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THE MOTHERHOOD WAGE PENALTY AND ITS DETERMINANTS: A PUBLIC-PRIVATE COMPARISON

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ABSTRACT

In this paper, we investigate whether public and private sector employees bear a different wage penalty from having children. Using data from the *Families and Employers* survey, we are able to address three potential biases: self-selection into employment, self-selection into sectors, and unobserved heterogeneity. We find that mothers of two or more children suffer from a much larger penalty when they work in the private sector. In addition, in both sectors, we find no unexplained penalty once we control for all the potential determinants of the family pay gap, namely, a reduced labour supply of mothers, child-related career interruptions, less access to management positions, and adjustments in working conditions. However, these factors play different roles in explaining the motherhood penalty in each sector; most notably, child-related career interruptions are much more harmful in the private sector than in the public sector.

Keywords: motherhood wage penalty, public-private comparison, child-related career interruptions.

JEL Classification: J13, J31, L33

Effet de la maternité sur la rémunération des mères et facteurs explicatifs : une comparaison public/privé

Résumé

L'objectif de cet article est de comparer l'effet de la maternité sur la rémunération des femmes selon qu'elles appartiennent au secteur public ou au secteur privé. En mobilisant les données issues de l'enquête Familles et Employeurs réalisée par l'Ined-Insee en 2004-2005 et en tenant compte des effets de sélection résultant non seulement du choix du secteur mais également de l'auto-sélection dans l'emploi ainsi que de l'hétérogénéité inobservée, nous montrons que la présence de deux enfants ou plus est davantage pénalisée dans le secteur privé que dans le secteur public. Néanmoins, au sein des deux secteurs, cette pénalité totale disparaît dès lors que sont pris en compte ses différents facteurs potentiellement explicatifs : réduction de l'offre de travail des mères, interruptions de carrière, moindre accès à des postes à responsabilités et ajustements des conditions de travail. Cependant, l'importance respective de ces différents facteurs explicatifs diffère entre les secteurs public et privé, avec notamment des interruptions de carrière bien plus pénalisantes pour les mères du privé que pour les mères fonctionnaires.

Mots-clefs : *maternité, rémunération, comparaison public/privé.*

INTRODUCTION¹

In France, women are overrepresented in the public sector and underrepresented in the private sector. For example, the annual report on the state of the public service (DGAFP, 2011) notes that women represented 59.8% of the public sector workforce but only 39% of all private sector employees in 2010. Lanfranchi and Narcy (2013) emphasise that the overrepresentation of women in the public sector arises, at least in part, from the greater number of family-friendly measures that the public sector provides. Among these measures, the following three practices are the greatest contributors to the feminisation of the public sector workforce: financial support for child care, systematic consideration of family life in adjusting to part-time work, and facilities for child care.

The greater number of family-friendly policies in the public sector likely explains why career transitions after the birth of a child differ between women in the public sector and women in the private sector. In particular, Pailhé and Solaz (2012) show that child-related career interruptions in France are much more frequent and longer lasting in the private sector than in the public sector. However, child-related career interruptions are widely recognised to have adverse effects on wages. As a consequence, the wage gap between mothers and women without children (the “family pay gap” or “motherhood penalty”) is likely to differ between the two sectors.

A large number of studies have estimated the “family pay gap”, but most of these studies do not distinguish the public and private sectors from one another. The vast majority of these studies agree that a motherhood wage penalty exists, although the size of this penalty varies across countries. For example, in the United States, a mother's hourly wage would be between 4 and 16% lower than that of a woman without children (Waldfogel, 1998; Lundberg and Rose, 2000; Anderson *et al.*, 2002; Gangl and Ziefle, 2009). The estimated motherhood penalty is often larger in Great Britain, where it ranges from 11 to 27% (Waldfogel, 1998; Gangl and Ziefle, 2009), and in Germany, where mothers earn wages approximately 16 to 26% lower than women without children (Beblo *et al.*, 2009; Gangl and Ziefle, 2009). In contrast, in Scandinavia, having children induces a much smaller wage penalty than doing so in the rest of Europe or in the United States. For example, in Denmark, the wage penalty for women with children is estimated to be between 5.7 and 6.5% (Simonsen and Skipper, 2006; 2012). To our knowledge, Davies and Pierre (2005) and Meurs *et al.* (2010) are the only studies that estimate whether a family pay gap exists in France. Compared with other countries, the wage penalty related to having children is lower in France. Indeed, according to Davies and Pierre (2005), mothers of one or two children do not earn lower wages than women without children, and the pay penalty for mothers of three children is estimated to be 10%. However, this penalty does not hold once unobserved heterogeneity is taken into account. According to Meurs *et al.* (2010), a motherhood penalty exists only for mothers who have interrupted their careers to take care of their children, with a one-year career interruption inducing an hourly wage penalty of approximately 2-2.5%.

Previous studies have not only estimated the family pay gap but also attempted to disentangle its determinants. Most analyses have highlighted that motherhood results in a wage loss because it leads a large number of mothers to interrupt their careers, which reduces human

¹ We would like to thank Thomas Brodaty for his insightful comments.

capital. More precisely, two phenomena can be distinguished. First, as experience is a major determinant of wages, career interruptions lead to a family pay gap because such interruptions reduce accumulated experience (Waldfogel, 1998; Budig and England, 2001; Datta Gupta and Smith, 2002; Gangl and Ziefle, 2009). Second, career interruptions may also induce depreciation of accumulated knowledge (Mincer and Polacheck, 1974). Thus, even when differences in actual experience are neutralised, career interruptions further reduce mothers' wages owing to human-capital depreciation (Phipps *et al.*, 2001; Kunze and Ejrnaes, 2004; Nielsen *et al.*, 2004, Buligescu *et al.*, 2009). In addition, to achieve a better work-family life balance, mothers sometimes adjust their working conditions following the birth of a child. Thus, mothers are frequently willing to trade off higher wages for job-related amenities, such as a flexible schedule, the ability to work from home, and no night work (compensating wage differentials theory) (Felfe, 2012). Furthermore, mothers who remain with the same employer after the birth of a child often experience a lower motherhood penalty (Waldfogel, 1998; Phipps *et al.*, 2001; Kunze and Ejrnaes, 2004). Indeed, mothers who change companies lose their job tenure and the firm-specific human capital that they have accumulated. Finally, the family pay gap may also arise from an employer's discriminatory behaviour.

The present study compares the size and determinants of the motherhood penalty in France between the public and private sectors. The novelty of this study is twofold. First, no study has investigated the effect of motherhood on women's wages in France by specifically distinguishing the public and private sectors. Yet, the results of previous studies that have estimated the family pay gap without distinguishing between the public and private sectors may hide large differences between the sectors. To our knowledge, this issue has only been investigated in Scandinavia by Albrecht *et al.* (1999), Datta Gupta and Smith (2000), Nielsen *et al.* (2004), and Simonsen and Skipper (2006). However, the results of these studies do not agree regarding whether the motherhood penalty is larger in the private sector than in the public sector. Second, none of the previously cited studies has attempted to disentangle why the motherhood penalty varies across the two sectors.

In a comparison of the effect of motherhood on women's wages between the public and private sectors, two major methodological issues should be addressed. First, estimating separate wage equations for each sector, and for a sample of working women, requires one to control for two types of selection effects: those arising from self-selection into sectors and those arising from self-selection into employment. Moreover, compared with mothers, women without children are likely to have better unobserved productive characteristics (*e.g.*, motivation, ambition, job involvement). Thus, controlling for such potential differences in unobserved characteristics is necessary to obtain consistent estimates of the family pay gap. Despite the cross-sectional nature of the data that we use, the richness of the survey enables us to address these two methodological issues.

To conduct the empirical analysis, we use the *Families and Employers* survey, which offers four major advantages. First, in contrast to many studies, we have data on households not merely on wage earners; thus, we can control for the self-selection of women into wage employment. Second, the survey poses a number of unusual questions that enable us to build an indicator of workers' job involvement/ambition and thus, to control for unobserved heterogeneity. Third, we have retrospective data on the entire professional career of every individual; thus, we can measure the duration of child-related career interruptions for every mother. Moreover, the respondents were asked to indicate whether they undertook a career transition following the birth of each child (and, if yes, what type of transition). Thus, contrary to many studies, we are able to unmistakably identify child-related career

interruptions. Fourth, we benefit from detailed data that enable us to investigate the effect of a high number of potential determinants of the family pay gap.

To take into account the self-selection of women into both employment and sectors, in a first step, we estimate a bivariate probit model with sample selection. In a second step, we estimate selectivity-corrected wage equations for the public and private sectors, and we take into account unobserved heterogeneity between mothers and women without children. We obtain the following four main results. First, we find no wage penalty associated with one child, namely, only mothers of two or more children experience a motherhood penalty. Second, the total wage penalty from having two or more children is much larger in the private sector than in the public sector. Third, in both sectors, we find no unexplained penalty once we control for all the potential determinants of the family pay gap, namely, a reduced labour supply of mothers, child-related career interruptions, less access to management positions, and adjustments in working conditions. However, these factors play a different role in explaining the motherhood penalty in each sector.

The remainder of this paper is organised as follows. Section 1 reviews the existing literature to highlight why the motherhood wage penalty might vary between the two sectors. Section 2 describes the methodology, and Section 3 describes the dataset and the variables used. Econometric results are analysed in Section 4, and Section 5 concludes.

1. WHY WOULD THE MOTHERHOOD WAGE PENALTY VARY BETWEEN THE PUBLIC AND PRIVATE SECTORS?

1.1. Theoretical explanations

The size of the motherhood penalty may differ across the public and private sectors for several reasons. According to most explanations, the wage penalty from having children is expected to be larger in the private sector than in the public sector, and this difference may explain why mothers are overrepresented in the public sector (Nielsen *et al.*, 2004).

First, the family pay gap mainly arises from child-related career interruptions (see Meurs *et al.* [2010] for France) that slow down human capital accumulation and lead to a depreciation of accumulated knowledge. Yet, in France, following the birth of a child, mothers in the private sector interrupt their careers much more frequently than mothers in the public sector (see Table 1). The difference between mothers in the two sectors increases with birth order: the gap increases by approximately 4 to 12 percentage points between the first and the third birth. Moreover, following the birth of their second and third children, women in the private sector interrupt their career for longer periods of time than mothers in the public sector; however, the difference is only significant for the second birth. Pailhé and Solaz (2012) confirm these differences, as they conclude that, all else being equal, child-related career interruptions are much more frequent and longer lasting in the private sector than in the public sector. This result can likely be explained by the greater number of family-friendly measures that characterise public sector employment compared with private sector employment (Lefèvre *et al.*, 2007; Lanfranchi and Narcy, 2013), such that mothers in the public sector are less likely to have to interrupt their working careers following the birth of a

child than mothers in the private sector². For example, public workers benefit from more child sick days, child-care facilities, and financial help for child care than private workers. Moreover, public workers can more easily adapt their working hours to fit the hours that they must spend raising their children.

Moreover, child-related career interruptions are likely to have less negative effects on mothers' wages in the public sector. In other words, even if mothers in the two sectors undertook exactly the same career transitions, the wage penalty from having children would be larger in the private sector than in the public sector. Indeed, in the public sector, wage progression mainly depends on seniority. As a result, and given that parental leave counts as actual working time for purposes of seniority, mothers who interrupt their careers should benefit from the same wage increases as women without children (Simonsen and Skipper, 2006). In contrast, in the private sector, where wage increases depend not only on seniority but also additional criteria (*e.g.*, performance, working hours), mothers who interrupt their careers are likely to benefit from lower wage increases than other women.

Moreover, in the public sector, where there are more family-friendly measures, working conditions are more adapted to mothers than those in the private sector: for example, working hours are more flexible, and workers are less constrained to work unscheduled overtime (Nielsen *et al.*, 2004). The working conditions in the public sector are thus more likely to help mothers to achieve a better work-family balance and to make mothers more productive than those in the private sector. Hence, as the "production technology" in the public sector is more adapted to mothers than that of the private sector, the productivity gap (and the wage gap) between mothers and women without children should be lower in the public sector than in the private sector.

In addition, because mothers benefit from a greater number of work/family life balance measures in the public sector, working mothers in the public sector may have greater access to management positions than mothers in the private sector. First, the availability of child-care facilities and of domestic services (*e.g.*, laundry and cleaning) makes it easier for mothers working in the public sector to free up time for their career and to meet the requirements for management positions³. Second, in addition to their effect on the labour supply of mothers, family-friendly measures can also affect employers' labour demand. For example, an employer who provides child-care facilities may be more apt to promote a mother to a management position, given that he knows that his employee will benefit from adequate facilities.

Finally, according to Nielsen *et al.* (2004), mothers may experience more discrimination in the private sector than in the public sector. Indeed, the wage indexation system in the public sector limits the possibilities of discriminating against mothers to a great extent. Moreover, given the duty of exemplarity of the public service, the public sector may aim to limit the potentially negative effects of motherhood on wages.

² Family-friendly measures (or work/family life balance measures) play a key role in keeping mothers employed. Indeed, a large segment of mothers who have interrupted their working careers following the birth of a child indicate that they would have liked to have continued working. According to these mothers, the lack of appropriate child-care facilities and the lack of a possibility to change working conditions prevented them from continuing working (Méda *et al.*, 2003).

³ A significant number of women indicate that the lack of adequate child-care facilities has prevented them from applying to management positions, which typically require high availability (Broadbridge, 2007).

Although the above arguments suggest that the motherhood penalty is lower in the public sector, other arguments suggest that the penalty would be larger in the public sector. In particular, certain types of family-friendly measures have a negative effect on mothers' wages (Glass, 2004). Thus, mothers who work in the public sector and who benefit from a greater number of family-friendly measures might unexpectedly experience a larger penalty than mothers in the private sector.

First, as part-time status is granted upon simple request in the public sector, a significantly greater number of civil servants switch to part-time work following the birth of a child than mothers in the private sector (see Table 1). For example, whereas only one mother in ten switches to part-time work following the birth of her second child in the private sector, one mother in five does so in the public sector. However, although the automatic assignment of part-time work enables mothers in the public sector to achieve a better work/family life balance and to interrupt their career less frequently, the shift to part-time work mechanically induces a substantial loss in purchasing power.

Moreover, working part time over a number of years may slow down mothers' wage progression, particularly in the public sector, where a larger share of mothers switch to part-time work after the birth of a child. Indeed, several studies have noted that workers who have been working part time during their career earn lower hourly wages when they return to full-time work than workers who have been continuously working full time because part-time workers accumulate less experience and have a lower probability of being promoted and undertaking professional training than full-time workers (Hirsch, 2005; Russo and Hassink, 2008; Nelen and de Grip, 2009).

In addition, certain types of family-friendly measures may have a particularly negative impact on mothers' access to management positions. For example, granting part-time work and allowing child sick days, which are more common practices in the public sector, are likely to lead mothers to work fewer hours and, in turn, to reduce their career prospects. In other words, some family-friendly measures may reinforce, rather than reduce, the "glass ceiling effect" in the public sector⁴.

Finally, according to Simonsen and Skipper (2006), in Denmark, mothers in the public sector have a much greater ability to adjust their working conditions following the birth of a child than mothers in the private sector. As a result, mothers in the public sector are more likely than mothers in the private sector to trade off working conditions that are often incompatible with family responsibilities (*e.g.*, working on nights or Sundays) for lower wages, as predicted by the theory of compensating wage differentials (Rosen, 1986). As a result, although these measures help to make work more compatible with family life, they lead to reduced hourly wages. However, job changes and adjustments in working conditions while remaining with the same employer are, on the whole, rare in France, and no significant difference exists between the two sectors. Indeed, only job changes that follow the birth of the first child are significantly more frequent in the private sector than in the public sector (see Table 1).

⁴ Thus, although mothers in the public sector benefit from more family-friendly measures than those in the private sector, this reasoning may explain why the "glass ceiling effect" is greater in the public sector than in the private sector in France (Albert, 2013).

Table 1. Career transitions of mothers the year following the birth of a child, according to sector (public or private)

	Private	Public	Diff.
Career transition			
Rank 1	25.2	18.7	6.5**
Rank 2	38.8	39.8	-1
Rank 3	59.2	54.9	4.3
<i>Of which:</i>			
(1) Career interruptions			
Rank 1	11.3	7.0	4.3**
Rank 2	22.6	14.0	8.6***
Rank 3	44.6	32.6	12.0*
Duration of career interruptions (in years)			
Rank 1	3.8 (4.7)	4.1 (3.8)	-0.3
Rank 2	2.7 (2.6)	1.8 (2.5)	0.9*
Rank 3	3.4 (3.2)	2.8 (2.4)	0.6
(2) Shift to part time			
Rank 1	4.1	5.7	-1.6
Rank 2	9.7	20.8	-11.1***
Rank 3	6.2	16.3	-10.1**
(3) Job change			
Rank 1	3.9	0.8	3.1***
Rank 2	1.2	0.8	0.4
Rank 3	2.3	1.1	1.2
(4) Change in position/working hours (same employer)			
Rank 1	5.1	4.9	0.2
Rank 2	4.3	3.0	1.3
Rank 3	3.8	4.3	-0.5

Source: Ined-Insee, *Families and Employers*, 2004-2005.

Field: Wage earner women before the birth.

Note: For the duration of child-related career interruptions, standard errors are reported in parentheses.

Reading: In all, 25.2% of women who were wage earners in the private sector before the birth of their first child indicate that they undertook a career transition the year following the birth of a child as a result of the birth. Among these women, 11.3% interrupted their career for an average of 3.5 years, and 4.1% switched to part-time work. Moreover, 3.9% indicated that they changed jobs, and 5.1% indicated that they changed positions or working hours while remaining with the same employer.

1.2. Results of previous studies

To our knowledge, only four studies have investigated whether the family pay gap varies between the public and private sectors: Albrecht *et al.* (1999) on Sweden and Datta Gupta and Smith (2000), Nielsen *et al.* (2004), and Simonsen and Skipper (2006) on Denmark. Although these studies indicate that the motherhood penalty differs between the two sectors,

they do not agree on whether the penalty is more severe in the private sector than in the public sector.

First, some of these studies conclude that the hourly wage penalty from having children is larger in the private sector than in the public sector. More precisely, mothers working in the public sector would benefit from a wage premium, whereas motherhood in the private sector would have negative or, at best, no effects on women's wages. Holding actual experience constant, Datta Gupta and Smith (2000) estimate that the number of children has a significantly positive effect on women's hourly wages in the public sector but no effect in the private sector. Nielsen *et al.* (2004) find that the hourly wage for mothers is 3% higher in the public sector but 6% lower in the private sector than that for women without children, all else being equal (particularly with child-related career interruptions held constant). Moreover, child-related career interruptions have a negative impact on hourly wages in the private sector but have no effect on hourly wages in the public sector. In other words, contrary to what occurs in the public sector, mothers in the private sector are penalised twice (owing to the negative impact of career interruptions and the direct effect of children).

However, Albrecht *et al.* (1999) provide more mixed results. According to these authors, when actual experience and career interruptions are held constant, having children has a positive impact on women's wages in the public sector but no effect in the private sector. However, they also find that maternal leave has a negative impact in the public sector but no effect in the private sector.

Finally, Simonsen and Skipper (2006) find, in contrast, that a motherhood penalty exists in both sectors and that the total penalty is larger in the public sector (-7.6%) than in the private sector (-6.4%). According to these authors, this result can mainly be explained by the different career transitions following the birth of a child between mothers in the public sector and those in private sectors: shifting to part-time work, changing jobs or positions to make work more compatible with family life, taking parental leave, and so forth. However, even when controlling for different possible career transitions, the authors find that having children has a significantly negative effect on women's wages in the public sector (-3.2%) but no effect in the private sector. According to the authors, the motherhood penalty is larger in the public sector than in the private sector because of the phenomenon of compensating wage differentials.

In sum, previous studies offer mixed evidence regarding the size of the motherhood penalty in the public sector compared with the private sector. The differences in results may arise, at least in part, from the different empirical methodologies used by previous studies. In estimations of the effects of motherhood on women's wages in the public and private sectors, three potential methodological problems may arise: self-selection of women into employment, self-selection of women into the public or private sector, and unobserved heterogeneity. Until now, however, no study has simultaneously addressed these three issues. For example, Albrecht *et al.* (1999) use panel data and estimate fixed-effects wage equations; thus, they can control for unobserved heterogeneity between mothers and women without children. However, these authors also estimate separate wage equations for the public and private sectors without taking into account potential selection effects (selection into employment and selection into sectors). Datta Gupta and Smith (2000) also estimate fixed-effects wage equations, but they also undertake a Heckman (1979) procedure to control for the potential selection of women into employment. Nonetheless, similar to Albrecht *et al.*, the authors do not control for the self-selection of women into one sector over the other. Using cross-sectional data, Nielsen *et al.* (2004) and Simonsen and Skipper (2006) account for mothers' self-selection into the public (or family-friendly) sector, but they do not control

for self-selection into employment and unobserved heterogeneity. However, these two studies also implement different empirical strategies. Indeed, whereas Nielsen *et al.* estimate an endogenous switching model, Simonsen and Skipper use a propensity score-matching method.

2. EMPIRICAL STRATEGY

2.1. A bivariate selectivity model

To compare the effect of having children on women's wages between the public and private sectors, previous studies have estimated separate wage equations for each sector (Albrecht *et al.*, 1999; Datta Gupta and Smith, 2000). Although this approach allows for the possibility that each worker faces an entirely different wage determination process according to the selected sector, it also assumes that workers randomly work in one sector rather than the other. Yet, this assumption is particularly restrictive and may lead to biased estimates given that women, and more particularly mothers, may self-select into the public sector, which offers more family-friendly practices than the private sector (Nielsen *et al.*, 2004; Lanfanchi and Narcy, 2013).

Moreover, the proportion of working women decreases as the number of children rises. According to the *Families and Employers* survey, approximately 83% of childless women work, whereas this proportion falls to 70 and 54.3% for women with two and three and more children, respectively. In addition, working mothers likely have better productive characteristics than nonworking mothers (Pailhé and Solaz, 2012). Consequently, to obtain unbiased estimates of the motherhood penalty, we must account for selection into both employment and sectors.

To estimate selectivity-corrected wage equations, we first must estimate a bivariate selectivity model (Tunali, 1986; Sorensen, 1989). First, women decide whether to work, and second, those who decide to work choose to work in the public or private sector. These two equations are written as follows:

$$I_{1,i}^* = \gamma_1' Z_{1,i} + \mu_{1,i} \quad (1)$$

$$I_{2,i}^* = \gamma_2' Z_{2,i} + \mu_{2,i} \quad (2)$$

Equation (1) is the participation equation of a women i , and Equation (2) is the sector choice equation that models the probability of working in the public sector rather than in the private sector. Vector $Z_{1,i}$ includes sociodemographic factors that influence the employment decision (*e.g.*, age, marital status, number of children). Vector $Z_{2,i}$ includes individual and job characteristics that influence expected wages in each sector and instrumental variables to identify the model. The error terms $\mu_{1,i}$ and $\mu_{2,i}$ are assumed to be normally distributed with zero mean and with a variance-covariance matrix as follows:

$$\Sigma = \begin{pmatrix} 1 & \rho \\ \rho & 1 \end{pmatrix}$$

$I_{1,i}^*$ and $I_{2,i}^*$ represent the additional level of utility derived from (i) being employed and (ii) working in the public sector rather than in the private sector, respectively. These are latent variables that cannot be observed. Only the following two dichotomous variables can be observed:

$$I_{1,i} = \begin{cases} 1 & \text{if } I_{1,i}^* > 0 \\ 0 & \text{if } I_{1,i}^* \leq 0 \end{cases} \quad (3)$$

$$I_{2,i} = \begin{cases} 1 & \text{if } I_{2,i}^* > 0 \\ 0 & \text{if } I_{2,i}^* \leq 0 \end{cases} \quad (4)$$

Equation (3) indicates whether woman i works ($I_{1,i} = 1$) or not ($I_{1,i} = 0$). Given that woman i works, equation (4) indicates whether she works in the public sector ($I_{2,i} = 1$) or in the private sector ($I_{2,i} = 0$). As a result, in the model, $I_{1,i}$ is observed for every women, whereas $I_{2,i}$ is only observed for working women, *i.e.*, for woman with $I_{1,i} = 1$. Thus, this model includes three mutually exclusive subsamples: S_1 , S_2 , and S_3 . S_1 comprises women who work in the public sector ($I_{1,i} = 1$ and $I_{2,i} = 1$). Women working in the private sector ($I_{1,i} = 1$ and $I_{2,i} = 0$) belong to S_2 , while women who do not work are in S_3 ($I_{1,i} = 0$).

The wage equation for women working in the public sector is written as follows:

$$\ln W_{pu,i} = \beta'_{pu} X_{pu,i} + \varepsilon_{pu,i} \quad \text{si } i \in S_1 \quad (5)$$

Similarly, the wage equation for women in the private sector is as follows:

$$\ln W_{p,i} = \beta'_p X_{p,i} + \varepsilon_{p,i} \quad \text{si } i \in S_2 \quad (6)$$

$\ln W_{pu,i}$ and $\ln W_{p,i}$ are the log of the monthly wage earned by woman i , in the public and private sectors, respectively. $X_{j,i}$ ($j = pu, p$) is a vector of individual and job characteristics that determines the log of the monthly wage. The error terms $\varepsilon_{pu,i}$ and $\varepsilon_{p,i}$ are assumed to be normally distributed with means of zero. Each error term of the selection equation, namely, $\varepsilon_{j,i}$ ($j = pu, p$), is assumed to be correlated with each error term of the selection equations, namely, $\mu_{k,i}$ ($k = 1, 2$), such as:

$$\text{cov}(\varepsilon_{j,i}, \mu_{k,i}) = \rho_{k,j}$$

For women who have chosen to work in the public sector, the expected value of the log monthly wage conditional on being employed is given by:

$$E(\ln W_{pu} | I_1 = 1, I_2 = 1) = \beta'_{pu} X_{pu} + E(\varepsilon_{pu} | I_1 = 1, I_2 = 1)$$

$$\begin{aligned}
 &= \beta'_{pu} X_{pu} + E(\varepsilon_{pu} | \mu_1 > -\gamma'_1 Z_1, \mu_2 > -\gamma'_2 Z_2) \\
 &= \beta'_{pu} X_{pu} + \sigma_{pu} \rho_{1,pu} \lambda^1_{pu} + \sigma_{pu} \rho_{2,pu} \lambda^2_{pu}
 \end{aligned} \tag{7}$$

For women who have chosen to work in the private sector, the expected wage is given by:

$$\begin{aligned}
 E(\ln W_p | I_1 = 1, I_2 = 0) &= \beta'_p X_p + E(\varepsilon_p | I_1 = 1, I_2 = 0) \\
 &= \beta'_p X_p + E(\varepsilon_p | \mu_1 > -\gamma'_1 Z_1, \mu_2 \leq -\gamma'_2 Z_2) \\
 &= \beta'_p X_p + \sigma_p \rho_{1,p} \lambda^1_p + \sigma_p \rho_{2,p} \lambda^2_p
 \end{aligned} \tag{8}$$

$$\begin{aligned}
 \text{With: } \lambda^1_{pu} &= \frac{\phi(\gamma'_1 Z_1) \Phi(C^{**})}{G(\gamma'_1 Z_1, \gamma'_2 Z_2; \rho)} \text{ and } \lambda^2_{pu} = \frac{\phi(\gamma'_2 Z_2) \Phi(C^*)}{G(\gamma'_1 Z_1, \gamma'_2 Z_2; \rho)} \\
 \lambda^1_p &= \frac{\phi(\gamma'_1 Z_1) \Phi(-C^{**})}{G(\gamma'_1 Z_1, -\gamma'_2 Z_2; -\rho)} \text{ and } \lambda^2_p = -\frac{\phi(\gamma'_1 Z_1) \Phi(C^{**})}{G(\gamma'_1 Z_1, -\gamma'_2 Z_2; -\rho)}
 \end{aligned}$$

Where:

$\Phi(\cdot)$ and $\phi(\cdot)$ are the standard normal distribution and density functions, respectively.

$G(\dots, \dots; \rho)$ denotes the bivariate standard normal distribution function with correlation coefficient $\pm \rho$.

$$C^* = \frac{\gamma'_1 Z_1 - \rho \gamma'_2 Z_2}{\sqrt{(1 - \rho^2)}} \text{ and } C^{**} = \frac{\gamma'_2 Z_2 - \rho \gamma'_1 Z_1}{\sqrt{(1 - \rho^2)}}$$

The model is estimated in two steps (Tunali, 1986). In the first step, the selection equations (1) and (2) are estimated by using a full information maximum likelihood function, which depends upon the bivariate normal distribution. This estimation gives consistent estimates of γ_1 , γ_2 , and ρ , which can then be used to compute the selection terms λ^1_{pu} , λ^2_{pu} , λ^1_p , and λ^2_p . In the second step, to take into account selection effects, the selection terms λ^1_{pu} and λ^2_{pu} are included in the wage equation for the public sector, and the selection terms λ^1_p and λ^2_p are included in the wage equation for the private sector.

2.2. Specifications of the wage equations: estimation of the “total” and “net” motherhood wage penalty and analysis of explanatory factors

In this study, we successively estimate various specifications of wage equations to compare not only the “total” motherhood wage penalty but also the “net” motherhood wage penalty between the public and private sectors.

The “total” motherhood wage penalty is obtained by estimating wage equations in which we only control for the wage determinants that are not affected by motherhood (specification 1). This “total” penalty thus corresponds to the total wage loss arising from having children. This wage loss may result from not only mothers’ voluntary professional choices (*e.g.*, shifting to part-time work) but also particular behaviour of employers towards their employed mothers (*e.g.*, less access to management positions).

The explanatory factors for the total motherhood wage penalty can be grouped into three main categories: a reduced labour supply of mothers, child-related career interruptions, and other explanatory factors commonly proposed in the literature (adjustments to working conditions and less access to management positions). Adding these different explanatory factors to the wage equations allows us to estimate the “net” motherhood wage penalty, *i.e.*, the wage gap between mothers and childless women that is likely to remain even after we control for the potential wage determinants that are affected by motherhood (specification 2).

Finally, to compare the determinants of the motherhood penalty between the public and private sectors, these three categories of factors are successively added to specification 1. For example, comparing the motherhood penalty obtained from model (specification) 1 with the motherhood penalty obtained when we control for labour supply variables enables us to isolate the share of the total penalty that arises from a reduced labour supply of mothers.

3. DATA

3.1. The *Families and Employers* survey

In this study, we use the *Families and Employers* survey conducted by Ined and Insee⁵ in 2004-2005. This nationally representative survey investigated 9,745 individuals between the ages of 20 and 49 years. To assess the impact of motherhood on women’s wages, we restrict the sample to women, regardless of whether they were working in 2004. Moreover, following Meurs *et al.* (2010), we exclude from our analysis casual workers (those working fewer than 10 hours per week) and individuals whose monthly wage is less than 260 euros (which corresponds to the minimum monthly wage for a 10-hour work week). We also exclude individuals from the sample who work more than 55 hours per week. Finally, we exclude individuals who are part-time workers but who nonetheless work more than 32 hours a week⁶ and those who are full-time workers but who nonetheless work fewer than 32 hours a week⁷. After eliminating these observations and individuals with missing information, our sample consists of 3,140 women. Among these women, 905 do not work (housewives, parental leave, or unemployed), 710 work in the public sector, and 1,525 work in the private sector. The public sector considered here includes state, community, and public hospital employees.

The *Families and Employers* survey offers four major advantages. First, even though we only have data on wages in 2004, we have retrospective information on the entire professional career of each woman since she was 18 years old. Indeed, every individual must indicate, for each year, whether she was involved in one of the following situations for at least six months: school, military service, inactivity, parental leave, unemployment, and employment (and, for employment, whether such employment was part-time or full-time work). Individuals also must indicate, for each year since they were 18 years old, whether they were

⁵ Ined is the French national institute for demographic studies, and Insee is the French national statistics institute.

⁶ The 32-hour threshold corresponds to the weekly working hours for the longest part-time employees (90% of normal hours).

⁷ Beforehand, we adjusted the weekly working hours for teachers who declare being full-time workers but who work less than 35 hours per week (statutory hours of work in France). Indeed, most teachers only declare their working hours to be the time that they spend teaching (27 hours for primary school teachers and 18 hours for other teachers). We set the working hours of these individuals to 35 hours.

involved in short-term employment, unemployment, or a remunerated internship (less than six months). Thus, the retrospective part of the survey enables us to calculate the level of actual experience of each individual.

Second, the survey contains detailed information regarding the career transitions that individuals have experienced following the birth of each of their children. Indeed, every surveyed individual must indicate whether, following the birth of a child, she experienced one of the following eight career transitions: change of job, change of position within the same company, timetable change while remaining at the same position, resignation or cessation of work, transition to unemployment, shift to part-time work, full-time parental leave from work, or no change. Moreover, individuals must indicate whether the career transition that they experienced during the year following the birth of a child was effectively due to the birth. As a consequence, contrary to many studies, we are able to unmistakably identify whether career transitions that we observed in the retrospective part of the survey the year following the birth of a child are effectively due to this birth. Although taking parental leave necessarily is due to a child's birth, determining whether spells of inactivity or unemployment that we observe the year following the birth of a child (in the retrospective part of the survey) are effectively due to the birth is much more difficult. Thus, combining the retrospective part of the survey with data regarding career transitions following the birth of children enables us to precisely identify child-related career interruptions (parental leave as well as inactivity or unemployment) and to measure their duration.

Third, the richness of our data enables us to investigate the role of a high number of potential determinants of the motherhood penalty and to control for a high number of explanatory variables. The respondents were also asked several original questions, which allow us to build an indicator of workers' job involvement/ambition and thus to control for potential unobserved heterogeneity between mothers and childless women.

Finally, data were collected from households, not merely from wage earners. Thus, every individual, whether wage earner, unemployed, or inactive, was surveyed. As a result, contrary to many studies that have data on wage earners only, we are able to control for potential self-selection into employment.

3.2. Specifications of the wage equations

Regarding the explained variable, almost every study on the family pay gap has investigated differences in hourly wages between mothers and women without children. However, mothers frequently work fewer hours following the birth of a child; thus, their purchasing power decreases, even if their hourly wages remain unchanged. As a result, we consider the logarithm of monthly wage as an explained variable in the wage equations. Monthly wage corresponds to the net monthly wage that individuals earn from their primary job and includes monthly complementary payments and overtime payments but not nonmonthly complementary payments (such as annual bonuses and thirteenth month pay).

In addition, to assess the effect of children, we construct three dummy variables to separately estimate the effect of having one child, two children, and three or more children. Contrary to a single variable that indicates the total number of children of women, these three dummy variables enable us to investigate whether the motherhood penalty disproportionately increases with the number of children, as has been previously shown in the literature (Waldfoegel, 1998; Anderson *et al.*, 2002; Davie and Pierre, 2005).

To estimate the “total” motherhood penalty, we first introduce the variables that are not affected by motherhood into the wage equations (specification 1): age, marital status, education level, job tenure⁸, potential experience⁹, occupation, establishment size, and several dummy variables, which are equal to one if the woman is an immigrant; has a temporary contract; works in education, health, or social work¹⁰; or lives in the Paris area. Descriptive statistics for these different variables are presented in the first part of Table A1 in the appendix.

To estimate the “net” motherhood penalty and to disentangle the driving factors of the total penalty, we add the wage determinants that are potentially affected by motherhood to the wage equation specification (specification 2). More precisely, we distinguish between three categories of factors: a reduced labour supply of mothers, child-related career interruptions, and other explanatory factors that are commonly considered in the literature.

First, to investigate the extent to which the motherhood penalty arises from a reduced labour supply of mothers, we introduce the following four variables: weekly working hours, a dummy indicating whether the woman works paid overtime, a dummy indicating whether the woman works part-time in 2004, and a dummy indicating whether the woman has always worked full time during her professional career. Although we control for working hours, we also control for being a part-time worker at the time of the survey because part-time work may affect hourly wages. For example, in the French public sector, part-time workers can benefit from an hourly wage premium because “long” part-time jobs are over-remunerated (for example, individuals working 80% of normal hours earn 85.7% of the salary of a full-time worker). Controlling whether a woman has always worked full time during her professional career is also desirable because, as discussed in Section 2 above, several studies have shown that individuals who have been working part time for several years earn lower hourly wages than those who have always worked full time (Hirsch, 2005; Russo and Hassink, 2008; Nelen and de Grip, 2009).

In addition, we aim to investigate the extent to which child-related career interruptions lead to a motherhood penalty. To that end, we use the retrospective part of the survey and create two variables: actual experience and duration of child-related interruptions. First, actual experience is calculated as the sum of the (long and short) spells of employment since the year of first employment¹¹. Second, we create a child-related career interruptions variable by combining the retrospective part of the survey and the data on career transitions for the year following the birth of a child. For every woman who declares having interrupted her career because of the birth of a child, we consider the child-related interruption equals the entire period of inactivity starting the year of the birth of the child. In the retrospective part of the survey, if no inactivity spell was reported for the year of the birth of the child, we consider

⁸ We agree that motherhood can affect job tenure, as mothers sometimes change employers following the birth of a child. However, as shown in Table 1, few mothers in France change their employers after a birth. Thus, and given that job tenure is a major determinant of wages in the public sector, we introduce job tenure into the baseline model.

⁹ Potential experience is calculated as the number of years since the women started her first job.

¹⁰ In the *Families and Employers* survey, sectors of activity are classified into 16 categories according to the aggregated economic classification NES 16. However, most categories only include public workers (administration) or private workers (industry, trade, transports, financial activities, and real estate, for example). Among the 16 categories, the “education, health, and social work” category is the only category for which there are enough workers in both sectors.

¹¹ Following Pailhé and Solaz (2012), if, for a given year, one situation (school, military service, inactivity, parental leave, unemployment, or employment) is declared, we consider this situation to have lasted one year. However, if two (three) situations are declared, we consider each situation to have lasted six (four) months.

the starting point to be the year following the year of the birth of the child (instead of the year of the birth). The career interruption ends as soon as we observe, in the retrospective part of the survey, that the woman is employed¹². Finally, for mothers who have more than one child, the child-related career interruption variable measures the total spell of interruption for all births. To account for the greater negative effects of long-term interruptions compared with short-term interruptions (Buligescu *et al.*, 2009), we create three dummy variables: (i) child-related interruption less than one year; (ii) child-related interruption between one and three years; and (iii) child-related interruption that lasts longer than three years.

Finally, we also consider other transmission channels that may explain why motherhood negatively affects wages. First, because they are less available, mothers are less likely to hold management positions. Thus, we create a dummy variable that equals one if the woman has workers under her responsibility and zero otherwise. Second, to make work more compatible with family life, mothers are likely to trade off higher wages for job-related amenities (compensating wage differentials). To investigate the role of adjustments made in working conditions, we create several dummy variables that indicate (i) nonstandard working hours (alternate or flexible working hours from one day (or week) to another); (ii) evening, night, or Sunday work; and (iii) commuting time. We expect these variables to positively affect wages and to characterise less mothers' employment than childless women's employment. Descriptive statistics for these various variables are presented in the second part of Table A1 in the Appendix.

3.3. Specifications of selection equations

First, to ensure identification of the bivariate probit model with sample selection, we need to have at least one variable that affects the probability of being employed but not the probability of working in the public sector and wages, *i.e.*, a variable in Z_1 but neither in Z_2 nor in X . We expect individuals whose mother never worked during their childhood to have a lower probability of working but do not expect these individuals to be either more or less prone to work in the public sector or to earn lower or higher wages.

In addition to this variable, we include in Z_1 all the potential determinants of the probability of working: age, marital status, immigrant status, education level, a dummy indicating whether the woman lives in the Paris area, and six dummy variables related to children. More precisely, we break down the three motherhood variables (one, two, three or more children) to account for not only the number of children but also whether a child is under three years old. Indeed, mothers' employment rate is markedly lower when they have children who are not yet old enough to attend school (Moschion, 2009).

Second, we also need to have variables that affect the probability of working in the public sector but that do not affect wages¹³. Thus, these variables are included in vector Z_2 , but not in vector Z_1 or in vector X , of wage equations (5) and (6). We propose the use of the following four instruments.

¹² To calculate the duration of child-related interruptions, we consider the inactivity spell to correspond to spells of parental leave, unemployment, and inactivity. If two (three) situations were declared for the same year, we consider each situation to have lasted six (four) months. Moreover, as inactivity spells are only reported in the retrospective part of the survey when they lasted more than 6 months, we do not consider in the child-related interruption variable short-term interruptions (less than 6 months).

¹³ These variables can affect wages, but only through the choice of sector.

The first three instruments are based on the assumption that the public sector is likely to attract more workers with a high degree of prosocial motivation because it has more social objectives than the private sector. This assumption has been empirically confirmed (see, for example, Borzaga and Tortia [2006]; Gregg *et al.* [2011]). Thus, the first instrument used is a dummy variable that equals one if the woman regularly engages in non-remunerated campaign or community interest activities and zero otherwise. Indeed, we expect that involvement in these types of activities reflects some degree of prosocial motivation and that such involvement should be reflected in sectorial choices. In addition, in the *Families and Employers* survey, respondents must indicate what would be their first criterion in choosing a job if they were looking for one. Nine criteria were proposed: wage, proximity to home, job security, career prospects, fit between job and tastes and/or training, convenience of working hours, work and human environment, working conditions and equipment, and other. Workers with a high degree of prosocial motivation should place more value on a job's intrinsic characteristics (*e.g.*, interest in the work, social value of the work, possibility of helping people) and less value on a job's extrinsic rewards (*e.g.*, wage, promotion prospects). As a result, we considered two additional instruments. The first is a dummy variable that equals one if the individual considers "job matches tastes and/or training" to be the most important criterion in choosing a job. Conversely, the second variable is a dummy that equals one if the individual considers "wage" to be the most important criterion in choosing a job. Our assumption is that individuals who most value wages are more likely to work in the private sector, whereas individuals who most value jobs that match their tastes or education are more likely to work in the public sector.

The last instrument captures whether a mother staying home to take care of a sick child is socially acceptable in the establishment in which the individual works. In our opinion, this variable reflects the suitability of the working environment for a work-family balance. As there are more family-friendly measures in the public sector than in the private sector (Lanfranchi and Narcy, 2013), we expect this variable to be positively correlated with the probability of working in the public sector. Descriptive statistics for these variables are presented in the third part of Table A1 in the Appendix.

Finally, in addition to these four instruments, we introduce in vector Z_2 all the explanatory variables that are included in the wage equations.

3.4. An original measure of job involvement and ambition

To obtain consistent estimates of the motherhood penalty, we need to account for the potential unobserved heterogeneity between mothers and childless women. Indeed, women likely have unobserved characteristics (such as motivation, job involvement, career aspirations) that are positively correlated with wages and negatively correlated with the probability of having children. Thus, failing to control for unobserved heterogeneity may lead to an overestimation of the motherhood wage penalty, as part of the estimated family pay gap would result from differences in unobserved productive characteristics between mothers and women without children. To account for unobserved heterogeneity, most previous studies have used panel data and estimated fixed-effects wage equations (Waldfoegel, 1998; Albrecht *et al.*, 1999; Datta Gupta and Smith, 2002; Anderson *et al.*, 2002; Buligescu *et al.*, 2009; Gangl and Ziefle, 2009; Felfe, 2012). To our knowledge, Simonsen and Skipper (2012) is the only study that manages to account for unobserved heterogeneity between mothers and women without children when using cross-sectional data. Their empirical strategy consists in comparing same sex twins (one who is a parent and the other who is not yet a parent), who are supposed to share the same

unobserved characteristics¹⁴. However, the issue of unobserved heterogeneity with cross-sectional data can also be addressed if the data used are sufficiently rich to build a measure of women's job involvement/ambition.

The richness of the data from the *Families and Employers* survey allows us to construct such an indicator. Indeed, respondents were asked several original questions that provide us with some information about their degree of job involvement/ambition. The first variable that we consider is whether the individual considers "career prospects" to be the most important criterion in choosing a job. The second variable corresponds to whether the employee works unpaid overtime. The third variable indicates whether the employee takes work home with her. The last variable indicates whether the employee does nothing at work other than work-related tasks¹⁵. Descriptive statistics for these variables are presented in the last part of Table A1 in the Appendix.

Following the method proposed by van Praag and Ferrer-i-Carbonell (2004), we build an indicator of job involvement/ambition from the four previously described variables. To create this indicator, we proceed in two steps. In the first step, we estimate a *logit* model for each of the four variables by including both individual and job characteristics that may potentially determine these variables as explanatory variables¹⁶. Indeed, in addition to the degree of job involvement/ambition of each individual, these four variables are likely to be influenced by other characteristics. For example, given the type of work that they do, managers and professionals can more easily take work home than workers who work on construction sites. Thus, managers and professionals are expected to indicate that they take work home more frequently than blue-collar workers, even though this behaviour does not necessarily reflect a higher degree of job involvement for managers than for workers. Thus, when individual and job characteristics are controlled for, the unobserved job involvement/ambition is contained in the error terms for each of the four estimated models. As a consequence, to build an indicator of job involvement/ambition, the second step consists of conducting a principal component analysis to extract the common part of these four error terms. To take into account unobserved heterogeneity between mothers and women without children, we add this indicator to the set of explanatory variables in wage equations.

4. RESULTS

4.1. Estimation of the total effect of motherhood

The primary objective of this study is to estimate the total effect of motherhood (or total penalty) in the public and private sectors by taking into account both selection effects and unobserved heterogeneity.

¹⁴ A similar strategy is implemented in Neumark and Korenman (1994), who use data on sisters and introduce "family" fixed effects.

¹⁵ More precisely, this variable is equal to one if the woman declares that she never does the following four activities when at work: calling or sending emails/text messages to her husband, children, or friends; undertaking an administrative task; compiling a grocery list; or planning leisure time activities for the night or weekend.

¹⁶ In each model, we introduce the following explanatory variables: age; marital status; immigrant status; education level; potential experience; job tenure; occupation; temporary worker status; employment in education, health or social work; residence in the Paris area; the three dummy variables for children; and employment in the public sector.

Table 2. Estimation results of the bivariate probit model with sample selection

	Prob. of working		Prob. of choosing the public sector	
	Coeff.	σ	Coeff.	σ
Age	0.012***	(0.004)	0.029***	(0.011)
Married or cohabiting	0.092	(0.064)	-0.163**	(0.076)
Immigrant	-0.326***	(0.088)	-0.568***	(0.150)
Level of education (ref.: no qualification)				
Vocational lower secondary	-0.099	(0.072)	0.116	(0.106)
Vocational or general upper secondary	0.219***	(0.083)	0.235**	(0.114)
Undergraduates	0.410***	(0.094)	0.245*	(0.128)
Graduates and above	0.426***	(0.086)	0.407***	(0.134)
Tenure	-	-	0.035***	(0.005)
Pot. experience	-	-	-0.026	(0.018)
Pot. experience ² /100	-	-	-0.033	(0.047)
Occupations (ref.: blue-collar workers)				
Managers and professionals	-	-	0.618***	(0.182)
Middle management employees and technicians	-	-	0.704***	(0.155)
Clerks	-	-	0.917***	(0.139)
Temporary contract	-	-	0.520***	(0.107)
Education, health, social work	-	-	0.986***	(0.075)
Live in the Paris area	0.080	(0.068)	0.059	(0.083)
Size of establishment (ref.: fewer than 20 employees)				
20-49 employees	-	-	0.286***	(0.098)
50-199 employees	-	-	0.462***	(0.090)
200-500 employees	-	-	0.440***	(0.102)
More than 500 employees	-	-	0.895***	(0.101)
Job involvement/ambition	-	-	-0.003	(0.031)
Number of children*age (ref.: no children)				
1 child more than 3 years old	-0.065	(0.098)	-	-
1 child less than 3 years old	-0.380***	(0.107)	-	-
2 children more than 3 years old	-0.174*	(0.090)	-	-
2 children, at least 1 less than 3 years old	-1.359***	(0.112)	-	-
3 children more than 3 years old	-0.605***	(0.098)	-	-
3 children, at least 1 less than 3 years old	-1.691***	(0.141)	-	-
Number of children (ref.: no children)				
1 child	-	-	-0.021	(0.100)
2 children	-	-	0.04	(0.109)
3 or more children	-	-	0.185	(0.147)
Own mother has never worked	-0.209***	(0.062)	-	-
Campaign or community-interest activities	-	-	0.191*	(0.110)
Job criterion				
Wage	-	-	-0.167**	(0.069)
Suitability in terms of taste and/or training	-	-	0.171*	(0.090)
Social acceptability of a mother staying home to take care of a sick child	-	-	0.460***	(0.091)
Constant	0.370**	(0.164)	-3.476***	(0.339)
ρ			0.372* (0.186)	
LR test of indep. eqns. (rho=0)			3.39*	
Log likelihood			-2685.13	
N			3140	

Source: Ined-Insee, *Families and Employers*, 2004-2005.

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, and * p<0.1.

To control for self-selection into both employment and sectors, we estimate a bivariate probit model with sample selection and report the results in Table 2. First, the correlation coefficient ρ is positive and significant; this result indicates that the bivariate probit model with sample selection is the appropriate model to be estimated (contrary to the estimation of two separate probit models). Thus, some unobserved characteristics affect (in the same direction) both the probability of being employed and the probability of working in the public sector. For example, the existence of family-friendly practices likely has positive effects on both the probability of being employed and the probability of working in the public sector. Indeed, without certain family-friendly measures (for example, the provision of child care facilities, which are almost exclusively provided by the public sector), some mothers would likely have stopped working following the birth of a child. In other words, if working in the public sector were not possible for these women, they would likely not work at all: the decision to work is conditional on the possibility of working in the public sector.

Regarding the determinants of the probability of being employed, the results indicate that older and more educated women have a higher probability of working, whereas immigrants exhibit a lower probability of working. Moreover, mothers have a significantly lower probability of being employed than women without children. The strength of this effect increases as the number of children increases and as the ages of the children decrease; these results are consistent with the results obtained by Moschion (2009). Only mothers with one child more than three years old have the same probability of working as women without children. Finally, women whose mother never worked have a significantly lower probability of working.

Regarding the estimation of the sector choice equation, more educated and older women have a higher probability of working in the public sector. Moreover, compared with blue-collar workers, managers, middle management employees and technicians, and clerks have a higher probability of working in the public sector because blue-collar workers are concentrated in occupations that are more common in the private sector. Workers in education, health care, and social work also have a higher probability of working in the public sector; this result is not surprising given that these industries have a stronger presence in the public sector than in the private sector. In addition, a larger establishment is associated with a higher probability of working in the public sector; the result is consistent given that larger establishments are more frequently in the public sector (public hospitals, for example). Temporary workers also have a higher probability of being in the public sector. Conversely, immigrants have a lower probability of working in the public sector; this result may be observed because some public sector positions are open only to French citizens. Married or cohabiting individuals are also less likely to work in the public sector. In addition, workers' job involvement/ambition has no significant impact on the probability of working in one sector or the other. Similarly, being a mother does not have a significant impact on the probability of choosing the public sector. This result contrasts with previous findings, such as those of Nielsen *et al.* (2004), who estimate that mothers deliberately choose to work in the public sector because it offers more family-friendly measures than the private sector. However, in contradistinction to Nielsen *et al.* (2004), we control for self-selection into not only sectors but also employment¹⁷. Finally, the coefficients associated with the four instrumental variables are all

¹⁷ Indeed, when we estimate an endogenous switching model, without controlling for potential selection into employment, mothers of three or more children have a significantly higher probability of working in the public sector than women without children (the results are available upon request).

significant and have the expected signs. Thus, women who engage in community interest activities and who declare that they would choose a job that matches their tastes and/or training have a higher probability of working in the public sector. Conversely, women who consider wage to be the most important criterion in choosing a job are less likely to work in the public sector. Finally, women who choose to work in an establishment where a mother staying home to take care of a sick child is socially acceptable are more likely to work in the public sector. This last result is consistent with the family friendliness of the public sector.

Table 3. Estimation of wage equations controlling for selection effects and unobserved heterogeneity

	Public sector		Private sector	
	Coeff.	σ	Coeff.	σ
Age	0.005	(0.005)	-0.002	(0.004)
Married or cohabiting	0.036	(0.027)	-0.008	(0.022)
Immigrant	0.053	(0.073)	-0.060	(0.046)
Level of education (ref.: no qualification)				
Vocational lower secondary	0.079**	(0.037)	0.060**	(0.029)
Vocational or general upper secondary	0.106**	(0.045)	0.159***	(0.032)
Undergraduates	0.135***	(0.054)	0.283***	(0.037)
Graduates and above	0.206**	(0.054)	0.257***	(0.044)
Tenure	0.007**	(0.003)	0.003	(0.002)
Pot. experience	0.009	(0.006)	0.019***	(0.005)
Pot. experience ² /100	-0.023	(0.016)	-0.026**	(0.013)
Occupations (ref.: blue-collar workers)				
Managers and professionals	0.203**	(0.080)	0.514***	(0.045)
Middle management employees and technicians	0.070	(0.078)	0.182***	(0.035)
Clerks	-0.145*	(0.082)	-0.090**	(0.036)
Temporary contract	-0.287***	(0.048)	-0.097**	(0.039)
Education, health, social work	-0.068	(0.057)	-0.155***	(0.053)
Live in the Paris area	0.124***	(0.022)	0.153***	(0.028)
Size of establishment (ref.: fewer than 20 employees)				
20-49 employees	0.067	(0.049)	0.071***	(0.027)
50-199 employees	0.065	(0.047)	0.064**	(0.029)
200-500 employees	0.125***	(0.048)	0.083***	(0.030)
More than 500 employees	0.118**	(0.059)	0.094**	(0.045)
Number of children (ref.: no children)				
1 child	-0.016	(0.029)	0.005	(0.024)
2 children	-0.061*	(0.033)	-0.119***	(0.032)
3 or more children	-0.159***	(0.049)	-0.249***	(0.048)
Job involvement/ambition	0.050***	(0.010)	0.060***	(0.008)
λ_1	0.029	(0.065)	0.171***	(0.061)
λ_2	-0.133	(0.084)	-0.168**	(0.084)
Constant	6.841***	(0.281)	6.572***	(0.105)
N	710		1525	
R ²	0.500		0.482	

Source: Ined-Insee, *Families and Employers*, 2004-2005.

Note: Bootstrapped standard errors (500 replications) in parentheses; *** p<0.01, ** p<0.05, and * p<0.1.

The results of the wage equations for the public and private sectors in which we control for both selection effects and unobserved heterogeneity are reported in Table 3. First, the

correlation coefficient between the error terms of the participation and wage equation for the private sector is significantly different from zero. Moreover, the correlation coefficient between the error terms of the sector choice equation and the wage equation for the private sector is significantly different from zero. These results confirm that women self-select into both employment and sector and that selectivity-corrected wage equations must be used to obtain unbiased estimates of the family pay gap. Regarding the explanatory variables other than children, the estimated coefficients have the expected signs and are significant. Indeed, a higher education level, greater tenure (for the public sector), and larger establishment size are associated with a higher monthly wage. Women living in the Paris area also earn higher wages. In the private sector, an inverse U-shaped relationship exists between potential experience and wages, whereas the relationship is not significant in the public sector. In addition, compared with blue-collar workers, managers and middle management employees and technicians earn higher wages, and clerks earn lower wages. Moreover, temporary workers earn significantly lower wages than permanent employees. Conversely, age and marital status have no significant impact on monthly wages. The lack of a significant effect of the age variable on wages likely occurred because we controlled for tenure and potential experience in the equation. Moreover, as previously noted, marital status has no significant impact on wages after we control for the number of children (Joshi *et al.*, 2007). Lastly, women who are more ambitious and/or involved in their job earn significantly higher wages.

Table 4 presents estimates of the total effect of motherhood on wages in the public and private sectors. Column (1) presents the penalty obtained by estimating the wage equation for the public and private sectors with OLS, without controlling for selection effects and unobserved heterogeneity. In Column (2), we present the penalty obtained by estimating selectivity-corrected wage equations to control for potential self-selection into employment and sectors. Lastly, Column (3) gives the penalty obtained by estimating selectivity-corrected wage equations and controlling for unobserved heterogeneity between mothers and women without children.

On the one hand, estimating wage equations without controlling for selection effects leads to an underestimation of the motherhood penalty, as previously described in the literature (see, for example, Buligescu *et al.* [2009]), because mothers who decide to continue with their career after having a child have the best unobserved productive characteristics¹⁸. On the other hand, controlling for unobserved heterogeneity between mothers and women without children does not change the estimated penalty. In the previous literature, no consensus has been reached regarding whether failing to control for unobserved heterogeneity leads to estimation bias. Indeed, although some studies conclude that failing to control for unobserved heterogeneity leads to an overestimation of the motherhood penalty (Anderson *et al.*, 2002; Datta Gupta and Smith, 2002), other studies show that, compared with fixed-effects models, OLS models do not lead to an overestimation of the penalty (Waldfogel, 1998; Albrecht *et al.*, 1999).

When controlling for selection effects and unobserved heterogeneity, we estimate that the total motherhood penalty is larger in the private sector than in the public sector. Indeed, the

¹⁸ Failing to control for selection effects logically leads to a more severe underestimation of the motherhood penalty in the private sector than in the public sector. Indeed, the gap in unobserved productivity between women without children and mothers who continue with their career after the birth of a child must be larger in the private sector than in the public sector because there are more family-friendly measures in the public sector than in the private sector (and thus a larger number of mothers can continue with their careers in the public sector). In addition, selection effects are more significant in the private sector than in the public sector.

wage penalty from having two children in the private sector is nearly twice as high as that in the public sector (11.9% *vs.* 6.1%, respectively). Similarly, the penalty associated with three or more children is 24.9% in the private sector and “only” 15.9% in the public sector. In addition, in both sectors, only mothers of two or more children experience a motherhood penalty.

Table 4. Total monthly penalty in the public and private sectors

	(1) No correction		(2) Selection effects		(3) Selection effects and unobserved heterogeneity	
	Public	Private	Public	Private	Public	Private
Number of children (ref.: no children)						
1 child	-0.017 (0.033)	0.025 (0.026)	-0.015 (0.033)	0.007 (0.028)	-0.016 (0.029)	0.005 (0.024)
2 children	-0.055 (0.034)	-0.076*** (0.028)	-0.062* (0.035)	-0.117*** (0.030)	-0.061* (0.033)	-0.119*** (0.032)
3 or more children	-0.124*** (0.039)	-0.144*** (0.034)	-0.154*** (0.047)	-0.249*** (0.048)	-0.159*** (0.049)	-0.249*** (0.048)

Source: Ined-Insee, *Families and Employers*, 2004-2005.

Note: Bootstrapped standard errors (500 replications) in parentheses; *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

4.2. Estimation of the net effect of motherhood

The second objective of this study is to understand why mothers earn lower monthly wages than women without children and why the motherhood penalty is higher in the private sector than in the public sector. For this purpose, we investigate the role of three categories of potential determinants of the family pay gap: (i) a reduced labour supply of mothers, (ii) child-related career interruptions, and (iii) other factors commonly proposed in the literature (less access to management positions and adjustments in working conditions). The main results are reported in Table 5.

First, to estimate the net effect of motherhood, we add the entire set of potential determinants of the family pay gap to the baseline specification (Column (2)). According to our results, in both sectors, the coefficients associated with the children variables are no longer significant after we control for the labour supply of mothers, child-related career interruptions, and other factors. Thus, we find no net motherhood penalty in France.

Regarding the labour supply variables, weekly working hours and working overtime both consistently have a positive and significant impact on monthly wages in the two sectors. Moreover, women who have never worked part time during their career earn higher wages. However, once we control for working hours and part-time work history, we find no penalty associated with being a part-time worker at the time of the survey. In other words, whether the worker has already worked part time (and thus has most likely missed professional training or promotion opportunities) is important, and not merely whether she is working part time at the time of the survey. This finding is consistent with the findings of Russo and Hassink (2008), who show that the part-time pay penalty only arises after several years of part-time work and increases over time as workers miss promotions.

Table 5. Motherhood wage penalty and its determinants in the public sector and the private sector

	(1) Baseline model		(2) All determinants		(3) All except actual experience		(4) Labour supply		(5) Career interruptions		(6) Other determinants	
	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private
Number of children (ref.: no children)												
1 child	-0.016 (0.029)	0.005 (0.024)	0.011 (0.025)	0.019 (0.020)	0.010 (0.024)	0.020 (0.020)	0.007 (0.021)	0.015 (0.020)	-0.022 (0.031)	0.007 (0.026)	-0.013 (0.031)	0.005 (0.025)
2 children	-0.061* (0.033)	-0.119*** (0.032)	0.013 (0.027)	-0.024 (0.026)	0.012 (0.027)	-0.030 (0.025)	0.006 (0.025)	-0.044* (0.024)	-0.057 (0.033)	-0.083*** (0.030)	-0.049 (0.033)	-0.109*** (0.030)
3 or more children	-0.159*** (0.049)	-0.249*** (0.048)	0.029 (0.036)	-0.054 (0.038)	0.029 (0.036)	-0.077** (0.036)	0.022 (0.034)	-0.101*** (0.035)	-0.121** (0.049)	-0.153*** (0.047)	-0.141*** (0.043)	-0.232*** (0.047)
Job involvement	0.050*** (0.010)	0.060*** (0.008)	0.033*** (0.008)	0.028*** (0.006)	0.033*** (0.008)	0.030*** (0.006)	0.035*** (0.008)	0.033*** (0.006)	0.048*** (0.010)	0.056*** (0.008)	0.046*** (0.010)	0.055*** (0.008)
Weekly working hours	-	-	0.029*** (0.003)	0.031*** (0.003)	0.030*** (0.003)	0.032*** (0.002)	0.029*** (0.003)	0.032*** (0.003)	-	-	-	-
Overtime	-	-	0.093*** (0.038)	0.101*** (0.032)	0.097*** (0.037)	0.105*** (0.031)	0.109*** (0.035)	0.108*** (0.028)	-	-	-	-
Always full time	-	-	0.048*** (0.018)	0.031* (0.018)	0.045** (0.018)	0.030* (0.018)	0.043** (0.018)	0.029 (0.018)	-	-	-	-
Part-time work in 2004	-	-	0.056 (0.036)	-0.004 (0.033)	0.052 (0.037)	-0.011 (0.031)	0.020 (0.035)	-0.014 (0.032)	-	-	-	-
Actual experience	-	-	0.021*** (0.005)	0.019*** (0.004)	-	-	-	-	0.019*** (0.007)	0.031*** (0.005)	-	-
Actual exp. ² /100	-	-	-0.042*** (0.014)	-0.020* (0.012)	-	-	-	-	-0.029 (0.021)	-0.035** (0.015)	-	-
Child-related career interruption												
Less than one year	-	-	0.015 (0.046)	-0.055 (0.035)	0.003 (0.045)	-0.058* (0.035)	-	-	-0.053 (0.060)	-0.120** (0.049)	-	-
Between 1 and 3 years	-	-	-0.031 (0.052)	0.039 (0.042)	-0.035 (0.055)	0.029 (0.042)	-	-	-0.127* (0.066)	-0.009 (0.049)	-	-
More than 3 years	-	-	-0.026 (0.040)	-0.055* (0.032)	-0.033 (0.041)	-0.081** (0.032)	-	-	-0.029 (0.060)	-0.080** (0.038)	-	-

Table 5. (Continued)

	(1) Baseline model		(2) All determinants		(3) All except actual experience		(4) Labour supply		(5) Career interruptions		(6) Other determinants	
	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private
Management position	-	-	0.086*** (0.024)	0.054*** (0.019)	0.084*** (0.024)	0.055*** (0.020)	-	-	-	-	0.128*** (0.030)	0.107*** (0.024)
Commuting time (ref.: less than 15 m.)												
15- 29 min	-	-	0.051** (0.020)	0.064*** (0.016)	0.044** (0.018)	0.059*** (0.015)	-	-	-	-	0.070** (0.027)	0.062*** (0.020)
30 min to 1 hour	-	-	0.072*** (0.026)	0.082*** (0.020)	0.061*** (0.023)	0.075*** (0.020)	-	-	-	-	0.116*** (0.036)	0.114*** (0.027)
More than 1 hour	-	-	0.055* (0.033)	0.049 (0.033)	0.047 (0.029)	0.047 (0.033)	-	-	-	-	0.095*** (0.034)	0.045 (0.040)
Evening, night, or Sunday work	-	-	0.075*** (0.018)	0.009 (0.016)	0.074*** (0.017)	0.010 (0.015)	-	-	-	-	0.085*** (0.023)	-1.95E-04 (0.022)
Nonstandard working hours	-	-	0.052*** (0.017)	0.029* (0.015)	0.045*** (0.016)	0.023 (0.016)	-	-	-	-	0.039* (0.024)	0.022 (0.021)
N	710	1525	710	1525	710	1525	710	1525	710	1525	710	1525
R ²	0.500	0.482	0.733	0.705	0.729	0.698	0.706	0.689	0.509	0.504	0.539	0.494

Source: Ined-Insee, *Families and Employers*, 2004-2005.

Note: Bootstrapped standard errors (500 replications) in parentheses; *** p<0.01, ** p<0.05, and * p<0.1.

Regarding the variables linked with child-related career interruptions, an inverted U-shaped relationship exists between actual experience and wages in both the public and private sectors. Moreover, women who interrupted their careers to take care of their child for more than three years earn significantly lower wages in the private sector. Conversely, child-related career interruptions do not have a robust effect on wages in the public sector. Thus, consistent with our expectations, the pay penalty from child-related career interruptions is much higher in the private sector. Note that in Column (2), as we control for actual experience, the coefficient associated with child-related career interruptions only captures human-capital depreciation effects and signaling effects and does not capture the negative effect of career interruptions on human capital accumulation. To estimate the total effect of child-related career interruption on wages, we reestimate the same model as in Column (2) but exclude actual experience (instead, we control for potential experience). The results are reported in Column (3). In this case, the coefficient associated with child-related career interruptions captures the effects of human capital depreciation, signaling effects, and the negative effects of career interruptions on the accumulation of human capital. In the private sector, the coefficient associated with career interruptions increases (in absolute value). Thus, the wage penalty for mothers who interrupted their career for more than three years increases from 5.5% in Column (2) to 8.1% in Column (3). Thus, in the private sector, child-related career interruptions are penalised because of their effects on both the accumulation and the depreciation of human capital. Conversely, in the public sector, even when actual experience is not controlled for, all the coefficients associated with child-related career interruptions are insignificant.

In addition, women who have workers under their responsibility earn higher wages in both sectors. Finally, all else being equal, bad working conditions, such as night/evening/Sunday work, nonstandard hours, or working far from home, are compensated with higher wages, particularly in the public sector.

4.3. Determinants of the motherhood penalty

To investigate the specific role of each of the potential determinants of the motherhood penalty, we separately add the following variables to the baseline specification: (i) labour supply variables (Column (4)), (ii) variables related to career interruptions (Column (5)), and (iii) other potential explanatory factors (Column (6)).

First, when we control for the labour supply of mothers, the coefficients associated with the children variables are no longer significant in the public sector (Column (4)). Thus, in the public sector, the monthly wage gap between mothers of two or more children and women without children essentially arises from the reduction in mothers' working hours. In the private sector, the motherhood penalty also decreases markedly with the same controls. For example, when we add the labour supply variables to the model, the penalty from having three or more children decreases by approximately 18 percentage points in the public sector and by nearly 15 percentage points in the private sector. However, in the private sector, the coefficients associated with the children variables remain significant. Thus, even when we hold labour supply constant, mothers of two children earn a monthly wage that is 4.4% lower and mothers of three or more children earn a monthly wage that is 10.1% lower than women without children.

In addition, when we add actual experience and child-related career interruptions to the baseline model, the motherhood penalty diminishes much more markedly in the private

sector than in the public sector (Column (5)). Indeed, the penalty from having three or more children is reduced by nearly 10 percentage points in the private sector and by only 3.8 percentage points in the public sector. This result arises from two phenomena: first, mothers in the private sector have a higher probability of interrupting their career, and second, the wage penalty for a career interruption is much larger in the private sector.

Finally, the introduction of controls for access to management positions and adjustments in working conditions leads to much lower decreases in the motherhood penalty than the introduction of the labour supply and career interruption variables. Compared with the baseline specification, the penalty associated with having two children decreases by only 1.2 percentage points in the public sector and by 1 percentage point in the private sector. The penalty associated with three or more children diminishes by 1.8 percentage point in the public sector and by 1.7 percentage point in the private sector. Thus, in France, the decreased access of mothers to management positions and adjustments in working conditions are not important drivers of the family pay gap. Moreover, adding these variables to the baseline specification leads to a similar decrease in the penalty in the two sectors. Thus, contrary to other countries (Simonsen and Skipper, 2006), in France, even though there are more family-friendly measures in the public sector, mothers in the public sector are not more likely than mothers in the private sector to trade higher wages for job-related amenities.

CONCLUSION

In this study, we compare the motherhood penalty and its determinants between the private and public sectors in France. For this purpose, we use the *Families and Employers* survey, which allows us not only to address self-selection into both employment and sectors but also to take into account potential unobserved heterogeneity between mothers and women without children. We find that failing to control for self-selection leads to a severe underestimation of the motherhood penalty in the two sectors. However, accounting for unobserved heterogeneity does not change the estimated penalty. With respect to the public-private differences in the motherhood penalty, we obtain four main results.

First, in both sectors, there is a monthly wage penalty for women with two or more children, whereas mothers of one child earn the same wage as women without children.

Second, the total motherhood penalty from having two or more children is markedly larger in the private sector than in the public sector. Indeed, in the private sector, the wage penalty from having two children is estimated at 11.9%, and the penalty from having three or more children is estimated at 24.9%. In the public sector, the motherhood penalty is lower, estimated at 6.1% for two children and at 15.9% for three or more children. As a result, estimating the motherhood penalty without distinguishing between the public and private sectors, as previous studies have done, hides large differences between the two sectors.

Third, in both sectors, the motherhood penalty is no longer significant after we control for all the potential determinants of the penalty, namely, a reduced labour supply of mothers, child-related career interruptions, less access to management positions, and adjustments in working conditions. The literature often assumes that the lack of an unexplained penalty indicates the lack of any discrimination against mothers. In our opinion, even if no unexplained motherhood penalty exists, drawing firm conclusions regarding whether discrimination against mothers occurs would be difficult. Indeed, some of the variables introduced in our model, such as having a management position or working part time, may capture some

discriminatory behaviour. For example, when controlling for the reduced access to management positions for mothers, we do not know whether the trend of fewer mothers in management positions arises from the deliberate choice of mothers or from the decisions of their employers.

Fourth, the determinants of the motherhood penalty vary between the public and private sectors. In both sectors, the motherhood penalty mainly arises from the fewer hours that mothers work compared with women without children. Thus, studying the gap in hourly wages between mothers and women without children leads to a severe underestimation of the decrease in the purchasing power of mothers following the birth of a child. However, the labour supply effect plays a more important role in the public sector than in the private sector, where it almost entirely explains wage differentials between mothers and women without children. Child-related career interruptions are the second most important determinant of the family pay gap. However, these interruptions play a much more important role in explaining the penalty in the private sector than in the public sector given that their explanatory power is almost as important as that of labour supply variables in the private sector. By contrast, in the public sector, where mothers have a significantly lower probability of interrupting their careers and where career interruptions are much less penalised than in the private sector, child-related career interruptions only explain a small share of the motherhood penalty. Finally, the reduced access of mothers to management positions and adjustments in working conditions also explain part of the penalty in both sectors, but their explanatory power is much lower than that of the two previous factors. Moreover, access to management positions and adjustments in working conditions play the same role in explaining the penalty in the public and private sectors.

To summarise, in France, the total motherhood penalty is larger in the private sector than in the public sector primarily because child-related career interruptions are more frequent and more harmful in the private sector than in the public sector. Thus, supporting the development of family-friendly measures in the private sector might reduce the number and extent of career interruption for workers and, ultimately, might reduce the motherhood penalty in this sector.

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APPENDIX

Table A1. Descriptive statistics – Women wage earners

			Public sector		Private sector	
	All	No children	Mothers	No children	Mothers	
Monthly wage	1289.08 (578.06)	1331.18 (420.26)	1401.71 (490.6)	1258.87 (555.41)	1239.73 (637.05)	
<i>Number of children:</i>						
No children	26.8	-	-	-	-	
One child	23.84	-	28.54	-	34.5	
Two children	33.57	-	45.52	-	46.02	
Three or more children	15.79	-	25.93	-	19.48	
Age	36.48 (7.77)	30.41 (7.03)	39.79 (6.38)	29.65 (7.03)	38.46 (6.56)	
Married or cohabiting	75.76	45.6	82.65	56.37	84.72	
Immigrant	6.94	3.3	3.36	8.49	8.67	
Pot. experience	15.26 (8.75)	8.2 (7.42)	18.45 (7.68)	8.42 (7.41)	17.47 (7.82)	
Tenure	9.31 (8.24)	5.81 (6.56)	13.38 (8.7)	5.01 (6.03)	9.57 (7.97)	
<i>Level of education:</i>						
No qualification	17.96	3.3	13.99	11.32	24.75	
Vocational lower secondary	25.17	18.68	25.56	17.45	28.95	
Vocational or general upper secondary	19.64	19.23	18.66	22.17	19.21	
Undergraduates	15.48	14.84	15.49	22.88	12.78	
Graduates and above	21.76	43.96	26.31	26.18	14.3	
<i>Occupations:</i>						
Managers and professionals	10.35	17.58	11.75	8.96	9.03	
Middle management employees and technicians	28.39	36.26	33.58	31.6	23.41	
Clerks	50.24	45.05	51.68	48.11	51.21	
Blue-collar workers	11.01	1.1	2.99	11.32	16.35	
Temporary contract	9.46	23.08	8.4	8.73	8.04	
Live in Paris area	19.02	21.98	19.03	21.93	17.43	
Education, health, social work	27.33	51.1	53.17	13.68	16.26	
<i>Size of establishment:</i>						
Fewer than 20 employees	32.73	12.09	19.78	39.62	39.68	
20-49 employees	15.66	10.44	15.49	17.45	15.91	
50-199 employees	22.38	32.42	25	20.05	20.38	
200-500 employees	13.71	12.64	15.86	12.03	13.49	
More than 500 employees	15.52	32.42	23.88	10.85	10.55	
Weekly working hours	33.31 (6.24)	34.41 (5.52)	32.91 (6.08)	34.39 (5.31)	32.9 (6.67)	
Always full time	51	68.13	40.67	63.21	48.53	
Part-time work in 2004	23.57	11.54	25.56	15.57	27.61	
Overtime	4.73	4.4	4.85	5.42	4.47	
Actual experience	13.17 (8.21)	7.23 (7.01)	15.99 (7.4)	7.53 (7.11)	14.92 (7.64)	
<i>Child-related career interruptions:</i>						
Less than one year	4.2	-	4.66	-	6.26	
Between one and three years	3.89	-	5.04	-	5.45	
More than three years	5.79	-	7.84	-	7.95	
No child-related interruption	86.11	-	82.46	-	80.34	
Management position	16.28	18.68	16.6	15.8	15.91	
Evening, night, or Sunday work	38.3	44.51	44.59	41.04	33.24	
Nonstandard working hours	40.11	47.8	41.23	42.45	37.44	

Table A1. (Continued)

	All	No children	Public sector Mothers	Private sector No children	Private sector Mothers
<i>Commuting time:</i>					
Less than 15 min	36.27	33.52	39.74	32.31	36.55
Between 15 and 29 min	33.66	34.62	32.84	35.85	33.07
Between 30 min and 1 hour	20.39	17.03	17.16	21.93	21.89
More than one hour	9.69	14.84	10.26	9.91	8.49
Campaigning or community-interest activities	7.65	10.44	11.75	3.54	6.79
Job criterion					
Wage	39.27	29.67	30.22	46.23	42.54
Suitability in terms of taste and/or training	15.48	27.47	21.27	15.09	10.9
Social acceptability of mother staying home to take care of a sick child	80.89	92.31	89.18	78.77	75.87
Own mother has never worked	18	12.64	19.22	11.08	20.91
Career prospects	9.75	10.56	7.17	17.77	7.80
Unpaid overtime	18.66	25.00	20.57	22.27	15.32
Take work home	13.78	20.00	15.09	13.51	12.24
Do nothing at work other than work	41.21	37.78	48.30	33.41	4.34
N	2235	180	530	422	1103

Source: Ined-Insee, *Families and Employers*, 2004-2005.

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