

Family Ties and Female Part-Time Labor Supply

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Abstract

In this study we explore the determinants of part-time labor supply for Spanish households using data from EPA. We develop a model of the household where the woman's contribution to family income affects her power in the collective decision unit. Our aim is to estimate the importance of part-time employment as an instrument to increase women's participation and to what extent part-time employment responds to traditional views of gender family obligations.

Key words: part-time employment, female participation, collective labor supply.

JEL Classification: C13, C25, J16.

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1 Introduction

Part-time employment is an employment option for many women that would otherwise be out of the labor market, yet in some countries the results of part-time employment policies on women's participation have not been as successful as expected. The rise of part-time jobs and women's participation during the last decades is a labor market feature shared by many developed countries, but there are still important differences in levels across countries, both in part-time employment and in women's participation. For instance, the share of part-time jobs in total employment varies from a 23.3 per cent in UK to 5.6 per cent in Greece with, overall, higher levels in Northern European countries. Participation rates follow a similar pattern: Southern EU countries like Spain, Italy and Greece show lower rates than Northern countries (see Table 1). The availability of part-time jobs is just one aspect of more flexible labor markets, and it usually comes along with other measures like work-family programs, child-care public services, and better maternal-leave policies, which can be very different from one country to another. Moreover, individuals' attitudes toward work practices and unions' preferences are also reflected in labor market regulations and employment policies, so it is not surprising that we find large variations in part-time employment shares across developed countries and even that similar part-time employment policies can yield very different outcomes across countries.

	Germany	France	Italy	UK	Denmark	Sweden	Norway	US	Canada	Greece	Spain
Women activity rate	64.5	62.5*	48.3	69.2	74.8	57.7	75.9	69.7	73.0	51.0	55.7
Part Time / Total E. Both sexes	19.6	12.9	12.0	23.3	15.8	14.1	21.0	13.2	18.8	5.6	7.8
Part time/ total W	36.3	22.8	23.6	40.1	21.9	20.6	33.4	18.8	27.9	9.9	16.5
Part time W / part Time	83.3	80.0	74.7	77.3	64.2	70.8	75.2	68.8	68.9	67.9	80.7

Figure 1: Part-time employment shares for some OECD countries. *Data source:* Statistical Annex 2004.

One of the most important issues in recent debates on part-time employment is the existence in some countries of large hourly earnings differentials between part-time and full-time jobs after controlling for job and worker's characteristics. Bardasi and Gornick (2002) analyse this problem in six developed countries. They find that a part-time worker in the US earns 17.1 percent less than a full-time worker, followed by Italy with 14.4 percent, Canada with 9.3 percent, Germany with 7.7 percent, and the UK with 1.1 percent. The exception is Sweden where a part-time worker earns 2.8 percent more than a full-time worker. To the extent that, on average, more than 80 percent of part-time jobs are held by women and that these earnings differentials cannot be explained by observable characteristics, this evidence suggests that in some countries part-time jobs can be a hidden form of gender differentials in earnings.

Therefore the relationship between part-time employment and the participation of women in the labor market is influenced or conditioned by multiple factors that might lead in some countries to the result that a part-time job is not an employment option. We can go further and ask whether higher participation rates of women are the cause, rather than the consequence, of higher shares of part-time jobs in total employment. That is, is it a larger presence of women in the labor market that pushes up more and better part-time jobs? Is part-time employment supply or demand driven?

In this work we explore the relationship between women's participation and part-time employment across Spanish households and try to answer some of these questions. Our aim is to investigate to what extent traditional gender roles within a household are responsible for a part-time labor supply that is mainly a woman's supply. With this aim we develop a model of the household where parents have some beliefs about the traditional division of labor between market and non-market production, and where the relative gender weights in the collective decision process is influenced by each agent's market earnings. We think Spain is an interesting case of study because the participation rate of women has been increasing steadily since the eighties, but the increase in part-time employment has been very weak in comparison with the pattern followed by Northern countries. With this aim

we first develop a collective model of the household where agents (parents) have to decide how to allocate their productive time between market work and housework. The purpose is to study the interaction between the labor market decisions of women and the balance of power within the family. .

The rest of the paper is organized as follows. In Section 2 we present some data about Spanish part-time employment trying to identify the main (individual and family) factors that shape the labor supply of married women. In Section 3 we develop a model of the household and analyze how households with similar characteristics can end up in very different situations regarding the woman's labor supply. In Section 4 we shall include the results concerning the estimation of the model. And finally some concluding remarks will be the content of Section 5.

2 Some features of part-time employment in Spain

As mentioned in the Introduction the main features of part-time employment in Spain are similar to those in other OECD countries —part-time employment is concentrated on the service sector and among the female population—but part-time employment is still a rare phenomenon in Spain, as well as in other Southern EU countries (like Italy or Greece). In this Section we want explore the main reasons for the supply of part-time employment across Spanish households using data from EPA 2000. An important short cut of this data source is that does not include information about wages or other family income sources, but it does contain very valuable and detail information about individual preferences over workweek lengths.

The EPA survey gives us some relevant information about the reasons why men and women have part-time employment. Table 2 summarizes how these reasons are distributed within each gender (% Col.) and across men and women (% Row) employed part-time. For instance, 47.4 percent of workers who have part-time because they are undertaking some education or training program are men and the rest are women; whereas 13.7 percent of men and 4.2 percent of women have it for that reason. It is clear from this Table that among workers that choose part-time work because they have family obligations men represent a very small share (1.2 percent) com-

	Men		Women	
	% Row	% Col.	% Row	% Col.
Education, training	47.4	13.7	52.6	4.2
Illness	60.0	3.0	40.0	0.6
Family obligations	1.2	0.6	98.8	13.7
Full-Time not found	22.0	22.5	78.0	21.9
Full-Time not wanted	16.1	4.1	83.9	5.9
Type of activity	20.9	37.0	79.1	38.2
Other	26.3	18.1	73.7	13.9
Unknown reason	13.1	0.9	86.9	1.7

Figure 2: Reasons for Part-Time Employment across Spanish Households.
Data Source: EPA 2000.

pared with that of women (98.8 percent), which reveals the unequal gender distribution of family duties. The data also show that among those workers that have not found a full-time employment the majority are women (78 percent), which could be interpreted as evidence that it is easier for men to get a full-time job. Moreover, the fact that most of part-time workers that do not want a full-time job are also women (83.9 percent) is probably the consequence of women being in households where men hold ‘good’ full-time jobs.

Our aim is to investigate to what extent traditional gender roles within a household are responsible for a part-time labor supply that is mainly a woman’s supply. With this aim we develop in the next Section a model of the household where parents have some beliefs about the traditional division of labor between market and family (non-market) production activities, and then estimate the results of the model in Section 4.

3 A model of the household

Consider a household composed by two productive adults, a woman and a man, and a fixed number of dependent children. Each productive adult has a unit of productive time that can be distributed between working in the market and working at home. Agents obtain utility from two kinds of

goods, a market good and a home good that cannot be traded in the market. Household time employed at home, h , generates a home good according with the following production technology:

$$z(h) = Ae^h, \quad (1)$$

We shall assume that the home good is a public good inside the household, so that (1) also represents the consumption of the home good of each family member.

A household or a family is a collective decision unit where dependent agents do not have any decision power. Denoting by $1 - \mu$ the woman's weight in the collective decision unit, the objective of the household is to maximize the following weighted sum of individual utilities,

$$(1 - \mu)U_f + \mu U_m, \quad (2)$$

subject to the home technology (1), the budget constraint,

$$c \cdot n = Y + w_f l_f + w_m l_m, \quad (3)$$

and the time constraint,

$$h = 2 - l_f - l_m. \quad (4)$$

Where $c \cdot n$ represents total household's consumption of the market good, Y is household's non-labor real income, w_i is the real wage of adult i , and l_i is the time individual i works in the market, *woman* = f , *man* = m . So equation (3) establishes that the household's consumption of the market good has to be financed out of total household's income, whereas equation (4) establishes that working time at home is determined by the household's endowment of productive time minus the working time spent in the market.

We suppose that utilities are identical across agents except for a term that captures an individual's belief in the social custom. The social custom, or social norm, in our context says that the husband should preferentially work more time in the market than the wife. Accordingly, we assume that the utility function of individual adult i is given by:

$$U_i = \log c + \delta(n) \log z - s_i \cdot (l_f - l_m), \quad (5)$$

$$\delta(n) > 0, \delta' \geq 0, s_i \geq 0.$$

That is, an adult cares about per capita consumption of both goods within the family, and about the social custom if $s_i > 0$. The term $\delta(n)$ represents the weight of the home good in the agents' utility as a non-decreasing function of family size. With this assumption we want to capture the idea that parents can be more concerned about the home good as the family rises. Or, in other words, the marginal utility of working at home increases with family size.

3.1 The collective labor supply

In this section we solve the problem of the household assuming that the weighting power factor μ is given to the collective decision unit. Substituting the constraints (1), (3) and (4) into the objective (2), and solving for the collective labor supplies of individuals, it is easy to show that an interior solution must satisfy the following conditions:

$$\frac{w_f}{Y + w_f l_f + w_m l_m} = \delta(n) + (1 - \mu) s_f + \mu s_m, \quad (6)$$

$$\frac{w_m}{Y + w_f l_f + w_m l_m} = \delta(n) - (1 - \mu) s_f - \mu s_m \quad (7)$$

The right side of (6) represents the household's marginal cost in terms of utility of the woman's time in the market, while the left side represents the corresponding marginal utility gain, given that the woman and the man spend, respectively, l_f and l_m time in the market. It is clear, then, that if the right side of (6) is larger than its left side, the woman's labor supply will be zero. And that if the right side of (6) is smaller than its left side, the woman's labor supply will be one. A similar argument follows from (7) for the man's labor supply.

Note that, by assumption, the right side of (7) is smaller than or equal to the right side of (6) and so the marginal cost of the woman's market

time will never be below that of the man. As a result, if the woman's wage is not larger than the man's, then the household's optimal time allocation implies that the woman will never spend more time in the market than the man. This result is consistent with the empirical evidence presented above for developed countries where the majority of employed men hold full-time jobs. Let y denote total family income when the man works full-time and the woman is out of the labor market, $Y + w_m$. Then, the following condition guarantees that the man in our model will work always full-time.

Condition 1 $\delta(n) - (1 - \mu)s_f - \mu s_m < \frac{w_m}{Y + w_f + w_m}$.

Under Condition 1 we can express the woman's labor supply as follows:

$$l_f^s = \begin{cases} 1 & \text{if } \delta(n) + (1 - \mu)s_f + \mu s_m \leq \frac{w_f}{y + w_f} \\ \tilde{l} \in (0, 1) & \text{if } \frac{w_f}{y + w_f} < \delta(n) + (1 - \mu)s_f + \mu s_m < \frac{w_f}{y} \\ 0 & \text{if } \delta(n) + (1 - \mu)s_f + \mu s_m \geq \frac{w_f}{y} \end{cases} \quad (8)$$

Figure 1 illustrates these three possibilities for given wages and family incomes. The horizontal lines represent, respectively, the marginal cost of the woman's market time, $\delta(n) + (1 - \mu)s_f + \mu s_m$, in each possible situation. The solid line represents a sufficiently low marginal cost so that the woman's labor supply is one (i.e.: E_1 represents the full-time case); the dotted line represents a marginal cost that is so high that the woman's labor supply is zero (i.e.: E_3 represents the non-participation case); and finally the dashed line stands for an intermediate marginal cost that equals the marginal utility gain of working in the market at a point where the woman's labor supply is positive but less than one (i.e.: E_2 represents a part-time solution). Note that, everything else the same, a larger n tends to decrease the amount of time supplied to the market because the marginal cost in terms of utility of working in the market rises with n and so the horizontal line $\delta(n) + (1 - \mu)s_f + \mu s_m$ shifts upwards. However, a larger man's weight in the collective decision unit, μ , can increase or decrease the marginal cost of market time depending on whether $s_m - s_f$ is positive or negative.

If the man were more concerned about the social custom than the woman, $s_m > s_f$, an increase (decrease) in μ will shift the marginal cost line upwards

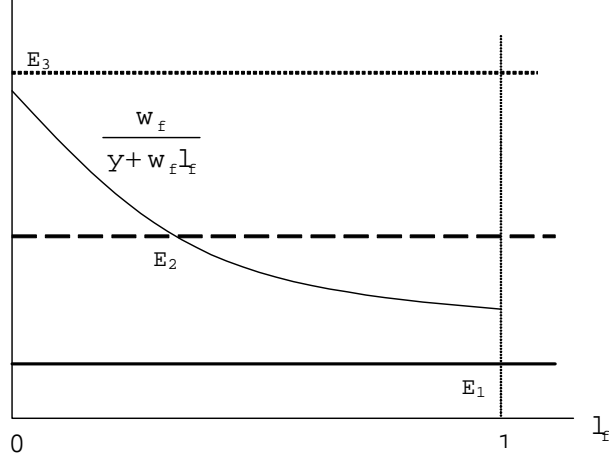


Figure 3: The female collective labor supply

(downwards) and so, everything else the same, the amount of time supplied to the market will tend to be lower (larger). On the contrary, if the woman were more concerned about the social custom than the man, these effects will be reversed.

In any case, notice that the woman will be out of the labor force for any value of μ if the term $\delta(n)$ is sufficiently large relative to w_f/y . So we shall focus the analysis on the more interesting case where the following condition is satisfied:

Condition 2 $\delta(n) < w_f/y$.

We are interested in the household's welfare ranking over the possible workweek lengths. Given (8), it is not difficult to show that if full-time is the most preferred option, then part-time employment is preferred to non-employment. But when working part-time is the most preferred option, non-working can be better than working full-time. The following Proposition summarizes the household's ranking over these employment options for different parameter specifications.

Proposition 3 *Under Conditions 1 and 2, the household's preferences over the woman's workweek length are the following:*

(i) Working part-time is the most preferred option if $\frac{w_f}{w_f+y} < \delta(n) + (1-\mu)s_f + \mu s_m < \frac{w_f}{y}$. In this case, working full-time is preferred to non-working if and only if $\log\left(\frac{w_f+y}{y}\right) \geq \delta(n) + (1-\mu)s_f + \mu s_m$.

(iii) Working full-time is the most preferred option and working part-time is preferred to non-working if $\log\left(\frac{w_f+y}{y}\right) \geq \delta(n) + (1-\mu)s_f + \mu s_m$ and $\frac{w_f}{w_f+y} > \delta(n) + (1-\mu)s_f + \mu s_m$.

(iii) Non-working is the most preferred option if $\delta(n) + (1-\mu)s_f + \mu s_m > \frac{w_f}{y}$.

3.2 The equilibrium of the household

In this section we suppose that the woman's power in the collective decision unit can be affected by her contribution to the household's earnings. In particular, we shall assume that μ is a decreasing function of the woman's labor income, $\mu(w_f l_f)$, that takes values on the interval $[\underline{\mu}, \bar{\mu}]$, $0 \leq \underline{\mu} < \bar{\mu} \leq 1$.

For given wages, non-labor income and a level of μ , the woman's collective labor supply will be given by (8), but this optimal allocation of time can cause a change in the factor μ and the household may want to adjust l_f^s further. We follow Basu (2004) and define the equilibrium of the household as a stationary solution to this process. That is, the process will continue until a pair (l_f^*, μ^*) is attained where l_f^* satisfies (8) for given μ^* , and $\mu^* = \mu(w_f l_f^*)$. In other words, we can interpret the equilibrium of the household as the outcome of an iterative process in which current labor income determines tomorrow's distribution of power within the household.

As we mentioned before, the woman's collective labor supply given by (8) will be non-increasing in μ if the man is more concerned about the social custom than the woman, $s_m > s_f$. Otherwise, the woman's labor supply will be non-decreasing in the factor μ . For illustration purposes, consider first the case $s_m > s_f$ and take a household where depending on the value of μ the woman could work full-time, work part-time or not work at all. That is, given wages, non-labor income and preference types, there exists a value of μ above which the woman's labor supply is zero, and a value of μ below which the woman's labor supply is one. The solid schedule in the following Figures represents the relationship between l_f^s and μ obtained from

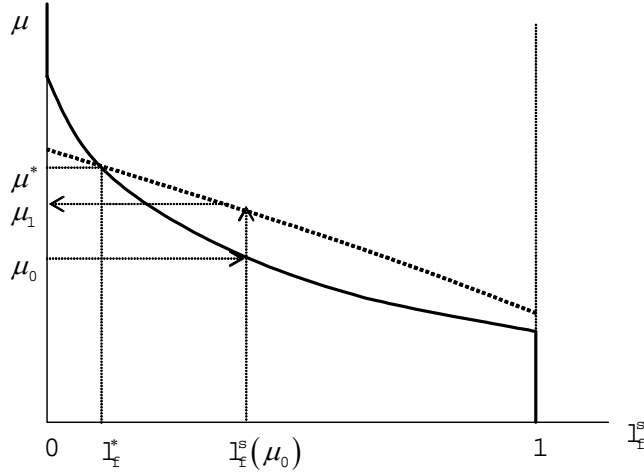


Figure 4: The household's part-time equilibrium is stable and unique

(8) assuming $s_m > s_f$, which is called the earnings-curve; and the dotted line represents the power function $\mu(w_f l_f)$. So the intersection of both lines will determine the equilibrium of the household. Notice that Figures 2, 3, 4 and 5 show only some of the possible outcomes and that, in principle, we cannot rule out the existence of multiple equilibria. Moreover, when the full-time case or the inactivity case arise as an equilibrium of the household, they are always stable solutions, whereas the part-time case can be stable or unstable. To see this consider first Figure 2, where the part-time equilibrium is unique and stable: pick a value of μ below μ^* , say μ_0 , then the earnings-curve will give us the optimal allocation of time $l_f^s(\mu_0)$, which in turn will cause an increase in the factor μ through the power-curve; the new value of the man's power factor μ_1 will cause a further adjustment of the woman's collective supply towards $l_f^s(\mu^*) = l_f^s*$. Similarly, if we pick a value of μ above μ^* , the household's optimal allocation of time will converge to l_f^s* and the power weighting factor will converge to μ^* .

In Figure 3 the power-curve is such that it cuts the earnings-curve at three points. In this case we have two part-time equilibria —one stable as in Figure 4 and another one allocating more time to market production that is unstable— and a stable full-time equilibrium. At the full-time equilibrium

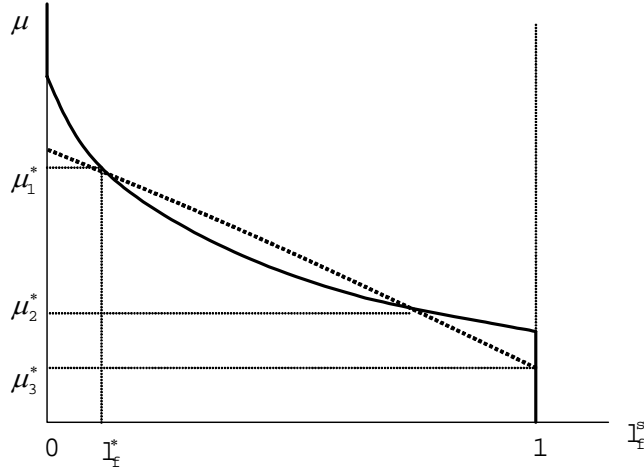


Figure 5: The household's full-time equilibrium is stable, a part-time equilibrium can be stable or unstable

the man's power weighting factor attains its minimum value $\mu_3^* = \underline{\mu}$. The household will be at the unstable part-time equilibrium only if the initial power factor happens to be there, $\mu_0 = \mu_2^*$, but any small perturbation will cause the household to move the allocation of time towards a stable equilibrium. Which equilibrium prevails as the household's choice will depend on the initial value of the power weighting factor.

Figure 4 shows the case where there is a unique and stable household's equilibrium that corresponds to the full-time case. In Figures 5 and 6 below the power-curve does not cut the earnings-curve from below and as a consequence non-participation arises as a household equilibrium. As before, if there are multiple equilibria, the one prevailing as the household's choice will depend on the initial man's power in the decision process. In Figure 5 there is a stable equilibrium characterized by non-participation, and a part-time unstable and a full-time stable equilibria as in Figure 3.

In Figure 6 the unique stable household equilibrium is that of non-participation: the woman remains out of the labor force and the man's power in the collective decision unit attains its maximum value $\mu^* = \bar{\mu}$.

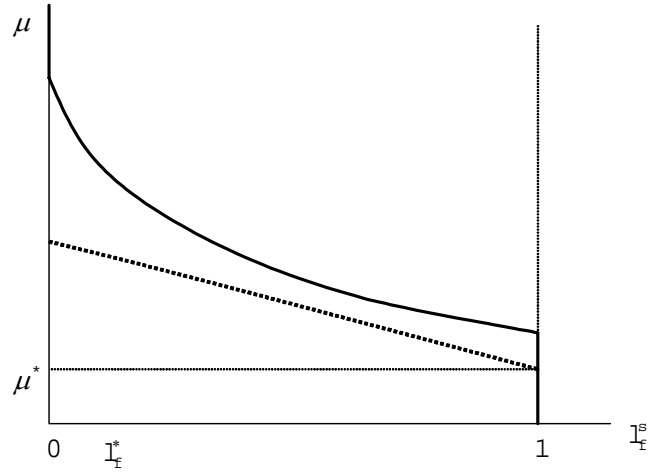


Figure 6: The household's full-time equilibrium is unique and stable.

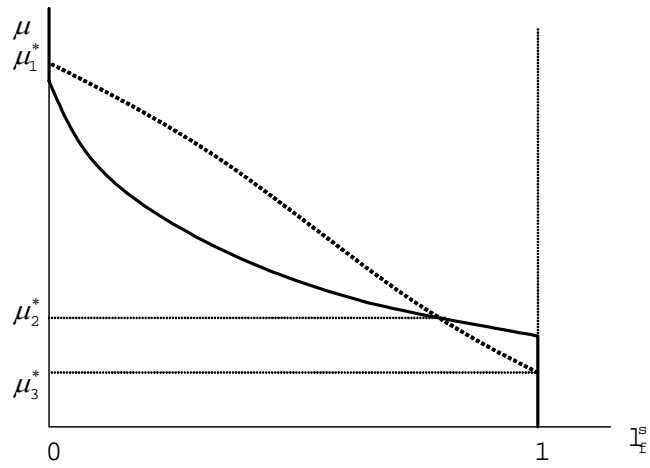


Figure 7: The household's non-participation and full-time equilibria are stable, the part-time equilibrium is unstable

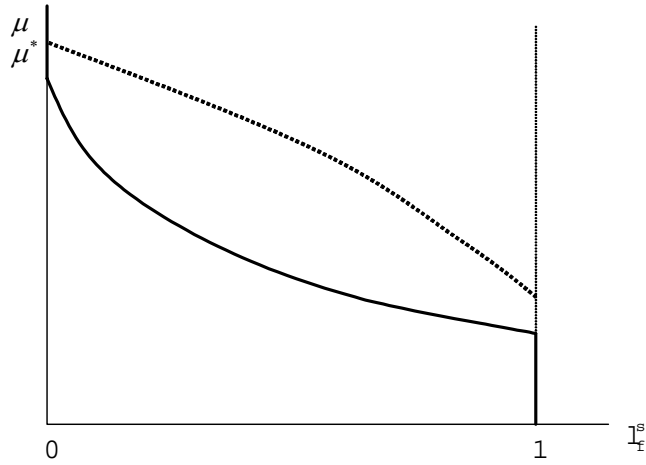


Figure 8: The household's non-participation equilibrium is stable and unique, the man's power decision factor is at its maximum value

In summary, if the man is more concerned about the social custom than the woman, there can be multiple household equilibria, which one prevails will depend on the initial weight of the man's power in the decision process. The full-time equilibrium and non-working equilibrium are always stable, but the part-time solution can be stable or unstable. In contrast, it is easy to show, following the same steps as before, that if the woman is more concerned about the social custom than the man, $s_f > s_m$, the household's equilibrium (full-time, part-time or non-working) is always unique and stable.

4 The statistical model

To be completed.

5 Conclusion

To be completed.

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