



Full length article

The relationship between labour force status and educational attainment: Evidence from a system of simultaneous equations model

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HIGHLIGHTS

- This study presents a model of the joint determination of labour market status and educational attainment.
- It employs a cross-sectional simultaneous equations model for the Australian labour market.
- This study found that there is a feedback effect between educational attainment and labour market conditions.
- Previous studies that ignored the reverse effects and used a single equation model may have produced biased estimates.
- This paper contributes to the literature by estimating the reverse causality of the relationship between education and labour supply.

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ABSTRACT

This study presents an estimate of the joint determination of labour market status and educational attainment in Australia using cross-sectional data collected by the Australian Bureau of Statistics. This paper is based on the premise that achieving an increasing level of educational attainment and labour supply does not happen in isolation, rather they are determined jointly. Applying a simultaneous system of two-equations model, the study finds that there is a feedback effect between educational attainment and labour market status. In the labour market equation the effects of achieving a higher educational attainment on the probability of being employed has been statistically significant and the effect is negative. Thus, previous studies that ignored the feedback effects and used a single equation model have produced biased and inaccurate estimates of the effects of educational attainment on labour market outcome.

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1. Introduction

The Australian Government's higher education policy – following the Bradley Review in 2008 – announced a target of 40% of all 25–34 year olds would be holding a bachelor degree or higher by 2025 (Gale and Parker, 2013). However, the Australian higher education sector faces falling short of the target because of a lack of aspiration among high school students (Carvalho,

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2015) to progress to higher education. Of late in the Australian labour market the youth unemployment rate has reached its highest level since mid-2008 (Gale and Parker, 2013). This macroeconomic phenomena has raised an important policy issue: does higher educational attainment affect labour market status? The answer to this question is under-researched in Australia, although the literature provides evidence of both positive and negative relationships between educational attainment and labour supply (or labour market status) in some countries.

Human capital theory (Mincer, 1958; Becker, 1964) or human capital effects (Le and Miller, 2000) suggest that higher educational attainment is likely to lead to better labour market outcomes. However, the opportunity cost theory suggests that unemployment causes an increased level of educational attainment because of the low opportunity costs of further education. An individual may decide to remain at school until the benefit derived from an additional level of education (i.e., marginal benefit) exceeds the marginal cost of education. The marginal benefit depends upon return(s) from work in the labour market, which is measured by labour market wage or income, and the marginal cost is measured by the opportunity cost plus the direct cost of schooling. If there are sufficient work opportunities, the marginal cost of an additional degree will be higher than the marginal benefit. Therefore, theoretically, a person may prefer work to education. Furthermore, the 'parking lot' hypothesis (Ballarino et al., 2013) states that a shortage of employment opportunities can lead to increased participation in education for an additional degree or qualification, when the unemployed person remains in the education sector and waits for proper job offers without increasing labour productivity. Therefore, the relationship between labour market status and educational attainment requires an investigation by applying both theories of human capital and opportunity cost (the parking lot hypothesis) simultaneously. In this paper, we examine this relationship econometrically by applying a system of simultaneous equations models.

Using cross-section data for 16-year-olds in Great Britain, Micklewright et al. (1990) found that unemployment affected the decision to leave school positively. Some researchers found a positive relationship between employment status and participation in education. Kodde (1988) analysed the demand for education within the framework of Becker's human capital theory (Becker, 1964), and that was extended by employment prospects at the macro level. The study found substantial empirical support for the theory that high unemployment, by itself, does not drive youths towards additional education, but that youths strive for more education in order to improve their employment prospects. However, contrasting evidence was provided by Rice (1998) with respect to English and Welsh data, and Pastore (2012) with respect to Polish data.

Rice (1998) examined the influence of labour market conditions on the decision to invest in further education among 16-year-old people in England and Wales. Using data from cohort studies in England and Wales and a binary probit model, this study showed that the unemployment condition is positively related with the decision to invest in further education in England and Wales because of decreasing opportunity costs of remaining in full-time education. The study further concluded that the effect was high at the time of economic recession and when unemployment rates were rising. In the context of Ireland, Flannery and O'Donoghue (2009) made similar findings. They concluded that during the time of economic recession, because of the low opportunity cost of education and the high unemployment rate, participation in higher education was high.

Pastore (2012) provided new evidence regarding the relationship between labour market conditions and increasing educational attainment. The researcher examined the relationship in Poland using the Heckman probit model and data from a Polish household survey. The underlying assumption of the study was that undertaking education and participating in the labour market are endogenous. The study provided evidence that the unemployment rate had a consistently negative rather than positive effect on pursuing further education. Furthermore, Jensen (2012) found evidence that employment opportunities affected young women's desire to undertake further education in India.

These studies methodologically used a discrete multivariate technique without considering the simultaneity between participation in education and labour supply, although the issue of a simultaneous relationship between labour supply and participation in education (or enrolment) has been discussed in the literature (see Gustaman and Steinmeier, 2001 for details). Based on Gustaman and Steinmeier's methodological prescription, in this study we control the simultaneity issue in examining the effect of labour market status on educational attainment in Australia. We have used a system of simultaneous equations models to capture this relationship. The justification of using the simultaneous relationship is that the two choices – investment in education and employment status in the labour market – are not independent (Pastore, 2012). Changing conditions in the labour market may influence an individual's decision to undertake education (Micklewright et al., 1990). Indeed, depressed conditions in the labour market (such as a prevailing high unemployment) may even encourage individuals to remain in or return to education. This is because individual life cycles suggests that individuals, as utility maximizers, are free to allocate their daily time to work, education and leisure, and they choose a level of education to maximize that utility (Blinder and Weiss, 1976). Further, an individual may decide to undertake higher education and to work simultaneously. It means there is a correlation between the error structures of the two models. For example, many students in Australia work while studying because of financial constraints and/or a willingness to gain work experience before starting a career (ABS, 2013a). Consequently, an individual's motivation to work and to undertake education progressively are not independent of each other. This may be determined jointly. Therefore, labour market status (employment vs unemployment) may have a feedback (or reverse) effect on educational attainment.

Theoretically, undertaking education is simultaneously a consumption and an investment (Gertler and Glewwe, 1990). An individual's investment in (or consumption of) education requires a substantial amount of resources over the life of an individual. Therefore, there might be a potential two-way relationship between an individual's income or participation in the labour market and the decision to undertake education. This concept of reverse effect refers to a two-way relationship

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