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POLICY BRIEF

Income Risks and Investment in Schooling in Bihar

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In brief:

- This brief reviews recent research on the effects of household income risk on schooling investment in rural Bihar.
- This project undertook unique primary survey of households to quantify income risk faced by households in twelve villages of Bihar and analyzed its effect on schooling investment.
- The author finds that income risk has a significant negative effect on schooling investment, particularly of female children.
- Results show that income risk has significantly larger negative effect on schooling investment of low income households relative to higher income households. These finding suggest that income risk faced by poorer households is an important reason for low schooling investment and the persistence of low educational achievement and outcomes in Bihar, particularly for female children.
- The author recommends that public policies designed to reduce income risks such as provision of insurance (e.g. crop insurance), easier availability of

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consumer credit, greater access to labor market information targeted towards poor households, are likely to have significant positive effect on schooling, particularly of female children. Microfinance institutions and NGOs can play an important role in the provision of insurance and labor market information. Public investment in irrigation, access to reliable and timely weather information, and unemployment insurance scheme can reduce income risk and encourage schooling investment.

Introduction

For most people future income is uncertain. Farmers may have bumper harvest, but crops may fail. Businesses may earn high profit, but they can incur losses or fail. Job earners can get promotion, but they may also lose their jobs. These uncertainties or risks will not matter if people have adequate insurance i.e. they are compensated when there are losses or their earnings fall. However, most households in developing countries, particularly in rural areas, have limited access to formal credit and insurance mechanisms.

It is well-known that in the absence of adequate credit and insurance facilities, poor household senter low-risk, low return activities (Eswaran and Kotwal 1989, Rosenzweig and Binswanger 1993, Dercon 1996) and low return and less capital-intensive activities (Collier and Gunning 1999) to reduce their income risk. One important issue is whether household income risks induce poor households to underinvest in schooling of their children. The main aim of this project is to quantify and analyze the effects of income risks on schooling investment in rural Bihar using primary household survey.

Bihar is one of the poorest states in India. Most households rely on agriculture or informal sector jobs for their livelihood, which are inherently risky. The coverage of

formal banking and insurance sector is inadequate, particularly in rural areas. The educational attainment is low (NUEPA 2017) and the quality of education is very poor. A recent report (ASER 2016) finds that only 41.8% of children in grade 5 can read grade 2 level text in 2016, and this percentage shows declining trend over time. Similar is the case with respect to learning outcomes for mathematics.

Schooling and learning outcomes crucially depend on household investment: both in terms schooling expenditure and time-spent by children studying in school and outside. This project addresses following questions: Does household income risk reduce schooling investment? Does income risk have differential effect on schooling investment of male and female children? Does income risk adversely affect schooling investment of poor households' more than richer households? It examines the effects of income risk on household schooling expenditure, time-spent by children in school and time-spent by children studying outside schooling hours.

Household Survey

To address these questions, a primary household survey "Risk and Investment in Education" funded by the International Growth Centre, United Kingdom, was undertaken by the Institute for Human Development, New Delhi in January to March 2017 in twelve villages in six districts (two villages in each district) of Bihar. These districts are located in three distinct regions of Bihar: North Bihar (three districts), Central Bihar (one district), and South Bihar (two districts). The sample consists of 659 households with 1365 children in the age group of 5-17 years.

The survey consisted of a questionnaire for each 5 to 17-year-old in the household and a family questionnaire. The questionnaire for children was designed to elicit information on schooling indicators such as enrollment and attendance, household schooling expenditure and its component, and time-spent by children studying in school and outside.

The family questionnaire collected detailed information on parental and household characteristics such as income, education level, family size and main source of income. It contained a module designed to elicit information on household's expectation about the next year income. The information from this module was used to estimate the variance of next year income of household. The variance of next year income of household is used as an indicator of household income risk. The method of estimating the income risk and its validity are discussed in Kumar (2017a).

Time Spent on Education

Table 1 shows the distribution of average time-spent by children in school.It shows that majority of children both male and female spent between 21-30 hours in school. Little over quarter of children spent more than 30 hours in school in a week. The pattern for both male and female children is similar.

Table 1

Distribution of Children over Average Time Spent in School in a Week by Gender (in percentage)

Hours	Male	Female	Total
<10 hours	4.06	5.47	4.93
11-20	10.95	11.89	11.25
21-30	58.68	55.55	57.05
31-40	25.97	26.44	26.29
>40	0.31	0.62	0.46
Average No. of Hours (in hours)	26.87	26.40	26.62

Table 2 shows average time-spent by children in studying, doing homework or tuition outside schooling hours. Around 37% of children spent less than 10 hours studying

outside schooling hours in a week. Plurality of children spent between 11-20 hours studying outside schooling hours in a week. Male children spent significantly more time studying outside schooling hours in a week than female children.

Table 2

Distribution of Children over Average Time Spent Studying Outside Schooling Hours in a Week by Gender (in percentage)

Hours	Male	Female	Total
<10 hours	31.87	41.78	36.82
11-20	47.03	42.41	44.68
21-30	18.13	13.62	15.94
31-40	1.87	1.56	1.69
>40	1.09	0.62	0.84
Average No. of Hours (in hours)	14.09	12.31	13.21

Household Schooling Expenditure

Table 3 shows the average annual schooling expenditure and its main components. The average annual schooling expenditure was INR 5834, which is about 6% of average household income. The expenditure on uniform and teaching material (INR 2248.37), private tuition cost (INR 1546) and fees (INR1364.5) were the three most important components. The annual average schooling expenditure for male children was much higher (INR. 7505) than for female children (INR4163).

Table 3

Annual Average Expenditure on Education by Gender (in INR)

	Male	Female	Total
Spent on book, uniforms and other material	3263.74	1233	2248.37
Private Tuition	1720	1372	1546
Fees	1787	942	1364.5
Transport	337	268	302.5
Miscellaneous	394	344	369
Total average expenditure	7505	4163	5884

Household Income Risk

Table 4 provides summary statistics of household-specific expected future income, its variance and coefficient of variation. Data shows large variation in the household expected future income, its variance and coefficient of variation. The average household-specific expected future income was INR 81,799 with the minimum expected future income of around INR 5211 and the maximum of INR 857250. The average household-specific coefficient of variation was 0.12 with the minimum of 0 and the maximum of 0.98. The average household-specific variance was INR 29100 (x 10^4)).

Table 4

Summary Statistics of Expected Future Income and Indicators of Income Risk

Variable	Mean	S.D.	Minimum	Maximum
Expected Future Income (in INR)	81799.0	73693.0	5211.5	857250
Standard Deviation of Future Income (in INR)	8933.9	14549.5	0	226509.9
Variance of Future Income (in 0000 INR)	29100	254000	0	5130000
Coefficient of Variation	0.1150	0.0934	0	0.9762
Range (in INR)	44956.9	35702.5	5000	300000

Note: Total number of observations 501. Source: Kumar (2017a)

Effect of Income Risk on Schooling Investment

As discussed above, evidence suggests that there is gender bias against female children in schooling investment, particularly in schooling expenditure and time-spent studying outside schooling hours. The question this project addresses is to what extent this gender bias is caused by income risk faced by households. Such gender bias in schooling investment can also be caused by other factors such as low income and low education level of parents. The main challenge is to isolate the effect of income risk on schooling investment. This is accomplished by use of regression analysis.

I briefly describe the main results of the regression analysis. Detailed results are given in Kumar (2017b). The analysis finds that income risk has a significant negative effect on schooling expenditure and time-spent studying outside schooling hours, but an insignificant effect on time-spent in school. It also finds that income risk has a much

larger negative effect on schooling expenditure and time-spent studying outside schooling hours of children belonging to poorer households.

Separate analysis for male and female children shows that income risk adversely affects the schooling expenditure and time-spent studying outside schooling hours for female children. In addition, it has a much larger negative effect on schooling expenditure and time-spent studying outside schooling hours of female children belonging to poorer households. Results show that household income risk has an insignificant effect on all indicators of schooling investment for male children. Overall, these results suggest that income risk negatively impacts schooling investment of female children. This adverse effect is greater for poorer households.

Conclusion and Policy Implications

The analysis finds that in come risk faced by poorer households is an important reason for low schooling investment and the persistence of low schooling achievement and outcomes in rural Bihar, particularly for female children. These finding suggest that income risks can widen income inequality and gender inequality in schooling in rural Bihar.

The government policies designed to reduce income risks such as provision of insurance (e.g. crop insurance), easier availability of consumer credit, and greater access to labor market information targeted towards poor households are likely to have positive effect on schooling. The non-government organizations and microfinance institutions can play an important role in the provision of insurance and labor market information. Public investment in irrigation, access to better and timely weather information, and unemployment insurance scheme can reduce income risk and encourage schooling investment.

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