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**Measuring human capital**

#### **Policy drivers for human capital measurement in New Zealand**

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Zealand**

*Summary*

This note summarises the policy issues that drive the need for human capital measurement in New Zealand. It does so by looking at the types of research and information questions that policymakers ask about human capital. These questions cover economic and social outcomes and labour market, immigration, and education policy.

## **I. Introduction**

1. The primary interest of human capital measurement to policymakers is to help understand social and economic progress. To a great extent such progress is determined by the abilities, skills, and competencies of a country's people.
2. Given the significance of human capital, its measurement is important in policy areas that include social and economic outcomes, and labour market, immigration, and education in turn. Each of these areas will be discussed in turn.
3. But first, what is human capital? The Organisation for Economic Co-operation and Development (OECD) (2001) defines human capital as "the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being."
4. Therefore though we often equate human capital with knowledge and skills, it reflects wider capabilities such as emotional intelligence, resilience, energy or drive, cultural affinity, and the ability to make social connections. However, because robust measures of these capabilities may not exist, and their value may be difficult to distinguish, we often limit ourselves to equating human capital with knowledge and skills. We proxy this with qualifications, which are themselves limited when compared with functional competencies such as literacy and numeracy (they are better than qualifications, but still partial).

## **II. Social policy**

5. For social policy the key questions in terms of human capital are:
  - (a) What are the economic and social outcomes for individuals that arise from their knowledge and skills?
  - (b) How does the distribution of human capital affect the distribution of well-being?
  - (c) How does human capital affect social mobility?
  - (d) How do parental levels of human capital affect outcomes for children?
  - (e) How does human capital affect how individuals make decisions over their lives?

### **A. Standard of living**

6. Human capital is the key determinant of individuals' economic standard of living, as it drives the earnings they receive from the labour market. Therefore it is important for policymakers to understand the relationship between human capital and the labour market. This understanding can inform key social policy issues, such as poverty, long-term unemployment, and benefit dependency.
7. Human capital affects economic outcomes through the labour market in two ways. First, higher-skilled individuals are more likely to be employed. In New Zealand there is strong evidence that education acts as a shield against unemployment over the business cycle. Second, those with greater human capital are more likely to be paid higher earnings.

8. Policymakers want to understand the relationship between human capital (skills, qualifications, and experience), employment, and earnings. Datasets that support this in New Zealand include:

(a) The Household Labour Force Survey, which allows the relationship between qualifications, employment, and earnings to be analysed. (Although this is primarily at a point in time, limited longitudinal analysis is also possible as people can be in the survey for up to eight quarters);

(b) The Linked Employer-Employee Dataset (LEED) (tax and benefit data) integrated with tertiary education administrative data, by Statistics New Zealand (NZ), the Department of Labour, and the Ministry of Education. This longitudinal, censal, dataset allows us to analyse how qualifications and labour market experience shape labour market outcomes over time;

(c) However, qualifications are only a proxy for real human capital. Earle (2010b) uses the international Adult Literacy and Life Skills Survey (ALL) to examine how qualifications and directly measured skills (literacy) affect labour market outcomes. He shows that increased literacy, without increased qualifications, is of limited benefit. An earlier study by Chapple and Maré (2000), using similar International Adult Literacy Survey data, found literacy had an independent effect (separate from qualifications) on outcomes. This shows that either there has been real change over the past decade, or there is difficulty in teasing out the relationships between these variables.

## **B. Well-being**

9. It is thought that human capital also enhances individual well-being beyond the greater income it brings. For example, knowledge could have an intrinsic value for some people, or people with higher levels of literacy may be able to more fully engage with society. Thus increasing levels of human capital can lead to higher levels of social capital. For example, more highly educated people tend to have greater civic participation, more tolerance, better health, and lower criminality (OECD, 2001).

10. It can be difficult for policymakers to measure these effects. The positive impact of human capital on people can be difficult to isolate from the impact of higher incomes. Ministry of Education researchers have attempted to identify the effect on well-being by using data from the ALL survey and the General Social Survey (GSS), a Statistics NZ survey that gathers well-being information across many dimensions.

## **C. Equity, literacy, and social mobility**

11. The past three decades have seen growing income inequality, both in New Zealand and internationally. At least some of this growth seems to be driven by increasing premiums for skills.

12. An important question that policymakers need data for is how is human capital distributed through society? Are there differences across groups (e.g. by ethnicity, gender, or region) in the distribution of human capital? Or differences in the returns that it can generate?

13. Overall, New Zealand's level of human capital compares well internationally, but it does have a wide dispersion of skill levels. Many at the bottom of the distribution have insufficient literacy skills to function fully in society. As Earle (2010b) states, "Over the last 10 years there has been a greater focus on developing the literacy and numeracy skills

of the adult population... Recent policy focus has been on developing these skills through work-place programmes and within lower-level tertiary qualifications.”

14. Policymakers are also interested in knowing the effect of background influences on people’s participation and engagement in learning. There is evidence that human capital plays an important role in social mobility, beyond that of socio-economic status. An example is the impact a parent’s level of education has on their children’s future outcomes.

15. However, this kind of analysis is difficult to do well. Gibbons (2010) outlines the intensive data requirements needed for social mobility analysis that does not rely on those interviewed remembering back to childhood (without resulting recall bias). There are few datasets in New Zealand that allow this to be done. The internationally renowned Dunedin study, headed by Professor Richie Poulton, continues to follow a cohort of people who were born in the early 1970s. The new Growing Up in New Zealand project will similarly track a cohort of people, from before birth to at least 21 years.

16. Internationally, data from the Programme for International Student Assessment (PISA) has allowed the impact of parental education on the literacy level of 15-year-olds to be estimated (though this effect may not hold into adult literacy/human capital levels).

17. Finally, in terms of education policy some key questions are:

- (a) Does the education system reduce, or replicate, inequalities in human capital?
- (b) Does the education system enable greater social mobility?

#### **D. Understanding decisions across a person’s life cycle**

18. When designing policies that involve understanding how people make decisions across longer time spans (e.g. a savings policy), it is important to take human capital into account, as this is often the most important asset people possess. Examples include:

- (a) Understanding income dynamics – the role of human capital in explaining why some people move up, and others get stuck in low-wage jobs.
- (b) Constructing a more complete picture of household net wealth – for example, including human capital as an asset to offset student loans. Scobie et al (2005) did this in analysing individual-level net worth in New Zealand. They observed that human capital significantly changed the financial picture for young adults.
- (c) Making better estimates of individual saving rates – through an individual’s investment in their own human capital.

### **III. Economic policy**

19. A strong link exists between economic performance and human capital. Earle (2010b) provides a good discussion of the relationship between education and economic performance, which can be extended to human capital. The link can be thought of in three broad ways:

- (a) Increased human capital means that the workforce is more skilled and better able to use technology and capital, which leads to greater productivity;
- (b) More human capital leads to more innovation, and improves or quickens how this new knowledge is transferred through the economy;

(c) There is also reverse causality. Strong economic performance expands the resources available for educating future populations and attracts more highly skilled migrants.

## A. Improved understanding of economic growth and productivity

20. Policymakers want to better understand how increasing the skills of the workforce translates into economic growth and productivity. Important policy questions here include:

(a) How much does economic performance improve by expanding human capital? Are there diminishing returns? How much human capital is enough? How does investment in human capital compare with other investment (e.g. physical capital)?

(b) What types of human capital should New Zealand invest in? What types of skills? (This is discussed further in the final section.)

(c) How does New Zealand's human capital compare internationally? What level of knowledge and skills is required for our country to participate in the global economy?

(d) Latest international comparisons by the OECD (2010)<sup>1</sup> suggest New Zealand has a high-skilled economy, with relatively low labour costs. Policymakers are interested in why this is so. Possible explanations include:

(i) The high skills are not resulting in higher productivity levels;

(ii) The relatively high proportion of New Zealanders with tertiary education has caused skill premiums to fall;<sup>2</sup>

(iii) The labour market is not adequately rewarding human capital;

(iv) The international comparisons are overestimating New Zealand's human capital?

(e) If New Zealand is a high-skill, low-cost economy, is this attracting foreign investment?<sup>3</sup>

## B. Innovation and knowledge transfer

21. Innovation is one way to increase productivity. Policymakers need to be able to track the extent and value of research and knowledge creation in New Zealand, and also how quickly new ideas take hold through the economy.

22. Partly to help answer these questions, and to see how innovation and knowledge transfer affects productivity, Statistics NZ has constructed the prototype Longitudinal Business Dataset (LBD). The LBD links a longitudinal version of our business register with cross-sectional business surveys and administrative sources of business data. The LBD includes data from the Business Operations Survey and the Research and Development Survey, which both provide information on innovation and knowledge transfers within businesses. In the future, the LBD will also be linked through to LEED, which contains earnings and qualification data for employees.

<sup>1</sup> Indicator A10.

<sup>2</sup> Chart A10.5 from OECD (2010) shows that skill premiums tend to fall as the skilled become a higher proportion of a country's population.

<sup>3</sup> OECD (2010) chart A10.4, which compares foreign direct investment rates and labour costs for the tertiary educated seems to suggest so.

23. The LBD will then allow the impact of innovation knowledge transfer and changes in labour quality to be measured at the business level. Policy researchers will be able to use the LBD to probe questions such as:

(a) What is the impact of highly skilled workers (e.g. those with a doctorate) joining a firm?

(b) What impact does work-based learning or on-the-job training have on productivity and on human capital accumulation?

#### **IV. The labour market**

24. Human capital interacts with the economy through the labour market – the labour market is the market for human capital. Therefore, for policymakers to understand how well the labour market is functioning they need to take account of human capital.

##### **A. Returns for skills**

25. For policymakers, returns from the labour market are important indicators of how different types of skills are valued by the economy and of the incentives that exist for people to improve their human capital. Policymakers are therefore interested in knowing how the labour market rewards human capital. For example:

(a) Are there differences for groups (e.g. sex or ethnicity) in the returns human capital generates? For example, in New Zealand women now achieve higher-level qualifications on average than men, but do not earn as much.

(b) As previously mentioned, New Zealand appears to be a developed country with relatively high skill levels, but relatively low labour costs.

(c) How do employment legislation changes affect returns for human capital? For example, how do minimum wage changes affect how different skills are rewarded in the labour market?

##### **B. Mismatches between supply and demand for skills**

26. Accounting for human capital is also important in understanding how efficiently the labour market matches the demand and supply of different types of skills. Questions that policymakers ask include:

(a) What is the link between human capital and labour market adjustment?

(b) How well does the aggregate human capital profile match the aggregate skill need of employers?

(c) Are there any subsector issues in the labour market? For example, by region or at the top, middle, or bottom of the skill distribution?

(d) Are there information problems that mean skill mismatches or shortages are not solved?

(e) Are there mismatches between skills that are possessed and needed skills (e.g. depreciated human capital – such as a programmer in a defunct computer language, who may be skilled but their skills are no longer demanded)?

(f) To what extent do labour practices, such as occupational licensing or language tests for migrants, affect the introduction of new human capital?

- (g) How do welfare institutions and incentives affect the supply of labour?
- (h) How does sickness and disability affect the supply of labour?
- (i) What are drivers of long-term unemployment?

## V. Sustainability of the human capital stock and the labour force

27. As the sustainability literature points out (Stiglitz et al, 2009, and others) human capital is one of the wealth stocks (along with physical capital and environmental assets) that need to be maintained for future generations. A measure (or measures) of the human capital stock needs to be monitored, to help ensure sustainability.

28. This monitoring would also help in constructing better measures of net national savings, such as adjusted net savings or genuine savings. In these measures, the national accounts are extended to account for human and environmental capital.

29. What will New Zealand's stock of human capital (and its labour force) look like in the future? Like other developed countries, New Zealand's population is ageing. This means that human capital is depreciating and needs to be replaced. Part of the solution is to look at retirement policies – to increase the labour market participation of older New Zealanders. Policy research needs good information on how people transition into retirement, why they transition, and how human capital can depreciate as people get older.

30. Sustainability of the human capital stock also relies on migration and how well the education sector performs. These topics are covered in the last two sections.

## VI. Migration

31. In New Zealand, the human capital stock is more affected by migration than in almost all other developed countries. Comparisons in Dumont and Lemaitre (2005) make this clear:

- (a) In the OECD, New Zealand has the fourth-highest foreign-born proportion (19.5 percent) of the population;
- (b) New Zealand has the second-highest proportion (16.0 percent) of expatriates (as a proportion of the total population);
- (c) In the proportion of the highly skilled population who are expatriates, New Zealand is equal-highest with Ireland, at 24.2 percent. This is not surprising given New Zealand's proximity to a larger, richer neighbour and the relatively low skill premiums in New Zealand.

32. This information means that the key policy questions around migration are about understanding the impact of external migration (in both directions) on the stock and composition of human capital within New Zealand. These questions link to the questions on labour market adjustment in section IV.B. Current policy is primarily aimed at attracting highly skilled workers and business people, using a points-based system.

33. To evaluate immigration policy, there are a number of key information needs:

- (a) Identify occupations that are experiencing skill shortages, which requires detailed labour market information;
- (b) Evaluate the settlement and employment outcomes for recent immigrants.

- (c) Evaluate the economic impact of recent immigrants.

34. These last two information needs led to Statistics NZ working closely with the Department of Labour to produce two new datasets. The first, the Longitudinal Immigration Survey: New Zealand, surveyed recent immigrants and their settlement experiences in New Zealand. The questionnaire was designed specifically to address policy-related information gaps.

35. A feasibility study has just begun into the second dataset. This dataset plans to integrate administrative data on migration with the LEED database, which contains longitudinal data on the labour market outcomes of all people in New Zealand. This integration should allow new types of policy-relevant research on immigrants' experiences in the New Zealand labour market, over time.

36. However, for international data comparisons, as Dumont and Lemaitre (2005) state, "the quality and comparability of international data on migration have scarcely kept pace [with increasing globalisation]". The OECD database on international migrants has gone some way to providing this information. This database depends on data from national censuses, particularly country of birth, nationality, and qualification level.

## **VII. Education policy**

37. Information for education policy decisions is particularly important. Education is the key creator of human capital – almost every question about public education policy and spending is also a question about human capital development. In addition, education absorbs a high proportion of government expenditure.

### **A. How effective is education policy?**

38. Government needs human capital measures to evaluate how well it is targeting its resources. For example, the perennial research topics that the Ministry of Education examines are:

- (a) How to balance investing in young people with investing in education over people's lifetimes?

- (b) How to balance investments across early childhood, school, vocational, and tertiary education?

- (c) How to balance investments across different fields of study? For example, between science, technology, and mathematics subjects and other subject areas; or between generic and specialist skills.

39. Ministry of Education research has shown that not all types of education create equal returns. This has led to changes in how education spending is allocated.

40. Education policymakers need to understand how people participate in study and how this is affected by the policies around entry and exit from education (e.g. compulsory school ages or access requirements for tertiary education). For example:

- (a) What are the barriers to participation in learning at all levels?

- (b) How do a person's attitudes, expectations, and perceptions affect their uptake of learning opportunities?

- (c) What pathways do people take at different times of their lives to obtain or upgrade their workplace and life skills, and their qualifications?



41. To understand these questions, policy researchers examine the relationship between human capital (different types of skills and qualifications) and labour market returns. This work is helped by datasets that include labour force surveys, international literacy surveys, surveys on well-being (such as the GSS), and LEED.

42. Researchers are closer to getting some answers. However, for the big questions, the answers for policymakers can be complicated and the lessons subtle.

## **B. Better measures of education output and productivity**

43. Finally, education is a large sector that is not well captured in either the national accounts or in productivity statistics. New human capital measurement techniques (e.g. the Jorgenson-Fraumeni method) should make answering the research questions easier, which will help give a more complete picture of economic growth and productivity.

44. This work would also improve understanding of the relative returns for public and private investment in education and training, and to what extent the returns accrue to the individual, or to society as a whole. Such understanding should help policymakers to balance public and private contributions to the education sector.

## **VIII. Implications for human capital measurement**

45. This paper has set out the policy questions that a measure of individual skill or human capital is needed to answer. Many of these questions are currently answered by using a proxy, such as qualifications. But to what extent can we improve on these proxies? This could be done by financially transforming qualifications, by directly testing for skills, or just by improving the quality and consistency of how we measure the proxies across data sources.

46. How viable are these alternative measures as analytical variables? Are they always preferable to the proxies we currently use – do they have more power in answering these policy questions? These are important questions to acknowledge and discuss at this seminar.

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