

The role of education in enhancing intergenerational income mobility

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How income is transmitted from generation to generation is important to understanding the distributional impacts of policy. Compared with other OECD countries, labour income in Australia is relatively mobile across generations and Australia also has a moderate level of inequality, based on current household disposable income. OECD countries, with the exception of Canada, have either high inequality and low mobility or low inequality and high mobility. Education is an important factor influencing the extent to which income is transmitted from parent to child. The relatively high standard of minimum education outcomes in Australia and Canada, as reflected in the OECD's Programme for International Student Assessment scores, are likely to play an important role in explaining Australia and Canada's experience. Education outcomes alone, however, do not fully explain this combination of relatively high intergenerational income mobility and moderate income inequality.

1 The author is from Macroeconomic Policy Division, the Australian Treasury. This article has benefited from comments and suggestions provided by Meredith Baker, Greg Coombs, Graeme Davis, Liam Findlay, Jyothi Gali, Steve Kennedy, Kruno Kukoc, Tony McDonald and Gene Tunny. The views in this article are those of the author and not necessarily those of the Australian Treasury.

Introduction

The distribution of consumption possibilities across different groups in society, geographic regions and generations is a marker of a society's wellbeing. It is one of five elements taken into consideration in framing the Australian Treasury's policy advice to Government. The aim of this policy advice is to enhance the wellbeing of Australians.²

The focus of this paper is on the intergenerational mobility of income from work. It explores some of the mechanisms which reinforce the influence of parental income on children's income in adulthood, as well as those that offset parental income.

Understanding how income is transmitted from generation to generation is important when analysing the impact of policy on the intergenerational distribution of consumption possibilities.

The following sections of this paper outline how intergenerational income mobility is measured, its level in Australia and selected OECD countries, and the mechanisms by which income is transmitted across generations. The paper will also discuss the relationship between mobility and current disposable household income inequality.

Intergenerational mobility of income from work

If an individual's earning capacity was wholly randomly determined, then over time and across generations, labour income would regress to the mean. In a society like this parents would have no influence over their children's earning capacity.

On the other hand, if jobs are inherited (as in the case of serfdom) rather than allocated according to merit, then a child's earning capacity will be solely determined by the parents' socio-economic position and it will remain unchanged from generation to generation. This would result in a suboptimal allocation of talent.

Such societies are characteristically stagnant, with rigid economic rules. Resources do not tend to be allocated to where they will be most productive. And, there are few incentives for individuals to invest in their human capital, let alone their children's.

2 The Treasury wellbeing framework consists of the following five elements: (i) the level of opportunity and freedom that people enjoy; (ii) the level of consumption possibilities; (iii) the distribution of consumption possibilities; (iv) the level of risk that people are required to bear; and (v) the level of complexity that people are required to deal with (Henry 2006).

There are few societies today that exhibit either of these extremes. Increasing their children's earning capacity may be a form of consumption for parents that adds to their own wellbeing.

A range of factors impact, to some extent or another, on an individual's earning capacity. These include education, health status, cognitive abilities and migrant status. And economic growth has enhanced the opportunities for people to improve their social and economic standing relative to those of their parents.

Social and economic characteristics, such as income, education, and occupations, may be transmitted across generations in varying degrees. Where low income and social isolation are transmitted from parent to child there is cause for concern as it limits the opportunity for these children to develop their potential.

Welfare income, as opposed to income from work or assets, can have negative effects on a number of outcomes for children, including reducing their chances of graduating from high school, reducing test scores, and reducing earnings and hours worked (Havemann and Wolfe 1994; Corcoran 1995; and Lefebvre and Merrigan 1998).

In Australia, Pech and McCoull (2000) have shown that children whose parents relied heavily on income support were more likely than other children to rely on it.³ In Canada, Corak et al (2004) show that there is a 10 percentage point difference in the use of unemployment insurance between people whose fathers received unemployment insurance and those whose fathers did not.

However, the effects of unemployment benefits on children's outcomes appear to be different from those linked to child support, which is generally associated with an improvement in educational attainment and test scores (Mayer 2002).

Intergenerational welfare dependency may be as much a function of the parent's participation in the welfare system and lack of education as the role model provided by the parent (Lewis 1998; Ludwig and Mayer 2006; and Mulligan 1997). The Cape York Institute has recognised the importance of behaviours and attitudes in its work to improve the wellbeing of Indigenous Australians (Pearson 2005).

Understanding the extent to which a child's opportunity to develop its potential is affected by parental circumstances and behaviours is important. If we can reduce the degree to which disadvantage is entrenched across generations, then the abilities of

3 The *Youth in Focus* project, jointly run by academic researchers and the Australian Government Department of Families, Community Services and Indigenous Affairs, is investigating the persistence of welfare across generations using a 'trans-generational' database (Cobb-Clark et al 2006).

everyone in society are more likely to be used efficiently. It will also improve opportunities for individuals to develop their potential.

Reducing the negative effects of adverse parental backgrounds on child outcomes is desirable. But it would be inappropriate to have a society in which the circumstances and behaviours of parents have no effect on their children's outcomes. As a general rule, parents want to do the best they can for their children, investing time, emotional commitment and money in them. There are many ways in which parents have a positive effect on their children's outcomes, for example, encouraging children to read.

How income is transmitted across generations

Parents influence the earnings capacity of their children by investing resources, including time and money, in their children's future. This can be done directly by transferring money to the child, or indirectly, for example, by investing in the child's development, including their education, health, and socialisation.

High-income earning parents may be able to purchase or produce better 'inputs' for their children's development. Low-income earning parents cannot offer their children the same quantity or quality of inputs. Studies have shown that children from low-income backgrounds are more likely to have lower educational attainment (Duncan et al 1998) and earnings in adulthood (Sigle-Rushton 2004) than those from high-income households.

The degree to which parents choose to invest in the future earnings capacity of their children is dependent on preferences, monetary constraints, and the rates of return, broadly defined.

In addition to parental income, education is also a major contributor to the intergenerational mobility of labour income (d'Addio 2007). An individual who acquires education is typically rewarded with returns in the form of increased productivity and therefore higher wages.

Educational differences tend to persist across generations. Differential education levels, as measured by years of schooling, explain between 35 and 50 per cent of intergenerational income correlations across countries (Blanden 2005).

Other factors also contribute to the intergenerational mobility of income. Health is an important element of human capital and health outcomes are often transmitted across generations. Poor health may limit earnings capacity in both generations (d'Addio 2007).

According to Corak (2006) high-income earning parents may also transfer more subtle advantages to their children in the form of social skills, beliefs, attitudes, and motivations, which may expand the child's earning capacity as an adult.

However, the child's adult income is not solely determined by parental characteristics. Some part of genetic ability is not dependent on parental characteristics. Nor are the market and social institutions that determine the extent to which education impacts on earnings (d'Addio 2007).

Measuring intergenerational earnings elasticity

The framework used in the literature to measure the intergenerational income mobility is relatively simple (Corak 2006). The adult income of the child is expressed as the average income of the children's generation plus two factors determining deviation from this average: (i) a fraction of parental income; and, (ii) other influences not associated with parental income. The intergenerational income mobility is measured by intergenerational earnings elasticity. This is the fraction of income that is, on average, transmitted from parent to child.

An intergenerational earnings elasticity of zero implies that differences in income do not persist across generations and income is completely mobile. An intergenerational earnings elasticity of one implies that differences in parental income are transmitted to children in full and there is complete immobility.

Leigh (2006) has estimated the intergenerational earnings elasticity for Australia as being between 0.14 and 0.19. That is, if the income of two sets of parents differed by 100 per cent then, on average, the children's labour income would differ by between 14 and 19 per cent.

Leigh's estimates indicate that the intergenerational earnings elasticity in Australia has not changed over the past 40 years.

The methodology used by Leigh to estimate Australia's intergenerational earnings elasticity conforms to best practice and the estimate has subsequently been used in cross-country comparisons (for example, d'Addio 2007).

However, there are a number of caveats relating to the availability of Australian data. In particular, suitable long-run panel surveys and samples of social security earnings are not available for Australia. Instead, Leigh used the average earnings of the father's occupation when the son was aged 14 as a proxy for actual father's earnings (Leigh 2006).

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Although intergenerational income mobility can be expressed as a single number, its level is not an appropriate target for policy. There is no optimal value for intergenerational income mobility, making it difficult to determine the magnitude and direction of change required. In addition, the measurement difficulties outlined below mean it is difficult to make judgements about small movements.

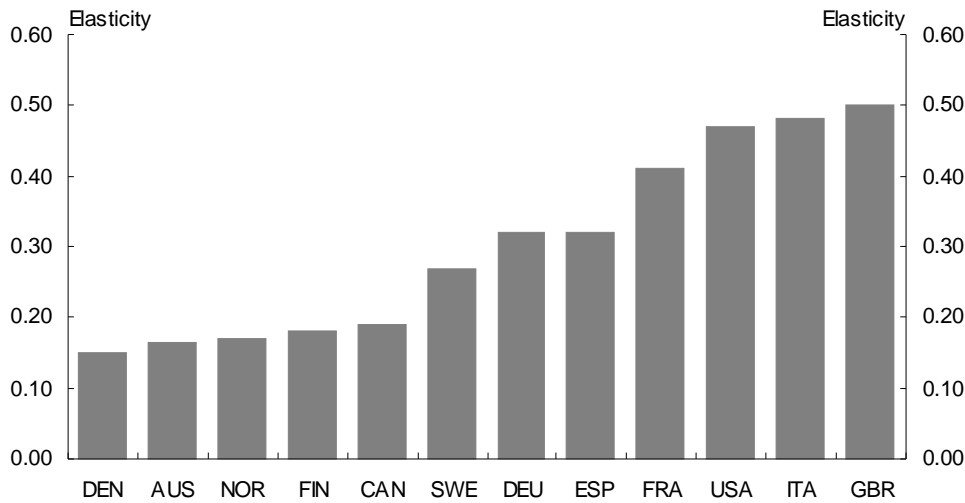
There are many measurement difficulties associated with estimating intergenerational elasticities. These include the period of time over which income is measured and the ages at which parental income and the child's adult income are measured, whether family, father's or mother's income is used as a proxy for parental income and which child's income is used.

Data and data collection methods, changes in the earnings distribution across groups of individuals and different labour force participation rates for men and women may lead to different elasticity estimates. These issues make cross-country comparisons particularly fraught.

Intergenerational income mobility in international context

A comparison of estimates of intergenerational earnings elasticities shows large cross-country differences between OECD countries. Denmark, Australia, Norway, Finland and Canada have intergenerational earnings elasticities of less than 0.2, implying a high degree of income mobility across generations (Chart 1). Sweden, Germany and Spain have elasticities around 0.3. France, the United States, the United Kingdom and Italy have intergenerational earnings elasticities greater than 0.4, implying a lower degree of intergenerational income mobility.

Chart 1: Intergenerational earnings elasticities estimates



Source: Based on Corak (2006) for all countries except Australia, Italy and Spain. For these countries, estimates are from Leigh (2006), Hugalde (2004), and Piraino (2006).

Note 1: Comparable data are available for 12 OECD countries. The height of each bar represents the best point estimate of the intergenerational earnings elasticity determined by Corak (2006).

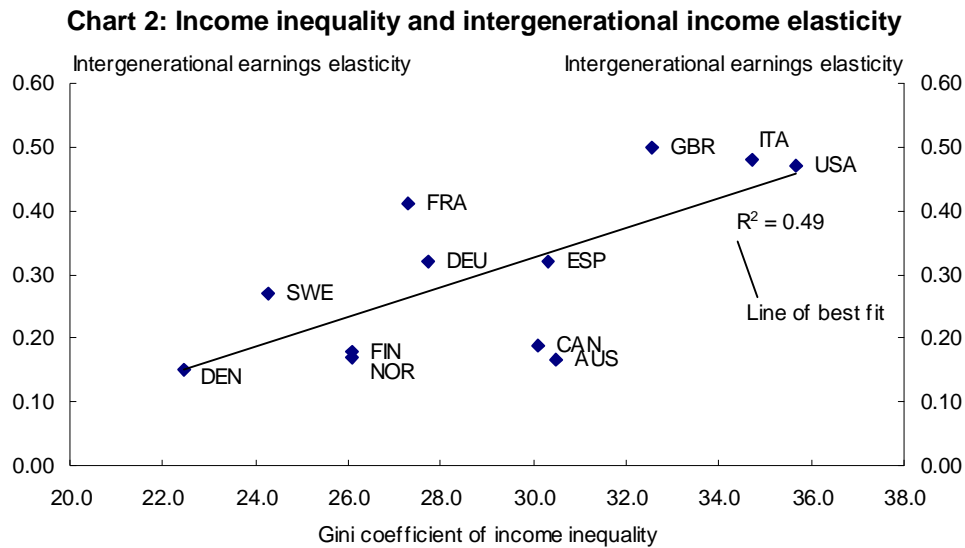
Note 2: The point estimate for Australia is the mid-point of the range estimated by Leigh (2006).

In the OECD, a relationship appears to exist between intergenerational income mobility and income inequality, with high intergenerational income mobility (as shown by low intergenerational earnings elasticity) associated with low income inequality (Chart 2).⁴

However, Australia and Canada do not appear to fit the pattern, experiencing moderate income inequality and high intergenerational income mobility.

4 The Gini coefficient is a commonly used measure of household disposable income inequality. Australia has a Gini coefficient of 30.5. Canada's is 30.1. These are both slightly below the OECD average of 30.8. However, Mexico and Turkey have extremely high Gini coefficients and are often excluded from comparisons. The OECD average excluding Mexico and Turkey falls to 29.4. As this adjusted average is less than Australia and Canada's Gini coefficients, Australia and Canada are said to have moderate inequality (OECD 2005b).

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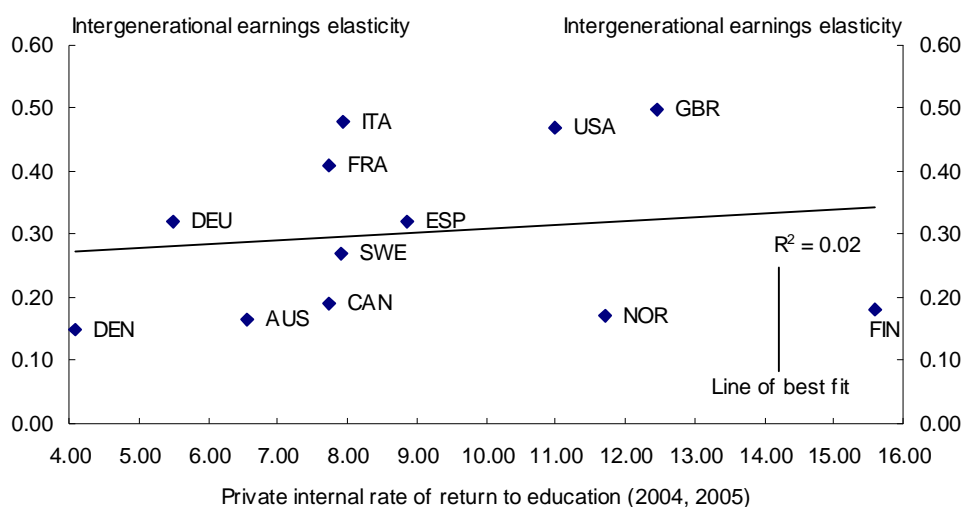
Source: Corak (2006) and OECD (2005b), Data chart EQ2.1, p 55.
Note: p-value for line of best fit is 0.01.

On the other hand, there appears to be virtually no association between intergenerational income mobility and the private rates of return to tertiary education in the OECD (Chart 3).⁵

It is notable that Australia, Canada, Denmark, Norway and Finland, which are all high mobility countries, experience a broad range of private rates of returns to education, from 4.1 per cent (Denmark) to 15.6 per cent (Finland). Finland's high private rates of return to education may be due to its small size, outstanding scholastic performance and the presence of the high-technology firm Nokia.

5 Attaining higher levels of education can be viewed as an investment, with costs paid by an individual that result in higher earnings over his lifetime.

Chart 3: Intergenerational income elasticity and returns to education



Source: Corak (2006) and OECD (2004, 2005a, 2006a), Tables A11.5, A9.6 and A9.6.
 Note: p-value for line of best fit is 0.64.

Where education is publicly funded children from high-income families may not access education at a substantially higher level than children from low-income families. In this case, high private rates of return to education may not necessarily impact on intergenerational income mobility.

Even if there were a strong negative relationship between rates of return to education and intergenerational income mobility, actively seeking to reduce the rate of return of education as way of improving mobility would be inappropriate. Reducing the rate of return to education would reduce the incentives to acquire education and to participate in the labour force, which may have negative effects on the sustainability of economic prosperity.

How then can we explain Australia and Canada's experience of high intergenerational income mobility and moderate inequality? The OECD suggests that the answer may lie in early education, immigration, or assistance for the disadvantaged.

Each of these possible explanations is considered in the following section.

Explaining intergenerational income mobility and income inequality in Australia and Canada

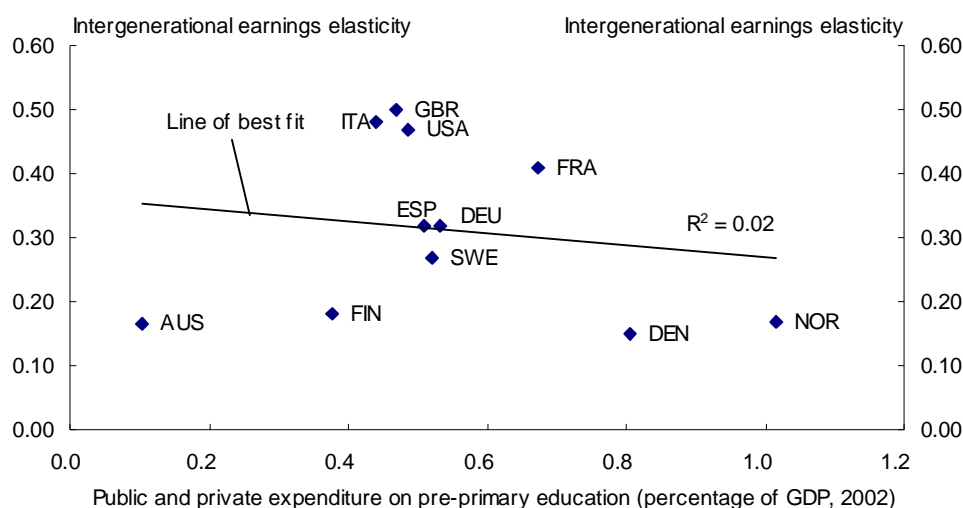
This section examines a number of possible explanations for Australia's and Canada's experience of moderate income inequality and high intergenerational mobility of income. This experience does not appear to fit the pattern of other OECD countries for which data are available.

Pre-primary education

Education is one of the key mechanisms through which income is transmitted across generations. As discussed above, using private rates of return to education to explain the link between inequality and intergenerational income mobility does not adequately account for Australia's and Canada's experience.

The OECD has suggested that the explanation could lie in intervention in early childhood education. However, Chart 4 does not show any association between expenditure on pre-primary education per pupil and intergenerational income mobility. Australia has a low level of public spending and high mobility.⁶

Chart 4: Intergenerational income elasticity and public and private pre-primary education spending



Source: Corak (2006) and OECD (2005a), Table B2.1c, p 186.

Note: p-value for line of best fit is 0.65.

Similarly, there does not appear to be any relationship between the enrolment rates of 3 to 4 year olds and intergenerational income mobility. Although Australia, Finland, Norway and Denmark have a similar level of mobility, enrolment rates are low in Australia and Finland and high in Norway and Denmark.

However, public spending on pre-primary education and enrolment rates for 3 to 4 year olds are only partial measures of the investment in early childhood development. They do not taken into account the full range of investments made by parents, which include investments in health, socialisation and the home learning environment. Nor do these measures take into account the quality of the education.

⁶ Comparable data for Canada are not available.

The United Kingdom's Effective Provision of Pre-School Education project showed that the development of all children is promoted by parents actively engaging with children in the home. While child outcomes are related to socio-economic background, the quality of the home learning environment is more important and this environment is only moderately associated with socio-economic background. This suggests that good quality interventions by government in early childhood development may have positive results for disadvantaged children, relative to what can be provided at home. (OECD 2006d)

Minimum education outcomes

Much of the focus of education is on inputs, such as the level of education spending, but what really matters is the education outcomes of all students. Good education outcomes may explain Australia's and Canada's experience of high intergenerational income mobility and moderate income inequality.

If all students get a relatively high minimum standard of education outcome, regardless of their socio-economic background, then high parental income will not necessarily mean that their child gets a better education than those from a less advantaged background. Since higher educational attainment is usually associated with higher incomes, intergenerational income mobility may be higher.

It should be noted that if access to good quality education is associated with high intergenerational income mobility, then we would not necessarily expect a negative relationship between inequality and intergenerational income mobility. For any given level of income inequality good educational outcomes, regardless of socio-economic background, will mean higher intergenerational income mobility.

In addition, where there are no financial barriers to accessing more education, the relative level of educational outcomes may help explain the level of intergenerational income mobility. That is, good educational outcomes may lead to higher attainment, higher incomes and, therefore, higher intergenerational income mobility.

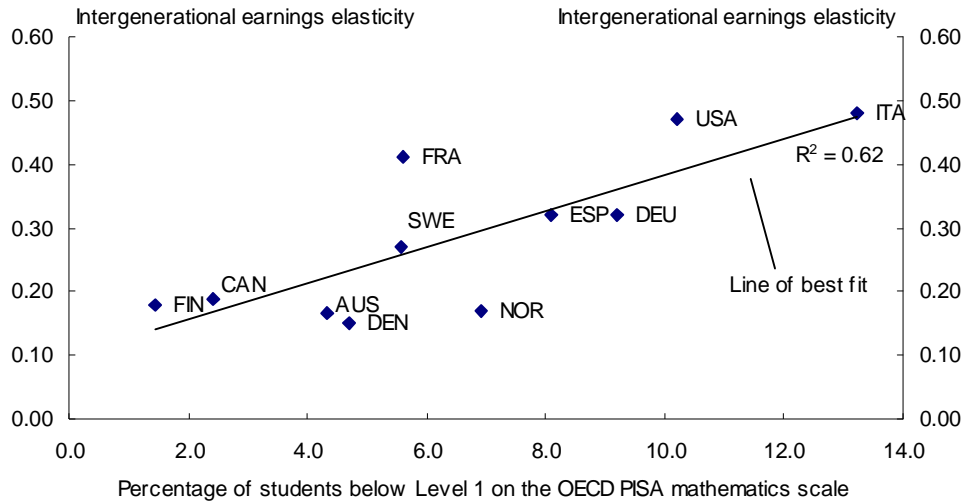
A higher percentage of low performing students in mathematics is associated with low intergenerational mobility of income (Chart 5). The relationship here is strong and statistically significant. Similarly, a high percentage of high performing students is associated with high mobility. And, a high median score for mathematics, reading and science in the 2003 OECD's Programme for International Student Assessment (PISA) is associated with high intergenerational mobility (results not shown).

This implies that, regardless of a country's current level of inequality, if children tend to perform better at school then they will have a better opportunity of getting higher

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paid employment as an adult. This would explain Australia's and Canada's experience.

Chart 5: Intergenerational income elasticity and low performing students, 2003



Source: Corak (2006) and OECD (2006a), Table A4.1, p 70.

Note 1: PISA data for the United Kingdom are not available.

Note 2: p-value for line of best fit is 0.004.

Improving disadvantaged students' education outcomes may lead to an increase in mobility. Given the evidence of the importance of starting early, improving the early childhood development of disadvantaged children, including access to education, may be particularly useful, as long as this is followed through into primary and secondary education (Heckman 2007).

Immigration

Immigration may increase both current income inequality and intergenerational income mobility.

In moving to a new country, migrants may sacrifice income for the opportunity for a better life. Their ability to earn a high income in their new country may be restricted due to language and cultural differences. However, their children, brought up in their new country, have the opportunity to earn higher incomes than their parents.

Australia and Canada both have relatively high levels of immigration (24 per cent and 18 per cent of their populations are foreign-born) and this may have led to the combination of moderate inequality and high intergenerational income mobility.

However, the Productivity Commission has found that, all other things being equal, increased immigration leads to a only small negative impact on domestic wages, but

this is dependent on the substitutability of foreign labour for domestic (Productivity Commission 2006). Therefore, the extent to which immigration impacts on the wages of resident workers varies across occupations.

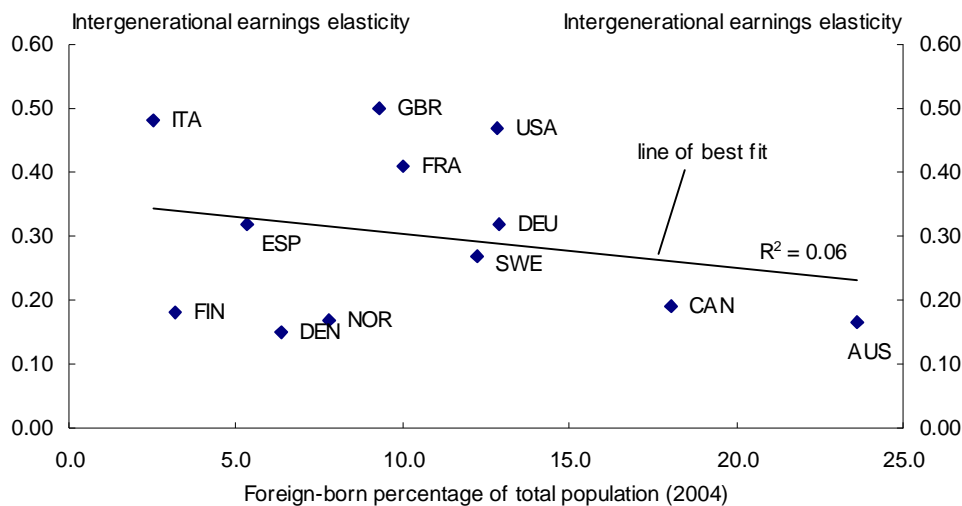
Australia and Canada also both have a very high proportion of skilled migrants. In Australia, 27 per cent of people with tertiary attainment are foreign-born, in Canada it is 20 per cent. This compares to an OECD average of 3 per cent.

A Productivity Commission (2006) study shows that an increase in skilled migration has a positive, but small, effect on average living standards. It is also likely that most of the benefits accrue to the immigrants themselves. This suggests that skilled migrants would not be systematically poorer than the resident community.

In addition, there is no association between intergenerational income mobility and immigration (Chart 6). Again, the high mobility countries of Australia, Canada, Denmark, Finland and Norway show a broad range of immigration levels. It seems that immigration explains little of Australia and Canada's experience.

Immigration may not explain the variation in mobility across countries because once migrants integrate into society the transmission of income between generations is dominated by the country's institutions rather than by country of birth of the parent. If all children are able to access good quality education, regardless of whether their parents are migrants or native-born, then they will have the opportunity to attain a high level of education and earn high income as an adult.

Chart 6: Intergenerational income elasticity and migration



Source: Corak (2006) and OECD (2006c), Table A.1.4., p 262.

Note 1: Migrant data refers to 2004, except for Germany (2003), Spain and Italy (2001) and France (1999).

Note 2: p-value for line of best fit is 0.45.

There may be supporting evidence for this in Australia and Canada where the mean PISA score for mathematics for first-generation, second-generation, and native students are higher than the OECD average each for these groups in 2003 (Table 1).⁷ For example, in Australia, first-generation students score 525 on average in mathematics, compared to an OECD average of 475 for first-generation students. Second-generation students score 522, compared to the OECD average for this group of 483. And, native students score 527, compared to an OECD average of 523.

In comparison, United States' first-generation, second-generation, and native students all score lower than the OECD average for these groups.

Table 1: Average scores for mathematics by immigrant status of student, 2003

	First-generation students	Second-generation students	Native students
Australia	525	522	527
Canada	530	543	537
Denmark	455	449	520
France	448	472	520
Germany	454	432	525
Norway	438	460	499
Sweden	425	483	517
Switzerland	453	484	543
United States	453	468	490
OECD average	475	483	523

Source: OECD 2006e, Table 2.3a, p 186.

Income re-distribution policies

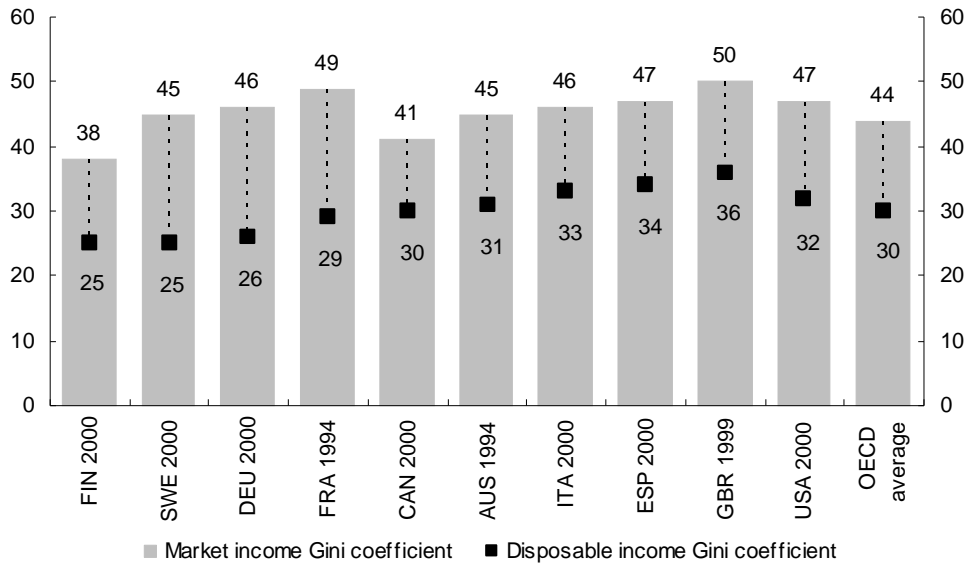
Re-distributional policies can be very effective in reducing the inequalities of market incomes. If such policies are successful at reducing inequality and if low inequality is associated with high intergenerational income mobility then a high degree of re-distribution may be associated with high mobility of income across generations.

Australia's tax and transfer system is relatively effective at reducing inequality household disposable incomes (see Chart 7). Australia's re-distribution policies reduce its market income Gini coefficient by 14 percentage points, compared to a fall of 11 percentage points in Canada and an average of 14 percentage points across 16 OECD countries (Brandolini and Smeeding 2006).

⁷ First-generation students are foreign-born with parents who are also foreign-born. Second-generation students are born in the country with foreign-born parents. Native students have at least one parent born in the country.

However, re-distribution policies are not costless. Policymakers face an ongoing challenge to balance the desire to reduce inequality with the need for incentives to ensure income increases. Policies that seek to reduce inequality, such as highly progressive income tax systems, can discourage participation in the workforce.

Chart 7: Inequality of market income and disposable income
Gini coefficients before and after taxes and benefits

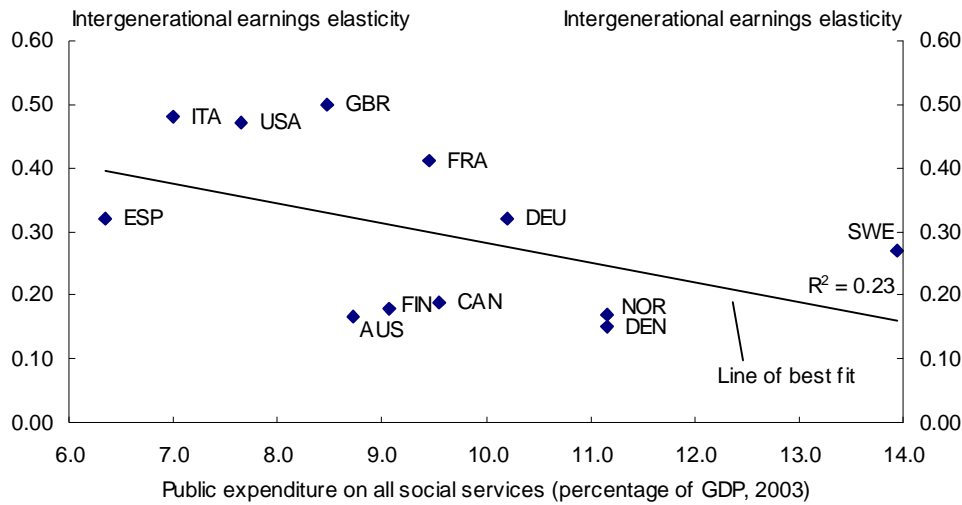


Source: Brandolini and Smeeding (2006).

On the basis of a scatter plot similar to Chart 8, cash benefits, such as unemployment benefits, are not associated with mobility. On the other hand, benefits in kind, such as public expenditure on education and health, have a weak negative association with intergenerational income elasticity (Chart 8).

However, we can see again that the high intergenerational income mobility countries, including Australia and Canada, have very different levels of social services expenditure. Income re-distribution policies would not appear to explain Australia's and Canada's experience.

Chart 8: Intergenerational income elasticity and benefits in kind



Source: Corak (2006) and OECD (2006c), Data chart EQ5.1.
 Note: p-value for line of best fit is 0.11.

Conclusion

Australia has a high level of intergenerational income mobility compared with other OECD countries for which comparable data are available. That is, the incomes that Australian children earn as adults are less dictated by the income level of their parents than in other countries. On average, disadvantage is not transmitted across generations and children have the freedom and opportunity to reach their full potential.

Income inequality in Australia is slightly higher than the OECD average (when Mexico and Turkey are excluded), but Australia's tax and transfer system is effective at redistributing income from high to low income households. Moderate income inequality reflects a relatively better matching of reward and effort.

Australia's and Canada's experience of high intergenerational income mobility and moderate inequality is unusual in the OECD.

Good minimum education outcomes appear to be a key factor explaining this experience. On the basis of the 2003 OECD PISA scores, Australian and Canadian children are receiving a good quality education relative to their peers in many other OECD countries, and therefore have a better opportunity to earn high incomes as adults.

However, Australia has a higher percentage of low performing students than Canada, which may have future implications for intergenerational income mobility. Focusing on reducing the size of the low performing tail may be appropriate.

Disadvantaged students in Australian and Canada are three times more likely to be low performers in mathematics than students from a high socio-economic background. While this is lower than the OECD average, improvements to the Australian and Canadian education systems to reduce the likelihood of disadvantaged students being low performers could be worthwhile. This may include a focus on the early childhood development of disadvantaged children.

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