***Mobility and Education (Double Causality (comparative advantage of longitudinal data):**

How education affects income mobility and how income mobility affects education

The Response of School Enrollment to Shocks in Parental Earnings

Most of the research that has documented the links has concentrated on the impact of persistent poverty on child labor and time in school. Less understood is whether transitory shocks to household income also affect decisions regarding child time allocations. If poor households can absorb income shocks by borrowing against future income, then short-term income loss from unemployment, illness, or injury to adults in the household should not affect the schooling or work decisions of the children in the home. However, if poor households face constraints on borrowing because they lack collateral or other means of demonstrating ability to repay, then child work time may be used to substitute for lost adult work time. Even temporary exits from school can lead to permanent loss of human capital if school success is predicated on continuous participation.

This study examines how the loss of earnings by the head of a household in Brazil affects how his children spend their time in school and work. The empirical model allows the impact of the earnings shock to differ by household income status before the earnings loss occurred. Children's time allocation in higher-income households was largely unaffected by the loss of earnings by the head. However, children in the poorest households were more likely to drop out, enter the labor force, and repeat the same grade in school. Because children who lag behind age-appropriate grade level are more likely to drop out or enter the labor market in the future, even those children whose education plans are not immediately altered may be permanently affected by the adverse consequences of the income shock on their chance for grade promotion.

These results are consistent with the presumption that the poorest households are credit- constrained, so children in those households will be more vulnerable to short-term fluctuations in household income due to parental job loss. Consequently, social insurance that provides a safety net against adverse income shocks to the poorest households may help to prevent premature and socially inefficient labor market entry or school drop-out by children in the poorest households.

The worst impact happens in families that head lost his job during a boom or a low educated family (permanently individually poor) in a rich area (permanently colectivelly poor) – combination of need with opportunity

: Dynamic Indicators of School Performance and Child Labor (Children between 10 and 15 years of age)

	Total		Boys		Girls	
Probability of:	Prob. %	Standard Error	Prob. %	Standard Error	Prob. %	Standard Error
Start working (1→2 or 3)[a]	2.662	0.0123	3.660	0.020	1.6988	0.014
Leave school given that does not work (1→3)	0.443	0.0050	0.433	0.007	0.4529	0.007
Leave school (1 or 2→3)	0.494	0.0054	0.505	0.008	0.4838	0.008
Start working given that attends school (1→2)	2.179	0.0110	3.053	0.018	1.3285	0.012
Number of observations	2,466,675		1,240,354		1,226,321	

[a]Numbers in parentheses reflect transition from and to education stages.

Logistic Estimation of the Probability a Child Leaves School				
Condition: In month 4, child is in stage 1 (attending school and not working) and head has positive earnin				
	Estimate		t-statistic	Odds Ratios
Male (reference = female)	0.04		0.88	1.04
Child's Age (reference = 15)				
10 years	-2.30	**	-15.96	0.10
11 years	-1.88	**	-16.48	0.15
12 years	-1.26	**	-14.93	0.28
13 years	-0.65	**	-9.70	0.52
14 years	-0.28	**	-4.72	0.76
15 years	0.00	**		1.00
Child Lags	1.15	**	14.84	3.17
Father's Education (reference = 4-7 years)				
0 years	0.38	**	5.36	1.46
1-3 years	0.29	**	4.87	1.33
4-7 years	0.00			1.00
8-11 years	-0.32	**	-3.61	0.73
12-15 years	-1.06	**	-3.48	0.35
16 + years	-1.00	**	-2.36	0.37
Mother's Education (reference = 4-7 years)				
0 years	0.58	**	8.72	1.78
1-3 years	0.27	**	4.45	1.31
4-7 years	0.00			1.00
8-11 years	-0.56	**	-5.45	0.57
12-15 years	-1.58	**	-3.42	0.21
16 or more years	-18.24		-0.00	0.00
Father's Earnings Quintiles (reference = Quintile V)				
Quintile I	0.75	**	5.21	2.11
Quintile II	0.64	**	6.41	1.89
Quintile III	0.57	**	6.22	1.77
Quintile IV	0.31	**	3.43	1.37
Quintile V	0.00			1.00
Income Shock[a]				
U^H (reference = Quintile V and $U^H = 0$)	-0.01		-0.05	0.99
Interactions (reference = QuintileV, U^H=1)[b]				
Quintiles I*U^H	0.38		1.02	1.46
Quintiles II*U^H	0.22		0.69	1.24
Quintiles III*U^H	0.27		0.87	1.31
Quintiles IV*U^H	0.17		0.50	1.19
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Number of Observations: 56,080				
Log Likelihood: -7290				
Notes: * significance at the .10 level; ** significance at the .05 level. Regression also includes dummy va				
for month, year, and metropolitan area.				
[a]Joint test of U^H and its interaction terms with quintile dummies is significant at the .05 level.				
[b]Odds ratios in brackets in the last column are relative to the same earnings quintile with U^H=0.				

Theory - The possible impact of household income shocks on child time in school or at work can be illustrated with a simple three-period variant of the Ben-Porath (1967) model. In the first stage, the child attends school full time, so attendance, A, = 1. In stage 2, 0 < A < 1, meaning the child divides time between school and work. In the third stage, the child specializes in working, setting A = 0. To show how the length of stage 1 or stage 2 varies with shocks for income, it is assumed that there are positive but diminishing returns to school attendance so the amount of additional marketable skill developed per year of schooling decreases as years of schooling increase. Total marketable skill at any point in time is given by the wage the child can claim, $W(H_t)$.

Between any two periods, t = 0 and t= 1, the decision of whether to attend school will reflect the relative returns to schooling versus working. Let r = the interest rate. If the child attends school so A > 0, he will earn (1 - A) $W(H_0)$ in the current period and his value of time will be $W(H_1) = W(H(H_0, A))$, where human capital production depends positively on past human capital accumulation and attendance. If the child does not attend school, A = 0 and the child's value of time in both periods is $W(H_0)$.

The child will attend school if

$$(1-A)W(H_0)+\frac{W(H_1)}{1+r}\geq W(H_0)+\frac{W(H_0)}{1+r} \quad \text{or} \quad -AW(H_0)+\frac{W(H_1)-W(H_0)}{1+r}\geq 0 \quad (1)$$

Condition (1) says the child should attend if the present value of the wage increase attributable to schooling exceeds the cost of child time in school. If condition (1) holds with inequality, A will be set equal to 1 and the child will spend the period in stage 1. If the condition holds with equality, optimal attendance will be in stage 2, where 0 < A < 1. If the condition is violated, then the child will be in stage 3, where A = 0.

Because returns to human capital are positive but diminishing as the level of human capital increases, the first term on the left-hand side of (1) grows progressively larger in magnitude and the second term on the left-hand side becomes progressively smaller as the child ages. Consequently, the child's schooling pattern will go from full-time to part-time to leaving school, as illustrated in figure 1. Income shocks will alter condition (1) for two reasons. First, income may make schooling more productive so that $W(H_1) – W(H_0)$ rises with income. Second, the interest rate is a decreasing function of income if the poor are credit-constrained. As a consequence, the second term on the left-hand side of (1) decreases if the household suffers an adverse income shock, as illustrated in figure 2. A negative income shock shifts the attendance schedule to the left, causing children aged t_0 to t_1, who would otherwise attend school full-time, to enter the labor market. The shock also would induce children aged t_2 to t_3, who would otherwise attend part-time, to drop out of school. A large enough income shock could cause children in stage 1 to move all the way to stage 3.

Figure 1: Stages of Investment in School

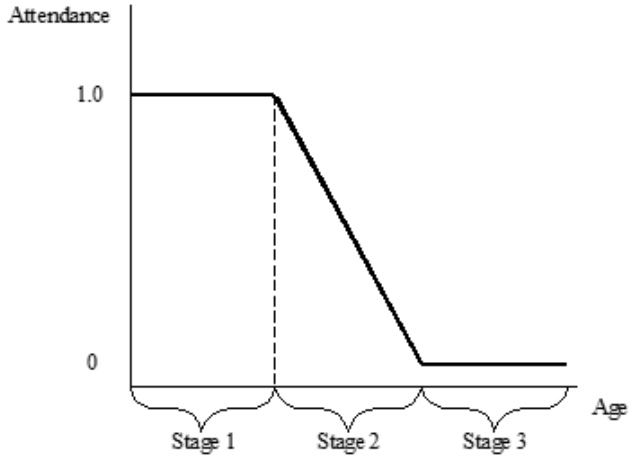
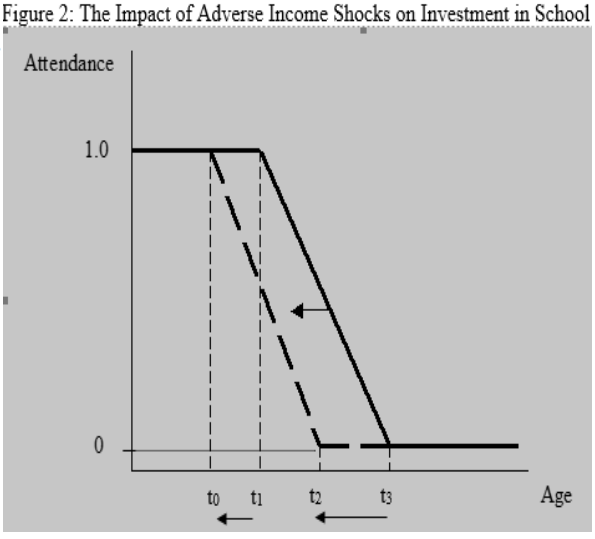
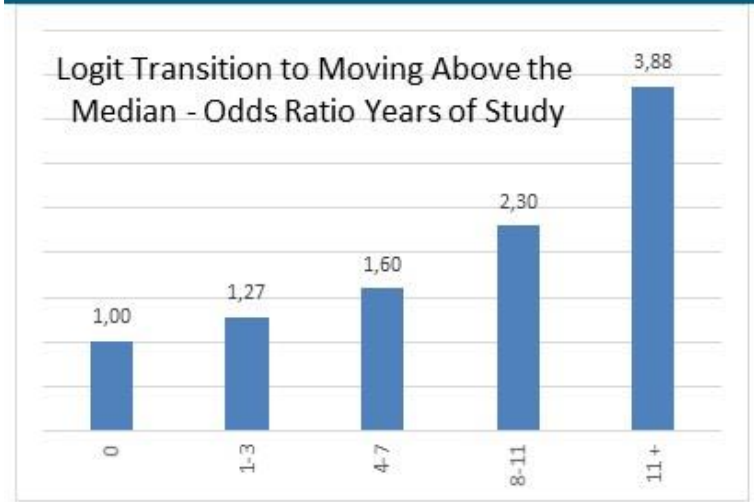


Figure 2: The Impact of Adverse Income Shocks on Investment in School



Per Capita Earnings Mobility

Chances of Transition to Above the Moving Median



Mincerian Equations – Per capita Household Earnings