

Gender Equality on the Labour Market in France: A Slow Convergence Hampered by Motherhood

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Abstract – In France since the 1970s, the growth in labour force has been driven largely by that of women's participation in the labour market and the fact that they interrupt their careers less often after motherhood. Their level of education has also risen considerably, and they have, on average, been more highly educated than men since the 1990s. But these developments did not result in reducing the gender pay gap to what might have been expected: the average hourly wage gap in the private sector has remained around 20% since the mid-1990s. In this average gap, the share explained by differences in human capital (education, experience) was cancelled out and even reversed between 1968 and 2015. The persistence of the wage gap now appears to be mainly linked to the consequences of motherhood. A child's arrival causes mothers a loss of annual income largely due to adjustments in their working time. This penalty is higher for mothers whose wages are at the bottom of the wage distribution.

JEL Classification: J13, J16, J31

Keywords: gender inequalities, gender wage gap, motherhood penalty, event study

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Translated from the original version: "Égalité professionnelle entre les femmes et les hommes en France : une lente convergence freinée par les maternités

In France, the current Presidency of the Republic has promoted equality between women and men as a major project (*grande cause*) of this five-year term. The emphasis placed on this issue is not new, as evidenced by the numerous studies, official reports and legal provisions adopted since the 1960s. On the narrower issue of equality of pay on the labour market, a paradox emerges: notwithstanding the increasingly detailed laws on the occupational equality practices to be implemented by employers, and despite significant changes in the number of women present in the labour market and their qualifications, the gender pay gap is only narrowing very slowly. How can this phenomenon be explained? Standard economic explanations based on differences in human capital, i.e. qualifications and experience, can no longer account for the pay gaps identified. Today, the consequences of parenthood on careers appear to be the principal obstacle to occupational equality between men and women.

In this paper, we review, firstly, the legal background to gender equality in pay and the long-term changes in men and women labour market participation in France. We then set out various measurements of the raw pay gaps and their development since 1967. We then move on to a statistical analysis of the average gaps over the long term. We will see that traditional statistical tools explaining the gap by differences in observed productive characteristics are less and less effective in accounting for the gap. Of the numerous lines of analysis of the gender pay gap, the impact of maternity on careers is the one emerging today as the primary obstacle to earnings convergence between women and men. In the second part of the paper, we estimate the consequences of a maternity (and paternity) on participation, hours worked and hourly pay in the ten years following the birth for the population as a whole, then according to the position in the wage distribution. We show that the impact of maternity leads to adjustments in terms of participation, hours worked and hourly pay to the detriment of mothers, these effects being much more pronounced for those with fewer qualifications.

A Legislative Framework Reinforced Since the 1960s

Concern in relation to equality in pay between women and men is nothing new, as demonstrated

by the numerous official reports on the subject (Majnoni d'Intignano *et al.*, 1999; Grésy, 2009) and the laws and decrees adopted in the last fifty years requiring employers to eliminate pay discrimination and, more widely, fostering occupational equality between women and men. The Law of 22 December 1972 established the principle of equality in pay between women and men in the Labour Code. From the 1980s onwards, a series of laws would pave the way for negotiations on this issue within companies and sectors. The Law of 13 July 1983 (*loi Roudy*) on occupational equality introduces the obligation to draw up a comparative status report providing harmonised statistical indicators to discuss with trade union organisations during negotiations on occupational equality; such discussions became compulsory, on an annual basis at company level and on a quarterly basis at sector level, following the Law of 9 May 2001 (*loi Génisson*), and the obligations have been extended since the Law of 23 March 2006 and the Decree of 18 December 2012. The Law of 4 August 2014 (*loi Valaud-Belkacem*) on effective equality between men and women goes beyond the scope of the company in seeking to combat gender inequality in the private and public spheres as well as in the labour market, focussing on the balance between family life and work.

With the under-representation of women at senior management level becoming increasingly apparent, further steps were taken to foster occupational equality between women and men with the Law of 27 January 2011 (*loi Coppé-Zimmerman*) requiring a minimum proportion of women (40% as at 1 January 2017) on boards of directors of listed companies, and, as of 2012, in state-owned companies; the obligation extends to the public service as of 1 January 2013 for appointments to senior management positions (covering around 6,000 positions).

Finally, the Decree of 8 January 2019 for the implementation of an index of equality in pay between women and men (*Index de l'égalité salariale entre les femmes et les hommes*¹) breaks with the earlier approaches, which had in common the prescription of rules for employers. Here, companies are asked to calculate and publish a single, standardised indicator, and have an obligation to achieve a minimum score of 75 out of 100 points over three years, with the threat of financial sanctions if they fail to do so (1% of the total wages bill if the company does

1. Established in Law No 2018-771 of 5 September 2018.

not achieve 75 points).² The score is constructed on the basis of several weighted criteria (pay gap, increases and promotions per position and age band, application of the legal obligation to pay an increase upon return from maternity leave equal to the increase granted to other employees, number of women among the ten most highly paid employees). Like any composite index, the method of calculation is open to discussion and may be improved. Currently, for the part relating to pay, only hourly earnings excluding bonuses and allowances are compared, which eliminates part-time work and bonuses while these are two key factors in pay inequality between women and men (Coron *et al.*, 2019). But there is clearly a shift away from the previous legislation: the issue is not to be able to show that the statutory rules are being formally applied, but that the operation of the company leads to “actual” equality of pay between women and men, i.e. as measured by the index.

Converging Behaviours in the Labour Market since the 1960s

All of these provisions apply to working populations the composition of which has changed profoundly since the 1960s, with a convergence

of behaviour on the labour market between women and men. We consider here some major indicators of these long-term developments.³

The first, very simple, indicator shows that France, like most OECD countries, has seen a marked increase in overall educational attainment since the 1960s, and that proportionately this has benefited girls rather than boys. One of the indicators of this development is the proportion of people holding the Baccalaureate in each generation. This increased from 20% in 1970 to 79% in 2017,⁴ with girls consistently achieving higher rates, regardless of the type of Baccalaureate (Figure I).

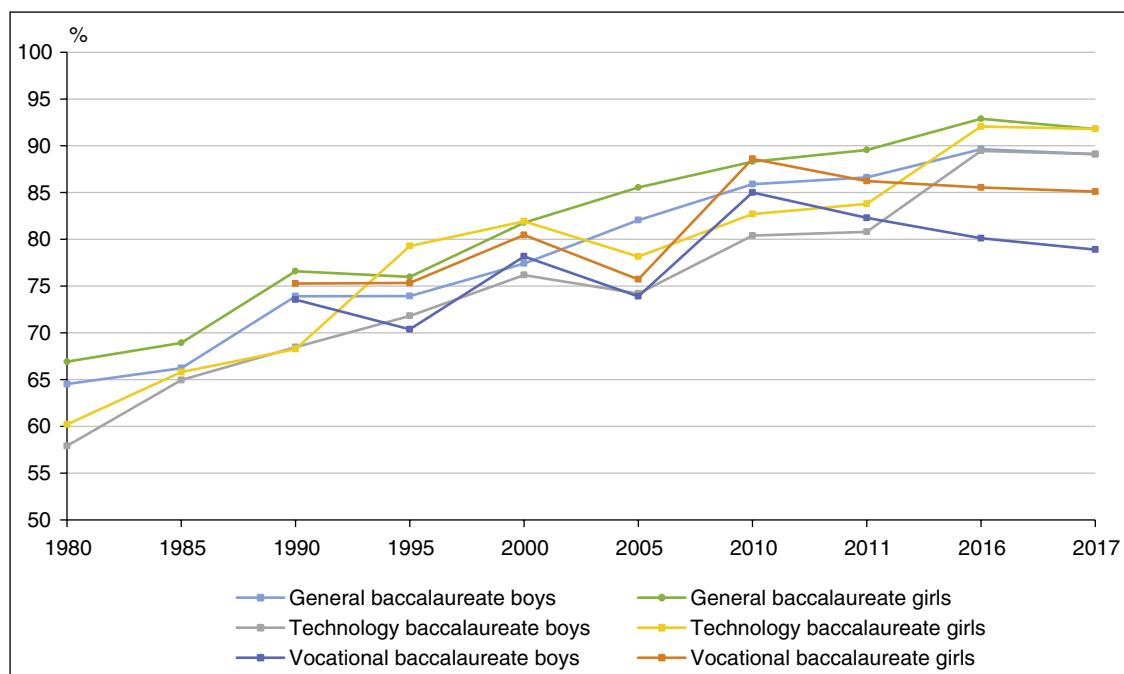
It should be noted that by 1971, the rate of girls holding the Baccalaureate had caught up with that of boys, reflecting the equality in access to higher education, as noted by Baudelot & Establet (1992) – who also noted that the gender mix was not fully achieved in terms of the fields of higher

2. This index was first implemented within companies with over 1,000 employees, then as of 1 September 2019 applied to all companies having over 250 employees.

3. For more detailed explanations of these changes, see Ministère du travail (Ministry of Labour), 2018.

4. See the DEPP time series, Ministère de l'Éducation Nationale (Ministry of National Education).

Figure I
Baccalaureate completion rate for candidates, by gender and baccalaureate type



Coverage: Metropolitan France plus overseas departments, including Mayotte from 2011 onwards.

Sources: MEN-MESRI-DEPP/Océan database and survey 60 on the final results of the MAA baccalaureate/Ministry of Agriculture database.

education. These differences have diminished, but have not disappeared.

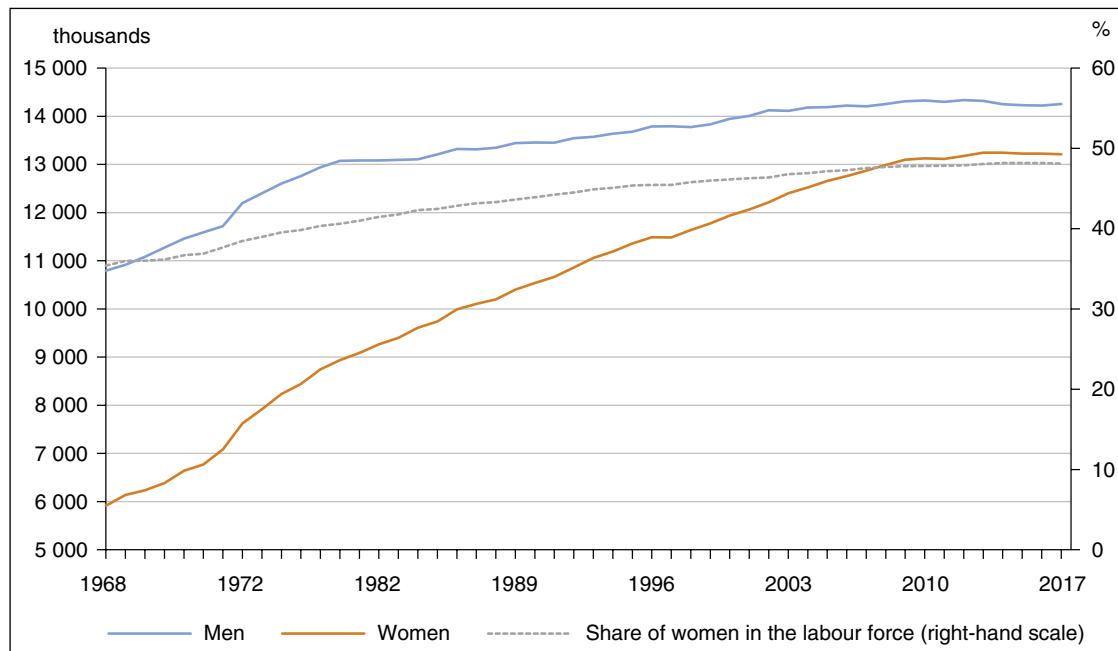
The second notable trend of the period 1968-2017 is the steady increase in absolute terms in labour market participation among the 20-59 age group (Figure II), particularly before the 2000s. The huge increase in the labour force (from 16.7 million to 27.5 million) was driven primarily by women: for this age group, the number of men in the labour force increased by a factor of 1.3 between 1968 and 2017, while the number of women increased by a factor of 2.2. As a result, the proportion of women in the labour force increased steadily, rising from 35% before 1970 to near parity (48%) at the end of the period (see also Marchand & Minni, this issue). Over the generations, women have also had an increased presence on the labour market during their lifetimes, and their probability to work between the ages of 25 and 54 has increased steadily (Minni, 2012).

In addition to the rise in female labour market participation rate and continuity of participation, women's risk of unemployment has become equivalent to the risk for men. In the 1960s, unemployment was close to zero for men aged between 20 and 59; France was in full employment for this age group. By contrast, in

the same period, women's unemployment rate was around 5% (Figure III). It subsequently increased in parallel for men and women from the 1970s onwards and by the end of the 1990s, it was 12% for women and almost 9% for men. During the 2000s, the parallel alignment of the two curves disappears. The male unemployment rate increases at a faster rate than the female rate, and the two rates are broadly equal since the 2008 crisis at just under 10%.

The trend described above of women's growing rate of participation in the labour market is reflected in the proportion of women amongst employees, with near parity (49%) achieved in 2015; in the private sector, the proportion of women increased from less than a third before 1970 to almost 45% by the end of the period (Figure IV). In the 1990s, this increase in the proportion of women in employment is closely related to growth in part-time employment: the proportion of female full-time employees rises more slowly than the proportion of female employees on the whole, particularly in the private sector (Afsa & Buffeteau, 2006). The growth in part-time employment is linked to the policy of exemptions from employer contributions introduced for part-time jobs in 1992, along with the potential to combine reductions in charges for jobs paid close to the minimum

Figure II
Labour market participation, 20-59 age group

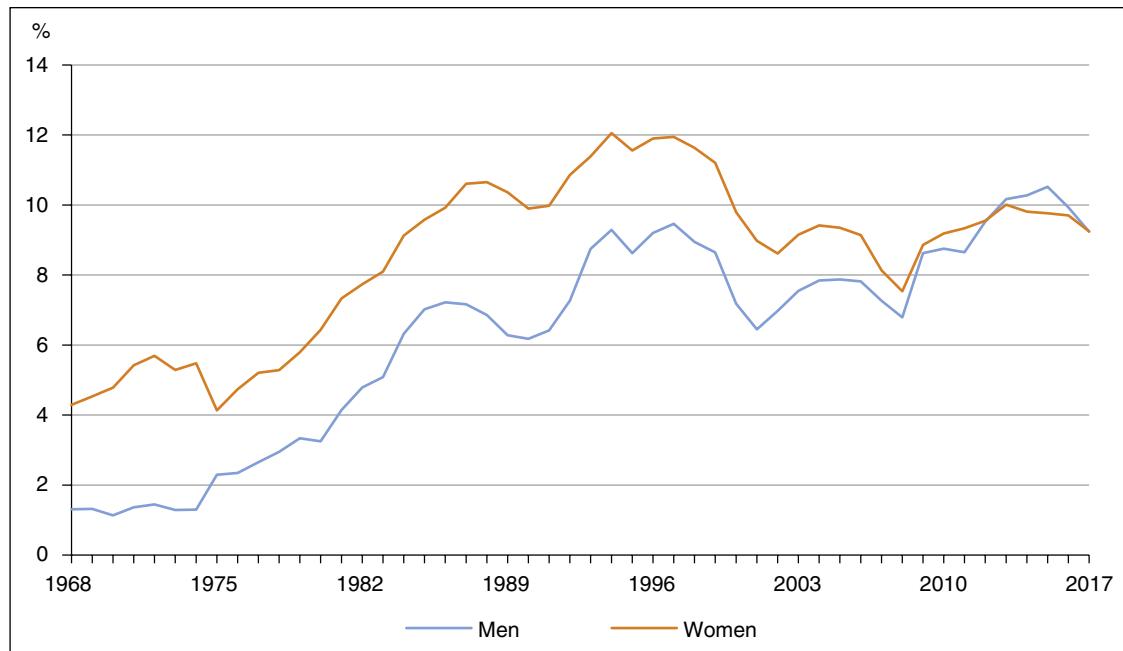


Coverage: 20-59 age group - metropolitan France.
Sources: Insee, Labour Force Surveys (*Enquêtes Emploi*).

wage until December 1997. The exemptions for part-time workers were discontinued in 2003 (*amendement Fillon*), but they undoubtedly

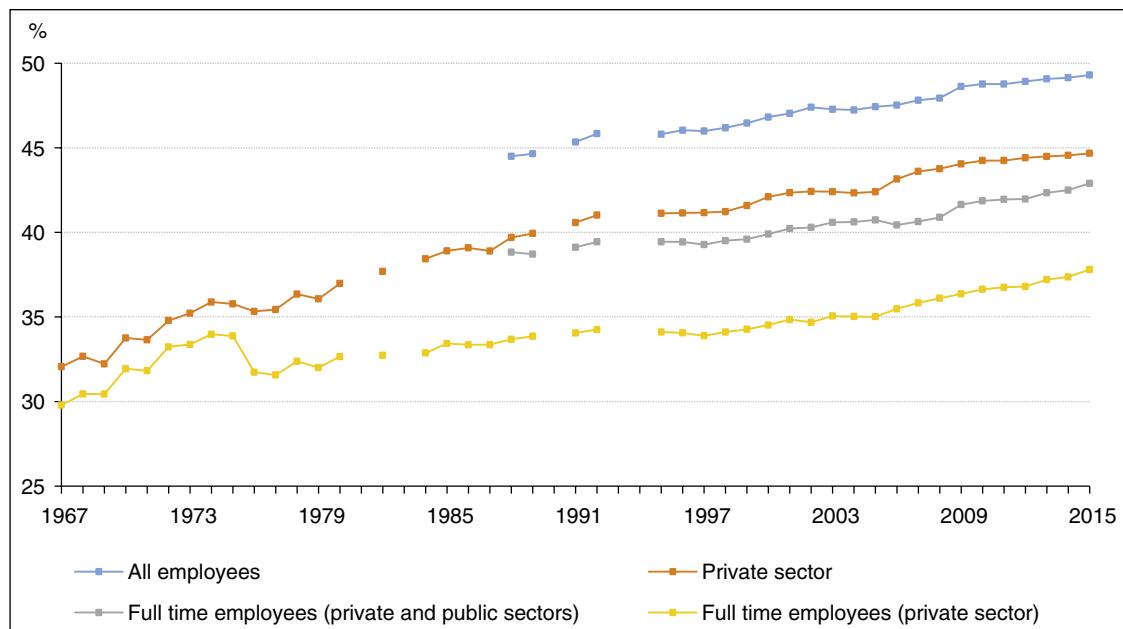
had a ratchet effect; the proportion of part-time female employees in the private sector has since remained stable at close to 30%. If we look at

Figure III
Unemployment rate, 20-59 age group



Coverage: 20-59 age group - metropolitan France.
Sources: Insee, Labour Force Surveys (*Enquêtes Emploi*).

Figure IV
Proportion of women in all employees, 20-59 age group



Notes: Data for years 1981, 1983 and 1990 are not available. Data for years 1993 and 1994 are not exploitable.
Coverage: Metropolitan France, all employees aged between 20 and 59, where the number of days of paid work in the year exceeds 45, excluding agriculture.
Sources: Insee, DADS panel.

full-time private sector employees, the increase in the proportion of women is less pronounced: at the end of the period, they only represent 36% of all employees.

A Gradual Progress Towards Equality in Pay Since 1967

The convergence of women's and men's behaviour in terms of labour market participation has not resulted in the net trend of reduction of the gender pay gap which might have been expected. But, before tracing developments since 1967, concepts and sources used must be clarified. Comparing men's and women's wage appears simple *a priori*, this variable being available in numerous databases. But in practice, it is impossible to give a unique figure for the raw gender pay gap. This is due to several possible methodological options: what coverage should be used? Which sources should be used? Should differences in working time be taken into account or not? These questions are associated with the issue itself: women and men do not work equally across all sectors, with the same numbers of working hours and the same duration over the year. Depending on the options retained, the variations in the raw gap are considerable: for example, in 2015, depending on whether we consider the hourly wage of all employees or the earnings from employment received during the year, the raw ratio of women's to men's wage is 85% or 77%,⁵ that is a divergence of almost ten points.

The main sources allowing to study changes to individual pay over the long term provide information of two kinds: either reported by the employees themselves (or the person in the household questioned) as in the *enquête Emploi* (the French Labour Force survey); or based on administrative data from employers, the information being set out in the DADS and its various satellites (see Box 1).⁶ The *enquête Emploi* has been widely used in statistical studies of inequality between women and men because it has the advantage of covering the entire population, including inactive persons, but it has the disadvantage of a lack of precision in terms of income and length of time worked. Further, wages are only available in level form from 1990 (previously the information was only on wage brackets). The "DADS" data, which remained difficult for researchers to access for a long time, have the advantage of being accurate in terms of both the composition of pay and length of time worked, and of providing information since 1967,

which means that it is the source with the longest historical record of pay; its disadvantage is that it only covers the private sector over the long term (that is since 1967), the public sector being added in 1988, and employees of individual employers in 2009. The inability to go back further than 2009 for hourly pay in the public sector and 1995 for all employees represents a severe limitation in the study of differences in pay between women and men in view of the far higher proportion of women in the public sector than in the private sector (62% and 46% respectively in 2017, see DGAFP, 2017⁷).

We present a series of indicators of the change in women to men ratio of net annual earnings, all based on the DADS, varying the coverage according to the availability of data. We start with the wage income of all employees (full-time and part-time) in the private sector over the period 1967-2015 and for employees in all sectors from 1988⁸ onwards (Figure V). Before 1970, in the private sector, women's average wage income was less than 60% of men's average wage income. This ratio rises throughout the period studied, reaching 73% in 2015. When all sectors are taken into account, i.e. including wages paid in the public sector, inequalities between women and men are slightly less pronounced: the ratio of women's average wage income to men's is 77% in 2015.

To illustrate the impact of working time differences on these ratios, we examine several measures of the wage gap between women and men (Figure VI). First, we consider the ratio of daily wages (wage income divided by the number of days worked) for all employees, then on the restricted scope of full-time employees – and, there again, since 1967 for the private sector and all sectors since 1988. Then we consider the ratio

5. Sources: DADS, 2015.

6. There are other surveys which provide information on pay, but they are more recent (ECMOSS – an annual survey on labour costs and pay structure undertaken by Dares, at 18,000 entities since 2005 with a sample of employees from each entity) or they are one-off surveys (*enquête Familles et Employeurs Insee-Ined 2004-2005* (*Insee-Ined family/employers survey*) or they provide aggregated information (ACEMO). Other promising sources are now available such as the ERFS (*enquête sur les Revenus Fiscaux et Sociaux*, a survey on household income) but they do not go back any earlier than 2005 (or 1996 for the ERF, the first version of the ERFS). Lastly, the European panels (firstly the ECHP and then EU-SILC) were set up in 1994, but pose problems with calculating hourly pay (the income declared is one year behind as compared with the working hours reported).

7. Analyses of the difference in the gender pay gap between the private and public sectors can be found in Arulampalam et al. (2007), Lucifora & Meurs (2006), and Gobillon et al. (2018).

8. Only employees who have worked more than 45 days are retained here and in the rest of the article, to limit the problems related to the measurement of very low volumes of work in the DADS on the one hand, and to work on a population of individuals who are relatively regularly present in paid employment on the other hand.

of hourly wages of all employees (from 1995 for the private sector, and from 2009 for all sectors).

The ratios measured on the basis of the daily wages of full-time employees and on the basis

of the hourly wages of all employees appear very similar over the period 1995-2015; the daily full-time wage therefore seems to be a good basis for measuring similar working time wage gaps over a long period. In 1967, this ratio was

Box 1 – Data and Definitions

DADS-EDP Panel

The DADS-EDP panel results from matching the DADS “all-employees” panel with the *Échantillon Démographique Permanent* (EDP, a demographic panel, based on the Population Census). The “all-employees” panel includes data from two administrative sources: the *Déclarations Annuelles de Données Sociales* (DADS, based on compulsory annual employers’ declarations on the employees at their entities) and State payroll files.

The all-employees panel provides information on a number of employee characteristics (e.g. sex, year of birth), their jobs (e.g. type of contract, date of appointment, wage and bonuses, number of days worked, hours paid) and the entities where they are employed (e.g. economic sector, company size, location).

The EDP is a socio-demographic panel developed since 1967; it is based on civil status certificates (e.g. births, marriages, deaths) and surveys for individuals born 1 and 4 October. The sample quadrupled in size in the 2000s with the addition of individuals born between 2 and 5 January and the first four days of April and July. The all-employee and EDP panels (forming the DADS-EDP panel) are matched through a registration index number (the NIR, *Numéro d’Inscription au Répertoire*); the matched data allow us to determine the level of education reported by employees in surveys, as well as their children’s year of birth. However, as no information was available before 2002 for individuals born in January, April and July, and the information was incomplete for children of individuals born on 2 or 3 October (Coutet, 2006), we matched individuals born on 1 or 4 October, then reconstructed data for employees born on 2 or 3 October. To recreate data on births of children of individuals born on 2 and 3 October, we use comprehensive Census data from between 1990 and 1999, available in the EDP. Specifically, we complete 1982 to 1997, absent from birth certificates, using data on births collected in the Censuses.

Coverage

The DADS coverage, and therefore of the all-employee panel, is not constant over time. Accordingly, the data used covers private sector employees from 1967, and public sector employees are only included from 1988. In the private sector, employees of individual employers are only included from 2009. The information on the number of hours paid is only available from 1995 for the private sector, public hospitals and local and regional authorities, and only from 2009 for the State civil service.

Unlike the DADS, the DADS-EDP panel covers all employees in all sectors (that is including the public

service) since 1988, which allows us to describe the pay gap between women and men for “all sectors” from that year onwards.

In order to obtain long series which are as consistent as possible over time, we work on different coverage depending on the data available: firstly, earnings paid by the private sector, which are available from 1967; secondly, we construct series relating to earnings paid by all sectors (public and private), for which the period covered starts in 1988.

Measuring Pay

For each coverage, we construct three pay series:

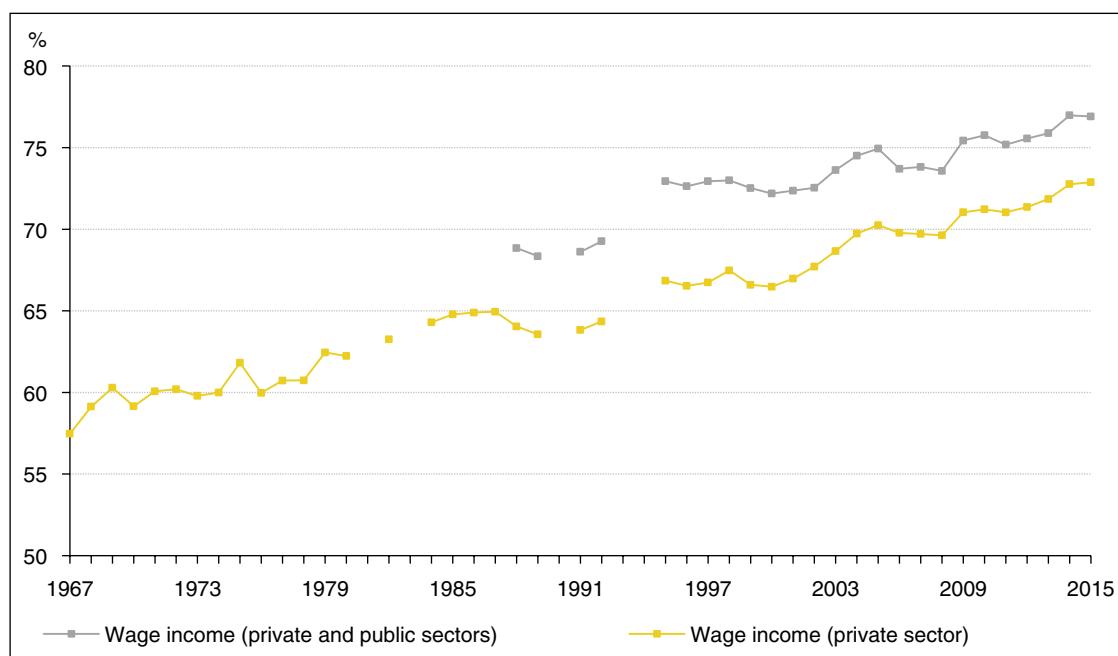
- A series on earnings, which corresponds to the sum of all earnings paid to employees, since 1967 for the private sector and from 1988 for the “all sectors” series;
- For full-time employees only, a series of daily wage, i.e. the ratio of annual earnings to the number of days worked in the year, covering the same periods;
- For all employees (full-time or part-time), a series of hourly wage, i.e. the ratio of annual earnings to the number of paid hours over the year; it can only be constructed from 1995 for the private sector, and 2009 for the “all sectors” series.

Earnings are measured in terms of net pay. Net pay includes all pay from all employers to an individual in a given year, net of all social contributions (that is, including the CSG and CRDS). This amount therefore represents the earnings received by employees, as opposed to labour costs for employers.

We use the paid hours entered into the all-employee panel database. Paid hours correspond to hours for which the employee is paid by the employer, including additional hours and overtime. For employees paid a fixed daily rate, the employer does not report paid hours, which are instead imputed on the basis of the number of paid days (salary period) while ensuring that the hourly pay is consistent for this imputation.

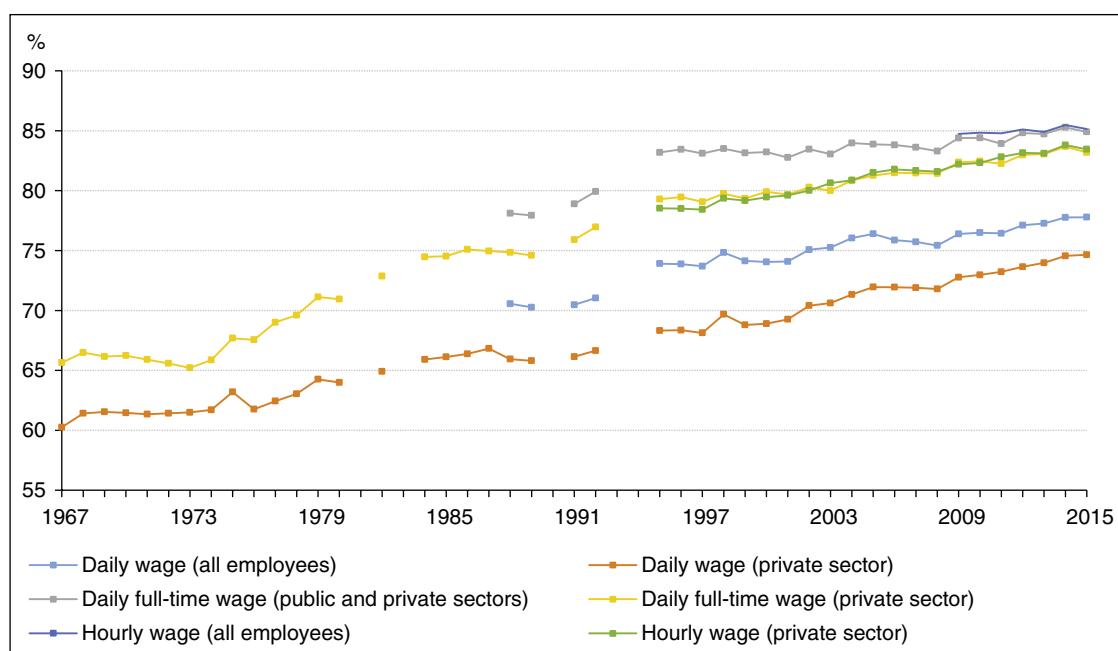
Payment of maternity leave is excluded from the earnings. In principle, paid hours are equal to 0 for the period of maternity leave, but not days (salary period). One notable exception relates to employees on a fixed daily rate, for whom the employer does not report the hours when completing the declaration. For these employees, hours are then allocated based on the salary period and hourly pay. As such, paid hours during the year in which maternity leave is taken are probably overestimated for these employees (and the hourly pay underestimated).

Figure V
Ratio of female-male wage incomes, 20-59 age group



Notes: Data for years 1981, 1983 and 1990 are not available. Data for years 1993 and 1994 are not exploitable.
Coverage: Metropolitan France, all employees aged between 20 and 59, where the number of days of paid work in the year exceeds 45, excluding agriculture and employees by private employers.
Sources: Insee, DADS panel.

Figure VI
Ratio of female-male daily wages, 20-59 age group



Notes: Data for years 1981, 1983 and 1990 are not available. Data for years 1993 and 1994 are not exploitable.
Coverage: Metropolitan France, all employees aged between 20 and 59, where the number of days of paid work in the year exceeds 45, excluding agriculture and employees by private employers.
Sources: Insee, DADS panel.

around 65% in the private sector; it increased substantially in the 1970s to 80%, remained at this level overall in the 1990s and increased slightly in recent years to finish at 83% in 2015. For employees in all sectors, the ratio is a little higher (85%).

These developments, generally favourable to women in the labour market, have had long term repercussions on pensions. The ratio of women to men pensions has effectively increased over the generations, from 55% for the cohort born in 1934 to 62% for the cohort born in 1942 (Aubert, 2012). Box 2 provides an analysis of pension inequality between currently retired women and men, which shows the positive impact of the extension of careers (and of higher reference salaries) for different generations.

The Wage Distributions Converge Over Time, but Less for Upper Deciles

To expand on this overview, we look at how wages distributions have altered over time. Figure VII sets out the distributions of daily wages for women and men in full-time employment for four years of the period under review. In 1967, the curve that represents women's wage distribution is clearly slanted to the left compared to that for men, reflecting the gender segregation of jobs and the fact that women, including those working full time, are concentrated in lower-paid jobs. In 1975, both distributions start to converge, particularly for the lowest earnings, albeit still skewed against women. Between 2000 and 2015, there is almost no change in the distributions. For low wages, both curves now almost overlap, and

Box 2 – Pension Inequality Between Women and Men - Slow Convergence^(a)

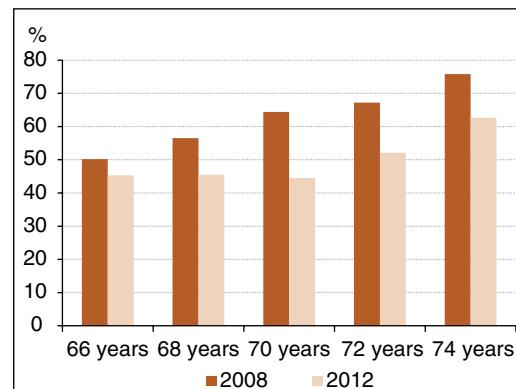
Inequalities in pay between women and men have a knock-on effect on pensions, which essentially depend on the actual previous career. Gender differences in pensions can be expected to decrease as the gender pay gap narrows. Of fundamental importance to this trend are the extension of contribution periods and the reference salary – and these two factors are likely to become even more crucial when the reform being discussed currently is implemented, and will affect the generations who are currently at the start of their careers.

What is the situation for the currently retired generations? To what extent have the changes identified since the post-war period affected differences in pensions between women and men? To answer this question, we use the years 2008 and 2012 of the *Échantillon Interrégime des Retraites* (EIR, pension sample across all schemes). This standardised data has the advantage of covering all pension schemes and amounts paid and enables the overall pension amount to be reconstituted for a sample of individuals, including persons having multiple pensions. We consider here retired persons under the general scheme (CNAV) and under the three components of the civil service: State (SRE), local/ regional authorities and hospitals (CNRACL), that is over 90% of retired persons. The average pension for women under the general scheme represents around 50% of the pension for men in both 2008 and 2012. The gaps are less pronounced among former civil servants, in the SRE (over 80%) as well as in the CNRACL (around 75% for persons having a single pension, over 80% for persons having multiple pensions). The average gaps narrowed slightly between these two dates, irrespective of which pension scheme is considered.

Considering two different years enables us to differentiate the "cohort" effect from the "age" effect and to examine the average pension amount for a single age on two different dates (2008 and 2012). We only take into account the pension to which a person is directly

entitled (excluding any survivor's pension) in order to focus on the links between the nature of the past career and the pension amount. The variations in pension gaps between 2008 and 2012 by cohort show a narrowing of the average gap between women and men of the same age (Figure A). The relatively low ratio for 66 year-olds is due to the fact that all economically active persons have not yet retired and that this situation is more relevant to highly-qualified men earning high salaries; for older persons (72 and 74 year-olds), the highest ratio relates primarily to a selection effect: women who have had a career are relatively rare in these generations.

Figure A
Average retirement pension gap between women and men in 2008 and 2012, by age



Source : Drees, *Échantillon Interrégime des Retraites*, 2008 and 2012.

(a) This Box shows part of the results of the report of Bonnet et al. (2016) for UNSA-IRES and the associated working paper (2018).

the gap in average wages between women and men is apparently due to the higher number of men in upper deciles.

For a more detailed picture of changes in these distributions over time, Figure VIII shows the ratio of women to men daily wages for different percentiles of the distribution. During all the period, the gap is much smaller at the bottom of the distribution. Up to the median, the women to men ratio has notably increased in the 1970s, from around 70%-75% to over 90% from the 1980s onwards. This trend reflects the impact of the minimum wage, which limits gender pay gaps, and that effect extends beyond the median, up to the 75th percentile. For the highest wages (90th and 95th percentiles), three findings emerge: at the end of the period, the gender wage gaps are higher than at the bottom of the distribution (81% and 79% in 2015 for the 90th and 95th percentiles respectively); they have continuously decreased since the late 1960s; they have continued to fall during the 2000s,

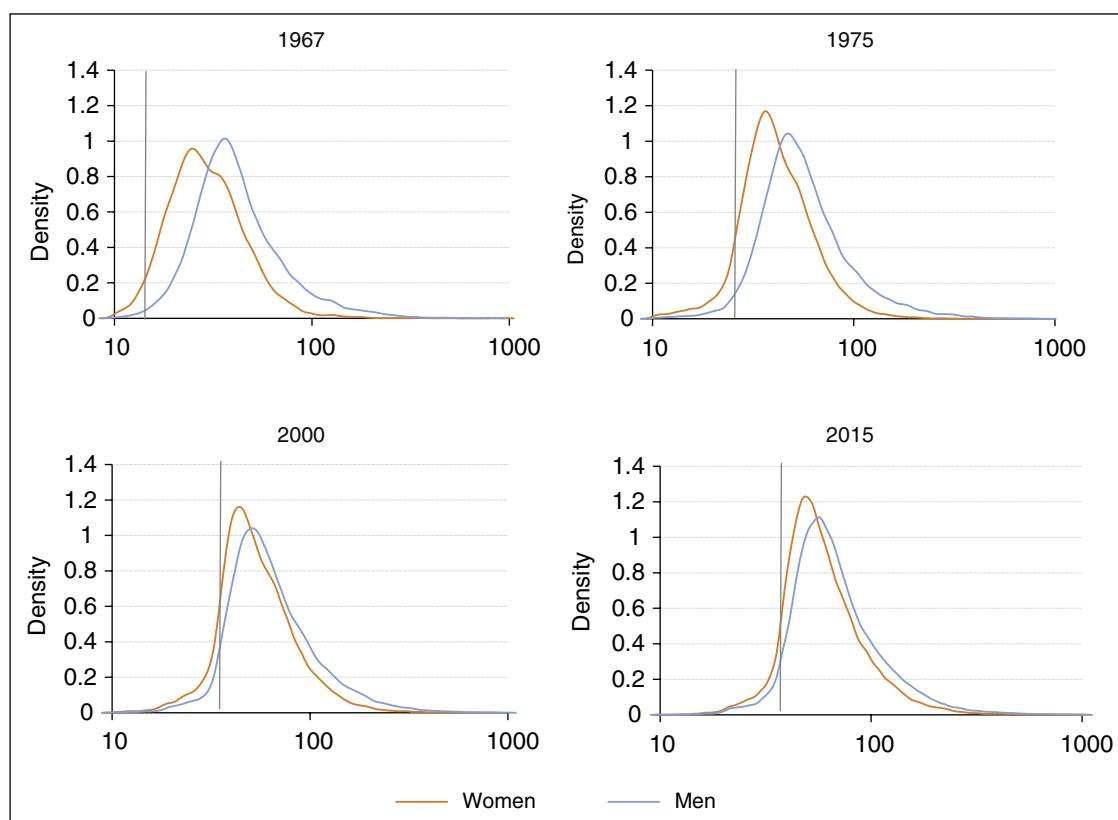
reflecting the increasing number of women in the highest-paid jobs during this period.

The Standard Methods of Decomposition of Average Pay Gaps

Statistical analysis of the sources of pay gaps between women and men has generated numerous economics studies, notably since the 1970s, with the wide distribution of methods of decomposition of the average divergences in pay (for a recent survey of all of these methods, see Boutchenik *et al.*, 2019).⁹ Since Oaxaca (1973) and Blinder (1973), it has become common practice to decompose the average pay gap between two groups (e.g. men and women, native and immigrant) into two components,

⁹. We only present the most usual methods of decomposition and do not deal with methods to decompose the pay gap across the whole wage distribution by constructing counterfactuals (for a survey of these methods, see Fortin *et al.*, 2011).

Figure VII
Distribution of full-time daily wages by gender, 1967, 1975, 2000, 2015 (2015 euros)



Notes: The density of hourly wages (in euros 2015) by sex is estimated by Gaussian kernel. The vertical bars represent the full-time daily net minimum wage for each year.

Coverage: Metropolitan France, all employees aged between 20 and 59, where the number of days of paid work in the year exceeds 45, excluding agriculture and employees by private employers.

Sources: Insee, DADS panel.

one corresponding to the average differences in productive characteristics of the two groups (e.g. education, experience, seniority, etc.), the other corresponding to differences in the return to these characteristics, or the unexplained component, of the pay gap. Formally, the wage gap between women and men can be expressed as follows:

$$Y_m - Y_f = (X'_m - X'_f) \beta_m + X'_f (\beta_m - \beta_f) \quad (1)$$

where Y is the average estimated wage of male (m) and female (f) employees, X is the vector of the means of these characteristics and β the returns to these characteristics, estimated in separate earnings equations for women and men. Should the structure of both populations be identical for the X variables considered, any wage differential could only result from a difference in the return of these characteristics, which is often considered as a measurement of pay discrimination. Reciprocally, should the average estimated returns of the characteristics be equal, the pay gap would be explained entirely by structural effects, which themselves may result from other types of inequality (e.g. access to education, accumulation of experience, etc.).

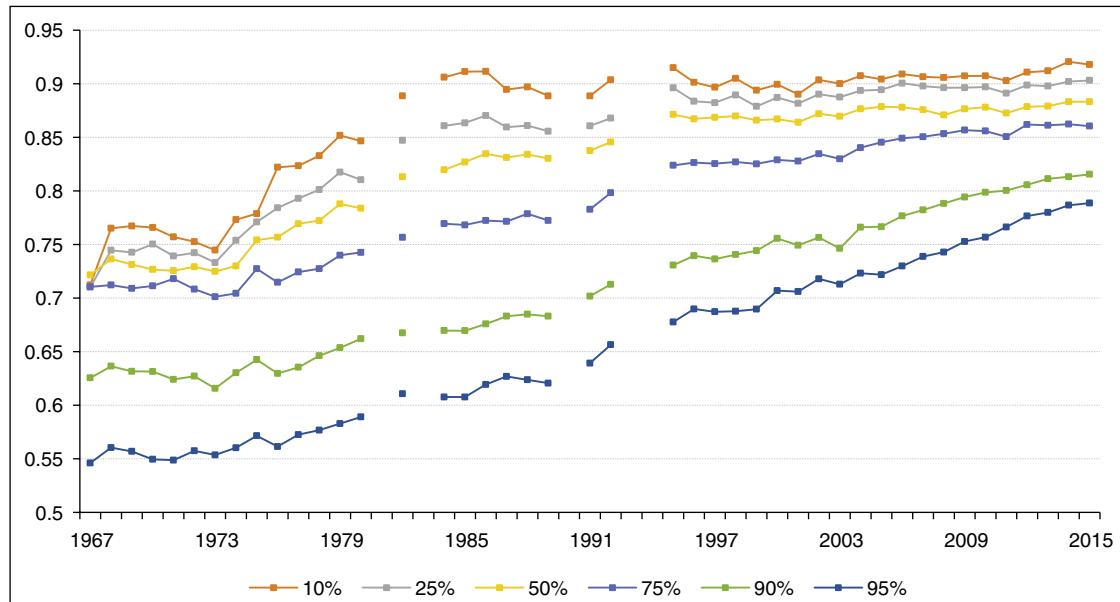
All decomposition methods face the problem of determining the “norm” – i.e. the returns to characteristics taken as reference – and the

corresponding weighting. In equation (1), differentials in returns are weighted by the mean of female characteristics and differentials in characteristics are weighted by estimated male returns. A number of other options have been used in this decomposition (see Oaxaca & Ransom, 1994), in particular in Oaxaca & Ransom (1988), which is now the most often used. The underlying basis for this methodology is to define a non-discriminatory standard for the returns to individual characteristics and to measure the advantage to men, the disadvantage to females and the component resulting from differences in characteristics against this standard. In practice, the non-discriminatory standard β_N is based on the estimation of a wage equation for the entire population under consideration, irrespective of the sex of individuals. The decomposition of the pay gap at the mean can therefore be written in three parts:

$$Y_m - Y_f = (X'_m - X'_f) \beta_N + X'_h (\beta_h - \beta_N) + X'_f (\beta_N - \beta_f) \quad (2)$$

The first term on the right hand side corresponds to the “explained” component of the pay gap. The two other terms represent the advantage resulting from being a man (higher returns than the “norm”) in relation to the “standard” β_N and

Figure VIII
Ratio of female-male daily wages by position on the wage distribution



Notes: Data for years 1981, 1983 and 1990 are not available. Data for 1993 and 1994 are not exploitable.

Coverage: Metropolitan France, all employees aged between 20 and 59, where the number of days of paid work in the year exceeds 45, excluding agriculture and employees by private employers.

Sources: Insee, DADS panel.

the disadvantage due to being a woman, with the total of both terms representing the unexplained component of the gap.

There are two main methodological issues with this approach. The first is determining the specification of the wage equation. The greater the number of control variables, the smaller the unexplained component becomes, but the “explained” component may then include differences not accounted for in the equation – e.g. occupational segregation that is, the fact that with the same level of qualifications, women have less access to higher-paid employment. The second issue relates to the selection bias, specifically the probability of having a job is not equal between women and men. Not taking these differences into account could lead to biased estimates of the returns to individual characteristics and, therefore, measurements of discrimination. Heckman’s “two-step” procedure (Heckman, 1979) is a frequently used method where the population in which pay is observed is not a random sample of the reference population. Its implementation nevertheless implies that information on the entire potentially employed population is available.

Differences in Human Capital No Longer Explain the Pay Gap Between Women and Men

Studies on the decomposition of the pay gap between men and women came to light rather late in France. One of the pioneering papers was that of Sofer (1990) which examined the effect of segregation of jobs by sex on the pay gap. Since then, numerous papers have presented decompositions of the pay gap (Meurs & Ponthieux, 2000; Meng & Meurs, 2001; Meurs & Ponthieux, 2006; Muller, 2012; Bozio *et al.*, 2014; Chamkhi & Toulemonde, 2015). It is difficult nonetheless to compare the results or to identify trends in development of the explained (or unexplained) component, because the relative magnitude of the components depends on the data used, the concept of pay (annual, monthly, hourly), the coverage (private or public sector, or both, firms’ size, etc.), the characteristics used in the analysis and the decomposition technique. For example, for the same year observed (2012), Bozio *et al.* (2014) obtain an unexplained component in the order of 25%, compared with around 10% in Chamkhi & Toulemonde (2015).

We propose below an illustration of the long-term evolution of the contribution of the differences

in human capital to the gender wage gap, using the DADS, which allow us to go back to 1967. Compared to the work just mentioned, the wage equation adopted is therefore “poor” in characteristics, close to Mincer’s (1958) original model. We cannot correct for the selection bias because we only observe employees and not the whole population. Wages are thus estimated as a function of education and experience, without any other explanatory variables. The idea here is to follow over a long period the share of the gender pay gap explained by these two factors representing human capital, while being aware that the unexplained share comes mainly from occupational segregation. The decomposition is carried out on the average daily wage gap (in logarithms) for full-time work in the private sector, for which we have the longest series (1967-2015). Measures of education and experience are based on the matched data from the DADS panel and the EDP (cf. Box 1).

Education is measured based on the highest diploma declared in the census. Six levels of diplomas are retained: Primary School Certificate and equivalent, Brevet (a secondary school certificate) and equivalent, CAP or BEP (technical degrees from secondary school), Baccalaureate (all types combined), Bac+2, Bac+3 and more. Figure IX shows the shares of employees holding each of these types of diploma as the highest. Three main changes are clear: the collapse among employees (men and women) of the share of the least qualified; a higher proportion of men than women with secondary school technical degrees (CAP, BEP); and a higher proportion of women than men with at least the baccalaureate, including Bac+3 degrees from the 2000s onwards.

With regard to experience, unfortunately it is not possible to calculate actual experience, because the date of first employment is not recorded for older generations. We therefore measure potential experience, which is the difference between an individual’s age and his/her likely age when he/she entered the labour market, based on his/her education level. This is a fairly standard approach, because data enabling actual experience to be measured are rare.¹⁰ It is clearly an imperfect measurement, which tends to overestimate experience, and, due to the more frequent interruptions to their career, that of women more than men,¹¹

10. We can mention the “Jeunes et carrières” survey of 1997, which supplemented the Labour Force survey for that year (<http://www.progedo-adisp.fr/enquetes/XML/lil.php?lil=lil-0047>), and the “Familles et employeurs” (Families and employers) survey of 2004 (www.efe.ined.fr), which both provided retrospective calendars.

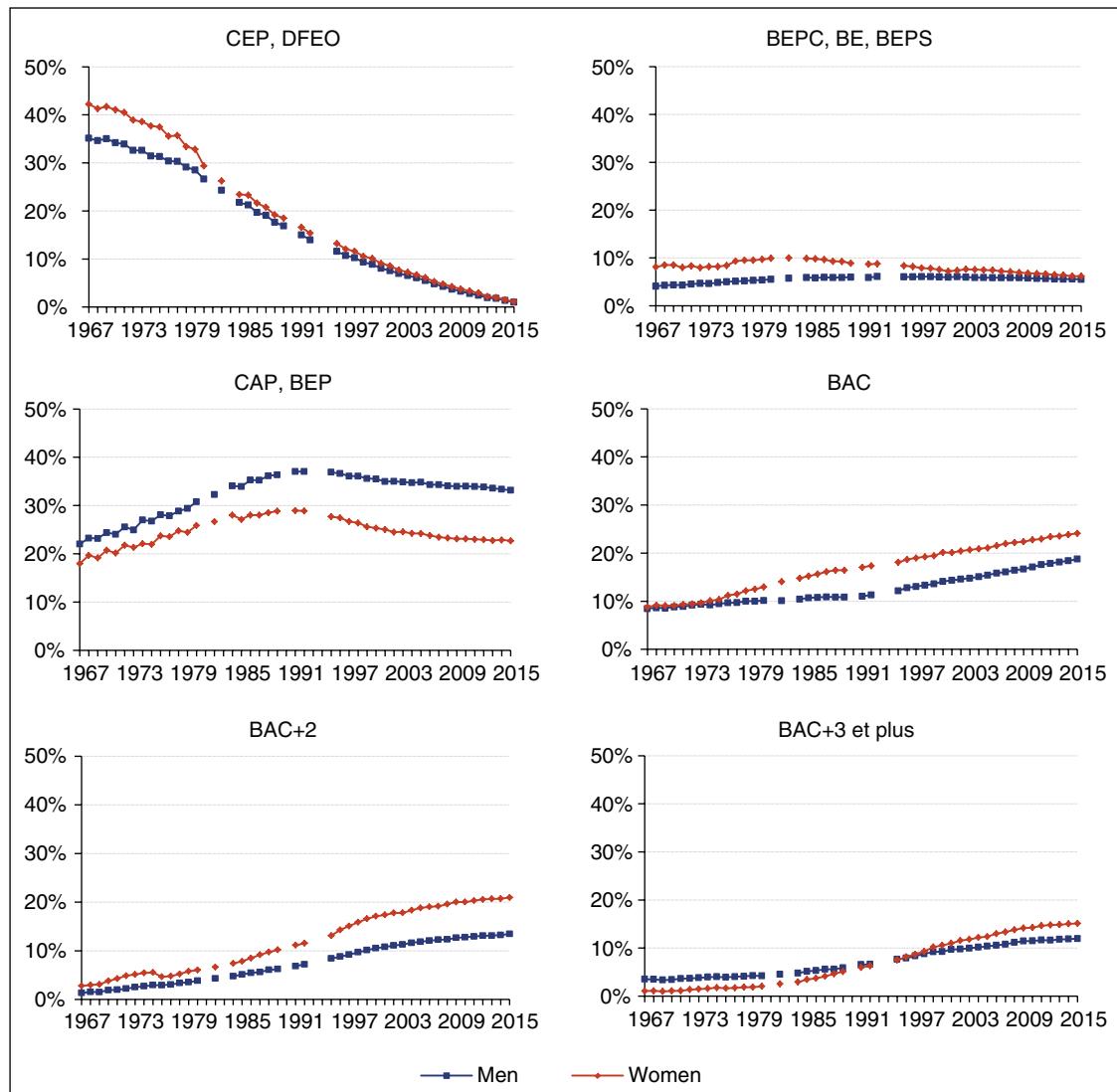
11. Which leads to the returns to experience being underestimated and pay discrimination being overestimated (Regan & Oaxaca, 2009).

notably at the start of the period. Figure X, which represents changes to potential experience of employees in our coverage, demonstrates that it has become practically equivalent between women and men at the end of the period.

Figure XI represents the evolution, from 1967 to 2015, of the gender wage gap, its share explained by differences in human capital gaps (diploma and potential experience) and the “unexplained” component (i.e. not explained by human capital differences). The raw gap between the average daily wages of women and men was at its highest,

around 35% in the early 1970s. Then it decreased fairly steadily until the early 1990s, reaching a plateau around 15%. The part explained by differences in human capital is positive in the 1970s, and represents about 5% of the wage gap; in other words, in that period, part of the raw gap (14 points of the total gap) results from women's lower level of human capital than men's, to which was probably added an important selection effect. In the 1980s, differences in education and experience fade and the corresponding share of the wage gap becomes therefore increasingly small. From the late 1990s onwards, the explained share of the

**Figure IX
Diploma level by gender and year among full-time private sector employees**



Notes: Data for years 1981, 1983 and 1990 are not available. Data for years 1993 and 1994 are not exploitable. CEP, DFEO: primary school degree; BEPC, BE, BPS: secondary school degree; CAP, BEP: vocational degree; Baccalauréat: general and vocational baccalaureates; BAC+2: first cycle college education; BAC+3: college education second degree and over.

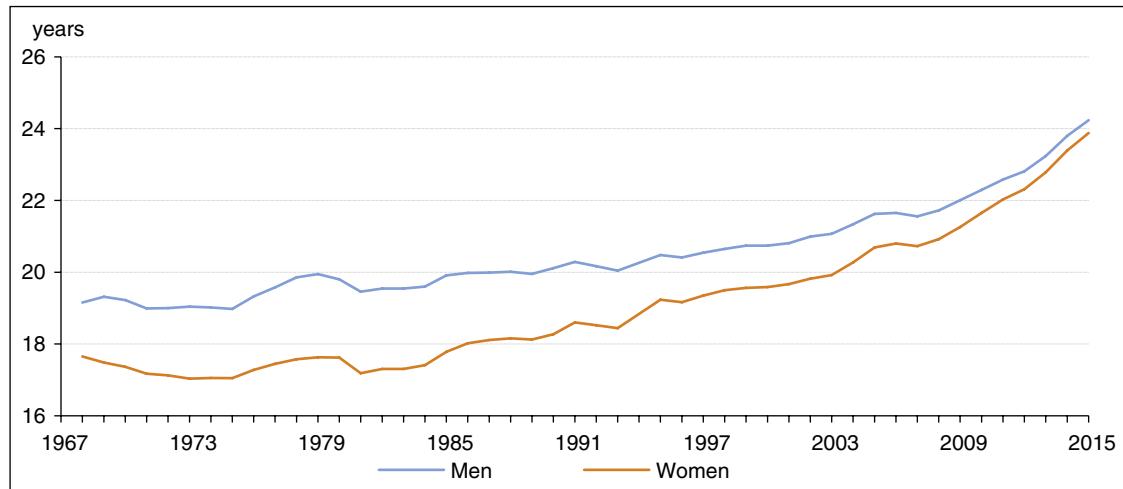
Coverage: Metropolitan France, all employees aged between 20 and 59, where the number of days of paid work in the year exceeds 45, excluding agriculture and employees by private employers.

Sources: Insee, DADS-EDP panel.

gap even becomes negative, and increasingly so, reaching -5% at the end of the period: this means that on average among full-time employees, women's average human capital, measured by qualifications and potential experience, has

become higher than that of men. The rest of the wage gap, the "unexplained" part, most likely reflects occupational segregation: with identical qualifications and experience, women work in lower-skilled jobs or in lower-paying sectors.

Figure X
Potential experience by gender and year among full-time private sector employees

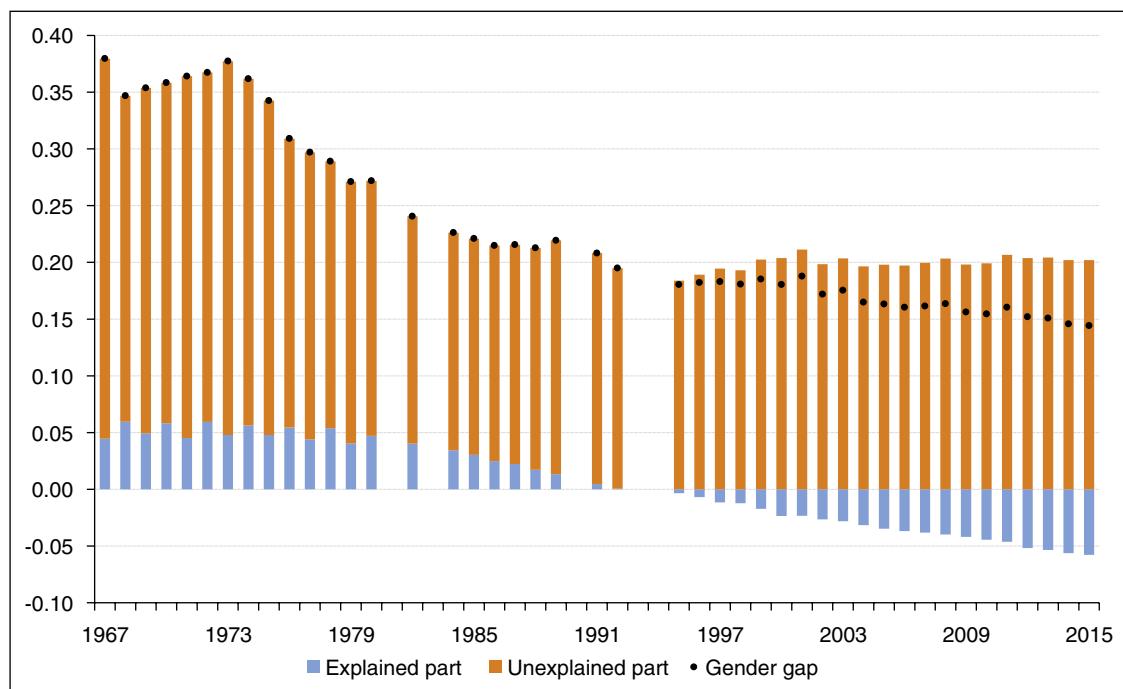


Notes: Sample includes only individuals born in an even year; series with a 2-years moving average.

Coverage: Metropolitan France, all employees aged between 20 and 59, excluding agriculture.

Sources: Insee, DADS-EDP panel.

Figure XI
Decomposition of average full-time daily wage gaps (log)



Data for years 1981, 1983 and 1990 are not available. Data for years 1993 and 1994 are not exploitable.

Sources: Insee, DADS-EDP panel.

Motherhood: An Obstacle to the Convergence of Women's and Men's Wage

How do we explain why the growing human capital advantage on the part of women is not reflected by a reduction in the pay gap through a more balanced distribution of women and men between sectors and jobs?

Various explanations have been offered, from the choice of educational specialisation (far more boys study engineering, and far more girls study humanities), to psychological traits (as women are more risk adverse, they are less likely to enter the highest-paying occupations¹²), to social norms¹³ which result in occupational segregation to the disadvantage of women, etc. There is no doubt that job segregation has tended to diminish, but it still remains high: measured using the Duncan index¹⁴, it stands at 51.6% in 2013 compared with 56% in 1982 in relation to classification in 86 roles (Dares, 2015). All these lines of analysis are consistent with the intuition that wage inequality is built up over time, from school through to choice of job and career progression within a company. In these life trajectories, a number of studies since the late 1990s underline the role played by motherhood to explain the fact that women's progress in education and experience does not translate into higher pay. A group of studies has therefore explored, using panel analysis, the extent of a long-term wage penalty on mothers compared with women who have not had children (the family pay gap).¹⁵ In this line, Meurs *et al.* (2010), using employment histories from the Insee-Ined survey *Familles et Employeurs*, find that women who interrupt their career are disadvantaged compared with women (with or without children) who have continuously pursued a full-time career; but they also find that women who have no interruption are also penalised compared with their male counterparts, which cannot be explained by differences in actual occupational experience. Other research in France has focussed specifically on the impact of parental leave (Piketty, 2005; Lequien, 2012; Joseph *et al.*, 2013), all of which conclude that the longer the parental leave, the higher the wage penalty. Lequien (2012) estimates that each additional year of parental leave results in a wage penalty of between 7% and 17%, depending on whether or not part-time employment is included in the model specification.

In Denmark, Kleven *et al.* (2018) recently revisited the approach of maternity-related wage penalty, using a quasi-experimental event

study approach applied to the entire population of Denmark (economically active and inactive persons) over a long period. They show in particular that the proportion of earnings inequality between women and men explained by a penalty resulting from having children doubled between 1980 and 2013, increasing from 40% to 80% of the gender earnings gap. In other words, the pay gap between women and men is primarily the result of having children and of the knock-on effects in terms of participation, working hours and career development.

Mothers are Penalised After Their First Child by the Cumulative Effect of Participation, Working Hours and Sluggish Growth in Hourly Earnings

What about France? The effect of births on women's professional activity appears very clear: based on the 2004-2005 Insee-Ined survey *Familles et employeurs*, Pailhé & Solaz (2006) show that among working women, nearly 40% will modify their activity after a maternity (change in status, hours, work intensity or withdrawal from the labour market). How does this affect wages?

We follow here the analytical framework of Kleven *et al.* (2018), with an event study approach. We apply it to a balanced panel of individuals whose labor earnings from the private sector are tracked over time; we further impose that these individuals worked for at least one year and have all had a child during the period in question (see Box 3). Our approach is also in line with prior studies by Coudin *et al.* (2017, 2018, 2019), who estimate the maternity-related wage penalty using the same database. Their main conclusions highlight the role of human resources policies in companies and their differentiated impact on women and men to explain the wage gap that has widened over the years between mothers and fathers. Mothers, in particular at the birth of the second child, will be more likely to be in companies that offer more flexible working hours, are closer to their home, and are less-highly paid.

In continuation with those studies, we extend the analysis to the wage income; we therefore

12. For a research survey on the links between psychology and economic behaviour, see Bertrand (2010).

13. The reference on this topic is Akerlof & Kranton (2000).

14. The Duncan & Duncan index is used to synthesise the degree of occupational segregation; it goes from 0 (no segregation, the proportion of women and men is the same, in all occupations, as on average in the relevant population) to 100 (complete segregation).

15. The most authoritative paper on this topic is Waldfogel (1998). For a literature review on this topic, see Ponthieux & Meurs (2015).

consider labour supply decisions on the extensive margin (whether or not to participate) and intensive margin (number of hours worked) when describing the impact of parenthood on earnings. The consequences of parenthood are identified by estimating the effect of the arrival of the first child. This effect aggregates all the consequences of the transition from childlessness to parenthood, including the consequences of subsequent births. The penalty we find can therefore be considered as a minimum in relation to all the consequences of motherhood on wages.

The period of the analysis (2005-2015) is a relatively institutionally stable period in terms

of family policy, in particular parental leave. The most significant reform, the creation of a unique benefit programme for early childhood (PAJE) merged a number of benefits (the birth grant, family allowances, a childcare subsidy, and an allowance (CLCA) for parents who take a break from paid employment or move to part-time hours), was introduced on 1 January 2004. For the first child, the maximum duration of CLCA is six months, that immediately follow maternity (or paternity) leave.¹⁶ Parental leave may

16. The maximum amount paid for the first six months where the parent opts to take leave in one instalment is on a flat-rate basis and was €573 in 2015.

Box 3 – Computation of the Penalty Effect of Parenthood

The effect of the birth of the first child on earnings is estimated, based on Kleven et al. (2018), using an “event-study” approach, which makes it possible to differentiate the effect of childbirth from other life-cycle effects and from the long-term growth of income over generations, detected by effects specific to an individual's age and year of birth. For the limited scope of individuals i with at least one child, we first of all regress the earnings in the private sector, observed each year (level and not logarithm, including 0 where the individual did not work in the private sector that year) on the time period in which the birth of the first child occurs (using the final year before birth as the reference), age and year of birth:

$$Y_{ist}^g = \sum \alpha_j^g 1_{t=j} + \sum \beta_k^g 1_{ag_i=k} + \sum \gamma_y^g 1_{s=y} + \nu_{ist}^g \quad (1)$$

where t denotes the period in which the event takes place, ag_i the age of individual i on the date in question, s the year of birth and g the employee sex. This regression provides, secondly, an estimate of the penalty associated with childbirth, by comparing α_j^g to the counterfactual earnings in the absence of a child, estimated as the average of earnings predicted by regression (1) to which the term related to childbirth refers:

$$P_j = \frac{\alpha_j^g}{E(\sum \beta_k^g 1_{ag_i=k} + \sum \gamma_y^g 1_{s=y} | t = j)} \quad (2)$$

This estimation can then be extended to other outcomes such as labour market participation by limiting it where necessary (for the number of paid hours or hourly pay) to individuals employed in the private sector. For paid hours, limiting it strictly to individuals with a positive number of paid hours makes it possible to substantiate decisions on the intensive margin, rather than an aggregate of decisions on the extensive and intensive margins. On the other hand, for earnings, it is desirable to re-aggregate labour supply decisions on the extensive and intensive margins, as well as the effect on hourly earnings: this is the aggregate effect that can subsequently be decomposed. For this reason, zero values for earnings are included in the analysis of earnings.

This estimation is carried out based on longitudinal data (balanced panel), which includes all individuals who have worked at least one hour between 2005 and 2015 and who had their first child between 2005 and 2015. For years in which those employees held at least one salaried position in the private sector, earnings are taken from the all-employee panel limited to the private sector. For years in which those employees did not hold any position in the private sector, a zero level of earnings is assigned.

The heterogeneity in penalties relating to maternity highlighted by Pora & Wilner (2019) is based on an approach similar in its intention, but not in implementation. This method involves considering earnings with the life-cycle, long-term growth and business cycle effects taken out. The effect of childbirth is then estimated in double-difference, by comparing the change in earnings (including zero values for individuals not working in the private sector) from the final year before birth, used as a reference, to any other year, between individuals who have had their first child and individuals (of the same sex) who do not have children. This double-difference estimation is implemented separately in cells corresponding to the rank in the hourly wage distribution prior to the birth: each individual is assigned his/her rank in the distribution of his/her generation's hourly wage average over the five years prior to the reference year. This approach makes it possible to obtain the childbirth effect, which depends on the rank in the wage distribution before the birth of the child. It is also compatible with an accounting decomposition of earnings between participation, days worked, paid hours per day and hourly wage.^(a) The authors also show that replacing the control group of individuals without children by a group of individuals who also have a child, but whose children were born on different dates, which is an identification approach closer to that of Kleven et al. (2018), yields essentially the same results.

(a) Plus a selection term relating to the fact that individuals employed on a given date do not necessarily have the same earnings in the reference year as those who are not employed.

be extended until the child is three years old, but leave is unpaid in such cases.

In order to have a rather homogeneous group of employees in terms of labour market participation, we applied a more strict definition of participation; in addition to having more than 45 days of paid employment per year, we apply a minimum requirement in terms of hours per day (more than one-eighth of statutory working hours) on average during the year¹⁷ and exclude hourly pay rates below 95% of the hourly minimum wage. Based on the matched DADS-EDP data, we are able to identify the children's dates of birth. We focus on the effect on total earnings (i.e. including zero salary values for individuals who are not employed in the private sector in a given year), from the birth of the first child for the following ten years. We consider that relative falls in total earnings may have three causes: participation (whether or not to take a break from employment after the birth), the number of hours worked (possible transition to part-time or fewer days worked in the year) and the effects on hourly earnings (e.g. due to time frames for promotions).

Figure XII represents the effect of the birth of the first child between 2005 and 2015 on these three margins. Based on the methodology used by Kleven *et al.* (2018), we compare parents (mothers and fathers separately) by the number of years since the event, controlling for the effect of age (i.e. life cycle) and the year of birth to take account of changes in earnings between generations. The baseline 0 denotes the year of the event (birth of the first child) and is the reference for measuring the impact before and after on the various values, separately for women and men. The chart details the difference in outcomes between those who had their first child in year zero, in relation to their counterparts who did not experience the same event in the same year; results are reported for each of the preceding five years and subsequent ten years.¹⁸

Ideally, the estimated coefficients for this panel should be zero before year zero (no pre-trend), which would lend weight to the interpretation that observed divergences would be only linked to the "birth" event (cf. Box 3). This condition is not met (the coefficients are significantly different from zero), neither for women nor for men. However, the trends for women and men are parallel, suggesting that the widening gap between women and men is indeed related to the entry into parenthood. Moreover, the magnitude of the pre-trend is very small compared to the changes that follow the event. For both men and

women, pre-trends are mainly due to an increase in participation, with no differences in paid hours and hourly wages.

More generally, the birth of the first child does not affect fathers' total earnings (despite a paternity bonus eight years later, but it is weakly significant). Whether considering participation, paid hours or hourly wage, becoming a father does not result in any significant change.

This is quite the opposite for women. The birth of the first child results in a relative decline in total wage earnings of 40% in year zero (this reduction includes time spent on maternity leave, for which allowances are not included into the earnings measured by the DADS panel¹⁹), and a subsequent sustained salary penalty of 30%. This fall is caused by a combination of three components identified above, namely reduced participation (break in employment), a sustained fall in paid hours (the marked reduction in year zero is linked to maternity leave) and an hourly wage penalty that appears with a delay, and can be interpreted as resulting from reduced presence at work that can have negative consequences for career and promotion prospects. This penalty widens over time to reach about 20% by the end of the period.

Negative Effects of the First Child Especially at the Lower End of the Earnings Distribution

A limitation of the above analysis is that it presents an average impact, for all types of employees and regardless of pay levels. However, the choice between career and family life does not arise in the same terms according to the wage level and career prospects. Family policies also play a role in parents' occupational choices after childbirth: the option to take paid parental leave after the birth of the first child at a fixed rate of just under €600 is more attractive for employees paid close to the minimum wage than for those in higher-paid jobs; conversely, the cost of child care is more easily covered for high wages. It is therefore useful to examine the salary penalty following the birth of the first child based on the mother's salary level.

17. The data indicate the number of hours worked in the year, a total below full-time hours corresponds either to part-time hours, or to fewer days worked in the year.

18. For example, we compare for period +1 the women who had a child in the previous year, irrespective of the actual year (2005, 2006, etc.), with those who will have one subsequently.

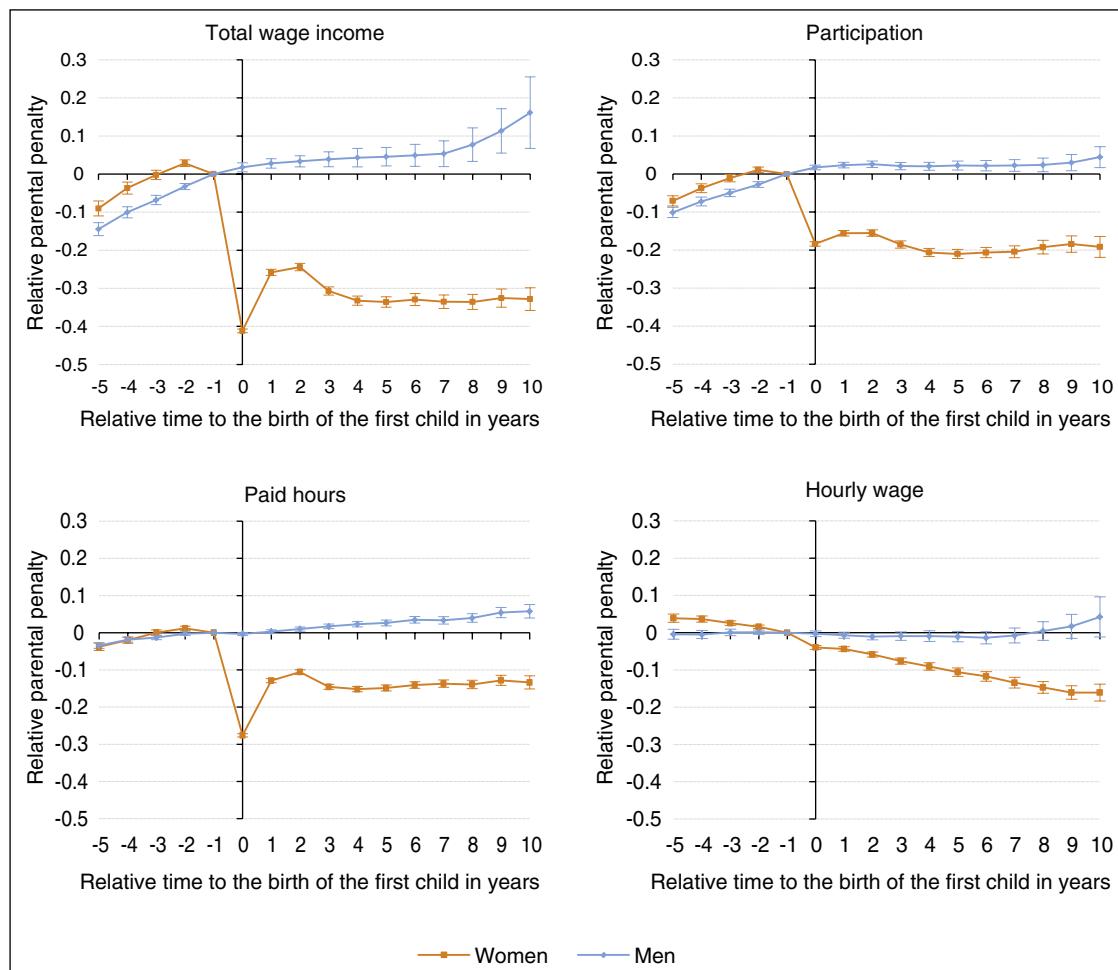
19. Excluding continued salary payments by the employer under some collective bargaining agreements.

We maintain the earlier approach, in which we track changes in earnings, participation, hours worked and the hourly wage before and after the birth of the first child, but with a slightly different the counterfactual now consists of employees who did not have children during the period. The results presented below, on the effects by rank in the wage distribution draw on those of Pora & Wilner working paper (2019). The hourly wage is calculated for each year and age, which enables us to order groups of employees by year and age according to their position in the hourly wage distribution, then assigning each to an earnings category. Here, we create twenty categories (P0-P5, P5-P10, etc.), for all employees (men and women) present in $t-1$ (one year before the birth) using observations in the five years prior to the birth, provided that they were present at least twice

in the four previous years. For each group (the group remains unchanged regardless of changes in wage after the birth) we estimate the effect of the birth of the first child on the wage of mothers by comparison with those who did not have children (cf. Box 3). We do not show results for fathers since we do not observe any effect for paternity, whatever the rank in the wage distribution.

Components of the overall effect on total wage include, as above, participation, working time (in hours and days over the year), hourly wage, to which we add a “selection” effect. This corresponds to the fact that employees observed in a given period, $t+k$, may not have had the same prior earnings as those who opted out. We expect this effect to be positive (i.e. the highest paid stayed longer) – which is what is actually obtained.

Figure XII
Impact of the birth of the first child on total wage income and its components



Coverage: Metropolitan France, private sector employees aged between 20 and 59, excluding agriculture, who have worked at least one hour in the private sector between 1995 and 2015. For the graphs on paid hours and hourly wage: if the number of hours per day exceeds one-eighth of statutory working time and daily wage exceeds 95% of the hourly minimum wage.
Sources: Insee, DADS-EDP panel.

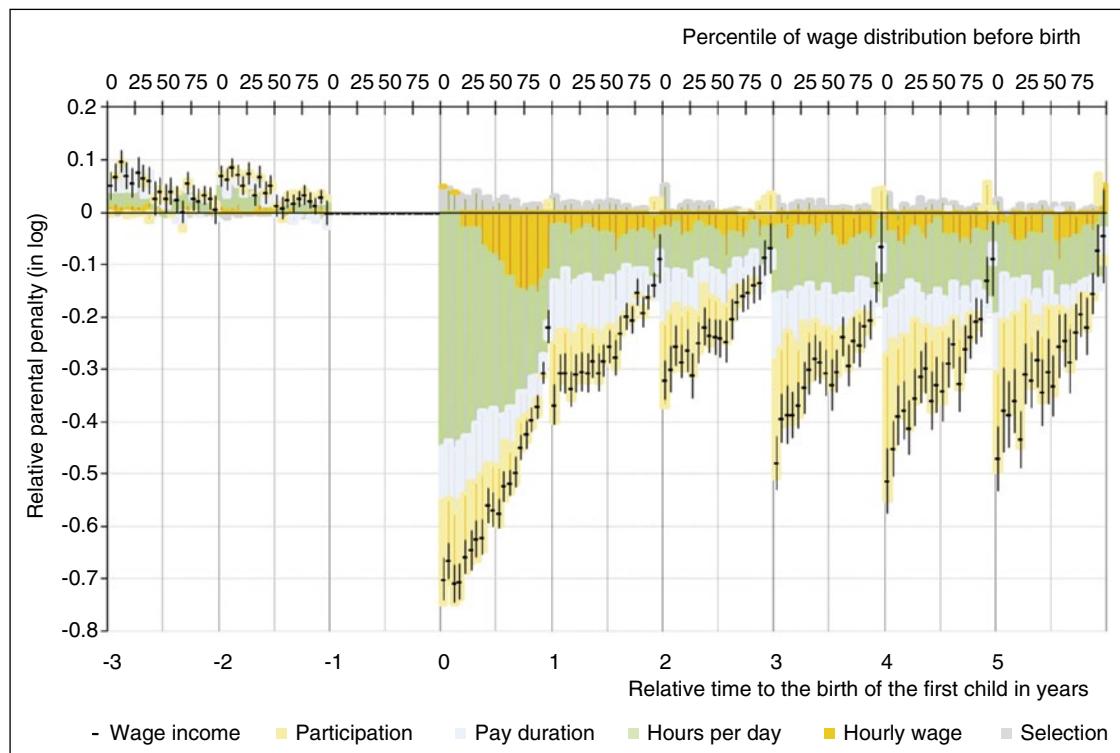
Figure XIII clearly shows that the overall penalty after childbirth is much greater for low wages than at the top of the distribution, throughout the period in question. In the lowest category of the distribution, childbirth results in a loss of earnings of 70 log points in the year following childbirth by comparison with those who did not have children, 45 log points one year later, and 50 log points at the end of the period. However, women at the upper end of the distribution also experience a loss of earnings of 20 log points in the first year and 5 points one year later; note that there is no further penalty in relation to the control group five years later.

As earlier, this approach comparing a “treated” group with an “untreated” group requires the absence of a pre-trend, and this is not the case here; we find significant positive differences in changes in earnings in favour of mothers before childbirth. However, as in the previous case, the magnitude of these differences is limited (less than 10 log points), and small compared with the changes observed after the event.

The analysis of the components of the loss in wage income helps understanding the source of heterogeneity in earnings changes. In summary, the lower the hourly wage before childbirth, the more it leads to changes in women’s labour supply, on the extensive margin by discontinuing work and reducing the number of days worked per year, as well as on the intensive margin, for example by moving to part-time hours. Therefore, the arrival of a first child reduces the probability of being employed the following year by 20 log points for the bottom decile, but has almost no effect on participation for the top decile.²⁰ However, changes in working hours (part-time) affect all groups almost through to the top of the distribution. Lastly, across the entire distribution, the wage penalty, very

20. On the other hand, participation among upper deciles tends to be higher in the “mothers” group when compared to the control group from t+3 onwards, but the difference is only marginally significant

Figure XIII
Effects of the birth of the first child on earnings by position on the wage distribution



Reading Note: Five years after the birth of their first child, women who before birth were among the 5% of the lowest paid employees have a 38% ($\exp(-0.47)-1$) lower wage income than if they had not had this child. This loss of income is explained by lower labour force participation (-17% = $\exp(-0.19)-1$), shorter pay duration (number of paid days) (-10% = $\exp(-0.11)-1$), lower number of paid hours per day (-15% = $\exp(-0.16)-1$) and lower hourly wages (-3% = $\exp(-0.03)-1$).

Coverage: Metropolitan France, private sector employees excluding agriculture, employees of personal employers, apprentices and trainees.

Sources: Insee, DADS-EDP panel.

pronounced in the first year²¹, falls back to a level around 5 log points in $t+1$ which increases slightly over time for upper deciles.

* *
*

Since the late 1960s, the situation of women in the labour market has changed radically in terms of participation and education. This has been reflected in a reduction in the gender pay gap, but this trend appears to have slowed down considerably since the mid-1990s. How to restart progress towards gender equality in the labour market? There is clearly no longer any significant improvement to be expected in terms of education and participation, even though less gendered qualifications would be positive for women's earnings, in particular for high-skilled jobs. There is also progress left to be made to reduce occupational segregation and differences in promotion between men and women. However today, it seems that no progress can be made without taking account of the impact of maternity, which appears to be the main obstacle to occupational equality in France.

A major lever to restart the movement towards eliminating the gender pay gap could then be to eliminate the penalty associated with reducing

hours worked (e.g. part-time hours, breaks in employment), itself strongly linked to time constraints associated with parenthood and the persistent unequal sharing of domestic tasks within households. What can policy-makers and companies do to effect change? Goldin (2014) argued that reorganizing and standardizing work and tasks – including skilled tasks – at company level could be one solution, because if employees become more replaceable, there would be no grounds for disproportionate financial rewards for a longer presence in the workplace. However, although equality in hourly wage could be achieved this way, there would still be inequality in total earnings related to adjustments in hours worked sustained by mothers, with repercussions on living standards and pensions. Another policy would be to target the supply side, by easing the combination of family and working life and by including fathers in this approach. The current arrangements for paternity leave in Europe are consistent with this approach; however, in France, the fixed rate paid for parental leave rather than in proportion to actual earnings is an obstacle to its development, and it indirectly penalises mothers, particularly those earning close to the minimum wage. □

21. At the top end of the distribution, the decomposition of the effect of childbirth on salary earnings into the effect on paid hours worked and the effect on the hourly salary may be biased by the difficulty to take into account maternity leave for managers with a salary package

BIBLIOGRAPHY

Afsa, C. & Buffeteau, S. (2006). L'activité féminine en France: quelles évolutions récentes, quelles tendances pour l'avenir ? *Économie et statistique*, 398(1), 85–97.

<https://doi.org/10.3406/estat.2006.7118>

Akerlof, G.A. & Kranton, R.E. (2000). Economics and Identity. *The Quarterly Journal of Economics*, 115(3), 715–753.

<https://doi.org/10.1162/003355300554881>

Arulampalam, W., Booth, A. L. & Bryan, M. L. (2007). Is There a Glass Ceiling over Europe? Explor-

ing the Gender Pay Gap across the Wage Distribution. *ILR Review*, 60(2), 163–186.

<https://doi.org/10.1177%2F001979390706000201>

Aubert, P. (2012). Les retraités polypensionnés : éléments de cadrage ». Drees, *Dossiers Solidarité et Santé*, N° 32.

<https://drees.solidarites-sante.gouv.fr/etudes-et-statistiques/publications/les-dossiers-de-la-drees/dossiers-solidarite-et-sante/article/les-polypensionnes>

Baudelot, C. & Establet, R. (1992). Allez les filles ! Paris : Le Seuil.

- Bertrand, M. (2010).** New perspectives on gender. Ashenfelter & Card (Eds) *Handbook of Labor Economics*, Vol. 4, chapter 17, 1543–1590.
[https://doi.org/10.1016/S0169-7218\(11\)02415-4](https://doi.org/10.1016/S0169-7218(11)02415-4).
- Blinder, A. S. (1973).** Wage discrimination: reduced form and structural estimates. *Journal of Human resources*, 436–455.
<https://doi.org/10.2307/144855>
- Boutchenik B., Coudin E. & Maillard S. (2019).** Les méthodes de décomposition appliquées à l'analyse des inégalités. Insee, *Document de travail* N° M2019/01.
<https://www.insee.fr/fr/statistiques/4130571>
- Bonnet, C., Meurs, D. & Rapoport, B. (2016).** Gender inequalities in pensions: Are determinants the same in the private and public sectors?
http://economix.fr/pdf/dt/2016/WP_EcoX_2016-08.pdf
- Bonnet, C., Meurs, D. & Rapoport, B. (2018).** Écarts de retraite entre les hommes et les femmes dans le privé et le public. UNSA-IRES.
<http://www.ires.fr/index.php/etudes-recherches-ouvrages/etudes-des-organisations-syndicales/item/5665-ecarts-de-retraite-entre-les-hommes-et-les-femmes-dans-le-prive-et-le-public>
- Bozio, A., Dormont, B. & Garcia-Penalosa, C. (2014).** Réduire les inégalités de salaire entre femmes et hommes. *Les notes du Conseil d'analyse économique*, 17.
<http://www.cae-eco.fr/Reduire-les-inegalites-de-salaires-entre-femmes-et-hommes>
- Chamki, A., Toutlemonde, F. (2015).** Ségrégation professionnelle et écarts de salaires femmes-hommes. *Dares Analyses*, N° 082.
<https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/etudes-et-syntheses/dares-analyses-dares-indicateurs-dares-resultats/article/segregation-professionnelle-et-ecarts-de-salaires-femmes-hommes>
- Coudin E., Maillard S. & Tô M. (2019).** Entreprises, enfants : quels rôles dans les inégalités salariales entre femmes et hommes ? *Insee Analyses* N° 44.
<https://www.insee.fr/fr/statistiques/3716874>
- Coudin E., Maillard S. & Tô M. (2018).** Family, firms and the gender wage gap in France. Insee, *Document de travail* N° F1805.
<https://www.insee.fr/fr/statistiques/3594169>
- Coudin E., Maillard S. & Tô M. (2017).** Ecarts salariaux entre les entreprises et au sein de l'entreprise : femmes et hommes payés à la même enseigne ? Insee Références — *Emploi, chômage, revenus du travail*.
<https://www.insee.fr/fr/statistiques/2891684?sommaire=2891780>
- Couet, C. (2006).** L'échantillon démographique permanent de l'Insee. *Courrier des statistiques*, 117–119.
<http://www.epsilon.insee.fr:80/jspui/handle/1/8334>
- Coron, C., Boussard-Verrecchia, E., Berthou, K. & Meurs, D. (2019).** Quelle efficacité attendre des indicateurs pour mesurer les écarts de rémunération entre les femmes et les hommes ? *Revue de droit du travail*, 3, 147–160.
- DGAFF (2017).** Chiffres clés de la Fonction publique.
https://www.fonction-publique.gouv.fr/files/files/statistiques/rapports_anuels/2017/CC-2017.pdf
- Fortin, N., Lemieux, T. & Firpo, S. (2011).** Decomposition methods in economics. *Handbook of Labor Economics* Vol. 4, 1–102. Elsevier.
<https://doi.org/10.3386/w16045>
- Gobillon, L., Meurs, D. & Roux, S. (2018).** Differences in positions along a hierarchy: Counterfactuals based on an assignment model. *CEPR Working Paper* 11982.
<https://ideas.repec.org/s/drm/wpaper.html>
- Goldin, C. (2014).** A Grand Gender Convergence: Its Last Chapter. *American Economic Review* 104(4), 1091–1119.
<https://doi.org/10.1257/aer.104.4.1091>
- Grésy, B. (2009).** Rapport préparatoire à la concertation avec les partenaires sociaux sur l'égalité professionnelle entre les femmes et les hommes. IGAS
<https://www.vie-publique.fr/rapport/30564-rapport-preparatoire-la-concertation-avec-les-partenaires-sociaux-sur>
- Heckman, J. J. (1979).** Sample Selection Bias as a Specification Error. *Econometrica* 47(1), 153–161.
<https://doi.org/10.2307/1912352>
- Joseph, O., Pailhé, A., Recotillet, I. & Solaz, A. (2013).** The economic impact of taking short parental leave: Evaluation of a French reform. *Labour Economics* 25, 63–75.
<https://doi.org/10.1016/j.labeco.2013.04.012>
- Kleven, H., Landais, C. & Søgaard, J. E. (2018).** Children and gender inequality: Evidence from Denmark. *American Economic Journal: Applied Economics*, 11(4), 181–209.
<https://doi.org/10.1257/app.20180010>
- Lequien, L. (2012).** The impact of parental leave duration on later wages. *Annals of Economics and Statistics*, 107–108, 267–285.
<https://www.jstor.org/stable/23646579>
- Lucifora, C. & Meurs, D. (2006).** The public sector pay gap in France, Great Britain and Italy. *Review of Income and wealth*, 52(1), 43–59.
<https://doi.org/10.1111/j.1475-4991.2006.00175.x>
- Majnoni d'Intignano, B. (1999).** Egalité entre femmes et hommes : aspects économiques. Conseil d'analyse économique.
<http://www.cae-eco.fr/Egalite-entre-hommes-et-femmes>

- Marchand, O. & Minni, C. (2019).** Les grandes transformations du marché du travail en France depuis le début des années soixante. *Economie et Statistique / Economics and Statistics*, ce numéro.
- Meng, X. & Meurs, D. (2001).** Différences de structure des emplois et écart salarial entre hommes et femmes en France. *Économie et Prévision*, 148, 113–126. <https://doi.org/10.3406/ecop.2001.6280>
- Meurs, D. & Ponthieux, S. (2000).** Une mesure de la discrimination dans l'écart de salaire entre hommes et femmes. *Économie et Statistique*, 337-338, 135–158. <https://doi.org/10.3406/estat.2000.7501>
- Meurs, D., & Ponthieux, S. (2006).** L'écart des salaires entre les femmes et les hommes peut-il encore baisser ? *Économie et Statistique*, 398(1), 99–129. <https://doi.org/10.3406/estat.2006.7119>
- Meurs, D., Pailhé, A. & Ponthieux, S. (2010).** Child-related career interruptions and the gender wage gap in France. *Annals of Economics and Statistics*, 99-100, 15–46. <https://doi.org/10.2307/41219158>
- Mincer, J. (1958).** Investment in human capital and personal income distribution. *Journal of Political Economy*, 66(4), 281–302. <https://doi.org/10.1086/258055>
- Ministère du travail (2018).** La situation du marché du travail au 1^{er} trimestre 2018, les 5 faits saillants. Les RDV de Grenelle. <https://travail-emploi.gouv.fr/grands-dossiers/rendez-vous-de-grenelle-point-trimestriel-sur-la-situation-du-marche-du-travail/article/rendez-vous-de-grenelle-1er-trimestre-2018>
- Minni, C. (2012).** Emploi et chômage des 55-64 ans en 2011. *Dares Analyses* N° 049. <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/etudes-et-syntheses/dares-analyses-dares-indicateurs-dares-resultats/article/emploi-et-chomage-des-55-64-ans-en-2011>
- Muller, L. (2012).** Les écarts de salaire entre les hommes et les femmes en 2009 : le salaire horaire des femmes est inférieur de 14 % à celui des hommes. *Dares Analyses* N° 016. <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/etudes-et-syntheses/dares-analyses-dares-indicateurs-dares-resultats/article/les-ecarts-de-salaire-entre-les-hommes-et-les-femmes-en-2009-le-salaire-horaire>
- Oaxaca, R. (1973).** Male-female wage differentials in urban labor markets. *International Economic Review*, 14(3), 93–709. <https://doi.org/10.2307/2525981>
- Oaxaca, R. & Ransom, M. (1994).** On discrimination and the decomposition of wage differentials. *Journal of Econometrics*, 61 (1), 5-21. [https://doi.org/10.1016/0304-4076\(94\)90074-4](https://doi.org/10.1016/0304-4076(94)90074-4)
- Oaxaca, R. & Ransom, M. (1988).** Searching for the effect of unionism on the wages of union and nonunion workers. *Journal of Labour Research*, 9 (2), 139–148. <https://doi.org/10.1007/BF02685237>
- Pailhé, A. & Solaz, A. (2006).** Vie professionnelle et vie familiale : la charge de la conciliation repose essentiellement sur les femmes. *Population et Sociétés*, n°426. <https://www.ined.fr/fr/publications/editions/population-et-societes/vie-professionnelle-et-naissance/>
- Piketty, T. (2003).** L'impact de l'allocation parentale d'éducation sur l'activité féminine et la fécondité en France. *CEPREMAP Working Papers* 0309. <https://ideas.repec.org/p/cpm/cepmmap/0309.html>
- Ponthieux, S. & Meurs, D. (2015).** Gender Inequality. In: Atkinson, T. & Bourguignon, F. (Eds), *Handbook of Income Distribution*, Vol. 2, 981–1146. Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-444-59428-0.00013-8>
- Pora P. & Wilner, L. (2019).** Child Penalties and Financial Incentives: Exploiting Variation along the Wage Distribution. Insee, *Document de travail*, G2019/08. <https://www.insee.fr/en/statistiques/4226421>
- Regan, T.L. & Oaxaca, R.L. (2009).** Work experience as a source of specification error in earnings models: implications for gender wage decompositions. *Journal of Population Economics* 22 (2), 463–499. <https://doi.org/10.1007/s00148-007-0180-5>
- Sofer, C. (1990).** La répartition des emplois par sexe: capital humain ou discrimination. *Économie & Prévision*, 92(1), 77–85. <https://doi.org/10.3406/ecop.1990.5160>
- Waldfogel, J. (1998).** Understanding the “family gap” in pay for women with children. *The Journal of Economic Perspectives*, 12(1), 137–156. <https://doi.org/10.1257/jep.12.1.137>