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ABSTRACT

The Motherhood Wage Penalty in a Mediterranean Country: The Case of Spain^{*}

We present evidence for the motherhood wage penalty in Spain as a representative Southern European Mediterranean country. We use the European Community Household Panel (ECHP, 1994-2001) to estimate, from both pool and fixed-effects methods, a wage equation in terms of observed variables and other non-observed individual characteristics. The empirical results confirm that there is clear evidence of a wage penalty for Spanish working women with children. Specifically, the fact that there is a birth in the family during the current year means that the woman loses 9% of her wage. We also find that having one child living in the household means a significant loss in wages of 6%, having two children, almost 14%, and having three or more, more than 15%.

JEL Classification: J30, D10, C23

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Introduction

In the last two decades, a new feature has received increasing attention in the OECD (Organisation for Economic Cooperation and Development) countries, the so-called motherhood wage penalty. That is to say, the wage gap between women with children and those without children. This wage penalty can be explained as part of the effects felt by the interruption of a woman's employment to have children, and the resulting responsibilities she assumes in raising them.¹ A number of recent articles have shown the existence of this motherhood penalty in different countries (Korenman & Neumark, 1992, Waldfogel, 1997, 1998a, 1998b, Lundberg & Rose, 2000, Budig & England, 2001, Anderson, Binder & Krause, 2002, 2003, and Edwards, 2005, in the United States; Waldfogel, 1995, 1998a, Joshi, Paci & Waldfogel, 1999, in the United Kingdom; Phipps, Burton & Latheridge, 2001, in Canada; Kunze & Ejrnæs, 2004, in Germany); although in other economies, basically those of Northern Europe, studies have not found this evidence (Albrecht, Edin, Sundstrom & Broman, 1999, in Sweden; Rosholm & Smith, 1996, Datta-Gupta & Smith, 2002, and Nielsen, Simonsen & Verner, 2004, in Denmark).

Against this background, a series of cross-country studies, such as those by Todd (2001), Harkness & Waldfogel (2003), and Sigle-Rushton & Waldfogel (2007a,b) present comparable international evidence showing a great deal of variation. Overall, it is observed that the United Kingdom and Australia are the countries that show the greatest losses in wages by mothers, with the average being more than 10% for women who have two or more children, followed by the US and Canada. In Germany, the penalty is around 8%, in the Netherlands less than 5%, whereas the wage penalty is almost imperceptible in Sweden, Norway and Finland.² These authors have related these results to the classical division of welfare states in industrialized countries. Thus, the liberal Anglo-American countries show

the largest motherhood wage penalties, followed by the Continental conservative ones, with the Nordic social democratic countries exhibiting no penalty at all.

More recently, the sociological literature has questioned the reduced typologies of welfare state regimes, and suggested the need to include additional possibilities. One is the Mediterranean (or Latin) rim, which reflects traits from both the liberal and conservative models, as explained below. In this context, our research uses data from Spain, which has rarely been considered in the literature, in order to provide evidence and explanations which help us to describe the motherhood wage penalty in this representative Mediterranean country.

In recent years, Spain has witnessed profound changes in the social structure of the labour market. These include an increase in the education level of women, with a resulting increase in the number of women participating in the workforce and, at the same time, a decrease in the birth rate. Despite the lack of certainty that the traditional wage gap between men and women has been closing (see López, García & Hernández, 2001; de la Rica, Dolado & Llorens, 2005), we here present the first single-country study providing specific empirical evidence of the motherhood wage penalty for Spanish women. Our method takes into account, not only observed characteristics, but also unobserved individual heterogeneity. To this end, a stepwise procedure using panel data is followed in order to control for a series of sets of determinants of this wage penalty, and to assess the relative influence of each of these sets on the degree of the wage penalty.

Specifically, while many observed characteristics, related to personal, family, human capital and the workplace, derived from economic rationality, are explicitly considered, the effects of unobserved individual heterogeneity are dealt with through the inclusion of time-invariant individual fixed effects. In this way, and once all these factors are controlled for, the gap in pay finally observed between mothers and non-mothers can only be attributed to

discrimination (or, for example, to time-varying unobserved characteristics, such as the degree of effort exerted in the workplace). A better understanding of the explanatory factors is needed in order to identify the relevant social policy measures that would combat potential discrimination against mothers.

The estimation results show, first, that unobserved heterogeneity plays an important role in disentangling the lack of evidence on the motherhood wage penalty observed in the raw data. A double-sided interpretation can be put forward: either mothers look for jobs that are better paid or, women who are better paid decide to become mothers (inverse causality). Secondly, as expected according to the discussion presented in the next Section, the motherhood wage penalty in Spain is at least as large as in the conservative countries, even reaching the levels observed in liberal countries, in which social security is not as extensive as in the other types of welfare state regimes.

The following section is dedicated to a brief background on both the characterization of the different welfare state regimes and the explanations for the existence of a motherhood wage penalty. The next section presents the database and describes some statistics of the sample. We then show the stochastic formulation and the empirical results. The paper ends with a summary of the most important conclusions.

Background

Esping-Andersen (1990) typically considers three regime models: Anglo-Saxon, Continental European and Nordic European. These are associated, respectively, with liberal, conservative and social democratic countries. As a first approximation, in the Anglo-Saxon model, in which a fairly high reliance on means-tested public assistance programs exists, individualism and the free market determine the provision of care and personal services. In

contrast, the Continental countries, shaped both by the Catholic legacy and statism, and the Nordic countries, exhibit universal insurance programs, the latter providing for individualized, citizenship-based entitlements.

Focusing on the aspects related to gender differences, the Nordic countries have developed strong family and equal opportunity policies, instrumented by generous maternity leave provisions and extensive child care. In Anglo-American countries the opposite is true, with poorly-developed family leave and child-care policies. The Continental countries are in the middle, with generous maternity leave provisions, but less extensive child-care coverage. These differences are reflected in the fact that, in liberal countries, such as Ireland and the UK, the State favours the functioning of the market, such that women are encouraged to participate in the labor force (particularly, in the service sector, see Arts and Gelissen, 2002), resulting in high levels of employment which largely take the form of part-time work (see Trifiletti, 1999). However, these female workers are insufficiently protected by the State, with this being reflected in a wide gender pay gap, and an even greater gap between mothers and non-mothers.³ In the Scandinavian countries, women, irrespective of whether they are mothers or not, are also encouraged to participate in the labor market, especially in the public sector, so that few differences in employment rates between mothers and non-mothers are observed, and, simultaneously, the gender pay gap is the narrowest. Finally, in the conservative countries, labour market participation by married women is strongly discouraged, with a redistributive policy of allocating resources to families with children and, as a consequence, significant differences in employment rates exist between men and women, and between mothers and non-mothers, as do differences in pay between genders.

The contributions of Todd (2001), Harkness & Waldfogel (2003), and Sigle-Rushton & Waldfogel (2007a,b) have been to extend the characterization of the three regime types by considering the motherhood wage penalty across countries. Thus, the largest penalties are

observed in the liberal countries, followed by the conservative, and finally, the social democratic countries, in which negligible gaps are found. However, recent contributions of Korpi (2000), Arts and Gelissen (2002) and others, have suggested new typologies be added, with one being the so-called Mediterranean model.⁴ The countries included in this regime type, such as Italy, Greece, Portugal and Spain, are characterized by relatively little state intervention in the welfare sphere. This is reflected in the lack of an articulated social minimum and right to welfare, with some benefit levels being very generous (e.g., old age pensions), and a highly fragmented social security system, with health care institutionalized as a right of citizenship (Arts and Gelissen, 2002). Other important features in the characterization of the Mediterranean model are the gender division of paid and unpaid work, and the fact that social care tends to be privatized within the family.

While these latter characteristics are not considered, by some authors, to be sufficient to differentiate Mediterranean countries from the Continental model, e.g. Katrugalos (1996, p. 43) classifies them as “immature, underdeveloped species of the Continental model”, some others, see e.g. Trifiletti (1999), highlight two features that distinguish Mediterranean countries as a different regime type from the Continental. First, the subsidiary role of the state, which is typical of the Continental countries, is modified since, in Mediterranean countries, it only covers those social risks which the family cannot protect itself against. Second, and as stated, whereas in Continental countries most benefits devoted to the family are instrumented through the male breadwinner, irrespective of whether the wife works, in Mediterranean countries, such benefits are allocated only to families in which the wife is in the labor market, and thus the traditional family role of the non-working mother is not especially protected.

Along these lines, Trifiletti (1999) constructs a typology of welfare states across two dimensions, one describing whether women are treated by the state as wives and mothers, or

as workers, and a second shaping whether or not the state protects women within the labor market. The Mediterranean welfare state regime type is then characterized both by considering women fundamentally in their family role, wives and mothers, and by not protecting them within the labor market. Therefore, this Mediterranean type combines traits from both the Continental conservative and the liberal models. Specifically, in Continental countries, policy measures treat women as wives and mothers, whereas in liberal countries women are not protected within the labor market. As a counterbalance to this, in the Continental model, women are effectively protected in the labor market through the social benefits received via their husbands, whereas in liberal countries women are essentially considered as workers (for more on this characterization, see Trifiletti, 1999). In these circumstances, a reduced proportion of women work, but they work mainly full time and only receive benefits and access to social services through their status as workers. This is the main way in which they are protected within the labor market. This situation can be attributed to limited aid from the welfare regime, the existence of help resources from extended family networks, and the necessity to work within a labor market whose conditions favour men.

Having characterized the different welfare state regime types, we now discuss the economic rationality for the existence of a motherhood wage penalty. The most common explanation for mothers earning less than non-mothers is that the loss of individual skills, as well as the depreciation of experience, is associated with the period spent out-of-work resulting from childbearing and child caring. This leads to a reduction in productivity related to the level of education attained by the mother (Mincer & Polachek, 1974; Ruhm 1998; Waldfogel, 1998a).

The earlier applied studies on this matter emerged from the existence of wage gaps between married and single women (Becker, 1985). From this initial research, the first rigorous econometric analysis of the wage penalty comes from Korenman and Neumark

(1992), who, using data from the United States, do not generally find significant effects on wages from having a first child, although there are effects in the case of a second child. Subsequently, Waldfogel (1998b), also in the United States, finds that having a first child does have an effect on wages, and that this increases with the arrival of the second child. She also finds that the existence of maternity leave, which covers the out-of-work period and maintains seniority/tenure, helps to reduce such a penalty. This prompts us to consider alternative explanations for the existence of the motherhood wage penalty.

The first of these has to do with the fatigue experienced by a woman who cares for her children at home, leading to less effort being dedicated to her job activity. The greater effort dedicated to home activities decreases as the child grows older, and increases as a higher level of education is required at work (Becker, 1985). Another important factor is that women show a preference for jobs that allow them to combine household schedules with their work schedule, in exchange for a lower wage, for example, part-time employment is associated with a large wage penalty in the UK, Waldfogel (1995). In this sense, Budig & England (2001) and Anderson, Binder & Krause (2003), even when human capital-related variables are controlled for, confirm the existence of penalty evidence in the United States. This, they argue, is not due to less work effort as a consequence of maternity, but rather to the choice of a flexible work-schedule.

Additional explanations are related to discrimination. On the one hand, statistical discrimination may explain why firms assume that all women will interrupt their working career at some time, although they may not subsequently have children, in such a way that firms tend to place them in jobs that have a lesser human capital requirement. These positions require less training, and consequently pay lower wages (Becker, 1991). On the other hand, there is a pervasive wage discrimination against women, which can be interpreted in two ways. The first interpretation relies on a more traditional explanation, according to which

women subordinate their professional careers to those of their husbands, accepting lower paid jobs (Anderson, Binder & Krause, 2003). The second refers to wage discrimination against mothers. This source of wage differentials is difficult to measure and can only be approximated as the residual in wage equations (see wage decomposition procedures in Oaxaca & Ransom, 1994).

Finally, in pursuing the research question of our work, that is to say, to test the existence of a wage penalty for Spanish working mothers, and to assess the impact of its determinants, we use panel data in order to estimate econometric models, such as fixed effects and/or instrumental variables, which allow us to control for unobserved individual heterogeneity, thus providing more efficient and robust estimates (see, for instance, Anderson, Binder & Krause, 2002; Datta-Gupta & Smith, 2002; Amuedo-Dorantes & Kimmel, 2005).

The Data

The Spanish data used in this paper come from the panel formed by the eight waves of the ECHP (European Community Household Panel) which correspond to the years 1994 to 2001.⁵ Given our objective, women between the ages of 24 and 45 who had a paid job, either salaried or self-employed, were selected for the sample. Those who were in job training, or who worked in family businesses, were excluded. Women under 24 were ruled out, to avoid correlations between their education level and their hours of work, as were women older than 45, to avoid those who had no minor children at home, but could have had them in the past. For each of these waves, an average of 1,400 sample observations was used, while each female worker was observed, on average, more than three times.

Table 1 shows the wage gap by expressing wages and earnings of women (mothers, non-mothers, and all combined) as a fraction of men's wages and earnings for the selected

individuals in the most recent sample year, 2001. A first noticeable result is that women received 77% of the earnings of men. When we focus on hourly wages, and ignore the fact that women work on average fewer hours than men, the wage gap is reduced to 10%. We also confirm that this gender gap exists, whether or not the woman works in the private or the public sector, or whether or not she has a full-time or part-time contract. Only in the case of single women, do they receive slightly higher wages than single men.

When looking at the differences between mothers and non-mothers in hourly wages, it appears initially that there is a motherhood wage advantage in the aggregate, and that in several kinds of work (public sector, permanent contract, salaried work) mothers make a larger fraction of men's wages than do childless women. However, in several categories, such as among full time workers, temporary contract workers and single mothers, there is evidence of a motherhood wage penalty.⁶

(Table 1)

This requires a careful treatment of all the characteristics influencing wages, in order to investigate the extent to which wage differences between women who are mothers and those who are not, can be explained by economic factors. As a consequence, controlling for demographic, human capital, family and job-related variables, provides a more refined measurement of the motherhood wage penalty. Thus, information about age, educational level, experience and seniority at work, size and resources of the family, and the type of contract, sector of activity, and firm size, is necessary to determine if differences in pay can be attributed or not to the characteristics studied. To the extent that panel data are available, time-invariant unobserved characteristics, such as motivation, desire for a professional career, the wish to be a mother, the interest in completion of tasks and exerting the appropriate effort, etc, can also be controlled for, allowing us to conclude that the family penalty finally

observed can be interpreted as a proxy for discrimination against mothers, or some time-varying unobserved characteristics.

Therefore, the need arises for a rigorous regression analysis in order to calculate the effects on the wages of working mothers, controlling for both observed variables and non-observed individual characteristics. In the next Section, we carry out a pool estimation, and we then take advantage of the panel structure to conduct a fixed-effects estimation. Prior to this, we devote some space to enumerating the variables taken into account in the analysis, and presenting some brief descriptive statistics in Table 2 for the last period of the sample, 2001.

(Table 2)

The dependent variable on the wage equation, *Wage*, is expressed by the logarithm of real wage per hour.⁷ Regarding the exogenous variables, we include the bearing of children, as well as several socio-demographic and other economic characteristics. In gathering the facts regarding having children, we consider two possible measures. The first, *Birth*, records if there has been a birth in the household during the current year. The second, *Number of Children*, is a set of qualitative variables that indicate whether the woman has no children, one, two, three or more. We chose these two measures since the period available only covers eight years and, therefore, there could have been women in the sample with children, but who had not had a child during the period under study. This means that the effect on wages of having children could have been felt some time ago, and would not be included in the estimates of the *Birth* variable.

Additionally, we consider a broad group of explanatory variables with triple justification. First, to increase the reliability and strength of the estimations, by including as many controls as possible so that the variables *Number of Children* and *Birth* are effectively

capturing the influence of motherhood. Second, to be able to provide some explanation of why the existence of a motherhood wage penalty in Spain is masked by the rough data presented in Table 1, as demonstrated below. Accordingly, including a large set of regressors helps us to identify which individual and job characteristics of women counteract the negative effect on wages of having a child. Third, to reduce the influence of any bias in the selection of the sample women, in terms of their participation in the labour market.⁸ Specifically, with respect to the social-demographic variables, some are considered to be strictly individual (*Age, Marital Status*), others are related to human capital (*Education, Experience, Seniority, Over-education*), others are related to work at home (*Child-care, Elder-care*), and still others are regional or time factors (*Region, Cycle*). Finally, with respect to the economic variables, we include the resources available to the family (*Wage Income, Non-wage Income, Family Income, Household Size*), as well as others linked to the woman's job (*Part Time, Sector, Occupation, Activity, Company Size, Contract Type, Self-employment*).

Beginning with the dependent variable, Table 2 shows that the average wage of mothers is slightly higher, compared to women who have not had children. We confirm that 5.5% of the women had a child during the current year; 26% had one child, 14% had two and only 2% had three or more; that is to say, almost 60% of working women sampled are childless. Sixty-five percent live with a partner. Regarding education level, 28% only completed primary school, 21% only completed secondary school and 51% completed university. The women in the sample have an average of 13 years of work experience and almost six years in their current position. Nine percent work part-time, 73% work in the private sector, 72% have a permanent contract and 9% are self-employed. Sixty percent of the female workers say their job requires less education than they actually have. The average number of hours devoted to child-care is 14.2 per week, while the care of other adults takes less than one hour a week.

When comparing average values between mothers and non-mothers, the main differences observed in Table 2 are related to demographic and human capital variables. Thus, mothers are, on average, three years older than non-mothers, and most of them live with a partner, have almost four years more work experience and eighteen months more seniority. If age, experience and tenure are expected to be remunerated, then mothers should receive higher wages than non-mothers, which partially explains the average higher wage of the former. Additional factors explaining higher hourly wages for mothers are that they are more likely to be enrolled in the public sector, with permanent and part-time contracts (which pay higher hourly wages), in skilled or manual jobs, or in the service sectors. Furthermore, non-wage income of mothers is higher than that of non-mothers (probably due to transfers from the government). By contrast, non-mothers have a higher level of education, since half of them have a university degree, and work two hours more per week than mothers. Finally, non-mothers obtain higher family income, their household size is smaller, and they devote fewer hours to childcare.

The Model Specification and the Empirical Results

Empirical Specification

Using the traditional model of human capital (Mincer, 1974), the wage equation for women takes the following form:

$$\ln \omega_{it} = \mu + \beta z_{it} + \alpha_i + u_{it} \quad i = 1, \dots, N \quad t = 1, \dots, T \quad (1)$$

where the vector of parameters β corresponds to the set of explanatory variables z_{it} . μ and α_i are constant terms, with the first representing the average population, and the second, the individual deviation from this average. When pool estimation is carried out, α_i is assumed to be zero, whereas in the panel estimation, α_i is specific to each woman in the sample. Finally,

u_{it} represents the error terms assumed to be independent, with a null average and a constant variance.

Estimation Procedure

After an initial estimation of the regression equation (1) in pool form by Ordinary Least Squares (OLS), we use the panel structure of available information to carry out a second set of regressions using an estimator of fixed-effects. We choose this particular method since the relevant variables, whose coefficients we wish to estimate in a consistent way, correspond to the number of children of the working woman. The fact of having children, as well as their number, can be related to individual unobserved characteristics of the female worker (i.e. preference for a professional career, a desire to be a mother, etc.), and thus we must consider an estimator of fixed-effects, which gives consistent estimations, even under the hypothesis of correlation between individual and unobserved effects.

In both pool and panel estimations, we propose a sequential process, progressively including new explanatory variables. We begin by considering, in addition to the variables related to having children, a series of fixed time and regional effects, as well as the *Marital Status* of the female worker. This would be only a rough measure of the wage penalty, since only demographic variables are included. The results from this estimation capture the information coming from the raw data shown in Tables 1 and 2. In the second stage of the estimation, the set of variables related to human capital is added (*Education, Experience, Seniority, Over-education and Age*).⁹ In this way, we take into account the possibility of differences in education and in experience between mothers and non-mothers. In the third phase, additional factors are included which give information about the job characteristics of the position held by the women surveyed (*Occupation, Activity, Company Size, Part Time, Contract Type, Sector, Self-employment*). Thus, the possibility of mothers choosing more appropriate jobs is explicitly controlled for. We add to the set of factors variables that attempt

to collect characteristics related to resources, both monetary and human, in the home (*Child-care, Elder-care, Household Size, Non-wage Income, Family Income*). Thus, we consider that households can differ between mothers and non-mothers because of their composition, and the resources available to them, which may indicate how decisions of women about the hours they work, or the wage they earn in a specific job, can be influenced by these resource-related variables.

It should be noted that in the available statistical data base there is no way of knowing if the female worker who has given birth has taken maternity leave or not, nor do we know the amount of time she has taken, or whether she has extended it. Therefore, this possibility is not considered in our study. Nevertheless, given the existing legislation in Spain (a period of 16 weeks absence from work compensated at a rate of 100% of her previous wage), the usual case is that mothers use up their maternity leave, especially if they work in the public sector, or have a permanent contract.¹⁰

Empirical Results

The results from the pool estimation related to the variables of special interest to this study, *Number of Children* and *Birth*, are shown in Table 3, while the other exogenous variables appear in Table A of the Appendix.¹¹ Significant evidence of wage penalty is only obtained when controls related to human capital and the workplace are included (see column 3), quantifying the penalty as 3% for two children. When the *Birth* variable is used, the wage penalty is somewhat higher, at 6%. With respect to the other exogenous variables (see Table A), we confirm in this pool estimation that the fixed regional effects, as well as the *Marital Status* variable, are not significant. Wage premiums exist for higher education, broader experience, and greater seniority. *Occupation*, as well as the sector of *Activity* and *Company Size*, are significant variables in determining the wage per hour of the female worker. Also significant are the *Part Time*, *Contract Type* and *Sector* variables. Regarding the variables

dealing with resources, only a greater *Non-wage Income* has a negative effect on the wage level, while the other variables are not significant.

(Table 3)

Based on these results, it seems that weak evidence for the motherhood wage penalty is found. Raw data displaying the wage premium for mothers have been imperceptibly modified by the pool estimation, which shows slightly higher wages for non-mothers, after controlling for human capital and job related characteristics. Compared with the international literature, the case of Spanish working mothers would be very close to that of the Scandinavian countries. However, these initial results must be treated with caution, since we are not including a relevant factor related to both the wages of working women, and the fact of having children, that is to say, the existence of unobserved characteristics. As stated earlier, this can be a source of an observed wage penalty and, consequently, it must be controlled for. In this sense, the ECHP is extremely useful since it permits us to control the influence of these variables.

The results of the panel estimation of fixed-effects, presented in Table 4, show evidence of a motherhood wage penalty in Spain. In directly comparing Tables 3 and 4, we observe that the estimated coefficient of the variable of children is always more negative and more significant when it is estimated with panel data, with this being a first important finding in our study. The empirical evidence of fixed-effects, given that the Lagrange Multiplier (LM) rejects the hypothesis that all individual effects are equal and therefore a strong individual heterogeneity exists, indicates to us that, in fact, the wage penalty does exist in Spain for female workers who have children. Thus, the wage penalty suffered by working mothers is masked in the raw data by the existence of some characteristics of mothers, some observed and others not, that cause them to be perceived as receiving a higher wage than women without children. That is, by controlling for unobserved characteristics of women, we detect

that mothers tend to earn less than non-mothers. In this sense, mothers are rewarded more for the unobserved characteristics (skill, desire to work, effort and concern for completion of tasks, etc.), which results in higher wages.¹²

(Table 4)

As for the observed characteristics, when a comparison is now made, within Table 4, column by column, we observe that in the most simple specification, with none of the controls, signs of the wage penalty are only found when the woman has three or more children, although the fact of having a birth in the family carries with it an 8% wage loss. From a comparison with the estimates in column 1 of Table 3 and the figures in Table 1, it can be deduced that mothers are rewarded more due to observed and unobserved characteristics. Once the latter are taken into account through time-invariant individual fixed effects, we can investigate the extent of the influence of the observed characteristics, which are entered in groups. Thus, by controlling for the variables related to human capital, the penalty extends to any number of children, progressively increasing from 5% with just one child, to more than 20% when there are three or more children. Accordingly, when there is a birth in the family, the woman loses 9% of her wage relative to not having a child, with this being interpreted as a rough average of the coefficients of *Number of Children*. This shows that, on average, mothers accumulate more human capital than non-mothers, and they are compensated appropriately. This becomes more evident when variables describing the job are included. Thus, the fact that there is a birth in the family during the current year means that the woman loses 9% of her wage, compared to there not having been a birth. Also, it can be interpreted as mothers working at firms who pay higher wages than those employing non-mothers. Additionally, having one child living in the household means a significant loss in wages of 6%, having two children, almost 14% and having three or more, more than 15%.

The addition of variables describing family resources diminishes somewhat the existence of the motherhood wage penalty, with this being discussed below in more detail.

One final noteworthy result is that, as we progressively include controls, the motherhood wage penalty becomes more apparent, showing that mothers tend to allocate themselves to better paid jobs or, alternatively, that women with better paid jobs are more likely to become mothers. This is opposite to the case of the US (see Budig & England, 2001; Anderson, Binder & Krause 2003), in which the motherhood wage penalty progressively decreases as controls are introduced in the estimation. This indicates that, in the US, the raw data show a clear penalty for working mothers, which decreases as additional characteristics are controlled for.

Discussion

Taken together, our results show that some characteristics of Spanish mothers, their level of accumulation of human capital, and the qualities of their job, allow them to receive higher wages, thus masking any wage penalty. In other words, in the case of two women with the same education level and job attributes, one being a mother and the other not, the first would receive a lower wage. Consequently, two conclusions can be immediately stated. First, mothers are not looking for more child-compatible jobs in exchange for lower wages. Rather, the opposite seems to hold. Mothers are enrolled in jobs in which they can get higher wages. Second, the remaining explanations for the un-revealed wage penalty in Spain rely either on some kind of wage discrimination, statistical or not, against mothers, or on the fact that mothers exert less effort at work than non-mothers. The impossibility of obtaining information about these two circumstances makes testing for them fruitless, and so they should be considered simple conjectures. In this context, if we believe that discrimination

underlies the observed wage penalty, it may be interpreted as a specific feature of a probable Mediterranean model, as suggested by many authors, according to which, mothers' employment has been traditionally discouraged, and only in very recent years has women's participation begun to increase. This accords with the existence of a traditional sexual division of paid and unpaid work, especially care and housework, in the Mediterranean countries. Only in recent years has this changed, allowing for an increase in women's participation rates that has, however, not ignored the fact that childcare and elder care are still primarily provided by women (see García, Molina & Montuenga, 2008a, 2008b).

Nevertheless, one final possibility is that causation is acting in the opposite way. That is, women earning more are the ones who decide to have children. Some of the results so far observed support this view. First, when fixed effects are included, the wage penalty becomes clear. Second, we have seen that mothers enjoy greater accumulation of human capital, and tend to opt for jobs which allow them to obtain higher wages. Furthermore, and just as in the case of the pool estimation, when the variables related to the existing resources in the home are introduced, the wage penalty is considerably reduced (see columns 4 and 8). However, this cannot be interpreted as an indication of a reduction of the wage penalty. Rather, it indicates that the family group compensates in large measure for the lost wages resulting from having a child. In particular, the importance of the *Non-wage Income* variable leads us to conclude that the distribution of alternate sources of income is related to a lower wage per hour, which can be interpreted as that those who have more financial support out-of-work can afford to have a child. Again, this could be associated with a special welfare state characterized by the existence of maternity benefits only for working women, and with reduced benefits in the case of child-care. Both are typical of the Mediterranean typology, as is the relevance of the family as a form of protection against labor risks. This suggests that, while benefits for parenthood, motherhood and childcare are not as extensive as in the

conservative or social democratic countries, policies enhancing the role of the family as the economic center should be implemented, since the family is a significant secondary provider of welfare to the individual.

In conclusion, despite our approach being limited to some extent by the fact that we consider only working women, and that having children is usually planned and, therefore, endogenous, our fixed-effects estimations effectively show the existence of the motherhood wage penalty in Spain, in particular, 9% if there is a birth in the family during the current year; 6% if having one child living in the household, almost 14% if having two, and more than 15% if having three or more. These figures are comparable to the Anglo-Saxon countries and greater than those of the Continental European countries. Thus, our analysis presents new empirical evidence for a Mediterranean country, illustrating some clear differences with the results observed in the literature for countries classified in the other well-established welfare state regime types. These results can be useful for future research investigating the emergence of a new welfare regime type, the Mediterranean or Latin rim, in which Spain can be interpreted as a paradigm.

Notes

1. Other penalties derived from motherhood from a family perspective include the clear trade-off between work and childcare (e.g., Cohen & Bianchi, 1999; Perry-Jenkins, Repetti & Crouter, 2000; Abrams & Goldscheider, 2002; Craig, 2007), and limitations in the access to managerial and academic occupations (e.g., Polacheck, 1981; England, 1982; Finkel & Olswang, 1996; Elliot, 2003; Edwards, 2005; Comer and Stites-Doe, 2006), although governments and social agencies try to minimize the effects of all these penalties (e.g. Baum, 2003; Berger & Waldfogel, 2004; Berger, Hill & Waldfogel, 2005; Livermone and Powers, 2006).
2. Sigle-Rushton & Waldfogel (2007a,b) analyse lifecycle earnings, according to which the largest differences in earnings are observed in countries like The Netherlands and

Germany, and the smallest in Scandinavia, with the US and the United Kingdom situated in an intermediate position. The explanation for a different ordering in “short run” wages, compared to “lifetime” earnings, relies on both the longer periods out-of-work by mothers, and on the higher protection that non-employed women receive in the Central European countries, compared to those living in Anglo-American countries.

3. Other international evidence on gender wage differences appears in Firestone, Harris & Lambert (1999), Swanberg (2005) and Urban & Olson (2005).
4. We thank one anonymous referee for calling our attention to this matter.
5. We here briefly outline Spanish social policies regarding maternity. Specifically, the rights recognised for maternity and child-care in Spain are fundamentally regulated by articles 46 and 48 of the Workers’ Statute. Maternity leave gives the right to 16 weeks away from work, immediately before or after the birth, paid for by the National Health System in the amount of 100% of the last wage. Subsequent to this leave, the mother is entitled to return to her job, maintaining her seniority. This leave can be shared with the father, although with certain restrictions: the first six weeks are exclusively for the mother and the rest of the time can be shared, although not simultaneously. An exception is made for cases of international adoption, only when the mother expressly gives up part of her leave. In addition, it is possible for either the mother or the father to take an optional leave for child-care, available from the end of the maternity leave to a maximum of 36 months. Although this is not paid, during this optional leave the same job is reserved during the first year and within the same professional group thereafter. There also exists a paternity leave that gives the father two additional weeks. The period of maternity leave in Spain is around the average for Europe, although the percentage of payment is among the highest. The leave for child-care in other European countries is often paid, although it is of much shorter duration. On the other hand, publicly-financed kindergartens are rare in the 0-3 year-old range, but quite common in the 3-5 range. Higher education, including university, is fully subsidized.
6. Similar evidence for several OECD countries is found in Harkness and Waldfogel (2003).

7. Given the fact that the existence of children at home can affect the number of hours a woman works, we prefer to present the variable that collects pay data in terms of wage per hour rather than annual or monthly earnings.
8. The correction of the selection bias in a framework of panel data is currently subject to some debate. In spite of the existence of interesting proposals, Kyriazidou (1997) or Wooldridge (1995), there is no unanimity regarding the most suitable approach for its application (see Dustman & Rochina-Barrachina, 2007; Jensen, Rosholm & Verner, 2002; Wooldridge, 2002).
9. The variables *Age* and *Experience* are introduced in squared terms to allow for the possibility of decreasing returns over time.
10. This situation could be different in the case of self-employed women or those who work with a temporary or a fixed-term contract, but there is no available data to test this possibility.
11. With respect to these variables of having children, the number of children at home younger than 14 was also considered, although the results are not presented given the fact that they do not substantially change with respect to those obtained using the two initial indicators. In addition, we have introduced the two original measures simultaneously in order to control for the influence of having children in the period under study. The combined effect of both measures is similar to that obtained in Tables 3 and 4.
12. Alternatively, one could think in terms of inverse causality, in the sense that the women who earn more money are those who decide to have children. That is to say, there would exist a double causation between wages and having children. In this case, the advisable thing would be to estimate with variables instrumental for those related to having children. Nevertheless, this is hard to achieve given the difficulty of finding suitable instruments for these variables. By ignoring the possible endogeneity of the variable of children, the individual fixed-effects may reflect the existing correlation between the disturbances and the variables, thus underlining the importance of this inverse causal relationship.

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TABLE 1
Women's earnings and wages expressed as a percentage of men's for different categories
(ECHP-2001)

Earnings	Total	Full Time	Private Sector	Public Sector	Permanent Contract	Temporary Contract	Salaried	Married	Single
All Women	77.0	85.4	75.6	91.3	84.7	83.9	84.5	71.6	98.8
Women with children	77.3	82.0	71.4	95.1	86.1	70.6	84.9	73.4	77.6
Women without children	76.8	79.5	78.4	87.6	83.5	90.6	84.3	70.0	102.0

Wages	Total	Full Time	Private Sector	Public Sector	Permanent Contract	Temporary Contract	Salaried	Married	Single
All Women	90.8	93.2	88.3	96.9	94.4	88.1	92.7	87.8	103.0
Women with children	94.4	91.9	88.0	100.1	97.8	82.6	95.7	92.3	91.3
Women without children	89.2	95.3	88.5	94.0	91.7	93.4	90.5	84.3	105.1

Notes: 2,775 men and 1,396 women of which 959 do not have children and 437 do.

TABLE 2
Definition of variables and characteristics of sample group (ECHP-2001)

Variable	Definition	Women	Mothers	Non mothers
Wage	Log of wage per hour deflated by RPI. It is computed from <i>Wage Income</i> and <i>Hours</i> (see below).	5.146 (0.540)	5.172 (0.544)	5.127 (0.538)
Birth	Qualitative variable indicating if there has been a birth in the household during the year in course.	0.055 (0.23)	0.132 (0.34)	—
Number of Children	Expresses number of children in the household. Child 0: No children. Reference category. Child1: There is one	0.262 (0.44)	0.623 (0.48)	—
	Child2: There are two	0.139 (0.35)	0.332 (0.47)	—
	Child3: There are three or more	0.018 (0.13)	0.044 (0.20)	—
Child14	Expresses number of persons under the age of 14 in the household.	0.596 (0.79)	1.421 (0.58)	—
Age	Age of woman	33.95 (5.92)	35.60 (5.08)	32.76 (6.20)
Marital Status	Has value 1 if the woman lives with a partner and 0 in other cases.	0.65 (0.48)	0.87 (0.33)	0.42 (0.49)
Education	Expresses the highest level of studies completed. There are three levels. Educ1: primary level (Basic education or less). Reference category	0.28 (0.45)	0.33 (0.47)	0.24 (0.43)
	Educ2: secondary level (secondary education, Baccalaureat or vocational training)	0.21 (0.41)	0.19 (0.39)	0.22 (0.42)
	Educ3: highest level, corresponding to university.	0.51 (0.50)	0.47 (0.50)	0.54 (0.50)
Experience	Calculated as difference between present age and the age at which the worker began her worklife on a permanent basis.	13.07 (8.06)	15.27 (7.38)	11.48 (8.16)
Seniority	Calculated as the number of years since the interviewee began to work for her present employer or business. 4 levels of seniority are considered: the reference category, Seniority 1, without experience; Seniority2, indicates less than 3 years' experience; Seniority 3, indicates between 3 and 10 years' experience; and, Seniority 4, more than 10 years' experience.	5.48 (6.17)	6.41 (6.32)	4.81 (5.98)
Over-education	A qualitative variable having the value of 1 if the worker considers that her education would allow her to have a more highly qualified job	0.62 (0.48)	0.57 (0.50)	0.66 (0.47)
Child-care	Expresses the number of hours per week that the interviewee devotes to childcare.	17.17 (24.15)	39.16 (22.12)	1.26 (6.94)
Elder-care	Expresses the number of hours per week that the interviewee devotes to adult care.	0.76 (5.17)	0.48 (3.49)	.96 (6.,10)
Hours	Number of working hours per week	39.01 (9.10)	37.74 (9.04)	39.94 (9.03)
Wage Income	Represents the income obtained by the worker from her work activity. This variable and the next two are expressed in millions of pesetas in 1992	1.873 (1.39)	1.876 (1.15)	1.870 (1.54)
Non-wage Income	Expresses income obtained by the worker apart from her wage.	0.055 (0.15)	0.059 (0.18)	0.048 (0.11)
Family Income	Represents the amount of income obtained by the worker's family. This is calculated by subtracting the total worker's income (wage and non wage) from that of her family.	1.892 (1.59)	1.799 (1.11)	1.969 (1.90)
Household Size	Expresses the number of adults (over 14) there are in the household not counting the woman.	3.33 (1.35)	3.86 (0.96)	2.95 (1.45)
Part Time	Qualitative variable with a value of 1 if the worker is not full time (that	0.09	0.13	0.07

	is, less than 30 hours a week)	(0.29)	(0.34)	(0.25)
Sector	Qualitative variable with a value of 1 if the woman works in the private sector, and 0 if she works in the public sector.	0.73 (0.44)	0.68 (0.47)	0.76 (0.42)
Occupation	There are nine occupation categories in accordance with the National Occupation Classification to one digit.			
	Ocup1. Management in companies or in the public administration. Reference category.	0.05 (0.21)	0.06 (0.24)	0.04 (0.19)
	Ocup2. Technicians and scientific and intellectual professionals	0.20 (0.40)	0.21 (0.40)	0.19 (0.40)
	Ocup3. Technicians and support professionals	0,09 (0,29)	0,07 (0,26)	0,11 (0,39)
	Ocup4. Administrative employees	0.18 (0.38)	0.16 (0.37)	0.19 (0.39)
	Ocup5. Workers in the hotel and catering, personnel, security and commercial sales services	0.02 (0.14)	0.02 (0.14)	0.02 (0.14)
	Ocup6. Qualified workers in agriculture and fishing	0.05 (0.22)	0.05 (0.21)	0.06 (0.23)
	Ocup7. Craftsmen and qualified workers in the manufacturing industries, construction and mining, except machine and installations operators; qualified workers in the extraction industries, metallurgy, machine construction and similar; qualified workers in the graphic arts, textiles and clothing, food manufacture, cabinetmakers, craftsmen and similar.	0.04 (0.18)	0.02 (0.13)	0.05 (0.21)
	Ocup8. Machine and installations operators and fitters, mobile machinery drivers and operators.	0.14 (0.35)	0.20 (0.40)	0.11 (0.31)
	Ocup9. non skilled workers	0.23	0.21	0.27
Activity	There are three possibilities: agriculture, industry, services. No further categorisation is possible as the response classified according to the NACE 2 figures is blank in the Panel response files.			
	Activity1: Agriculture	0.04 (0.18)	0.05 (0.21)	0.03 (0.16)
	Activity2: Industry	0.15 (0.36)	0.12 (0.32)	0.18 (0.38)
	Activity3: Services	0.81 (0.39)	0.83 (0.37)	0.79 (0.40)
Company Size	Expresses the size of the establishment worked in. Size0: Companies with no workers. This is the reference category Size1: Companies with between 1 and 4 workers	0.30 (0.46)	0.29 (0.45)	0.32 (0.46)
	Size2: Companies with between 5 and 19 workers	0.22 (0.41)	0.21 (0.40)	0.23 (0.42)
	Size3: Companies with between 20 and 49 workers	0.14 (0.35)	0.15 (0.36)	0.13 (0.34)
	Size 4: Companies with more than 50 workers.	0.33 (0.10)	0.25 (0.10)	0.32 (0.10)
Contract Type	Qualitative variable with a value of 1 if the woman has a permanent contract. The duration of contract variable has not been included given that 80% of those polled did not indicate this.	0.72 (0.45)	0.77 (0.42)	0.68 (0.47)
Self-employment	Qualitative variable with a value of 1 if the worker is self employed.	0.09 (0.29)	0.09 (0.29)	0.09 (0.29)
Region	Fixed effects for each of the 7 regions in the NUTS 1 classification			
Cycle	Fixed time effects for each one of the waves of the panel.			
Number of individuals		917 469	385 214	532° 255

Note: Standard deviations in brackets

TABLE 3
Pool estimation

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Child1	0.015 (0.74)	0.003 (0.02)	-0.016 (-1.14)	-0.012 (-0.52)	—	—	—	—
Child2	0.038 (1.59)	-0.009 (-0.42)	-0.035* (-2.05)	-0.034 (-1.23)	—	—	—	—
Child3+	0.021 (0.40)	0.005 (0.11)	0.026 (0.72)	0.001 (0.54)	—	—	—	—
Birth	—	—	—	—	0.055 (1.31)	-0.030 (-0.83)	-0.061** (-2.42)	-0.004 (-0.12)
Human Capital	—	X	X	X	—	X	X	X
Job Resources	—	—	X	X	—	—	X	X
	—	—	—	X	—	—	—	X
N	5963	5864	4448	2294	5963	5864	4448	2294
R ²	0.178	0.387	0.578	0.603	0.175	0.388	0.578	0.603

Note: t-ratios in brackets. * significant to 5%, ** significant to 1%.

- (1) Baseline estimation
- (2) Human capital-related variables added
- (3) Job-related variables added
- (4) Resources-related variables added.

TABLE 4
Fixed-effects Estimation

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Child1	-0.026 (-1.10)	-0.052* (-2.15)	-0.063** (-3.33)	-0.035 (-1.18)	—	—	—	—
Child2	-0.053 (-1.62)	-0.104** (-3.07)	-0.137** (-5.00)	-0.112** (-2.70)	—	—	—	—
Child3+	-0.155* (-2.35)	-0.209** (-3.16)	-0.151** (-2.59)	-0.152* (-1.90)	—	—	—	—
Birth	—	—	—	—	-0.081** (-2.85)	-0.091** (-3.22)	-0.090** (-4.54)	-0.041 (-1.36)
Human Capital	—	X	X	X	—	X	X	X
Job Resources	—	—	X	X	—	—	X	X
	—	—	—	X	—	—	—	X
N	1925	1907	1544	805	1925	1907	1544	805
R ²	0.200	0.231	0.299	0.332	0.200	0.230	0.298	0.329
LM	2,824.54 (0.0000)	1,214.41 (0.0000)	501.76 (0.0000)	21,543 (0.0000)	2,847.89 (0.0000)	1,220.99 (0.0000)	501.65 (0.0000)	214.38 (0.0000)

Note: t-ratios in brackets. * significant to 5%, ** significant to 1%. Same as to Table 3.

Note: The LM contrast, is, in fact, applied to the random effects estimation to verify whether the variant in individual effects is equal to zero or not. Given that there is a high number of individual effects, this verification is much simpler to apply than a test on the fixed effects

Appendix

TABLE A
Complete estimations

	Pool	Fixed-effects	Pool	Fixed-effects
Child1	-0.012 (-0.52)	-0.035 (-1.18)		
Child2	-0.034 (-1.23)	-0.111 (-2.70)		
Child3	0.001 (0.02)	-0.151 (-1.90)		
Birth			-0.004 (-0.12)	-0.041 (-1.36)
Marital Stat	0.001 (0.06)	-0.036 (-1.01)	-0.003 (-0.17)	-0.033 (-0.93)
Educ1				
Educ2	0.070** (3.15)	0.009 (0.28)	0.069** (3.11)	0.009 (0.27)
Educ3	0.144** (5.75)	0.048 (1.,15)	0.144** (5.74)	0.051 (1.22)
Experience	0.014** (3.,46)	-0.000 (-0.03)	0.013** (3.41)	-0.000 (-0.01)
Experienc2	-0.047** (-3.43)	0.007 (0.18)	-0.046** (-3.38)	0.012 (0.29)
Senior1				
Senior2	0.191** (8.09)	0.232** (9.91)	0.191** (8.09)	0.235** (10.01)
Senior3	0.268** (11.14)	0.176** (5.,74)	0.269** (11.14)	0.181** (5.88)
Senior4	0.309** (10.74)	0.116** (2.,61)	0.309** (10.75)	0.116** (2.60)
Age	-0.009(-0.48)	0.058 (1.,46)	-0.012 (-0.62)	0.041 (1.04)
Age2	0.032 (1.12)	-0.208** (-3.73)	0.036 (1.26)	-0.18** (-3.37)
Over-educ.	0.021 (1.38)	-0.001 (-0.08)	0.021 (1.39)	-0.000 (-0.02)
Activity1				
Activity2	0.236** (3,69)	-0.096 (-0.96)	0.241** (3.77)	-0.098 (-0.99)
Activity3	0.255** (4.25)	-0.042 (-0.42)	0.258** (4.30)	-0.050 (-0.49)
Size2	-0,024 (-1,11)	-0,026 (-1,00)	-0,024 (-1,13)	-0,025 (-1,97)
Size3	0.047* (2.01)	-0.006 (-0.24)	0.047* (2.02)	-0.009 (-0.33)
Size4	0.074 ** (3.98)	-0.045 (-1.97)	0.075** (3.98)	-0.048* (-2.08)
Part Time	0.182** (7.98)	0.239** (8.27)	0.182** (8.01)	0.239** (8.27)
Sector	-0.108** (-6.03)	0.021 (0.60)	-0.108** (-6.03)	0.022 (0.61)
Permanent	0.096** (4.80)	-0.048* (-2.11)	0.096** (4.83)	-0.046* (-2.03)
Child care	0.000 (0.59)	0.000 (0.58)	0.000 (0.05)	0.000 (0.39)
Elderly care	0.001 (0.97)	-0.000 (-0.42)	0.001 (0.98)	-0.000 (-0.33)
Household size	-0.009 (-1.32)	-0.002 (-0.21)	-0.008 (-1.25)	0.004 (0.39)
Non-wage income	-0.198** (-4.36)	-0.279** (-6.40)	-0.195** (-4.20)	-0.269** (-5.98)
Family income	0.021** (4.48)	0.007 (0.83)	0.020** (4.48)	0.006 (0.66)
Occupation	yes	Yes	yes	yes
RFE	yes	Yes	yes	yes
TFE	yes	No	yes	no
Constant	5.093** (15.37)	5.829** (8.80)	5.134** (15.61)	6.089** (9.33)
N	2,294	2,294	2,294	2,294
R ²	0.61	805 groups	0.61	805 groups

Note: t-ratios in brackets. * significant to 5%, ** significant to 1%. Occupation means the 9 dummy variables. RFE means regional fixed effects. TFE means time fixed effects. Yes stands for they are included in the regression.