Economic Modelling xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Economic Modelling

journal homepage: www.elsevier.com/locate/econmod

Child labour and human capital in developing countries - A multi-period stochastic model☆

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ARTICLE INFO

JEL classification:
D60
I26
N35

Keywords:
Child labour
Human capital
Education policy
Financial inclusion

ABSTRACT

This study investigates the co-determination of child labour and human capital acquisition through a life cycle model. It explores three categories of households with zero, ten and fifteen years' education of household heads who also have differential access to financial markets. Results show that financially excluded, uneducated households prefer assets with negative returns over human capital investments in their offspring, and hence fall into an intergenerational poverty trap. Their educational investments begin only after an income threshold is reached and the same may be funded through transfers or withdrawal of educational subsidies from college educated households without lowering their human capital investments. Educational subsidies and higher access to educational inputs work best for middle educated households who have higher demand for education. For policy analysis, this study quantifies the contributions of income support, financial inclusion, lower uncertainty and subsidised education in reducing the supply of child labour.

1. Introduction

Why are some countries poorer than others? This question has been at the centre of a fecund research agenda in the field of economic growth and development. Whilst recognizing the role played by culture, geography, natural resources, government, openness, and institutions, the differences in growth across nations are factored into differences arising from the accumulation of physical capital, technology, and human capital. With regard to human capital, it has been documented that countries with higher per capita output have a more educated population (Mankiw et al., 1992). However, this does not translate into a straightforward policy guideline that countries should focus their energies on better educational systems as that is associated with larger output per capita. This is because it disregards the point that it is individuals that make choices with regard to investments in human capital under the influence of different forces and constraints.

Human capital investments are usually made in the early stages of the life cycle when children are not free agents and their parents decide for them. Regions of the world with low levels of income also have a high incidence of child labour and this impedes the ability of children to receive an education and accumulate human capital (Strulik, 2004; Basu and Tzannatos, 2003). Posso (2017) shows that children engaged in child labour earn significantly lower than their peers as adults. It is therefore important to study household decision making with respect to human capital investment and child labour in a unifying framework in order to understand an important part of the dynamics of economic development.

In the literature, some of the early models on family influence and human capital acquisition[1] were developed by Becker and Tomes (1979, 1986) and Loury (1981). These studies incorporated altruism and credit market imperfections and contributed towards understanding the role of initial conditions in determination of income mobility across generations. Galor and Zeira (1993) showed the existence of multiple steady states in the presence of credit market imperfections and non-convexities in human capital investments. Among the multi-period quantitative models which this study focusses on, Aiyagari et al. (2002) developed a framework incorporating altruism and incomplete credit markets to show that credit constraints and lack of insurance do not necessarily lead to underinvestment in human capital. Cunha and Heckman (2007) have looked at the technology of capability development while studies like (Keane and Wolpin, 2001) and Lochner and Monge-Naranjo (2012) have investigated the presence of borrowing

☆ The authors would like to thank Professor Sushanta Mallick, Editor, and the anonymous reviewers for their comments. The authors would also like to thank Professor Partha Sen, Professor Chetan Ghate and seminar participants at ISI, Delhi for their constructive feedback. All remaining errors are solely the authors' responsibility.

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[1] related literature but not the focus of this study explores fertility decisions along with human capital (Becker et al., 1990; Hazan and Berdugo, 2002; Doepke and Zilibotti, 2005; Galor and Moav, 2002; Moav, 2005)

http://dx.doi.org/10.1016/j.econmod.2017.09.006
Received 6 March 2017; Received in revised form 8 September 2017; Accepted 9 September 2017

constraints in influencing college education.[2] Other models (Caucutt and Kumar, 2003) have introduced uncertain pay-offs in human capital acquisition and the role of early investment period in children in determining later period college decisions (Restuccia and Urrutia, 2004).

While the multi-period quantitative studies with focus on developed countries do not find a strong impact of market imperfections on human capital outcomes, the same may not be true for developing countries where banking access is limited to only 30% of the households and due to extreme poverty, instead of investing in the human capital of children, households are forced to rely on their labour to augment the low family income.

This study's innovation is the provision of a framework to enable us to consider how income, child labour and investment in human capital are co-determined in the backdrop of poverty, uncertainty, parental altruism, differential access to financial markets and human capital investment constraints. Through a novel seventy period discrete time[3] life cycle model the study attempts to track household decisions on present/future consumption, and child labour versus various types of human capital acquisition from time and non-time educational inputs. This study's extension of the literature is in the joint consideration of risky income and returns to financial savings, as well as differential access to finance and human capital investment options. This study's framework enables an understanding of the importance of income deficiency as separate from financial exclusion or high cost of education as a determinant of child labour and participation in an educational institution.

To account for differences in education of the head of the household, the study works with three types of households: those where the head is either uneducated, or, has completed a secondary school education, or, has completed an undergraduate degree. In line with studies that link financial access with levels of education, this study associates an uneducated head of household with financial exclusion, the secondary school educated head of household with access to a bond market, and the college educated head of household with access to both bond and stock markets. Sensitivity analysis with respect to education and income provide confidence to the discrete choice of levels of education and financial access.

The study also examines the consequences of various policy interventions which aim to limit if not eliminate child labour. Lack of financial inclusion has been advanced as a reason for child labour being inefficiently high (Baland and Robinson, 2000) as parents can neither borrow nor have sufficient assets to sell. Child labour has also been reported to increase with the cost of access to education. The study examines the impacts of various types of policies such as income support, higher returns on savings, discounts and subsidies on the costs of educational inputs such as books, improvements in access to education, and self financed loans to households, on the supply of child labour and participation in an educational institution.

In the literature on human capital and child labour, the impact of wage income on parental investments in childrens' human capital and child labour are considered in a deterministic scenario. For example, Basu and Van (1998) look at the effect of a reduction in the adult wage and predict that this results in sending children to work. The study extends the analysis to a dynamic setting where wage income is assumed to be stochastic. The study finds that an increase in the risk to income has no impact on the schooling of children from families where the head of the household has no education. Such a family responds by increasing precautionary savings and reducing pre-school consumption that affects the early stage development of children. Households where the head has a secondary school or college education respond with more financial savings as well as an increase in human capital investments.

The study extends the literature by inquiring into how financial access affects the acquisition of human capital of the young. Earlier studies have shown how financial widening positively affects education (Dehejia and Gatti, 2005). This study shows that this result does not hold for those families where the head of household is uneducated. This study argues that it is low income and not financial access that influences the decision of this type of family. Financial access to bond markets affects the uneducated household asset holding and increases later period consumption. For other households who already had financial access, the increase in the portfolio of assets they can save in results in an increase in human capital investment as well as consumption.

Subsidies on the cost of education such as cheaper books are seen to induce middle income households with prior financial access to invest more in human capital. The study shows that these subsidies can be financed by transfers from college educated households without affecting their decisions regarding investments in human capital. However, the study finds that even completely financed educational resources are not strong enough to induce the uneducated household category to send its offspring to school.

Our results support some of the empirical findings in the literature whilst providing some new insights. For instance, the income effect of human capital investment is brought out in Edmonds and Schady (2012) who show that the extent of child labour falls with cash transfers. Transitory negative income shocks have been reported to reduce schooling and induce child labour in the studies of Edmonds (2005); Edmonds and Turk (2002); Kazianga (2005); Beegle et al. (2006) & Bandara et al. (2015). In addition, studies such as Baland and Robinson (2000); Ranjan (2001); Alvi and Dendir (2011) document that when external credit is unavailable and households are financially excluded, they make children work rather than invest in human capital. The role of education subsidies in the form of free uniforms, text books, scholarships, and fee exemptions in promoting school enrolment is a feature of studies such as Kremer et al. (2002, 2009) and Grogan (2009). Other studies have explored the impacts of trade liberalization (Jafarey and Lahiri, 2002), labour market reform and inflow of foreign capital (Chaudhuri, 2011; Dwibedi and Chaudhuri, 2010), migrants' remittances (Bouoiyour et al., 2016) and child wage subsidies (Estevez, 2011) on child labour.

Results of this study present important policy implications for stimulating the human capital investments of different household categories. The financially excluded uneducated households are seen to prefer financial assets with negative real returns over human capital investments in their offspring and consequently fall into an intergenerational poverty trap. While policies like financial inclusion and free educational inputs are ineffective, only income support which pushes the household beyond a minimum income threshold is effective in starting educational investments of this household category. Such income doles may be funded through direct transfers or withdrawal of educational subsidies from college educated households, in which case one college educated household can start educational investments of 10.9 and 2.4 uneducated households through these policies respectively. Simulations indicate that households with secondary level of education of the household head and access to basic financial services, display higher preference for human capital investments over financial savings. For these households, targeted policies like subsidized education and access to more educational resources are much more efficient in raising human capital than income support. While stock market participation increases human capital acquisition by 5.8% and life cycle loans impact it positively with elasticity of 2.23, subsidised higher returns on savings is not that effective as it is seen to promote child labour in this household category.

This study's work indicates the importance of extending the framework in future towards understanding decision making that includes

[2] see also Todd and Wolpin (2003); Cunha and Heckman (2008); Lee and Seshadri (2014); Carneiro and Heckman (2002)

[3] The choice of the span of the time period is to mimic the life expectancy associated with a typical household in the developing world