

Working Smarter: Driving Productivity Growth Through Skills

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Working Smarter: Driving Productivity Growth Through Skills

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Preface to this productivity series

New Zealand faces a big challenge to overcome its long-standing productivity shortfall

One of the biggest challenges facing New Zealand is its productivity shortfall relative to other OECD countries: New Zealand is currently ranked 22nd out of the 30 OECD countries in the productivity league table and an hour worked in New Zealand typically generates 30 per cent less output than an hour worked in Australia. Low productivity is not a new phenomenon: productivity has been an issue in New Zealand since at least the 1970's.

A focus on productivity is desirable not only so that New Zealand becomes more internationally competitive, but also because, in the long run, growth in incomes is fundamentally linked to output per worker. Growth in GDP per person rests on either encouraging a greater proportion of the population into work, or by improving the productivity with which each worker produces output. New Zealand has performed well in encouraging increased numbers of people into the labour market, but there is a limit to how much increased participation in the workforce can drive further growth. Productivity improvements must be at the heart of New Zealand's future economic growth.

This is one of a series of Treasury papers on productivity performance

This paper is part of the *Productivity Performance and Policy* series of papers that discuss New Zealand's long-term productivity performance and the factors that may be inhibiting New Zealand from reaching its potential. *Putting Productivity First* is the overview paper which sets out the productivity challenge facing New Zealand and highlights key issues across five drivers of productivity: enterprise, skills, innovation, investment, and natural resources. The next two papers, *New Zealand's Productivity Performance* and *Does Quality Matter in Labour Input? The Changing Pattern of Labour Composition in New Zealand*, discuss past and more recent productivity performance and the impact that improving labour quality has had on labour productivity respectively. The final four papers address the enterprise, innovation, investment and skills drivers in turn, building on the analysis in the preceding papers by reviewing and interpreting available evidence to draw conclusions for the underlying factors affecting productivity.

A number of factors are important for lifting productivity and there are no quick fixes. For some measures the impact may not be seen for decades. The supply and utilisation of skills in New Zealand, and the policies that underpin this are one important set of elements in lifting productivity performance.

Summary

Skills matter for productivity growth – more than ever

- How countries perform in developing and utilising skills is one important factor that helps to explain differences in countries' long-term productivity and growth performance. The macro-economic evidence about the importance of skills is increasing, and the effects are stronger than previously shown.

Skills and the other drivers of productivity are interdependent

- Higher skills increase individuals' productivity and the productivity of others they work with. Skills have a dynamic effect on productivity growth by increasing the capacity to innovate and apply new ideas. Skills can enhance the returns to capital investment, and increase firms' ability to adapt to new markets and competitive challenges.
- The impact of skills on productivity depends critically on the quality of an economy's institutions, and the effectiveness of firms in utilising the skills of their workforces. Increased skills have the greatest impact on productivity in open competitive and entrepreneurial economies with efficient labour markets and institutions.

Globalisation is increasing the importance of skills for growth

- Technological change and the increasing integration of the global economy are driving greater mobility of skilled labour, greater returns to skills, and ongoing economic structural change. In this context, overall skill levels and the opportunities to acquire skills and re-skill become increasingly important for both social and economic objectives.

We need to take a broad and long-term view of skills

- Specialised technical skills are important, but so too are the many "soft" skills such as communication, teamwork, creativity and problem solving. Attitudes and values matter as much as knowledge and technical skill.
- Skill development is a life-long, self-reinforcing process. It happens not only in formal education, but also in the home, the community and the workplace. Public policy approaches to skills and productivity must therefore take a broad view, and include a very long-term perspective.

Skills supply needs to respond to changing demand, and firms need to effectively utilise their workforces' skills

- The contribution of skills to productivity depends not only on the overall level of educational achievement, but on how the supply of skills is matched to changing demand (through labour market responses, responsive tertiary education and training systems, and migration) and on firms' ability to effectively utilise workforce skills.

NZ's skills performance: many areas of strength but room for improvement

- New Zealand has relatively good overall levels of skills and the trends are positive. We rate near the OECD average for qualifications in the adult population, and there are strong flows of skills into the workforce due to more skilled and qualified school

leavers, high participation in tertiary education (including industry training) and skilled immigrants.

- Wide disparities in achievement are evident at all ages and stages of education. Low skill levels are more concentrated in the growing Māori and Pacific communities. Too many young people leave school without a senior secondary qualification, and too few continue to participate in education and training after they leave school.
- High participation rates in tertiary education in the last 20 years are improving the qualifications profile of the workforce, but in recent years there has been no growth in degree-level graduates. The low foundation skills of a large minority in the current workforce are a barrier to upskilling and productivity growth.

Policy implications

A lot of work is already underway

A great deal of work is already underway across the public sector, in the business community and the wider community to improve New Zealanders' skills and the contribution of skills to productivity.

A productivity focus for future public policy should include:

This paper does not evaluate specific policies and programmes. Instead, it seeks to identify issues that will need continued emphasis in the ongoing development and implementation of public policy.

- targeted support for disadvantaged young children

- Sustained, targeted support for disadvantaged young children through early childhood education and other interventions to support child development can deliver significant long-term benefits in skills and productivity, as well as broader social benefits.

- maximising the quality of teaching in schools

- Children from disadvantaged home environments benefit most, and they should be the priority for future government investment in children's services. Their access to quality services may be compromised by broader demand pressures and supply constraints in the early childhood education sector.
- New Zealand's "tail" of underachievement in schooling can be addressed without compromising outcomes for high achievers.
 - Maximising children's experience of quality teaching is the critical factor. The most effective schooling systems focus on:
 - high quality teacher training and professional development;
 - effective systems to identify and respond to the needs of students at risk of falling behind;
 - supporting effective leadership and the development of learning organisations in schools; and
 - measurement, accountability and incentive systems that focus on student achievement.

- Challenges for schooling policy in New Zealand include:
 - focusing resources on effective programmes and building the capability needed to take them to scale; and
 - increasing flexibility and responsiveness to meet the needs of students who are falling behind.
- improving secondary school retention, achievement and post-school transitions
 - Increasing youth participation and achievement in education and training will have significant benefits for skills and productivity. Greater emphasis is needed on improving secondary school retention, school leavers' qualifications, and transitions into tertiary education and training.
 - Regulatory, funding and accountability arrangements should place more emphasis on the retention and achievement of those students who leave early and with poor qualifications;
 - More flexibility is needed in senior secondary schooling and post-school transitions to meet all young people's education needs.
- careful development of foundation skills programmes for low-skilled workers
 - Improving the foundation skills of low-skilled workers could deliver significant productivity gains, and merits the increasing activity now underway by government, firms and education providers in this area. An experimental and developmental approach is needed as the existing evidence of effective approaches to improve the basic skills of low-skilled adults is limited.
 - The basic architecture of New Zealand's tertiary education system is sound. Strategies in the sector include specific priorities to improve tertiary education's contribution to productivity.
 - The challenge remains in the implementation of policy tools to achieve these objectives. High quality information is needed to identify and respond to changes in employer and student demand, and to assess the quality of tertiary education programmes. Planning and resource allocation will need to adjust responsively to changing demands and priorities.
 - A productivity focus would see any increase in government tertiary education expenditure concentrated on ensuring broad access and improving the quality of provision. Increased subsidies for existing students and/or graduates are unlikely to contribute to productivity growth.
- high quality information, planning and resource allocation in the tertiary education sector
 - Support to accelerate settlement and integration of skilled migrants, both in employment and in the community, could increase the contribution of new migrants to productivity growth;
 - International students studying for higher qualifications are a major potential source of skills, of valuable international connections for knowledge transfer and market development. Efforts to maximise the potential benefits of international students' connections to New Zealand should be sustained and intensified.
- support for the integration of skilled immigrants, with international students as a target group
 - Support to accelerate settlement and integration of skilled migrants, both in employment and in the community, could increase the contribution of new migrants to productivity growth;
 - International students studying for higher qualifications are a major potential source of skills, of valuable international connections for knowledge transfer and market development. Efforts to maximise the potential benefits of international students' connections to New Zealand should be sustained and intensified.

- improving firms' utilisation
of skills through competition
and support

- Firms' ability to effectively develop and utilise their workforces' skills is critical for skills to contribute to productivity growth. Management capability is a crucial factor in this.
 - Fostering a dynamic and competitive enterprise environment is the most important contribution government can make.
 - Government can also help to create opportunities for firms, entrepreneurs and managers to learn from each other.

Taking a broad view of skills

In this paper, “skills” is used as shorthand for the range of characteristics, knowledge and abilities that determine people’s capacity to add value in economic activity. There are many alternative labels, such as “embodied human capital¹”, “competencies” or “capabilities”. The distinctive meanings of each term matter, but the important point here is that we need to take a broad view of skills.

The skills needed in a knowledge economy and in a healthy society are essentially the same

In a knowledge-based and globalising economy, distinctions between the skills needed for economic productivity and the broader benefits of education are largely false distinctions. The attributes of highly skilled and productive workers are essentially the same as those of confident, creative, culturally enriched good citizens.

Hierarchies in firms are becoming flatter, products and services are more customised, and employees at all levels need to act more autonomously. Innovation, creativity, entrepreneurship and initiative are required not only in the laboratory, design studio and boardroom but in all areas of a firm including the factory floor and the shop front. Entrepreneurs, managers, supervisors and “front-line” staff can all be involved in creating and applying new knowledge of value to firms. This includes creating or responding to new market opportunities, developing or adapting new technologies, or achieving efficiency gains in production processes.

The “soft” skills and attributes that enable good communication, problem solving, creativity, persistence and teamwork are critical aspects of the skills that matter for productivity growth.

Skill formation happens everywhere

The skills that contribute to productivity and economic growth are developed in many places. Formal education plays an important part, and is where governments have the most direct role and the most policy options. But the skill formation process begins with infancy (or sooner!), and parents, family and whanau, peers and communities play an important role. Both formal and informal on-the-job learning is critical to develop skills specific to the systems, routines and cultures of particular firms and professions.

¹ Human capital can be broadly defined as “the knowledge, skill, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being” (OECD, 2001)

How skills can drive productivity

Skills contribute to productivity in several ways

Skills applied in the workplace can increase productivity by:

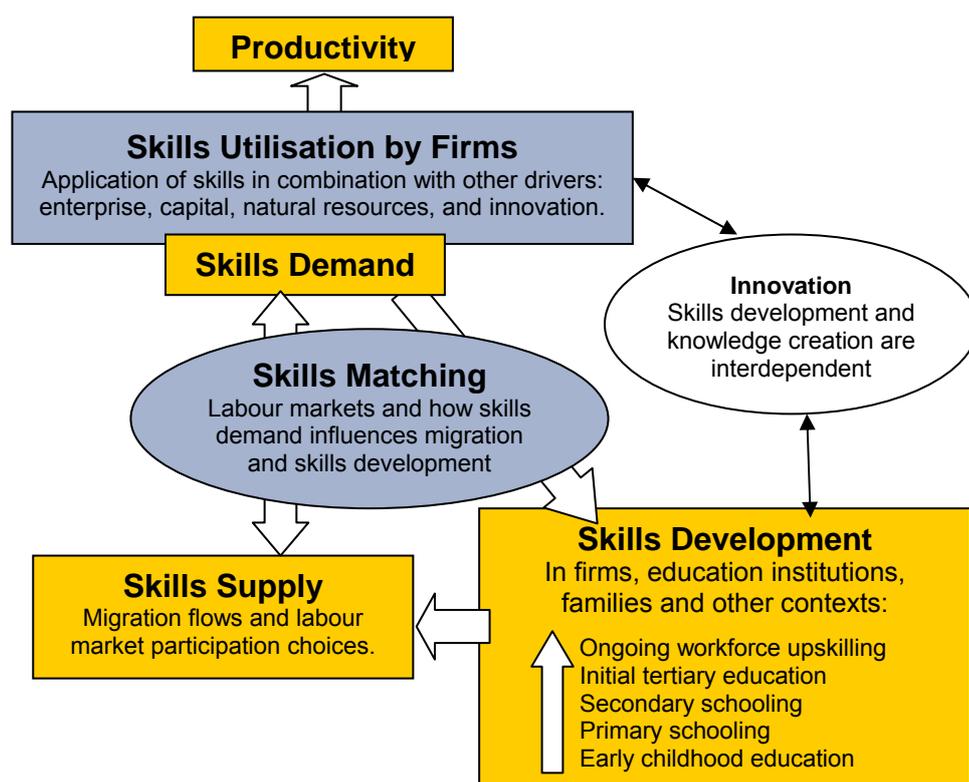
- directly increasing individuals' productivity, enabling them to achieve more with the resources and technology available;
- increasing the productivity of others they work with – enabling others to work more effectively with the resources and technology available;
- enabling firms to adapt more quickly – by integrating new technologies, or adjusting to new markets and new challenges;
- increasing people's capacity to *innovate* – creating, adopting and applying new ideas and technologies.

Productivity comes from the development, supply, matching and utilisation of skills

The key stages in the process through which skills policy can drive productivity are:

- **skills development** – the overall “domestic” supply of skills
- **skills supply** – the skills made available to the economy
- **skills demand and utilisation** – how firms behave in recruiting and deploying skills
- **skills matching** – the linkages between these three domains, including processes by which skills are redeployed to activities of higher value through the labour market, and how information on firms' skills needs feeds back into skill development and supply.

Figure 1: How skills contribute to productivity



Skills policy issues therefore span many areas of public policy, including: education; labour market and industry regulation; migration; tax policy; internationalisation; and social policy.

Some critical aspects of skills development, such as early childhood education and schooling, are long-term drivers where improvements will not impact on overall labour quality in the workforce for decades. Other aspects of skills policy can impact on productivity in the much shorter term – for example by boosting workforce participation of high skilled workers or increasing the efficiency of labour market matching of skills supply and demand.

Other papers in this productivity series connect skills with innovation and enterprise

This paper focuses on the “embodied human capital” or skills of individuals and how this can drive productivity. Other papers cover related issues:

Innovation and Productivity: Using Bright Ideas to Work Smarter looks in more depth at innovation as a driver of productivity growth, including the importance of the “disembodied human capital” of shared knowledge and technology, and the contribution of tertiary education institutions to New Zealand’s innovation system.

Enterprise and Productivity: Harnessing Competitive Forces includes a discussion of the importance of entrepreneurial and management skills.

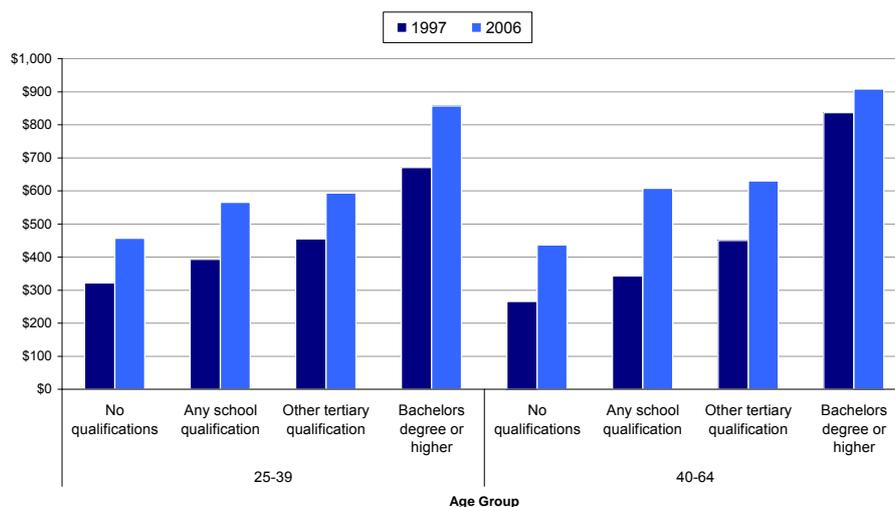
The evidence that skills matter for productivity growth is stronger than ever

Investment in skills has high individual and social rates of return

There is a large body of microeconomic evidence demonstrating the importance of skills in determining the economic success of individuals, and the value of education in raising skills. The private and social rates of return from education are high.

Differences in the incomes of people with different qualifications and work experience are the simplest indicator of this:

Figure 2: Median Weekly Income by Level of Qualification



Source: Statistics New Zealand, New Zealand Income Survey

Internal rates of return from education can be estimated from an individual’s perspective (counting the individual’s costs and foregone earnings during study, and their future income gains) and from a public perspective (incorporating costs of education subsidies, and the net effect on lifetime tax payments). OECD estimates of the average private and public internal rates of return from gaining a qualification in New Zealand are presented in the table below.

Table 1: Public and private internal rates of return to education

When enrolling directly after completing the previous level qualification	Upper secondary qualification		University degree	
	Males	Females	Males	Females
Private internal rate of return	14.1	14.9	9.3	12.9
Public internal rate of return	8.3	5.2	9.9	9.9

Source: *Education at a Glance 2007: OECD Indicators tables 9.5-9.8*

Some of the best evidence of high returns from investment in skills comes from studies that look at how changes in school leaving age laws have affected individuals’ incomes. These studies (for example, Oreopoulos, 2008) are valuable because they are effectively a “natural experiment” that can compare outcomes for similar individuals and groups who left school immediately before and after the introduction of a higher schooling leaving age. An extra year of schooling is found to increase lifetime income by approximately 10%.

Recent evidence shows that skills differences explain much of the difference in countries’ growth rates

Recent macroeconomic analysis is showing more clearly that differences in education and skills explain much of the international differences in long-term growth rates.

Many earlier studies of comparative growth rates suggested that human capital differences account for little if any of the differences in countries’ growth performance over time. These studies have generally used the average number of years spent at school as a

proxy measure for each country's human capital. The modest positive relationship between long-run growth and quantity of education shrinks or disappears once other variables such as fertility rates and proxies for institutional quality are added (for example, Krueger and Lindahl, 2001).

But the problems with using years of schooling as a measure of a country's level of skills are rather obvious. This approach:

- does not measure the actual skills of students;
- ignores differences in the *quality* of education (a year of schooling is assumed to have the same impact on skills in all countries, despite huge differences between education systems); and
- assumes, despite all the evidence to the contrary, that attending school is the only thing that contributes to people's skills.

Recent research is overcoming this problem by measuring differences in countries' skill levels more directly. By using data on countries' performance in various international education surveys, it is possible to test whether differences in directly measured abilities (such as reading, numeracy and scientific literacy) are important in predicting countries' long-term economic growth rates.

Hanushek and Wößman's (2007) paper "The Role of Education Quality in Economic Growth" found that a much larger proportion of the variance in GDP per capita between countries can be explained by differences in human capital:

- When educational *quality* (as measured by test results) is added to a simple model relating per-capita income growth and schooling, the amount of variation in economic growth explained by the model jumps from 0.25 to 0.73 (adjusted R²).
- The authors estimate that a standard deviation increase in test scores (relative to OECD) is associated with an annual average growth rate in GDP per capita that is two percentage points per year higher over a 40 year period;
- There is stronger evidence of a *causal* relationship – that higher skills contribute to higher economic growth, rather than other unobserved factors influencing both skills levels and growth rates or reverse causality (where increases in GDP enable higher expenditure on education not *vice versa*);

Improvements in skills at all levels of ability seem to matter. Increases in both the proportion of top achievers and the proportion with at least a minimal level of literacy and numeracy are correlated with higher economic growth rates.

Some research seeks to test the theory that advanced skills will matter most in economies that are near the technological frontier, while the general skill level of the broader workforce will matter more in economies where growth comes more from imitating and adapting technologies rather than from creating new technology.

Increases both in advanced and basic skills are related to growth

But distance from the technological frontier varies at a micro-level between sectors, between firms, and even between units within firms. It is not something that can be usefully measured on an economy-wide level. Each firm and sector will have a different optimal mix of the advanced skills needed for innovation, technical skills needed to copy and adapt technologies, and the general workforce skills needed to achieve efficient production.

We can't choose between developing a small community of elite "top talent" and providing a high quality education for all – we have to do both.

The contribution of skills to productivity is dependent on other productivity drivers

Hanushek and Wößman (2007) also present evidence that the effect of educational quality on economic growth is greater in countries that are more open to international trade, and countries where property rights are more secure.

This highlights the connectedness between skills and the other drivers of productivity discussed in this series of papers.

For investments in skills to deliver the greatest benefits for productivity growth, New Zealand's economy needs to encourage innovation and capital investment. Firms in open and competitive markets are more likely to utilise the available skills of their workforces to improve productivity.

Workers in flexible and efficient labour markets can more readily find information about employers' skills demands and new opportunities to work smarter and earn more.

Internationalisation and skills

The importance of international connections to productivity is a theme running through all of the papers in this productivity series and skills is no exception. Greater globalisation and technological change are driving three particular trends of relevance to skills: increasing mobility of skilled labour, increasing returns to skills, and ongoing economic structural change.

First, future flows of skilled labour are likely to increase. Skill levels are rapidly increasing in developing economies, enabling them to compete not only on the basis of low labour costs, but also in high-value, high skilled industries. Competition for skilled workers is likely to increase as ageing populations and declining birth rates in many OECD countries create skill shortages, and as opportunities for high-skilled employment in developing countries also increase. New Zealand already has one of highest levels of diaspora in the OECD and moderate levels of immigration. These migration flows are likely to increase as skilled New Zealanders pursue opportunities abroad and immigrants arrive.

Skills contribute more to growth in open economies with sound institutions.

Increasing competition for highly skilled people will lead to greater migration flows

Information and communication technologies are enabling international trade in sectors (especially services) that were previously not exposed to international competition. Coupled with political change and expansion of international trading systems, this has allowed huge numbers of people in developing countries to join the international marketplace as both workers and consumers². This creates new market opportunities and competitive challenges for workers and firms in New Zealand.

Returns to skills are increasing and people will need to continually upskill

Second, globalisation and the use of technology are increasing the returns to skills. This is more than simply the substitution of least-skilled human labour by technology. There continue to be limits to the degree to which technology can replace labour, especially in the rapidly growing lower-skilled services sector. As a result, many developed economies are seeing rising relative demand for well-paid skilled jobs and for low-paid least skilled jobs and falling relative demand for those jobs “in the middle”. This is because technology can substitute for human labour in (or can facilitate the outsourcing of it) jobs like craft manual jobs and book-keeping jobs that require precision and hence, were never the least-skilled jobs in the labour market. Maximising the opportunities for all people to develop their skills should be a priority from both a social equity and economic competitiveness.³

Firms and individuals need to adapt to structural changes and new markets

Third, we will see ongoing structural change in the economy, with some firms and sectors in New Zealand’s economy expanding as others decline. To integrate with global supply chains and develop new markets, firms will need to upskill their workforces in order to adapt their internal systems and processes, integrate new technologies, and enable effective communication and collaboration with people of other cultures and languages. Individuals will need to be more flexible and adaptable – learning new skills and able to move between firms and sectors. Managing the transition through structural change by enabling ongoing upskilling is, again, important for both social and economic objectives.

² Friedman (2005) estimates that between three and four billion people joined the global economy as the economies of Eastern Europe, Central Asia, China, India and Latin America opened up at the end of the 20th Century.

³ This interface of social and economic development is discussed in a recent joint paper of the UK Treasury, German Ministry of Finance and Swedish Ministry of Finance: Social Bridges II: The Importance of Human Capital for Growth and Inclusion (March 2008)

New Zealand's skills profile

Looking across all measures, New Zealand's skills levels are good and improving. This should lead to an increase in measured labour quality in the workforce and boost labour productivity.

On average, and for top talent, New Zealand compares well and trends are positive.

Our students have, on average, very high levels of achievement at age 15, and the percentage of students achieving at the highest level at this age near the top of the OECD. This offers the prospect of very high quality flows of skilled young workers into New Zealand's future workforce.

But problems include relatively poor skills in the growing Māori and Pacific communities, and low youth participation rates.

This prospect is clouded, however, by some particular areas of poor performance. First, our high average achievement levels mask a relatively large "tail" of low achievement in which our growing Māori and Pasifika communities are over-represented. Second, we have a very low rate of retention of youth in education – despite improvements, a large proportion of students still leave school without senior secondary school qualifications, and participation in education by those aged 15-19 is amongst the lowest in the OECD.

High tertiary education participation has lifted workforce skills, but many workers still have low foundation skills.

Within the current working-age population, participation in education and training, including formal on-the-job training, is high. Increases in tertiary education over the last 20 years are changing the structure and composition of the adult workforce, but we are still only around the average in the OECD for adult qualifications. A large minority of the current workforce has low foundation skills that are an impediment to further skills development and productivity growth. Recent growth in tertiary education has been concentrated in sub-degree level qualifications, and a rebalancing of participation towards younger students and higher level qualifications study would likely deliver greater productivity gains in the long term.

New Zealand's 15 year-olds perform well by international standards:

High average achievement in school, but wide disparities

The OECD's Progress in International Student Achievement (PISA) study measures 15-year olds' achievement in reading, mathematics and scientific literacy in 57 countries.

on average...

- New Zealand students' *average* score is near the top of the OECD in all three subject areas – only three OECD countries do significantly better in mathematics, only two do better in reading, and only one does better in science;

and for top achievers...

- New Zealand has amongst the highest proportion of students achieving at the *highest* levels measured in PISA. For example, in 2006, New Zealand had nearly twice the OECD's average percentage scoring in the top levels (Levels 6&7) in science literacy.

but ethnic and socio-economic disparities are large.

- Ethnic disparities are significant. In PISA 2006, the OECD average score in reading was 492. New Zealand, average reading scores were: 542 for Pākehā-European students; 528 for Asians; 477 for Māori; and 461 for Pacific students.
- New Zealand has one of the largest spreads of student achievement, and achievement is more closely correlated with students' socio-economic status than in many OECD countries.

Table 2: Reading, maths and science achievement at age 15

Mean achievement of 15 year-olds in the 2006 PISA study: OECD countries

	Country mean is statistically significantly above New Zealand's
	Country mean is not statistically significantly different from New Zealand's
	Country mean is statistically significantly below New Zealand

Reading		Mathematics		Science		% achieving level 6 or 7 on a 7-point scale	
	Mean		Mean		Mean		
	Korea	556	Finland	548	Finland	563	20.9
	Finland	547	Korea	547	Canada	534	14.4
	Canada	527	Netherlands	531	Japan	531	15.1
	New Zealand	521	Switzerland	530	New Zealand	530	17.6
	Ireland	517	Canada	527	Australia	527	14.6
	Australia	513	Japan	523	Netherlands	525	13.1
	Poland	508	New Zealand	522	Korea	522	10.3
	Sweden	507	Belgium	520	Germany	516	11.8
	Netherlands	507	Australia	520	United Kingdom	515	13.7
	Belgium	501	Denmark	513	Czech Republic	513	11.6
	Switzerland	499	Czech Republic	510	Switzerland	512	10.5
	Japan	498	Iceland	506	Austria	511	10.0
	United Kingdom	495	Austria	505	Belgium	510	10.1
	Germany	495	Germany	504	Ireland	508	9.4
	Denmark	494	Sweden	502	Hungary	504	6.9
	Austria	490	Ireland	501	Sweden	503	7.9
	France	488	France	496	Poland	498	6.8
	Iceland	484	United Kingdom	495	Denmark	496	6.8
	Norway	484	Poland	495	France	495	8.0
	Czech Republic	483	Slovak Republic	492	Iceland	491	6.3
	Hungary	482	Hungary	491	United States	489	9.1
	Luxembourg	479	Luxembourg	490	Slovak Republic	488	5.8
	Portugal	472	Norway	490	Spain	488	4.9
	Italy	469	Spain	480	Norway	487	6.1
	Slovak Republic	466	United States	474	Luxembourg	486	5.9
	Spain	461	Portugal	466	Italy	475	4.6
	Greece	460	Italy	462	Portugal	474	3.1
	Turkey	447	Greece	459	Greece	473	3.4
	Mexico	410	Turkey	424	Turkey	424	0.9
	United States	m**	Mexico	406	Mexico	410	0.3
	OECD total	484	OECD total	484	OECD total	491	8.7
	OECD average	492	OECD average	498	OECD average	500	9.0

* Percentage of students scoring 6 or 7 on the 7-point science achievement scale.

** USA reading data not suitable for valid comparisons.

The wide variance in achievement, and disparities linked to ethnicity and socio-economic status, appear in the earliest assessments of primary school pupils and persist thereafter.

Significant improvements in achievement have been observed in Year 5 students' achievement in mathematics. New Zealand children's achievement is near the average for the OECD countries that participated in the Trends in International Mathematics and Science Study (1994, 1998 and 2002). Over this period, New Zealand students' performance improved significantly across the board, with the biggest improvements for the bottom quartile.

School leavers' qualifications are improving

More students are gaining school qualifications

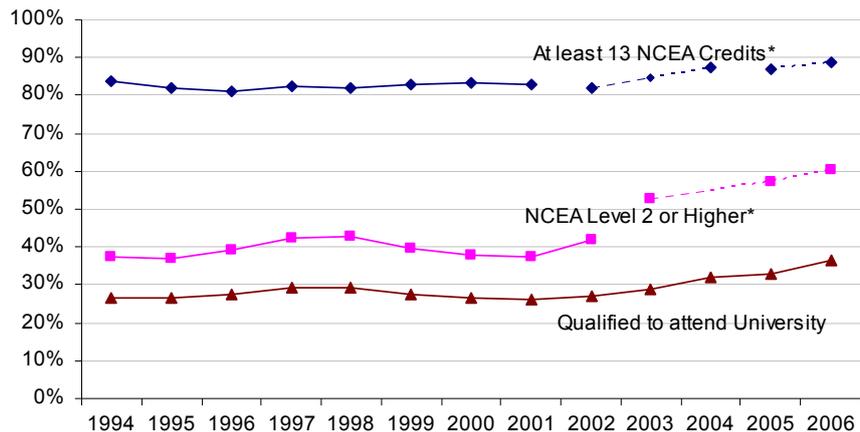
Recent year-on-year increases in school leaver qualifications after many years without improvement reflect the more flexible, standards-based design of the New Zealand Certificate of Educational Achievement (NCEA). Achievement, as measured by qualifications of all levels, has increased across all school deciles and for all ethnic groups.

but disparities persist and too many still leave without qualifications

But again, disparities in qualifications rates are of concern: by gender (favouring girls), by ethnicity and by socio-economic status. To the extent that comparisons between different qualifications systems and societies are possible, these gaps appear wider in New Zealand.

Figures 3, 4 and 5 illustrate the overall trend in qualifications and the disparities between ethnic groups.

Figure 3: Percentage of school leavers gaining qualifications



Series breaks: * To 2001, no qual or <12 National Cert credits. 2002-04: 13 NCEA L1 credits. From 2005, 13 credits any level. **Before 2003, completing 6th Form Cert. After 2003, NCEA Level 2.

Figure 4: School leavers with at least NCEA Level 2, by ethnicity

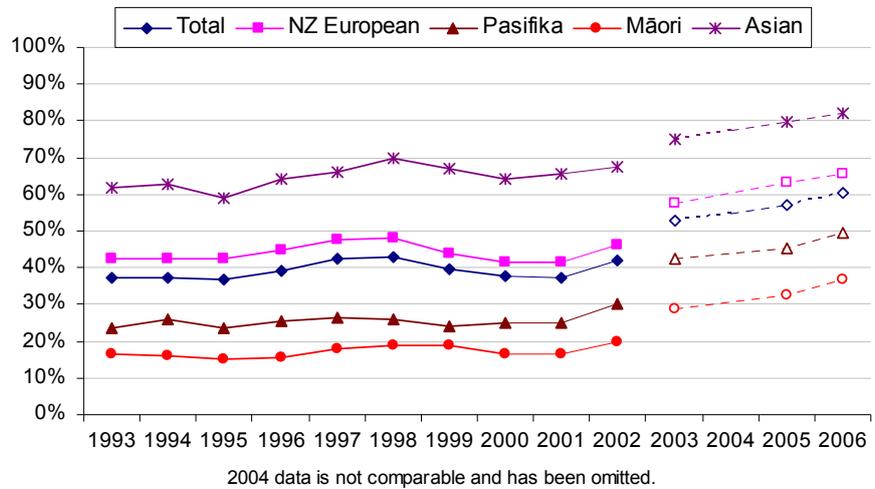
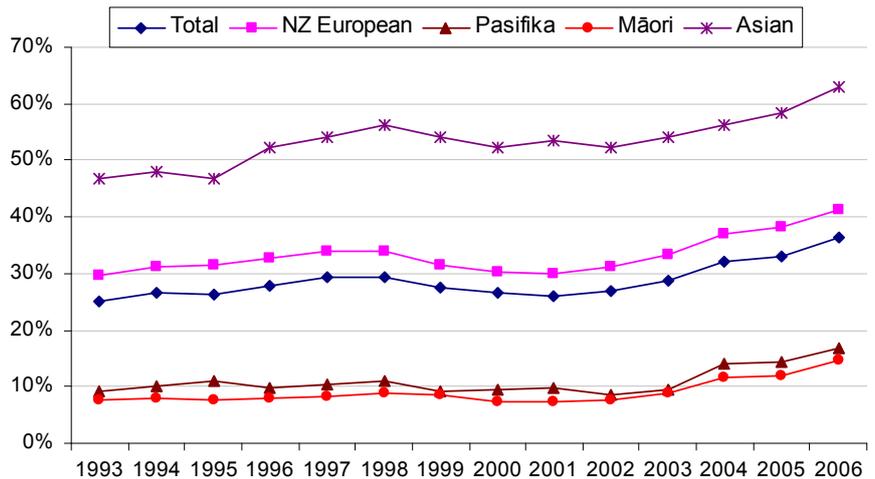


Figure 5: School leavers qualifying to attend university, by ethnicity



Future workforce growth will be in those ethnic groups with highest and lowest qualifications rates

Considering these patterns of achievement alongside the projections for New Zealand’s working-age population highlights the importance of addressing disparities in the educational achievement of young New Zealanders, and the extent to which the cultures of many firms will need to adjust in the next two decades. Statistics New Zealand’s recently updated population projections show that over the next 20 years, all the growth in our workforce will be through the growth of Māori, Asian and Pacific populations.

Figure 6: Workforce growth will be Māori, Pacific and Asian

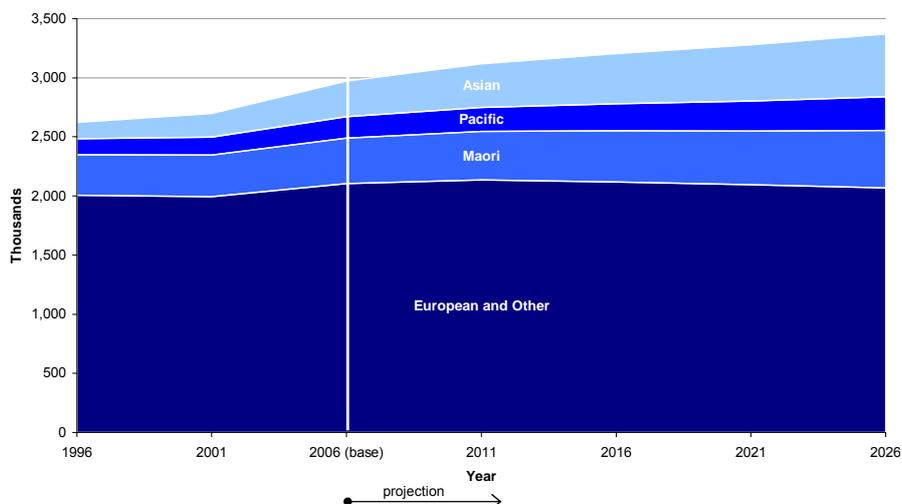


Table 3: Projected change in working age population by ethnicity 2006-2026

	Working age population (thousands)				
	European and Other	Māori	Asian	Pacific	Total
2006 Base	2,105	384	302	180	2,971
2026 Projection	2,068	486	532	285	3,371
Change	-37	102	230	105	400
% change 2006-2026	-1.8%	26.6%	76.2%	58.3%	13.5%

Statistics New Zealand National Ethnic Population Projections, April 2008. 2006 base, medium fertility, mortality and migration assumptions (series 6)

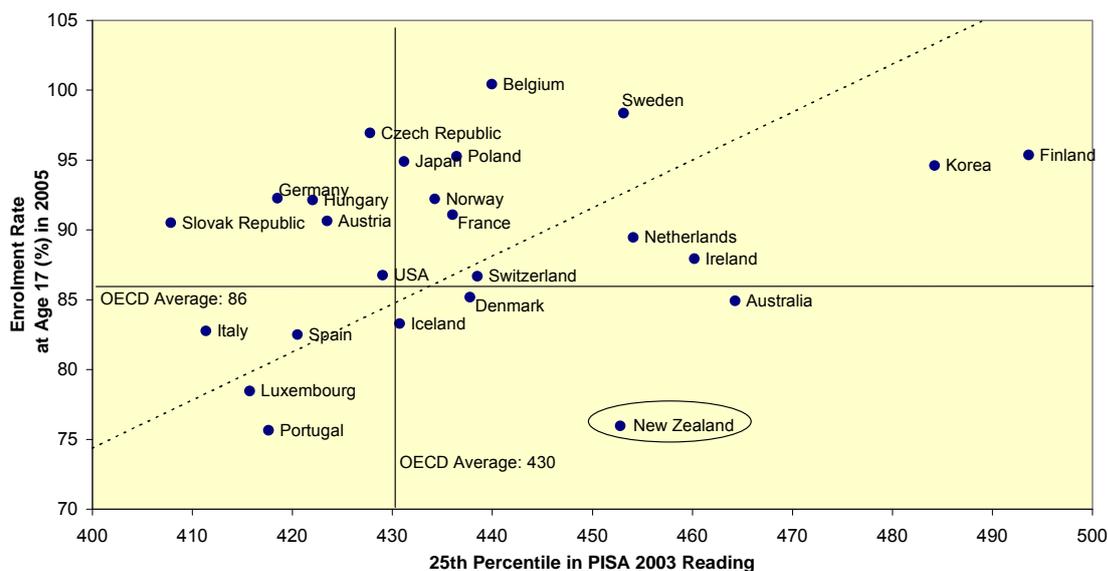
Too many youth disengage from education

15-19 year-olds' education enrolment rates are low

New Zealand's youth (age 15-19) participation rate in education and training is well below the OECD average. This is surprising, given the strong positive correlation between the achievement of a country's 15 year olds in PISA and subsequent youth education participation rates.

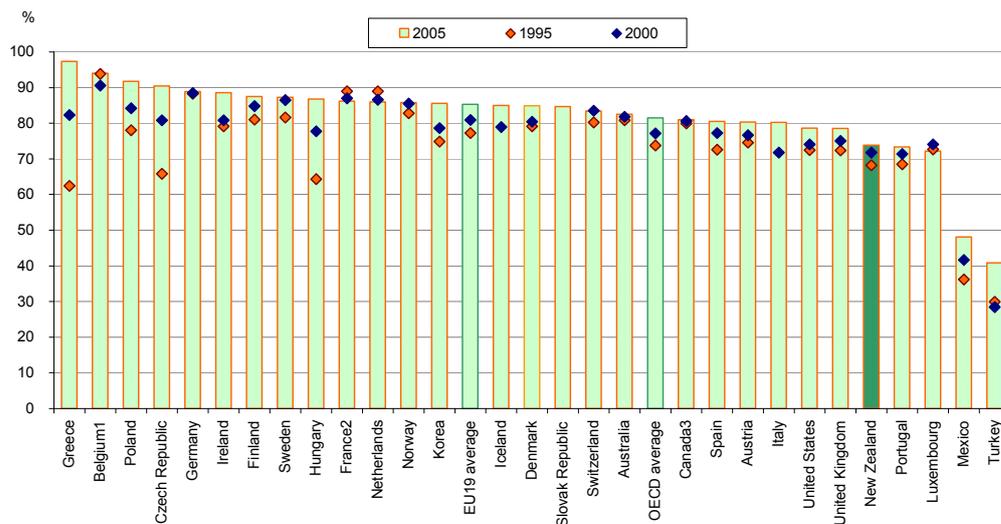
Given the strength of evidence about the value of completing school and continuing in education, having so many young people disengaging from education at this age will be detrimental to New Zealand's long-term skills and productivity.

Figure 7: Achievement at age 15 and retention in education to age 17



Note: Low outliers Mexico and Turkey are not shown. Excluded: Canada (missing enrolment data); UK (missing PISA data); Greece (enrolment data volatile)

Figure 8: Education enrolment rates of 15-19 year olds in the OECD



1. Excludes the German-speaking Community of Belgium. 2. Excludes overseas departments for 1995 and 2000. 3. Year of reference 2004. Countries ranked in descending order of enrolment rates in 2005. Source: OECD, Table C2.2. (www.oecd.org/edu/eag2007)

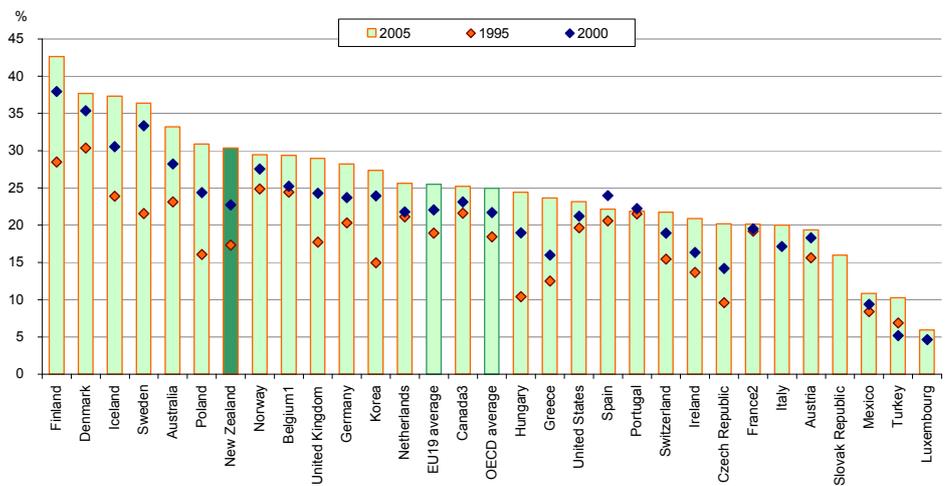
High participation in tertiary education is raising overall workforce qualifications

Tertiary education growth has been strong but unbalanced

In contrast to our low youth participation rates, participation in tertiary education by older New Zealanders has grown significantly, and is well above the OECD average.

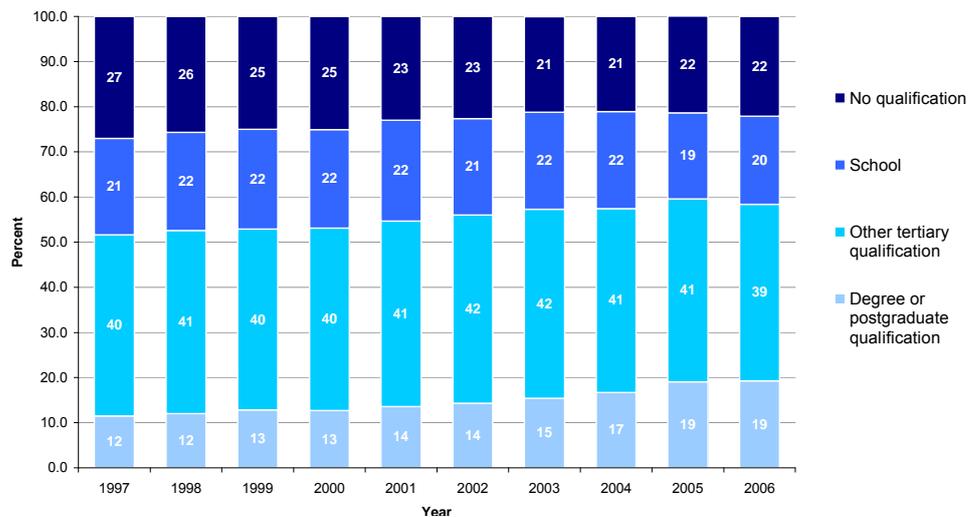
Our tertiary education graduation rates (annual graduates as a percentage of the population) are amongst the highest in the OECD. The growth in tertiary education over the last two decades is now being reflected in overall working-age qualifications. In 2006, 19.3% of adults had university degrees, an increase from 11.5% in 1997.

Figure 9: Education enrolment rates of 20-29 year olds in the OECD



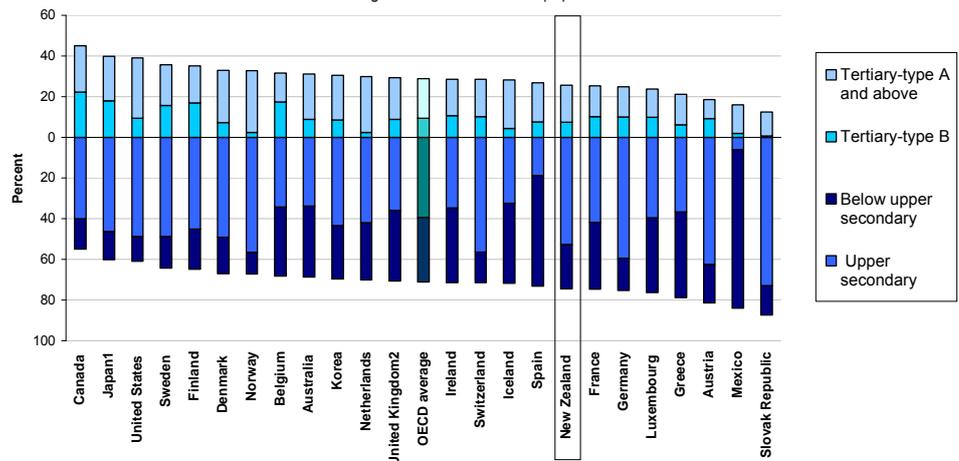
1. Excludes the German-speaking Community of Belgium. 2. Year of reference 2004. 3. Excludes overseas departments for 1995 and 2000. Countries ranked in descending order of enrolment rates in 2005. Source: OECD. Table C2.2. (www.oecd.org/edu/eag2007)

Figure 10: Increasing qualifications levels in the adult population



Source: Household Labour Force Survey

Figure 11: Qualifications of the adult population across the OECD



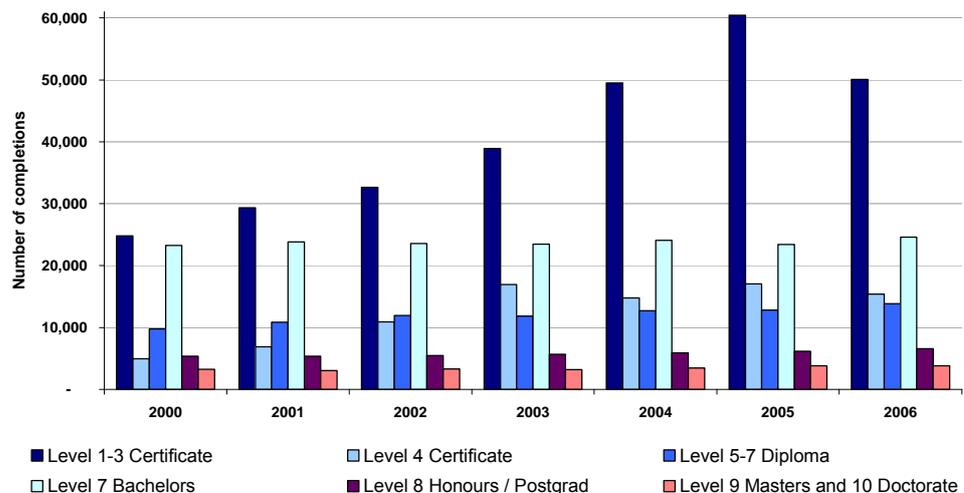
Source: Education at a Glance: OECD Indicators 2007, indicator A1
 1. Year of reference 2003.
 2. Upper secondary includes some ISCED 3c short programmes.
 3. Czech Republic, Italy, Hungary, Poland and Turkey - data not available.

Formal work-based education and training has also increased (by approximately 75% from 2001 to 2006), with 190,000 participants in industry training and modern apprenticeships in 2006 (8.4% of the workforce) (Ministry of Education, 2007).

Growth has been almost entirely in lower-level qualifications

From 1999-2006, almost all the growth in tertiary education participation was in sub-degree certificates and diplomas. This included a large increase in participation for Māori adults, and the growth of industry-linked training. In contrast, there was no significant growth in degree-level completions, despite a general pattern of higher rates of return on degree-level study.

Figure 12: Recent growth has been in lower-level tertiary qualifications



Not all the growth has been well aligned with firms' skills demands

The recent tertiary education reforms were initiated in response to concerns by government, employers, tertiary education providers and other stakeholders about these unbalanced patterns of growth, the quality and relevance of some provision to national economic and social goals, and the sustainability of some providers.

Poor completion rates and low income premiums for some qualifications (especially at the sub-degree level) provide some evidence to support this concern, as does the persistence of skills shortages in some sectors and regions.

Poor foundation skills are a barrier for many adults

Fewer working-age adults are at the lowest levels of literacy than in 1997

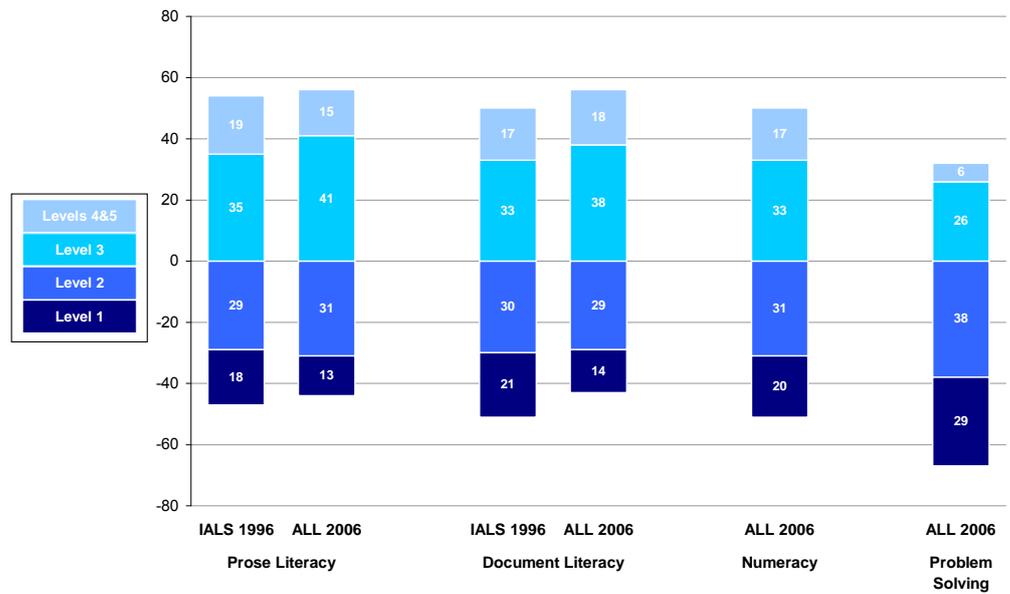
The Adult Literacy and Life Skills Survey (*ALL*), conducted in New Zealand in 2006, provides a direct measure of the working-age population's skills in prose and document literacy, numeracy and problem solving. The literacy results can be compared with those from the 1996 International Adult Literacy Study (*IALS*). Only limited international comparisons are available at present.

Key findings include (Satherley, Lawes and Sok, 2008):

- New Zealanders' overall literacy improved significantly in the 10 years from 1996. The proportion of the population with the lowest levels of literacy fell from 21% to 14% for document literacy, and from 18% to 13% for prose literacy.
- Similar literacy trends were seen in Australia and Canada, but New Zealand saw greater improvement in document literacy.
- Much of this improvement is likely due to the "ageing out" of the 55-64-year old cohort of the 1996 IALS study – a generation with significantly lower levels of school completion and other qualifications.
- Overall, New Zealand's numeracy and problem solving results are nearly indistinguishable from those of Canada and Australia, and generally above those of the USA.

NZ adults' foundation skills match those in Australia and Canada

Figure 13: Adult Literacy and Life Skills survey – New Zealand 2006



Source: Satherley, Lawes and Sok (2006)

Changes in the composition of the workforce partially explain recent labour productivity performance

Another paper in this productivity series investigates the extent to which changes in the composition of the New Zealand workforce over time have influenced the country's labour productivity growth.

Does Quality Matter in Labour Input? The Changing Pattern of Labour Composition in New Zealand (Szeto and McLoughlin, 2008) uses an index of labour input factoring in changes in the composition of the workforce including factors such as age and experience, gender, and qualifications. It finds that labour quality has increased since the 1980s, but increased more slowly in recent years as employment rates have risen, bringing in inexperienced workers.

Looking over the medium term, labour quality is likely to rise further:

“Firstly, we will likely see a further increase in qualification levels of the workforce as older cohorts with lower average qualification levels continue to be replaced by younger cohorts with higher average qualification levels.

Secondly, we do not expect a dampening impact from a large increase in the quantity of lower-skilled labour input as may have occurred since 1999. ...

Lastly, an ageing workforce may have a further positive impact in terms of increasing work experience. The baby-blip cohort (currently 15 to 24 years old) moves into older groups over the next decade, and the 40 to 49 year group continues to make up a large proportion of the population”

Szeto and McLoughlin (2008).

Recent workforce composition changes have reduced the growth rate of “labour quality” and lowered labour productivity growth

Labour quality will continue to increase over the medium term

Migration and skills

Migration is a major influence on New Zealand's skills supply

Nearly one quarter of New Zealand's resident population were born overseas, including 37% of Aucklanders. Migrants therefore have a major impact on labour utilisation rates and total economic output. But what influence does immigration have on productivity?

Immigration can contribute to productivity in several ways:

- Immigration of skilled workers can increase human capital levels, and/or offset human capital losses from emigration of skilled residents;
- Immigration can affect capital flows and investment – as migrants bring investment capital with them, and as they send remittances back to their country of origin;
- Migrants can enable firms to invest and adapt new technologies by overcoming shortages or lags in the supply of specialist skills;
- Migrants can bring new ideas, technologies and processes that can be adapted and applied in New Zealand firms;
- Migrants can help to establish new connections with international markets and supply chains that enable firms to invest and grow.

Evidence on the relative skills and productivity of New Zealand immigrants is mixed. Immigrants have, on average, higher education and qualifications levels than New Zealand born people. The proportion of new migrants entering through the skilled migrant programme has risen, and the level of qualifications of migrants entering under the general skills category has increased.

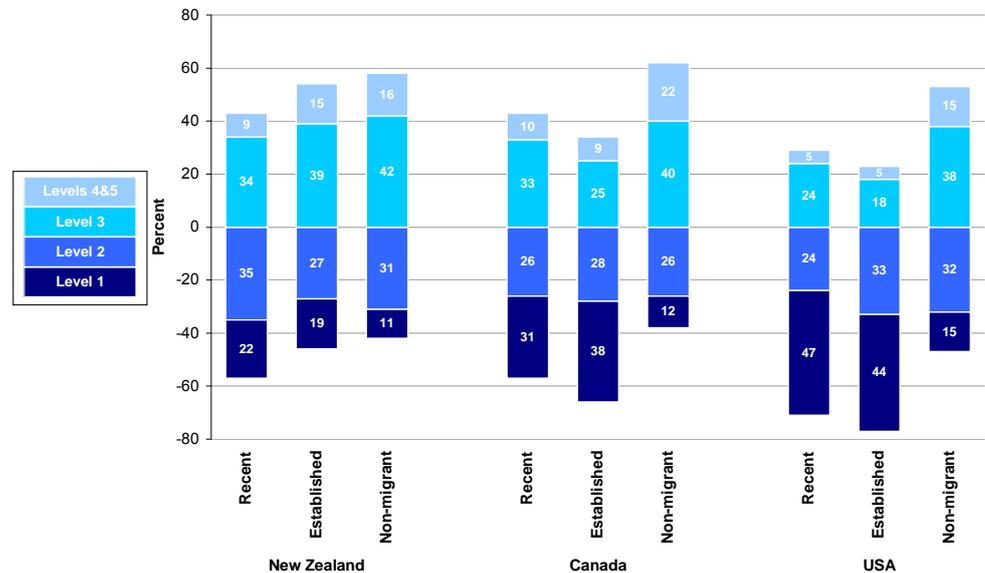
New Zealand attracts relatively highly qualified immigrants

The Adult Literacy and Life Skills (ALL) survey shows that recent immigrants have lower overall literacy (and slightly lower numeracy) than established immigrants and those born in New Zealand. The literacy gap is largely transitory and closes once migrants are established. In the OECD's PISA study, 15 year-old first generation migrants' mathematics achievement is almost identical to that of New Zealand-born students. Of the 14 OECD economies with significant immigrant populations, this was the case only in New Zealand, Australia and Canada (OECD, 2007, Indicator A6).

but income data suggests immigrants take time to reach full productivity

Income data indicates that new migrants' productivity (and hence their incomes) is generally lower than similarly-qualified New Zealand-born workers (Boyd, 2003). The initial income gap, and the speed with which it closes as migrants become established, varies with country or region of origin. This income gap may be due to several factors – including differences in the quality of education underlying the nominally equivalent qualifications of different countries, discrimination, difficulties adjusting to New Zealand firms' culture and work practices, and the time required to adapt and develop their skills to work and life in New Zealand.

Figure 14: Immigration status and prose literacy in the Adult Literacy and Life Skills survey 2006



Source: Satherley, Lawes and Sok

Immigrants' direct contribution to GDP growth appears at present to be largely through increased labour utilisation rather than through increases in average labour quality that raise labour productivity.

Supporting immigrants' integration into life and work in New Zealand could help to lift productivity

New Zealand's immigration system attracts and admits relatively highly skilled people, and the overall architecture of the system is well-designed. Fine-tuning to target specific skills could help skills supply adjust more quickly to clear skills shortages. Public policy measures, and improvements in communities' and firms' ability to integrate migrants, could increase the contribution of migrants' skills to productivity growth by helping migrants to fully utilise their skills in the New Zealand economy.

International students studying high-level qualifications are a source of skills, ideas and market connections

The growth of international education as an export market has brought large numbers of students to New Zealand. This offers a major strategic opportunity to increase the contribution of immigration to productivity. Strategies are being implemented to increase the proportion of international students studying for advanced qualifications, and to enable their subsequent immigration and/or the establishment of lasting connections with New Zealand. The long-term impact of this on is yet to be seen, but international students are a group with the kinds of skills most likely to contribute to knowledge transfer and market development.

What works to improve skills and skills' contribution to productivity?

Skills development is cumulative – early years matter most

Investing effectively in the development and learning of young children from disadvantaged backgrounds has a big productivity pay-off over the long term

Skills development is a lifelong and dynamic process. The early years are critical. Strategies to lift productivity through skills must therefore be long-term. Some of the most important long-term gains will come through improving outcomes for very young children, and effective public policy programmes in areas such as early childhood education and parenting support have greater benefits for children from disadvantaged backgrounds.

Development and learning experiences in early childhood play a critical role in establishing or limiting children's lifetime opportunities and learning potential – and hence their potential productivity. Early investments in children's development improve the return on later investments.

Heckman and Masterov (2007, p.3-6) summarise the evidence:

“Skill begets skill; learning begets learning. Early disadvantage, if left untreated, leads to academic and social difficulties in later years. Advantages accumulate, so do disadvantages.”

...dysfunctional and disadvantaged families are major producers of cognitive and behavioural deficits that lead to adverse teenage and adult social and economic outcomes. The effects of disadvantage appear early and persist. Remediating these disadvantages at later ages is costly. Human abilities affect lifetime performance and are shaped early in the life of the child. Early interventions promote cumulative improvements. Enriched interventions targeted towards children in disadvantaged environments are cost-effective remedies for reducing crime and the factors that breed crime, and raising productivity in schools and the workplace.”

This does not mean that the quality of education, health and social services for older children and adults is unimportant – the gains from early learning will dissipate if not followed up with later investment (see, for example, Currie and Thomas, 2000). But investments in early learning development increase the rate of return on investments in later years.

A productivity and growth-oriented policy approach should, like a social equity-oriented policy approach, target resources at children from disadvantaged families who are at greater risk of underachievement.

In the context of early childhood education, this raises a potential trade-off between long-term and shorter-term growth priorities. Broad-based increases in participation in early childhood education can help to raise per-capita GDP by increasing labour market participation by parents. But in the long-term, the greatest productivity gains will come from the impact that high quality early childhood education has on children's learning – an impact that is greatest for children from disadvantaged home environments.

Demand pressures and supply constraints in the expanding early childhood sector may restrict access for those children who would benefit most

In New Zealand's early childhood education sector, increases in quality are being pursued (e.g. by increasing teacher qualifications) simultaneously with broad-based subsidies to increase participation. While government funding to build the sector's capacity has increased significantly, this growth is leading to demand pressures and supply constraints. In this environment, there is a risk that access to high quality services may be compromised for those children who stand to benefit from them the most.

From a long-term skills and productivity perspective, future policy development and investment in early childhood education should prioritise targeted support for children from disadvantaged families over support for broader-based increases in participation and quality.

Shortening our "tail of underachievement" in schools

Many of the core policy settings in New Zealand's schooling sector reflect "best international practice" and contribute to New Zealand students' high average performance in the OECD PISA study.

A recent McKinsey & Company report titled "*How the World's Best-Performing School Systems Come Out On Top*" (Barber and Mourshed, 2007) looks at the characteristics of high-performing school systems across the world and notes numerous strengths of New Zealand's schooling system.

These strengths include: devolved management and governance; a flexible qualifications system; independent evaluation and review by the Education Review Office; high-quality assessment tools; an emphasis on professional development; and the supervision and support of new teachers entering the profession.

Improving schooling outcomes depends on the quality of teaching

New Zealand's "tail" of underachievement in schooling can be addressed without compromising outcomes for higher achievers. Maximising children's experience of quality teaching is the critical factor. Few schooling policy changes can make a difference to children's learning and New Zealand's future skills base unless they contribute to improved teaching and learning in the classroom.

There is no easy formula for increasing the quality of teaching and raising student achievement. There is, however, an increasing

evidence base about what works⁴. The most effective investments in schooling include a focus on:

- high quality teacher training and professional development;
- effective systems to identify and respond with extra support when students are at risk of falling behind;
- supporting effective leadership and the development of learning organisations in schools; and
- outcome measurement and accountability systems that focus on student achievement.

For extra expenditure to improve outcomes, it must be aligned with system improvements

Many expensive attempts around the world to improve schooling have failed to deliver increases in students' skills. International comparisons show little if any relationship between per-student expenditure and the overall quality of schooling and student achievement. This does not mean that "money doesn't matter", but that the amount of funding seems to matter less than the quality of the system into which it is invested.

"Economic growth flows only from reforms that bring actual improvements in cognitive skills"

Hanushek, Jamison, Jamison and Woßmann (2008) p.70.

Commonly tried policy options, such as general class size reductions, are expensive and relatively ineffective because they have little impact on teaching quality or on support for students who are falling behind.⁵

Challenges in New Zealand include how to focus resources and build the capability needed to scale up effective programmes, and ensuring that further investment in schools is delivered in a way that encourages flexibility and responsiveness in meeting the needs of all students.

⁴ For example, the Ministry of Education's *Best Evidence Synthesis* series is producing systematic reviews of evidence about teaching quality, professional development, initial teacher education and school leadership. <http://www.educationcounts.govt.nz/themes/BES>

⁵ Hanushek and Woßmann (2007) review the evidence and debates about the relationship between funding and student achievement, and the characteristics of high-performing school systems.

Increasing school completion rates and youth participation in education and training

Ensuring that young people don't disengage from education too early will help to lift productivity

Completing secondary school and continuing with tertiary education soon afterward leads to higher lifetime income

New Zealand's low participation rate in education for youth aged 15-19 should be of particular concern for public policy focused on raising New Zealand's productivity through skills.

Completing an additional year of secondary school can increase the expected lifetime earnings (and therefore must raise the productivity) of students of all levels of academic ability. Estimates of this lifetime income gain range around 10% (Oreopoulos 2007).

Tertiary education also offers higher returns for those who start soon after completing school than it does for those who start later in life. The private and social rates of return are higher for two reasons. First, young graduates will spend more years working and earning higher incomes (and paying more tax) due to their qualifications. Second, there is evidence that for those who gain qualifications at younger ages, the income premium is greater.

Poor achievement in secondary school limits options for future tertiary education and reduces students' chances of future educational success. The low proportion of Māori school leavers achieving a university entrance qualification almost entirely explains the disparities in university participation and completion between Māori and non-Māori (Earle 2007). The long-run solution to ethnic and socio-economic disparities in tertiary education lies largely in the earlier years of schooling and early childhood development.

New Zealand's high employment rates and low unemployment partially explain the high exit rate of youth from education, as higher wages and greater job security act as "pull factors". But other countries with similarly strong youth employment rates appear to do better at keeping young people engaged in education (OECD, 2008, p.47). The increase of the youth minimum wage to the adult minimum wage could increase incentives for early school leaving, but may also reduce employment opportunities for low-skilled youth and increase their risk of unemployment if tight labour market conditions ease.

Secondary schooling must be more flexible to meet the needs of all students

Within the secondary schooling sector, more flexible approaches to provision are needed to complement the flexibility of the curriculum and the qualifications system. At present, the flexibility of provision appears to be constrained by funding, staffing and regulatory models that are premised on a fairly uniform model of schooling for all ages. Options should be explored to open up senior secondary schooling to include more vocationally-oriented options, and more flexible transitions between school, tertiary education and employment.

Increasing secondary school retention rates requires more flexible structures and rules, and clearer expectations and accountability

Accountability and funding arrangements for secondary schools should ensure that schools' performance measures and incentives put emphasis on keeping all students engaged in learning in an appropriate setting. There is significant variability in retention rates between schools with similar student populations, indicating that there is scope to improve system performance by benchmarking performance and sharing effective practice.

The OECD's 2008 report *Jobs for Youth: New Zealand* recommends that strategies to address youth educational and employment challenges include the following four components:

- improving retention rates in secondary education;
- ensuring tertiary education provides the skills required in the labour market and improving quality and scope of vocational education at tertiary level;
- monitoring potential demand-side barriers to youth employment (including the effects of increasing the youth minimum wage); and
- improving the design and coherence of the current activation strategy for disadvantaged youth.

Increasing tertiary education's contribution to skills and productivity

Tertiary education's contribution to skills and productivity can be increased through better matching of skills supply to the changing needs of firms and sectors in the economy, and through effective links with firms to facilitate innovation, knowledge transfer and the application of new ideas.

The tertiary education system plays a critical role in upskilling the existing workforce and matching skills supply and demand

Immigration and labour market adjustments can provide shorter-term mechanisms to clear skills shortages, but tertiary education must play the central role in upskilling the existing workforce and matching the skills of new entrants to the workforce with the needs of firms.

New Zealand's tertiary education system has made a major contribution to our skills base, as participation in all forms of structured education and training has grown over the last two decades.

The basic infrastructure and policy framework for New Zealand's tertiary education has been relatively robust. Broad access has been maintained and extended, with the concept of lifelong learning put into practice more effectively than in many OECD countries. Tertiary education providers have been responsive to changing patterns of student demand. Cost sharing between the state, individual students and employers is well embedded. Institutions are autonomous and innovative, with increasingly strong international connections. The qualifications system provides for flexibility, transferability and consistency.

The Tertiary Education Strategy's priorities align well with the challenges of raising productivity

Despite these strengths, the system has faced difficulties in coping with the pace of growth, the increasing diversity of the population, and the changing skills needs of firms in a tight labour market. The system has been subject to ongoing review and policy reform in response to the challenges and trade-offs raised by the pace of change.

The Tertiary Education Strategy (Ministry of Education, 2006) has identified priorities that align well with national goals and the need to increase the contribution of skills to productivity growth. Its priorities include:

- maintaining broad equitable access to tertiary education,
- increasing young people's achievement of higher level qualifications;
- strengthening tertiary providers' connections with firms and increasing the supply of advanced technical, trade and professional qualifications;
- addressing foundation skills in the existing workforce; and
- increasing the contribution of tertiary education providers to knowledge transfer.

The critical challenge is in implementation of the public policy tools to give effect to these objectives.

Achieving the Tertiary Education Strategy's goals will depend on effective implementation of planning and resource allocation systems

It is too early to judge the overall success of the Government's recent tertiary education reforms in contributing to productivity growth. The reforms have created a range of new policy instruments and processes for planning and steering the sector and for allocating resources. These will take time to bed in and take effect:

- High quality information about skills demand is needed to inform individuals' education and training decisions, the planning and course development decisions of tertiary providers, and the new approach to government planning and resource allocation. Effective relationships between government, tertiary providers, and employers will be critical to achieve this.
- Resource allocation through the new planning and funding system will need to ensure that public investment in tertiary education adjusts responsively to changing demands and priorities.
- There is a risk that in managing within a defined funding path for tertiary education, resource allocation will not adjust quickly enough to changing patterns of demand from students and employers.
- A balance must be struck between providing certainty of funding for tertiary providers and government, and the need to maximise responsiveness to changing demand. There will be ongoing trade-offs between containing costs to existing students, increasing

This in turn depends on high quality information that can help direct resources in response to providers' performance and changing skills demand

To lift productivity, investment in tertiary education should focus on further broadening access and improving quality

quality and capability in tertiary providers, and meeting ongoing growth in demand.

- Increases in subsidies and support to students already in the system, of for those who have already graduated are unlikely to contribute to productivity growth. A productivity and skills focus for tertiary education expenditure would see further government investment in tertiary education focussed on ensuring broad access and improving the quality of provision.

Addressing foundation skills of low-skilled adults

Workers with poor foundation skills are less able to develop the advanced, specialist and job-specific skills that increase their productivity

The Adult Literacy and Life Skills Survey (ALL) results show that despite improvements in literacy levels, a large minority of adults in the existing workforce have low foundation skills. Literacy, language, numeracy and problem-solving are the more measurable aspects of foundation skills, but foundation skills are much broader – including “softer” non-cognitive skills such as interpersonal communication, ability to work in teams, punctuality and ability to focus on a task.

There is clear evidence that literacy and other foundation skills boost individuals’ incomes and employment. Workers with poor foundation skills are less able to develop the advanced, specialist and job-specific skills that increase their productivity, their incomes, and their ability to adapt to changes in technology and structural changes in the economy.

Employers’ organizations, unions, community groups and government agencies have highlighted the challenge of addressing foundation skills in the existing workforce. In recent years, investment in this area has increased substantially, with funding to build the capability of education providers and expand provision, including community-based and work-based programmes. Further work on workplace foundation education is being organised under the Unified Skills Strategy.

Research on specific adult foundation education programmes has identified some detail of what works to improve adults’ foundation skills. As with quality in schooling, the key is high-quality teaching: well trained teachers; effective assessment tools; and maximizing opportunities to learn with content relevant to the learner (Benseman, Sutton and Lander, 2005).

Investment in foundation skills for low-skilled workers should be incremental and focus where employers and workers are committed

Success in work-based programmes is most likely where their design is evidence-based, employers and workers are actively and constructively engaged, and high quality evaluation is built in.

An incremental and experimental approach should be taken to investing in programmes to increase adults’ foundation skills. The potential benefits of raising foundation skills in workforce are clear, but there is relatively little robust evidence that large-scale education programmes can achieve this in a cost-effective way (Johnston,

2004). A key benefit of adult foundation skills education may come indirectly, improving children's outcomes in the long term by increasing parents' skills and confidence, rather than through direct impacts on workforce productivity.

Strengthening firms' skills utilisation capability

For skills to contribute to productivity, firms must utilise them effectively

In New Zealand, increasing attention is being given to the potential for productivity gains by improving firms' performance in utilising the skills available to them. In part, this focus on firms' behaviour is catching up with similar work that has been done in the UK and other OECD countries. It follows ongoing engagement between government, employer groups and unions (for example, the Workplace Productivity Working Group, August 2004 "*The Workplace Productivity Challenge*").

Management capability and practices determine firms' ability to effectively utilise the skills of their workforce

Firms' ability to develop and fully utilise the skills available in their workforces is at the "sharp end" of the process through which skills contribute to productivity. Management capability and management practices are of critical importance. This includes managing production processes - effectively combining the skills, capital and other resources available to the firm. But perhaps more important is the ability to create organisational structures and cultures that motivate effort and creativity, and enable firms to become not only efficient, but adaptable.

While formal education and training can supply skills, much of the productivity of individuals derives from often-informal on-the-job learning. With continual technological change, firms need to continually reinvest in the skills of their workforce. At this point, the development of "learning organisations" in firms starts to have similarities to the earlier discussion of high quality in schooling. Maximising the learning and achievement of a workforce is no easier a task, requiring an understanding of existing abilities, ability to motivate and assess learning, and a focus on results.

There is evidence that firms in some sectors and sectors may be settled in path-dependent low-skill, low-capital and low-innovation equilibriums. Issues of management capability, firm and industry structure, competitive environment and the interplay between capital, skills and innovation require further work (Durbin, 2004).

Another paper in this Treasury productivity series, *Enterprise and Productivity: Harnessing Competitive Forces*, provides a fuller discussion of the contribution of management capability to productivity, and reviews evidence on management capability in New Zealand firms.

Competition focuses management effort on improving performance, rewards the best and sorts out the rest.

As that paper notes, policies to promote competition may be the biggest contribution public policy can make to lifting firms' utilisation of skills:

"Perhaps above all other factors, competition drives better management practices. The threat of entry or takeover focuses managerial efforts on improving firm performance and a key aspect of this is implementing better management structures and systems. Improvements in New Zealand's management skills and practices can be driven by continued assessment of the competition regime to make sure that firms are open to international and domestic competition."

Enterprise and Productivity: Harnessing Competitive Forces, Treasury, 2008, p14.

Competition focuses management effort on improving performance, rewards the best and sorts out the rest.

But other public policy options should also be considered. Relying solely on competitive forces to increase firms' skills utilisation capability ignores some potential market failures where Government can assist by:

- Assisting firms and business sector networks to share effective practices and learn from each other;
- Providing information and resources for firms to assess their skills needs and development opportunities; and
- Making it easier for firms to connect with tertiary education providers and access the resources available in the tertiary education sector.

This is an area where further research on firm dynamics could contribute. The forthcoming Unified Skills Strategy will include a range of actions to address this "demand side" of the skills system.

Incentives to invest in skills

The benefits of investing in skills accrue to individual learners, to employers, and to the broader society. The "spillover" benefits of tertiary education (while not as great as those from early childhood and schooling) include both social benefits and productivity benefits if the increased skills of one individual raise the productivity of others working with them.

The rate of return to individuals from investing in their skills depends on the direct costs of study, the opportunity cost of foregone income, their future expected income gains and any other personal benefits from upskilling.

Many government policies affect the financial returns to individuals and firms from investing in skills

Government policy impacts on investment in skills in a variety of ways. Direct subsidies for tuition and student support reduce the direct and opportunity costs of education and training. Policies that encourage flexible, responsive tertiary education provision can also

reduce barriers and increase incentives to study. An effective qualifications system and efficient labour markets increase expected future income gains from investing in skills. Taxation and, in particular, the effective marginal tax rates on the extra income gained by upskilling, reduces the return to individuals and discourages investment in skills. Income tax opens a gap between the value of skills to an employer (with wages linked to productivity) and the return on skills to an employee, while subsidies for education and training reduce this gap.

The estimated rates of return to education in New Zealand, and the high participation rates of adults in part-time tertiary education, suggest that overall, government policy is stimulating investment in skills by individuals and employers.

But as with other aspects of skills discussed in this paper, the overall patterns and averages may hide important areas of concern. One area that may merit further research is whether persistent skills shortages in some occupations might be related to incentive effects of high effective marginal tax rates⁶ over the relevant income range for workers with household characteristics common in those occupations.

Conclusion

Maximising the contribution of skills to productivity in New Zealand requires continued improvement on many fronts. It requires a long-term perspective, and well-designed and focussed investments.

Issues of “culture change” seem to arise in many aspects of skills policy: taking up the challenges of globalisation; raising expectations for educational success; improving teaching quality and the responsiveness of schools; adjusting to the changing faces of New Zealand’s population; and building firms that fully utilise the skills and potential of their workforce.

⁶ The effective marginal tax rate is the combined effect of the income tax rate applying to extra income earned, and the abatement of any targeted entitlements (eg: accommodation supplement) and tax credits (eg: working for families tax credits).

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