Crowding Out the Shadow: Effect of School Expansion on Private Supplementary Education in Taiwan

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Introduction

Students in Taiwan often spend considerable amount of time in after-school private tutoring. Reformers in Taiwan have long argued building more schools would reduce the stress of students trying to get into those schools. Starting from 1994, the Taiwanese government implemented a series of education reforms. One of the policies implemented was to increase the number of high schools.

However, many researchers have concluded the education reform a failure when they observe an increase in number of registered private tutoring centers during the same period of the education expansion.

Theoretical Discussion

Even if the students study just enough to get into high school, recent theoretical work by Chang (2011) and Chu (2015) showed that the outcome of education expansion is uncertain. There are students who would increase spending on private tutoring while some would decrease their spending on private tutoring.

Method

I use a household survey on income and expenditure collected by the Taiwanese government (Survey of Family Income and Expenditure) from 1991-2006 and run the following regression:

\[ Y_{ijt} = \alpha + \beta H_{jt} + \gamma X_{ijt} + \delta D_j + \varepsilon_{ijt} \]

- \( Y_{ijt} \): log of household private tutoring spending/indicator for participation
- \( H_{jt} \): availability of high schools (Number of first year high school students divided by number of middle school graduates)
- \( X_{ijt} \): household characteristics and county unemployment rate
- \( D_j \): county and year fixed effects

\* i denotes individual household, j denotes county, t denotes year

I estimate the model using Tobit and Probit to separately look at effect on:
- amount of spending
- likelihood of having any spending

To account for other policies during the education reform, I exploit the variation in school construction intensity across counties. The figure below suggests that the government built high schools randomly across counties.

Results

The table below illustrates the results of the model:

<table>
<thead>
<tr>
<th>Year</th>
<th>Participation</th>
<th>Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>0.088</td>
<td>0.068</td>
</tr>
<tr>
<td>1992</td>
<td>0.075</td>
<td>0.082</td>
</tr>
<tr>
<td>1993</td>
<td>0.062</td>
<td>0.085</td>
</tr>
<tr>
<td>1994</td>
<td>0.040</td>
<td>0.065</td>
</tr>
<tr>
<td>1995</td>
<td>0.021</td>
<td>0.065</td>
</tr>
<tr>
<td>1996</td>
<td>0.010</td>
<td>0.065</td>
</tr>
</tbody>
</table>

Note: The size of the dots represents the population size in each county.

Effect on different households

(a) Spending (by Income Quintile)
(b) Participation (by Income Quintile)
(c) Spending (by Head Education)
(d) Participation (by Head Education)