Job Loss, Change in Marital Status and the Allocation of Time within Families: Evidence from Urban Mexico

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1. Introduction

Children and their potential to perform income earning and other economically valuable services may be an integral part of the strategy of families to achieve self-insurance. Human capital investments in children are intricately related to the ability of families to insure through formal financial markets (borrowing or buying insurance) or other informal arrangements such as getting help from friends and relatives. In so far as households have limited access to formal and informal insurance and are thus forced to use their children's time for income earning activities (e.g. sending children to work or withdrawing them from school), then poverty may be perpetuated.

The main question we address in our paper is whether families succeed at protecting their children's leisure time or the time children devote to school when their father or mother become unemployed or when their parents divorce. The extent to which the market labor supply of adult males and females is affected by changes in their health their employment status or their marital status has received considerable attention in the literature (Bartel and Taubman, 1979; Johnson and Skinner, 1986). Much less is known, however, on whether or how these shocks impact on the time allocation of other household members. The scarce evidence that exists suggests that such shocks or shocks of similar nature have a significant effect on the time use of other adult members in the households as well as children. Pitt and Rosenzweig (1990) for example, provide one of the first investigations into the implications of infant morbidity on the time allocation of teenage boys and girls in Indonesia. Their findings indicate that the existing gender-based differences in the division of time household labor force and schooling activities are reinforced among teenagers where child morbidity is at a higher level. In a similar spirit, Jacoby and

Skoufias (1997) examine the impact of unanticipated income shocks on the school attendance of children in rural India and find that households withdraw their children from school when experiencing shortfalls in crop income. This suggests that children's time is used as a form of insurance by poor households at the expense of investment in their human capital. While the economic shocks may be temporary, they can have permanent impacts through lowering human capital investment in children. [1]

There is now an extensive literature on the sharing of risks among households focusing primarily on the implications of the hypothesis on their consumption (e.g., Deaton, 1992; Hayashi et al, 1996; Morduch, 1995; Townsend, 1995). With access to complete insurance (formal or informal), household idiosyncratic shocks should have no significant effect on the consumption of households, once aggregate or uninsurable shocks are controlled for (Cochrane, 1991; Townsend, 1994). Yet, although similar implications can be derived for the sharing of time (Townsend, 1994), there is little econometric evidence on the extent to which households share risks among themselves or among their members so as to smooth the allocation of their time.

Mexico represents the case of a developing country, one with approximately one-tenth the average GDP of the United States, which has undergone a number of economic crises since the early 1980s, the most recent occurring in 1995. Overall educational attainment while growing rapidly, remains low- the average level of education of men and women above the ages of 15

[1] Related contributions include Sawada (1998) who follows a similar approach to Jacoby and Skoufias (1997) but is able to distinguish the impact of shocks on the school attendance of boys and girls in Pakistan, Haurin (1989) who uses US data to examine the effects of unanticipated changes in a husband's earnings on women's hours of work, and Kochar (1999) who focuses on

was 7.5 and 7.0 years respectively in 1995 (INEGI, 1999). By the age of 17, the majority of children, even in urban areas, are no longer enrolled in school. The extent to which the recent economic crises may have reduced the educational achievement of children below what it would have been in the absence of crises remains a topic on which there has been little research.

Our analysis uses the National Mexican Urban Employment Survey (Encuesta Nacional de Empleo Urbano- ENEU) survey, a large longitudinal survey in urban areas of Mexico. The ENEU contains repeated observations over a period of five quarters on the time use of individuals 12 years of age or older in six main activities for the week prior to the interview. The survey also contains demographic and socio-economic information as well as a standard set of detailed questions on employment, unemployment and entries and exits into the labor market. The combination of these factors offers the rare opportunity to examine the role of risk-sharing in time allocation not only between families but also within families with simple empirical methods.

Our analysis is conducted separately for adult males and females and for boys and girls in order to capture potential differences in the effect of the shocks according to gender. We regress individual specific changes in time allocated to the activities mentioned above on a set of variables describing changes in the value of time of household members, and changes in the economic opportunities available to the household. The differencing of the individual observations allows us to eliminate all time invariant individual and therefore household unobserved heterogeneity. The key variables characterizing the economic opportunities of the

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the extent to which the wage labor market can serve as a substitute for asset transactions in

household are the value of time of individual members as measured by the potential (or predicted) market wage rates of adult males, females and children.

We are also careful to distinguish between aggregate shocks and idiosyncratic shocks. Aggregate shocks are events that affect all households in the community and thus are uninsurable through formal and informal arrangements with other households in the same community. Aggregate shocks are captured by including dummy variables for each of the cities covered by the survey. Idiosyncratic shocks are events that are specific to the family and have the potential of being insured through ex-ante or ex-post arrangements with other households, or household members or institutions within the community. We capture idiosyncratic shocks with variables indicating whether anyone among the parents lost their job involuntarily or whether there was a marital change of the parents.

We conduct our analysis on two household panels carried out during and after the economic crisis of 1995 in Mexico. This crisis began with a devaluation of the peso in December of 1994, with GDP falling by 7% in real terms in 1995 and recovering in 1996. We use two different periods in order to test whether the nature of the aggregate shocks in the economy interacts significantly with the potential insurance arrangements among households. As such our analysis provides some of the first evidence about the types of shocks families are able or unable to insure against in Mexico. It also provides a first glimpse into the role of marital dissolution as a factor in the investment in human capital of children.

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smoothing household consumption in India.

2. Model

Our model is a simple extension of the standard model of labor supply over the life-cycle (MaCurdy, 1981). To keep the model simple we do not model household production explicitly and instead specify the household utility function to depend on the time allocated to depend on the time allocated to each activity by each household member.[2] We assume, for the moment, that a household consists of an adult and a younger member, and specify the preferences of the household as additively separable across time.[3] Utility at time t is given by

$$U(t) = U\left(C(t), L^A(t), H^A(t), L^C(t), H^C(t), S^C(t), X^*(t)\right)$$

where $C(t)$ denotes consumption of a composite commodity in period t, $L^A(t)$ is the hours of leisure of an adult member and $H^A(t)$ is her hours of work either at home or in the market, and $L^C(t), H^C(t), S^C(t)$ are the hours of leisure, work and schooling by a younger household member in period t, and $X^*(t)$ is a vector of observable and unobservable factors affecting a household's preferences (specified in more detail below). The function is U assumed to be strictly concave in its arguments reflecting diminishing marginal utility of consumption or leisure.

The real wage rates expressed in units of the consumption good, are given by $W^A(t)$ and $W^C(t)$, for adults and children, respectively, and are assumed to be treated as fixed by individuals. We assume the existence of a perfectly competitive credit market that allows wealth

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[2] Heckman and Killingsworth (1986) provide a useful illustration of the equivalence of these two approaches.

[3] Thus we abstract from the possibility that time allocation decisions are made within a bargaining framework.

to be transferred from period to period by holding an asset with a known and riskless real rate of return $r(t+1)$ payable at the beginning of period *t+1*.

Formally the maximization problem of the household is to choose values for $C(t), L^A(t), H^A(t), L^C(t), H^C(t), S^C(t)$, for *t =1,…,T*, to

$$MaxE_1 \sum_{t=1}^{T} b^{t-1} U\left(C(t), L^A(t), H^A(t), L^C(t), H^C(t), S^C(t), X^*(t)\right), \quad (1)$$

subject to the asset accumulation constraints

$$\overline{A}(t+1) = (1+r(t+1))A(t) \quad (2)$$

$$A(1) \text{ constant, and } A(T+1) = 0 \quad (3)$$

and the time constraints:

$$L^A(t) + H^A(t) = 1 \quad (4)$$

$$L^C(t) + H^C(t) + S^C(t) = 1 \quad (5)$$

where β is the subjective discount factor, E_t is the expectation operator conditional on the information set at period t, $\overline{A}(t)$ and $A(t)$ denote the value of real assets held at the beginning and at the end of period t, *V(t)* is unearned income and

$$A(t) = \overline{A}(t) + W^A(t) + W^C(t) + V(t) - \left(C(t) + W^A(t)L^A(t) + W^C(t)L^C(t) + W^C(t)S^C(t)\right).$$

Assuming interior solutions, we obtain the following first-order necessary conditions for a maximum:

$$U_C(t) = l(t) \quad (6)$$

$$U_{L^A}(t) = l(t)W^A(t) \quad (7)$$

$$U_{H^A}(t) = l(t)W^A(t) \quad (8)$$

$$U_{L^C}(t) = \lambda(t) W^C(t) \tag{9}$$

$$U_{H^C}(t) = \lambda(t) W^C(t) \tag{10}$$

$$U_{S^C}(t) = \lambda(t) W^C(t) \tag{11}$$

$$\lambda(t) = (1 + r(t+1))\beta \; E_t(\lambda(t+1)) \tag{12}$$

where $\lambda(t)$ is the lagrangian multiplier associated with the period t assets accumulation constraint and the subscripts of U denote partial derivatives. As Heckman and MaCurdy (1980) and MaCurdy (1981) note, $\lambda(t)$ represents the marginal utility of wealth in period t, which is a sufficient statistic summarizing all past and future information relevant to the current choices of the household. Specifically, $\lambda(t)$ is a function of the path of past, current and expected future wages rates of adults and children, initial assets, the vector of observable and unobservable factors affecting utility and the parameters describing the household's preferences.

Equations (6)-(11) in combination with the 'Euler equation' for the marginal utility of wealth $\lambda(t)$ provide a characterization of the optimal consumption and time allocation choices across time. For example, equations (11) and (12) may be expressed as

$$E_t\left(\frac{U_{S^C}(t+1)}{U_{S^C}(t)}\right) = \left(\frac{\beta^{-1}}{1 + r(t+1)}\right) E_t\left(\frac{W^C(t+1)}{W^C(t)}\right). \tag{13}$$

Holding the interest rate constant, and assuming a within-period utility function that is additively separable in each of its arguments, this condition implies that the time allocated to schooling (or leisure) between periods t+1 and t is inversely related the ratio of the child wage rates between period t+1 and t. A similar result holds for the allocation of time of adult members in leisure activities across time.

3. Empirical Strategy

We estimate time allocation functions for adult males, females, boys and girls, derived from the subset of first-order conditions above. Following the common practice in the life-cycle labor supply literature, we derive marginal utility of wealth or Frisch time allocation functions that decompose current decisions at any point in time into two components (Heckman and MaCurdy, 1980; MaCurdy, 1981). The first consists of a set of variables observed in the current period such as current period wage rates, prices and factors influencing individual tastes toward work, and the second being the marginal utility of wealth $l(t)$ that summarizes the influence of all past events and the expectations about future events on current decisions. An essential requirement for the empirical specification is that the marginal utility of wealth of the household $l(t)$, enters additively in the time allocation decision rules of all household members. With panel data, first differencing of the individual-specific observations allows us to eliminate the unobserved marginal utility of wealth $l(t)$ from the equation to be estimated.

For our empirical model, we assume the utility function in each period is additively separable in each of its arguments. Distinguishing a household by the letter *i* and each of its members by the letter *j*, we specify $X^*(i,j,t) = X(i,j,t) + e(i,j,t+1)$, where $X(i,j,t)$ is the vector of observable characteristics affecting household tastes such as age and education and $e(i,j,t+1)$ summarizes the influence of all unobservable shocks to tastes. Using the flexible functional form proposed by Browning et al, (1985), the equation for labor supply, for example, in each period may be written as

$$H(i,j,t) = b^j \ln W(i,j,t) - b^j \ln l(i,t)^{-1} + d^j X(i,j,t) + e(i,j,t+1).$$

The separability of the household utility function in each of its arguments induces the time allocation function of each member to depend only on his or her wage and not on the wage rate of other household members. After taking first differences across time the expression above becomes

$$\Delta H(i,j,t) = b^{j}\Delta \ln W(i,j,,t) + d^{j}\Delta X(i,t) - b^{j}h(i,t+1) + \Delta e \quad (i,j,t+1) \qquad (14)$$

where $\Delta H(i,j,t) = H(i,j,t+1) - H(i,j,t)$.

The focus of our analysis and discussion is on the $h(i,t+1)$ term that reflects the difference between the one-period ahead expected value of the (inverse of) marginal utility of wealth of household *i* and its realized value (i.e. $h(i,t+1) = E_t(l(i,t+1)) - l(i,t+1)$).[4] In an uncertain environment, as various unexpected events are realized in each period, households acquire new information about their current and future prospects and respond to this information by adjusting the value of their marginal utility of wealth, according to the empirical analog of equation (12). Thus, according to the life-cycle model of time allocation specified the term $h(i,t+1)$ is an integral part of the time allocation decision rules of every member in a given household.

A stronger specification for the term $h(i,t+1)$ representing innovations in the marginal utility of wealth is provided by the complete markets hypothesis. According to the recent literature of complete risk-sharing and consumption insurance (Cochrane, 1991, Townsend, 1994) it is conceivable that household communities devise a set of institutions or contracts, formal or otherwise, that allow them to fully diversify idiosyncratic risk. In these circumstances,

it is only aggregate or uninsurable risk that matters in determining individual changes in time allocation or consumption. Put differently, with complete risk-sharing household idiosyncratic shocks (whether anticipated or not) will have no significant effect on the time allocation of individuals within an insurance community. In terms of the notation used above, the complete markets hypothesis implies that the term $h(i,t+1)$ simply varies across time and not across households, i.e.,

$$h(i,t+1)=h(t+1),$$

symbolizing the fact that only aggregate shocks have an impact on changes in the time allocation of individual members of an insurance group.[5]

For our empirical analysis we exploit this overidentifying restriction of the hypothesis of complete markets or risk-sharing. We first construct variables that measure unanticipated shocks to the marginal utility of households. Examples of such shocks (discussed in more detail below) include the loss of job by the household head or his/her spouse or and termination of employment due to illness. These "shock" variables are then included as regressors in equation (14) along with a set of binary variables for each survey round interacted with the city in which a household resides. These city-time interactions dummy variables capture aggregate shocks in each of the cities in our sample and reflect our implicit assumption that the insurance community is the set of all households residing within the same city. In more practical terms, their inclusion into the

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[4] As first noted by Chamberlain (1984) the forecast errors may contain aggregate components that are common across the forecast errors of households.

[5] See Altug and Miller (1990) for a formal derivation of this key result and Jacoby and Skoufias (1998) for a more detailed presentation of the differences between permanent income and complete markets hypotheses in explaining the consumption behavior of households.

regressions amounts to expressing all variables in the regression as deviations from their average in each city and time period.

To the extent that the idiosyncratic "shock" variables contain information that is relevant for the life-cycle plan of the household and its members, then the strict version of the life-cycle model of labor supply predicts that they should be significant in the decision rules of all members of any given household irrespective of gender or age. In our empirical analysis below we are cognizant of the hazards associated with drawing inferences from the impacts of shocks on own labor supply. The coefficient of the shock from a regression based on individuals experiencing the shock is likely to be correlated with an individual's unobserved components of tastes (Ham, 1986). Workers who are laid-off, for example, may also have stronger unobserved preferences for leisure (or distaste for work). Therefore, we are careful to base our inferences on the effect of the shock on the time allocation of the household members not directly affected by the shock. These "cross-effects" of the impact of the shock on "other" household members provide a cleaner estimate of the forecast error of the marginal utility of the household and are probably less contaminated by endogeneity bias. With these considerations in mind, we interpret the absence of significant "cross effects" of the shocks on the time allocation of other household members as evidence consistent with the hypothesis that risk sharing is taking place within families.

4. Data Description

The National Urban Employment Survey (ENEU), has been undertaken quarterly since 1986 by *INEGI* (National Institute of Statistics and Geography). The sample and areas covered have been expanded over the years of the survey and currently include 44 metropolitan centers and over

100,000 households. The ENEU includes information on time use for individuals aged 12 and over, education, family structure, and dwelling characteristics, as well as a standard set of detailed questions on employment, unemployment and labor market withdrawal. The time-use and labor force participation information include hours spent in the last week on school, housework, market work and community activities.

The longitudinal data included in this research comes from the 20%, five quarter, rotating panel that is imbedded in the design of the ENEU. Each household is interviewed every three months for a period of a year, so that there are five observations for each household (and consequently all of the individuals in the household). The design is such that in any given cross-section of the ENEU, 20% of households are in their first interview, 20% are in their second interview etc. Panels can be constructed by following each 20% of households over time. This version of the paper makes use of two separate panels over the period from 1995 to 1997. Each panel has a sample of approximately 18,000-19,000 households, depending on the year.

While there is a fair amount of attrition in these short panels (about 27% on average of individuals by the end of the fifth interview have left the sample), our paper keeps all individuals in each panel who are observed for at least 2 observations. We eliminate those individuals observed only once, which corresponds to about 8% of individuals in each panel (see data appendix for more details).

Dependent variables

Our dependent variables include hours spent during the last week on a) leisure, b) work (the sum of market work and household work) and c) school. For the time allocation analysis, we divide

the sample into four groups, boys aged 12 to 17, girls aged 12 to 17, males aged 18 to 65 and women aged 18 to 65. Appendix Table 1 shows overall participation rates of and weekly hours spent by boys and girls aged 12 to 17 in school, market work and domestic work.. The table makes evident the large decreases in school attendance which begin by the age of 12 to 13 and the consequent increases in market work and household work for both girls and boys.

Shocks

We construct four key variables to measure household idiosyncratic shocks based on the information collected by the ENEU survey, which includes job loss due to firing, job loss due to illness, divorce, and marriage. Given that the job loss shocks may have different impacts depending on which household members they affect, we construct separate shocks for the head of household versus the spouse\companion of the household head.

Our first two shocks are defined according to whether a) the head of household or b) spouse/companion reports having lost their job within the past 3 months. Job loss here includes those who report that the reason they are not working is due to a) layoffs at their firm, b) the firm moved or c) work was temporary.[6] Our second two shocks are defined according to if either a) head of household or b) the spouse/companion of the household head reported that they stopped working within the last 3 months because of illness.

[6] Note that reporting that work was temporary as a reason for losing job may seem to some extent less an idiosyncratic shock than job loss due to layoffs as it may include some individuals who were aware before taking the job that the work would be temporary. We carried out the analysis excluding and including individuals in this category and the results remained similar.

The next shocks reflect the impact of family structure changes on household time allocation. The divorce shocks measure whether the household head or spouse became divorced since the previous panel interview. The marriage shocks measure whether the household head or spouse married or began living with a partner since the previous panel interview. This variable principally captures re-marriages, not first marriages. Note that it may seem implausible to consider that marriage would be an unanticipated shock. If marriage were anticipated however, it should have no impact in our regressions on time allocation, according to both the life cycle model and the complete markets hypothesis. Our inclusion of this variable is simply to shed light on possible market imperfections in credit and insurance markets, which would be evidenced by significant impacts of marriage on time allocation. Appendix table 2 contains the frequency of incidence of the shocks discussed above in our estimation samples. Though the incidence of these shocks may not be very frequent our analysis below demonstrates that these shocks are significantly correlated with changes in individual time allocation.

One response to economic shocks may be adjustments in family size, for instance, a family member may migrate elsewhere looking for work. While our empirical model does not explicitly allow family size to be endogenous, we do make an effort to eliminate the role of adjustments in family size and composition from influencing estimates. We run labor market shock regressions on two different samples: first for the full sample of individuals and second for the sample of individuals in households where there was no change in family size change during the five quarters. Only about 15% of all individuals live in a household where there was a change in family size over the five quarters. Evidence that the impact of the shock is higher in the sample of individuals where there is no change in family size over the sample period, compared to the

full sample suggests that changes in family size represent an ex-post adjustment to labor market shocks.

For the divorce and marriage shocks, nevertheless, we carry out the analysis with all observations, given that most divorces and marriages are associated with changes in household composition and eliminating households with family size changes would eliminate a large fraction of our observations of divorce and marriage.

Wages

To measure the value of time of each member, we calculate predicted wages for each individual in the family in each time period using standard Heckman selection corrected wage equations.[7] Our interest is to have three measures of wages for each household, male wages, female wages and child wages. We thus average the individual predicted wages at the household level for males, females and children. For each period, we then calculate the change in wages (individual opportunities) simply by first differencing the predicted wages.

We also implemented a second method for estimating changes in male, female and child wages which directly predicts changes in individual wages between the periods by estimating the determinants of changes in log wages, (as opposed to the first method which calculates levels of wages in each period and then takes differences). [8] Since this alternative method did not have any

[7] The wage regressions include level of education, potential experience and experience squared. The identifying variables of labor force participation include marital status and demographic variables at the household level, which include the number of individuals by age and sex. The Appendix contains results of the wage estimations.

[8] The determinants include education, potential experience and a series of dummy variables measuring age structure of the household by gender.

noticeable impact on the sign or significance of the coefficients of the shocks we do not report these estimates.[9]

The data permit a number of different geographic levels to be defined, including state, city, and municipality. Here our definition of "community" reflects the level at which an aggregate shock (and potential insurance arrangements) may take place. At the geographical level, we consider the most sensible level at which to aggregate to be at the city level, although we also carried out estimations allowing for aggregate effects at the state and municipality level, which gave similar results and are not reported here.

5. Discussion of Results

The effects of labor market shocks on the time allocation of adults and children.

Table 1 contains the estimated coefficients and associated test statistics of the employment shocks on changes in individual time allocation. These are obtained from the estimation of equation (14) using the four different labor market shocks in place of the $h(i,t+1)$ term using the full sample of individuals and then the sample of individuals from households where family size did not change during the five quarters. As discussed above, aggregate shocks were taken into account by including a complete set of city and quarter interaction terms. We have estimated separate regressions for the schooling time as well as the leisure time and work time of adults and children although a separate regression for either leisure or work time is, in principle, redundant.

[9] The estimated time allocation regressions using predicted changes in wages instead of changes in predicted wages are available from the authors upon request.

For each of the regressions estimated we conducted F-tests on the joint significance of the aggregate shocks and in all cases we rejected the hypothesis that aggregate shocks are not significantly different from zero using conventional levels of significance.[10] Additional explanatory variables in the time allocation equations for children included the change in the log of the predicted wage for children, and a set of dummies for the age of the child. In the time allocation equations for adult males we use the change in the log of the predicted wage for adult males, the age of the individual and age squared. For females the wage is replaced by the change in the log of the predicted wage for adult females. Given that July and August are vacation months during which most schools are closed, a much larger fraction of children report they did not dedicate any time to schooling during the previous week in the third quarter of both 1995 and 1996, corresponding to the second period of each panel. To account for this seasonality in schooling we included a dummy variable for changes in schooling hours between periods 1 and 2 and periods 2 and 3.

We begin first with the results of the shocks related to job loss in tables 1-3, followed by the results of the family structure shocks in table 4. Because of the large sample size in our analysis, we consider a variable to be significant only if the t-statistic is significant at the 5% level or below.[11]

The results show that during 1995-1996, a period of economic crisis and adjustment, that idiosyncratic household shocks had a significant impact on the leisure (or work) time of adult males and females. Specifically, the lay-off of the household head (or the loss of job due to

[10] Although the detailed results of the F-tests are not reported they are available upon request.

illness) decreases the work time of not only adult males but also adult females, suggesting that these shocks have a spill-over effect on other adult household members. As the coefficients indicate, adult males are not able to fully compensate the loss of their time from wage-earning activities with work in other household activities, and as a result they end-up consuming (willingly or unwillingly) more leisure. Interestingly, the job loss of the household head has a significant effect in the same direction on the leisure (or work time) of females, though the size of the coefficient is much smaller.

The presence of a significant effect of the job loss of the household head on the work time of adult females is consistent with the notion that this shock contains information that necessitates adjustment in the marginal utility of wealth of the household. In contrast, the job loss of the spouse either due to lay-off or illness appears to have little or no impact on the marginal utility of the household and thus no significant effect on the time allocation of (most) other members in the household besides on their own time allocation. Since males typically are the main source of wage income in Mexican households, their job loss is bound to limit the lifetime resources of the household which then affects the time allocation of the adult female in the household. Interestingly, however, the same shock has no effect on the leisure time and schooling time of boys and girls.

Although there is an indication that the lay-off of the household head has a significant positive effect on the work hours of girls, this effect becomes insignificant when we look at the leisure time or schooling time of girls. Thus, in contrast to its effect on adult time allocation, the

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[11] To help readers in going through the various coefficients reported on their own, we have also shaded estimates with a p-value less than or equal to 5 percent.

job loss of the household head seems to have no effect on the leisure time and schooling time of both boys and girls. As outlined earlier, this suggests that children are insulated or insured from these shocks. In fact, this appears to be the case for the other three employment shocks to the household. One exception is the effect of the loss of job of the spouse of the household head due to illness on the work time of girls. As is the case with the head being laid-off, the loss of job by an adult female increases significantly the work time of girls and this significantly reduces the leisure time of girls. One plausible explanation for this effect is that girls pick-up some of the household tasks performed previously by the their mother. Nevertheless, none of the four employment-related shocks appear to have a significant effect on the time allocated to schooling by either boys or girls.

In order to check whether our results so far are contaminated from ex-post adjustments in family size we have also replicated the analysis restricting the sample to individual observations from households where there was no change in family size. These estimates are in panel 1B in the lower half of table 1. As it can be inferred, the changes are not substantial enough to warrant any changes in the general conclusions. One remarkable difference is that the effect of a job loss from illness of the household head now ceases to have a significant effect on female work. Nevertheless, the loss of job due to lay-off of the household head continues to have a significant negative effect on the work hours of adult females. Also, the shocks continue to be insignificant on the schooling hours of children in most cases. The only difference is that job loss of a spouse due to illness now actually has a significant positive impact on boys' schooling whereas in panel 1A this shock is also positive but significant only at the 7 percent. This contrary to expectations

result may reflect that a spouse who loses his/her job may spend more time in the household, thereby ensuring that children, boys in particular, dedicate more time to their studies.

As mentioned already, the estimates in table 1 are from a period of economic crisis in Mexico. Depending on the economic conditions prevailing the same shocks may convey very different information about the lifetime wealth of households and therefore on the extent to which households adjust their marginal utility of wealth as a result of the shock experienced. In order to examine whether the change in the overall economic conditions impacts the "information content" of the idiosyncratic shocks experienced by households and the potential for insurance arrangements between and within households we have also examined whether the same patterns hold during a period of economic recovery. The estimates from the new panel of households during the 1996-1997 period, a period of economic recovery, are presented in table 2.

Once again, the estimates in table 2 yield the same general conclusions regarding the time use of children. The time allocated by children to school continues to be unaffected from these shocks, suggesting that adults insulate their children from economic shocks. The loss of job by the spouse due to illness continues to have a significant effect on the hours devoted to schooling by boys but not girls (see panel 2B). As before, this effect becomes less significant when using the full sample. In addition, during the period of economic recovery, job loss of the spouse due to sickness also increases leisure of girls and decreases their work hours. In contrast, during the crisis period, the same shock had a significant effect and opposite sign for girls. This result is consistent with the interpretation that the information content of the same shock conveys different information about the lifetime opportunities of the households during periods of an economic downturn and recovery. This assertion can be further supported from the effect of the

job loss of the household head on the work of adult females. During the period of the crisis, this shock had a significant effect on the work hours of females. During the period of economic recovery it ceases to be significant suggesting that the shock does result in a significant updating of the marginal utility of wealth of the household.

The effects of labor market shocks on the school attendance and grade advancement.

The estimates discussed so far have relied on the actual hours allocated to the work, schooling and leisure activities. For children who are not in school or attend school irregularly the zero hours of schooling are treated in the same manner as a positive value. Given that the presence of the zero values may bias our results of the impact of shocks on schooling, we also carry out further investigations about the potential effect of these shocks on the schooling of children. The hours devoted to schooling during the week prior to the interview are not necessarily a good indicator of the potential effect of the shock on children's schooling achievement. For this reason we also examine whether children residing in households experiencing these labor market shocks are more likely to drop-out of school. Although the survey does not have an explicit question on whether a child is currently enrolled in and attending school in each quarter we use the time allocated to school in the first and fifth quarter of the panel, covering two school years, to construct a binary variable indicating whether the child reports positive hours in school in each of these quarters. We then limit our sample to children with positive hours of schooling in the first quarter and examine whether in this sample of children the shocks have a significant effect on the likelihood of dropping out. Since this is a cross sectional regression, the aggregate shocks are captured by the inclusion of the dummy

variables for the city of residence of the household. In this setting the idiosyncratic shock is also slightly amended to signify whether an adult member experienced a labor market shock in any of the five quarters covered by the survey. Additional regressors included are variables describing the age and gender composition of the household that a child resides in, and dummies for the age of the child.

Another potential effect of shocks is that while they may not result in immediate dropout, they may result in higher repetition or failure rates, which are then likely to reduce overall lifetime educational achievement (Duryea, 1998). To address this question, we also carry out estimations of the probability of grade completion and promotion using the sample of children in school in quarter1 and in quarter 5 and checking whether the shocks at any point in time between quarter 1 and quarter 5 decrease the likelihood of advancing to the next to the next highest grade.

Table 3 contains the effects of these labor market shocks on the probability of dropping out of school and on the probability of grade advancement. The numbers reported are the marginal effects of the shocks estimated from a probit specification of the probability of the occurrence of the event in question. As can be seen, the job loss of the spouse of the household head has no effect on school drop-out rates or grade advancement. The shock that has a significant effect on the probability of dropping out of school is the job loss of the household head. This shock increases significantly the probability that girls drop out of school, irrespective of whether we control for ex-post adjustments in household size or whether we use the 1995-96 panel or the 1996-97 panel of households. Thus, although the earlier results in tables 1 and 2 imply that the school hours of both boys and girls are insulated from this shock, we now have evidence that these efforts to protect children's investments in human capital are not completely

effective at least when it comes to girls continuing school. Additional supportive evidence of the absence of complete insurance is provided by the results on the impact of job loss due to illness of the household head. In families where ex-post adjustments in family size did not take place, this shock increases significantly the probability of drop-out for both boys and girls (see panel 3D in table 3). However, even in this case, the higher marginal probability for girls suggests that the shock affects girls more than boys.

The effects of changes in marital status

We now turn to the results of the divorce and (re) marriage shocks on time allocation contained in table 4. All of the estimates reported in table 4 are obtained using the full sample of households.. During our crisis year 1995-1996, divorce tends to reduce leisure and increase work both for boys and girls, with a larger effect for girls than boys. Divorce has a negative effect on the time girls allocate to schooling and also tends to increase the dropout of girls, although there is no effect on school promotion rates. For adults, divorce tends to reduce female leisure and increase work although there is no apparent impact for males.

In contrast to 1995-1996, divorce has no effect on children's time allocation during 1996-1997. Nevertheless, divorce continues to increase the probability of dropout for boys. It also reduces the probability of girls passing a school year successfully. For adults, there are no significant effects of divorce, with the exception that male work is reduced by divorce. These results, on balance, would appear to suggest that divorce is more likely to be harmful for children in periods of economic crisis. This result reinforced by the fact that divorce rates may increase during periods of economic crises as unemployment and the difficulty of finding jobs put

additional stresses in the relationship of adults within families, suggests that the potential costs of economic downturns may have bigger and longer lasting effects since they also affect the human capital of future generations.

(Re)marriage on the other hand appears to increase the work of girls and women, in both periods of analysis. Time dedicated to schooling is also reduced for girls in both periods of analysis, and marriage increases the probability of dropout as well. There are, curiously, few impacts on males, the only exception being is that boys' leisure is reduced with marriage in 1995-1996.

In summary, the demographic variables shocks in our analysis overall appear to have more impact on children than the job loss variables although their effects in the case of divorce are greater during economic crisis than non-economic crisis. (Re)marriage appears to heavily alter the time allocation of girls and women, increasing work for girls and females and reducing schooling for girls.

6. Concluding Remarks

To what extent do families succeed at protecting their children's leisure time or the time their children devote to school when the father or mother become unemployed or when their parents divorce? The evidence presented here suggests that children, and boys more so than girls, are largely unaffected by economic shocks, as measured by job loss, even during periods of economic crisis. Nevertheless, there are some negative effects of divorce, which are in fact more severe during economic crisis. These results suggest that parents are apparently able to insulate

their children from the effects of economic crisis. The same, however, does not to appear to be true for divorce.

The question arises as to why the demographic change shocks appear to have more impact than the job loss shocks. One plausible explanation lies with the duration or expected duration of the shock. Unemployment in Mexico is a relatively short-term phenomenon. Most unemployed individuals have a short duration of employment, 60% of unemployed men find work within 3 months (Parker and Pacheco, 1999), even during economic crises. Furthermore whereas the 1995 crisis was quite severe in terms of falls in real wages and GDP, it was also relatively short, by 1996, GDP was growing at rates above 5% in real terms.

Divorce on the other hand is likely to be a longer-term state, and so may be viewed as more of a permanent shock to family well-being than unemployment. For this reason, it may have greater effects on child well-being. Note that we have shown that divorce tends to reduce children's time dedicated to schooling, as well as increasing dropout and lowering the probability of grade promotion to the next grade, which suggests that the shocks may have long term effects on children's educational attainment. Longitudinal data with observations for a much longer time than our short panels would be required to provide more conclusive evidence on this issue.

In terms of policy implications, it is important to note that our evidence that children are generally well protected from these idiosyncratic shocks does not imply that government sponsored insurance schemes have no role to play in periods of economic crisis. Policies aimed at providing a safety net (such as unemployment insurance- which does not exist in Mexico) can still be effective in reducing the impact of the aggregate shocks on household decisions. Instead, what we think is potentially more important for policy design is the evidence we have uncovered

using the two household panels from two different periods with different macroeconomic conditions. Our results suggest that the nature of the aggregate shock interacts with the extent to which households are successful at protecting the time use of their members and the human capital investments in their children. This evidence suggests that safety net programs can become more effective in protecting families and their members if, by design, these programs are sensitive to the nature of the aggregate shock. In future related research we hope to provide more extensive evidence of how the increasing globalization of the Mexican economy and the potentially faster transmission across space (cities or regions) and dissipation across time (shorter period of economic downturn) of aggregate shocks in the economy impacts on the potential of households to protect their members from idiosyncratic shocks.

We close with an observation on models of family behavior. While our paper is not a strict test of the two competing hypotheses, the results provide mixed evidence on whether the life-cycle model or the complete markets hypothesis provide more appropriate predictions of economic behavior in the case of time allocation. Our results suggest that families have more possibilities of insurance than those contemplated by a strict version of the life cycle model, although not to the extent predicted by the complete markets hypothesis. The results thus reinforce the belief that no single model can fully describe individual behavior and especially that of families. In many circumstances, however, new and in some cases deeper insights, can be obtained from a careful and considerate combination of two competing hypotheses. We hope that this paper has been a first step in that direction.

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Table 1

The Impact of Employment Shocks on Changes in Individual Time Allocation 1995-1996

1A: Full Sample

		During last 3 months: Head laid-off				Head lost job due to illness				Spouse laid-off				Spouse lost job due to illness			
Changes in:		**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**
Leisure	**Boys**	2.356	1.35	1.75	0.08	-1.013	3.71	-0.27	0.79	-1.577	2.49	-0.63	0.53	-3.512	4.07	-0.86	0.39
	Girls	-1.883	1.32	-1.43	0.15	-0.176	4.36	-0.04	0.97	-2.157	2.09	-1.03	0.30	-8.631	4.36	-1.98	0.05
	Males	20.460	0.73	28.20	0.00	15.519	2.03	7.63	0.00	0.052	1.27	0.04	0.97	0.235	2.30	0.10	0.92
	Females	1.556	0.67	2.33	0.02	4.257	1.64	2.59	0.01	8.288	1.20	6.93	0.00	13.451	2.05	6.57	0.00
Work	**Boys**	-1.624	1.02	-1.59	0.11	-4.194	2.82	-1.49	0.14	3.090	1.89	1.63	0.10	-2.566	3.10	-0.83	0.41
	Girls	1.966	1.00	1.98	0.05	1.214	3.29	0.37	0.71	-0.551	1.58	-0.35	0.73	8.372	3.29	2.55	0.01
	Males	-20.507	0.71	-28.99	0.00	-15.145	1.98	-7.64	0.00	-0.075	1.24	-0.06	0.95	-0.796	2.24	-0.36	0.72
	Females	-1.748	0.66	-2.67	0.01	-3.518	1.61	-2.18	0.03	-8.482	1.17	-7.22	0.00	-14.264	2.01	-7.09	0.00
Schooling	**Boys**	-0.733	1.10	-0.67	0.50	5.199	3.02	1.72	0.09	-1.515	2.03	-0.75	0.46	6.072	3.31	1.83	0.07
	Girls	-0.080	1.15	-0.07	0.95	-1.024	3.80	-0.27	0.79	2.707	1.82	1.49	0.14	0.258	3.80	0.07	0.95

1B: Sample of Individuals from households where family size did not change during the five quarters

		During last 3 months: Head laid-off				Head lost job due to illness				Spouse laid-off				Spouse lost job due to illness			
Changes in:		**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**
Leisure	**Boys**	2.413	1.51	1.60	0.11	-6.496	5.49	-1.18	0.24	-0.296	2.57	-0.12	0.91	-6.246	5.77	-1.08	0.28
	Girls	-1.941	1.60	-1.22	0.22	-2.580	4.48	-0.58	0.57	-2.323	2.35	-0.99	0.32	-6.752	4.78	-1.41	0.16
	Males	20.787	1.00	20.83	0.00	14.724	2.82	5.22	0.00	1.177	1.44	0.82	0.41	3.687	3.30	1.12	0.26
	Females	1.259	0.74	1.71	0.09	3.434	2.70	1.27	0.20	8.497	1.32	6.46	0.00	12.021	3.21	3.74	0.00
Work	**Boys**	-1.543	1.07	-1.45	0.15	-0.068	3.69	-0.02	0.99	2.041	1.86	1.10	0.27	-2.155	3.91	-0.55	0.58
	Girls	1.549	1.30	1.20	0.23	2.328	3.64	0.64	0.52	-0.136	1.84	-0.07	0.94	6.664	6.09	1.09	0.27
	Males	-20.662	0.99	-20.78	0.00	-14.485	2.79	-5.20	0.00	-1.262	1.34	-0.95	0.35	-3.429	3.27	-1.05	0.29
	Females	-1.471	0.73	-2.01	0.05	-2.501	2.69	-0.93	0.35	-8.609	1.27	-6.78	0.00	-13.380	3.09	-4.33	0.00
Schooling	**Boys**	-0.871	1.20	-0.73	0.47	6.551	3.63	1.81	0.07	-1.748	2.55	-0.68	0.49	8.393	3.26	2.57	0.01
	Girls	0.394	1.28	0.31	0.76	0.271	2.68	0.10	0.92	2.457	2.10	1.17	0.24	0.085	4.43	0.02	0.99

Table 2

The Impact of Employment Shocks on Changes in Individual Time Allocation 1996-1997

2A: Full Sample

		During last 3 months: Head laid-off				Head lost job due to illness				Spouse laid-off				Spouse lost job due to illness			
Changes in:		**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**
Leisure	**Boys**	-1.071	1.76	-0.61	0.54	9.014	3.31	2.72	0.01	2.578	2.51	1.03	0.31	-3.488	4.32	-0.81	0.42
	Girls	2.084	1.67	1.25	0.21	5.186	3.14	1.65	0.10	1.923	2.54	0.76	0.45	7.288	3.66	1.99	0.05
	Males	23.817	0.97	24.50	0.00	17.615	2.08	8.49	0.00	2.135	1.41	1.52	0.13	5.333	2.37	2.25	0.03
	Females	1.138	0.86	1.33	0.19	6.819	1.66	4.11	0.00	9.143	1.30	7.03	0.00	6.683	2.23	3.00	0.00
Work	**Boys**	1.078	1.39	0.77	0.44	-8.230	2.62	-3.14	0.00	-1.982	1.99	-1.00	0.32	-1.885	3.42	-0.55	0.58
	Girls	-1.020	1.31	-0.78	0.44	-5.351	2.46	-2.17	0.03	-0.003	1.99	0.00	1.00	-9.227	2.87	-3.21	0.00
	Males	-24.179	0.95	-25.52	0.00	-17.208	2.02	-8.51	0.00	-2.437	1.37	-1.78	0.08	-7.196	2.31	-3.11	0.00
	Females	-0.925	0.84	-1.10	0.27	-6.463	1.63	-3.97	0.00	-8.226	1.28	-6.43	0.00	-7.135	2.19	-3.25	0.00
Schooling	**Boys**	-0.007	1.41	-0.01	1.00	-0.784	2.65	-0.30	0.77	-0.597	2.01	-0.30	0.77	5.373	3.45	1.56	0.12
	Girls	-1.063	1.43	-0.74	0.46	0.166	2.69	0.06	0.95	-1.920	2.17	-0.89	0.38	1.943	3.13	0.62	0.54

2B: Sample of Individuals from households where family size did not change during the five quarters

		During last 3 months: Head laid-off				Head lost job due to illness				Spouse laid-off				Spouse lost job due to illness			
Changes in:		**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**	**coeff**	**st error**	**t-val**	**p-value**
Leisure	**Boys**	-1.511	2.03	-0.75	0.46	9.150	4.44	2.06	0.04	4.333	3.10	1.40	0.16	-3.784	4.55	-0.83	0.41
	Girls	2.249	2.15	1.05	0.30	5.967	5.49	1.09	0.28	3.845	2.92	1.32	0.19	9.365	4.73	1.98	0.05
	Males		1.33	18.14	0.00	17.710	2.99	5.93	0.00	2.141	1.49	1.44	0.15	7.154	3.10	2.31	0.02
	Females	0.669	1.09	0.61	0.54	6.877	2.44	2.82	0.01	10.133	1.56	6.51	0.00	6.303	2.66	2.37	0.02
Work	**Boys**	1.659	1.89	0.88	0.38	-8.262	3.17	-2.61	0.01	-3.310	2.12	-1.56	0.12	-1.723	4.02	-0.43	0.67
	Girls	-0.471	1.59	-0.30	0.77	-6.346	4.95	-1.28	0.20	-2.838	2.96	-0.96	0.34	-9.875	4.96	-1.99	0.05
	Males	-24.473	1.33	-18.46	0.00	-17.950	2.93	-6.13	0.00	-2.749	1.34	-2.06	0.04	-8.807	3.13	-2.82	0.01
	Females	-0.280	1.06	-0.26	0.79	-6.473	2.49	-2.60	0.01	-9.290	1.59	-5.83	0.00	-6.825	2.68	-2.55	0.01
Schooling	**Boys**	-0.148	1.82	-0.08	0.94	-0.888	2.77	-0.32	0.75	-1.022	2.30	-0.44	0.66	5.507	2.38	2.31	0.02
	Girls	-1.777	1.62	-1.09	0.27	0.379	2.37	0.16	0.87	-1.008	2.54	-0.40	0.69	0.515	3.38	0.15	0.88

Table 3

The Impact of Shocks on the Probability of Dropping out of School & Grade Advancement

3A: Full Sample 1995-1996

	During last 3 months: Head laid-off				Head lost job due to illness				Spouse laid-off				Spouse lost job due to illness			
	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value
Boys	0.040	0.03	1.35	0.18	0.118	0.11	1.21	0.22	-0.002	0.05	-0.03	0.98	0.202	0.13	1.88	0.06
Girls	0.072	0.04	2.13	0.03	0.023	0.11	0.21	0.83	-0.046	0.05	-0.94	0.35	0.001	0.10	0.01	0.99
Boys	0.082	0.03	2.27	0.02	0.000	0.14	0.00	1.00	0.031	0.06	0.49	0.63	0.007	0.14	0.05	0.96
Girls	0.105	0.03	2.69	0.01	-0.057	0.17	-0.36	0.72	0.072	0.05	1.23	0.22	0.136	0.07	1.27	0.21

3B: Sample of individuals from households where family size did not change during the five quarters 1995-1996

	During last 3 months: Head laid-off				Head lost job due to illness				Spouse laid-off				Spouse lost job due to illness			
	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value
Boys	0.016	0.03	0.48	0.63	0.036	0.12	0.32	0.75	0.010	0.06	0.17	0.87	0.131	0.15	1.00	0.32
Girls	0.096	0.04	2.45	0.01	-0.089	0.10	-0.71	0.48	-0.033	0.05	-0.62	0.54	-0.027	0.13	-0.19	0.85
Boys	0.052	0.04	1.25	0.21	-0.023	0.16	-0.15	0.88	0.027	0.07	0.36	0.72	0.084	0.15	0.47	0.64
Girls	0.076	0.04	1.60	0.11	n.a.	n.a.	n.a.	n.a.	0.063	0.06	0.91	0.36	0.090	0.11	0.66	0.51

3C: Full Sample 1996-1997

	During last 3 months: Head laid-off				Head lost job due to illness				Spouse laid-off				Spouse lost job due to illness			
	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value
Boys	0.047	0.04	1.19	0.23	0.127	0.11	1.36	0.18	0.011	0.05	0.21	0.83	n.a.	n.a.	n.a.	n.a.
Girls	0.091	0.05	2	0.05	0.131	0.09	1.59	0.11	0.059	0.07	0.92	0.36	-0.083	0.07	-0.96	0.34
Boys	-0.003	0.04	-0.06	0.95	0.112	0.07	1.06	0.29	0.041	0.05	0.69	0.49	-0.017	0.13	-0.13	0.89
Girls	0.010	0.05	0.19	0.85	0.039	0.10	0.35	0.72	0.073	0.06	1.03	0.30	-0.021	0.12	-0.19	0.85

3D: Sample of individuals from households where family size did not change during the five quarters 1996-1997

	During last 3 months: Head laid-off				Head lost job due to illness				Spouse laid-off				Spouse lost job due to illness			
	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value	coeff	st error	t-val	p-value
Boys	0.032	0.05	0.75	0.46	0.206	0.13	1.94	0.05	0.060	0.07	0.99	0.32	n.a.	n.a.	n.a.	n.a.
Girls	0.123	0.06	2.23	0.03	0.238	0.14	2.03	0.04	0.042	0.08	0.58	0.56	0.082	0.17	0.53	0.59
Boys	0.061	0.05	1.26	0.21	0.074	0.10	0.58	0.56	0.073	0.05	1.15	0.25	-0.006	0.17	-0.04	0.97
Girls	0.044	0.07	0.66	0.51	n.a.	n.a.	n.a.	n.a.	0.042	0.08	0.52	0.60	-0.042	0.21	-0.21	0.83

Table 4

The Impact of Divorce/Marriage

1995-1996

Changes in:		During last 3 months Head or Spouse: Divorced				Married			
		coeff	st error	t-val	p-value	coeff	st error	t-val	p-value
Leisure	**Boys**	-3.728	1.62	-2.31	0.02	-3.364	1.60	-2.10	0.04
	Girls	-2.157	1.61	-1.34	0.18	0.104	1.36	0.08	0.94
	Males	-0.084	0.95	-0.09	0.93	0.501	0.78	0.64	0.52
	Females	-2.590	0.70	-3.70	0.00	-1.805	0.72	-2.51	0.01
Work	**Boys**	2.243	1.24	1.81	0.07	1.679	1.27	1.33	0.19
	Girls	4.189	1.33	3.16	0.00	3.116	1.17	2.65	0.01
	Males	-1.657	0.95	-1.75	0.08	-0.515	0.76	-0.68	0.50
	Females	1.213	0.73	1.67	0.10	2.562	0.72	3.56	0.00
Schooling	**Boys**	1.482	1.26	1.18	0.24	1.682	1.13	1.49	0.14
	Girls	-2.131	1.27	-1.68	0.09	-3.214	0.96	-3.34	0.00
Dropping out of School	**Boys**	0.063	0.04	1.59	0.11	0.080	0.06	1.48	0.14
	Girls	0.098	0.04	2.39	0.02	0.227	0.06	4.59	0.00
Grade Advancement	**Boys**	-0.064	0.05	-1.30	0.19	-0.033	0.06	-0.52	0.60
	Girls	-0.002	0.05	-0.05	0.96	-0.040	0.06	-0.67	0.50

1996-1997

Changes in:		During last 3 months Head or Spouse: Divorced				Married			
		coeff	st error	t-val	p-value	coeff	st error	t-val	p-value
Leisure	**Boys**	1.566	1.70	0.92	0.36	-0.422	1.60	-0.26	0.79
	Girls	-2.326	1.57	-1.48	0.14	-2.292	1.22	-1.88	0.06
	Males	1.270	0.91	1.39	0.16	-0.318	0.80	-0.40	0.69
	Females	-0.860	0.75	-1.15	0.25	-0.449	0.69	-0.65	0.52
Work	**Boys**	-1.177	1.30	-0.90	0.37	1.240	1.37	0.91	0.37
	Girls	0.546	1.45	0.38	0.71	4.497	1.26	3.58	0.00
	Males	-2.945	0.95	-3.12	0.00	0.962	0.79	1.22	0.22
	Females	-0.818	0.76	-1.08	0.28	1.431	0.69	2.08	0.04
Schooling	**Boys**	-0.389	1.26	-0.31	0.76	-0.818	1.20	-0.68	0.49
	Girls	1.780	1.19	1.50	0.14	-2.207	0.97	-2.28	0.02
Dropping out of School	**Boys**	0.072	0.05	1.71	0.09	-0.028	0.05	-0.52	0.60
	Girls	0.062	0.04	1.53	0.13	0.216	0.06	4.37	0.00
Grade Advancement	**Boys**	-0.030	0.05	-0.63	0.53	-0.054	0.07	-0.86	0.39
	Girls	-0.143	0.06	-2.71	0.01	-0.077	0.07	-1.21	0.23

DATA APPENDIX

The original panel of households in the 1995-96 ENEU survey contained 83,688 individuals from 18,112 households (total of 346,468 observations). After dropping individual of age 11 or younger for which information on time allocation is not collected, and after dropping individuals observed for only one of the 5 quarters, the final sample contained observations for 57,516 individuals from 17,489 households. In the 1996-97 ENEU survey there were 85,793 individuals from 18,842 households (total of 357,897 observations). After applying the same restrictions the final sample reduced to 59,480 individuals from 18,203 households (total of 264,633 observations).

Appendix Table 1
School, Market work, and Domestic work
by Age and Gender

12		13		14		15		16		17	
	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
.0	83.0	80.2	79.7	76.2	74.0	67.4	64.3	57.4	57.4	47.1	47.5
.7	3.5	9.7	5.1	14.7	7.5	21.8	13.3	30.7	18.3	40.9	23.3
.3	81.0	65.6	83.0	64.8	84.4	62.2	85.4	59.1	84.5	54.6	85.9
.4	33.9	34.3	34.9	35.0	35.3	34.9	35.5	35.1	35.0	35.0	35.3
.7	20.9	24.4	27.2	30.1	7.5	33.8	13.3	38.3	37.5	41.3	40.6
.3	13.2	10.6	14.5	10.9	15.9	11.5	17.8	11.6	19.8	11.7	21.5

econd trimester

Appendix Table 2
Frequency of Shocks in our samples

1995-1996

During last 3 months	**Frequency** (in%)
Head laid-off	1.50
Head lost job due to illness	0.20
Spouse laid-off	0.44
Spouse lost job due to illness	0.14
Head or Spouse Divorced	1.04
Head or Spouse Married	0.87

1996-1997

During last 3 months	**Frequency** (in%)
Head laid-off	0.83
Head lost job due to illness	0.21
Spouse laid-off	0.35
Spouse lost job due to illness	0.13
Head or Spouse Divorced	0.93
Head or Spouse Married	0.80