Child Labour's effect on long-run earnings: An analysis of cohorts

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ABSTRACT

The effect of child labour on wages in adulthood is conceptually ambiguous. Children who work learn responsibility and work-ethic, increasing adult earnings. However, working children have less time for play and homework, hindering cognitive development, resulting in lower earnings. The limited existing empirical work is similarly confounding. This paper assesses the nexus between child labour and adult earnings using unique data from an Ecuadorian 2015 labour market survey. It applies novel instrumental variable regression techniques that account for earnings, education and child labour being jointly determined. The sample is divided into age cohorts (20s, 30s, 40s and 50+) to ascertain the long-run consequences of child employment at different stages of life. The results suggest that former child (and teenage) workers earn significantly less per hour. The analysis of cohorts reveals that the effect is stronger for older workers. This gives impetus to the hypothesis that child work hinders cognitive development, which becomes more evident when workers reach full maturity. The study concludes with policy recommendations.

1. Introduction

Do former child workers earn significantly less as adults? On the one hand, children who work have the potential to learn important lessons about socialisation, working with others, responsibility, vocational training, job market strategies and work ethic that could increase their earnings in adulthood (Rodgers and Standing, 1981). Moreover, child labour could also increase informal human capital accumulation though apprenticeship, which could result in higher earnings.[2] Further, as standard wage equations show that work experience results in increased wages, the long-run returns from a year of work experience may be greater than the returns from a year of schooling, particularly if schools are of poor quality (Ilhai et al., 2001). Empirical evidence from Brazil and Vietnam suggest that this is certainly possible. Emerson and Souza (2011), for example, find that although former child workers in Brazil earn less as adults, the effect becomes positive for those entering the labour market as teenagers – after the ages of 12 to 14. Similarly, Beegle et al. (2009) find that former child workers in Vietnam are more likely to be employed in wage labour five years later.

On the other hand, however, working children have less time for play, which hinders their cognitive, physical, social and emotional development, which, in turn, could result in worse labour market outcomes in adulthood (Ginsburg, 2007). Indeed, previous evidence

suggests that playtime is conducive to cognitive development and superior learning outcomes, which could translate to labour market success later in life (Pellegrini and Bohn, 2005). Furthermore, Akabayashi and Psacharopoulos (1999) and Zabaleta (2011) find evidence that children's work hinders educational achievement in Tanzania and Nicaragua, respectively. Working children, for example, are less likely to have time for homework. In turn, lower educational achievement and human capital development can potentially affect earnings in adulthood. Both Ilhai et al. (2001) and Emerson and Souza (2011) find evidence to suggest that individuals in Brazil that began working before the age of 13 earn less as adults.

These ambiguities, particularly the finding in Emerson and Souza (2011), suggest that further evidence on the nexus between child labour and adult earnings is warranted. This study addresses this issue with a unique labour market survey conducted in Ecuador in 2015. Ecuador makes for a useful case study because it is an economy with typical frequencies of child labour within Latin America, where the issue remains rampant because of serious resource constraints that prevent the enforcement of child labour laws (DOL, 2014). Furthermore, the 2015 survey has information about the working history of individuals, which can allow for analyses of the consequences of child labour later in life. This is important given that the growing policy interest in eradicating child labour across countries should be

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coupled with a growing understanding of its consequences.[3] Finally, Ecuador is a country with relatively little research into its labour market even though it is ranked among the poorest countries within the Latin American region. Fig. 1 presents data on children (boys and girls) aged between 7 and 14 in employment averaged over the period 2002 to 2012. The figure shows that in most of the region's countries, approximately 10 per cent of children work. Further, the figure shows that Ecuador is representative of the regional median.

The Ecuadorian survey gathered comprehensive labour market information, including the year at which a person began employment. The empirical strategy is to divide the sample of respondents into age cohorts (people in their 20s, 30s, 40s and 50 plus) to better ascertain the long-run consequences of child employment at different stages of life. This is important, as the results in previous studies, which pooled cohorts together and controlled for age, might have been driven by particular cohorts. For example, labour markets could reward education over experience more for younger than older workers. Alternatively, cognitive differentials between former child workers and others may become more evident among older, more mature, workers. This is particularly true when considering psychological evidence that suggests that cognitive development continues until individuals' mid-20s (Pujol et al., 1993). Furthermore, the relationships evident at different life stages could be potentially different for both former child as well as teenage workers.

The econometric strategy focuses on fitting a Mincer equation augmented with a former child-worker indicator. This model is estimated using OLS as well as with a novel instrumental variable (IV) technique proposed in Lewbel (2012) that controls for unobserved omitted variables that could affect earnings as well as educational and child work choices, such as ability, using internally-constructed instruments. The generation of internally-constructed instruments is useful in applied microeconomics because the exclusion restrictions needed to justify the use of traditional instruments are often difficult to meet, particularly when the number of potential endogenous variables is large (as in the present study) (Belfield and Kelly, 2010; Emran and Shilpi, 2012; Awaworyi Churchill and Mishra, 2016; Mishra and Smyth, 2015).

The results suggest that individuals who were once child (and teenage) workers earn significantly less per hour. Furthermore, the analysis of cohorts reveals that this effect is stronger for older workers. It is argued that this gives impetus to the notion that there are psychological costs associated with child labour, such as lessened cognitive development, which become more evident for more mature workers. Therefore, it is later in life that differences between former child workers and others may become more obvious, which could push the labour market to make more significant earnings adjustments.

An important limitation of this study, as well as previous studies in this field, is that the available data makes it impossible to distinguish between different types of child labour. There are, of course, several forms of child employment, some hazardous, some in the agricultural sector, some in urban areas, as well as jobs in modern or traditional industries, to name a few (Galli, 2001). In that regard, the type of work could potentially have markedly different effects on adult earnings. Therefore, the results in this study must be interpreted with caution and seen, perhaps, as much generalised results of the effects of child labour on adult earnings.

The remaining of this paper is structured as follows. The next section presents the empirical strategy. Section 3 discusses the data, while Section 4 presents the results. The final section provides a conclusion.

2. Empirical strategy

Following convention in the literature, this study estimates a reduced-form Mincer equation of labour market earnings (logged earnings per hour). A significant proportion of the literature aims to explain labour market outcomes, particularly income, using a large array of variables, with education and experience being the most popular (Lemieux, 2006). This study employs a set of variables that is both informed by previous research and available in the data set.

Accordingly, this paper estimates a Mincer wage equation in the following form:

$$lnY_i = \beta_1 CL_i + \beta_2 A_i + \beta_3 E_i + \beta_4 G_i + \beta_5 Loc_i + \beta_6 Mar_i + \beta_7 Eth_i + \varepsilon_i, \quad (1)$$

where Y is earnings, A is age, E is the level of education, G is gender, Loc is location, Mar is the marital status and Eth is ethnicity. Finally, the term ε represents an idiosyncratic error. In this paper, Eq. (1) is augmented with the variable CL, which is a dummy variable equal to 1 if the respondent identified that he or she worked as a child. This variable comes from a survey question that asked about the age at which the individual started working. The variable CL, therefore, captures individuals who worked during their first 17 years of life. In robustness tests, this variable is divided into those individuals who worked when they were 12 or younger and those who worked as teenagers (between the ages of 13 and 17). The latter is important for testing whether the quadratic relationship found in Emerson and Souza (2011) is also evident in Ecuadorian data.

As mentioned above, Eq. (1) is estimated for separate cohorts (respondents in their 20s, 30s, 40s and older than 50) to ascertain whether the child labour effect is driven by younger or older workers. As a robustness test, Eq. (1) is also estimated in a traditional sense, which pools cohorts together and controls for age and age squared.

The equation is estimated using OLS, augmented with 25 province-level fixed effects, which control for omitted characteristics, such as weather, altitude, and more general agricultural factors, which can influence earnings.[4] Additionally, the regression clusters standard errors at the municipality level.[5]

In interpreting Eq. (1), economists often argue for caution because of an unobserved ability bias. This bias suggests it is difficult to ascertain whether the higher earnings experienced by better educated workers result from higher education, or simply reflect individuals with a higher earning capacity choosing to attain higher levels of education (Card 1999; Heckman et al. 2006). Harmon et al. (2003), for example, argue that students with greater ability, such as IQ, are likely to receive more schooling and also receive higher income. This could result from a correlation between schooling and wages that does necessarily reflect a causal link. If this is the case, then the standard Mincer model would give biased results. On a similar note, as Emerson and Souza (2011) argue, the child labor choice could suffer from a similar bias if households with high-ability children choose to send their children to work at a younger (or older) age. For example, parents of children with higher ability may expect a lower opportunity cost of child labour in terms of say, school grades, and may, therefore, ask their children to begin work at an earlier age. Alternatively, it is difficult to determine whether child workers are possibly less likely to finish school because they work or whether those individuals who are less likely to finish school because of unobserved factors (such as ability) may be more

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[3] Sustainable Development Goal 8 aims at eradicating all forms of child labour by 2025.

[4] The Ecuadorian statistical agency classified zones into the country's 24 provinces plus a smaller 'not defined area', *El Piedrero*, which from 2016 has been an Ecuadorean territory that is not assigned to any province. The area lies between the provinces of Guayas and Cañar.

[5] An alternative approach would be to include municipality fixed effects. Unfortunately, however, the inclusion of 587 municipality fixed effects sacrifices the degrees of freedom in the regression significantly and presents estimation difficulties. The use of clustering, however, is justifiable given that this method also considers the fact that unobserved variables from a given municipality are correlated (Nichols and Schaffer, 2007).