Why do Parents Underinvest in their Children’s Education? Evidence from China

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Introduction

• The traditional theory predicts that the optimal amount of human capital investments is determined by equating its marginal returns to the market return (see e.g. Becker (2009)).

• Many papers, however, found that parents often underinvest in the human capital of their children, especially in developing countries such as China (Psacharopoulos, 1985; Heckman, 2005).

• In this paper, we extend the theoretical model of (Raut and Tran, 2005) by including parental liquidity constraints and fixed costs of investment as two potential explanations for the underinvestment in education.

• First, binding liquidity constraints might prevent the parents to invest sufficiently in the education of their children (see e.g. Bartham et al. (1995)).

• Second, parents might face fixed costs when they perform such investments. One can think of the costs when the households have to pay for the children’s preparation for the college entrance examination.

Model

• We extend the models from (Raut and Tran, 2005) by incorporating liquidity constraints faced by parents and educational fixed costs. The lifetime utility and budget constraint of the parent are:

\[
\begin{align}
&\max_{\upsilon, \gamma} \mathcal{U}(\upsilon, \gamma) \equiv \beta \mathcal{U}(\upsilon(1), \gamma) \\
&\text{s.t.} \quad \upsilon(1) = \mathcal{E}_1 - \left(\bar{S} + \gamma \mathcal{H}\mathcal{C} \right) + \gamma \mathcal{C} \mathcal{H} \mathcal{E} \mathcal{C} \mathcal{H} \mathcal{E}
\end{align}
\]

• For solving the budget constraint, we have the optimal level of human capital investment

\[
\frac{\partial \mathcal{E}_1}{\partial \upsilon} = \frac{1 + r}{\beta} \left( \frac{\mathcal{E}_1}{\gamma} + \frac{\mathcal{H}\mathcal{C} \mathcal{H} \mathcal{E} \mathcal{C} \mathcal{H} \mathcal{E}}{\gamma} \right)
\]

• and optimal old-age transfer from children to parents under fixed costs:

\[
\mathcal{T}_2 = \left\{ \begin{array}{ll} \gamma_1 = \gamma_1(\gamma_1, \gamma_2) & \mathcal{E}_2 + \gamma_2 \mathcal{H}\mathcal{C} \mathcal{H} \mathcal{E} \mathcal{C} \mathcal{H} \mathcal{E} = \gamma \mathcal{C} \mathcal{H} \mathcal{E} \mathcal{C} \mathcal{H} \mathcal{E}, \frac{\mathcal{E}_2}{\mathcal{E}_1} \beta \mathcal{C} \mathcal{H} \mathcal{E}, \frac{\mathcal{E}_2}{\beta}, (0, \beta) \end{array} \right.
\]

Data

• We draw data from the China Health and Retirement Longitudinal Study (CHARLS) 2013

• The core of the data is household information used to construct various economic indicators and characteristics of children

Empirical Strategy

• To empirically test liquidity constraint, we predict children’s marginal returns $MR$ to human capital investment and use the following specification

\[
MR = \beta_0 + \beta_1 HHLifetimeIncome + \beta_2 HHLifetimeIncome \times Age + \beta_3 HHNetIncome + \beta_4 HHNetIncome \times Age + \beta_5 HHNetIncome \times Years of Schooling + \beta_6 HHNetIncome \times Female
\]

• To empirically test fixed costs, we directly translate model (4) into an econometric model

Empirical Results

\[
\begin{array}{lcccc}
\hline
\text{VARIABLES} & \text{MC (Years of College Spending)} & \text{MC (HR Investment)} \\
\text{PARAMETERS} & \text{P-values} & \text{P-values} \\
\hline
\text{Liquidity Index} & 0.219 & -0.240 \\
\text{HH Income} & 0.0001 & 0.179 \\
\text{Years of Schooling (Parent)} & 0.00046*** & 0.00082*** \\
\text{Num. of Children} & 0.00073*** & 0.700*** \\
\text{HH Income \times Liquidity Index} & 0.00094 & 0.0352 \\
\text{HH Income \times Years of Schooling (Parent) \times Liquidity Index} & 0.000064 & 0.0209 \\
\text{HH Income \times Years of Schooling (Parent) \times Fixed Costs} & 0.000127 & 0.0254 \\
\text{HH Income \times Years of Schooling (Parent) \times Fixed Costs} & 0.00072 & 0.165 \\
\text{HH Income \times Years of Schooling (Parent) \times Fixed Costs} & 0.01016 & 0.0762 \\
\text{HH Income \times Years of Schooling (Parent) \times Fixed Costs} & 0.00315 & 0.0278 \\
\hline
\end{array}
\]

References


Table 1: Tests for Liquidity Constraint

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>MC (DependOnChild) Parameter Estimates</th>
<th>P-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.10-25***</td>
<td>0.00442</td>
</tr>
<tr>
<td>Age Squared</td>
<td>0.10-25***</td>
<td>0.00011*</td>
</tr>
<tr>
<td>Years of Schooling</td>
<td>0.10-25***</td>
<td>0.00001*</td>
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<tr>
<td>Num. of Children</td>
<td>0.10-25***</td>
<td>0.00001*</td>
</tr>
<tr>
<td>Child Agr. Index</td>
<td>0.10-25***</td>
<td>0.00001*</td>
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<tr>
<td>Income</td>
<td>0.10-25***</td>
<td>0.00001*</td>
</tr>
<tr>
<td>HH Income</td>
<td>0.10-25***</td>
<td>0.00001*</td>
</tr>
<tr>
<td>Fixed Costs</td>
<td>0.10-25***</td>
<td>0.00001*</td>
</tr>
<tr>
<td>Observations</td>
<td>12,800</td>
<td>7,200</td>
</tr>
</tbody>
</table>

Table 2: Tests for Fixed Costs

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\[
\begin{align}
&\text{MR} = \beta_0 + \beta_1 HHLifetimeIncome + \beta_2 HHNetIncome + \beta_3 HHNetIncome \times Age + \beta_4 HHNetIncome \times Years of Schooling (Parent) + \\
&\beta_5 HHNetIncome \times Female
\end{align}
\]