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Job Loss and Household Labor Supply Adjustments in Developing Countries: Evidence From Argentina

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Job loss and household labor supply adjustments in developing countries: Evidence from Argentina*

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Using longitudinal data for Argentina, we estimate the labor supply reaction of spouses and children to their husband's or father's job loss. Our findings show that job loss by the household head has a positive and significant impact on the labor supply of other household members. However, it increases the likelihood of spouses to switch to informal and downgraded employment, and of children to drop-out from education. While effects are stronger among vulnerable households, coverage of social security does not provide enough support in coping with unemployment shocks. Instead, we find that mothers' labor participation may prevent the educational drop-out of their daughters.

JEL codes: J16, J21, J22, J65. ***Keywords:*** Job loss, Labor supply, Female labor participation, Educational enrollment, Educational drop-out, Human capital formation, Idiosyncratic shocks.

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1 Introduction

Belonging to a household implies risk-sharing and represents an insurance mechanism to deal with adverse shocks. Aiming to smooth consumption, households can cope with adverse labor market shocks suffered by the main income earner through changes in the labor force participation of other household members. Early theoretical contributions (Humphrey, 1940; Woytinsky, 1940) and empirical studies (Heckman, 1983; Lundberg, 1985; Maloney, 1987, 1991; Spletzer, 1997; Stephens, 2002) labeled the reaction of wives to their husband's employment loss as "added worker effect". More recently, researchers found several factors influencing the existence and magnitude of this coping strategy. Among these, the role of social security (Cullen and Gruber, 2000; Bentolila and Ichino, 2008; Birinci, 2019; Wu and Krueger, 2021), aggregate female labor participation (Bredtmann et al., 2018; Keldenich and Knabe, 2018), labor informality (Basu et al., 2000; Maloney, 2004), liquidity restrictions (Ortigueira and Siassi, 2013) and macroeconomic dynamics (Parker and Skoufias, 2004; Mattingly and Smith, 2010; Bryan and Longhi, 2018; Albanesi, 2019; Serrano et al., 2019; Guner et al., 2021). Furthermore, the effects of parental job loss and income shocks on children's labor and educational decisions were explored separately. It was found that economic shocks may lead to educational drop-out (e.g. Duryea et al., 2007; Cardona-Sosa et al., 2018; Cerutti et al., 2019; GC Britto et al., 2021) and parental unemployment can have persistent effects on offspring's human capital investments and future income (Schmidpeter, 2020; Kaila et al., 2021).

Our main contribution is to analyze the joint reaction of spouses and children to sudden unemployment of the *breadwinner* in the household in the context of a developing country. The joint consideration of labor participation decisions of different household members permits to evaluate the existence of substitution effects between them. We study this effect using rich sets of individual panel data for urban Argentina from 1995 to 2015 that enables to obtain estimates abstracting from individual level heterogeneity. Furthermore, in additional analyses we follow the literature and control for bias deriving from potential sources of endogeneity, such as skill selection and anticipation effects, by focusing on households where the head lost his job in any time period in our panel and exploiting the variation in the timing of the job loss, and by considering only individuals that lost their job due to mass layoffs or plant closures (e.g. Halla et al., 2020; Hardoy and Schøne, 2014; Hilger, 2016; Fadlon and Nielsen, 2021). Our results are consistent when abstracting for these potential sources of endogeneity. First, we estimate the effect of job loss by the (male) household head on the likelihood

of their (female) partner to become active on the labor market, or to increase their working hours. Second, we estimate the likelihood of taking up an informal job and of occupational downgrading by the spouse in reaction to her husband's job loss. Third, we estimate the impact on older children's labor force participation and educational drop-out. We analyze heterogeneity in these effects along the income distribution, and for male and female children. Furthermore, we test whether the labor supply reaction of one household member is substituted by the reaction of another household member, and whether the effects differ depending on the provision of unemployment benefits.

We also provide evidence regarding women's job quality when having an additional worker role. The role of labor informality and employment downgrading as strategies to cope with unemployment shocks suffered by the partner are still unsolved questions, despite their importance for the evaluation of labor market prospects, especially of women. While recent contributions found that informal jobs prevent female worker from leaving the labor market upon motherhood (Berniell et al., 2021), studies on the effect of breadwinner's unemployment on female labor participation are, so far, limited to examine whether the female partner became active on the labor market and indeed found a job (Bredtmann et al., 2018). Our analysis contributes new evidence on this issue.

The study of coping strategies to insure from household shocks is particularly relevant for developing countries. In these contexts, female labor participation and educational enrollment are usually lower than in developed countries, particularly in Latin America. Also, income and unemployment shocks are more frequent since labor markets are likely to show higher instability and social security is narrower. Cultural factors may also play a role, since traditional gender roles are likely to be more prevalent. Indeed, the literature found significant differences in female labor supply responses to their husband's job loss between developed and developing countries: estimates in Latin American countries show that women increase their labor force participation by between 12 and 20 percentage points (Parker and Skoufias, 2004; Fernandes and Felício, 2005; Paz, 2009; Cardona-Sosa et al., 2018) while for European countries the estimates show an increase by between 3 and 9 percentage points (Hardoy and Schøne, 2014; Bredtmann et al., 2018; Halla et al., 2020; Keldenich and Knabe, 2018).

Most of the literature studying the factors shaping household coping strategies is focused on developed countries. Our findings shed light on the role of insurance mechanisms within the household in the typical context of a developing country, with rather high income volatility, unstable macroeconomic conditions, the prevalence of informal labor arrangements, and relatively low coverage of un-

employment benefits. In developed countries these type of social benefits are broader and may crowd out labor participation adjustments (Bentolila and Ichino, 2008; Birinci, 2019; Wu and Krueger, 2021; Bertheau et al., 2022). We test whether in the context of a developing country these benefits are effective to insure households against unemployment shocks, avoiding informality, downgrading and educational drop-out.

Our main findings suggest that a substantial amount of female spouses who were initially outside of the labor market become active in response to their husband's job loss. Our estimates show an increase in labor supply by 15 percentage points. Those who were already employed increase their labor supply by around two working hours per week. We also find significant effects on labor informality and employment downgrading among women exposed to these shocks. Regarding children, after job loss by the household head, the labor force participation of sons and daughters increases by seven percentage points. Among sons, the effect is around six percentage points, while among daughters around nine. Importantly, our results confirm that the labor supply response of mothers and their adult children substitute each other, especially when there are no younger siblings in the household. Our estimates also suggest that enrollment in education falls by 14 percentage points due to the job loss of the household head, and that this effect is higher among sons than among daughters. Importantly, mothers' labor participation insures their daughters against educational drop-out. Lastly, we find that these effects are stronger among poorer households and that social security plays an only rather limited role in helping households to cope with unemployment shocks, given that its coverage only encompasses a relatively low number of households.

The remainder of this paper is organized as follows: Section 2 descriptively introduces the specific mechanisms under investigation within the context of our case study. Section 3 presents the data, Section 4 our estimation strategy, Section 5 the results, and Section 6 concludes.

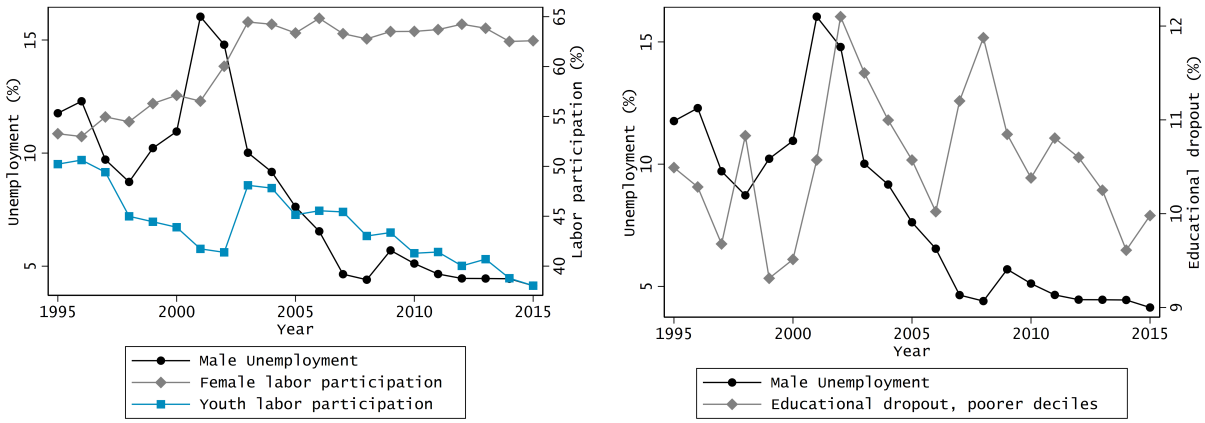
2 Institutional Background

Argentina represents an interesting case study to examine the mechanisms through which households cope with unemployment shocks. The country is characterized by a rather unstable economic performance, which can be illustrated by the evolution of unemployment displayed in Figure 1. Following a deep economic crisis during the 1980's, structural reforms related to trade liberalization and macroeconomic stabilization in the early 1990's helped unemployment reduction. However, the combination

of international economic crises (particularly in 1998) with an unsustainable fiscal policy led to an economic crisis in 2001-2002. After this disruptive episode, and helped by windfalls in international commodity prices, the Argentinian economy started another stabilization process. From 2003 to 2008, a stronger labor market, combined with progressive fiscal policies, resulted in a considerable decrease in unemployment rates. Following the 2009 international crisis, the tailwind ended and government fiscal capacity shortened. Unemployment remained virtually stagnant and employment rates started to decrease once again.

Figure 1 also gives a first aggregate overview about household responses to unemployment shocks. The left panel suggests a positive relationship between male unemployment trends and both women and youth labor participation, as documented in previous contributions (Serrano et al., 2019). The right panel suggests a positive correlation between male unemployment and educational drop-out of individuals in households belonging to the three lowest income deciles. In our empirical set up, we test whether these mechanisms are indeed present at the household level.

Figure 1: Unemployment, labor participation and educational attendance.



Source: SEDLAC (CEDLAS and World Bank).

The described patterns are also silent about the characteristics of the jobs in which women and children are inserting. Household labor supply adjustments can, at least partially, compensate income losses; however, it may be at the expense of job quality. For instance, the income loss might lower the opportunity cost and, thus, force household members to accept any job opportunity. This is particularly relevant for women, who, as the recent literature shows, are more likely to be employed in flexible jobs in order to combine employment and motherhood (Berniell et al., 2021). To evaluate the conditions in which women are inserting in the labor market, we also study whether a husband's

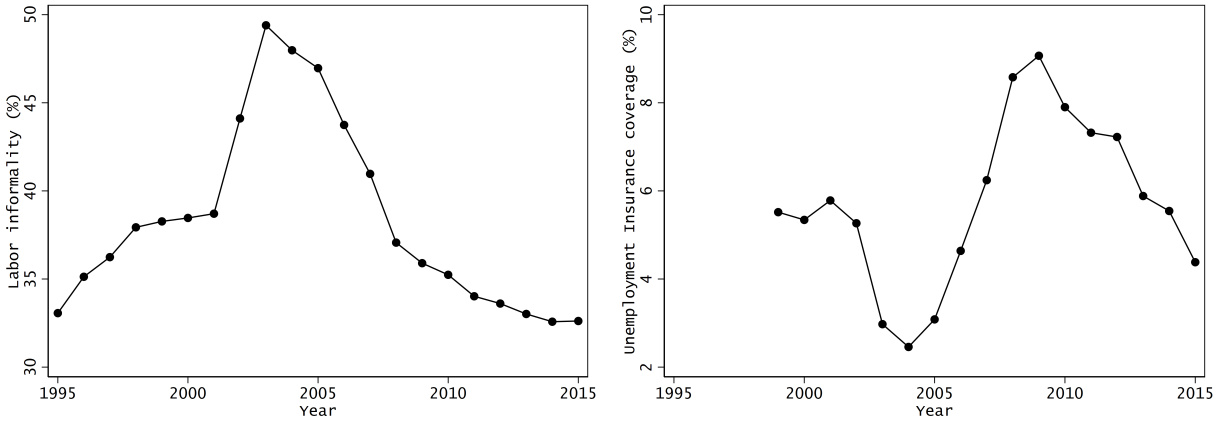
job loss induces them to be employed in informal work or being over-skilled for the job they are employed in (*employment downgrading*). This topic still represents an important gap in the literature.

To understand the effects of household shocks on job quality is particularly important in the context of developing countries, where labor informality is high and the coverage of unemployment insurance rather low. Figure 2 provides a stylized figure of this. The left graph in Figure 2 shows that labor informality affected constantly more than 30% of the Argentinian working population from 1995 to 2015, reaching almost 50% during the 2001-2002 crisis. As much of the literature documents, labor informality has important consequences in terms of labor market prospects.[1] Importantly, labor benefits may be inadequate to fully insure against income shocks, making households more likely to trigger other coping strategies, such as individual labor supply adjustments. With respect to informality, income compensations, such as social protection schemes, tend to have a low coverage in developing countries.[2] The right graph in Figure 2 shows that in Argentina the coverage of unemployment insurance estimated by the National Agency of Social Security (ANSES) is, on average, about 6%. Previous literature focused on developed countries, where this type of social assistance is broader, found that these benefits can crowd out household labor participation adjustments (Bentolila and Ichino, 2008; Birinci, 2019; Wu and Krueger, 2021). The low coverage of these transfers in Argentina raises the question, whether they are effective in reducing the adverse reactions of households to employment and income shocks. We will test this hypothesis in our empirical analysis.

[1] Informality in Latin America is consistently associated with lower earnings and higher job instability (Gasparini and Tornarolli, 2009; Tornarolli et al., 2014; Ulyssea, 2020) and also to less on-the-job human capital accumulation (Bobba et al., 2021).

[2] Unemployment insurance in Latin America is connected to the labor market functioning, since informality (both in levels and transitions) is high and only formal workers are entitled to receive income compensation benefits (Levy and Schady, 2013). Recent advances in non-contributory schemes, which are mainly focused on people in extreme poverty, provide little help against income shocks due to unemployment (Busso et al., 2021).

Figure 2: Informality and unemployment insurance.



Source: SEDLAC (CEDLAS and World Bank) and ANSES (*Administración Nacional de la Seguridad Social*), own elaboration.

3 Data

We use longitudinal data from the *Encuesta Permanente de Hogares* (Permanent Household Survey; hereafter, EPH), the primary household survey in Argentina carried out by the INDEC (*Instituto Nacional de Estadísticas y Censos*). We restrict our analysis to the period between 1995 and 2015 because more recent survey versions do not include the panel structure needed to compute labor transitions. The survey contains information on a large number of socioeconomic variables, including employment and marital status, household structure, individual income, region of residence and education of each household member. Approximately 19,000 households are surveyed in every round. Overall, the survey covers more than 100,000 inhabitants in urban areas representing about 68% of the country's population. The rural population is not covered. Some questions in the survey are answered by each individual over the age of ten living in the household. Other questions related to the whole household are answered by the household head. In all cases, it is possible to clearly identify couples, offspring and their individual characteristics.[3]

During the analyzed period, the EPH has a rotative panel structure, which enables to follow households for a maximum of four survey waves over a 1.5 year period. The rotative panel design differs between the period 1995-2002 and 2003-2015. In the first interval, the survey collected information for two waves in each year, updating 25% of the sample in each survey. Consequently, between 2003 and 2015, each household was visited four times, twice in two consecutive trimesters, then left

[3]Our definition of fathers and mothers is based on whether the individual is the child's parent or step-parent.

without visitation for two trimesters, and then visited two times during the last two trimesters.[4] We exploit this rotative panel structure to compute employment and/or educational transitions for each individual, with special attention to periods of unemployment. Since we are particularly interested in changes in female labor force participation due to their husband's job loss, we focus on households with heterosexual couples and male household heads.[5] Additionally, the sample is restricted to couples in which both members are between 25 and 60 years old in the initial period to avoid to consider the influence of educational and retirement decisions of household heads and their partners on labor market participation. Finally, we only consider households interviewed four times in order to avoid biases related to panel attrition.[6] Since we are also interested in analyzing changes in labor market participation and educational enrollment of sons and daughters living in the household, and to evaluate a potential substitution effects with their mother's reactions, we define labor and educational transition variables at the individual level.

The main explanatory variable that we use in the estimations is a binary indicator which equals one if the household head became unemployed between two consecutive survey waves. We also define outcome variables for spouses and children by exploiting changes between two consecutive survey waves. We consider labor market participation changes in both the extensive margin (labor market entry) and intensive margin (weekly working hours). In the case of older children, we also compute a variable indicating educational drop-out; i.e. a negative change in educational enrollment from one period to the next.

Each of these main outcome variables is defined within a particular sample. When computing the labor market participation of female spouses (offspring) at the extensive margin, we only consider those spouses (offspring) who were not participating in the labor market in the initial period. When we consider changes in hours worked among female spouses (offspring) we restrict our sample to those spouses (offspring) that were employed across all time periods. Changes in offspring's educational enrollment are only defined for those that were enrolled in education in the first period in which they are included in the survey. Hence, after applying the sample restrictions mentioned above, the analysis is performed on five different samples according to the outcome variable we are analyzing. Table 1 illustrates descriptive statistics for the five samples (A to E). While the percentage of household

[4] Table A.1 in the Appendix Section illustrates the EPH rotating panel scheme.

[5] Households with female household head represent only about 5% of the full sample.

[6] In the Online Appendix (Tables A.10 and A.11) we also present our main results without this sample restriction. Results do not change significantly.

Table 1: Main variables descriptive statistics

	Sample A	**Sample B**	**Sample C**	**Sample D**	**Sample E**
	mean	*mean*	*mean*	*mean*	*mean*
HH head job loss (%)	12.28	11.18	11.74	13.02	10.75
	(32.82)	(31.51)	(32.19)	(33.66)	(30.97)
Male Head's education (years)	9.68	11.18	11.74	9.42	10.81
	(3.70)	(4.05)	(4.07)	(3.87)	(4.00)
Wives' education (years)	9.59	11.95	10.38	9.53	10.86
	(3.49)	(3.97)	(3.96)	(3.75)	(3.84)
Male Head's age	44.32	44.02	49.25	50.84	49.16
	(10.65)	(9.69)	(6.54)	(6.78	(6.35)
Wives' age	41.65	41.49	46.67	48.33	46.63
	(10.89)	(9.33)	(6.43)	(6.75)	(9.17)
Household income (log)	5.80	6.51	6.00	6.25	6.08
	(1.85)	(1.67)	(1.83)	(1.63)	(1.85)
At least one child (%)	91.01	85.51	100	100	100
	(28.60)	(35.20)	-	-	-
Num. of children	2.30	1.94	3.07	2.64	2.99
	(1.53)	(1.35)	(1.55)	(1.41)	(1.45)
Regional Unemployment (%)	14.70	13.99	14.35	14.33	14.49
	(4.20)	(3.84)	(4.06)	(3.84)	(4.09)
Regional male Unemployment (%)	13.97	13.21	13.59	13.56	13.74
	(4.48)	(4.13)	(4.35)	(4.12)	(4.37)
Observations	101233	96049	79517	20374	74518

Notes: Standard errors in parentheses. Samples - (A) Female spouses not participating in the labor market in the initial period; (B) Female spouses always employed; (C) Households with at least one son or daughter not participating in the labor market in the initial period; (D) Households where at least one son or daughter was employed; (E) Households with at least one son or daughter enrolled in any educational level in the initial period. *Source*: EPH, own estimates.

head's job loss is similar across samples, a relevant difference appears when comparing households with female spouses who were not participating in the labor market in the initial period, with those households in which spouses were employed in all periods. The former group has, on average, lower education and income, and higher child presence and unemployment exposure than the latter. At the same time, households with at least one son or daughter outside of the labor market, and those with at least one son or daughter enrolled in education (at any level), show income, education and unemployment exposure levels between the other samples, as well as a higher number of children. Lastly, the sample of households with 16-25 year old children outside of the labor market is composed of older couples.[7]

[7]We restrict the sample of offspring to those that are between 16 and 25 years old. The main rationale for choosing this age bracket is because individuals in this age range are more likely to make decisions on whether to work or to study. Younger children are not included as their labor participation may be under-reported in household surveys since employment of children under the age of 16 is illegal in Argentina. As a result, respondents may choose not to disclose the working habits of underage children.

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4 Empirical Strategy

In order to compute changes to labor participation and education, we exploit the time structure of the data in the same spirit as event-study approaches. As mentioned in the previous section, changes at the extensive margin of female partners, sons or daughters only take into consideration those households in which the female partner, son or daughter, respectively, was initially not active on the labor market. Regarding changes in labor force participation at the intensive margin, we measure changes in the hours worked per week of those that were already employed before the event (job-loss of the household head). Changes in educational enrollment are measured for those sons or daughters in the household that were already in education before the event. Educational drop-out is then defined as leaving education between one period and the next without graduating.

To analyze spouses and offspring's labor supply responses to job loss of the household head and potential substitution effects, we estimate the following model:

$$Y_{ihrt} = \alpha + \gamma E_{hrt} + \delta F_{hrt} + \zeta E_{hrt} F_{hrt} + X_{ihrt}^{'}\beta + \psi_i + \phi_{rt} + \varepsilon_{ihrt} \quad (1)$$

where Y_{ihrt} is the outcome of interest of individual i, living in household h and region r, in time period t. The coefficient γ captures i's reaction to changes in the employment situation of the household head (E_{hrt}). E_{hrt} is one if the male household head was employed in the previous period and is not employed in the current period, and zero otherwise. F_{hrt} is the labor supply reaction of other household members (e.g. of the mother when the labor supply reaction of children is estimated). Hence, δ identifies the existences of substitution effects between household members.

We estimate five different specifications for Y_{ihrt}: a) female spouses' labor force participation at the extensive margin (labor market entry); b) female spouses' labor force participation at the intensive margin (weekly working hours); c) children's labor force participation at the extensive margin; d) children's labor force participation at the intensive margin; e) children's educational enrollment. In specification a) and c), we restrict our sample to spouses or children, respectively, who were not active on the labor market in the first interview. In specification b) and d) Y_{ihrt} indicates the weekly hours of work. In specification d), we consider a sample of children who were enrolled in education in the first interview. In the first specifications of our empirical model, we abstract from substitution effects and

restrict δ and ζ to be zero. In these models, in presence of household adjustment mechanisms between spouses, we expect γ, which is our main coefficient of interest, to be positive in each specification of the empirical model.

The vector X_{ihrt} is a vector of individual and household level control variables including age, presence of children in the household, age of the youngest child in the household, and number of children. In addition, estimations include region-specific time fixed effects (ϕ_{rt}), and individual fixed effects (ψ_i). The inclusion of individual fixed effects captures unobserved heterogeneity, which represents a potential identification issue that has not been entirely ruled out in most previous contributions (Bredtmann et al., 2018). ε_{iht} is an idiosyncratic error term. We obtain our estimates clustering standard errors at the individual level.

Two potential caveats of our analysis are related to, first, negative skill selection into unemployment and, second, the household members' potential anticipation of unemployment loss. If, due to assortative mating and intergenerational transmission of human capital, the labor force reaction of spouses and children, as well as children's educational enrollment decisions, are also negatively correlated with skills, skill selection would bias our estimates upward. Anticipation effects, on the other hand, would bias our estimates downward, because spouses and children may have already adjusted their labor force participation or educational enrollment before their husband or father's unemployment occurs. In Section 5.4 we address these potential endogeneity issues by estimating the effect on a more homogeneous sub-sample of households where the head lost his job in any of the time periods in our analysis, following Hilger (2016); Halla et al. (2020); Fadlon and Nielsen (2021).

Another potential issue are general macroeconomic conditions that could be correlated with both, job loss by the household head and employment of other household members. Since we analyze labor force participation (including those active in the labor market but unemployed), rather than employment, our specification does not depend on the actual likelihood to find a job by household members. However, individuals may become discouraged amid a recession and, thus, stay out of the labor market. The literature on this subject is still inconclusive: some contributions find evidence supporting this hypothesis (Kohara, 2010); others show that this effect is particularly strong when other household members expect to find a job in the same industry where the household head was employed (Hardoy and Schøne, 2014); recent studies–focused on the interaction between household

responses and macro conditions–found opposite results (Bredtmann et al., 2018). In presence of these "discouraged worker effects" our estimates could be considered as a lower bound.

5 Results

In this section, we present the main results of this paper: In 5.1 we show the estimates of the effect of breadwinner's job loss on female labor participation, both at the extensive and the intensive margin, and job quality. We also discuss possible substitution effects between mother and children's labor participation. In 5.2 we focus on children's labor force participation and educational dropout, also considering mothers' labor participation. In 5.3 we report heterogeneous effect by initial household income and social benefits recipients. Finally, in 5.4 we discuss potential sources of endogeneity in our estimates and provide robustness checks to test the validity of our findings in terms of causal inference.

5.1 The effect on female labor force participation

Table 2 shows the impact of household head's job loss on female labor force participation at the extensive and intensive margin, and on job quality. Panel A shows the baseline estimates, omitting substitution effects between mother's and children's labor participation, whereas Panel B considers also the reaction of other household members. Interestingly, we do not find significant differences between the two analyses, suggesting that the reaction of mothers is independent of their children's labor force participation decisions. The point estimates in column (1) shows that female labor participation increases by around 15 percentage points in reaction to their husband's job loss. Considering that a share of about 47% of women are initially out of the labor market, our results point at an increase in female labor participation of 31%. This point estimate is similar to previous findings in Latin America that found an effect between 12 and 20 percentage points (Parker and Skoufias, 2004; Fernandes and Felício, 2005; Cardona-Sosa et al., 2018; Paz, 2009). In comparison to previous contributions, our estimates control for individual level heterogeneity and estimate the effect over a longer time horizon. Recent contributions for developed countries show lower estimates, between 3 and 9 percentage points (Hardoy and Schøne, 2014; Bredtmann et al., 2018; Keldenich and Knabe, 2018; Halla et al., 2020).

To evaluate whether these women indeed find a job when entering the labor market, column (2) shows estimates where the outcome variable is one if the woman, who previously was not active on the labor market, becomes employed when becoming active in reaction the her husband's job loss.[8] The results suggest that the vast majority of women becoming active on the labor market indeed find a job soon.

Column (3) shows the effects at the intensive margin; i.e. changes in the amount of weekly working hours. The estimates suggest an increase of about 1.4 working hours. Considering that spouses who were initially employed work, on average, 32 weekly hours, our results suggest an increase of about 4.4%. Despite previous contributions for developed countries found a positive effect on women's labor supply responses at the intensive margin (Mattingly and Smith, 2010; Bredtmann et al., 2018; Bryan and Longhi, 2018), this paper is the first to find a significant effect in a developing country.[9]

The findings so far show that women are able to enter the labor market, find an employment or increase their working hours as reaction to household income shocks. However, this does not take into account the characteristics of the employment. As mentioned, the income shock could reduce the opportunity cost of work and force women to accept any job in order to mitigate the shock. In addition, women may prefer jobs that are more flexible, such as informal jobs, due to childcare and other kind of domestic tasks (Berniell et al., 2021). Columns (4) and (5) show the effect estimates on labor informality, columns (6) and (7) on employment downgrading, as indicators of women's employment quality. An informal job is hereby defined as such if it does not provide any right to pensions once retired. In column (4) the sample comprises all women, while in column (5) the sample comprises only women employed in the initial period, and hence measures the effect on changing from a formal to an informal employment. Both point estimates are positive and statistically significant. The likelihood to work in an informal employment among all women increases by around three and among employed women by around four percentage points. Interestingly, the increase is in the same order of magnitude, and even slightly higher both in absolute and relative terms, among already employed women. This suggests that not only newly employed women are more likely to

[8] This aspect was explored by Bredtmann et al. (2018).

[9] Fernandes and Felício (2005) and Martinoty (2015) present results for Brazil and Argentina, respectively, suggesting that the entire women labor supply response materializes at the extensive margin. However, both studies are focused on economic crisis periods which might be a special case.

take informal jobs, but also that women are more likely to switch from a formal to an informal job in reaction to their husband's sudden unemployment.

We also find evidence supporting the existence of employment downgrading among women. In columns (6) and (7) we only consider skilled women (i.e. those with a completed high school diploma). In order to classify occupations we follow INDEC's *Código Nacional de Ocupaciones* and consider low-skilled jobs as those identified as "non-skilled" or "operative", which correspond to the 1-digit ISCO categories 7, 8 and 9. The results show that the likelihood of highly qualified women to work in low-skilled jobs increases by around seven percentage points, both for the full sample and among already employed women, in reaction to their husband's job loss.

In sum, the results from our estimations suggest that the labor force participation of women increases in reaction to their husband's job loss. However, it also induces women to be more likely to work in informal jobs or jobs for which they are overqualified.

Table 2: Estimates on female labor participation

Panel A – Baseline estimates.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss	0.148***	0.130***	1.322***	0.025***	0.037***	0.070***	0.071***
	(0.011)	(0.010)	(0.513)	(0.008)	(0.008)	(0.013)	(0.014)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	96782	96782	93054	70773	55776	60364	49449
Average	.47	.47	32.03	.36	.26	.46	.42

Panel B – Considering substitution effects.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss=1	0.149***	0.127***	1.119**	0.023***	0.035***	0.071***	0.072***
	(0.011)	(0.011)	(0.550)	(0.008)	(0.008)	(0.014)	(0.015)
HH head job loss=1 × Children's LFP=1	-0.026	0.014	1.452	0.018	0.012	-0.020	-0.013
	(0.026)	(0.025)	(1.484)	(0.020)	(0.022)	(0.025)	(0.028)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	96665	96665	92969	70715	55741	60332	49430
Average	.47	.47	32.03	.36	.26	.46	.42

Notes: Column (1) measures the effect of male household head's job loss on the labor force participation of their wives. Column (2) measures the effect on finding a job. Column (3) measures the effect on weekly working hours among employed women. Column (4) measures the effect on informality. Column (5) on switching from a formal to an informal job. Column (6) measures the effect on employment downgrading (i.e. women working in a job for which they are overqualified). Column (7) measures the effect on switching to a "downgrading" employment. Panel A considers all spouses while Panel B only includes those with children. Robust standard errors clustering at the individual level indicated in parentheses. ** $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*. The value in the last row indicates the average of the dependent variable in the first interview. *Source*: EPH, own estimates.

5.2 The effect on sons and daughters

Partners are not the only household members who can take on the role as "added worker" in the household. Older children may also change their labor force participation decisions and their enrollment in education in reaction to their father's job loss, particularly in developing countries. The effect on children can have important implications for their human capital formation and, if the effect is asymmetric across socioeconomic groups, negatively affect intergenerational mobility and increase future inequality. In what follows, we estimate the effects on children's labor supply and educational enrollment.[10] Importantly, we also examine whether mothers' labor supply reactions can prevent their children's labor participation and educational drop-out.

Table 3 shows the effect of father's job loss on labor force participation, hours worked and educational dropout of sons and daughters living in the same household. Again, Panel A shows the baseline estimates, omitting substitution effects. Panels B and C consider the joint reaction of children and mothers at the extensive and intensive margin, respectively. The first three columns show the effect estimates for the sample of daughters, the last three columns for the sample of sons. In Panel A, for children of both sexes the effects follow the same pattern and the effect sizes are, on average, in a similar order of magnitude. Job loss by the household head is associated with a significant labor force participation increase by around ten (six) percentage points for daughters (sons), and a higher likelihood to drop out from education by 14 (15) percentage points. Instead, we do not find any statistically significant association with weekly working hours for those already in the labor force. Our results regarding the effects on children's drop-out are in line with previous estimates for Latin American countries (Duryea et al., 2007; Cardona-Sosa et al., 2018; Cerutti et al., 2019; GC Britto et al., 2021) while previous contributions found negligible effects in developed countries (Hilger, 2016).

When considering substitution effects in Panel B and C we find interesting differences by child gender. While children's labor force participation is completely prevented by their mother's labor market entry, educational drop-out seems not fully insured in the case of sons. However, mother's labor supply participation counterbalances daughters' educational drop-out. This means that even when the mother becomes active on the labor market in reaction to the job loss suffered by the household head, and this substantially reduces the likelihood of children to become active of the labor market themselves, educational drop-out still cannot be fully avoided.Also, when mothers already participat-

[10] As explained in Section 3, we restrict the sample to children aged between 16 and 25. Estimations considering couple's children aged between 18 and 25 years yield similar results.

ing to the labor force increase their working hours in reaction to the income shock, this only weakly prevents their children's reaction to the household shock: given that the average change in mothers' hours worked is around 11, it only preventsdaughters' labor force participation reaction by about 32% and dropout by about 18%.

The increase in educational drop-outs is particularly worrisome. It may depend on an income effect with bilateral repercussions on enrollment: on the one hand by forcing children to leave education due to the direct costs attached to it, on the other hand by having an impact on the necessity of children to participate in the generation of household income. In Argentina, educational enrollment is almost universal for children between six and 14 years old. However, this rate is substantially lower–around 82%– for individuals aged between 15 and 17 (Marchionni et al., 2019). Employment shocks might, hence, further decrease children's human capital formation by leading to educational drop-out and lower overall achievements. Our findings, which show a higher effect of parental job loss on educational dropout than on labor force participation, suggest that the direct cost of education plays an important role, besides of the opportunity cost associated with foregone earnings. Income support programs or scholarships targeting the direct costs of education might hence be a tool that could reduce disruptions in human capital formation due to household income losses.

Table 3: Estimates on children labor participation

Panel A – Baseline estimates.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss	0.097***	-1.859	0.140***	0.062**	-0.340	0.147***
	(0.029)	(1.236)	(0.020)	(0.029)	(1.343)	(0.024)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	41188	7121	37147	35631	12469	34715
Average	.65	9.84	.69	.51	14.02	.58

Panel B – Considering substitution effects.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.103**	-0.873	0.144***	0.078	0.808	0.149***
	(0.044)	(1.669)	(0.023)	(0.056)	(2.103)	(0.020)
HH head job loss=1 × Mother's LFP=1	-0.121*	3.797	-0.082**	-0.167**	0.101	-0.003
	(0.068)	(2.904)	(0.041)	(0.083)	(3.164)	(0.045)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20912	3385	17380	18059	6712	16455
Average	.65	10.23	.65	.49	14.83	.53

Panel C – Considering substitution effects (in hours worked).

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.136***	-3.693**	0.121***	-0.027	-1.151	0.125***
	(0.052)	(1.834)	(0.024)	(0.057)	(1.937)	(0.022)
HH head job loss=1 × Mother's hrs. change	-0.004*	-0.135	-0.002*	-0.001	0.088	-0.001
	(0.002)	(0.097)	(0.001)	(0.002)	(0.106)	(0.001)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20270	3733	19752	17557	5744	18250
Average	.66	9.80	.72	.53	13.42	.63

Notes: Columns (1) and (4) measures the effect of male household head's job loss on the labor force participation of their daughters and sons, respectively. Columns (2) and (5) measure the effect on weekly working hours among employed children. Columns (3) and (6) measure the effect on educational dropout. Panel A considers all children, Panel B only includes children whose mothers were not participating in the labor market in the initial period, and Panel C considers children of already working mothers. Robust standard errors clustering at the individual level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The value in the last row indicates the average of the dependent variable in the first interview. *Source*: EPH, own estimates. *Source*: EPH, own estimates.

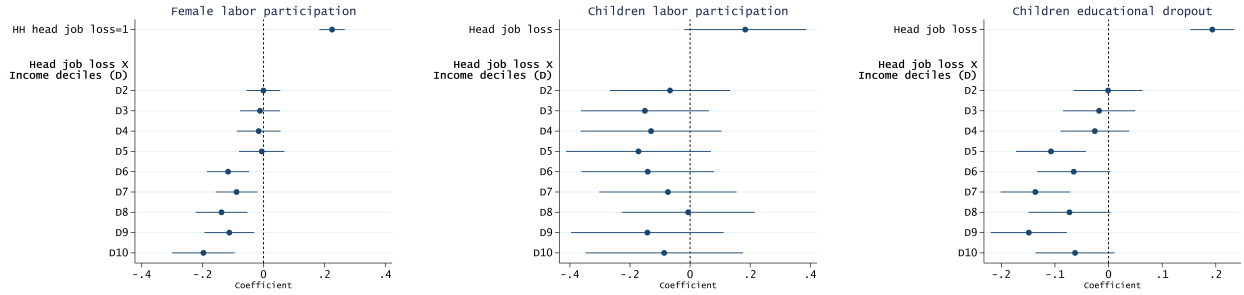
5.3 Heterogeneous impacts

Once we extended the study to other family members different than the couple, the aim is to analyze some of the mechanisms that explain how households cope with unemployment shocks. We consider asymmetric impacts by initial household income (i.e., reported household income in the first interview) and benefits received by the household (severance payment and unemployment insurance).To perform these analyses we include an interaction term between E in equation (1) and these variables. To the best of our knowledge, this paper represents the first contribution analyzing the determinants of household coping strategies in this way, particularly in the context of a developing country.

Household income Theoretically, the relationship between labor supply reactions and household income is, in principle, ambiguous. On the one hand, for high-income households job loss may represent a higher drop in income and, hence, a stronger need to compensate consumption levels by the labor supply participation of other household members. However, income should also be positively correlated with savings and wealth, which may help to better cope with adverse shocks in the short-run. Additionally, higher income can be associated with higher levels of education and skills, which may help to find soon other employment solutions. However, due to assortative mating and intergenerational transmission of human capital, this may also apply for other household members, who, thus, may find it easier to enter the labor market in reaction to income shocks. Consequently, the overall impact of initial household income is, a priori, unclear.

Figure 3 shows the estimates of the interaction term between job loss of the household head and initial household income for three outcomes of interest: women's labor supply at the extensive margin, children's labor supply reaction at the extensive margin, and children's educational drop-out. The results suggest that the magnitude of the female labor supply reaction to their husband's job loss decreases with initial household income. The probability for women who were initially out of the labor force to become active on the labor market is substantially higher for households with an income level below the median of the distribution. In line with previous contributions for Latin America (such as Serrano et al., 2019), our results suggest that female labor force participation reactions are stronger among lower income households. On the other hand, while we do not find any clear relationship between household income and children's labor supply changes, the effect of a father's job loss on educational enrollment is suggestively lower among richer households.

Figure 3: Labor supply adjustments and household income.



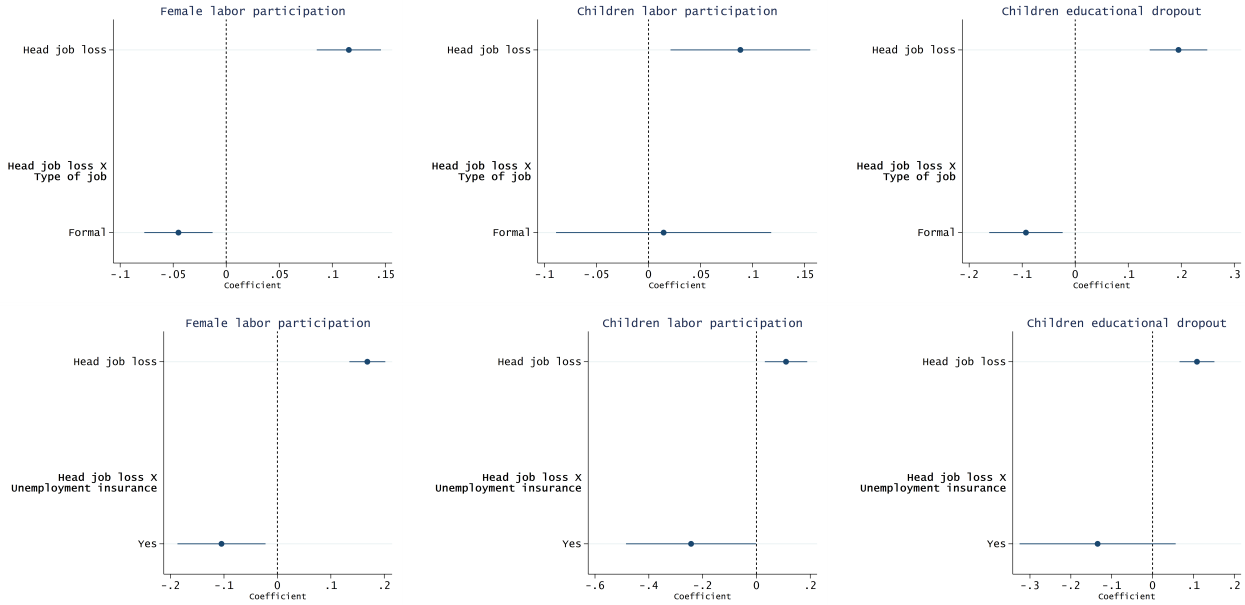
Notes: 90% confidence intervals. *Source*: EPH, own estimates.

Formal employment and unemployment insurance Finally, we study the role of income compensation mechanisms. We first evaluate differences in the reaction of spouses and children to their household head's job loss depending on whether the job was in the formal or informal sector. Figure 4 shows the results of this analysis. While we do not find a statistically significant difference of the effect on children's labor participation, the labor force participation response of spouses and educational dropout of children of workers who lose their employment in the formal sector is about 30-50% lower than of workers that were previously employed in the informal sector.

Then, we analyze the role of social security. While previous contributions have demonstrated that social security leads to smaller secondary worker's responses in developed countries (Cullen and Gruber, 2000; Bentolila and Ichino, 2008; Birinci, 2019; Wu and Krueger, 2021), less in known about the role of these transfers in developing countries. This difference is, however, very important since most of the social security schemes (for example, unemployment insurance) are designed for formal employment contexts, while in Argentina about 35% of the jobs are informal (SEDLAC, 2022) . Considering this, we estimate the effect for households were the main earner benefited from the receipt of any form of unemployment insurance vs. households that did not receive this form of income support. Figure 4 shows the estimates.

The results suggest that the unemployment insurance may partially or fully insure households against unemployment shocks. While in households that do not receive any unemployment insurance spouses and children are likely to become active on the labor market, and children are likely to drop out of education, this likelihood is close or indistinguishable from zero for households that do receive the transfer. This result confirms past findings: social security can help in mitigating the consequences of employment or income shocks. However, due to the low coverage of unemployment insurance in Argentina, taking into account the full population, this impact is rather limited.

Figure 4: Labor supply adjustments and income support



Notes: 90% confidence intervals. *Source*: EPH, own estimates.

5.4 Endogeneity and Robustness

In previous contributions, such as Bredtmann et al. (2018), unobserved heterogeneity could not be entirely ruled out due to data restrictions. However, certain unobserved individual characteristics, such as preferences for leisure and opportunity costs, could be correlated with initial household income and employment status and, hence, bias the estimates in an *a priori* undefined direction. To address this issue, our empirical model includes individual fixed effects. As mentioned, remaining caveats of our analysis are related to negative skill selection into unemployment and anticipation effects.

To address these potential endogeneity issues, in this Section we report the results of additional analyses that aim at estimating the employment loss only among households for which it can be considered an idiosyncratic shock. First, following recent contributions we estimate the effect on a sub-sample of households in which the head lost his job in any of the time periods in our analysis (e.g. Hilger, 2016; Halla et al., 2020; Fadlon and Nielsen, 2021). The objective of this specification is to estimate the effect among a homogeneous sample of households with respect to their unobserved skills and likelihood of unemployment. Hence, in this analysis we mainly exploit the variation in the timing of the job loss. In each quarter, we compare households affected by unemployment shocks to those currently not affected, but that will lose their job in a later period. By controlling for quarter and household fixed effects, households exposed and non-exposed to job loss should be rather comparable.

The results, reported in the Online Appendix in Tables A.12 and A.13, confirm the patterns observed so far and are very close to the baseline results.

Then, in order to abstract from potential anticipation effects, we perform the analysis taking advantage of a particularity of our data: it includes self-reported questions on whether the employment loss was due to a plant closure or a mass layoff at the firm level. Assuming these as unforeseeable events from the point of view of the worker, they provide an exogenous source of variation to estimate the effect of individual unemployment shocks (see e.g. Hardoy and Schøne, 2014; Halla et al., 2020). Also, these events should affect workers with different skills in the same manner and, hence, allow to control for skill selection into unemployment. Although the estimates have less statistical power since self-reported plant closures and mass layoff events represent only about 4% and 14% of total job losses, respectively, the results of these additional estimations, reported in Tables A.15 to A.18 in the Online Appendix, mostly confirm the baseline results in sign and magnitude.

Finally, we evaluate our results in different time periods. In line with Bredtmann et al. (2018) we consider indicators of macroeconomic performance for the subdivision in periods. We define the time periods based on the male employment dynamics in Argentina displayed in Figure 1. Section A in the Appendix shows the results. Generally, the same qualitative pattern of the baseline results is observed in each time period. Interestingly, while the labor supply reaction of spouses seems particularly relevant around the major 2001-2002 crisis that the country suffered, job loss by the household head is consistently associated with the educational drop-out of children in all time periods. Furthermore, unlike in other periods, during the crisis mothers' labor force participation does not prevent their daughters' educational drop-out.

6 Conclusions

In this paper, we evaluated how households cope with adverse income shocks originated by employment shocks in the context of a developing country. Hereby, we took into account the joint reaction of distinct household members, estimated the effect on labor force participation and enrollment in education, and evaluated the presence of substitution effects. As we argue, our estimates abstract from individual level heterogeneity, skill selection and anticipation effects. Therefore, our analysis contributes to a more comprehensive picture of how households cope with unemployment shocks in developing countries. Additionally, we study different heterogeneities, such as by gender of the child

and along the distribution of household income. Lastly, we evaluated the role of social protection in shaping coping strategies.

We found that both spouses and children substantially increase their labor force participation after a male breadwinner's job loss, especially in low-income households. Additionally, our estimates show a substantial impact of the shock on labor informality and employment downgrading among women, and on educational drop-out of children. We also found that the labor force participation of mothers prevents their sons' and daughters' labor force participation but hampers only the educational dropout of daughters. Finally, we found that income support and social security are indeed able to counterbalance adverse household reactions to income shocks, but that they play a rather minor role due to the low coverage of these social protection schemes. Extending social insurance mechanisms, for instance increasing labor formality, could hence be an effective strategy to reduce the vulnerability of households in the middle and at the bottom of the distribution from unexpected life events, such as income shocks.

In conclusion, the results of our analysis are relevant from a policy perspective. They show that shocks affect households in an asymmetric way and may deteriorate the process of human capital formation of future generations. Our findings highlight the need for efficient social security systems and employment policies that target women and young adults in order to match the increased labor supply with its demand and provide support to ensure equality of educational opportunities also in times of crisis. As research has shown, improving equality of opportunities can be a driver of economic development (Neidhöfer et al., 2021). Hence, policies that prevent disruptions to human capital formation, which may happen through educational dropout or employment downgrading, should have long run benefits for individual and aggregate economic performance.

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ONLINE APPENDIX

Table A.1: *Encuesta Permanente de Hogares* (EPH) rotative panel structure.
Panel A – *Encuesta Permanente de Hogares 1995-2002.*

Year 1		**Year 2**		**Year 3**		**Year 4**	
May	*October*	*May*	*October*	*May*	*October*	*May*	*October*
X							
X	X						
X	X	X					
X	X	X	X				
	X	X	X	X			
		X	X	X	X		
			X	X	X	X	
				X	X	X	X
					X	X	X
						X	X
							X

Panel B – *Encuesta Permanente de Hogares 2003-2015.*

	Year 1				**Year 2**				**Year 3**	
*Q*1	*Q*2	*Q*3	*Q*4	*Q*1	*Q*2	*Q*3	*Q*4	*Q*1	*Q*2
X									
X	X								
	X	X							
		X	X						
			X	X					
X	X			X	X				
	X	X			X	X			
		X	X			X	X		
			X	X			X	X	
				X	X			X	X

Source: Own elaboration.
Notes: Each "X" represents a household observation. Highlighted observations correspond to a panel: every household is surveyed four times.

A Results by time windows

A.1 1995-1998 period

Table A.2: Estimates on female labor participation

Panel A – Baseline estimates.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss	0.166***	0.140***	0.731	0.027	0.049	0.069**	0.090**
	(0.029)	(0.026)	(1.423)	(0.035)	(0.030)	(0.029)	(0.036)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16224	16224	10913	8048	5226	7306	5074
Average	.56	.56	34.21	.35	.24	.33	.27

Panel B – Considering substitution effects.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss=1	0.150***	0.114***	0.358	0.034	0.060**	0.075**	0.102***
	(0.032)	(0.027)	(1.535)	(0.037)	(0.030)	(0.031)	(0.038)
HH head job loss=1 × Child LP=1	0.079	0.159**	3.393	-0.065	-0.103	-0.091**	-0.135***
	(0.062)	(0.066)	(2.712)	(0.100)	(0.103)	(0.040)	(0.046)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16194	16194	10899	8038	5221	7301	5072
Average	.56	.56	34.21	.35	.24	.33	.27

Notes: Column (1) measures the effect of male household head's job loss on the labor force participation of their wives. Column (2) measures the effect on finding a job. Column (3) measures the effect on weekly working hours among employed women. Column (4) measures the effect on informality. Column (5) on switching from a formal to an informal job. Column (6) measures the effect on employment downgrading (i.e. women working in a job for which they are overqualified). Column (7) measures the effect on switching to a "downgrading" employment. Panel A considers all spouses while Panel B only includes those with children. Robust standard errors clustering at the individual level indicated in parentheses. ** $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*. The value in the last row indicates the average of the dependent variable in the first interview. *Source*: EPH, own estimates.

Table A.3: Estimates on children labor participation

Panel A – Baseline estimates.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss	0.176*	-1.707	0.250***	0.135*	-0.717	0.116**
	(0.094)	(2.035)	(0.075)	(0.074)	(4.434)	(0.049)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5528	1115	5158	4437	1944	4550
Average	.59	12.24	.65	.45	16.53	.55

Panel B – Considering substitution effects.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.235**	-3.771**	0.212**	0.300***	2.864	0.162***
	(0.106)	(1.541)	(0.090)	(0.114)	(4.070)	(0.052)
HH head job loss=1 × Mother LP=1	-0.035	2.679	-0.048	0.002	-4.306	0.014
	(0.170)	(2.600)	(0.107)	(0.216)	(7.960)	(0.114)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3346	598	2982	2635	1216	2536
Average	.61	11.84	.64	.43	16.75	.51

Panel C – Considering substitution effects (in hours worked).

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.085	0.008	0.235**	-0.016	-7.993	0.068
	(0.156)	(3.990)	(0.093)	(0.134)	(6.242)	(0.068)
HH head job loss=1 × Mother hrs. change	0.002	-0.045	-0.005	-0.007**	-0.047	-0.003
	(0.007)	(0.168)	(0.004)	(0.003)	(0.163)	(0.002)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2182	517	2176	1802	728	2014
Average	.58	12.13	.65	.47	14.84	.61

Notes: Columns (1) and (4) measures the effect of male household head's job loss on the labor force participation of their daughters and sons, respectively. Columns (2) and (5) measure the effect on weekly working hours among employed children. Columns (3) and (6) measure the effect on educational dropout. Panel A considers all children, Panel B only includes children whose mothers were not participating in the labor market in the initial period, and Panel C considers children of already working mothers. Robust standard errors clustering at the individual level indicated in parentheses. * *p < 0.10, ** p < 0.05, *** p < 0.01*. The value in the last row indicates the average of the dependent variable in the first interview. *Source*: EPH, own estimates. *Source*: EPH, own estimates.

A.2 1999-2003 period

Table A.4: Estimates on female labor participation

Panel A – Baseline estimates.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss	0.148***	0.110***	1.456*	0.025**	0.028**	0.056***	0.059**
	(0.018)	(0.017)	(0.828)	(0.011)	(0.013)	(0.022)	(0.025)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21988	21988	16856	12712	8290	9778	6815
Average	.54	.54	34.29	.35	.22	.38	.32

Panel B – Considering substitution effects.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss=1	0.160***	0.113***	1.645*	0.021**	0.022**	0.060**	0.064**
	(0.019)	(0.018)	(0.900)	(0.009)	(0.010)	(0.024)	(0.027)
HH head job loss=1 × Child LP=1	-0.108***	-0.024	-1.114	0.043	0.053	-0.044	-0.069*
	(0.038)	(0.038)	(1.817)	(0.051)	(0.062)	(0.034)	(0.038)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21963	21963	16847	12708	8289	9775	6814
Average	.54	.54	34.29	.35	.22	.38	.32

Notes: Column (1) measures the effect of male household head's job loss on the labor force participation of their wives. Column (2) measures the effect on finding a job. Column (3) measures the effect on weekly working hours among employed women. Column (4) measures the effect on informality. Column (5) on switching from a formal to an informal job. Column (6) measures the effect on employment downgrading (i.e. women working in a job for which they are overqualified). Column (7) measures the effect on switching to a "downgrading" employment. Panel A considers all spouses while Panel B only includes those with children. Robust standard errors clustering at the individual level indicated in parentheses. ** $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*. The value in the last row indicates the average of the dependent variable in the first interview. *Source*: EPH, own estimates.

Table A.5: Estimates on children labor participation

Panel A – Baseline estimates.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss	0.115**	-5.420	0.147***	0.102*	-0.683	0.147***
	(0.046)	(3.815)	(0.041)	(0.059)	(3.735)	(0.040)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8229	1337	7689	6918	2210	6978
Average	.65	10.12	.72	.51	12.63	.6

Panel B – Considering substitution effects.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	-0.020	0.597	0.141***	0.020	2.676	0.145***
	(0.066)	(2.849)	(0.040)	(0.109)	(4.822)	(0.045)
HH head job loss=1 × Mother LP=1	-0.027	1.010	-0.088	-0.149	1.388	-0.006
	(0.096)	(5.746)	(0.071)	(0.146)	(5.629)	(0.080)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4621	745	4072	3885	1357	3778
Average	.64	10.86	.67	.49	13.81	.55

Panel C – Considering substitution effects (in hours worked).

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.264***	-5.968*	0.097***	-0.035	0.379	0.114***
	(0.084)	(3.245)	(0.035)	(0.123)	(4.471)	(0.038)
HH head job loss=1 × Mother hrs. change	-0.005*	-0.268**	-0.001	0.001	0.194	-0.000
	(0.003)	(0.128)	(0.001)	(0.004)	(0.186)	(0.001)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3608	592	3617	3033	853	3200
Average	.68	9.3	.77	.53	11.74	.64

Notes: Columns (1) and (4) measures the effect of male household head's job loss on the labor force participation of their daughters and sons, respectively. Columns (2) and (5) measure the effect on weekly working hours among employed children. Columns (3) and (6) measure the effect on educational dropout. Panel A considers all children, Panel B only includes children whose mothers were not participating in the labor market in the initial period, and Panel C considers children of already working mothers. Robust standard errors clustering at the individual level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The value in the last row indicates the average of the dependent variable in the first interview. *Source*: EPH, own estimates. *Source*: EPH, own estimates.

A.3 2004-2008 period

Table A.6: Estimates on female labor participation

Panel A – Baseline estimates.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss	0.135***	0.130***	2.032*	0.034***	0.044***	0.068**	0.061**
	(0.026)	(0.025)	(1.177)	(0.013)	(0.016)	(0.028)	(0.027)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21668	21668	23957	18247	11645	14718	9822
Average	.44	.44	30.99	.43	.34	.48	.44

Panel B – Considering substitution effects.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss=1	0.130***	0.125***	1.818	0.035**	0.045**	0.066**	0.057**
	(0.026)	(0.027)	(1.316)	(0.014)	(0.018)	(0.028)	(0.026)
HH head job loss=1 × Child LP=1	0.022	0.024	1.513	0.000	0.003	0.016	0.027
	(0.074)	(0.061)	(3.166)	(0.019)	(0.022)	(0.055)	(0.056)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21650	21650	23937	18233	11639	14710	9818
Average	.44	.44	30.99	.43	.34	.48	.44

Notes: Column (1) measures the effect of male household head's job loss on the labor force participation of their wives. Column (2) measures the effect on finding a job. Column (3) measures the effect on weekly working hours among employed women. Column (4) measures the effect on informality. Column (5) on switching from a formal to an informal job. Column (6) measures the effect on employment downgrading (i.e. women working in a job for which they are overqualified). Column (7) measures the effect on switching to a "downgrading" employment. Panel A considers all spouses while Panel B only includes those with children. Robust standard errors clustering at the individual level indicated in parentheses. ** $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*. The value in the last row indicates the average of the dependent variable in the first interview. *Source*: EPH, own estimates.

Table A.7: Estimates on children labor participation

Panel A – Baseline estimates.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss	0.069	-1.520	0.130***	-0.025	-0.290	0.168***
	(0.060)	(2.685)	(0.043)	(0.063)	(2.648)	(0.048)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10033	2003	9363	8741	3412	8928
Average	.63	10.16	.67	.5	14.35	.59

Panel B – Considering substitution effects.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.182	2.336	0.096**	-0.013	-5.305	0.127***
	(0.137)	(4.683)	(0.041)	(0.107)	(4.655)	(0.035)
HH head job loss=1 × Mother LP=1	-0.287**	14.611**	0.089	-0.094	-4.281	0.124
	(0.143)	(7.044)	(0.102)	(0.142)	(9.028)	(0.088)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4746	846	4114	4233	1680	4079
Average	.63	10.28	.64	.5	14.76	.58

Panel C – Considering substitution effects (in hours worked).

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.112	0.529	0.117***	-0.057	6.703*	0.112***
	(0.090)	(4.028)	(0.044)	(0.118)	(3.769)	(0.033)
HH head job loss=1 × Mother hrs. change	-0.004*	0.151	0.003*	0.002	0.199	-0.000
	(0.002)	(0.182)	(0.001)	(0.003)	(0.158)	(0.001)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5284	1155	5246	4505	1732	4848
Average	.62	10.42	.69	.5	14.21	.61

Notes: Columns (1) and (4) measures the effect of male household head's job loss on the labor force participation of their daughters and sons, respectively. Columns (2) and (5) measure the effect on weekly working hours among employed children. Columns (3) and (6) measure the effect on educational dropout. Panel A considers all children, Panel B only includes children whose mothers were not participating in the labor market in the initial period, and Panel C considers children of already working mothers. Robust standard errors clustering at the individual level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The value in the last row indicates the average of the dependent variable in the first interview. *Source*: EPH, own estimates. *Source*: EPH, own estimates.

A.4 2009-2015 period

Table A.8: Estimates on female labor participation

Panel A – Baseline estimates.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss	0.144***	0.145***	1.092	0.011	0.027**	0.070***	0.063**
	(0.019)	(0.019)	(0.795)	(0.014)	(0.014)	(0.023)	(0.026)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	36902	36902	41328	31766	22606	28562	20846
Average	.44	.44	31.68	.31	.22	.49	.44

Panel B – Considering substitution effects.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss=1	0.147***	0.149***	0.413	0.004	0.019	0.077***	0.068**
	(0.020)	(0.020)	(0.799)	(0.014)	(0.012)	(0.025)	(0.028)
HH head job loss=1 × Child LP=1	-0.048	-0.045	5.094*	0.057	0.065	-0.069**	-0.063*
	(0.046)	(0.045)	(2.853)	(0.040)	(0.053)	(0.030)	(0.037)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	36858	36858	41286	31736	22589	28546	20838
Average	.44	.44	31.68	.31	.22	.49	.44

Notes: Column (1) measures the effect of male household head's job loss on the labor force participation of their wives. Column (2) measures the effect on finding a job. Column (3) measures the effect on weekly working hours among employed women. Column (4) measures the effect on informality. Column (5) on switching from a formal to an informal job. Column (6) measures the effect on employment downgrading (i.e. women working in a job for which they are overqualified). Column (7) measures the effect on switching to a "downgrading" employment. Panel A considers all spouses while Panel B only includes those with children. Robust standard errors clustering at the individual level indicated in parentheses. ** $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*. The value in the last row indicates the average of the dependent variable in the first interview. *Source*: EPH, own estimates.

Table A.9: Estimates on children labor participation

Panel A – Baseline estimates.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss	0.064	-2.231	0.114***	0.051	0.001	0.163***
	(0.053)	(2.364)	(0.032)	(0.048)	(1.822)	(0.049)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17398	2666	14937	15535	4903	14259
Average	.68	8.87	.71	.53	13.65	.58

Panel B – Considering substitution effects.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.090	-1.953	0.152***	0.094	1.872	0.163***
	(0.067)	(4.044)	(0.040)	(0.106)	(3.123)	(0.038)
HH head job loss=1 × Mother LP=1	-0.114	-0.865	-0.185***	-0.167	0.698	-0.100
	(0.096)	(6.924)	(0.067)	(0.179)	(4.679)	(0.089)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8199	1196	6212	7306	2459	6062
Average	.69	9.26	.65	.51	14.61	.51

Panel C – Considering substitution effects (in hours worked).

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.052	-0.367	0.119***	0.007	-3.472	0.136***
	(0.096)	(2.672)	(0.041)	(0.098)	(2.846)	(0.043)
HH head job loss=1 × Mother hrs. change	-0.005*	-0.211	-0.003**	-0.002	-0.134	-0.001
	(0.003)	(0.198)	(0.001)	(0.005)	(0.192)	(0.002)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9196	1469	8713	8217	2431	8188
Average	.69	8.95	.74	.55	13.08	.64

Notes: Columns (1) and (4) measures the effect of male household head's job loss on the labor force participation of their daughters and sons, respectively. Columns (2) and (5) measure the effect on weekly working hours among employed children. Columns (3) and (6) measure the effect on educational dropout. Panel A considers all children, Panel B only includes children whose mothers were not participating in the labor market in the initial period, and Panel C considers children of already working mothers. Robust standard errors clustering at the individual level indicated in parentheses. * *p < 0.10, ** p < 0.05, *** p < 0.01*. The value in the last row indicates the average of the dependent variable in the first interview. *Source*: EPH, own estimates. *Source*: EPH, own estimates.

B Alternative sample results

B.1 Attrition

Table A.10: Estimates on female labor participation. Sample with attrition.

Panel A – Baseline estimates.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss	0.136***	0.117***	1.400***	0.028***	0.037***	0.065***	0.071***
	(0.009)	(0.009)	(0.463)	(0.007)	(0.008)	(0.012)	(0.014)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	144409	144409	143311	109858	55776	96421	49449
Average	.46	.46	32.11	.35	.26	.47	.42

Panel B – Considering substitution effects.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss=1	0.136***	0.113***	1.178**	0.024***	0.035***	0.064***	0.072***
	(0.010)	(0.010)	(0.495)	(0.007)	(0.008)	(0.013)	(0.015)
HH head job loss=1 × Children's LFP=1	-0.018	0.017	1.752	0.031	0.012	0.013	-0.013
	(0.023)	(0.022)	(1.340)	(0.022)	(0.022)	(0.030)	(0.028)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	144239	144239	143183	109765	55741	96370	49430
Average	.46	.46	32.11	.35	.26	.47	.42

Source: EPH, own estimates.

Notes: Columns (3), (4) and (6) considers a sample where female spouses were employed in the current period while columns (5) and (7) regards to a sample where female spouses were employed each time the household was interviewed. Panel A considers all spouses while Panel B only includes those with children. Robust standard errors clustering at the individual level indicated in parentheses. $*\ p < 0.10$, $**\ p < 0.05$, $***\ p < 0.01$. The value in the last row indicates the average of the dependent variable in the first interview

Table A.11: Estimates on children labor participation. Sample with attrition.

Panel A – Baseline estimates.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss	0.091***	-1.597	0.129***	0.076***	-0.183	0.152***
	(0.026)	(1.140)	(0.019)	(0.027)	(1.241)	(0.022)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	57894	10000	52573	50484	17474	49378
Average	.65	9.84	.69	.51	13.93	.58

Panel B – Considering substitution effects.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.123***	-0.874	0.137***	0.137***	0.057	0.149***
	(0.034)	(1.440)	(0.020)	(0.044)	(1.685)	(0.020)
HH head job loss=1 × Mother's LFP=1	-0.130**	4.106	-0.080**	-0.136*	-3.026	0.019
	(0.060)	(2.715)	(0.038)	(0.073)	(2.854)	(0.043)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	29124	4715	24323	25319	9264	23211
Average	.66	10.07	.65	.49	14.6	.53

Panel C – Considering substitution effects (in hours worked).

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.095**	-4.056**	0.114***	-0.038	-0.390	0.119***
	(0.047)	(1.770)	(0.022)	(0.049)	(1.946)	(0.021)
HH head job loss=1 × Mother's hrs. change	-0.001	-0.131*	-0.001	0.002	0.052	-0.000
	(0.002)	(0.074)	(0.001)	(0.002)	(0.096)	(0.001)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28762	5281	28230	25142	8196	26155
Average	.65	9.85	.72	.53	13.42	.63

Source: EPH, own estimates.

Notes: Columns (2) and (5) considers a sample including children employed in the current period. Panel A considers all children while Panel B only includes children whose mothers were not participating in the labor market in the initial period and Panel C considers children of already working mothers. Robust standard errors clustering at the individual level indicated in parentheses. $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$. The value in the last row indicates the average of the dependent variable in the first interview

B.2 Households affected by job losses

Table A.12: Estimates on female labor participation. Job loss sample.

Panel A – Baseline estimates.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss	0.153***	0.132***	1.102**	0.027***	0.037***	0.073***	0.074***
	(0.011)	(0.010)	(0.484)	(0.007)	(0.007)	(0.013)	(0.013)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12286	12286	10824	8239	6010	4730	3625
Average	.5	.5	32.57	.5	.39	.55	.51

Panel B – Considering substitution effects.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss=1	0.159***	0.132***	1.110**	0.028***	0.041***	0.077***	0.080***
	(0.012)	(0.011)	(0.514)	(0.008)	(0.008)	(0.013)	(0.014)
HH head job loss=1 × Children's LFP=1	-0.084**	-0.014	-1.571	-0.020	-0.045	-0.073**	-0.096**
	(0.033)	(0.035)	(1.948)	(0.031)	(0.035)	(0.034)	(0.038)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12266	12266	10809	8229	6004	4727	3624
Average	.5	.5	32.57	.5	.39	.55	.51

Source: EPH, own estimates.

Notes: Columns (3), (4) and (6) considers a sample where female spouses were employed in the current period while columns (5) and (7) regards to a sample where female spouses were employed each time the household was interviewed. Panel A considers all spouses while Panel B only includes those with children. Robust standard errors clustering at the individual level indicated in parentheses. $*\ p < 0.10$, $**\ p < 0.05$, $***\ p < 0.01$. The value in the last row indicates the average of the dependent variable in the first interview

Table A.13: Estimates on children labor participation Job loss sample.

Panel A – Baseline estimates.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss	0.092***	-2.737*	0.164***	0.063**	-0.675	0.152***
	(0.026)	(1.648)	(0.021)	(0.030)	(1.555)	(0.022)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5149	946	4224	3939	1673	3611
Average	.61	10.95	.61	.42	14.56	.47

Panel B – Considering substitution effects.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.171***	-3.943**	0.150***	0.115*	0.764	0.153***
	(0.039)	(1.804)	(0.020)	(0.067)	(3.344)	(0.021)
HH head job loss=1 × Mother's LFP=1	-0.237***	8.269***	-0.059	-0.211	-2.037	0.031
	(0.087)	(3.048)	(0.051)	(0.137)	(4.161)	(0.052)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2671	470	1996	2069	933	1781
Average	.61	12.07	.55	.41	15.71	.43

Panel C – Considering substitution effects (in hours worked).

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.118**	-3.459*	0.141***	-0.048	-5.585**	0.145***
	(0.046)	(1.935)	(0.025)	(0.097)	(2.694)	(0.024)
HH head job loss=1 × Mother's hrs. change	-0.002	-0.300**	-0.001	0.005*	0.147*	-0.001*
	(0.002)	(0.127)	(0.001)	(0.003)	(0.077)	(0.001)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2478	476	2228	1870	740	1830
Average	.62	10.54	.63	.44	14.07	.49

Source: EPH, own estimates.

Notes: Columns (2) and (5) considers a sample including children employed in the current period. Panel A considers all children while Panel B only includes children whose mothers were not participating in the labor market in the initial period and Panel C considers children of already working mothers. Robust standard errors clustering at the individual level indicated in parentheses. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. The value in the last row indicates the average of the dependent variable in the first interview

B.3 Households affected by firm events

Table A.14: Firm events description.

Firm event	Job loss share	Job recoveries	Observations
	Sample A		
Plant Closure	4.67%	24.08%	99450
Mass Layoff	14.62%	24.79%	
	Sample B		
Plant Closure	3.88%	24.25%	109986
Mass Layoff	12.82%	25.07%	
	Sample C		
Plant Closure	3.46%	16.61%	38252
Mass Layoff	11.15%	17.53%	
	Sample D		
Plant Closure	3.45%	23.11%	5963
Mass Layoff	11.36%	22.76%	
	Sample E		
Plant Closure	4.43%	22.46%	170098
Mass Layoff	14.57%	24.16%	

Source: EPH, own estimates.
Samples: (A) Households with female spouse who were not participating in the labor market in the initial period; (B) Households where female spouse was employed in the initial and last period; (C) Households with at least one son or daughter not participating in the labor market in the initial period; (D) Households where at least one son or daughter was employed in the initial and last period; (E) Households with at least one son or daughter enrolled in any educational level in the initial period.
Notes: "Recoveries" refers to the share of individuals who became unemployed because of firm events but find another job later on.

B.3.1 Plant closures

Table A.15: Estimates on female labor participation. Plant closures sample.

Panel A – Baseline estimates.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss	0.138**	0.059	-1.559	0.077	0.089	0.075	0.116
	(0.057)	(0.039)	(3.054)	(0.054)	(0.068)	(0.053)	(0.072)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	613	613	572	443	335	294	225
Average	.49	.49	33.92	.38	.29	.57	.53

Panel B – Considering substitution effects.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss=1	0.138***	0.068*	-1.553	0.069	0.082	0.099*	0.147*
	(0.053)	(0.040)	(3.273)	(0.053)	(0.068)	(0.058)	(0.079)
HH head job loss=1 × Children's LFP=1	-0.324	-0.326	0.243	0.051	0.030	-0.318	-0.375
	(0.322)	(0.265)	(7.079)	(0.225)	(0.283)	(0.222)	(0.273)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	612	612	572	443	335	294	225
Average	.49	.49	33.92	.38	.29	.57	.53

Source: EPH, own estimates.

Notes: Columns (3), (4) and (6) considers a sample where female spouses were employed in the current period while columns (5) and (7) regards to a sample where female spouses were employed each time the household was interviewed. Panel A considers all spouses while Panel B only includes those with children. Robust standard errors clustering at the individual level indicated in parentheses. $*\ p < 0.10$, $**\ p < 0.05$, $***\ p < 0.01$. The value in the last row indicates the average of the dependent variable in the first interview

Table A.16: Estimates on children labor participation. Plant closures sample.

Panel A – Baseline estimates.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss	0.159	4.187***	0.170	0.059	19.330***	0.157
	(0.119)	(0.372)	(0.144)	(0.129)	(6.565)	(0.124)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	186	675	683	294	706
Average	.42	11.69	.48	.36	13.78	.44

Panel B – Considering substitution effects.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	-0.228	-4.811***	0.176	0.005	10.262***	0.137
	(0.204)	(0.000)	(0.150)	(0.353)	(3.059)	(0.106)
HH head job loss=1 × Mother's LFP=1	-0.018	14.500***	-0.310*	-0.145	-36.622**	0.008
	(0.292)	(0.000)	(0.168)	(0.526)	(14.379)	(0.169)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	437	88	341	366	189	375
Average	.43	11.46	.42	.36	14.47	.43

Panel C – Considering substitution effects (in hours worked).

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	-1.551***	-2.493***	0.201	0.094	1.329***	0.089
	(0.561)	(0.794)	(0.131)	(0.165)	(0.000)	(0.105)
HH head job loss=1 × Mother's hrs. change	0.029	-0.075***	-0.002	-0.000	-0.533***	-0.003
	(0.057)	(0.000)	(0.002)	(0.009)	(0.000)	(0.003)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	323	98	334	317	104	331
Average	.42	11.71	.56	.39	13.11	.47

Source: EPH, own estimates.

Notes: Columns (2) and (5) considers a sample including children employed in the current period. Panel A considers all children while Panel B only includes children whose mothers were not participating in the labor market in the initial period and Panel C considers children of already working mothers. Robust standard errors clustering at the individual level indicated in parentheses. $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$. The value in the last row indicates the average of the dependent variable in the first interview

B.3.2 Mass layoffs

Table A.17: Estimates on female labor participation. Mass layoffs sample.

Panel A – Baseline estimates.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss	0.158***	0.104***	0.540	0.011	0.015	0.103***	0.098***
	(0.029)	(0.026)	(1.128)	(0.014)	(0.013)	(0.028)	(0.030)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1786	1786	1599	1254	971	845	681
Average	.49	.49	33.39	.39	.3	.53	.49

Panel B – Considering substitution effects.

	Labor Participation	Employed	Hours	Informality	Change into Informality	Downgrading	Change into Downgrading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HH head job loss=1	0.162***	0.113***	0.570	0.013	0.014	0.117***	0.106***
	(0.031)	(0.028)	(1.175)	(0.014)	(0.014)	(0.031)	(0.033)
HH head job loss=1 × Children's LFP=1	-0.184	-0.198*	-1.434	0.006	0.131	-0.240*	-0.192
	(0.117)	(0.109)	(3.931)	(0.079)	(0.102)	(0.132)	(0.187)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	No	No
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1785	1785	1598	1253	971	845	681
Average	.49	.49	33.39	.39	.3	.53	.49

Source: EPH, own estimates.

Notes: Columns (3), (4) and (6) considers a sample where female spouses were employed in the current period while columns (5) and (7) regards to a sample where female spouses were employed each time the household was interviewed. Panel A considers all spouses while Panel B only includes those with children. Robust standard errors clustering at the individual level indicated in parentheses. $*\ p < 0.10$, $**\ p < 0.05$, $***\ p < 0.01$. The value in the last row indicates the average of the dependent variable in the first interview

Table A.18: Estimates on children labor participation. Mass layoff sample.

Panel A – Baseline estimates.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss	0.143**	0.109	0.208***	0.132*	2.404	0.124**
	(0.063)	(2.998)	(0.062)	(0.077)	(6.474)	(0.056)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2034	441	1873	1721	796	1744
Average	.45	12.08	.53	.33	14.16	.41

Panel B – Considering substitution effects.

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	0.086	-1.540	0.179***	-0.029	9.389	0.195***
	(0.167)	(3.722)	(0.065)	(0.164)	(5.943)	(0.054)
HH head job loss=1 × Mother's LFP=1	-0.149	-11.851***	-0.074	-0.086	-22.073*	-0.006
	(0.233)	(3.038)	(0.101)	(0.280)	(12.435)	(0.093)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1147	240	940	994	503	951
Average	.45	12.56	.47	.33	14.99	.38

Panel C – Considering substitution effects (in hours worked).

	Daughters			Sons		
	Labor Participation	Hours	Dropout	Labor Participation	Hours	Dropout
	(1)	(2)	(3)	(4)	(5)	(6)
HH head job loss=1	-0.106	8.131***	0.216***	0.032	18.113***	0.194***
	(0.130)	(0.102)	(0.076)	(0.105)	(2.154)	(0.058)
HH head job loss=1 × Mother's hrs. change	0.007	-0.004	-0.003	-0.004	0.078	0.002
	(0.006)	(0.004)	(0.002)	(0.007)	(0.083)	(0.002)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	887	201	933	727	292	793
Average	.47	11.84	.57	.34	13.28	.44

Source: EPH, own estimates.

Notes: Columns (2) and (5) considers a sample including children employed in the current period. Panel A considers all children while Panel B only includes children whose mothers were not participating in the labor market in the initial period and Panel C considers children of already working mothers. Robust standard errors clustering at the individual level indicated in parentheses. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. The value in the last row indicates the average of the dependent variable in the first interview

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