

Intra-Household Coping Mechanisms in Hard Times : the Added Worker Effect in the 2001 Argentine Economic Crisis

Laurine Martinoty⁺

February 15, 2014

Preliminary version, please do not quote

Abstract

This paper shows that the added-worker effect (AWE) plays an important role in coping against aggregate shocks, even in cases where the discouragement effect prevails at a macroeconomic scale. Using an Argentine panel dataset between 2000-2002, we instrument the endogenous variation in husbands' labor market outcomes using the collapse of the convertibility era as a natural experiment, and measure its causal impact on their wives' labor supply decisions. Within this framework, we show that on average, women whose husband experiences a decline in income are 3.2 p.p. more likely to enter the labor market. Robustness checks support the validity of the empirical strategy, and results are robust to various sensitivity tests.

Keywords: panel data, natural experiment, instrumental variable, married women labor market participation, added worker effect, intra-household allocation, aggregate shock, coping strategy

JEL: C33, D13, J22

⁺ Université de Lyon, Lyon, F-69007, France ; CNRS, GATE Lyon Saint-Etienne, Ecully, F-69130, France ; Ecole Normale Supérieure de Lyon, Lyon, F-69007, France ; Contact: Laurine.Martinoty@ens-lyon.fr

Introduction

Along her life cycle, an individual is repeatedly exposed to a wide variety of idiosyncratic shocks, like health or displacement shocks, as well as aggregate shocks, like economic turmoil, political conflicts, or climate change. These shocks may cause a transitory or even permanent wealth loss. Transitory shocks like displacement or economic crises affect individuals because they usually impact their ability to supply work. However, in theory, this should not lead to any particular strategic adjustment, since temporary demand for credit allows them to smooth their consumption along the life cycle. However, given that information is imperfect and credit markets are constrained, shocks come at cost in terms of well-being, in so far they are unable to maintain their consumption at an optimal level.

Acknowledging this fact, the economic literature on coping strategies usually stresses out the distinction between *ex ante* and *ex post* risk coping mechanisms (Alderman and Paxson, 1992). Though response mechanisms vary greatly according to local specificities and the types of shock, they can be summed up into three categories (see e.g. Snel and Staring (2001)). *Adjustment strategies* consist in modifying consumption patterns, selling assets or allocating more time to home production. In Zimbabwe, individuals responded to drought by selling cattle in a consistent way with long term livestock accumulation objectives (Kinsey et al., 1998). During the 1998 financial crisis in Russia, middle and lower class households decreased their consumption of normal goods (Lokshin and Yemtsov, 2004). In the aftermath of the 2001 Argentine economic crisis, individuals allocated a larger amount of their leisure time to shopping activities, with the aim to track down information on available goods and best prices (McKenzie and Schargrodsky, 2011). *Network strategies* rely on the social capital accumulated by individuals. Sharing a network with family or friends who migrated enable an individual to cash in remittances during hard times (Mohapatra et al., 2012), and also facilitate own migration strategy. In Botswana, urban migrants keep their former rural network and assets as a safety net against uncertain urban prospects (Krueger, 1998). Informal insurance between households also allow for monetary or non monetary redistribution, as in the case of US young active move in and out of the parental home depending on labor market risks (Kaplan, 2012). Finally, *active strategies* regroup labor market oriented strategies, like double shift jobs, informal secondary occupation, selling of home production. For example, in rural India, Kochar (1999) shows that individuals switch from on to off-farm activities with climate shocks.

Clearly, household formation plays an important role in all coping responses against risk and shocks. Indeed, insurance is one of the traditional functions of marriage (Gong,

2011), in so far it allows for *ex ante* risk diversification. In addition, shock coping decisions taken at the intra-household level are *de facto* more flexible than the set of strategies available to a single individual, because households are assumed to pool their resources in time and income². This is particularly the case for market-oriented strategies. Indeed, single individuals can only increase their labor supply at the intensive margin. On the opposite, households can extend their labor supply by having one or more extra members entering the labor market. Taking its origin in Woytinsky (1940), the *added worker effect* hypothesis (AWE) states that in the eventuality of a shock on the primary earner in the household, secondary workers would enter the labor market as imperfect substitutes to smooth consumption profile at the household level.

In theory, assuming complete markets and perfect information, the AWE is expected to be small for two reasons. At the individual level, the first life cycle models show that the income reduction from a temporary shock is negligible in relation to lifetime income (Heckman and Macurdy, 1980). Intertemporal allocation of other members' time should thus not be too distorted by the transitory unemployment spell or income shock of the household head. Second, at the aggregate level, a discouraged worker effect should prevail over the added worker effect: even if spouses individually increase their labor market participation in response to a negative shock affecting the household head, the depressed economy is expected to drive even more spouses to withdraw from the labor market, the overall impact of the negative shock on additional workers' participation thus being negative.

However, in practice, the magnitude of the AWE depends on several factors: availability of alternative strategies to smooth income loss; imperfection of markets for credit and liquidity constraint limiting access to consumption smoothing through borrowing (Bingley and Walker, 2001); unemployment shock perceived as a new information about negative lifetime income prospects (Dynarski and Sheffrin, 1987). Taking this uncertainty into account, MaCurdy (1985) develops a life-cycle labor supply model allowing for substantial temporary added-worker effects (Stephens, 2002; Gong, 2011). In this model, the stochastic marginal utility of wealth is the key determinant for labor supply of family members. At each period, the household computes its marginal utility of wealth by updating its expected value with available new information carried by unanticipated wealth shocks. Accordingly, family members readjust their current labor supply from period to period. Within this uncertain lifetime environment, an increase in other members' labor

²This income pooling hypothesis corresponds to a unitary conception of the household. Collective models have proven their empirical consistency and repeatedly rejected full income pooling (see e.g. Chiappori (1992) and Duflo and Udry (2004)). However, in this paper, we adopt a unitary framework, because our dataset is insufficient to test for model adequacy.

force participation thus represents an optimal response to temporary shocks on heads' occupational situation. The overall effect of shocks in a husband's earnings on family members' participation decision is an open empirical question depending of magnitude of the effects at stake.

The literature testing the existence of this AWE mechanism remains relatively scarce, and empirical evidence is mixed. While early, seminal studies (Mincer, 1962; Heckman and MaCurdy, 1982) established that transitory shocks on husband's labor market outcomes have an impact on their spouse's labor supply (also see Lundberg (1985), Maloney (1987)), other studies failed to discover any significant effect (e.g. Layard et al. (1980) on UK data; Pencavel (1982) and later Maloney (1991) on US data). Recent developments in the literature on AWE (Bingley and Walker, 2001; Stephens, 2002; Gong, 2011) explain this inability to reach a consensus because of several methodological issues regarding differences in definition of the AWE or in the underlying labor supply model, as well as weaknesses in the identification strategy. The most recent studies tend to favor the AWE hypothesis. Using panel data to investigate fluctuations in child labor and schooling attendance in rural India, Jacoby and Skoufias (1997) show that child labor varies with income shocks, suggesting that child labor does cope against adverse economic shocks. In Tanzania, Beegle et al. (2006) find that transitory income shocks lead to increases in child labor, particularly in households holding no asset. Karaoglan and Okten (2012) concentrate on AWE for spouses, and show that between 2000 and 2010, Turkish women increased their participation by 4 to 8 percent following their husband's job loss. Over the period 1994-2006, an AWE is also observed for skilled Taiwanese couples whenever household head enters into an unemployment spell, and this effect is stronger if the business cycle is going downward (Huang et al., 2012). The effect also appears in developed economies, mostly in cases where access to social security is limited (Cullen and Gruber, 2000; Hardoy and Schoene, 2013), as well as where the tax system is not too desincitative for married women activity (Harkness and Evans, 2011). Using PSID data from 1968 to 1992, Stephens (2002) revisits the AWE in the US and shows that the number of working hours of married women increases by as much as 11 percent in the four years following their husband's displacement. In Japan, over the period 1993-2004, the AWE accounts for 2.1 to 2.7 percent of the increase in married women labor market participation (Kohara, 2010). Between 2001 and 2007, Australian women with husband experiencing a job loss are 2.8 percentage points more likely to be employed full time than similar women with employed husband (Gong, 2011). During the 2007-2009 recession in the US, a married women with displaced husband is 4 percentage points more likely to participate in the labor market than her counterpart married to an employed husband (Starr, 2013).

In Argentina, the AWE hypothesis is usually acknowledged as a main explanatory factor when explaining the increase in labor market participation of married women after 1990 (Ministerio del Trabajo, 2005). Between 1970 and 1990, following the same trend as other countries in the *Cono Sur* (Argentina, Brazil, Chile, Uruguay), the female participation rate had risen from 31.4 to 50.2 percent of the female working age population. However, before 1985, this trend was mainly driven by traditional factors, namely changes in fertility and education, combined with a structural change in economic activities towards services. In the aftermath of the 1989 hyperinflation, a series of liberal measures were undertaken, implying waves of privatization and labor market flexibility measures, which created the conditions for economic growth, at cost of a burst in unemployment. The increase in unemployment was coexisting with an increase in married women participation, giving credit to the AWE hypothesis. Building on this stylized fact, Cerrutti (2000) found that between 1991 and 1994, in Buenos Aires, a married woman whose husband had an unstable labor market status was twice as likely to enter the labor market than a woman with a more stable husband ³.

However, this positive correlation between a growing husband unemployment rate and female labor market participation faded out in the second half of the decade. In 2001, male unemployment rate kept up with its historically high 1995 level, whereas female participation slightly decreased. Did the AWE disappear completely? Could it be that the 1991-1994 AWE exhausted the stock of married women with the lowest reservation wages? Or does the discouraged worker now prevail over the AWE at the aggregate level? In their study of the AWE in Spain between 1968-2007, Congregado et al. (2011) find that the AWE dominates the discouraged worker effect, but only when unemployment is below a 11 percent threshold. Above this threshold, the two effects cancel each other out: married women participation rate is not influenced by further deterioration of economic conditions. If this is the case, the AWE disappears at the aggregate data level, but should still be observed at the individual data level ⁴.

Using the *Encuesta permanente de hogares* (EPH) panel data between 2000 and 2002, this paper aims at assessing the existence and magnitude of the AWE during the 2001 economic crisis in Argentina. Identifying the causal effect of a household head un-

³This result is based on panel data. However the author provides no similar regression using an other time period, which casts doubts on the interpretation to give to the results. It could be that this association is unrelated the neoliberal reforms, and simply reflects assortative mating, less risk averse women marrying more unstable men and being less reluctant to enter the labor market in case the household runs into economic hardship.

⁴Indeed, Fields and Sánchez Puerta (2010) compare earning mobilities in Argentina before and after the currency board collapses, and warn that panel data analysis gives a totally different picture of income redistribution than the one obtained with simple cross sectional comparisons.

employment or income loss on his spouse's labor market outcomes is challenging because spouses choose simultaneously their time allocation between leisure, home and market production according to a utility function including both spouses' preferences. Female labor supply is the result of a household maximisation process that evolves taking into account changes in market wages and tastes, or alternatively the result of a bargaining process in case of a collective intra-household labor supply model ⁵. Without a proper identification strategy, the AWE would spuriously account for these decisions that are by no mean coping strategies against unexpected shocks. In this paper, we make use of the sudden collapse of the currency board system in December 2001-January 2002 as an exogenous shock asymmetrically affecting economic sectors. The EPH provides information on households directly before and after the sudden collapse of the convertibility exchange rate regime, which affected households in a very different ways according to the sector of employment of the household head. This provides a natural experiment framework, and the exogenous variations are used to instrument household head's labor market outcomes, namely real monthly income and unemployment (Rosenzweig and Wolpin, 2000). By selecting the variations in income and unemployment that are unrelated to the classical intrahousehold bargaining process, the IV estimation allows for a causal identification: under the common trend and exclusion restriction assumptions, this estimation strategy yields an unbiased estimate of the AWE in Argentina.

This paper contributes to the recent focus shift towards a better understanding of labor supply's role in mitigating uncertainty and shocks within households over the life-cycle (Blundell et al., 2007, 2012). More specifically, it adds to existing literature on female labor supply and intra-household decision process by collecting information on labor supply decisions in an emerging economy. Understanding the process by which household labor allocation occurs is important for policy and project design (Haddad et al., 1997), as indirect implications of this increase in participation are unclear for own and other household members' welfare (Lundberg and Pollak, 1993; Pollak, 2005; Lim, 2000; Klasen and Pieters, 2012).

In addition, this paper contributes to the literature on AWE by clearly distinguish its aggregate and micro dimensions, and explicitly recognizing their difference. It untangles the fact that the micro level AWE is a necessary condition for the macroeconomic AWE to exist, but that the reverse does not hold. The concept of AWE confusingly builds on two very different strands of literature which should not be assimilated. To our knowledge,

⁵For example, if leisure of both spouses are substitutes, the correlation between the labor supply decisions of both spouses within the household simply picks up the intra-household decision process where husbands and wives commonly decide of a new allocation set between labor and leisure, keeping the overall household welfare constant.

no empirical study has assessed the magnitude of the AWE using data on 2001 economic crisis. We believe that the AWE should not be discarded as a candidate for female labor supply decision in Argentina, even if the negative correlation between labor outcomes of married spouses washes out at the aggregate level.

A third distinguishing feature of this paper is its innovative identification strategy. Studying household-level effects of an economic event in emerging countries rarely involves panel data analyses. Additionally, we take advantage of the 2001-2002 economic crisis episode, where sectoral asymmetry in unanticipated aggregate shock generated an exogenous variation in husband income shocks. Natural experiment settings using economic shocks to reveal strategical responses from households are still sparse, though promising methods (Yang, 2008).

Our findings suggest that in the absence of a sufficient safety net, shock coping is still one of the functions of marriage. A correlation analysis reveals that the 30 percent decrease in husband real monthly labor income is associated with a 0.51 percentage point increase in married women participation, which represents half of the variation observed over the period. A women whose husband loses his job is 7.3 percentage points more likely to enter the labor market, 4 percentage points more likely to find an occupation, and almost 2 percentage points more likely to work full-time. When instrumenting for husband labor market outcomes using the convertibility shock as a natural experiment, the causal effect of a negative shock affecting the household is multiplied by 5 with respect to the correlation estimation framework. On average, married women are 3.1 percentage points more likely to supply labor at the extensive margin if the household head experienced the average decrease in labor income over the period. Using a conservative definition of participation, the effect still accounts for a 2.1 percentage points increase in married women participation over the period. When a household head experiences an unexpected displacement, his spouse is 40 percentage points more likely to enter the labor market, and 35 percentage points more likely to be employed.

Section 1 presents the dataset, gives key summary statistics, and conducts a preliminary analysis with a simple linear probability model including individual fixed effects. Section 2 details the empirical strategy, gives key elements of the Argentine political and economic context underlying the natural experiment used for instrumentation, and outlines the construction of the instrument sets. Section 3 displays and comments the main results. Section 4 conducts robustness checks and a sensitivity analysis, and Section 5 gives insights on heterogeneity in the AWE. Last section sums up the results.

1 Data and preliminary analysis

1.1 The data

The data for this study comes from the *Encuesta Permanente de Hogares*, hereafter EPH. EPH is collected by Argentina's National Statistical Agency (*Instituto Nacional de Estadísticas y Censos*, hereafter INDEC) in May and October of each year in 28 main urban areas (INDEC, 2002a). The survey is a rotating panel. Each household is followed during at most 18 months (four waves), then rotated out. Each wave contains information on employment, as well as demographic, economic, and social characteristics of roughly 90000 individuals in 30000 households. Non-response represents roughly 20% of available information. Like most extensive household surveys, the survey uses a geographical criteria, and follows household dwellings, rather than specific groups of individuals. Households moving to another area are not followed. To avoid mismatching, the spouse's age cannot differ by more than one year from one wave to the next (McKenzie, 2004).

The subsample on working age couples is extracted from the May 2000 to October 2002 EPH waves. Working age for women is defined following the 2001 legislation⁶. Since the legal age for marriage is 16 for women and 18 for men, the working age sample is restricted to women aged 16-60 and males aged 18-65⁷. Married women receiving pension and perceiving unemployment benefits represent respectively 2.54% and 0.15% of the whole sample of married women of working age. Because their participation decision is endogenous to these income sources, and in so far they represent an extremely small group, corresponding observations are dropped. Households whose head is retired or student are also excluded from the sample. Finally, the panel is restricted to households that are observed at least once before *and* after the end of the convertibility period. The final sample contains 15577 observations on working age couples with an active head between May 2000 and October 2002⁸.

⁶Between 1994-2002, an ongoing pension reform gradually changed the pension age for men and women. The retirement age is 62 for men and 57 for women in 1994, 63/58 in 1996, 64/59 in 1998, and 65/60 since 2001.

⁷In 2001, children can theoretically work from the age of 14. However, children aged 14 to 16 are allowed to work up to 3 hours daily and 15 hours a week during the morning or afternoon, as long as the work is within a family business, is not hazardous, and does not interrupt schooling.

⁸The main analysis is based on this sample. The robustness checks typically use a larger sample going back to the May 1998 wave.

1.2 Main variables and summary statistics

This paper aims at measuring the causal impact of a negative shock in household head's labor market outcomes on the labor supply decisions of his spouse. The negative shock is alternatively defined as a decline in *real monthly labor income*, or as a *job loss*.

Married women can respond to the negative shock experienced by their husband by supplying work at the extensive margin or at the intensive margin. As for the extensive margin, *participation* is a dummy variable equal to 1 if the spouse is currently employed or declare to be actively looking for an occupation. *Occupation* is a dummy standing for employment only, unemployed labor market participants being redefined as 0. A dummy for *full time* employment signals whether the spouse is currently employed and works at least 21 weekly hours.

These measures of labor supply are completed by taking into account the workfare program *Jefes y jefas de hogar* (henceforth JJH program). The JJH program was introduced in January under loan and technical assistance from the World Bank as an extension to the *Trabajar I* (1993) and *Trabajar II* (1996) workfare programs. Eligible to the program are unemployed household heads with at least one child under 18. Though the program is universal, 20 weekly working hours are required as counterpart for the 150 AR\$, in order to target the poorest households, whose members have a lower reservation wage. Following the collapse of the convertibility era, the program is largely extended from April 2002 onwards⁹. In theory, this program simply relaxes the constraint on labor demand. In practice, the rapid extension of the program casts doubts on the enforcement or the work requirement. To account for this possibility, we redefine participation and occupation, excluding participants of the JJH workfare program, unless they work strictly more than the minimum legal amount of hours, or declare working the legal number of hours *and* wishing to work more hours. Finally, at the intensive margin, this paper concentrates on two labor supply measures: *actual weekly working hours*, and a dummy variable equal to 1 if the spouse expresses the willingness to work more hours.

On the whole, this set of variables at the extensive and intensive margins allows to investigate (i) whether spouses experiencing a shock at the household level supply more work than spouses experiencing no such negative shock over the period ; (ii) whether these

⁹Decision N 565 of April 3, 2002, acknowledging that *taken into account the highly critical economic and financial situation of the Republic, has been declared a state of emergency regarding the social, economic, administrative, financial and exchange fields*, concludes: *being public and notorious the knowledge on severity of the crisis affecting [Argentina], which reaches new levels of extreme poverty, aggravated by deep productive paralysis, it is essential to take the necessary and appropriate measures to overcome the difficult situation experienced by a large segment of the population.*

spouses actually manage to increase their employment probability and their working hours when the constrained demand side of the labor market is taken into account.

All specifications of this paper are estimated using a panel data model with individual fixed effects¹⁰. All individual fixed effects are thus differentiated out in the *within* estimation procedure. However, time varying variables have to be accounted for in case they influence married women participation into the workforce.

Having additional children is a first time varying variable potentially influencing married women participation decisions. For this reason, we control for the variation in the number of pre-schooling children, children in compulsory schooling age, and children in working age. Another important time-varying variable is the availability of alternative shock coping strategies. There is no reason why households should pick up one strategy over the available set. As detailed by Frankenberg et al. (2003) in the 1997 Indonesian crisis case, households usually diversify their coping strategies to mitigate the negative effects of a shock on their well being. For this reason, and within the limits of available data, we control for alternative coping strategies using information on sources of non-labor income: labor income coming from other household members, and a series of non labor income sources proxying for adjustment strategies (fluctuation in capital income) or network strategies (fluctuation in remittances from non-members).

Another reason for married women participation to rise could be that their opportunities on the labor market increase in absolute terms, or relatively to their male counterpart. This could be the case if the sectoral composition changes towards services. To control for this eventuality, we compute the mean unemployment rate and hourly wage rate faced by female workers at each wave-region-age-education level¹¹, and include them into the regression. Furthermore, we include the ratio of hourly female wage rate on hourly male wage rate, calculated at the wave-region-age-education level as well, to account for an evolution in relative hourly wages.

Tables 1 and 2 present summary statistics on means for outcome, interest, control and demographic variables¹².

Table 1 gives information on married women labor market decision and husbands' outcomes. As mentioned above, simple descriptive statistics are not supportive of an

¹⁰Serial correlation is accounted for by clustering the standard errors at the individual level (Bertrand et al., 2004).

¹¹There are 6 regions, 3 age categories (16-29, 30-44, 45-59) and 3 educational levels (primary or less, secondary, superior education)

¹²Means of time constant variables are actually not constant between 2000-2001 and 2002 because households can be observed twice before or after the currency board collapsed.

TABLE 1 – Summary statistics: labor market outcomes of both spouses

	Mean before and after Convertibility		
<i>Labor market outcomes, female</i>			
Participation ^a (%)	48.47	49.42	0.197
Participation ^b (%)	47.94	46.89	0.151
Unemployed (%)	5.06	5.87	0.016**
Occupation (%)	43.41	43.55	0.845
Full time ^c (%)	31.20	29.52	0.013**
Self-employed (%)	7.93	7.10	0.032**
Workfare program JJH (%)	1.70	4.62	0.000***
Hours worked	29.44	25.62	0.000***
Add. hours supplied ^d (%)	33.18	27.81	0.000***
<i>Labor market outcomes, male</i>			
Participation ^b (%)	99.81	99.26	0.000***
Unemployed	10.04	14.37	0.000***
Occupation	89.96	85.63	0.000***
Full time ^c (%)	81.80	75.57	0.000***
Self-employed (%)	22.10	21.73	0.541
Workfare program JJH (%)	1.43	2.56	0.000***
Hours worked	41.68	37.30	0.000***
Add. hours supplied ^d (%)	37.77	36.44	0.196

Note: Statistics on 2000-2002 EPH sample of working age couples with active household head and being observed at least once before and after the currency board breakdown. ⁺ P-values of differences, * p < 0.1, ** p < 0.05, *** p < 0.01. ^a Participation is 1 if individual is employed or declare actively looking for a job. ^b Participation rate excluding workfare program beneficiaries who do not declare looking for more hours or an other occupation. ^c Full employment is working strictly more than 20 hours. ^d Additional hours supplied is 1 if individual is employed and declares wishing to work more hours. ^e All information on income is expressed in May 1998 pesos.

TABLE 2 – Summary statistics: income and household characteristics

	Mean before and after Convertibility		
<i>Income</i>			
Husband monthly wage ^e	642.70	437.80	0.000***
Wife monthly wage ^e	219.74	154.99	0.000***
Monthly wage, other ^e	76.76	51.49	0.000***
Pension ^e	9.17	7.62	0.078*
Capital ^e	5.34	2.56	0.003***
U benefits ^e	3.99	3.69	0.742
Remittances ^e	3.11	2.16	0.014**
Other ^e	12.85	8.10	0.040**
Tot. non-labor inc. ^e	34.45	24.13	0.000***
<i>Macroeconomic opportunities, female</i>			
Mean U	15.52	16.39	0.000***
Mean hrly wage	3.20	2.35	0.000***
Relative hrly wage	0.64	0.63	0.000***
<i>Demographics, female</i>			
Age (in years)	38.13	38.93	0.000***
Primary or less (%)	38.63	39.45	0.255
Secondary (%)	39.18	39.07	0.876
Superior (%)	22.19	21.49	0.246
<i>Demographics, male</i>			
Age	40.89	41.70	0.000***
Primary or less (%)	41.23	41.89	0.357
Secondary (%)	40.32	40.16	0.817
Superior (%)	18.45	17.95	0.378
<i>Demographics, household</i>			
Gran Buenos Aires	15.47	12.70	0.000***
North-West	20.33	20.62	0.632
North-East	12.01	12.65	0.185
Cuyo	11.31	12.07	0.106
Pampa	26.47	26.88	0.532
Patagonia	14.40	15.09	0.187
<i>Household members</i>			
Nb child 0-5	0.66	0.64	0.068*
Nb child 6-13	0.95	0.96	0.438
Nb child 14-17	0.39	0.41	0.046**
Nb older dep	0.05	0.05	0.669

Note: See note Table 1

added worker effect. Women participation increased from 48.47 to 49.42 percent between 2000 and 2002, however, this difference is not statistically significant. In case JJH beneficiaries that do not declare working 20 hours weekly nor actively seeking to work more hours are redefined as inactive, the participation has even a tendency to decline. The same evolution is to be observed at the intensive margin: conditional on being occupied during the convertibility period, married women work on average 5 hours less in 2002 than in 2000-2001. Additionally, they do not show signs of willingness to work extra hours: on the opposite, the proportion of women willing to work more hours actually decreases significantly. This was to be expected, since unemployment is rising between the pre and the post convertibility periods: labor supply mechanically decreases at the intensive margin, because part of the former employed married women now supply labor at the extensive margin again. As expected, the number of workfare program beneficiaries increases together with its extension decided in April 2002, and concerns 4% of married women in 2002.

Table 2 conveys information on other time-varying variables detailed above. Unsurprisingly, all types of non labor income decreased, except unemployment benefits ¹³. Part of this decline is related to the 30 percent inflation following the peso devaluation; the rest is either nominal decrease, or asset selling in the case of capital income.

1.3 Preliminary analysis

In theoretical models of intra-household labor supply, the demand for leisure differs across households according to their marginal utility of wealth, which is in turn a function of their initial assets, the interest rate and their expected wages over their life cycle (MaCurdy, 1985; Stephens, 2002). Initial assets and wage profiles are unobservable variables, which is problematic in so far they are not orthogonal to labor supply decisions. In this case, estimates based on a comparison between households are necessarily biased. The use of panel data is an absolute requirement for understanding labor supply at the intra household level (Blundell and MaCurdy, 1999), because then the unobserved marginal utility of wealth is differentiated out. The baseline estimates are generated using a simple linear fixed-effects (or within) estimator, in line with Gong (2011):

$$Y_{it} = X_{it}\beta + W_{it}\gamma + \mu_i + \phi_t + \epsilon_{it} \quad (1)$$

¹³As mentioned above, households with wife cashing in unemployment benefits are dropped out of the sample for endogeneity issues. Unemployment benefits still concern 1.11 percent of the sample. In 86.6 percent of the cases, unemployment benefits belong to the household head.

where Y_{it} represents labor supplied by household i 's married woman in t , W_{it} stands for her spouse's labor market outcome, μ_i is the unobserved fixed effect that may be correlated with levels of W_{it} , ϕ_t is a time fixed effect, ϵ_{it} represents a time varying idiosyncratic error, and X_{it} is a matrix containing a unitary vector, as well as information on time-varying household characteristics and partners' characteristics.

Results of specification (1) are displayed in Table 3. A 30 percent decrease in household head's labor income (which is the mean evolution in household head labor income over the period) is associated with a 0.51 percentage point increase in his spouse's probability to enter the labor market (column 1). Going back to Table 1, this represents half of the variation in female labor supply over the period. Turning to unemployment, it appears that a married woman is 7.3 percentage points more likely to enter the workforce if her husband loses his job. Since unemployment probability for married men rises by 4.3 percentage points, this overall unemployment is related to a 0.3 percentage point increase in female participation. Accounting for potential windfall effects generated by the introduction of the workfare program does not dramatically changes the results (column 2).

As it was to expected in such a depressed context, the added participants do not all find a job. Still, employment represents more than two third of the additional workforce (column 3) related to husband's losses in labor income or employment, half of which translating into full-time employment (column 5).

Finally, controlling for evolutions in own macroeconomic situation, employed married women do wish to work more hours in case their husband experiences a negative shock on the labor market. The overall decline in income is related to a 0.3 percentage points increase in their probability to declare wanting additional working hours (column 6). However, at the intensive margin, this extra labor supply does not translate into more actual working hours (column 7).

2 Empirical strategy

Unlike estimations relying on cross-sectional data, fixed effect estimations allow to measure the correlation in labor supply decisions within the household, abstracting from spurious correlations due to unobserved differences between households. This being said, this correlation is not necessarily causal. For example, the job loss of the household head does not necessarily cause a negative income shock exogenously affecting his spouse's participation. For example, unemployment can be seasonal, or correspond to a quit. In this

TABLE 3 – Female labor market participation and their spouse labor market outcomes
– Linear probability results

	Extensive margin					Intensive margin	
	Part	Part ⁺	Occup	Occup ⁺	Full-time	Wish more hours	Hours worked
Household head monthly wage	−0.017*** (0.002)	−0.013*** (0.002)	−0.013*** (0.002)	−0.009*** (0.002)	−0.004* (0.002)	−0.010** (0.004)	−0.059 (0.097)
Household head unemployment	0.073*** (0.013)	0.059*** (0.013)	0.053*** (0.012)	0.040*** (0.012)	0.017* (0.010)	0.069*** (0.024)	0.421 (0.573)
Observations	18755	18755	18755	18755	18755	7944	7944

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses, clustered at the individual level.

⁺ Restrictive definition of participation and occupation: excludes JJH workfare program participants, unless they declare working strictly more than the legal amount, or 20 hours and wishing to work more hours.

Estimates from linear-probability regressions with individual fixed effects. Following time-varying variables are included into the estimation: *macroeconomic opportunities for female suppliers* (mean unemployment rate at year-region-age level, log mean hourly wage rate at year-region-age level, relative hourly wage rate with respect to male counterparts at year-region-age level), *household composition* (number of children under schooling age, number of children at compulsory schooling age, number of children in working age and under 18, number of third generation parents), *alternative sources of income* (other labor income, pension, capital income, unemployment indemnities, remittances, other), and *time fixed effects* for each observation wave.

case, no shock coping mechanism is to be expected from the spouse, since unemployment is part of the household welfare optimisation.

Taking into account this possibility, Stephens (2002) restricts his analysis to displacements due to plant closures. Nonetheless, this estimation strategy necessarily restricts to the private sector, which reduces the external validity of the results with respect to the whole population. In addition, during the Argentine crisis, negative income shocks mainly happened through declines in nominal and real wages, and not uniquely through unemployment (McKenzie, 2004). Accounting for exogenous shocks in unemployment would tell only one half of the story, leaving aside decreases in nominal wages.

In order to estimate the causal effect of a household head's evolution in labor market outcomes W_{it} on his partner's labor supply decisions Y_{it} , this paper relies on an instrumental variable approach combined with a panel estimations controlling for individual and time fixed effects. In equation 2, μ_i is the unobserved fixed effect that may be correlated with levels of W_{it} , ϕ_t is a time fixed effect, ϵ_{it} represents a time varying idiosyncratic error. X_{it} is a matrix containing a unitary vector, as well as information on time-varying household characteristics and partners' characteristics. Finally, we use an exogenous, profound economic shock Z_{it} asymmetrically affecting household heads' labor

market outcomes from December 2001 onto October 2002.

$$\begin{aligned} Y_{it} &= X_{it}\beta + \hat{W}_{it}\gamma + \mu_i + \phi_t + \epsilon_{it} \\ W_{it} &= X_{it}\beta' + Z_{it}\alpha + \mu'_i + \phi'_t + \epsilon'_{it} \end{aligned} \tag{2}$$

The validity of this estimation design is conditioned to the two following assumptions: (i) As common in linear probability models with individual fixed-effects, the empirical strategy exposed above is valid if the common trend assumption holds: no time-varying unobservable variable is allowed to affect both the interest and outcome variables. (ii) As usual in an instrumental variable approach, the exclusion restriction must hold: the asymmetrical change in labor market outcomes of the household head has no direct influence on the labor supply decision of his spouse, except through the endogenous regressor instrumented: $cov(Z_{it}, \epsilon_{it}) = 0$. Additionally, the instrument should not be too weakly correlated with the endogenous regressors, because IV estimators perform poorly when instruments are weak (Stock and Yogo, 2002).

Under these assumptions, the IV procedure enables to capture the causal effect of W_{it} on Y_{it} . Additionally, it corrects for the attenuation bias resulting from measuring error in the labor income of the household head W_{it} . However, these assumptions do not necessarily hold for a series of reasons.

Potential sources of bias – The common trend assumption is not satisfied in case households can foresee the profoundness of the oncoming economic shock, and take precautionary measures in anticipation. A second possible time-varying confounder is the JJH workfare program. In theory, this program simply relaxes the labor demand constraint on employment opportunities: unemployment is involuntary, the reservation wage of participants is inferior than the market rate. However, in practice, this workfare program is a potential source of estimate bias for two reasons. First, institutions had no possibility to know who was the head of the household, which drove women into soliciting this complementary income while husbands were searching for work – or were involved in informal activities (Galasso and Ravallion, 2004). This creates a spurious correlation between a husband unemployment and his spouse’s participation decision. Second, program allocation decision is highly decentralized and distributed according to a ‘first come, first served’ basis with high level of clientelism through syndicates and *piqueteros* associations¹⁴. Indeed, observers in randomly picked localities reported a strong heterogeneity in levels of control for compliance with working hours counterpart (Bosaz and

¹⁴*Piqueteros* are associations of unemployed individuals protesting and blocking roads to defend their right to jobs and social protection.

al., 2003; Modolo, 2004). This windfall effect is likely to bias the measured added worker effect upwards, because the women benefiting from moral hazard or local acquaintances would otherwise not have been seeking a job. Finally, a third source of bias is related to attrition. As for any panel survey, attrition is of potential concern. Notably, INDEC (INDEC (2002b)) reports some troubles in collecting the data for interviewers in nine areas of the Greater Buenos Aires (GBA) after the outburst of the economic and social turmoil of December 2001. According to their estimates, insecurity on field accounts for a 2.2 percentage point decrease in GBA sample's representativeness. A random assignment of these social troubles is unlikely. Mismatching represents another concern for attrition bias. As mentioned earlier, in its sampling strategy, EPH uses a geographical criterion, following household structures rather than specific households. As a consequence, mismatching can lead to an attrition bias, especially if the decision to move in or out is determined by economic environment – which is likely to be the case.

In the main analysis, windfall effects of the JJH workfare program are accounted for using a restrictive, conservative definition of female participation. The robustness section provides further tests for these assumptions. The common trend assumption is tested using data prior to 2001 within a placebo regression analysis. The attrition bias is tested with a series of mean tests.

Validity of the exclusion restriction – Regarding the exclusion restriction assumption, no empirical test is available, and some elements of context are required to examine to what extent the convertibility collapse qualifies for instrumentation. During the 1990s, Argentina was presented as the IMF's model pupil. Argentina had made no exception to the *lost decade* experienced by Latin American economies throughout the 1980s: in 1990, the GDP had decreased by 7.25% with respect to its 1980 level. Under Carlos Menem and Minister of Finance Domingo Cavallo, a set of neoliberal measures were undertaken from 1991 onwards to restore trust into the domestic currency, to foster foreign investments flows and to fight against hyperinflation. In conformity with the Washington Consensus, a massive privatization of public enterprises was decided. In April 1991, the Convertibility plan established a currency board that irremediably pegged the Argentine peso to the US dollar, initiating the *uno a uno* (one to one) period. During the 1990s, Argentina took up with growth again, at costs of a growing unemployment, due to the newly privatized economic sectors as well as new legislation increasing labor market flexibility. The main achievement of this currency board had been to durably contain inflation which had been the pest of Argentine economy for decades, and restore trust into domestic currency: whereas prices had been growing by 1300% between January and December 1990, in April 1991, inflation shrank to 5.5% monthly, and the annual inflation rate was reduced

to 25% by April 1992¹⁵. Minister Domingo Cavallo gained a huge popularity among the middle class, and the 1990s were a period of sustained economic growth¹⁶. However, from 1999 onwards, a combination of external and internal factors made it increasingly difficult for an Argentina in moderate recession to sustain the Convertibility regime¹⁷. Nonetheless, throughout the difficulties, Argentina was repeatedly financially supported by the IMF. The situation escalated from October 2001 onwards: the popular Domingo Cavallo had been reinstalled as Minister of Finance under the presidency of Fernando de la Rúa with the aim to contain the economic crisis. However, his highly unpopular *corralito* measure – consisting in freezing banking accounts to stop the bank run – and the sudden stop to the Argentine financial support decided by the IMF a few days later triggered the social, political and economic collapse of the December events.

Thus, before November 2001 and the *corralito* measure, the collapse of the currency board system is likely to have been largely unanticipated by Argentine households. As shown by McKenzie (2004), the deep degradation in Argentine economic indicators took economists by surprise. In October and November 2001, most predictions were optimistically announcing a zero growth or a moderate recession¹⁸. There is no reason to believe that individuals would be more informed on the gravity of their country's economic situation. Under this exogeneity assumption, the pre-crisis labour market participation decisions were not related to the imminence of a deep crisis. On the other hand, post-crisis adjustments in labor market participation can legitimately be interpreted as strategical responses to this new information. Most of the time, the effect of wages on variations in labor supply and demand is not identified, as both curves shift over time. Here, the economic shock plays the role of an exogenous labor demand curve-shifter (Angrist and Krueger, 2001), allowing to properly measure the causal effect of a shock on a husband's wage on his wife's labor force participation.

The collapse of the convertibility profoundly altered the expectations of economic agents with respect to inflation; the floating exchange rate with the US dollar, as well as the sudden stop of foreign investment hit the different economic sectors in an asymmetric way.

¹⁵Source: INDEC, Dirección de Índices de precios de consumo

¹⁶An exception is the 1995 recession. However, it corresponds to the Mexican 'Tequila' crisis affecting the whole region.

¹⁷For a detailed analysis, see e.g. Fanelli (2002).

¹⁸For example, the IMF (2001) predicted a 1.1 percent decline in GDP coupled with 0.5% deflation for 2002 in the December 2001 *World Economic Outlook*. These forecasts evolved rapidly in response to December 2001 events, such as January 2002 Economist Intelligence Unit Country Report who drastically revised its GDP predictions from -1% to a -7% and its inflation predictions from -0.6% to 12.7% increase in consumer price index.

FIGURE 1 – GDP yearly growth rate 1991-2005, by primary/goods and service sectors

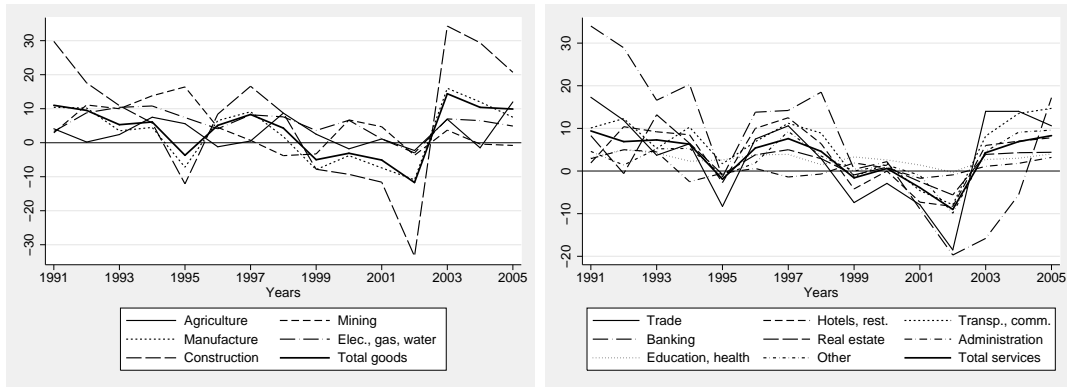


Figure 1 displays the growth rates at a sectoral level between 1991 and 2005. First, the 2002 deep recession clearly appears and contrasts with the growth period of 1991-1998, and the mild recession happening in 1999-2000, usual in a volatile emerging economy. Within the 1991-2005 period, no other recession period is to be noted, but in 1995, because of the regional contagion of the Tequila crisis in Mexico.

Second, during the 2002 economic crisis, the sectoral asymmetry in growth rates is exacerbated with respect to the growth and mild recession periods. During the growth period, asymmetries are to be noted, however the volatility is general and rather erratic, especially before 1995. During the mild recession years, growth rates are similar and around 0 for service sectors, or concentrated in a -10/+10 bandwidth for good sectors. However, the recession rates differ greatly between sectors after 2001: -30 percent for the construction sector, -20 percent for the banking sector against 0 percent growth for mining and -5 for the real estate sector.

The sudden collapse of the convertibility regime has the properties of a natural experiment. The asymmetric effects of this event on occupational sectors serves as an instrument for changes in household heads' labor market outcomes between 2000-2001 and 2002.

Instrumental variable – Household head's labor market outcomes are instrumented using a typical natural experiment framework. For robustness purposes, we present the results obtained with three different versions of the instrument. All of the defined instruments exploit the variation in time as well as the asymmetry between exposed and preserved economic sectors, and control for group manipulation if the household head changed sector within the observation window. Each set of instruments thus contains three variables: a dummy variable equal to 1 if the observation was collected after December 2001, a dummy variable indicating whether household head belongs to a later

to be exposed sector of activity¹⁹, and an interaction term between the two. The sets of instruments differ only with the definition of ‘sectoral exposure’. Whereas first two instrument definitions rely on the EPH data, the last instrument is constructed using information on GDP evolution provided by *INDEC*.

To define instrument variables sets *IV1* and *IV2*, we first regress the labor income of the household head W_{it} on a dummy variable $shock_{it}$ equal to 1 whether observation is from May or October 2002 and 0 otherwise, using a panel estimator with individual fixed effects. Then, the same estimation is run separately for each of the 22 economic sectors s , as seen in equation 3.

$$\begin{aligned} W_{it} &= a_0 + a_1 shock_{it} + c_{is} + u_{it} \\ W_{its} &= a_{0s} + a_{1s} shock_{it} + c_{is} + u_{its} \end{aligned} \tag{3}$$

Coefficient a_{1s} is a measure of sectoral exposure²⁰. For *IV1*, we first define a sector s as exposed if household heads employed in this sector experience a negative and significant degradation in W_{it} between 2001 and 2002 (a_{1s} significant and negative), and if sector s suffers relatively more than other sectors (i.e., $a_{1s} > a_1$). Second instrumental variable set *IV2* relies on the intensity of the economic shock. It relaxes the rigidity of this asymmetry, and uses directly a_{1s} instead of the 0/1 dichotomy. In this case, the exposure dummy still defines whether sector is a later to be exposed or protected one. Finally, a third instrument set *IV3* is generated using an external source of data on sectoral evolution in GDP between 2001 and 2002. In this case, the sector is defined as exposed if its real GDP recession rate is superior to 8 percent.

Estimates for specification (3) and IV definitions are presented in Appendix. Top panel of Table 12 gives results for primary and secondary sectors, and top panel of Table 13 displays results for service sectors. Definitions of the three IV sets corresponding to the explanation above are reported in bottom panels of Tables 12 and 13.

3 Estimation

Following the empirical strategy defined in Section 2 above, equation 2 is estimated using instrumental variables Z_{it} . Control variables X_{it} are similar to the variables presented

¹⁹In case of the second and third instrument set, the dummy is replaced by the shock intensity measure.

²⁰Alternatively, equation 3 can be estimated defining W_{it} as the household head’s unemployment instead of his labor income. Results are very similar, thus not reported here.

for the preliminary analysis in Section 1²¹

Table 4 presents IV results using the three sets of instrumental variable and instrumenting for two variables of interest, namely household head's labor income and unemployment. First stage F statistics are reported, and are well above 10, suggesting that estimates do not suffer from a weak instrument bias.

TABLE 4 – Female labor market participation at the extensive margin and their spouse labor market outcomes – IV results

	Dep. Var: Participation			Dep. Var: Participation ⁺			Dep. Var: Occupation		
	IV1	IV2	IV3	IV1	IV2	IV3	IV1	IV2	IV3
R	-0.142*** (0.025)	-0.135*** (0.023)	-0.141*** (0.027)	-0.071*** (0.022)	-0.062*** (0.020)	-0.053** (0.024)	-0.110*** (0.022)	-0.110*** (0.021)	-0.110*** (0.024)
F-stat FS	32.63	33.83	25.40	32.63	33.83	25.40	32.63	33.83	25.40
C	0.433*** (0.124)	0.429*** (0.110)	0.401*** (0.128)	0.289** (0.118)	0.242** (0.103)	0.160 (0.122)	0.353*** (0.116)	0.379*** (0.103)	0.367*** (0.121)
F-stat FS	30.60	34.45	24.86	30.60	34.45	24.86	30.60	34.45	24.86
Observations	18755	18755	18755	18755	18755	18755	18755	18755	18755

Note: See note Table 3.

Instruments are constructed on a natural experiment framework using the exogenous and asymmetric macroeconomic shock generated by the sudden breakdown of the currency board system. Each set of instrument contains three variables: a time dummy variable equal to 1 after the economic shock ; a dummy variable equal to 1 if employment sector of the provider is an exposed / later to be exposed sector ; finally, an interaction term between the time dummy and a measure of the exposure intensity. In IV1, this exposure is defined as a dummy variable; IV2 adopts an more flexible intensity measure ; finally, IV3 reflects the asymmetric exposure using information on disaggregated GDP (see above for more detailed definitions.)

The first line presents results relating household head labor income to his spouse labor market decisions²². A 1 percentage point decrease in husband unemployment generates a 0.14 percentage point increase in female labor market participation. Considering that the household head real wage decreased by 32% between 2000 and 2002 (see Table 2), this implies that the AWE generated a 4.4 percentage point increase in female participation. This is clearly superior to the 1 percentage point increase observed at the aggregate level, meaning that the AWE is indeed offset by an important discouraged worker effect.

²¹Only time fixed effects are accounted for differently. Indeed, time already appears within the instrumentation procedure through a pre/post convertibility dummy variable, because the identification relies on sectoral differences before and after the collapse of convertibility. A complete set of semestrial time fixed effects is collinear to the pre/post dummy. Within each of the pre and post periods, time fixed effects are accounted for. Reference categories are october 2001 for the *pre* period, and october 2002 for the *post* period.

²²A more complete set of results is to be found in appendix. Tables 14, 15 and 16 display results for first stage estimations. Tables 17, 18, 19 and 20 detail the point estimates for all time-varying variables included into the specification.

Since the *JJH* workfare program is a potential confounder, we single out and exclude the program beneficiaries who declare working 20 compulsory hours or less, or work the 20 hours required to be entitled, but do not explicitly wish to work more hours. Almost half of the program beneficiaries are redefined as inactive. With this definition, the AWE is slightly inferior, and statistically less significant. However, it still accounts for 1.7 to 2.25 percentage point increase in the labor market participation of married women over the period.

Does this AWE translate into more employment for married women whose husband lost labor income with the outburst of the 2001 economic crisis? Occupation does indeed increase significantly: a spouse whose husband experienced a 1 percent decrease in his labor income is 0.11 percentage points more likely to actually work at least one hour.

Similar effects are to be found when measuring the causal impact of household head displacement on the participation of his spouse. A married women with unemployed husband is 43 percentage points more likely to enter the labor market if her husband becomes unemployed. Within this period, unemployment increased by 4.3 percentage points, implying that unemployment generated a 1.85 percentage point increase in married women participation overall. When windfall effects of *JJH* workfare program are singled out, the AWE decreases by one third, but still generates a 1 to 1.3 percentage point increase in female participation.

Table 5 displays estimates for spouses' labor supply at the intensive margin. Here, the sample is reduced to households with an employed spouse in both periods. With respect to the extensive margin, results are less robust across the various specifications. A robust causal relation appears between household head's unemployment and his spouse's desire to work more hours. With respect to women whose husband does not change situation, they are twice more likely to declare wishing to work more hours. However, this supply of hours does not evolve into an actual increase in working hours. In fact, if anything, the relation goes counter the AWE hypothesis. Only women whose husband is employed over the whole period, or experiences a positive labor income shock, are actually able to work more hours. This suggests that the capacity to extend working hours is not randomly assigned with respect to household characteristics, and is related to the fact that spouses are assorted.

Overall, the results obtained with the IV method in Table 4 are higher than the results obtained with the simple fixed effect model in Section 1, Table 3. For example, when accounting for all evolutions in income, female participation increases by 0.02 percentage points as her husband losses 1 percent income. Once we instrument for variations in income and employment using the Convertibility shock, we only take into account the

TABLE 5 – Female labor market participation at the intensive margin and their spouse labor market outcomes – IV results

	Dep. Var: Wish to work more hours			Dep. Var: Hours worked weekly		
	IV1	IV2	IV3	IV1	IV2	IV3
Household head monthly wage	−0.013 (0.037)	−0.040 (0.034)	−0.083** (0.042)	1.495 (0.915)	1.676* (0.884)	2.344** (1.123)
F-stat FS	13.64	14.46	10.86	13.64	14.46	10.86
Household head unemployment	0.287 (0.218)	0.406* (0.209)	0.566** (0.266)	−6.158 (5.441)	−7.631 (5.219)	−14.407** (6.810)
F-stat FS	10.22	10.96	8.54	10.22	10.96	8.54
Observations	7039	7039	7039	7039	7039	7039

Note: See note Table 4. At the intensive margin, the sample size is reduced and contains only married women in activity.

exogenous negative income shock, and we find that female labor supply causally responds by increasing her participation probability by 0.1 percentage points. Though this difference may seem important, it does not contradict intuition. Indeed, a standard change in time allocation within the household does not necessarily imply an added-worker entering the labor market, and especially not simultaneously. On the other hand, unexpected, negative shocks is compatible with a massive, simultaneous added-worker flow.

4 Robustness

4.1 Common trend assumption

This section relies on a larger EPH sample with observations dating back to May 1998, to test whether the common trend assumption holds. Using a linear probability model with individual fixed effects, we first regress household heads' labor market outcomes on a set of variables corresponding to the classical natural experiment setting:

$$W_{it} = b_0 + c_i + \phi_t + b_1 V_{it} + b_2 V_{it} \phi_t + v_{it} \quad (4)$$

If the common trend assumption holds, the coefficient b_2 should not be significant before 2002. Results are presented in Table 6. As shown in Table 6, the instrumentation using disaggregated information on GDP (IV3) exactly displays this pattern. The common trend assumption is less convincing in the case of internally defined instruments IV1 and IV2. Exposed sectors seem to follow a diverging trend from October 2001 onwards.

However, the long lasting common trend in the previous periods is to be noted. Moreover, the October 2001 group-specific trend is much smaller and represents only 30 to 40 percent of the May and October 2002 divergences.

As a complementary robustness check, we thus perform a placebo test arbitrarily redefining the Convertibility collapse to happen in October instead of December 2001. Table 7 is generated by running the exact same instrumental definition and estimation procedures presented in Section 2 above, with this new definition of the Convertibility collapse. Within this estimation framework, we find that a variation in the household head's employment status does not affect female participation. In the case of labor income, all coefficients but one happen to be small and insignificant. In the case of unemployment, all displayed coefficients are smaller than the coefficients reported in Table 4 and insignificant.

4.2 Attrition analysis

A simple test for panel attrition consists in computing group-means for a range of outcomes of interest: husband unemployment, husband log income, wife labor force participation for each year $t = 1998, 1999, \dots, 2002$ separately. Individuals are grouped according to their stage j ($j = 1, 2, 3, 4$) in EPH survey. Significant differences in means between these different groups would give support to the attrition bias hypothesis.

Formally, we use the enlarged sample and test for mean equalities: $\bar{W}_1 = \bar{W}_2 = \bar{W}_3 = \bar{W}_4$: regressing it on j dummies for waves, for each t between 1998 and 2002:

$$W_i = \sum_{j=1}^4 \beta_j w_{ij} + \epsilon_i \quad (5)$$

Constant term indicates mean outcome for new entrants in survey, and coefficients measure deviation to this mean for participants in waves 2, 3, and 4 of the same year exposed to same economic conditions. Results reported in Table 8 suggest that panel attrition is limited. Regardless of the year, household head labor market outcomes exhibit no pattern of attrition from wave to wave.

4.3 Sensitivity analysis with respect to the workfare program

Within the *EPH*, JJH beneficiaries are defined as employed. However, the rapid scaling-up and the institutionally explosive context made it difficult to ensure that beneficiaries were complying with the work requirements, which may have fostered shirking. Additionally,

TABLE 6 – Common trend assumption test for the natural experiment instrument

	IV1 and IV2		IV3	
	Dep. var.: husb. mthly income	Dep. var.: husb. unempl.	Dep. var.: husb. mthly income	Dep. var.: husb. unempl.
<i>Ref: 1998 (May)</i>				
1998 (October)	-0.037 (0.021)	0.001 (0.003)	-0.039 (0.023)	0.001 (0.004)
1999 (May)	-0.077** (0.027)	0.011* (0.004)	-0.055 (0.030)	0.009 (0.005)
1999 (October)	-0.120*** (0.032)	0.011* (0.005)	-0.115** (0.035)	0.012* (0.006)
2000 (May)	-0.160*** (0.036)	0.024*** (0.006)	-0.148*** (0.041)	0.022** (0.007)
2000 (October)	-0.208*** (0.039)	0.026*** (0.007)	-0.197*** (0.045)	0.028*** (0.008)
2001 (May)	-0.322*** (0.043)	0.035*** (0.007)	-0.288*** (0.049)	0.043*** (0.008)
2001 (October)	-0.485*** (0.048)	0.044*** (0.008)	-0.517*** (0.055)	0.046*** (0.009)
2002 (May)	-0.897*** (0.051)	0.060*** (0.009)	-0.926*** (0.058)	0.067*** (0.010)
2002 (October)	-0.778*** (0.054)	0.047*** (0.009)	-0.805*** (0.062)	0.053*** (0.010)
<i>Ref: Protected sector</i>				
Exposed sector	0.102* (0.052)	0.004 (0.010)	0.029 (0.054)	-0.004 (0.010)
<i>Ref: Protected sector in 1998 (May)</i>				
Exposed sector in 1998 (October)	0.028 (0.040)	-0.006 (0.007)	0.024 (0.035)	-0.004 (0.006)
Exposed sector in 1999 (May)	-0.025 (0.048)	-0.001 (0.009)	-0.053 (0.044)	0.003 (0.008)
Exposed sector in 1999 (October)	-0.036 (0.054)	0.001 (0.010)	-0.031 (0.051)	-0.001 (0.009)
Exposed sector in 2000 (May)	-0.098 (0.060)	0.015 (0.011)	-0.086 (0.058)	0.013 (0.010)
Exposed sector in 2000 (October)	-0.069 (0.065)	0.001 (0.012)	-0.066 (0.062)	-0.003 (0.011)
Exposed sector in 2001 (May)	-0.041 (0.067)	0.016 (0.013)	-0.083 (0.066)	-0.004 (0.012)
Exposed sector in 2001 (October)	-0.195** (0.072)	0.042** (0.013)	-0.075 (0.071)	0.024 (0.013)
Exposed sector in 2002 (May)	-0.512*** (0.077)	0.121*** (0.015)	-0.297*** (0.076)	0.070*** (0.014)
Exposed sector in 2002 (October)	-0.501*** (0.083)	0.077*** (0.016)	-0.287*** (0.081)	0.040** (0.015)
Observations	79527	79527	79527	79527

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in parentheses, clustered at the individual level.

TABLE 7 – Placebo test: Convertibility arbitrarily ends before October 2001

	Dep. Var: Participation			Dep. Var: Participation ⁺			Dep. Var: Occupation		
	IV1	IV2	IV3	IV1	IV2	IV3	IV1	IV2	IV3
Husb. mthly income	-0.010 (0.049)	-0.049 (0.035)	-0.057 (0.052)	-0.030 (0.049)	-0.065* (0.035)	-0.060 (0.052)	0.029 (0.045)	-0.014 (0.031)	-0.006 (0.047)
F-stat FS	9.05	17.44	7.13	9.05	17.44	7.13	9.05	17.44	7.13
Husb. unempl.	-0.057 (0.215)	0.158 (0.174)	0.197 (0.178)	-0.010 (0.214)	0.215 (0.176)	0.219 (0.179)	-0.171 (0.202)	0.014 (0.158)	0.019 (0.163)
F-stat FS	13.57	17.36	16.09	13.57	17.36	16.09	13.57	17.36	16.09
Observations	18880	18880	18880	18880	18880	18880	18880	18880	18880

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses, clustered at the individual level.

Note: See note Table 4.

TABLE 8 – Mean test for sample attrition analysis

	Dep. var.: husb. monthly income			Dep. var: husb. unemployment		
	EPH 2000	EPH 2001	EPH 2002	EPH 2000	EPH 2001	EPH 2002
Second wave participant	-0.003 (0.038)	-0.023 (0.043)	-0.095 (0.061)	0.001 (0.006)	0.011 (0.007)	0.014 (0.010)
Third wave participant	-0.043 (0.038)	-0.020 (0.043)	-0.078 (0.061)	0.004 (0.006)	0.006 (0.007)	0.015 (0.010)
Fourth wave participant	-0.021 (0.040)	-0.069 (0.045)	-0.063 (0.062)	0.001 (0.006)	0.010 (0.007)	0.016 (0.010)
Constant	5.875*** (0.028)	5.669*** (0.031)	5.191*** (0.051)	0.085*** (0.005)	0.101*** (0.005)	0.122*** (0.008)
Observations	16184	15945	12936	16184	15945	12936

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses, clustered at the individual level.

anecdotal claims report clientelism from the part of municipalities and unions in the granting process. If this is the case, the JJH program plays the role of a time confounder in the causal estimation of the AWE.

First of all, in their evaluation of the JJH program, Galasso and Ravallion (2004) insists on the essential role of the program in alleviating poverty and reducing unemployment : more than the half of the JJH participants were originally unemployed, meaning that the windfall effect does not exceed 50 percent of the JJH beneficiaries.

As a robustness check, this paper gets closer to the AWE that would have prevailed, had the workfare program not existed. In order to better assess the impact of the JJH program within the AWE, we adopt two strategies to disentangle the windfall effect of the program from the measured AWE. First of all, we use available information in the *EPH* to redefine as inactive JJH participants that would most likely not seek for a job. Secondly, we concentrate on relevant subsamples, and show that the AWE also appears in subgroups where the JJH program was not available or requested.

Redefining participation – First of all, program beneficiaries are excluded from the participation group, unless they report complying strictly more than the legal amount of hours, or at least the legal 20 hours and additionally express the desire to work more. This group represents 52 percent of the total JJH beneficiaries²³. These results are already presented together with the main analysis in Section 3. Alternatively, we redefine JJH beneficiaries as inactive, unless they declare actively look for a job at least once in the year prior to JJH program participation. Of course, such information is not available for all married women in the panel, so this definition is overly conservative: only 14.7% of the original JJH beneficiaries qualify to be include into the labor market participating group. Finally, taking into account that the working counterpart was mostly enforced after May 2002 (Galasso and Ravallion, 2004), we redefine all beneficiaries entering the program before May 2002 as inactive.

Table 9 presents the results for participation decision and employment probability with respect to husband labor market outcomes once we restrict participation and occupation definitions. We argue that these restrictions select out the beneficiaries that are least likely to comply with the workfare contribution and most likely to shirk and benefit from a windfall effect. In case that moral hazard issues are sorted out, the implementation of the workfare program comes down to relaxing the constraint over the demand side. In Table 9, the AWE is still significant, and represents one half to two thirds of the

²³Two definitions are used : whether they wish to work more hours, or whether they actively look for an other occupation.

estimates displayed in Table 4.

TABLE 9 – Sensitivity analysis: using restrictive definitions for participation and occupation

	Dep. Var: Participation			Dep. Var: Occupation		
	(1)	(2)	(3)	(1)	(2)	(3)
Husband labor income	-0.072*** (0.027)	-0.056** (0.026)	-0.088*** (0.027)	-0.056** (0.024)	-0.040* (0.024)	-0.072*** (0.025)
F-stat FS	33.78	33.78	33.78	33.78	33.78	33.78
	(1)	(2)	(3)	(1)	(2)	(3)
Husband unemployment	0.278** (0.117)	0.217* (0.114)	0.322*** (0.120)	0.206* (0.108)	0.145 (0.107)	0.249** (0.111)
F-stat FS	45.55	45.55	45.55	45.55	45.55	45.55
Observations	18755	18755	18755	18755	18755	18755

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses, clustered at the individual level.

Note: For estimation methodology and specification: see note Table 4. *Specification (1)*: JJH beneficiaries excluded from participation and occupation, unless: (i) they work more than the 20 required weekly hours; (ii) they work at least 20 hours and wish to work more hours. *Specification (2)*: JJH beneficiaries excluded from participation and occupation, unless they happen to have been unemployed prior to JJH program extension. *Specification (3)*: JJH beneficiaries excluded from participation and occupation if they entered the program before May 2002. Instrument set is *IV1*. *IV2* set yields similar results. With *IV3*, coefficients are of similar magnitude, but error terms are higher.

However, this correction does not really deal with the discouragement effect issue. Even if these individuals do participate and work under the JJH program, would they have supplied labor in the first place, had the program not existed? To collect evidence on this question, we concentrate on the AWE in two subgroups of data.

AWE on subgroups – We now measure the AWE by dropping all JJH participants from the original sample. We show that there is substantial evidence supporting the fact that the AWE exists independently from the JJH program.

Table 10 displays results using the same methodology presented in Section 2 on one subsample of the data. Interestingly, when JJH beneficiaries are excluded from the sample, the AWE is still showing up, and is far from negligible: a 10 percent decrease in the household head's labor income generates a 0.64 percentage point increase in the probability of his spouse to participate into the labor market. This represents 60 percent of the AWE effect found using the whole sample. However, unlike in the case of Table 4, this participation does not translate that easily into more employment. In a context of

TABLE 10 – Sensitivity analysis: using a restricted sample

	Subsample w/o JJH	
	Part.	Occup.
Husband labor income	−0.064** (0.027)	−0.035 (0.024)
F-stat FS	31.57	31.57
	Part.	Occup.
Husband unemployment	0.245** (0.116)	0.111 (0.105)
F-stat FS	45.89	45.89
Observations	18088	18088

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses, clustered at the individual level.

Note: For estimation methodology and specification: see note Table 4. *Sample:* JJH beneficiaries excluded from participation.

decreasing opportunities, spouses whose husband experiences an income decline or a job loss are not more likely to actually find a job than spouses with more stable husbands, which mean that they enter unemployment without benefiting from the JJH program. This result is further evidence in favor of the poverty and unemployment alleviation role played by the JJH (Galasso and Ravallion, 2004): married women ineligible or unable to benefit from the JJH express willingness but cannot cope against the shock affecting their household.

5 Heterogeneity analysis

This section provides an insight into heterogeneous effects at work beyond the average AWE. Several assumptions can be made regarding the relevant sources of heterogeneity. First, in a traditional labor supply perspective, women in childless couples should have a preference for working, or should be less constrained in their labor supply decisions. As a consequence, their AWE should exceed the AWE expressed by women with children. On the other hand, according to a more collective view of the household (Chiappori, 1992; Lundberg et al., 1997), all else being equal, and controlling for the variation in the number of children within the household, women with children could enter relatively more the labor market if their husband experience a decline in income, in order to smooth their children’s consumption. Second, the AWE should be negatively correlated with the

holding of assets. Though information on savings is not available within this survey, the life cycle theory suggests that individuals smooth their consumption over their lifetime, implying that savings are formed in an intermediate phase of the life cycle. The AWE is expected to vary according to the age category of the household (Starr, 2013). Third, income utility marginally decreases. Correspondingly, the wealth effect associated with a given temporary income loss should be higher if the household belongs to the first income quartile at baseline, than in case it pertains to the richest quartile (MaCurdy, 1985). Following this idea, the AWE should be smaller in case the household owns its dwelling. Finally, all else being equal, the AWE should be related to the level of human capital accumulated by married women. On the one hand, the AWE should be higher when wives are more educated, because educated wives should be prone to work and find better opportunities. On the other hand, their participation level is already high relatively to the less educated women, and their reservation wage is higher, which is a barrier to entry on the informal labor market.

In order to answer these empirical questions, household head's labor market outcomes – i.e. labor income and employment status – should be interacted with a series of characteristics that are allegedly a source of heterogeneity. In our case, an issue appears, in so far household head's labor market outcomes are instrumented. Following Wooldridge (2002)²⁴, the interaction terms are thus endogenous, non linear variables. In Wooldridge's words, a 'forbidden regression' would arise if we interact the exogenous variables with the predicted value of our instrumented interest variable. As in the case of the interest variable, all of the interaction terms have to be instrumented by an interaction between the exogenous variables and the instruments. For example, a correct estimation of the heterogeneous effect of baseline home ownership implies to instrument husband's income using the set of instruments IV1, and to instrument the interaction between husband's income and the exogenous ownership dummy with the IV1 set itself interacted with the home ownership dummy²⁵.

Results are presented in Table 11. For the sake of concision, we only display results using the IV1 set of instruments, and participation decision at the extensive margin. Only results using husband's variation in income are presented, because regressions instrumenting for husband's variation in employment status is subject to weakness.

Looking at Panel A, the AWE does not differ according to age categories. There is no evidence that younger couples use relatively more labor market coping strategies

²⁴Section 9.5 pp. 236-7.

²⁵Because of this complex instrumentation procedure, we study each heterogeneity source separately. As a consequence, the heterogeneous effect of income quartile at baseline is likely to partly capture the heterogeneous effects of human capital.

TABLE 11 – Heterogeneity analysis

	Part	Part ⁺	Occup	Occup ⁺	Full-time
<i>Panel A : Age, woman</i>					
Husb. monthly income	−0.0189 (−0.70)	−0.0405 (−1.51)	−0.0230 (−0.89)	−0.0446* (−1.76)	0.0114 (0.49)
× aged 16 29	−0.0142 (−0.56)	0.0150 (0.60)	−0.00215 (−0.09)	0.0271 (1.14)	−0.0205 (−0.93)
× aged 30 44	−0.00477 (−0.22)	0.0167 (0.76)	0.00775 (0.36)	0.0292 (1.40)	−0.00900 (−0.47)
<i>Panel B : Homeownership</i>					
Husb. monthly income	−0.119*** (−4.67)	−0.0667** (−2.82)	−0.0925*** (−3.99)	−0.0403* (−1.91)	−0.0356* (−1.89)
× owner	0.0587*** (3.82)	0.0302** (2.13)	0.0469*** (3.36)	0.0184 (1.46)	0.0182 (1.61)
<i>Panel C : HH income quartile at baseline</i>					
Husb. monthly income	0.0201 (0.98)	0.0263 (1.29)	0.0454** (2.32)	0.0516** (2.69)	0.0283 (1.46)
× income Q1	−0.0388* (−1.84)	−0.0419** (−1.99)	−0.0568** (−2.83)	−0.0599** (−3.05)	−0.0342* (−1.74)
× income Q2	−0.0566** (−2.60)	−0.0580** (−2.67)	−0.0735*** (−3.48)	−0.0749*** (−3.61)	−0.0401* (−1.95)
× income Q3	−0.0178 (−0.79)	−0.0211 (−0.94)	−0.0394* (−1.84)	−0.0428** (−2.01)	−0.0253 (−1.16)
<i>Panel D : Education, woman</i>					
Husb. monthly income	0.0532** (2.73)	−0.00928 (−0.49)	0.0381** (2.10)	−0.0243 (−1.40)	0.00898 (0.52)
× primary degree	−0.0679*** (−4.06)	−0.00970 (−0.60)	−0.0487** (−3.14)	0.00951 (0.64)	−0.0153 (−1.03)
× secondary degree	−0.0544*** (−4.20)	−0.00902 (−0.72)	−0.0394** (−3.27)	0.00593 (0.52)	−0.0124 (−1.07)
<i>Panel E : Children</i>					
Husb. monthly income	−0.0919** (−3.11)	−0.0667** (−2.29)	−0.0563** (−2.07)	−0.0310 (−1.19)	−0.0376 (−1.53)
× child under 5	0.0153 (1.33)	0.00866 (0.76)	0.00317 (0.30)	−0.00352 (−0.35)	0.00478 (0.50)
× child above 5	0.0468** (2.43)	0.0335* (1.77)	0.0319* (1.81)	0.0187 (1.10)	0.0240 (1.50)
<i>Panel F : Husb. gets U benefits</i>					
Husb. monthly income	−0.146*** (−5.77)	−0.0722** (−3.22)	−0.113*** (−4.96)	−0.0391* (−1.95)	−0.0332* (−1.77)
× U benefits	0.111*** (4.37)	0.0640** (2.81)	0.0685** (3.11)	0.0219 (1.13)	0.0158 (0.90)
Observations	18755	18755	18755	18755	18755

Note: See note Table 3 and 4. Instrument set is IV1. Because of the complex instrumentation procedure involving endogenous non linear variables, each source of heterogeneity is analysed in a separate regression. When categories are not binary, reference categories are: aged 45 59, superior degree, income Q4, childless couple.

because they cannot cope against unexpected shocks using savings. Panel B and C show that the wealth effects associated with the shock varies indeed according to the level of income at baseline, or according to home ownership. Women belonging to the richest quartile in 2000-2001 are less likely to enter the labor market and find a job in case their husband is hit by a shock than women belonging to quartiles 1, 2 and 3. Panel C indicates that in case households own their dwelling, the AWE is divided by half. Panel D displays heterogeneity results according to education attainment. The AWE is more important for lower educational degrees, however this heterogeneity disappears when JJH beneficiaries are redefined as non-participants. Panel E displays the differences in AWE for childless couples, couples with at least one child under compulsory schooling age, and couples with at least one child above schooling age and under 18. Surprisingly, while women with underaged children react similarly to unexpected shocks in their husband's income, women with children above 5 have a significantly lower AWE. Finally, Panel F indicates that the AWE is significantly smaller for women whose husband experiences a decrease in labor income, but is entitled to unemployment insurance or compensation.

Conclusion

So far, literature on the AWE has answered two main questions: (i) do households whose head is hit by an idiosyncratic shock – e.g. unexpected plant closures in developed countries, or climate shocks in developing countries – respond by sending additional workers on the labor market? and (ii) in downward business cycles, is the added worker effect prevailing over the discouraged worker effect at the aggregate level? This paper fills the gap between the two literatures and develops an original empirical strategy to assess the existence and extent of the added-worker shock coping strategy in the case of an aggregate shock and a macro discouragement effect. Intra-household market oriented strategies are tricky to measure, because in normal times spouses' labor supply is jointly determined, implying that the decision of each spouse is endogenous to the decision of the other spouse. The dramatic collapse of the convertibility era generates an aggregate shock presenting asymmetries with respect to economic sectors. This natural experiment framework is used to instrument for the household head's endogenous labor market outcomes. Results points out that even when discouragement prevails at the aggregate level, there is evidence of an added-worker effect.

In the Argentine case, this AWE is far from negligible. Married women whose spouse experiences a 30 percent decrease in monthly wage (which correspond to the sample mean) are 3 percentage points more likely to enter the labor market. Husbands'

increase in unemployment causes spouses to increase their participation rate by almost 2 percentage points. The magnitude of this effect reflects the fact that the Argentine state relaxes the demand side of the labor market by offering workfare programs paid below the market wage. As a robustness check, we redefine program participants as inactive if they do not work the legal amount of time to be entitled to the program, or if they do not declare wishing working more hours, in order to select out the potential windfall effect created by the program. The AWE still accounts for a 2 percent increase in female participation over the period. In line with intuition, this AWE is nonetheless slightly inferior to the one observed during upward business cycle by Cerrutti (2000), even after controlling for changes in macroeconomic opportunities over the period. A preliminary analysis at the intensive margin displays less robust patterns of an "added hours effect" from the part of spouses whose husband undergoes a wage or job loss. Finally, in line with intuition, the AWE proves to be heterogeneous with respect to home ownership, household income quartile, education degree, husband's unemployment insurance, and the presence of children within the household at baseline.

In a broader perspective, this paper contributes to a recent focus shift in labor supply studies towards a better understanding of labor supply's role in mitigating uncertainty within households over the lifetime. Perhaps surprisingly, shock coping is still an essential role of the family. Highlighting the existence of a non negligible AWE is the first step towards a better understanding of intra household coping mechanisms in emerging economies with embryonic social safety nets. Future work will have to assess the effectiveness of this AWE in mitigating the impact of the economic downturn. In addition, a complementary aspect of the AWE is whether the additional workforce actually returns to inactivity once lost income has been compensated for. From 2003 onwards, Argentine economy experiences a sudden and radical upward cycle, as displayed in figure 1. A possible extension to present work is to document the decisions of married women labor supply at the intra-household level, in order to assess whether the added workers tend to stay in or leave the workforce in a context of drastic economical improvement. Overall, a correct identification of the interrelations between primary and secondary earners' wages, as well as the indirect effects of this intra-household insurance scheme have important policy implications. Literature on female labor supply generally proposes alternative welfare fallouts: female participation increases bargaining power (Chiappori, 1992; Pollak, 2005), affecting income allocation between members, but also leads to precarious positions and overwork (Lim, 2000; Klasen and Pieters, 2012). Design and implementation of welfare programs have to interfere intelligently in these existing mechanisms.

References

- Alderman, H. and Paxson, C. (1992). Do the poor insure? a synthesis of the literature on risk and consumption in developing countries. Papers 164, Princeton, Woodrow Wilson School - Development Studies.
- Angrist, J. and Krueger, A. B. (2001). Instrumental variables and the search for identification: From supply and demand to natural experiments. Working Paper 8456, National Bureau of Economic Research.
- Beegle, K., Dehejia, R. H., and Gatti, R. (2006). Child labor and agricultural shocks. *Journal of Development Economics*, 81(1):80 – 96.
- Bertrand, M., Duflo, E., and Mullainathan, S. (2004). How much should we trust differences-in-differences estimates? *The Quarterly Journal of Economics*, 119(1):pp. 249–275.
- Bingley, P. and Walker, I. (2001). Household unemployment and the labour supply of married women. *Economica*, 68(270):157–186.
- Blundell, R. and Macurdy, T. (1999). Chapter 27 labor supply: A review of alternative approaches. In Ashenfelter, O. C. and Card, D., editors, *Handbook of labor economics*, volume 3, Part A of *Handbook of Labor Economics*, pages 1559 – 1695. Elsevier.
- Blundell, R., MaCurdy, T., and Meghir, C. (2007). Chapter 69 labor supply models: Unobserved heterogeneity, nonparticipation and dynamics. In Heckman, J. J. and Leamer, E. E., editors, *Handbook of Econometrics*, volume 6, Part A of *Handbook of Econometrics*, pages 4667 – 4775. Elsevier.
- Blundell, R., Pistaferri, L., and Saporta-Eksten, I. (2012). Consumption inequality and family labor supply. Working Paper 18445, NBER.
- Bosaz, M. A. and al. (2003). *Fortalecimiento institucional de los Consejos Consultivos: Programa Jefas y Jefes de Hogar*, chapter Representatividad y Funcionamiento de los Consejos Consultivos. Caritas Argentinas.
- Cerrutti, M. (2000). Economic reform, structural adjustment and female labor force participation in buenos aires, argentina. *World Development*, 28(5):879 – 891.
- Chiappori, P.-A. (1992). Collective labor supply and welfare. *Journal of Political Economy*, 100(3):437–67.

-
- Congregado, E., Golpe, A. A., and van Stel, A. (2011). Exploring the big jump in the spanish unemployment rate: Evidence on an 'added-worker' effect. *Economic Modelling*, 28(3):1099–1105.
- Cullen, J. B. and Gruber, J. (2000). Does unemployment insurance crowd out spousal labor supply? *Journal of Labor Economics*, 18(3):546–572.
- Duflo, E. and Udry, C. (2004). Intrahousehold resource allocation in cote d'ivoire: Social norms, separate accounts and consumption choices. Working Paper 10498, National Bureau of Economic Research.
- Dynarski, M. and Sheffrin, S. M. (1987). Consumption and unemployment. *The Quarterly Journal of Economics*, 102(2):411–428.
- Fanelli, J. M. (2002). Growth, macroeconomic instability and the crisis of convertibility in argentina. *ECLAC Review*, 77.
- Fields, G. S. and Sánchez Puerta, M. L. (2010). Earnings mobility in times of growth and decline: Argentina from 1996 to 2003. *World Development*, 38(6):870–880.
- Frankenberg, E., Smith, J. P., and Thomas, D. (2003). Economic shocks, wealth, and welfare. *Journal of Human Resources*, 38(2):280–321.
- Galasso, E. and Ravallion, M. (2004). Social protection in a crisis: Argentina's plan jefes y jefas. *World Bank Economic Review*, 18(3):367–399.
- Gong, X. (2011). The added worker effect for married women in australia. *Economic Record*, 87(278):414–426.
- Haddad, L., Hoddinott, J., and Alderman, H. (1997). *Intrahousehold resource allocation in developing countries: models, methods, and policy*. International Food Policy Research Institute (IFPRI), Johns Hopkins University Press.
- Hardoy, I. and Schoene, P. (2013). Displacement and household adaptation: insured by the spouse or the state? *Journal of Population Economics*, pages 1–21.
- Harkness, S. and Evans, M. (2011). The employment effects of recession on couples in the uk: women's and household employment prospects and partners? job loss. *Journal of Social Policy*, 40(4):675–693.
- Heckman, J. J. and MaCurdy, T. (1982). Corrigendum on a life cycle model of female labour supply. *The Review of Economic Studies*, 49(4):pp. 659–660.

-
- Heckman, J. J. and Macurdy, T. E. (1980). A life cycle model of female labour supply. *The Review of Economic Studies*, 47(1):pp. 47–74.
- Huang, F.-M., Luh, Y.-H., and Huang, F.-Y. (2012). Unemployment information and married women’s labor supply responses to husbands job loss: Evidence from taiwan. *China Economic Review*.
- INDEC (2002a). Base usuaria ampliada de total e.p.h. (bua) - version octubre 2002. Technical report, INDEC.
- INDEC (2002b). Novedades de la onda para total e.p.h. - version mayo 2002. Technical report, INDEC.
- Jacoby, H. G. and Skoufias, E. (1997). Risk, financial markets, and human capital in a developing country. *The Review of Economic Studies*, 64(3):311–335.
- Kaplan, G. (2012). Moving back home: Insurance against labor market risk. *Journal of Political Economy*, 120(3):446–512.
- Karaoglan, D. and Okten, C. (2012). Labor force participation of married women in turkey: Is there an added or a discouraged worker effect? Technical report, Discussion Paper series, Forschungsinstitut zur Zukunft der Arbeit.
- Kinsey, B., Burger, K., and Gunning, J. W. (1998). Coping with drought in zimbabwe: Survey evidence on responses of rural households to risk. *World Development*, 26(1):89 – 110.
- Klasen, S. and Pieters, J. (2012). Push or pull? drivers of female labor force participation during india’s economic boom. Discussion Paper 6395, IZA.
- Kochar, A. (1999). Smoothing consumption by smoothing income: Hours-of-work responses to idiosyncratic agricultural shocks in rural india. *Review of Economics and Statistics*, 81(1):50–61.
- Kohara, M. (2010). The response of japanese wives labor supply to husbands job loss. *Journal of Population Economics*, 23(4):1133–1149.
- Krueger, F. (1998). Taking advantage of rural assets as a coping strategy for the urban poor: the case of ruralurban interrelations in botswana. *Environment and Urbanization*, 10(1):119–134.
- Layard, R., Barton, M., and Zabalza, A. (1980). Married women’s participation and hours. *Economica*, 47(185):pp. 51–72.

-
- Lim, J. Y. (2000). The effects of the east asian crisis on the employment of women and men: The philippine case. *World Development*, 28(7):1285 – 1306.
- Lokshin, M. M. and Yemtsov, R. (2004). Household strategies of coping with shocks in post-crisis russia. *Review of Development Economics*, 8(1):15–32.
- Lundberg, S. (1985). The added worker effect. *Journal of Labor Economics*, 3(1):pp. 11–37.
- Lundberg, S., Pollak, R., and Wales, T. (1997). Do husbands and wives pool their resources? evidence from the uk child benefit. *Journal of Human Resources*, 32:463–480.
- Lundberg, S. J. and Pollak, R. A. (1993). Separate spheres bargaining and the marriage market. *Journal of Political Economy*, 101(6):988–1010.
- MaCurdy, T. (1985). *Longitudinal Analysis of Labor Market Data*, chapter Interpreting Empirical Models of Labor Supply in a Life Cycle Setting. Cambridge University Press, Cambridge.
- Maloney, T. (1987). Employment constraints and the labor supply of married women: A reexamination of the added worker effect. *The Journal of Human Resources*, 22(1):pp. 51–61.
- Maloney, T. (1991). Unobserved variables and the elusive added worker effect. *Economica*, 58(230):pp. 173–187.
- McKenzie, D. and Schargrodsky, E. (2011). Buying less but shopping more: the use of nonmarket labor during a crisis. *Economia*, 11(2):1–35.
- McKenzie, D. J. (2004). Aggregate shocks and urban labor market responses: Evidence from argentina’s financial crisis. *Economic Development and Cultural Change*, 52(4):pp. 719–758.
- Mincer, J. (1962). *Aspects of Labor Economics*, chapter Labor Force Participation of Married Women, pages 63 – 97. Princeton University Press.
- Ministerio del Trabajo, E. y. S. S. . (2005). Diagnostico sobre la situacion laboral de las mujeres. Technical report, MTEySS.
- Modolo, C. (2004). Los peligros institucionales del plan jefes y jefas de hogar. Technical report, Novenas Jornadas ”Investigaciones en la Facultad” de Ciencias Econmicas y Estadstica, Universidad de Rosario.

-
- Mohapatra, S., Joseph, G., and Ratha, D. (2012). Remittances and natural disasters: ex-post response and contribution to ex-ante preparedness. *Environment, Development and Sustainability*, 14(3):365–387.
- Pencavel, J. H. (1982). Unemployment and the labor supply effects of the seattle-denver income maintenance experiments. *Research in Labor Economics*, 5:131.
- Pollak, R. A. (2005). Bargaining power in marriage: Earnings, wage rates and household production. Working Paper 11239, National Bureau of Economic Research.
- Rosenzweig, M. R. and Wolpin, K. I. (2000). Natural” natural experiments” in economics. *Journal of Economic Literature*, 38(4):827–874.
- Snel, E. and Staring, R. (2001). Poverty, migration, and coping strategies: an introduction. *European Journal of Anthropology*, 38:7–22.
- Starr, M. A. (2013). Gender, added-worker effects, and the 2007–2009 recession: Looking within the household. *Review of Economics of the Household*, pages 1–27.
- Stephens, M. J. (2002). Worker displacement and the added worker effect. *Journal of Labor Economics*, 20(3):504–537.
- Stock, J. H. and Yogo, M. (2002). Testing for weak instruments in linear iv regression. NBER Technical Working Papers 0284, National Bureau of Economic Research, Inc.
- Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data*. MIT Press, Cambridge, Massachusetts.
- Woytinsky, W. S. (1940). Additional workers and the volume of unemployment in the depression. Pamphlet Series 1, Washington: Social Science Research Council, Committee on Social Security.
- Yang, D. (2008). International migration, remittances and household investment: Evidence from philippine migrants exchange rate shocks. *The Economic Journal*, 118(528):591–630.

Appendix

TABLE 12 – Construction of the instrumental variables, based on 2002 shock asymetry between household head sectors: primary and secondary sectors

	Prim	Goods						
		Alim	Text	Chem	Metal	Other	Gas	Constr
Shock(2002 = 1)	-0.437* (0.145)	-0.413* (0.112)	-0.304 (0.199)	-0.623* (0.170)	-0.847* (0.144)	-0.831* (0.131)	-0.310* (0.100)	-1.027* (0.080)
Constant	5.913* (0.091)	5.449* (0.068)	5.483* (0.117)	6.226* (0.107)	5.861* (0.087)	5.661* (0.077)	6.507* (0.061)	4.769* (0.049)
Observations	594	585	282	253	690	723	287	3291

	Prim	Goods						
		Alim	Text	Chem	Metal	Other	Gas	Constr
<i>IV1</i>								
Exposed sector ^a	0	0	0	1	1	1	0	1
<i>IV2</i>								
Exposed sector	0	0	0	1	1	1	0	1
Intensity ^b	-0.437	-0.413	-0.304	-0.623	-0.847	-0.831	-0.310	-1.027
<i>IV3</i>								
Exposed sector ^c	0	1	1	0	1	1	0	1
Intensity ^b	-2.28	-10.90	-10.90	-3.74	-10.90	-10.90	-3.01	-33.42

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses, clustered at the individual level.

Note: All IV sets additionally contain a shock dummy. ^a Exposed sector is a dummy equal to 1 if the shock coefficient is significantly negative and lower than the mean aggregate shock. ^b Intensity is measured by the shock coefficient for *IV2*, and by the 2001-2002 GDP recession rate provided by INDEC for *IV3*. ^c In case of *IV3*, exposure is 1 if the decline in GDP is superior to 8 percent.

TABLE 13 – Construction of the instrumental variables, based on 2002 shock asymmetry between household head sectors

	Services											Tot			
	Trade	Retail	Rest	Transp	Comm	Bank	Estate	Adm	Educ	Health	Other		Repair	Domestic	Care
Shock(2002 = 1)	-0.608*	-0.487*	-0.590*	-0.515*	-0.891*	-0.349*	-0.516*	-0.455*	-0.208*	-0.503*	-0.439*	-0.670*	-0.535	-0.611*	-0.591*
	(0.105)	(0.068)	(0.187)	(0.077)	(0.209)	(0.118)	(0.105)	(0.043)	(0.101)	(0.109)	(0.087)	(0.119)	(0.470)	(0.139)	(0.023)
Constant	5.816*	5.578*	5.430*	5.700*	5.877*	6.549*	6.127*	6.286*	5.948*	6.561*	5.959*	5.421*	4.201*	5.286*	5.682*
	(0.061)	(0.042)	(0.114)	(0.048)	(0.125)	(0.075)	(0.064)	(0.028)	(0.067)	(0.072)	(0.054)	(0.074)	(0.276)	(0.083)	(0.015)
Observations	887	1813	306	1488	452	356	818	2875	607	553	688	821	92	294	18755

	Services											Tot			
	Trade	Retail	Rest	Transp	Comm	Bank	Estate	Adm	Educ	Health	Other		Repair	Domestic	Care
<i>IV1</i>	1	0	0	0	1	0	0	0	0	0	0	1	0	1	1
<i>IV2</i>	1	0	0	0	1	0	0	0	0	0	0	1	0	1	1
Exposed sector ^a	-0.608	-0.487	-0.590	-0.515	-0.891	-0.349	-0.516	-0.455	-0.208	-0.503	-0.439	-0.670	-0.535	-0.611	-0.591
<i>IV3</i>	1	1	1	0	0	1	0	0	0	0	1	1	1	1	1
Exposed sector ^c	-18.46	-18.46	-8.28	-7.93	-7.93	-19.72	-5.58	-90	-0.31	-0.31	-9.86	-18.46	-9.86	-9.86	-9.86
Intensity ^b															

Note: See note Table 12

TABLE 14 – Convertibility period asymmetric breakdown and husband labor market outcomes: first stage IV1

	Part		Part ⁺		Occup		More		Hours	
	W	U	W	U	W	U	W	U	W	U
<i>Instruments</i>										
Shock * Exposed sector	-0.409*** (0.051)	0.081*** (0.009)	-0.409*** (0.051)	0.081*** (0.009)	-0.409*** (0.051)	0.081*** (0.009)	-0.502*** (0.097)	0.079*** (0.017)	-0.502*** (0.097)	0.079*** (0.017)
Exposed sector	0.093 (0.065)	0.016 (0.012)	0.093 (0.065)	0.016 (0.012)	0.093 (0.065)	0.016 (0.012)	0.152 (0.122)	0.030 (0.022)	0.152 (0.122)	0.030 (0.022)
Shock (2002)	-0.160*** (0.050)	-0.026*** (0.009)	-0.160*** (0.050)	-0.026*** (0.009)	-0.160*** (0.050)	-0.026*** (0.009)	-0.171** (0.081)	0.001 (0.014)	-0.171** (0.081)	0.001 (0.014)
<i>Own opportunities</i>										
Mean U	-0.001 (0.004)	0.000 (0.001)	-0.001 (0.004)	0.000 (0.001)	-0.001 (0.004)	0.000 (0.001)	-0.011 (0.007)	0.002* (0.001)	-0.011 (0.007)	0.002* (0.001)
Mean hrly wage	0.295** (0.127)	-0.029 (0.023)	0.295** (0.127)	-0.029 (0.023)	0.295** (0.127)	-0.029 (0.023)	0.230 (0.205)	0.025 (0.034)	0.230 (0.205)	0.025 (0.034)
Relative hrly wage	-0.449 (0.318)	0.068 (0.058)	-0.449 (0.318)	0.068 (0.058)	-0.449 (0.318)	0.068 (0.058)	-0.157 (0.573)	0.067 (0.099)	-0.157 (0.573)	0.067 (0.099)
<i>Household composition</i>										
Nb child 0-5	0.078* (0.042)	-0.010 (0.009)	0.078* (0.042)	-0.010 (0.009)	0.078* (0.042)	-0.010 (0.009)	0.026 (0.084)	0.013 (0.018)	0.026 (0.084)	0.013 (0.018)
Nb child 6-13	0.014 (0.048)	-0.001 (0.010)	0.014 (0.048)	-0.001 (0.010)	0.014 (0.048)	-0.001 (0.010)	0.016 (0.092)	0.024 (0.016)	0.016 (0.092)	0.024 (0.016)
Nb child 14-17	0.103* (0.053)	-0.017* (0.010)	0.103* (0.053)	-0.017* (0.010)	0.103* (0.053)	-0.017* (0.010)	0.099 (0.093)	-0.009 (0.016)	0.099 (0.093)	-0.009 (0.016)
Nb older dep	-0.137 (0.156)	0.029 (0.027)	-0.137 (0.156)	0.029 (0.027)	-0.137 (0.156)	0.029 (0.027)	-0.232 (0.298)	0.034 (0.049)	-0.232 (0.298)	0.034 (0.049)
<i>Other income sources</i>										
Monthly wage, other	0.018 (0.012)	-0.003 (0.002)	0.018 (0.012)	-0.003 (0.002)	0.018 (0.012)	-0.003 (0.002)	0.027 (0.022)	-0.008** (0.004)	0.027 (0.022)	-0.008** (0.004)
Pension	-0.029 (0.035)	0.005 (0.005)	-0.029 (0.035)	0.005 (0.005)	-0.029 (0.035)	0.005 (0.005)	-0.061 (0.075)	0.005 (0.011)	-0.061 (0.075)	0.005 (0.011)
Capital	-0.070** (0.028)	0.007* (0.004)	-0.070** (0.028)	0.007* (0.004)	-0.070** (0.028)	0.007* (0.004)	-0.012 (0.034)	0.007 (0.005)	-0.012 (0.034)	0.007 (0.005)
U benefits	-0.470*** (0.037)	0.078*** (0.006)	-0.470*** (0.037)	0.078*** (0.006)	-0.470*** (0.037)	0.078*** (0.006)	-0.483*** (0.068)	0.077*** (0.011)	-0.483*** (0.068)	0.077*** (0.011)
Remittances	-0.318*** (0.032)	0.044*** (0.006)	-0.318*** (0.032)	0.044*** (0.006)	-0.318*** (0.032)	0.044*** (0.006)	-0.155** (0.073)	0.009 (0.012)	-0.155** (0.073)	0.009 (0.012)
Other	-0.297*** (0.022)	0.029*** (0.003)	-0.297*** (0.022)	0.029*** (0.003)	-0.297*** (0.022)	0.029*** (0.003)	-0.215*** (0.038)	0.016*** (0.005)	-0.215*** (0.038)	0.016*** (0.005)
<i>Time effect besides 2002</i>										
October 2000	0.274*** (0.047)	-0.032*** (0.008)	0.274*** (0.047)	-0.032*** (0.008)	0.274*** (0.047)	-0.032*** (0.008)	0.324*** (0.083)	-0.029* (0.015)	0.324*** (0.083)	-0.029* (0.015)
May 2001	0.142*** (0.032)	-0.013** (0.006)	0.142*** (0.032)	-0.013** (0.006)	0.142*** (0.032)	-0.013** (0.006)	0.123** (0.054)	-0.014 (0.009)	0.123** (0.054)	-0.014 (0.009)
May 2002	-0.159*** (0.037)	0.034*** (0.007)	-0.159*** (0.037)	0.034*** (0.007)	-0.159*** (0.037)	0.034*** (0.007)	-0.176*** (0.061)	0.022** (0.011)	-0.176*** (0.061)	0.022** (0.011)
Observations	18755	18755	18755	18755	18755	18755	7039	7039	7039	7039
F-stat FS										

TABLE 15 – Convertibility period asymmetric breakdown and husband labor market outcomes: first stage IV2

	Part		Part ⁺		Occup		More		Hours	
	W	U	W	U	W	U	W	U	W	U
<i>Instruments</i>										
Shock * Exposed sector	-0.932*** (0.111)	0.195*** (0.021)	-0.932*** (0.111)	0.195*** (0.021)	-0.932*** (0.111)	0.195*** (0.021)	-1.145*** (0.206)	0.182*** (0.036)	-1.145*** (0.206)	0.182*** (0.036)
Exposed sector	0.069 (0.063)	0.019 (0.012)	0.069 (0.063)	0.019 (0.012)	0.069 (0.063)	0.019 (0.012)	0.124 (0.118)	0.034 (0.022)	0.124 (0.118)	0.034 (0.022)
Shock (2002)	0.251*** (0.078)	-0.114*** (0.014)	0.251*** (0.078)	-0.114*** (0.014)	0.251*** (0.078)	-0.114*** (0.014)	0.326** (0.132)	-0.078*** (0.023)	0.326** (0.132)	-0.078*** (0.023)
<i>Own opportunities</i>										
Mean U	-0.000 (0.004)	0.000 (0.001)	-0.000 (0.004)	0.000 (0.001)	-0.000 (0.004)	0.000 (0.001)	-0.011 (0.007)	0.002** (0.001)	-0.011 (0.007)	0.002** (0.001)
Mean hrly wage	0.303** (0.127)	-0.030 (0.022)	0.303** (0.127)	-0.030 (0.022)	0.303** (0.127)	-0.030 (0.022)	0.214 (0.205)	0.027 (0.034)	0.214 (0.205)	0.027 (0.034)
Relative hrly wage	-0.429 (0.318)	0.064 (0.058)	-0.429 (0.318)	0.064 (0.058)	-0.429 (0.318)	0.064 (0.058)	-0.102 (0.574)	0.058 (0.099)	-0.102 (0.574)	0.058 (0.099)
<i>Household composition</i>										
Nb child 0-5	0.083** (0.042)	-0.011 (0.009)	0.083** (0.042)	-0.011 (0.009)	0.083** (0.042)	-0.011 (0.009)	0.033 (0.083)	0.011 (0.017)	0.033 (0.083)	0.011 (0.017)
Nb child 6-13	0.012 (0.048)	-0.001 (0.010)	0.012 (0.048)	-0.001 (0.010)	0.012 (0.048)	-0.001 (0.010)	0.013 (0.091)	0.025 (0.016)	0.013 (0.091)	0.025 (0.016)
Nb child 14-17	0.101* (0.052)	-0.017* (0.010)	0.101* (0.052)	-0.017* (0.010)	0.101* (0.052)	-0.017* (0.010)	0.094 (0.093)	-0.008 (0.016)	0.094 (0.093)	-0.008 (0.016)
Nb older dep	-0.143 (0.157)	0.030 (0.027)	-0.143 (0.157)	0.030 (0.027)	-0.143 (0.157)	0.030 (0.027)	-0.266 (0.297)	0.040 (0.049)	-0.266 (0.297)	0.040 (0.049)
<i>Other income sources</i>										
Monthly wage, other	0.019 (0.012)	-0.003 (0.002)	0.019 (0.012)	-0.003 (0.002)	0.019 (0.012)	-0.003 (0.002)	0.028 (0.022)	-0.008** (0.004)	0.028 (0.022)	-0.008** (0.004)
Pension	-0.030 (0.035)	0.005 (0.005)	-0.030 (0.035)	0.005 (0.005)	-0.030 (0.035)	0.005 (0.005)	-0.056 (0.074)	0.004 (0.011)	-0.056 (0.074)	0.004 (0.011)
Capital	-0.070** (0.028)	0.007* (0.004)	-0.070** (0.028)	0.007* (0.004)	-0.070** (0.028)	0.007* (0.004)	-0.014 (0.034)	0.007 (0.005)	-0.014 (0.034)	0.007 (0.005)
U benefits	-0.468*** (0.037)	0.078*** (0.006)	-0.468*** (0.037)	0.078*** (0.006)	-0.468*** (0.037)	0.078*** (0.006)	-0.481*** (0.068)	0.077*** (0.011)	-0.481*** (0.068)	0.077*** (0.011)
Remittances	-0.317*** (0.032)	0.044*** (0.006)	-0.317*** (0.032)	0.044*** (0.006)	-0.317*** (0.032)	0.044*** (0.006)	-0.153** (0.073)	0.009 (0.012)	-0.153** (0.073)	0.009 (0.012)
Other	-0.295*** (0.022)	0.028*** (0.003)	-0.295*** (0.022)	0.028*** (0.003)	-0.295*** (0.022)	0.028*** (0.003)	-0.213*** (0.037)	0.016*** (0.005)	-0.213*** (0.037)	0.016*** (0.005)
<i>Time effect besides 2002</i>										
October 2000	0.274*** (0.046)	-0.033*** (0.008)	0.274*** (0.046)	-0.033*** (0.008)	0.274*** (0.046)	-0.033*** (0.008)	0.323*** (0.083)	-0.029* (0.015)	0.323*** (0.083)	-0.029* (0.015)
May 2001	0.143*** (0.032)	-0.014** (0.006)	0.143*** (0.032)	-0.014** (0.006)	0.143*** (0.032)	-0.014** (0.006)	0.123** (0.054)	-0.014 (0.009)	0.123** (0.054)	-0.014 (0.009)
May 2002	-0.159*** (0.037)	0.034*** (0.007)	-0.159*** (0.037)	0.034*** (0.007)	-0.159*** (0.037)	0.034*** (0.007)	-0.178*** (0.060)	0.022** (0.011)	-0.178*** (0.060)	0.022** (0.011)
Observations	18755	18755	18755	18755	18755	18755	7039	7039	7039	7039
F-stat FS										

TABLE 16 – Convertibility period asymmetric breakdown and husband labor market outcomes: first stage IV3

	Part		Part ⁺		Occup		More		Hours	
	W	U	W	U	W	U	W	U	W	U
<i>Instruments</i>										
Shock * Exposed sector	0.015*** (0.002)	-0.004*** (0.000)	0.015*** (0.002)	-0.004*** (0.000)	0.015*** (0.002)	-0.004*** (0.000)	0.018*** (0.004)	-0.004*** (0.001)	0.018*** (0.004)	-0.004*** (0.001)
Exposed sector	-0.025 (0.067)	-0.009 (0.013)	-0.025 (0.067)	-0.009 (0.013)	-0.025 (0.067)	-0.009 (0.013)	-0.004 (0.121)	-0.037* (0.021)	-0.004 (0.121)	-0.037* (0.021)
Shock (2002)	-0.128** (0.053)	-0.045*** (0.009)	-0.128** (0.053)	-0.045*** (0.009)	-0.128** (0.053)	-0.045*** (0.009)	-0.131 (0.087)	-0.017 (0.015)	-0.131 (0.087)	-0.017 (0.015)
<i>Own opportunities</i>										
Mean U	-0.000 (0.004)	0.000 (0.001)	-0.000 (0.004)	0.000 (0.001)	-0.000 (0.004)	0.000 (0.001)	-0.011 (0.007)	0.002** (0.001)	-0.011 (0.007)	0.002** (0.001)
Mean hrly wage	0.306** (0.127)	-0.032 (0.023)	0.306** (0.127)	-0.032 (0.023)	0.306** (0.127)	-0.032 (0.023)	0.221 (0.205)	0.027 (0.034)	0.221 (0.205)	0.027 (0.034)
Relative hrly wage	-0.417 (0.319)	0.063 (0.058)	-0.417 (0.319)	0.063 (0.058)	-0.417 (0.319)	0.063 (0.058)	-0.093 (0.574)	0.058 (0.100)	-0.093 (0.574)	0.058 (0.100)
<i>Household composition</i>										
Nb child 0-5	0.085** (0.042)	-0.011 (0.009)	0.085** (0.042)	-0.011 (0.009)	0.085** (0.042)	-0.011 (0.009)	0.033 (0.083)	0.012 (0.017)	0.033 (0.083)	0.012 (0.017)
Nb child 6-13	0.015 (0.048)	-0.002 (0.010)	0.015 (0.048)	-0.002 (0.010)	0.015 (0.048)	-0.002 (0.010)	0.024 (0.091)	0.024 (0.016)	0.024 (0.091)	0.024 (0.016)
Nb child 14-17	0.103* (0.053)	-0.017* (0.010)	0.103* (0.053)	-0.017* (0.010)	0.103* (0.053)	-0.017* (0.010)	0.107 (0.093)	-0.008 (0.016)	0.107 (0.093)	-0.008 (0.016)
Nb older dep	-0.130 (0.156)	0.027 (0.027)	-0.130 (0.156)	0.027 (0.027)	-0.130 (0.156)	0.027 (0.027)	-0.245 (0.295)	0.040 (0.048)	-0.245 (0.295)	0.040 (0.048)
<i>Other income sources</i>										
Monthly wage, other	0.019* (0.012)	-0.003 (0.002)	0.019* (0.012)	-0.003 (0.002)	0.019* (0.012)	-0.003 (0.002)	0.029 (0.022)	-0.008** (0.004)	0.029 (0.022)	-0.008** (0.004)
Pension	-0.030 (0.035)	0.005 (0.005)	-0.030 (0.035)	0.005 (0.005)	-0.030 (0.035)	0.005 (0.005)	-0.057 (0.075)	0.003 (0.011)	-0.057 (0.075)	0.003 (0.011)
Capital	-0.070** (0.028)	0.007* (0.004)	-0.070** (0.028)	0.007* (0.004)	-0.070** (0.028)	0.007* (0.004)	-0.009 (0.034)	0.007 (0.005)	-0.009 (0.034)	0.007 (0.005)
U benefits	-0.470*** (0.038)	0.078*** (0.006)	-0.470*** (0.038)	0.078*** (0.006)	-0.470*** (0.038)	0.078*** (0.006)	-0.481*** (0.069)	0.078*** (0.011)	-0.481*** (0.069)	0.078*** (0.011)
Remittances	-0.317*** (0.033)	0.044*** (0.006)	-0.317*** (0.033)	0.044*** (0.006)	-0.317*** (0.033)	0.044*** (0.006)	-0.159** (0.073)	0.011 (0.012)	-0.159** (0.073)	0.011 (0.012)
Other	-0.297*** (0.022)	0.029*** (0.003)	-0.297*** (0.022)	0.029*** (0.003)	-0.297*** (0.022)	0.029*** (0.003)	-0.216*** (0.037)	0.016*** (0.005)	-0.216*** (0.037)	0.016*** (0.005)
<i>Time effect besides 2002</i>										
October 2000	0.273*** (0.047)	-0.032*** (0.008)	0.273*** (0.047)	-0.032*** (0.008)	0.273*** (0.047)	-0.032*** (0.008)	0.324*** (0.083)	-0.029* (0.015)	0.324*** (0.083)	-0.029* (0.015)
May 2001	0.143*** (0.032)	-0.013** (0.006)	0.143*** (0.032)	-0.013** (0.006)	0.143*** (0.032)	-0.013** (0.006)	0.122** (0.054)	-0.014 (0.009)	0.122** (0.054)	-0.014 (0.009)
May 2002	-0.161*** (0.037)	0.035*** (0.007)	-0.161*** (0.037)	0.035*** (0.007)	-0.161*** (0.037)	0.035*** (0.007)	-0.177*** (0.061)	0.022* (0.011)	-0.177*** (0.061)	0.022* (0.011)
Observations	18755	18755	18755	18755	18755	18755	7039	7039	7039	7039
F-stat FS										

TABLE 17 – Female participation at the extensive margin and spouse labor income

	Participation			Participation ⁺			Occupation		
	IV1	IV2	IV3	IV1	IV2	IV3	IV1	IV2	IV3
<i>Husband</i>									
Household head monthly wage	-0.142*** (0.025)	-0.135*** (0.023)	-0.141*** (0.027)	-0.071*** (0.022)	-0.062*** (0.020)	-0.053** (0.024)	-0.110*** (0.022)	-0.110*** (0.021)	-0.110*** (0.024)
<i>Own opportunities</i>									
Mean U	-0.002* (0.001)	-0.002* (0.001)	-0.002* (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)
Mean hrly wage	0.114*** (0.031)	0.108*** (0.030)	0.112*** (0.032)	0.126*** (0.028)	0.118*** (0.027)	0.110*** (0.029)	0.067** (0.028)	0.068** (0.027)	0.068** (0.029)
Relative hrly wage	-0.024 (0.082)	-0.019 (0.081)	-0.023 (0.083)	-0.140* (0.073)	-0.132* (0.073)	-0.124* (0.073)	0.019 (0.075)	0.019 (0.075)	0.019 (0.075)
<i>Household composition</i>									
Nb child 0-5	-0.019 (0.012)	-0.020 (0.012)	-0.019 (0.012)	-0.016 (0.011)	-0.016 (0.011)	-0.017 (0.011)	-0.015 (0.011)	-0.015 (0.011)	-0.015 (0.011)
Nb child 6-13	-0.006 (0.014)	-0.006 (0.014)	-0.006 (0.014)	-0.011 (0.012)	-0.011 (0.012)	-0.011 (0.012)	-0.006 (0.012)	-0.006 (0.012)	-0.006 (0.012)
Nb child 14-17	0.004 (0.014)	0.004 (0.014)	0.004 (0.014)	-0.005 (0.012)	-0.006 (0.012)	-0.007 (0.012)	0.007 (0.012)	0.007 (0.012)	0.007 (0.013)
Nb older dep	0.003 (0.040)	0.004 (0.039)	0.003 (0.040)	-0.003 (0.034)	-0.001 (0.034)	-0.000 (0.034)	-0.008 (0.036)	-0.008 (0.036)	-0.008 (0.036)
<i>Other income sources</i>									
Monthly wage, other	0.009*** (0.003)	0.009*** (0.003)	0.009*** (0.003)	0.008*** (0.003)	0.007*** (0.003)	0.007*** (0.003)	0.008*** (0.003)	0.008*** (0.003)	0.008*** (0.003)
Pension	-0.015* (0.008)	-0.015* (0.008)	-0.015* (0.008)	-0.009 (0.007)	-0.009 (0.007)	-0.009 (0.007)	-0.014** (0.007)	-0.014** (0.007)	-0.014** (0.007)
Capital	-0.002 (0.007)	-0.001 (0.007)	-0.002 (0.007)	0.004 (0.006)	0.005 (0.006)	0.005 (0.006)	0.003 (0.006)	0.003 (0.006)	0.003 (0.006)
U benefits	-0.059*** (0.014)	-0.056*** (0.013)	-0.058*** (0.015)	-0.019 (0.012)	-0.015 (0.011)	-0.010 (0.012)	-0.047*** (0.012)	-0.047*** (0.011)	-0.047*** (0.013)
Remittances	-0.044*** (0.011)	-0.042*** (0.010)	-0.044*** (0.011)	-0.018* (0.010)	-0.015 (0.009)	-0.012 (0.010)	-0.051*** (0.009)	-0.051*** (0.009)	-0.051*** (0.010)
Other	-0.049*** (0.009)	-0.047*** (0.008)	-0.048*** (0.009)	-0.024*** (0.007)	-0.021*** (0.007)	-0.019** (0.008)	-0.042*** (0.008)	-0.043*** (0.007)	-0.042*** (0.008)
<i>Time effect</i>									
October 2000	0.019 (0.014)	0.017 (0.014)	0.018 (0.015)	-0.001 (0.013)	-0.004 (0.013)	-0.007 (0.013)	0.019 (0.013)	0.020 (0.013)	0.020 (0.013)
May 2001	0.018* (0.009)	0.017* (0.009)	0.018* (0.009)	0.013 (0.008)	0.011 (0.008)	0.010 (0.008)	0.013 (0.008)	0.013* (0.008)	0.013 (0.008)
May 2002	-0.049*** (0.011)	-0.046*** (0.010)	-0.048*** (0.011)	-0.015 (0.010)	-0.012 (0.009)	-0.009 (0.010)	-0.047*** (0.010)	-0.047*** (0.009)	-0.047*** (0.010)
Observations	18755	18755	18755	18755	18755	18755	18755	18755	18755

Note: See note Table 4.

TABLE 18 – Female participation at the extensive margin and spouse unemployment

	Participation			Participation ⁺			Occupation		
	IV1	IV2	IV3	IV1	IV2	IV3	IV1	IV2	IV3
<i>Husband</i>									
Household head unemployment	0.433*** (0.124)	0.429*** (0.110)	0.401*** (0.128)	0.289** (0.118)	0.242** (0.103)	0.160 (0.122)	0.353*** (0.116)	0.379*** (0.103)	0.367*** (0.121)
<i>Own opportunities</i>									
Mean U	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)
Mean hrly wage	0.003 (0.022)	0.003 (0.022)	0.002 (0.022)	0.074*** (0.022)	0.072*** (0.021)	0.069*** (0.021)	-0.017 (0.020)	-0.016 (0.020)	-0.017 (0.020)
Relative hrly wage	0.075 (0.074)	0.075 (0.074)	0.077 (0.074)	-0.095 (0.071)	-0.092 (0.071)	-0.087 (0.070)	0.095 (0.071)	0.093 (0.071)	0.094 (0.071)
<i>Household composition</i>									
Nb child 0-5	-0.026** (0.011)	-0.026** (0.011)	-0.027** (0.011)	-0.019* (0.011)	-0.019* (0.011)	-0.020* (0.011)	-0.020** (0.010)	-0.020** (0.010)	-0.020** (0.010)
Nb child 6-13	-0.006 (0.013)	-0.006 (0.013)	-0.007 (0.013)	-0.011 (0.012)	-0.011 (0.012)	-0.011 (0.012)	-0.007 (0.011)	-0.007 (0.011)	-0.007 (0.011)
Nb child 14-17	-0.001 (0.013)	-0.001 (0.013)	-0.002 (0.013)	-0.007 (0.012)	-0.008 (0.012)	-0.009 (0.012)	0.003 (0.012)	0.003 (0.012)	0.003 (0.012)
Nb older dep	0.012 (0.035)	0.012 (0.035)	0.013 (0.035)	-0.000 (0.033)	0.001 (0.033)	0.003 (0.033)	-0.002 (0.032)	-0.002 (0.033)	-0.002 (0.033)
<i>Other income sources</i>									
Monthly wage, other	0.008*** (0.003)	0.008*** (0.003)	0.008*** (0.003)	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)
Pension	-0.013* (0.007)	-0.013* (0.007)	-0.013* (0.007)	-0.009 (0.007)	-0.009 (0.007)	-0.008 (0.007)	-0.013* (0.007)	-0.014* (0.007)	-0.013* (0.007)
Capital	0.005 (0.006)	0.005 (0.006)	0.005 (0.006)	0.007 (0.006)	0.007 (0.006)	0.008 (0.006)	0.008 (0.005)	0.008 (0.005)	0.008 (0.005)
U benefits	-0.026** (0.011)	-0.025** (0.011)	-0.023** (0.012)	-0.008 (0.011)	-0.004 (0.010)	0.002 (0.011)	-0.023** (0.011)	-0.025** (0.010)	-0.024** (0.011)
Remittances	-0.019** (0.009)	-0.018** (0.008)	-0.017** (0.009)	-0.008 (0.008)	-0.006 (0.008)	-0.002 (0.008)	-0.031*** (0.008)	-0.033*** (0.007)	-0.032*** (0.008)
Other	-0.019*** (0.005)	-0.019*** (0.005)	-0.018*** (0.005)	-0.011** (0.005)	-0.010** (0.004)	-0.007 (0.005)	-0.020*** (0.005)	-0.020*** (0.005)	-0.020*** (0.005)
<i>Time effect</i>									
October 2000	-0.012 (0.012)	-0.012 (0.012)	-0.013 (0.012)	-0.014 (0.011)	-0.016 (0.011)	-0.019 (0.011)	-0.004 (0.011)	-0.003 (0.011)	-0.003 (0.011)
May 2001	-0.005 (0.007)	-0.005 (0.007)	-0.005 (0.007)	0.003 (0.007)	0.002 (0.007)	0.001 (0.007)	-0.004 (0.007)	-0.004 (0.007)	-0.004 (0.007)
May 2002	-0.017** (0.008)	-0.017** (0.008)	-0.016** (0.008)	-0.002 (0.008)	-0.001 (0.007)	0.002 (0.008)	-0.024*** (0.007)	-0.024*** (0.007)	-0.024*** (0.007)
Observations	18755	18755	18755	18755	18755	18755	18755	18755	18755

Note: See note Table 4.

TABLE 19 – Female participation at the intensive margin and spouse unemployment

	Dep. Var: Wish to work more hours			Dep. Var: Hours worked weekly		
	IV1	IV2	IV3	IV1	IV2	IV3
<i>Husband</i>						
Household head monthly wage	-0.013 (0.037)	-0.040 (0.034)	-0.083** (0.042)	1.495 (0.915)	1.676* (0.884)	2.344** (1.123)
<i>Own opportunities</i>						
Mean U	0.000 (0.002)	0.000 (0.002)	0.001 (0.002)	0.096** (0.046)	0.095** (0.046)	0.093** (0.047)
Mean hrly wage	0.026 (0.052)	0.049 (0.051)	0.087 (0.056)	1.205 (1.336)	1.050 (1.321)	0.477 (1.462)
Relative hrly wage	-0.057 (0.157)	-0.071 (0.157)	-0.093 (0.162)	3.177 (4.092)	3.270 (4.122)	3.614 (4.229)
<i>Household composition</i>						
Nb child 0-5	0.080*** (0.024)	0.081*** (0.024)	0.084*** (0.024)	-1.003 (0.659)	-1.012 (0.663)	-1.048 (0.675)
Nb child 6-13	0.065** (0.025)	0.066*** (0.025)	0.067** (0.026)	-1.907*** (0.680)	-1.912*** (0.684)	-1.932*** (0.702)
Nb child 14-17	0.056** (0.024)	0.059** (0.025)	0.064** (0.026)	-1.302** (0.644)	-1.323** (0.647)	-1.400** (0.673)
Nb older dep	0.085 (0.086)	0.079 (0.088)	0.069 (0.092)	0.858 (1.833)	0.898 (1.862)	1.043 (1.961)
<i>Other income sources</i>						
Monthly wage, other	-0.007 (0.005)	-0.006 (0.005)	-0.005 (0.005)	-0.011 (0.149)	-0.016 (0.149)	-0.036 (0.154)
Pension	-0.028 (0.018)	-0.029 (0.018)	-0.032* (0.018)	-0.426 (0.370)	-0.414 (0.374)	-0.371 (0.399)
Capital	-0.006 (0.010)	-0.007 (0.010)	-0.007 (0.010)	-0.067 (0.323)	-0.067 (0.324)	-0.063 (0.329)
U benefits	-0.020 (0.021)	-0.033* (0.020)	-0.054** (0.024)	0.959* (0.573)	1.046* (0.562)	1.367** (0.661)
Remittances	0.003 (0.014)	-0.001 (0.014)	-0.007 (0.015)	-0.300 (0.420)	-0.273 (0.421)	-0.174 (0.432)
Other	0.002 (0.010)	-0.004 (0.009)	-0.014 (0.011)	0.129 (0.251)	0.168 (0.247)	0.313 (0.301)
<i>Time effect</i>						
October 2000	0.009 (0.026)	0.019 (0.026)	0.035 (0.028)	-0.580 (0.632)	-0.646 (0.630)	-0.891 (0.680)
May 2001	0.011 (0.016)	0.016 (0.015)	0.024 (0.016)	0.441 (0.406)	0.408 (0.405)	0.285 (0.423)
May 2002	0.019 (0.018)	0.009 (0.017)	-0.007 (0.020)	-0.049 (0.448)	0.017 (0.438)	0.261 (0.502)
Observations	7039	7039	7039	7039	7039	7039

Note: See note Table 4. At the intensive margin, the sample size is reduced and contains only married women in activity before the Convertibility period abruptly ends.

TABLE 20 – Female participation at the intensive margin and spouse unemployment

	Dep. Var: Wish to work more hours			Dep. Var: Hours worked weekly		
	IV1	IV2	IV3	IV1	IV2	IV3
<i>Husband</i>						
Household head unemployment	0.287 (0.218)	0.406* (0.209)	0.566** (0.266)	-6.158 (5.441)	-7.631 (5.219)	-14.407** (6.810)
<i>Own opportunities</i>						
Mean U	-0.000 (0.002)	-0.000 (0.002)	-0.000 (0.002)	0.107** (0.045)	0.109** (0.046)	0.117** (0.049)
Mean hrly wage	0.023 (0.042)	0.026 (0.043)	0.030 (0.044)	2.327** (1.057)	2.288** (1.063)	2.112* (1.104)
Relative hrly wage	-0.077 (0.157)	-0.088 (0.158)	-0.103 (0.162)	2.984 (4.010)	3.121 (4.034)	3.754 (4.195)
<i>Household composition</i>						
Nb child 0-5	0.076*** (0.023)	0.075*** (0.023)	0.074*** (0.024)	-0.862 (0.659)	-0.847 (0.657)	-0.780 (0.671)
Nb child 6-13	0.058** (0.026)	0.055** (0.026)	0.051* (0.027)	-1.720** (0.677)	-1.686** (0.679)	-1.529** (0.711)
Nb child 14-17	0.057** (0.024)	0.058** (0.025)	0.060** (0.025)	-1.189* (0.623)	-1.203* (0.629)	-1.270* (0.668)
Nb older dep	0.078 (0.087)	0.074 (0.089)	0.069 (0.091)	0.733 (1.728)	0.781 (1.747)	1.002 (1.843)
<i>Other income sources</i>						
Monthly wage, other	-0.005 (0.005)	-0.004 (0.005)	-0.003 (0.006)	-0.016 (0.153)	-0.028 (0.153)	-0.081 (0.162)
Pension	-0.028 (0.018)	-0.029 (0.018)	-0.029 (0.018)	-0.494 (0.341)	-0.487 (0.342)	-0.455 (0.360)
Capital	-0.008 (0.010)	-0.009 (0.010)	-0.010 (0.011)	-0.034 (0.317)	-0.025 (0.318)	0.020 (0.321)
U benefits	-0.036* (0.021)	-0.046** (0.021)	-0.058** (0.025)	0.720 (0.557)	0.835 (0.545)	1.361** (0.657)
Remittances	0.003 (0.013)	0.001 (0.014)	-0.000 (0.015)	-0.462 (0.417)	-0.447 (0.420)	-0.382 (0.441)
Other	-0.000 (0.007)	-0.002 (0.007)	-0.005 (0.008)	-0.094 (0.173)	-0.070 (0.173)	0.041 (0.205)
<i>Time effect</i>						
October 2000	0.013 (0.023)	0.017 (0.024)	0.022 (0.025)	-0.228 (0.561)	-0.275 (0.563)	-0.490 (0.599)
May 2001	0.014 (0.015)	0.017 (0.015)	0.020 (0.015)	0.601 (0.385)	0.574 (0.385)	0.447 (0.395)
May 2002	0.013 (0.014)	0.008 (0.014)	0.003 (0.016)	-0.366 (0.368)	-0.311 (0.362)	-0.060 (0.394)
Observations	7039	7039	7039	7039	7039	7039