
2 Literature review

There is an extensive literature in Australia and overseas that investigates the effects of education and health on wages (or other comparable measures such as income or earnings). This chapter briefly describes some of the literature and reports the main findings relating to the effects of education (section 2.1) and health (section 2.2) on wages.

2.1 Education and wages

The influence of education on wages has been investigated extensively. Often this has been done in the context of studying other questions such as male–female wage differentials (for example, Breusch and Gray 2004; Miller and Rummery 1991), comparing full-time and part-time wages (Booth and Wood 2006), and looking at wages across different demographic groups (Creedy et al. 2000). Leigh (2007) used HILDA data to estimate the returns to different levels of education in Australia. He found that education had significant positive effects on participation and productivity. The basic approach to quantifying the effects of education and health conditions in this paper is based on these and other studies that used Australian data, and on overseas studies.

The assumption in each of the papers mentioned above is that higher levels of education have a positive effect on wages. Econometric models were specified to estimate the size and strength of the relationship. Higher levels of educational attainment are consistently found to have a positive and statistically significant effect on wages. The results from these papers suggest that people holding a degree or higher qualification earn wages between 30 per cent and 45 per cent higher than people with otherwise similar characteristics who have not completed year 12. Overseas literature supports the conclusion that higher education leads to higher wages (box 2.1).

Box 2.1 **Some overseas estimates of the effects of education on wages**

Researchers have estimated the effects of education in other countries, finding that education is related to higher wages. For example:

- Pereira and Martins (2001) carried out a meta-analysis to estimate the returns to education in Portugal and to assess the appropriateness of Mincer-style wage equations (the type of equation that was used in this paper) to inform public policy. They estimated that in Portugal in 1995 an extra year of education increased wages by around 9.7 per cent, and supported the use of education coefficients in Mincer equations as an upper bound on the benefits of education for public policy discussions.
- Bonjour et al. (2003) estimated the returns to education for women in the United Kingdom. They estimated that an extra year of education increased hourly wages by 7.7 per cent.
- Kedir (2008) found that education has a positive relationship with wages in Ethiopia, and that women experience higher returns to schooling than men.

2.2 Health and wages

The effects of health conditions on wages in Australia have been the subject of less research than the effects of education on wages. Cai (2007) and Brazenor (2002) point out the relatively small number of studies into the effects of health on labour market outcomes and attempt to fill the gap in knowledge.

Cai (2007) used a self-reported measure of general health to estimate the effect of health on male wages (box 2.2). He found that good health is positively related with wages. For example:

... compared to persons with poor or fair health, people with very good or excellent health can earn a wage 18 per cent higher. (Cai 2007, p. 17)

Cai used a simultaneous equation model to allow for endogeneity between health and wages.¹

Brazenor (2002) investigated the effect of disability status on earnings in Australia. He found that men with a nervous or emotional condition earn approximately 35 per cent less than average male income. Men who suffer from chronic pain or

¹ 'Endogeneity' refers to the possibility that as well as better health leading to higher wages, higher wages may lead to better health. The issue is discussed further in chapter 3.

discomfort were estimated to earn 15 per cent less than average, and women 10 per cent less.

Box 2.2 Measuring the effects of health status for labour market research

One issue that arises in studies of the effects of health on participation, productivity and wages is the measurement of health status. Some researchers use data based on formal diagnosis of particular medical conditions. For example, the 2003 HILDA survey asked respondents:

Have you ever been told by a doctor or nurse that you have any of the long-term health conditions listed below? [The list of conditions included arthritis, asthma, cancer, chronic bronchitis, emphysema, diabetes, heart disease and high blood pressure] (AC Nielsen 2003, p. 10)

Other studies rely on individuals' self-reported general health. Self-reported general health can be derived from direct responses to survey questions regarding a person's health status. For example, the HILDA survey asks respondents whether 'in general' they would describe their health as: 'excellent; very good; good; fair; or poor'. In the context of labour market research, this kind of health measure can be prone to 'rationalisation endogeneity', which occurs when a person uses their self-assessed health as a rationalisation for their labour market status. Cai and Kalb (2005) found mixed evidence of rationalisation behaviour in previous studies, and also found that self-assessed health status is highly correlated with diagnosed conditions.

Alternatively, measures of general health can be derived from responses to questions about how well people are able to perform certain tasks (such as climbing stairs and carrying groceries) and how they feel (for example, 'how much bodily pain have you felt during the past four weeks').

Brazenor's study comes closest to providing the estimates of interest in this project. However, Brazenor did not look at most of the chronic conditions targeted by the National Reform Agenda. Specifically, no attempt was made to measure the effects of cancer, cardiovascular disease, diabetes or serious injury on wages. Also, Brazenor used total income (less age and disability pension payments) as the dependent variable rather than hourly labour income. Total income is not a very satisfactory proxy for labour productivity, partly because total income depends on hours worked as well as wages, and includes other (non-labour) income sources.

The results reported by Brazenor (2002) and Cai (2007) are consistent with overseas literature that finds a positive relationship between good health and measures of wages, income and earnings (box 2.3).

Box 2.3 Overseas estimates of the effects of health on wages

Gambin (2005) used European data to investigate the relationship between wages and two measures of health: general self-assessed health; and whether the respondent reported having any chronic physical or mental health problem, illness or disability. She found that good health has a significant positive effect on wages throughout Europe, and that self-assessed general health has a larger effect for men's wages, while chronic illness has a larger effect on women's wages.

Jäckle and Himmler (2007) investigated the relationship between hourly wages and self-assessed health (on a 1-10 scale) in Germany. They found that there was no statistically significant relationship between health and wages for women, but that healthy men were estimated to earn between 1.3 per cent and 7.8 per cent more than those in poor health.

Pelkowski and Berger (2004) used US data to investigate the effects of temporary and permanent health conditions on the wages and hours of work of men and women. They found that temporary health conditions have no significant effect on labour market outcomes for men or women. Permanent health conditions are associated with a reduction in wages of between 4.2 per cent and 6.4 per cent (for men) and 4.5 per cent and 8.9 per cent (for women). Hours worked decline by between 6.1 per cent and 6.9 per cent (men) and 3.9 per cent and 4.5 per cent (women).

Andren and Palmer (2004) investigated the effects of past illness on current earnings in Sweden. They found that people who have had a long spell of sickness in previous years have lower earnings than people who have no record of long-term sickness. Andren and Palmer accounted for age in their model, but did not account directly for work experience.

Marcotte and Wilcox-Gök (2001) estimated that in the United States mental illness is associated with a decline in annual income of between US\$3500 and US\$6000.

Kedir (2008) investigated the relationship between height, body mass index (BMI) and wages in Ethiopia. Height and BMI were used as indicators of nutrition and general health, and were found to be positively correlated with wages (although women at the upper end of the wage distribution were found to suffer a wage penalty related to higher BMI).