

Household Educational Responses to Labor-Market Shocks in Brazil, 1982-99

Marcelo C. Neri

and

Mark R. Thomas[†]

Preliminary Draft

May 31, 2000

[†] The authors are, respectively, associate, Fundação Getulio Vargas, Rio de Janeiro, and economist, World Bank, Brasília.

Abstract

This paper uses household employment surveys from Brazil (1982–1999) to examine the effects of income and employment shocks on children’s education (dropout, repeat) and the labor-market participation of children and spouses.

The first part presents the distributive effects of selected recessions and growth periods. Mobility between employment states and income levels is higher among more educated workers. This implies that negative shocks carry more weight for less educated, on average poorer workers, since the subsequent chances of recovery are slimmer. Second, earnings among the informal self-employed are less stable than formal-sector earnings. Movements from the formal to the informal sector therefore generally imply increased earnings risk. Third, workers’ propensity to exit the informal sector into the formal sector is the clearest difference at the level of employment transitions between growth periods and recessions.

The second part analyzes responses in household educational variables to these shocks. Dropout, repeat, and child labor have been steadily falling. Deviations from trend show that boys’ and girls’ starting to work and repeating the school year tend to be associated with economic upturns rather than downturns.

A difference-in-differences analysis of responses reveals that formal- to informal-sector movements have more systematic deleterious effects than movements into unemployment. Economic risk in Brazil is not principally determined by unemployment. A transition from formal- to informal-sector employment of the household head systematically raises the probability of a child entering the labor market during growth periods although not during recessions, suggesting the importance of shifts in demand for child labor. For children who stay in school, formal-to-informal transitions systematically raise the probability of the child repeating that year’s school grade during recessions, although not during growth periods. In recessions, this occurs in tandem with increased labor-market participation by spouses in response to the same shocks.

*

*

*

Introduction

The topic of this paper is the link between economic risk—fluctuations in individuals’ economic welfare (or their perceptions of it)—and the decisions that households make in response. We are in particular concerned with decisions about children’s education. Families’ decisions regarding investment in the human capital of their children may of course have important long-run consequences for their welfare. If these decisions are significantly affected by macroeconomic or “social” risks, such effects may be undesirable.

Our approach will be positive rather than normative, although the results are suggestive for policy. In the first part of the paper, we investigate the kinds of shocks to which households are subject. We present data from three recessions (splitting the most recent recession into its earlier and later stages), and contrast these with three periods of economic growth.

Given a particular set of observed responses on the part of households to their circumstances, it is impossible to say with certainty whether those responses were in fact economically efficient. There nonetheless lurks in the background of many discussions the notion that, for example, if a family withdraws a child from school in response to the main earner losing his or her job (with the attendant assumption that the child would have remained in school absent the employment shock), this is inefficient in the economic sense of the term.

The counterfactual—what would have happened had the household not lost its main income source for a period of time—is impossible to know for sure. In the second part of this paper, by using a simple difference-in-differences approach to panel household data, we nonetheless try to shed some light on this matter. We estimate the effects of income and employment shocks (we shall have to assume that these shocks are exogenous to make any progress) on household-level outcomes: whether a child drops out of school, whether the child repeats the school year,¹ whether the child engages in paid employment, and whether the spouse of the main earner enters employment.

Our data come from Brazil’s monthly employment survey, the PME (*Pesquisa Mensal de Emprego*). The main advantage of this survey is its panel structure. Households are visited monthly four times, and then again, monthly, four times after a hiatus of eight months (that is, if the survey first visits a household in month 1, it generates observations of that household in months 1 to 4 and 13 to 16). We use this structure to generate variables describing the household a year apart. We then investigate the effects of *changes* in households’ circumstances. Shocks are defined as such changes in income and employment status.

Regarding income, the main shortcoming of the PME is that it only asks respondents about income from employment. We would like to measure household “welfare”. Whatever this is, it is certainly not well captured by four months’ of labor-market earnings, but this is unfortunately the best we can do in the current context. In the first part of the paper we shall also use a poverty line of approximately R\$65 per month (as developed in Rocha, 1996) to examine movements of households in and out of poverty.

¹ This is not strictly a household decision, but rather the outcome of many factors: the child’s ability, time spent in school, effort, as well as school- and household-level variables too numerous to list here. We nonetheless class this outcome as a “response” to the economic parameters we are investigating.

Turning to employment, we first divide labor-market status for simplicity into four categories: formal employment, informal employment, unemployment, and inactivity. In Brazil, formal employment usually implies that the worker is an employee with a signed employment booklet (*carteira*). To this usual definition we have added self-employed (*conta-própria*) workers with 12 or more years of education, on the assumption that these were mostly professionals.

Informal employment in Brazil is understood to imply that the worker is an employee without a signed employment booklet (*sem carteira*), which means that the employment relation is not registered with the Ministry of Labor and is therefore not legally covered by the labor code (meaning that the worker probably does not receive certain benefits and protections). In this category we include self-employed workers with less than 12 years of education.

Unemployment in the PME is a narrowly defined concept: the worker must have looked for work in the week prior to the interview, and not be engaged in any employed activity. Any worker who is not employed and has not undertaken such a search is defined as inactive. This category is, as a consequence, more heterogeneous than the others, comprising anyone from the leisure-seeking plutocrat to the discouraged jobless. We therefore exclude inactive workers from most of the analysis in this paper.

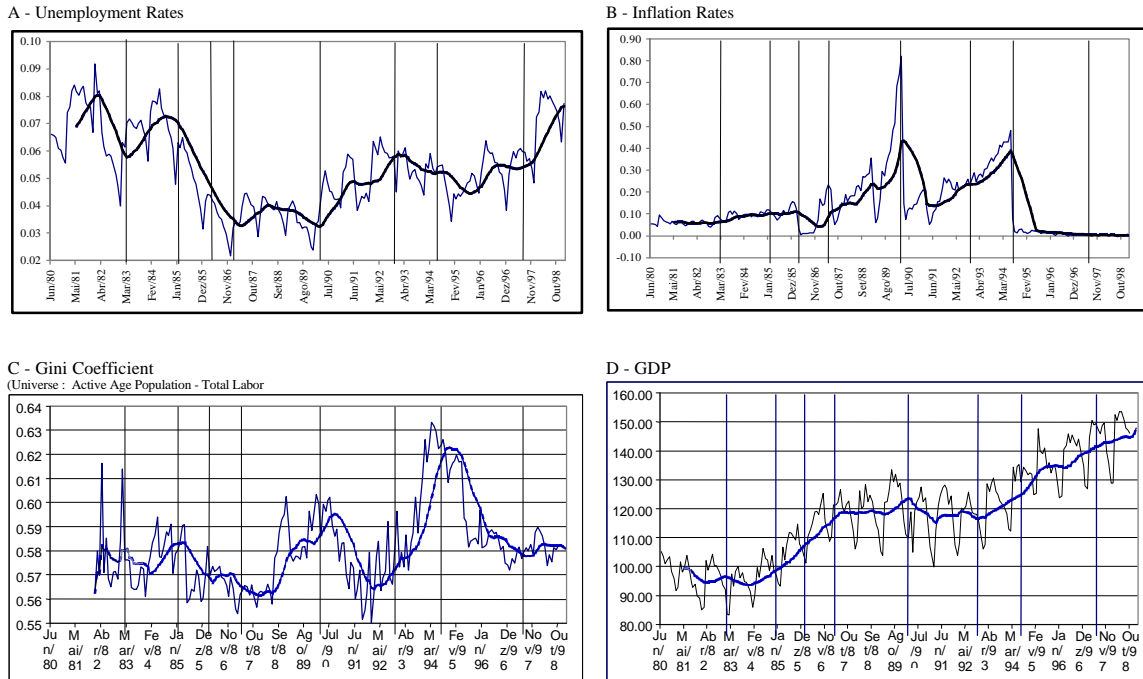
To conclude this section, we should own up to the artificial nature of the distinction we shall be making between *shocks* (assumed to be exogenous)—those slings and arrows that we assume households are subject to—and households' *responses*. Of course the reality is that many variables are determined simultaneously by events and actions that we do not observe: household income is a function of decisions taken over job offers and work hours, while educational enrollment similarly depends on illness and other factors that also affect income.

The inter-relatedness of things notwithstanding, however, some variables in the system are plausibly assumed to be outside the control of the household. Employment status is our main example here, if we believe, particularly during a recession, that relatively few workers voluntarily leave formal-sector jobs for unemployment or informal-sector jobs. Other variables are more easily thought of as outcomes: educational enrollment and progress respond to parental stimuli. An intermediate case is the decision of the spouse of the main earner over whether to work. We shall report the correlation of this decision with other outcomes; it is simultaneously a determinant and a result of other household decisions.

Part I: The Economic Environment

Brazil is well known for having sailed some choppy economic seas since the Latin-American debt crisis of 1982, and we shall not lengthily revisit here a narrative that has been well covered elsewhere (see, for example, Neri and Thomas, 1999, for a brief such account). Figure 1 describes some economic time series for the period 1980–98, with significant “regime changes” marked with vertical bars. The charts give some idea of acuity of the cycles that Brazil has traversed in recent times.

Figure 1
Selected Macroeconomic Time Series, 1980–98



The PME allows us to compare households’ trajectories during different periods. We are particularly interested in recessions, but for comparison we shall also take some examples of upturns. In fact, they turn out to be of just as much interest.

We work with household per-capita income, averaged over a four-month period, and restrict our sample to household heads. We then calculate earnings changes for each household head between the second four-month period (months 13–16) and the first (months 1–4). Averaging over four month periods before calculating the difference minimizes the effects of measurement error on estimates of the wage, and is probably a more accurate measure of welfare than a single wage observation. Monthly wages fluctuate considerable, and both economic theory and empirical observation suggest that consumption, which is more closely related to welfare than income, fluctuates much less month to month.

We split the sample into earnings quintiles to assess the distributive effects of episodes. It is incorrect to use current reported earnings to perform this split. To see why, consider a worker who receives a negative wage shock (falls ill, for example) in the first period. This worker is thus more likely to fall into a low income bracket. He is also more likely to post a wage gain in the following period (he will probably not be ill again). Summing over workers, such effects would generate spurious income gains among the lower income brackets, regardless of the episode in question. Measurement error in wages would generate the same effect. The solution we adopt is to define “Mincerian” quintiles according to a predicted estimate of income: a function of attributes of the worker and the worker’s sector of employment.²

²The equation contained gender, marital status, polynomials of age and experience, and employment sector.

Income

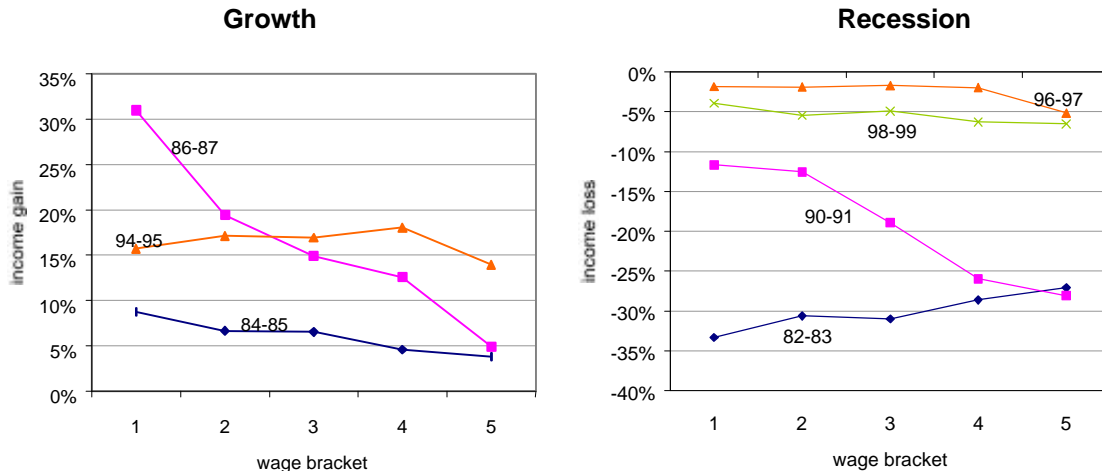
Table 1 shows income gains and losses by quintile for seven periods (three of growth and four of recession). Among the recessions it stands out that recorded income losses since 1996, both at the onset of the Asian crisis and later after the Russian debt default, are much less severe than the recessions of 1982–83 and 1990–91. Among the periods of growth, that associated with the *cruzado plan* in 1986–87 stands out as both the most spectacular and the most pro-poor.

Table 1
Income Gains and Losses by Wage Bracket (percent)

Wage Bracket	Growth			Recession			
	1984-85	1986-87	1994-95	1982-83	1990-91	1996-97	1998-99
1 (poorest)	8.77	31.02	15.71	-33.34	-11.65	-1.84	-3.91
2	6.65	19.44	17.13	-30.65	-12.54	-1.88	-5.45
3	6.55	14.93	16.94	-31.01	-18.92	-1.70	-4.93
4	4.56	12.58	18.04	-28.62	-25.96	-1.96	-6.27
5 (richest)	3.81	4.90	13.95	-27.09	-28.07	-5.17	-6.52

Figure 2 illustrates the data graphically. There is clearly much diversity in the incidence of different periods of growth. In all three periods, the poor felt at least as much impact from periods of growth as the rich. The right-hand chart shows the recessions, and there is even greater variety. The 1990–91 recession “hit the rich harder” (in percentage terms) while the 1982–83 recession hit the poor hardest. The lines for 1996–97 and 1998–99 show income deteriorating after the jitters from the Russian default, and, surprisingly, the rich losing a slightly greater fraction of wage income than the poor.

Figure 2
Income Gains and Losses



The left-hand chart does not necessarily imply that growth reduces inequality, as measured by, say, the Gini coefficient. In fact, the opposite has often been true. Although growth benefits the poor more if gains are expressed as a percentage of wages, in absolute terms the lion’s share still accrues to the rich. The 1990–91 recession, for example, actually reduced inequality, despite increasing poverty dramatically.

There are differences in how growth and recessions affect workers' incomes according to whether they are working in formal- or informal-sector jobs (table 2). The obvious expectation, that informal workers suffer greater variability in income, is only true of self-employed (*conta própria*) workers, not of informal (*sem carteira*) employees. Self-employed workers' incomes have been particularly vulnerable to recessions, whereas informal employees' incomes show no more sensitivity during recessions than formal-sector employees. Informal workers in the 1980s seemed to show a greater propensity to benefit from upturns, although this feature did not generalize to the recent *real boom*.

Table 2
Informal and Formal Sectors, Median Income Changes

Labor Category	Growth			Recession			
	1984-85	1986-87	1994-95	1982-83	1990-91	1996-97	1998-99
formal employee	1.95	9.67	15.69	-26.31	-20.87	-0.69	-4.73
informal employee	8.18	20.11	15.85	-24.60	-14.53	-1.38	-4.18
self-employed	6.17	23.59	15.34	-28.56	-19.35	-4.74	-7.36

Poverty

Estimates using variability between Brazilian states suggest that for one percentage point of annual growth in Brazilian GDP, the number of poor decreases by approximately 0.6 percent (Neri, 1999). This number is low by international standards.

Figure 3 displays the probabilities of workers in the PME sample moving in or out of poverty during the episodes studied. We separate periods of growth from recessions for clarity and present the transition probabilities for different levels of worker education, since this is the main determinant of vulnerability to poverty.

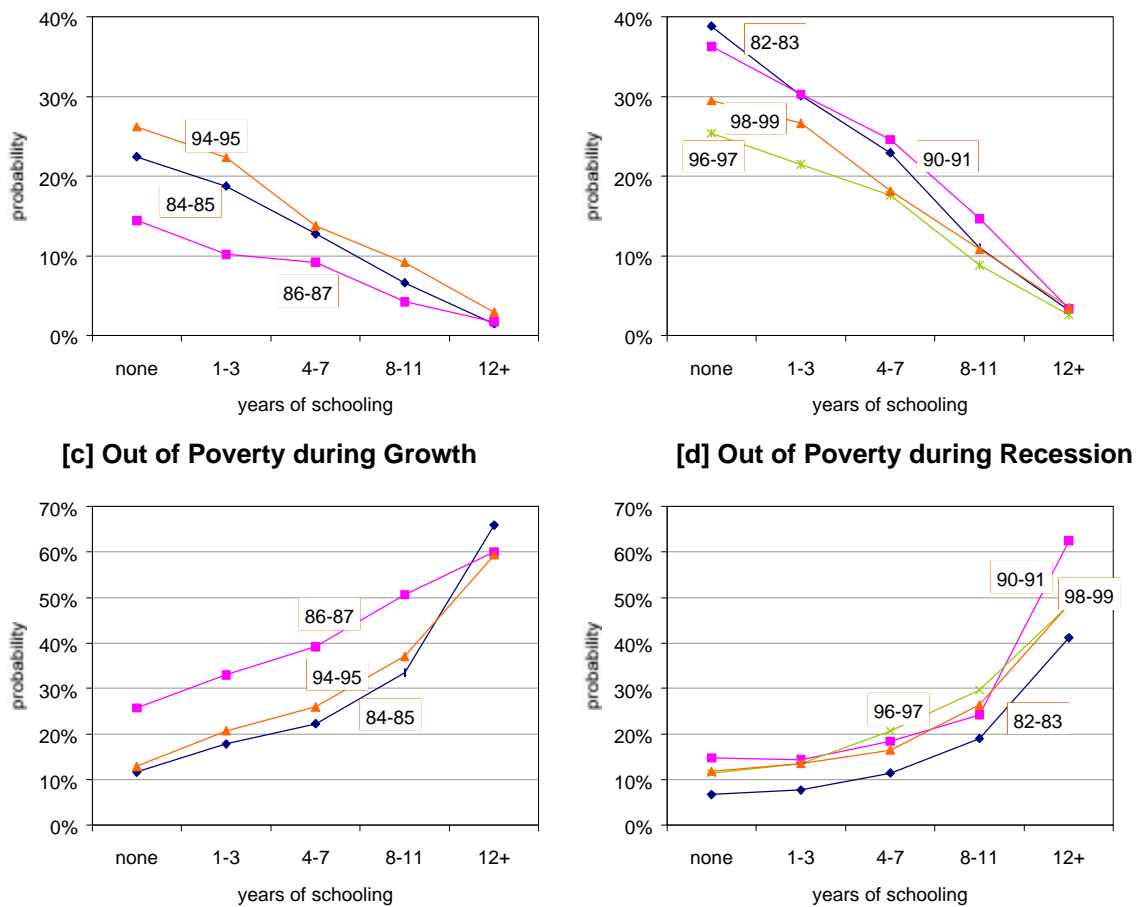
It is striking how alike expansions look and how alike recessions look in this dimension. During a period of expansion (see figure 3a), a non-poor worker without any education has historically had a 20 to 25 percent probability of falling into poverty one year later (this probability was markedly lower during 1986–87). At the same time (see figure 3c), an uneducated poor worker has had about a 12 percent probability of exiting poverty. Looking at recessions, we see (figure 3b) that an initially non-poor worker with no education has had a 30 to 40 percent probability of falling into poverty. Meanwhile (figure 3d), an uneducated poor worker has had about a 10 to 15 percent probability of exit from poverty during recessions.

Comparing horizontally (figures 3a and 3b), we gain an impression of how expansions and recessions operate on poverty. Notice that for someone with secondary education or beyond (12 plus years), it makes almost no difference whether the economy is in expansion or recession to their probability of being recorded as passing into poverty (about 2 percent). For those vulnerable owing to low education, it makes a difference of the order of 10 to 20 percent. The lines in figure 3b are rotated clockwise relative to the lines in figure 3a. For example, in 1998–99, during a time of recession, a non-poor

worker with one to three years of education had a 27 percent risk of falling into poverty. In 1986–87, a time of expansion, a comparable worker had only a 10 percent risk.

The picture regarding moves out of poverty is similar. Again, educated workers have high probabilities of escaping poverty regardless of the external economic environment. Workers with little education this time also display similar characteristics regardless of whether the period is one of growth or expansion: *uneducated workers exit poverty at about the same rate—ten percent or so—in recessions as in growth periods.* (Again, the 1986–87 expansion was an exception in this regard). The differences between recessions and expansions are thus most pronounced for workers with intermediate levels of education—from one to 11 years.

Figure 3
Moves into and out of Poverty by Level of Education
[a] Into Poverty during Growth **[b] Into Poverty during Recession**



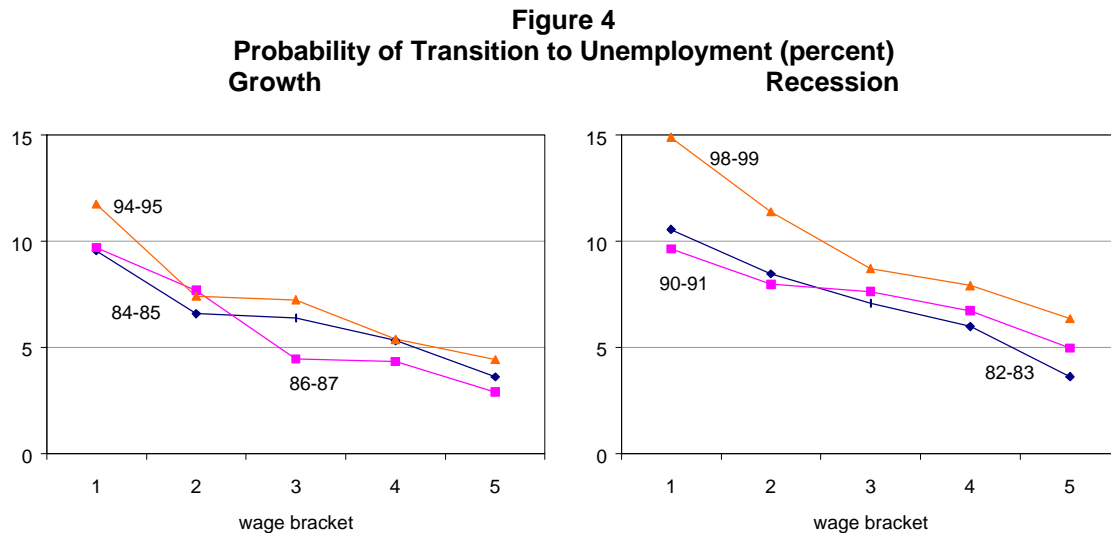
Less-educated workers fall into poverty at appreciable rates during *both* recessions and growth periods, although at a greater rate during recessions. The same workers have escaped poverty with low probability regardless of growth conditions. For workers as a whole, mobility in and out of poverty is quite high—workers recorded as poor (according to current income) in one period may well not be a year later—but there is a core of uneducated poor that is not easily amenable to reduction through economic growth alone.

Measurement error accounts for some of the apparent mobility of workers between states of poverty and non-poverty. Unless measurement error occurs in very quite different patterns during recessions as compared with growth periods, however, it is will not account for the patterns in the data described by the graphs in figure 3. We shall nonetheless restrict our analysis of transitions into and out of poverty to the first part of the paper, and use more robust methods in the second part relating to household responses.

Employment

The PME are also characterized by high mobility between states of unemployment, informal employment, and formal employment. This is an important characteristic, and helps explain why during rapid expansions in Brazil (such as the *cruzado* and *real* booms analyzed here), social indicators have at times moved quite rapidly in response to growth. But rates of mobility again depend on worker characteristics.³

Figure 4 shows the probability of a worker becoming unemployed or inactive during recessions and growth periods, broken down by earnings quintiles. The pattern of transitions to unemployment or inactivity has been similar whether the economy has been in periods of expansion or recession. The exception is the recession in 1998-99, which has seen higher probabilities of unemployment or inactivity for all workers, and in particular among the poor.



The link between unemployment and poverty in Brazil has not been a close or constant one. Unemployment, in its narrowest definition in the PME data—a worker without a job who has actively searched for one in the past week—is a transient empirical phenomenon. Inactivity, as we have mentioned, encompasses a confusingly broad array of other possibilities, and is about three times as common in the data. Neither unemployment or inactivity in the PME is strongly linked to poverty. In the case of unemployment, this is because workers tend not to stay unemployed (in its narrow sense) for very long. In the case of inactivity, this may imply voluntary unemployment, not a phenomenon commonly associated with poverty.

³ For related work see Maloney (1999) and González and Maloney (1999).

The relationship between poverty and unemployment also depends on the rate of growth, and this relationship has evolved over time.

Table 3
Poverty Transition Probabilities by Labor Category

	<i>Growth</i>			<i>Recession</i>			
	1984-85	1986-87	1994-95	1982-83	1990-91	1996-97	1998-99
Transition into Poverty							
formal employee	9.67	7.10	11.27	18.6	19.57	11.39	12.16
informal employee	12.52	9.73	10.48	25.27	26.34	14.58	15.90
self-employed	15.88	8.07	13.13	26.26	23.61	15.61	17.00
Unemployed	14.29	3.45	5.17	29.23	26.19	17.14	21.52
Transition from Poverty							
formal employee	20.19	34.03	26.64	8.65	16.71	19.78	17.14
informal employee	17.03	41.89	26.54	11.59	18.52	19.93	15.71
self-employed	19.8	36.79	24.36	9.33	15.28	16.79	17.77
Unemployed	24.87	47.06	32.29	16.62	26.37	25.00	24.51

Table 3 shows that, during growth periods, unemployment is the state of the four *least* likely to lead to poverty and *most* likely to lead out of it. Yet, during recessions, unemployment is the state *most* likely to lead to poverty but also *most* likely to lead out of it. Two observations may explain these results. First, poor workers simply do not remain unemployed. A poor worker out of a job will more likely enter some form of low-paid informal activity rather than remain unproductive. Second, during growth periods, when higher-paid employment is more abundant, workers use unemployment (and particularly unemployment insurance) to search for better jobs.

Although the 1998–99 recession has not been as severe as either 1982–83 or 1990–91, unemployment during 1998–99 has been more closely associated with poverty than in the past. This is consistent with evidence, cited elsewhere (see, for example, World Bank, 1998), that unemployment duration has recently increased. Moreover, as unemployment and its duration has increased, the role of the informal sector as an outlet for unemployed workers to find employment has increased. Whereas, during the 1990–91 recession, unemployed workers were more likely to enter formal than informal jobs, by 1998 this relationship had reversed, with the informal sector providing a greater number of new jobs to the unemployed.

The final, and perhaps most interesting, category of transitions that we investigate here is that between informal- and formal-sector jobs. Table 4 presents these, and shows that the main difference between growth periods and recessions occurs through workers'

exiting the informal sectors at a higher rate. The last two rows split this effect into its components: movements by both *sem carteira* employees and *conta-própria* workers into the formal sector. Both move into formal-sector jobs at higher rates during growth periods than recessions.

Table 4
Labor Category Transition Probabilities (percent)

	<i>Growth</i>			<i>Recession</i>			
	1984-85	1986-87	1994-95	1982-83	1990-91	1996-97	1998-99
Formal sector:							
Stay formal	20.2	9.2	11.9	9.8	10.3	10.8	12.3
Move to informal	75.6	87.1	83.0	84.8	83.5	83.3	80.6
Informal sector:							
Stay informal	56.1	68.0	70.6	n/a	74.1	71.6	71.0
Move to formal	33.7	22.1	19.7	n/a	16.9	18.4	16.5
Informal to formal:							
Informal employee	42.3	36.3	29.9	28.0	27.2	31.2	25.4
Self-employed	16.8	15.8	15.3	n/a	11.5	11.2	11.3

To conclude this section, the data illustrate four important points for what follows. First, recessions and growth periods have not all been alike. For example, the 1982–83 recession was considerably more severe for the poor than subsequent ones. Similarly, the *real boom*, despite reducing poverty quite fast, was less pro-poor than the *cruzado boom* (although of course its long-term benefits may turn out to be greater). Finally, unemployment has been more common, particularly among the poor, during the most recent recession than during previous ones.

Second, mobility between employment states and income levels is higher among more educated workers. This in turn implies that negative shocks carry more weight for less educated, on average poorer workers, since the subsequent chances of recovery are slimmer.

Third, informal earnings, in particular those among the informal self-employed, are less stable than formal-sector earnings. This may not strike the reader as very surprising, but it is important for what follows in that it suggests that movements from the formal to the informal sector imply increased earnings risk.

Finally, the most palpable difference in the data on employment transitions between growth periods and recessions appears in workers' propensity to exit the informal sector for the formal sector, which rises for both informal employees and self-employed during periods of economic growth.

Part II: Households' Responses

What are the effects of the mobility, another word for which might be “risk,” described so far on long-term welfare? One way to answer this question is to examine household responses to transitions in employment states and income shocks.

We consider four potential such responses or outcomes:⁴

1. the child leaves school
2. the child fails to advance a grade in school
3. the child participates in the labor market
4. the spouse enters labor market.

We focus on educational responses because they are important in themselves, but also because they are to some extent *irreversible*. If a child drops out of school, they may return, although they do so without doubt educationally held back by the time out, and of course they may not return at all. Similar logic applies to some instances of child labor. The spouse's labor-market participation we include since it may relate to children's educational outcomes; it is not obviously irreversible nor undesirable.

For the analysis in this section we were forced to narrow the definition of a family, somewhat, to the main earner, spouse, and eldest child, and to restrict analysis to households with eldest children in the age range 10–15. This was due to complications in defining the household response in the case when there were multiple children in the household.

Deviations-from-Trend Measures of the Effects of Growth and Recessions

The first three of the response variables listed above, have, thanks to educational and social-protection reforms undertaken by Brazilian governments, been in steady decline. It is instructive to examine deviations from these trends, as some systematic patterns in the data become immediately clear.

Figure 5 shows the percentage of children aged 10 to 15 out of school steadily falling for both genders. Figure 6 investigates when children actually drop out, by plotting the probability of a child in school dropping out (a probability which has also been falling, not surprisingly) against time, and distinguishing the periods of recession from those of growth. The salient point of the chart is that the points lie on the line regardless of whether the economy is in recession or not: children (and this result is true for boys and girls individually) are not more likely to drop out (in terms of deviation from trend) in recessions than in growth periods.

⁴ We also analyzed child participation in domestic tasks. Since the results for this variable were not striking in any way, they are not included in the paper.

Figure 5
Percentage of Children 10–15 out of School

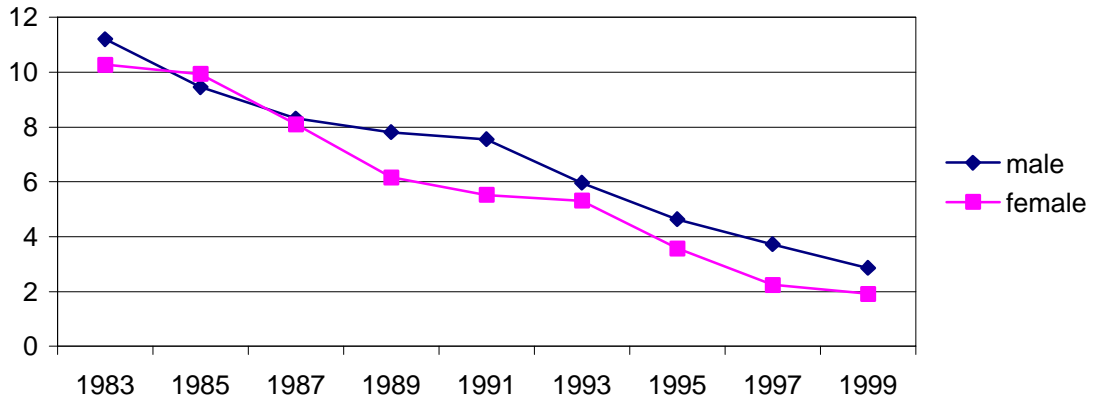
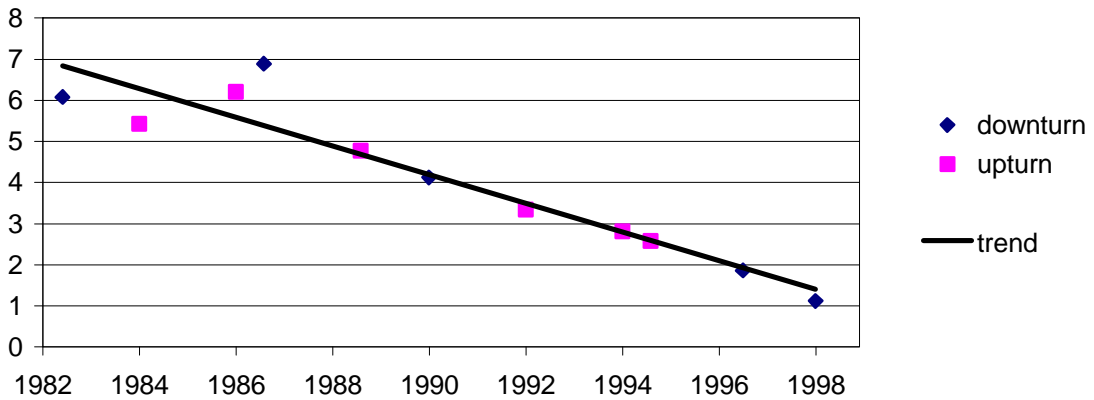
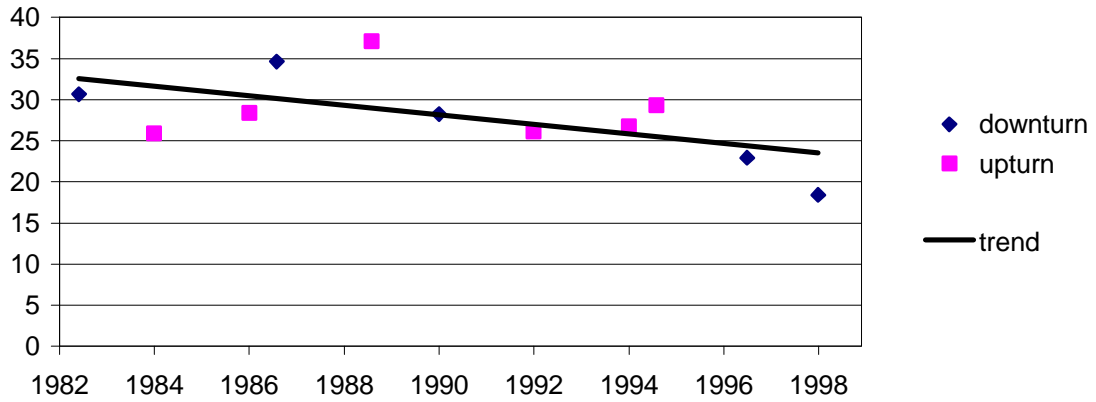


Figure 6
Probability of Dropout



The results for repeating a grade are more striking. Figure 7 shows the downward trend in the probability that a child repeats the school year. Three of the four points lying above the trend line are actually periods of economic growth (August 1988 to December 1989, January 1994 to June 1995, and August 1994 to December 1995).

Figure 7
Percentage Probability of Repeat of School Grade



Finally, child labor exhibits similar tendencies. The probability of a child working has been falling dramatically in Brazil (figure 8). It has deviated above this trend in periods of growth, however, not generally in recessions (figure 9).

Figure 8
Incidence of Child Labor (aged 10–15, percent)

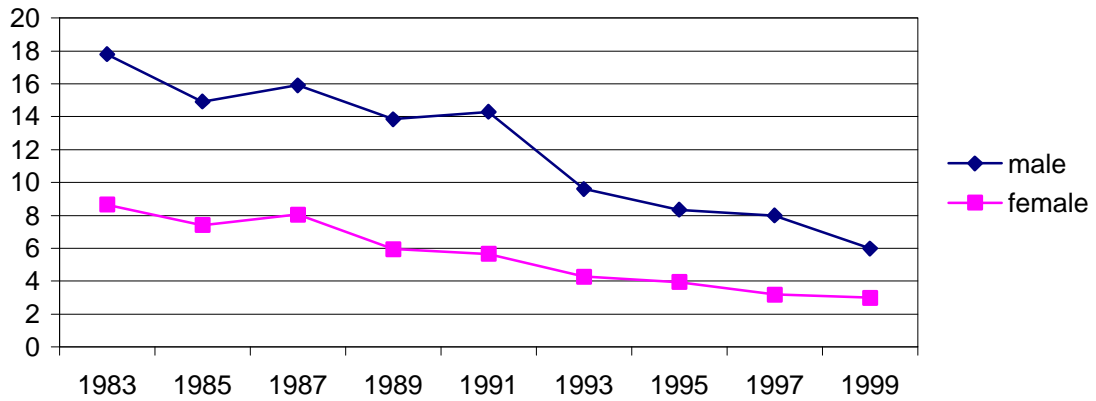
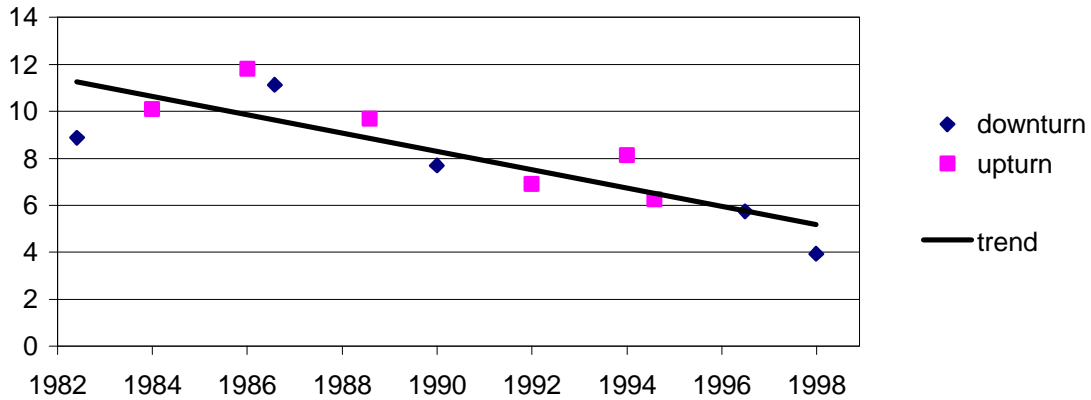


Figure 9
Probability of Child 10–15 Starting Work



Difference-in-Differences Estimation

The PME does not provide a large enough sample for between-group differences in the responses to be statistically significant in a given period. Our approach is therefore to examine responses across two classes of period: recessions, and periods of stable economic growth. We then adopt a non-parametric approach to assess the statistical significance of differences across time periods.

For example, given five recessions, assume that a parent losing their job has no effect on the probability of a child dropping out of school. The probability that the proportion of children dropping out for such families (head lost job) is higher than for other families (head kept job) in all five recessions would then be 2^{-5} or 0.031. A two-sided non-parametric test which rejects the null hypothesis of no effect of the parent losing his or her job, if and only if in all of the five recessions this difference is negative or in all it is positive, therefore has a significance level of 6 percent. This is the rule we use. It has the merits of simplicity and feasibility given the data we are using, since we are able to define five periods of recession (negative growth) and five of positive economic growth (greater than 2 percent). These are defined in the tables below.

Table 5 (see end of paper) describes household responses measured by child dropout from school. We measure the effects of shocks in difference-in-difference form for three definitions of labor-market shock and two definitions of income-shock. The labor market shocks we define are formal-to-informal transition, formal-to-unemployment transition, and informal-to-unemployment transition. The income shocks we define are a 50 percent drop in reported labor income (the comparison group here being households whose income did not fall by more than 20 percent, and a transition from positive to zero earnings of the household head.

During recessions, none of the labor shocks has a significant effect on dropout. For a formal–informal switch, in four out of five recessions the sign is the one we might predict, but according to our rule, this does not lead us to accept the results as evidence of this effect. Since the data for informal–unemployed switches were incomplete for the 1990–91 recession, we cannot draw conclusions about the effects of such shocks, but it is worth remarking that in the other four periods such moves were associated with *reducing* the probability of dropout.

This effect—that informal–unemployed switches lower the probability of dropout—is significant during growth periods: in all five growth periods dropout is observed less in households where the head moved from informal employment to unemployment than in households where an informally-employed head remained so. This result is actually quite expected in Brazilian data. Other authors have noted (Gill and Neri, Paes de Barros) that reportedly unemployed workers are often either working on the side, or using unemployment insurance to look for a better job. The ability to do this is quite possibly associated with improvement in workers’ perceived prospects rather than deterioration in them. In particular, during growth periods, when workers have higher chances of finding better work, this is likely to be the case. Unemployment shocks therefore do not seem to have deleterious effects on children’s enrollment. Notice that this result reinforces the impression from the simpler deviations-from-trend analysis above. Finally, in none of the cases do income shocks (as we have defined them) seem to have systematic effects on dropout.

Table 6 reports the effect of income and employment shocks on the probability of the child repeating that year’s school grade. In recessions, there is a systematic effect of formal–informal switches on grade repeat, in the direction that one would expect: such employment shocks increase the probability of the child repeating. This effect is, however, not systematic during growth periods. Nor do there seem to be systematic effects of the other employment or income shocks.

Grade repeat is no doubt influenced by many conditions in the home. Parents who suffer employment shocks may work longer hours, may be preoccupied and devote less attention to their children’s attendance or effort, may have less time to pay attention to helping the child, and so on. These effects are more manifest during recessions, since in particular an employment shock may be harder to rectify in the near future.

One reason for both dropout and grade repeat can be that the child is devoting time to labor activities. Table 7 reports the results for this category: the effect of shocks on the probability that a child starts work. Again, the results are consistent with the deviations from trend discussed above. In recessions there is no systematic effect. In growth periods, however, formal–informal movements are systematically associated with a rise in the probability that the child starts to work.

Other authors have noted that child labor is not a phenomenon that is particularly closely linked with recessions (Paes de Barros, Schady for Peru). The obvious explanation is that the demand for child labor is lower during recessions, so that even if the economic imperatives of the household to send the child to work tend to become more acute during recessions, child labor may be less common in recessions than growth periods.

The policy lessons, even at this preliminary stage, are easy to see. There is nothing wrong with intervening at the household level, as many policy initiatives do, to try to discourage parents’ incitement of their children to work. The demand for such labor may be just as important a point of intervention. Government may reduce this by increasing workplace inspection activities, strengthening laws, increasing penalties for child employment, and so forth.

Finally, table 8 investigates the decision of the spouse of the household head to enter employment. As mentioned earlier, the tone of the research is slightly different here: this decision is clearly simultaneous with that of the household head about where and how much to work. The correlations are nonetheless of interest.

In recessions, formal–informal switches are systematically associated with a rise in the probability of the spouse working. Informal–unemployment switches, on the other hand, have the opposite association: the spouse becomes less likely to work.

The first of these effects coincides with the rise in the probability of the child repeating that year’s school grade: an association that is suggestive, although we would hesitate to launch into precipitous policy recommendations based on this alone. It is plausible, nonetheless, that the same household circumstances—increased economic uncertainty through loss of severance-related benefits, higher income variability—that are deleterious for a child’s educational progress, might also be associated with increased labor activity by the spouse.

The second of these effects reinforces our observation above that unemployment shocks, particularly for workers in the informal sector, do not seem to be a meaningful measure of increases in economic risk (or even, necessarily, decreases in welfare). On the contrary, for informal workers, moving into unemployment may signal optimism about future prospects or private knowledge of future earnings.

Finally, as with the other household responses we have looked at, there is no significant effect of shocks to income, whether measured as movements to zero earnings or a 50 percent fall in reported labor income. As we have already noted, four months of labor income is not necessarily a very relevant measure of perceived risk or welfare from the household’s point of view (although it is the best we can do with the PME data). Employment shocks, signaling expected earnings over a (possibly) longer period, may be more telling.

The main objection to such an approach is that there are variables missing from the analysis (initial income, or education of the parents, for instance). In this case, a regression-adjusted difference-in-differences approach is more appropriate than the simple DD estimator we employ. There are two main reasons we do not pursue this here. The first is sample size. Once one splits the PME sample into the sub-samples necessary to examine the probabilities that are the subject of this paper, the numbers of observations are not large enough to permit multivariate techniques. In this case, the simpler difference-in-differences approach has the advantage of expositional clarity. The second is that many such variables would introduce more serious specification biases of their own. For example, due to serially uncorrelated movements in measured labor income (such as measurement error), initial income is spuriously correlated with income shocks (negatively), and its inclusion in such a regression is therefore ruled out.

There is therefore no easy answer to the allegation that missing variables make the correlation reported here potentially misleading. Note, however, that for this to be the case, a missing variable would have to be correlated with both the income or employment shock and the change in behavior. It is easy to think of household variables correlated with income level or employment status. The same variables have less obvious correlation with first differences in these variables. We conclude that the advantages of simplicity and tractability in the current context outweigh the demerits of simple difference-in-differences estimators.

Concluding Remarks

The methodology we have employed in this research has been above all quite simple and descriptive. The data have shortcomings which make the more traditional approaches:

running probit regressions to explain enrollment decisions, for instance, inapplicable. Sample sizes are too small, and there are missing household and individual variables. On the other hand, the panel structure of the PME allows us to construct first differences over a one-year period and examine the probability of key events, such as withdrawing a child from school. We can then investigate the correlation of these probabilities with income and employment shocks.

Our central conclusion is that households' educational decisions do respond to income and employment shocks, though not always in the most obvious ways. Moreover, such responses are likely to be country specific. Our finding, for example, that unemployment shocks do not have deleterious educational effects, and may even sometimes be associated with lower dropout, is plausible and comprehensible in the context of Brazil, but for another country might appear mystifying.

Secondly, educational responses differ according to macroeconomic circumstances. Demand for child labor rises during periods of economic growth, and this may play an important role in determining the outcome of household decision-making: child labor tends to rise in growth periods, and the effect of employment shocks on children's propensity to enter the workforce also rises.

Finally, the results here are suggestive for the path of future research and not, in themselves, sufficient to base significant policy decisions upon. We have compared five recessions with five growth periods in order to be able to make statements about whether or not effects appear to be systematic. In future work, we hope to reinforce this research with further episodic analysis as well as parametric analyses of household decisions.

*

*

*

References Cited

- Gill, I.S. and M.C. Neri (forthcoming) "Do Labor Laws Matter? The Pressure Points in Brazil's Labor Legislation," in *Stabilization, Fiscal Adjustment, and Beyond: Quantifying Labor Policy Challenges in Argentina, Brazil, and Chile*, forthcoming, Washington DC: The World Bank Group.
- González, P.A. and W.F. Maloney (1999) "Logit Analysis in a Rotating Panel Context and an Application to Self-Employment Decisions," Policy Research Working Paper, Washington Dc: World Bank.
- Maloney, W.F. (1999) "Does Informality Imply Segmentation in Urban Labor Markets? Evidence from Sectoral Transitions in Mexico," *World Bank Economic Review*, 13:2.
- Rocha, S. (1996) "Regional Price-Adjusted Poverty Lines for Brazil," working paper, IPEA, Rio de Janeiro.
- Neri, M.C. (1999) "A Note on the Growth Sensitivity of Poverty across Brazilian States," working paper, IPEA, Rio de Janeiro.
- Neri, M.C. and M.R. Thomas (2000), "Growth and Recessions: An Episodic Analysis of their Effects on Employment, Income, and Poverty in Metropolitan Brazil since 1982," working paper, Fundação Getulio Vargas, Rio de Janeiro.
- World Bank (1998) "Brazil: Critical Unemployment Issues," Informal Report of the World Bank, Brazil Country Management Unit.