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Birth weight and schooling and earnings: estimates from a sample of twins

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Abstract

Based on analysis of a sample of twins, this study suggests that birth weight is not related to levels of schooling, that it plays only a minor role in the determination of earnings, and that ability differences that are not removed in the within-twins model of earnings are not biasing the results in twins studies such as Ashenfelter and Krueger [Ashenfelter, O., Krueger, A., 1994. Estimates of the economic return to schooling from a new sample of twins, American Economic Review, 84(5) pp. 1157–1173].

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1. Introduction

Earnings are influenced by a wide range of factors, though the main ones of interest appear to be ability, environment, schooling and experience. Various approaches have been taken to assess the roles these play and one that has stimulated considerable interest in the recent literature uses samples of twins.

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Ashenfelter and Krueger's (1994) study of the increments in earnings associated with extra schooling for identical twins in the US labour market led them to conclude that family and genetic effects make virtually no contribution to the returns to schooling. Their research has been replicated for the US (Ashenfelter and Rouse, 1998; Rouse, 1999) and other countries (see Miller et al., 1995 for study of Australia and Isacsson, 1999 for study of Sweden).

The approach taken in these studies has been questioned by several authors. One important line of criticism suggests that Ashenfelter and Krueger's (1994) findings may be adversely affected by ability differences between identical twins that are not removed in the fixed effects model and which are correlated with twin differences in years of schooling (Neumark, 1999; Bound and Solon, 1999). Moreover, any ability differences between identical twins that remain in the fixed effects model are shown by Neumark (1999) to be associated with greater biases in Ashenfelter and Krueger's (1994) within-twins IV model than in the standard within-twins estimator.

This has led to search for measures of the ability differences between identical twins that remain in the fixed effects model. Two possibilities that have been considered are birth weight (Neumark, 1999) and birth order (Ashenfelter and Rouse, 1998).

This paper presents further analyses of the links between birth weight and schooling and earnings using a sample of Australian identical twins. It is structured as follows. Section 2 outlines the data. Section 3 presents statistical analyses of the links between birth weight differences within twin pairs and differences in schooling and earnings outcomes. Section 4 contains a summary and conclusion.

2. The Australian twins survey

The sample of twins analysed in this study are identical twins in the young adult cohort of the Australian Twin Register. They constitute a volunteer twin panel born between 1964 and 1971. Nearly all were first registered with the panel between 1980 and 1982 by their parents. As with the data analysed by Ashenfelter and Krueger (1994), Miller et al. (1995) and Ashenfelter and Rouse (1998), each twin provided reports on both their own level of education and on that of their co-twin. This permits application of the IV estimators proposed by Ashenfelter and Krueger (1994). Moreover, for about one-half of the sample, there is information on birth weight. Again, each twin reported on both their own birth weight and on that of their co-twin.[1] Further details are presented in Le et al. (in press) and Miller et al. (2004).

The identical twins included in the study range in age from 23 to 36 years. The mean age is 30 years. On average the twins have almost 14 years of schooling. The sample is reasonably evenly balanced between males and females, and also between twins who are married and those who are not married. Around 80% of the twins were employed on a full-time basis.[2]

Birth weight is measured in ounces in this analysis: in comparison, in studies such as Conley and Bennett (2000) and Boardman et al. (2002) the emphasis is on binary indicators of very small birth

[1] While there is information on birth weight for about one-half of the sample, imposing the requirement that there must be valid birth weight data for both members of a set of twins reduces the usable sample to around one-third of the larger sample used in analyses of these data by Miller et al. (2004).

[2] To omit part-time workers would require omitting sets of twins where either member was employed on a part-time basis. Fully 30% of the sample would be lost if such a sample selection criterion were applied.