

Gender and the Great Recession: Changes in labour supply in Spain

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Abstract

The focus of this paper is on the different effects of this Great Recession on the decision of women and men to participate or not in the labour market. The literature on the differentiated effects by gender of past economic crises on labour supply is analyzed, including the Latin American debt crises, the Asian crises of the nineties and recent studies about the impacts of this Recession worldwide. In the applied part of the paper we test the two different hypotheses: the added-worker effect (AWE), showing a countercyclical behaviour of labour supply that implies an increase in individual labour supply in response to transitory shocks in his/her partner's earnings, and the procyclical discouraged-worker effect (DWE).

Given the deep effect of the Great Recession on the Spanish labour market, the empirical part of this paper is focused on the analysis of Spanish labour supply behaviour by gender. We have estimated labour supply models for individuals aged 25 to 54 living in couples with or without children by gender by using the EU-SILC 2007 and 2011 micro data for Spain.

The results of our analysis show evidence of a strong AWE, much more significant for women whose labour supply increases by 21% when their partner is unemployed against a 0.7% increase experienced by men married to unemployed women. A relevant AWE has also been detected for women if the partner works part-time and is therefore more likely to be underemployed. Also, by comparing the labour supply behaviours before and after the crisis we can see that the discouraging effect connected to higher regional unemployment rates lost significance in 2011 leaving the AWE to dominate the labour supply decision during the crisis for couples.

Another important result reached through our analysis on households with at least one child aged less than 14 is related to the positive impact of the presence of child care services on women's labour supply. This positive and significant effect of the presence of childcare services on mothers' labour supply suggests a higher public effort on the diffusion of childcare services to increase female labour supply.

Keywords: Labour supply, Great Recession, Gender, added-worker effect, discouraged-worker effect

JEL codes: J22, J21, J16, J64

1. Introduction¹

Women and men are affected differently by the different political and economic circumstances, especially in the case of an economic crisis of the magnitude of this Great Recession. This is because women and men occupy different positions and have, in most cases, an unbalanced and unequal access to economic resources, including employment, credit, land and other natural resources, time and work sharing, or positions of power (Benería and Feldman, 1992; Elson, 1995, 2010; Floro, 1995; Benería and Floro, 2004, Antonopoulos, 2009; Gálvez and Torres, 2010; Pearson and Sweetman, 2011; Gálvez and Rodríguez-Modroño, 2011; Rodríguez-Modroño, 2011, 2012). Economic crises either emphasize or modify previous gender imbalances. One recurring effect underscored in the literature is the intensification of women's work, both paid and unpaid work. For example, during the Great Depression of the 30s not only female employment increased, but also the household's provision of goods and services that were previously acquired in the market (Milkman, 1976). In fact, this intensification and the more speedy recovery of male employment once the recession phase of the cycle is overcome are the two constants identified by Gálvez and Rodríguez-Modroño (2011) in their historical analysis of economic crises.

In this paper, we analyze the different effects that this Great Recession has had on the decision of women and men to participate or not in the labour market. The economically active population ratio can generally be decomposed into a trend and a cyclical component. This last one can be of different sign: the added-worker effect (AWE), when labour supply behaviour is countercyclical since it implies an increase in a person's labor supply (hours worked or participation) in response to transitory shocks in his/her partner's earnings, or the discouraged-worker effect (DWE) when it is procyclical². Women's decisions to enter the labour market have always been more sensitive than male ones to economic cycles (Lundberg, 1985; Tano, 1993) because of the traditional secondary nature of female labour and lower women's activity rates linked to their historical specialisation in unpaid domestic work (Sarasúa and Gálvez, 2003). It is therefore very difficult to grasp in all its complexity how the economic cycle affects the labour supply, without taking into account gender differences.

It should be noted that studies like that of Sabarwal et al. (2011) warn about the fact that the present economic crisis appears to be altering the predictions and the gendered behaviours common to previous crises as a result of the recent increase in women's attachment to the workforce and the contraction of the global demand. Therefore, in addition to studying the differences in women and men's labour supply, the differentiated effects by gender of their partner's employment condition and individual and family characteristics, such as income, age, educational level, children, regional differences in unemployment rates and availability of childcare services, are analysed, so that we can contribute to the specific literature on AWE and DWE, and especially to the analysis of the specificities of this Great Recession by introducing a more complex gendered approach. Therefore, we have chosen the country whose labour market appears to be the most severely hit by the crisis: the Spanish one with almost 6 million people unemployed and an unemployment rate of 26% at the end of 2012, as it has

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² Early development of both theories can be found in Humphrey (1940) and Mincer (1966) for the DWE and Woytinsky (1940) and Long (1958) for the AWE.

suffered the negative impacts of the international economic crisis together with a huge housing and mortgage crisis, which has led to a loss of 1,333.9 thousands of jobs in construction since its maximum in the second quarter of 2007 to 2012 Q3.

Moreover, the Spanish labour market is known for being more sensitive to the cycle than those of other developed or OECD countries, creating many jobs in times of expansion and destroying even more in times of recession (Bentolila et al., 2011). With a destruction of 3,445.2 thousand jobs in the last 5 years, Spanish unemployment rates have risen up to 26.55% for women and 25.58% for men in 2012 Q4 since its minimum level of 7.95% in 2007 Q2 (6.1% for men and 10.5% for women). The extreme and persistent fluctuations of the Spanish unemployment rates make Spain a particularly suitable case to study the AWE and the DWE. In order to do so, two probit models of labour supply by gender are proposed, using the Spanish data from the EU SILC 2011, the EU Labour Force Survey and statistics on schooling services. The few existing studies regarding the effect of the Great Recession on the Spanish labour supply have not either analysed the added and discouraged worker effects by gender (Congregado et al., 2011), or have used more limited sets of data and analysis (Domingo, 2011).

The article is structured as follows. In Section 2, we discuss empirical evidences of previous studies supporting the AWE or the DWE of economic crises by gender. In Section 3 analyses previous results for the Spanish case, as well as certain particularities regarding the Spanish labour market and its institutional framework. Section 4 presents the methodology and data used to estimate the labour supply models, while section 5 discusses the results of the estimation. Policy suggestions are subsequently provided together with some concluding remarks.

2. Crises, economic cycle and labour supply by gender

The literature about the gender effects of economic crises began to develop during the 1970s, while the oil crisis and the scientific development of the gender approach were taking place. These early debates focused on the different impact of the crisis on employment of women and men³. These analyses focused on the appropriate use of the Marxist concept of "reserve army" to analyse women's behaviour during periods of expansion and crisis (Benston, 1971; Mitchell, 1971). According to the defenders of such concept, female labour supply presented a procyclical behaviour due to the DWE, whereas other authors like Bruegel (1979) or Rubery and Tarling (1982), pointed to a countercyclical behaviour derived from the AWE. Finally, a third set of works stressed the importance of occupational segregation in explaining the differential impacts of crises on women and men (Milkman, 1976; Johnson, 1983; Miller, 1990).

In more recent literature, using more sophisticated econometric analysis, ambiguous results regarding the AWE and the DWE and further support to the key role played by occupational segregation are to be found. In fact, the vulnerability of the various types of workers in the face of economic downturns remains subject to considerable debate⁴.

³ One exception was the work by Milkman (1976) which focused on the Great Depression of the 30s in the U.S., and also included an analysis of the impact of the crisis not only in paid work but also on the unpaid domestic work performed by women, noticing that this work "took up the slack" during the crisis and allowed for the survival of many families at the expense of the intensification of women's work.

⁴ For Cho and Newhouse (2013) different impacts across groups of people during a downturn can be explained by three aspects: first, differences in workers' initial exposure to the shock; second, firms' perceptions regarding worker productivity and labour market attachment; and third, workers' labour market behaviour in response to declines in household income.

Despite the empirical evidence supporting both effects, the DWE seems to be predominant on an aggregate and long-term basis, with little evidence supporting the AWE, at least in developed countries⁵ (Dernburg and Strand, 1966; Maloney, 1987, 1991; Dex et al., 1995; Spletzer, 1997; Addabbo, 1999; Cullen and Gruber, 2000; Prieto and Rodríguez, 2000).

The degree of development and the timing of the crises in each country are important factors affecting the magnitude of the two effects, as found in the various studies. Signorelli et al. (2012) analyse the impact of past (1980-2005) financial crises on female labour force participation and female unemployment in four types of countries: 20 high income economies (Spain among them); 10 upper middle-income economies; 20 lower middle-income economies; and 15 low income economies⁶, concluding that unemployment and vulnerable employment for the weakest segments of the labour market, including women, persist for about 5 years after the crisis and the worst impact is found in the second and third year. According to this study, financial crises lead to a decline in female participation rate, and the effects are great (and the results more robust) in high-income countries, where women work mostly in the formal sector.

The results of existing analyses on the impact of this Great Recession on men and women are also mixed. Studies mostly drawing on European and US data suggest that men suffer larger unemployment increases than women due to their concentration in the banking and finance sectors, the export-oriented industry (Barakat et al., 2010; Elsby and Smith, 2010) and the building sector, in the case of Spain. The study by Filatriau and Reynès (2012) of twelve OECD countries (Spain among them) between the 1970s/1980s and 2006 shows that, generally speaking, the DWE dominates the AWE because an increase in the unemployment rate reduces the labour participation ratio. However, for 25 to 54 year-old women living in continental Europe and Mediterranean countries or in Japan, a 1 point increase in the unemployment rate leads to a 0.45 points increase in their labour participation rate, suggesting that the AWE is predominant. Stephens (2002) and Kohara (2010) also find the AWE to be significant using panel data from US and Japan. Analyses of the impact of the present recession on European countries, like Arpaia and Curci (2010) and Bettio et al. (2012), show evidence of the DWE for both sexes, but also the presence of the AWE for women.

Other studies regarding mid-income countries, provide further support for the AWE. Karaogland and Okten (2012) analysis on married women in Turkey for the period 2000-2010 shows that wives whose husbands experience a job loss are more likely to increase their labour force participation. However, a worsening of overall unemployment conditions appears to have a discouraging effect on wives' labour supply responses.

Cho and Newhouse (2013) analyse the effects of the recent economic crisis on the labour markets of seventeen medium-sized countries and find a mild AWE as compared to that of previous crises, even among less educated women. This limited AWE suggests that the informal sector is playing a relatively little role as a buffer for the shock. Their study indicates that a substantially larger share of men than women suffer

⁵ Following García (1991), that could be explained for three reasons: (i) sociological factors such as macho behaviour; (ii) selective marriage, being possible both members of the couple have the same labour problems (for Maloney (1991), this is the most important factor); and, (iii) the benefit system, when the value of the unemployment benefit received by the husband is linked to the wage received by his spouse (founding that this was the most important factor in the British case).

⁶ For these authors, the adverse effect of crisis on unemployment disappears after 5 years subsequent to crisis.

adverse labour market impacts, partially because of men's higher pre-crisis employment levels and greater concentration in the hard-hit industrial sector (on average, gender disparity in employment is largely explained by men's higher rates of initial employment, roughly 56-58 percent, and men's higher presence in the industrial sector). Their results show that disparities in employment adjustments between groups are sizeable in comparison with overall employment declines. For all types of workers, falls in employment mainly lead to increased unemployment rather than to reduced participation, except for the young remaining in or returning to school. While variations across countries are large, in harder-hit countries (Latvia, Lithuania, Turkey) men tend to experience particularly large employment losses while, in mildly-hit countries (Indonesia, Jordan, Costa Rica), women bear the brunt of falling employment.

According to these authors, in many middle-income countries there is a large share of working-aged women who become added workers with the crisis. That happened also in Chile during the oil crisis of 1973, in Costa Rica in 1982 (Leslie et al., 1988), in Peru during the crisis of the 1980s (Francke, 1992), in Argentina's *corralito* crisis (Pessino and Gill, 1997; Cerutti, 2000) or in the Mexican tequila crisis (Skoufias and Parker, 2006). However, in Brazil there was a compensatory effect between poor women, who joined the workforce, and women who were above the poverty line and were expelled from the labour market (Humphrey, 1996), and in the 2002 Argentinean crisis, the loss of employment was comparable for men and women in urban areas (McKenzie, 2004).

There is also evidence of the AWE during the 1997 Asian crisis. Layoffs had a marginally greater effect on men than on women in both Thailand and Malaysia (Nathan and Kelkar, 1999) and in the Indonesian and Philippines crises of the 1990s (Smith et al., 2002), during which employment fell more markedly for men than for women, as female workers were absorbed by the informal sector and by more resilient large firms (Hallward-Driemeier et al., 2011). In contrast, after the 1997 financial crisis in South Korea, despite official unemployment rates being higher for men than for women (Lee, 2010), overall, more women than men abandoned the labour force (Kim and Voos, 2007).

Therefore, although in global terms women's greater participation seems to dominate the labour market (AWE) during crises,⁷ there is a considerable heterogeneity in women's response regarding the labour market, and a large number of women may withdraw from the labour force (DWE) during a recession depending on factors such as the institutional setting, occupational segregation, the harder-hit sectors, the stage of the crisis, the extent of austerity policies and welfare cuts and women's relative position in the labour market according to their educational level, age, household income, etc.

3. Crisis, economic cycle and labour supply by gender in Spain

The extreme and persistent fluctuations in the Spanish unemployment rate due to the Spanish overreaction to movements in the GDP, in both expansive and recessive phases (Dolado and Jimeno, 1997; Toharia, 2003), make Spain a particularly suitable case to study the AWE and the DWE (Congregado et al., 2011). Spain is one of the countries most severely hit by this Great Recession in terms of labour market behaviour. It is experiencing a massive rise in unemployment, which started as early as June 2007, and combines an increased inflow rate into unemployment with a decreased outflow rate. In

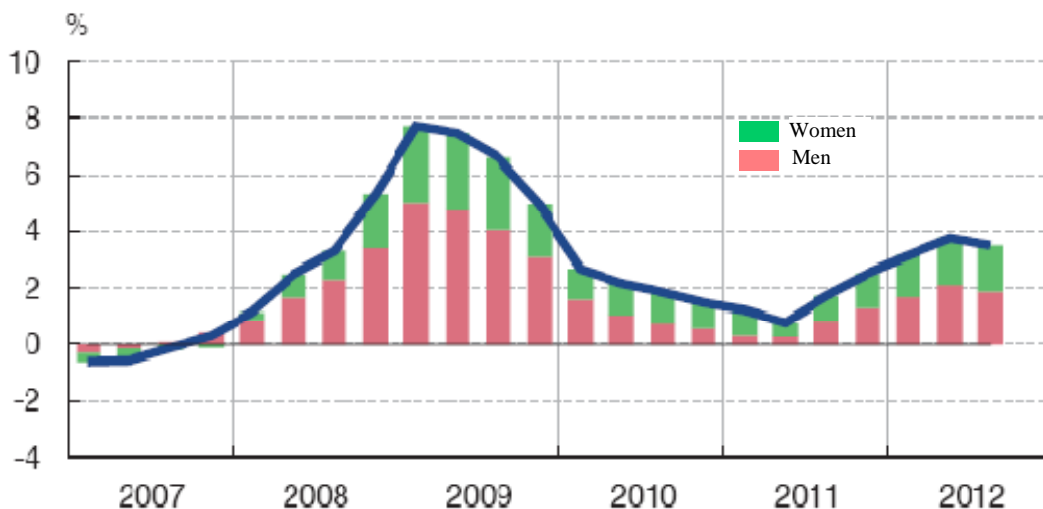
⁷ Bhalotra and Umaña-Aponte (2010) show that a 10 percent drop in a country's GDP is associated with an increase of 0.34 points in the participation of women in the workforce in the present economic crisis.

Spain, not only one in four labour force participants are projected to be unemployed through 2013, but also half of all young labour force participants are jobless and more than 40 percent of the unemployed have been out of work for more than six months (IMF, 2012), worsening the employment perspective of the increased pool of unemployed and raising concern about long-term unemployment and risks of labour market detachment.

Since the onset of this Great Recession the number of unemployed persons in Spain has increased from around 2 millions at the end of 2007 to almost 6 millions in 2012 Q4. Three stages can be identified within this process (Banco de España, 2012): (i) since mid-2008 and during the first half of 2009, unemployment grew extraordinarily, with entries of more than 500,000 persons in some quarters, mainly explained by the intensity of job losses, especially among men; (ii) from mid-2009 to mid-2011 the growth of unemployment was somehow moderated by a less intense net job decline, less entries into the workforce and similar increases in women and men's unemployment rates; (iii) since the third quarter of 2011, rising unemployment has rebounded to around 200,000 persons per quarter and female unemployment has increased at a faster rate in many quarters.

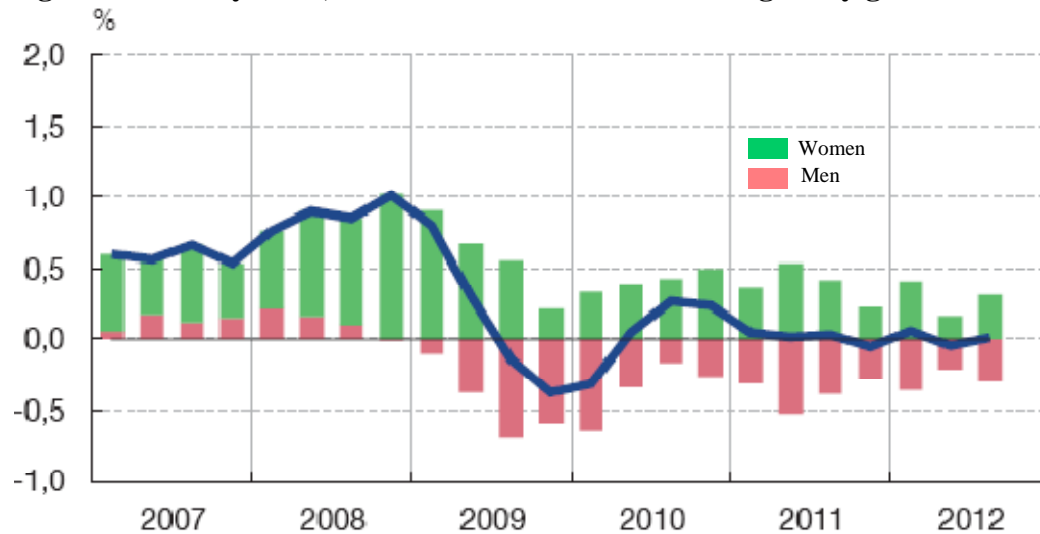
As we can see in Figure 1, at the first stage of the crisis inputs into unemployment increased greatly, mainly as a result of the intensity in the loss of jobs, mainly from men in the building and manufacturing sectors. In addition, entries into unemployment from inactivity also increased, showing a high AWE of women between 25 and 54 years old (Figure 2). In this first stage, there was no DWE as the flows from unemployment to inactivity showed a decreasing trend. In the second phase of the crisis, from mid-2009 outflows from employment to unemployment eased slightly, however entries from inactivity to unemployment remained a growing trend. In the third phase since mid-2011, we have seen a new increase in exits from employment to unemployment to levels higher than at the beginning of the crisis and a decline in output rates from unemployment. Already from the middle of the second phase, the AWE of women have been reduced though is still present and women's unemployment increased at similar rates than men's one due to the spread of the recession to all sectors as well as the effects of the severe fiscal consolidation in cuts in public services and actual downsizing of public employment.

Figure 1. Unemployment rates, interannual variations and weights by gender



Source: Bank of Spain and Spanish Statistical Institute.

Figure 2. Activity rates, interannual variations and weights by gender



Source: Bank of Spain and Spanish Statistical Institute.

Congregado et al. (2011) analyse the period between 1976 and 2008 and find that the AWE dominates in Spain only when unemployment is below 11.7 percent. Above this rate, the two effects cancel each other. Since in 2009 unemployment was above 11.7%, they predicted no further increases in the participation rate in the near future. However, this has not been so for, the overall activity rate has continued increasing due to the rise of women's activity rate from 51% in 2009 Q1 to 53.4% in 2012 Q4.

Although women's entry in the Spanish labour market has been predominantly positive since the 1980s due to its initial low levels and Spain's structural economic and demographic developments⁸, there is also evidence that women's participation responds to the business cycle, because it still partly depends on their husbands' labour position. Prieto and Rodríguez (2000) found that women's labour force participation in Spain was still highly conditioned by their husbands' labour status at the time of the study, especially if the latter were unemployed⁹.

A recent study by Domingo (2011) finds a primacy of the AWE among Spanish women during the recent crisis, with a positive effect in relation to university studies, divorced or separated marital status and the presence of other unemployed household members, while married or widowed marital status, the presence of young children and grandparents in the household, a partner holding a university degree and high regional unemployment presented a negative sign.

Therefore, though the gender gaps in labour participation, employment and unemployment have been reduced from the onset of the crisis to 2012 Q4 in, respectively, -13.1, -10.27 and 0.97 percent because of the AWE on Spanish women and the severe job losses in male-dominated sectors at the beginning of this recession, female unemployment rates continue to be very high and may decline at a lower pace.

⁸ Bover and Arellano (1995) point out to technical changes in production, increased demand for skilled non-physical labour, development of regional administration, decline in the rate of fertility and women's increase in education; however, women's increase in labor supply also coincides with a decline in salaries and the encouraging of family debt.

⁹ For Prieto et al. (2000) mainly related to inactivity more than to unemployment.

The reasons are the role of women as a reserve labour force, occupational segregation (Molto, 1993; Caceres et al., 2004) and the tolerance for female unemployment and exclusion (Torns, 1997) associated to the political responses to the crisis.

4. The model and data

The model used to test the AWE and DWE hypotheses is a probit model of individual's labour supply. The labour supply variable Y is a dichotomous variable taking the value of 1 if the individual is in the labour force. Among the X regressors the partner's employment status has also been included and it is assumed that the model takes the form of:

$$Pr(Y = 1|X) = \Phi(X'\beta)$$

where Φ is the cumulative distribution function of the standard normal distribution and β is estimated by using maximum likelihood.

Among the regressors, imputed wages have been included. In the case of women, they have been estimated by using a Heckman two-step model so as to take into account their non-random selection into employment (Heckman, 1979). Table A2 and Table A3 in the Appendix show the results of the estimation for 2011 and 2007, respectively.

To test the DWE hypothesis, region-specific unemployment rates have been considered. They have been computed with reference to the NUTS2 (Nomenclature of Territorial Units for Statistics) since, as shown in Table 1 and the literature on regional unemployment in Spain (Jimeno and Bentolila, 1998; Moral, 2005), this classification presents a higher regional variation than NUTS1.

Table 1. Regional unemployment rates in Spain, 2007 and 2011

NUTS1	NUTS2	Regions	2007			2011		
			Total Unemp	Men Unemp	Women Unemp	Total Unemp	Men Unemp	Women Unemp
ES1 NO	ES11	Galicia	7.64	5.72	10.06	17.41	16.64	18.29
	ES12	Asturias	8.48	6.42	11.10	17.86	18.25	17.41
	ES13	Cantabria	5.91	4.46	7.87	15.29	16.09	14.31
ES2 NE	ES21	País Vasco	6.12	4.80	7.83	12.01	11.34	12.77
	ES22	Navarra	4.76	3.18	6.94	12.94	12.36	13.63
	ES23	Rioja, La	5.66	3.88	8.29	17.01	16.30	17.87
	ES24	Aragón	5.24	3.7675	7.24	17.09	16.73	17.56
ES3 CM	ES30	Madrid	6.30	4.93	7.97	16.73	16.70	16.77
ES4 C	ES41	Castilla y León	7.18	4.76	10.64	16.74	15.35	18.50
	ES42	Castilla - La Mancha	7.61	5.03	11.79	22.92	20.60	26.12
	ES43	Extremadura	13.06	9.14	18.95	25.10	22.63	28.49
ES5 E	ES51	Cataluña	6.55	5.58	7.83	19.25	19.81	18.60
	ES52	Comunitat Valenciana	8.76	6.87	11.38	24.49	24.23	24.80
	ES53	Balears, Illes	7.03	5.86	8.61	21.96	22.40	21.45
ES6 S	ES61	Andalucía	12.76	9.48	17.61	30.39	28.88	32.33
	ES62	Murcia	7.56	6.00	9.98	25.40	25.26	25.61
	ES63	Ceuta	20.28	15.50	28.75	29.38	23.14	38.98
	ES64	Melilla	18.16	12.09	27.94	24.46	20.16	30.41
ES7 CA	ES70	Canarias	10.44	8.52	13.05	29.69	29.67	29.72

Source: Our elaborations on Survey on Active Population from the Spanish Statistical Institute.

According to the literature on labour supply, a crucial role in both allowing continuity in labour supply over the life cycle and increasing women's labour supply is played by the availability of childcare services. There is great regional disparity in the degree of coverage of childcare services by region, especially in the 0-2 age group, as seen in Table 2. Again, the data show the need of disaggregating by NUTS2.

Table 2. Degree of coverage of child care services by regions on 0-2 years old and 0-5 years old children living in the region, academic courses 2006-07 and 2010-11

NUTS1	NUTS2	Name of the region	2006-07		2010-11	
			School 0-2	School 0-5	School 0-2	School 0-5
ES1 NO	ES11	Galicia	16.94	57.73	21.80	60.63
	ES12	Asturias	8.78	53.16	14.04	57.99
	ES13	Cantabria	16.80	57.26	22.98	61.12
ES2 NE	ES21	País Vasco	48.79	74.37	53.50	78.25
	ES22	Navarra	25.70	62.02	9.00	53.63
	ES23	Rioja, La	4.82	51.72	10.96	54.70
	ES24	Aragón	30.14	64.58	31.81	65.89
ES3 CM	ES30	Madrid	32.09	61.07	41.66	67.16
ES4 C	ES41	Castilla y León	12.25	56.72	14.04	57.40
	ES42	Castilla - La Mancha	2.60	54.31	34.01	68.93
	ES43	Extremadura	2.82	51.36	3.35	51.82
ES5 E	ES51	Cataluña	32.02	63.74	34.30	66.30
	ES52	Comunitat Valenciana	12.22	52.98	21.83	58.77
	ES53	Balears, Illes	10.36	49.75	19.41	55.25
ES6 S	ES61	Andalucía	4.06	50.75	29.66	64.99
	ES62	Murcia	15.65	56.36	16.73	56.34
	ES63	Ceuta	4.29	52.31	4.34	55.66
	ES64	Melilla	15.50	55.45	14.53	53.63
ES7 CA	ES70	Canarias	0.00	46.84	7.65	51.13

Source: Our elaborations on educational data from the Spanish Statistical Institute.

To implement the labour supply model and estimate the impact on an individual of their partner's employment condition, a data set that contains individual and family characteristics and allows for regional statistical significance is required. For these purposes, the Spanish components of the EU Surveys on Income and Living Conditions (EU-SILC) run in 2007 and 2011 have been used.

EU-SILC 2011 was conducted on a sample of individuals aged 25 to 54 (average at 42) and living in a couple made up of 4,712 women and 4,135 men. In the sample, women were characterised by lower labour force participation and employment rates than men (Table 3). Women's unemployment rate was 20 percent on average in 2011, against 15 percent for men. Women in the sample were more likely to have a degree than men (35 against 29 percent), as well as to be chronically ill (14 against 12 percent). As far as the children in the household were concerned, about 12 percent had at least one child aged under 3, while 18 percent had children aged 3 to 5, 27 percent had children aged 6 to 10 and 18 percent children aged 11 to 14. The literature on labour supply shows the existence of a discouragement effect on mothers of the presence of small children on women's labour supply. The presence of child care services can mitigate the negative effect of young children on their mothers' labour supply. Child-care services are not

equally distributed across regions in Spain (as shown above) and to take this difference into account we have considered the diffusion of child care services to children aged less than 2 in the model whose estimation will be presented in the following Section. We have then added the regional unemployment rates by gender to take into account the regional heterogeneity in the labour market outlined above. Comparing 2011 and 2007 data it is possible to see the increase in the average unemployment rates and how the gap between women's and men's unemployment rates in this age group and living in this couple status was actually reduced from 8 to 5 percent (Table 3).

Table 3. Descriptive statistics on the sample

Variables	2007				2011			
	Women		Men		Women		Men	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Age	41.23	7.44	42.11	7.23	41.80	7.41	42.71	6.99
Wage	4.03	5.23	6.54	5.43	4.44	6.66	6.14	5.83
At least one child in the household aged less than 3	0.13	0.33	0.14	0.35	0.12	0.33	0.13	0.34
At least one child in the household aged 3-5	0.17	0.37	0.18	0.39	0.18	0.39	0.20	0.40
At least one child in the household aged 6-10	0.24	0.43	0.26	0.44	0.27	0.44	0.28	0.45
At least one child in the household aged 11-14	0.18	0.39	0.19	0.40	0.18	0.39	0.19	0.39
Elementary	0.18	0.38	0.18	0.39	0.13	0.34	0.14	0.35
Secondary	0.26	0.44	0.27	0.44	0.26	0.44	0.30	0.46
High school degree	0.24	0.43	0.24	0.43	0.24	0.43	0.25	0.43
Labour force rate	0.69	0.46	0.98	0.15	0.74	0.44	0.97	0.18
Employment rate	0.60	0.49	0.93	0.26	0.59	0.49	0.83	0.38
Unemployment rate (on the Labour Force)	0.12	0.33	0.04	0.20	0.20	0.40	0.15	0.35
Chronic ill	0.16	0.37	0.16	0.36	0.14	0.35	0.12	0.33
Number of observations	4,888		4,355		4,712		4,135	

Source: Our elaborations on Spain EU-SILC data 2007 and 2011.

Turning to those who are employed, women appear to be more concentrated in part-time jobs than men. In fact, 20 percent of them are part-timers against 1.58 percent of men. Concerning the reasons why they work part-time, women are more likely to do it for family reasons (42 percent because of housework and looking after children or other persons) while men mostly do it because they could not find a full-time job (68 percent). As compared to 2007, underemployment had massively increased in 2011. Being underemployed was a reason given by 15 percent of men working part-time in 2007 and 68 percent in 2011, while it affected 17 percent of women part-timers in 2007 and 38 percent in 2011 (see Table A1 in the Appendix).

5. Labour supply models estimation results

To test the AWE versus the DWE hypotheses, together with variables like the educational level, age, presence of children aged under 15 and health status, some

variables that account for the partner's employment status and the regional unemployment rates have also been included in the model.

Consistently with the literature on labour supply, women's labour supply shows to be positively related to their own imputed wage: a 1 percent increment in it increases by 5 percentage points their probability to participate in the labour market. The higher the income of other family member the lower women's participation is, although the effect is not significant.

Women's labour supply appears to be more discouraged than men's by the presence of children under a certain age. The highest negative effect is observed in the presence of children aged 3 to 5: having at least one child in this age group is found to reduce mothers' labour supply probability by 13 percent, while having a child under 3 years-old reduces that probability by 10 percent. This lower negative effect can be related to recent improvements in maternity protection and parental leave in the Spanish Workers' Statute¹⁰ and the implementation of the 3/2007 Law for Effective Equality of Men and Women (dated 22 March, 2007). This Equality Law incorporates express provisions on the maintenance of equal rights in the employment conditions of workers enjoying maternity leave benefits and establishes paternity leave¹¹ as a new form of employment contract suspension.

Women's labour supply is positively affected by higher education. Having a university or high school degree increases the labour supply probability by 11 percent for women and 1 percent for men. On the other hand, having a chronic illness is found to have a similar discouraging effect for both sexes (about 9 percent).

Concerning the test of the AWE and the DWE that is at the heart of this study, the results show that higher women's regional unemployment rates discourage women's participation in the labour market, though the effect is not significant. A strong AWE is detected among women: the presence of an unemployed partner increases by 21 percent women's participation probability. The AWE also appears when the partner works part-time (increasing by 27 percent women's participation) and, to a lower extent, when he is self-employed (9 percent).

The AWE affects men but to a much lower extent than women: men's labour supply increases by 0.7 percent if his partner is unemployed. Similarly lower are the effects of having a partner working part-time (it increases men's labour supply probability by 0.9 percent) or self-employed (0.8 percent). Men show the prevalence of the other income effect (an increase in another family member's income is found to decrease by 1 percent their participation probability) and a low and not significant elasticity in relation to their own wage.

¹⁰ The Workers' Statute states that a dismissal without cause is void in relation to: any employee who is on maternity leave, paternity leave, at risk or ill during pregnancy or breastfeeding leave, a pregnant woman, irrespective of whether the employer is aware of the pregnancy; any employee after maternity or paternity leave, during the nine months following the date of birth, adoption or fostering; any employee who has reduced their working hours to look after a child, disabled person or relative; and any employee taking a period of leave in order to look after a child, a disabled person or a relative. The legal consequence of the dismissal being void is that the employee has a right to be reinstated to his/her previous role, on the same terms and conditions.

¹¹ Though the Equality Law created a non transferable paternity leave of 13 days, the economic crisis has counteracted this new right and the number of fathers taking the paternity leave has not increased since 2009. Also, the extension in the paternity leave to 4 weeks that was to be implemented in 2011 has been postponed by the government every year.

In order to test the results on the AWE and the DWE in relation to the economic cycle, the same model has been implemented, using 2007 EU SILC data, to estimate those same effects by gender before the crisis began to hit. The results are shown in Table 5. The most striking difference concerns the size and relevance of the region-specific unemployment rate coefficients that turn out to be significantly discouraging for both women's and men's labour supply. A 1 percent increase in women's region-specific unemployment rates reduces women's labour supply by 64 percentage points while men's regional unemployment rates are found to reduce men's labour supply to a much lesser extent (by 11 percent).

Table 4. Probit models on the labour supply probability women and men living in couples 25-54 years old - coefficients and marginal effects evaluated at the sample mean, 2011

Variables	Coefficients		Marginals	
	Women	Men	Women	Men
Age	0,038 (0.0459)	0.00981 (0.112)	0,0108 (0.0130)	0.000193 (0.00222)
Age squared	-0.00102* (0.000547)	-0.000589 (0.00128)	-0.000287* (0.000154)	-1.16e-05 (2.66e-05)
Other member of the family equivalent income	-0.0450 (0.0390)	-0.516*** (0.116)	-0.0127 (0.0110)	-0.0102*** (0.00215)
Imputed wage	0.182*** (0.0244)	0,0604 (0.0733)	0.0515*** (0.00685)	0.00119 (0.00152)
At least one child in the household aged less than 3	-0.327*** (0.0993)	-0.0229 (0.249)	-0.101*** (0.0330)	-0.000461 (0.00513)
At least one child in the household aged 3-5	-0.418*** (0.0792)	-0.00676 (0.200)	-0.130*** (0.0265)	-0.000134 (0.00399)
At least one child in the household aged 6-10	-0.330*** (0.0665)	-0.264* (0.148)	-0.0988*** (0.0208)	-0.00612 (0.00394)
At least one child in the household aged 11-14	-0.221*** (0.0710)	0,0204 (0.154)	-0.0660*** (0.0221)	0.000396 (0.00294)
Upper education (high school or degree)	0.362*** (0.0839)	0.642*** (0.219)	0.105*** (0.0247)	0.0146** (0.00602)
Chronic ill	-0.315*** (0.0732)	-1.313*** (0.113)	-0.0968*** (0.0241)	-0.0917*** (0.0187)
Partner unemployed	0.942*** (0.0738)	0.473*** (0.149)	0.212*** (0.0131)	0.00737*** (0.00282)
Regional Specific unemployed rate	-0.639 (0.459)	-0.640 (1.094)	-0.181 (0.129)	-0.0126 (0.0212)
Partner part-timer	1.794*** (0.166)	0.769*** (0.216)	0.268*** (0.0101)	0.00875*** (0.00299)
Partner self employed	0.365*** (0.0726)	0.617*** (0.150)	0.0925*** (0.0165)	0.00804*** (0.00269)
Constant	-0.132 (1,005)	6.703** (2.984)		
Observations	4,494	3,303	4,494	3,303

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Pseudo R² 0,21 0,34

Source: Our elaborations on Spain EU SILC data 2011.

Table 5. Probit models on the labour supply probability women and men living in couples 25-54 years old - coefficients and marginal effects evaluated at the sample mean, 2007

Variables	Coefficients		Marginals	
	Women	Men	Women	Men
Age	-0.116** (0.0476)	0.212* (0.115)	-0.0358** (0.0147)	0.00207* (0.00117)
Age squared	0.000705 (0.000567)	-0.00233* (0.00135)	0.000218 (0.000175)	-2.28e-05* (1.37e-05)
Other member of the family equivalent income	-0.201*** (0.0494)	-0.488*** (0.107)	-0.0621*** (0.0151)	-0.00478*** (0.00141)
Imputed wage	0.230*** (0.0321)	-0.138* (0.0834)	0.0710*** (0.00977)	-0.00136 (0.000918)
At least one child in the household aged less than 3	-0.689*** (0.0994)	0,373 (0.306)	-0.243*** (0.0381)	0.00262 (0.00169)
At least one child in the household aged 3-5	-0.305*** (0.0759)	0,077 (0.201)	-0.100*** (0.0262)	0.000699 (0.00178)
At least one child in the household aged 6-10	-0.277*** (0.0637)	-0.192 (0.162)	-0.0895*** (0.0211)	-0.00218 (0.00222)
At least one child in the household aged 11-14	-0.174*** (0.0673)	-0.337** (0.164)	-0.0558** (0.0222)	-0.00451 (0.00279)
Upper education (high school or degree)	0,11 (0.111)	0.987*** (0.312)	0,035 (0.0343)	0.0135* (0.00705)
Chronic ill	-0.283*** (0.0703)	-1.519*** (0.157)	-0.0928*** (0.0245)	-0.0706*** (0.0140)
Partner unemployed	1.400*** (0.102)	0,03 (0.186)	0.263*** (0.0119)	0.000264 (0.00172)
Regional Specific unemployed rate	-2.063*** (0.734)	-11.13*** -3.307	-0.637*** (0.227)	-0.109** (0.0474)
Partner part-timer	2.080*** (0.152)	0.373* (0.222)	0.332*** (0.0106)	0.00269* (0.00143)
Partner self employed	0.00105 (0.0648)	0,17 (0.172)	0.000326 (0.0200)	0.00146 (0.00153)
Constant	4.542*** (1,05)	3.810 (2,398)		
Observations	4,765	3,325	4,765	3,325
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				
Pseudo R ²	0.2430	0.36		

Source: Our elaborations on Spain EU SILC data 2007.

In order to test the effect of childcare services on labour supply by gender the models have been applied to a subsample consisting of couples with at least one child aged under 15 (the marginal effects evaluated at the variables' sample means are shown in Table 6). The presence of regional childcare services for children under 2 years-old significantly affects mothers' labour supply by increasing their participation probability by 14 percent with a 1 percent increase in the coverage, whereas they do not significantly affect fathers' labour supply in 2011 (the effect was positive but not significant in 2007, see Table 7).

Table 6. Probit models on the labour supply probability women and men living in couples 25-54 years old with at least one child aged less than 15. Marginal effect evaluated at the sample mean, 2011

Variables	Coefficients		Marginals	
	Women	Men	Women	Men
Age	0.148** (0.0697)	0,077 (0.155)	0.0399** (0.0188)	0.000961 (0.00208)
Age squared	-0.00228*** (0.000869)	-0.00144 (0.00182)	-0.000614*** (0.000234)	-1.81e-05 (2.56e-05)
Other member of the family equivalent income	0.00843 (0.0546)	-0.432*** (0.128)	0.00227 (0.0147)	-0.00541*** (0.00181)
Imputed wage	0.158*** (0.0323)	0,042 (0.115)	0.0425*** (0.00860)	0.000529 (0.00153)
At least one child in the household aged less than 3	-0.376*** (0.119)	-0.0467 (0.287)	-0.111*** (0.0375)	-0.000603 (0.00392)
At least one child in the household aged 3-5	-0.490*** (0.0981)	0,022 (0.266)	-0.141*** (0.0299)	0.000274 (0.00326)
At least one child in the household aged 6-10	-0.437*** (0.0888)	-0.234 (0.174)	-0.118*** (0.0241)	-0.00306 (0.00260)
At least one child in the household aged 11-14	-0.353*** (0.102)	0,084 (0.244)	-0.0999*** (0.0302)	0.00101 (0.00278)
Upper education (high school or degree)	0.468*** (0.115)	0.818** (0.362)	0.133*** (0.0343)	0.0135* (0.00724)
Chronic ill	-0.253** (0.112)	-1.375*** (0.172)	-0.0742** (0.0351)	-0.0752*** (0.0238)
Partner unemployed	1.044*** (0.103)	0.436** (0.184)	0.217*** (0.0166)	0.00434* (0.00262)
Regional Specific unemployed rate	0,168 (0.645)	0.617 (1.627)	0,045 (0.174)	0.00773 (0.0212)
Partner part-timer	1.885*** (0.185)	0.856** (0.336)	0.271*** (0.0134)	0.00621** (0.00314)
Partner self employed	0.356*** (0.0982)	1.048*** (0.292)	0.0861*** (0.0213)	0.00708** (0.00333)
Regional child care 0-2 rates	0.525* (0.314)	0,240 (0.642)	0.142* (0.0840)	0.00301 (0.00791)
Constant	-3.032** (1.452)	4.370 (3.793)		

Observations	2.506	1.972
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		
Pseudo R ²	0.22	0.35

Source: Our elaborations on Spain EU SILC data 2011.

Table 7. Probit models on the labour supply probability women and men living in couples 25-54 years old with at least one child aged less than 15. Marginal effect evaluated at the sample mean, 2007

Variables	Coefficients		Marginals	
	Women	Men	Women	Men
Age	-0.0545 (0.0715)	0.472*** (0.154)	-0.0166 (0.0218)	0.00220 (0.00138)
Age squared	0.000164 (0.000896)	-0.00562*** (0.00181)	5.00e-05 (0.000272)	-2.62e-05 (1.63e-05)
Other member of the family equivalent income	-0.135** (0.0637)	-0.524*** (0.155)	-0.0411** (0.0192)	-0.00244** (0.00119)
Imputed wage	0.246*** (0.0385)	-0.0417 (0.112)	0.0747*** (0.0116)	-0.000194 (0.000551)
At least one child in the household aged less than 3	-0.478*** (0.111)	0,499 (0.382)	-0.157*** (0.0388)	0.00176 (0.00131)
At least one child in the household aged 3-5	-0.164* (0.0959)	0,101 (0.290)	-0.0510* (0.0301)	0.000446 (0.00123)
At least one child in the household aged 6-10	-0.169* (0.0888)	-0.218 (0.210)	-0.0517* (0.0268)	-0.00107 (0.00129)
At least one child in the household aged 11-14	-0.107 (0.0972)	-0.255 (0.260)	-0.0330 (0.0301)	-0.00137 (0.00172)
Upper education (high school or degree)	0,099 (0.138)	0.898** (0.397)	0,03 (0.0425)	0.00641 (0.00549)
Chronic ill	-0.262*** (0.0966)	-1.716*** (0.187)	-0.0849** (0.0331)	-0.0623*** (0.0186)
Partner unemployed	1.438*** (0.130)	0.424* (0.243)	0.266*** (0.0157)	0.00132 (0.000953)
Regional Specific unemployed rate	-1.262 (1.262)	-6.749 (5.164)	-0.384 (0.384)	-0.0314 (0.0269)
Partner part-timer	2.212*** (0.174)	0,313 (0.313)	0.351*** (0.0144)	0.00113 (0.000887)
Partner self employed	0.00428 (0.0828)	0,175 (0.238)	0.00130 (0.0251)	0.000715 (0.000960)
Regional child care 0-2 rates	0,37 (0.404)	-0.288 (0.950)	0,113 (0.122)	-0.00134 (0.00447)
Constant	1.957 (1.459)	-1.941 (3.271)		

Observations	2,647	1,939
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		
Pseudo R ²	0,25	0,44

Source: Our elaborations on Spain EU SILC data 2007.

6. Conclusions and policy implications

The crisis has deeply hit the Spanish labour market increasing unemployment, inequality and poverty. There has been a dramatic rise in the unemployment rate from 8% in 2007 to 26% in 2012 Q4, EU-SILC data shows that social inequality as measured by the Gini coefficient of equivalised disposable income increased from 31.3 in 2008 to 34 in 2011 (EU27 average is 30.7), and 22 percent of the population in Spain in 2011 were at-risk-of-poverty after social transfers (19.7 in 2007), compared to 17 percent in EU27.

This paper aims at analysing the effects of the crisis, with its sharp increase in unemployment rates, on labour supply within the family. For this purpose the 2007 and 2011 EU-SILC microdata for Spain have been used to implement labour supply models and estimate these effects by gender on individuals aged 25 to 54 living with their partners and having children or not. The results show evidence of the existence of a AWE, much more significant for women, whose labour supply increases by 21 percent when their partner is unemployed, than for men living as a couple with unemployed women, whose labour supply only experiences a 0.7 percent increment. A relevant AWE is also found among women when their partner works part-time and is therefore more likely to be underemployed (see Section 5). The latter factor increases women's participation rate by 27 percent and men's by 0.9 percent. By comparing this behaviour before and after the crisis, it is possible to observe that the DWE connected to higher regional unemployment rates lost significance in 2011, leaving the AWE to dominate the labour supply decisions of couples during the crisis.

In the presence of joblessness or underemployment, this behaviour should reduce the household's income loss connected to the crisis. However, the larger reaction shown by women to their partner's joblessness or underemployment during the crisis may not result in a higher employment rate. Actually, a large gender gap in employment rates will occur, as shown by descriptive analyses, and higher unemployment rates may be anticipated to affect this population, according to the results presented by Signorelli et al. (2012). Moreover, if 'inactive' women step into the labour force to be unemployed, this AWE poses the question on how the welfare system can protect their income, since they are also more likely to leave the labour force than their partners.

This also brings to the forefront the question on how active labour market policies adapt to women's entry into the group of jobless searching for a job. One should not forget that, even when they are in the labour force having their partner unemployed, women are usually the ones most responsible for care and housework, especially in the Mediterranean countries (Gálvez, Rodríguez and Domínguez, 2011), and, though a gender equality-oriented public policy could possibly impact this gender imbalance in the distribution of time within the family, the current situation shows its persistence. According to the 2010 Spanish Time Use Survey, an unemployed Spanish man increases his time devoted to domestic and care work in only one hour per day when he loses his job and becomes unemployed (from 2h 21' to 3h 23'), whereas a Spanish

woman in the same situation increases her time in almost two hours (from 3h 46' to 5h 35'). This unequal time allocation should be taken into account when devising the schedule of training courses and providing counselling in job search.

Women have always suffered from worse working conditions and lower opportunities in the Spanish labour market, and these are hardening with the current crisis. Female unemployment and long-term unemployment rates have risen dramatically in Spain. Spanish female long-term unemployment rate has swollen from 2.5 in 2007 to 9.5 in 2011. Moreover, Spanish women are much more likely to have part-time jobs (23.5 percent of employed women were part-time workers in 2011, in contrast with just 6 percent of men) and underemployed part-time jobs (8 percent of the active population consists of underemployed part-time female workers, compared to 2 percent of men in Spain or 5.3 of women in EU27 in 2011). According to the Spanish Wage Structure Survey, 69.5 percent of female workers earn just the minimum wage or less, which means a maximum of 8,400 € per year, in contrast with only 30.4 of men in that situation in 2010.

These gender inequalities in the Spanish labour market lead to high gender differences in pensions and to a high risk of poverty for elderly women. Retired Spanish women earn as an average a monthly pension of 652.07 € compared to 1,057.36 € for men¹² and women represent 81% of people that receive a non-contributory pension which amounts to only 364.90 € per month¹³. The recent reform in the Spanish pension system will affect women even hardly, by increasing the retirement age, the minimum years required to get 100% of the pension and the period to compute the pension.

These facts call for more investment in labour market and welfare policies to avoid a deepening of income inequalities and discontinuity in female labour supply.

Another important result reached by our focus on households with at least one child aged less than 14 is related to the positive impact of the presence of child care services on women's labour supply. This positive and significant effect of the presence of childcare services on mothers' labour supply confirmed in this article suggests the need to make a greater effort in the diffusion of childcare services. Therefore, if the target is to reduce income inequality and to ensure an increase in female labour supply, no cut in social expenditure devoted to childcare should take place.

However, fiscal consolidation in Spain is focusing on the public sector and the social services, not only reducing the quantity and quality of women's jobs but also hampering women's opportunities to supply their labour in the same terms as men. Though the specific impact of the recession cannot yet be gleaned from time use data, the fall in the expenditure on routine maintenance goods and services, care services and meals has been sufficiently pronounced to support the hypothesis that unpaid women's work has primarily contributed to offset lower purchases (Bettio et al., 2012). This increase in women's unpaid work, as in other crises throughout history (Harcourt, 2009), may neutralise the fall and better distribution of unpaid work between the sexes observed in the last decade¹⁴.

¹² Data at January 1st, 2013 from the Spanish Social Security.

¹³ Data from Imserso for December 2012.

¹⁴ The studies of Ajenjo and García (2012) and Domínguez (2012) on the tendency in the distribution of unpaid domestic and care work in Spain since TUS 2002-03 to 2009-10 (the years of the two Time Use Surveys carried out in Spain) show a decline in women's work, partially offset by an increase in men's work, mainly on care activities. Despite this positive trend, Spanish women living in a couple with children

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still performed 4 hours and 45 minutes daily of domestic and care work, compared to 2 hours and 34 minutes dedicated by men (data from the Spanish Time Use Survey, INE 2010).

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Appendix

Table A1. Reasons to work part-time by gender, 2007 and 2011

Reasons to work part-time	2007		2011	
	M	W	M	W
Education	2,79	0,91	0	0,7
Illness disab	27,12	1,2	1,67	1,34
Underemployed	14,73	17,29	67,95	37,94
Voluntary	0	11,44	2,66	6,7
Housework	26,25	57,61	12,16	42,48
Other reasons	29,12	11,55	15,55	10,83
Total	100	100	100	100

Source: Our elaborations on Spain EU-SILC data 2007 and 2011.

Table A2. Wage equations by gender - individuals aged 25-54, 2011

Variables	Women		Men
	Log Wage	Employment	Log Wage
Age	0.0347*	0,182	0,085
	(0.0179)	(0.0398)	(0.0185)
Age squared	-0.000286	-0.000435	-1.23e-05
	(0.000216)	(0.000480)	(0.000220)
At least one child in the household aged less than 3		-0.0377	
		(0.0874)	
At least one child in the household aged 3-5		-0.123*	
		(0.0741)	
At least one child in the household aged 6-10		-0.144**	
		(0.0597)	
At least one child in the household aged 11-14		-0.0866	
		(0.0622)	
High school	0.166***	0.384***	0.153***
	(0.0411)	(0.0599)	(0.0295)
degree	0.563***	0.848***	0.417***
	(0.0699)	(0.0568)	(0.0254)
chronic ill		-0.200***	
		(0.0678)	
Specific regional unemployment rates	-0.637*	-3.229***	-0.668***
	(0.329)	(0.392)	(0.233)
Constant	0.947**	0,091	1.624***
	(0.370)	(0.809)	(0.387)
Observations	4,634	4,634	2,563
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			
Heckman lambda	0,023		

Source: Our elaborations on Spain EU-SILC data 2011.

Table A3. Wage equations by gender - individuals aged 25-54, 2007

Variables	Women		Men
	Log Wage	Employment	Log Wage
Age	0,059 (0.0400)	0,03 (0.0415)	0.0452** (0.0207)
Age squared	-0.000534 (0.000473)	-0.000735 (0.000507)	-0.000397 (0.000247)
At least one child in the household aged less than 3		-0.684*** (0.0905)	
At least one child in the household aged 3-5		-0.263*** (0.0685)	
At least one child in the household aged 6-10		-0.248*** (0.0584)	
At least one child in the household aged 11-14		-0.0946 (0.0613)	
High school	0.322*** (0.0385)	0.469*** (0.0604)	0.181*** (0.0285)
degree	0.640*** (0.0375)	1.088*** (0.0644)	0.448*** (0.0274)
chronic ill		-0.357*** (0.0655)	
Specific regional unemployment rates	-1.469*** (0.463)	-4.696*** (0.648)	-1.578*** (0.566)
Constant	0,15 (0.851)	0,49 (0.824)	0.775* (0.422)
Observations	4,508	4,508	3,177
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			
Heckman lambda	0,130		

Source: Our elaborations on Spain EU-SILC data 2007.