. The Teacher-Led Innovation Fund provides grants to teachers to develop innovative practices that improve learning outcomes.
Foster teaching quality by improving teacher training and professional development, especially as to diverse student needs, bolstering school leaders' capacity via selective hiring and training, and tying salaries and career paths to performance rather than merely seniority.	A range of initiatives focused on lifting teaching effectiveness has been introduced or is in development. These include changes to initial teacher education and professional learning and development; the reform of the teacher professional body; and Investing in Educational Success, which supports teacher collaboration, expands career pathways for expert teachers and provides additional allowances for principals in high-needs schools.
Continue to strengthen existing measures to help school boards, principals and teachers to use student achievement data to ensure that all students are performing well.	As part of the development of a Community of Learning Kāhui Ako, members examine their data, identify factors affecting achievement and agree achievement challenges to work on. New leadership and teaching roles within Communities of Learning, and resourcing for collaboration time, provide support for effective data use. Changes to centrally funded professional learning, in place from the start of 2017, include a greater focus on supporting schools in using their data and evidence to identify focus areas and assess impacts.
Collaborate with Australian tax authorities to enforce the same repayment obligations of NZ student debt-holders working there as those who remain at home.	An agreement on an information-sharing arrangement between Australian and NZ authorities for the recovery of student loans came into operation in 2016.

Taxation

Recommendations	Action taken since previous <i>Survey</i> (June 2015)
Eliminate the double-taxation of trans-Tasman profits distributed to shareholders by continuing to work towards agreement with Australia on mutual recognition of imputation and franking credits for foreign investment.	No action taken.
Consider limiting KiwiSaver tax credits to low-income members. Extend automatic enrolment to all existing employees. Change the investment strategy for default funds to a life-cycle approach that is adapted to the member's age.	No action taken.

Green growth

Recommendations	Action taken since previous <i>Survey</i> (June 2015)
Investigate and promote innovations (e.g. smart metering, pastoral emissions mitigation technology) proven to enhance responsiveness to ETS price signals.	The work programme exploring complementary measures, in addition to the ETS, to promote long-term emissions reductions is proceeding.
Monitor the implementation of the 2014 National Policy Statement for Freshwater Management in regional plans to ensure water quality meets agreed goals. Provide clearer technical guidance for regional councils.	The National Policy Statement for Freshwater Management has been implemented in two regional councils and is progressively being implemented in others. As detailed in the OECD's 2017 Environmental Performance Review, regional councils are likely to need additional support to manage water within ambitious quality and quantity limits and to implement effective collaborative governance.

Inclusiveness

Recommendations	Action taken since previous <i>Survey</i> (June 2015)
Complement the recent welfare reform by following people going off benefit, as planned, to ensure satisfactory outcomes. Strengthen the focus of social spending on lifting the long-term outcomes of the disadvantaged, including by improving public-sector coordination.	Research has been undertaken on where people go when they move off benefit, including on people's characteristics and outcomes. Trials are underway to test approaches to improve employment and social outcomes for long-term unemployed people.
Review policy settings to strengthen the incentives for those on low incomes to work more than 20 hours a week, including benefit abatement rates and childcare costs.	From April 2016 a new higher rate (NZD 5 per hour) of childcare assistance was introduced for lower-income families, available for up to 50 hours per week for each child. Families with children aged three, four and five are eligible for a higher rate of assistance for the first 20 hours each week under the 20 Hours Early Childhood Education programme.
Increase welfare benefits for beneficiary households with children, and step-up job-search and activation investments, especially for those in social housing.	Families with children on benefits have received an additional NZD 25 per week since 1 April 2016. The 2017 budget increased Working for Families Family Tax Credit rates and accommodation assistance available to beneficiary households with children.