MEMORANDUM

From Motherhood Penalties to Fatherhood Premia: The New

Challenge for Family Policy

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ABSTRACT

The processes that occur in the family are today probably the largest obstacle to continued progress in gender equality in the workplace. Gender differences in wages between single men and women are consistently found to be considerably smaller than among men and women who are married or have children. This study examines how family processes affect gender differences on wages using longitudinal matched employee-employer data from Norway, 1980-1997. We find that over this period the large wage penalty initially associated with marriage and children for women decreases substantially, so that by 1997 women who do the same work for the same employer earn similar wages, regardless of marital status or motherhood. This is not true among men, where the small wage premia for marriage and fatherhood remain relatively constant across this period. Thus, while gender differences at the beginning of this period were primarily due to women being penalized for marriage and motherhood, by the end of this period, family processes create gender differences in wages primarily through the premia for men. These results suggest that Norwegian family policies have been largely successful at ameliorating the wage penalties for women, so that the role of family on gender differences in wages is now primarily due to the male premia. We explore how these processes play out in wage growth and promotions, and conclude by discussing the policy implications of these findings for Norway and the United States.

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1   Introduction

By the end of the twentieth century it had become abundantly clear that the processes unfolding in the family are a core, if not the core, obstacle to achieving gender equality in the workplace. For men, marriage and to some extent children have positive effects on wages and careers. For women, the reverse is the case: Small differentials for marital status but large penalties to having children. Family thus pulls in opposite directions for men and women: Helping wages and careers for one sex, detrimental for the other, and jointly increasing the gap between men and women.

Analyses of gender equality in the workplace today therefore should account for the processes that occur in the family and their interrelationship with the workplace. This claim has been a staple of feminist writings for 40 years, succinctly summarized by Gerson (1985, p. 231): "The conflicts and dilemmas women face will not diminish, despite women's changing social position, until the costs and rewards of working and parenting are more equally distributed by gender." Or as Hewlett (2002, p. 136) comments almost 20 years later: "only a small portion of the gap can be attributed to discrimination" and "Increasingly, women earn less than men because of the unequal impact of family responsibilities."

But these processes are amenable to change. A first source of change arises from family policies: paid parental leave with a portion reserved for fathers, subsidized child care at high quality and low cost, tax and cash benefits for children, and not the least employment policies allowing flexible hours and access to part-time employment. These can shift the incentives and the feasibility for being active in market work for both men and women, and thus the bargains that are struck within the family. A second source comes from broader cultural changes. These have affected the household division of labor and remade the fatherhood institution and how families operate during the last 30 years. Employers too have been affected, and are undoubtedly more willing today to accomodate constraints arising from family obligations than in 1970.

Central to understanding how change can occur, and of great importance for public policy, is the extent to which the family gap arises from differential treatment by employers, possibly favoring married men and fathers, while discriminating against mothers, or whether it arises form the adaptations men and women make between the family sphere and work, from differential household-division of labor and preferences for different lifestyles? If the core problem is differential treatment by employers, more extensive equality legislation is required. If the core problem is the unequal distribution of work in the home, expanding family policies (e.g., child care) and

further cultural changes in the family institution are needed.

Against this background we address two issues. The first is to assess the extent to which the gaps that arise from family situation (marriage and parenthood) are due to differential treatment by employers: (a) whether employers pay differentially according to marital and parenthood status, (b) the role of sorting of employees on occupations and establishments for the size of penalties (and premia), and (c) whether the penalties (and premia) arise from promotion and wage growth differentials. The second and also entirely novel objective is to assess how the premia and penalties have evolved over time during a period when significant family policies have been unrolled. To this end we use matched employer-employee data from Norway in the period 1980–1997, a country in the family-friendly corner of the world, Scandinavia. Our data enable us to provide entirely novel and crucial empirical angles, by documenting where the premia and penalties arise, at the level of the employer or in how employees are sorted on employers and occupations. The longitudinal aspect of the data allows us to investigate changes over time in the penalties.

The answers to these questions have significant public policy implications. Employers are easier to regulate than families, and if gains can be had by further regulation of employers, then this should be done. If employers are not a culprit, increased emphasis on family policies and broad-scale cultural changes is warranted. The question then arises as to whether family policies have had effects in settings where they have been tried on a large scale. Nowhere has this been more the case than in Scandinavia: Major policies to reinvent the family and its relationship to work were rolled out over the last 20–30 years. They aimed principally at making it easier to combine family and career, but aimed also at the internal organization of the family, hoping to create a more equal division of household labor and caring for children. But have the policies worked? Have they led to one of their goals, to faciliate employment and careers for both parents?

The answer to the question of policy succcess is not obvious, and some dissenters hold very negative views. Hakim (2000, p. 240) concludes: "In sum, Nordic women have not achieved any significant degree of equality with men in market work, in terms of access to the top jobs, occupations with authority, or higher pay." She continues (p. 243), "Some scholars are now concluding that Nordic egalitarian policies have failed, ..." and that "National policies that offer mothers substantial periods of paid and unpaid maternity leave, the right to work shorter hours, and other benefits to help reconcile work with family do have unintended side-effects."

A caveat is in order. Ultimately it is probably impossible to discern the precise effects of family policies on the rewards and penalties to family status, simply

because policies work out over many years and come bundled with other changes. Policies impact fertility, the work-family interface, and employer adaptations, each of which adjusts slowly over several years. But then there have been concurrent changes in family culture and decline in discrimination against women more generally. Empirically one thus faces an entire constellation of changes. But to the extent that declines have occurred in the economic rewards and penalties to family over the last 20–30 years, family policies likely have been a major contributing cause.

Before proceeding we note that the concerns of this paper and current debates are not only contemporary. In Weber's (1908[1924]) elaborate quantitative case study of a German textile factory there was a running fascination with the relationship between preparation for wedding, marital status, sexual activity, and labor productivity. He pointed out that marriage decreases productivity for women while increases it for men. With much subtlety and empirical ingenuity he also reported several exceptions. Among male workers he identified some offsetting effects of marriage on productivity, including a finding that married men seem to suffer more from stomach and intestinal diseases, which he attributed (p. 173, n. 3) to the "culinary disqualifications of the working-class wives." With respect to the role of sexuality he provides that (p. 168) "older, unmarried female workers, ... are still useful on the bobbin winder, and then, since immune against erotica, are quite especially useful" and later continues (p. 174) "the in no way irrelevant sexual life of the worker in relationship to the work effort has altogether not been researched."

2   Selection, Treatment, and Discrimination

In the following seven subsections we review the three central hypotheses for male premia (2.1), do the same for female premia and penalties (2.2), discuss the implications (2.3), discuss our core errand, the role of differential pay within versus sorting on establishments, occupations, and occupation-establishment units for how the rewards and penalties arise (2.4), lay out the role of family policies (2.5), discuss the importance of cultural changes (2.6), and summarize existing evidence (2.7).

2.1   Men and Family

Three hypotheses have been put forth to explain the premia and penalties to marriage and parenthood (Chiodo and Owyang 2002, 2003), and have been applied to both sexes, but with different implications. According to the *selection* hypothesis those who get married and become parents are different from those who don't, and would earn different wages and have different careers even in absence of marriage

and children. According to the *treatment* hypothesis, men and women change their workplace behavior upon marriage and children with attendant change in productivity and hence also wages and careers. According to the *discrimination* hypothesis employers treat married employees and parents differently from single and nonparent employees.

The *selection* hypothesis argues that men who marry and become fathers are more productive than men who don't, even before entrance into marriage and fatherhood. The traits that make men attractive partners are the same as those valued by employers: conscientiousness, industriousness, and so forth. Marriage as such does nothing to increase their productivity.

The *treatment* hypothesis argues that getting married and becoming a father induce men to change their behavior by paying more attention to work, by working harder, and so on. Marriage thus causes higher productivity. The proposed mechanisms are varied: more time for market work due to the benefits from household specialization and increased investments in skills and human capital.

The *discrimination* hypothesis, in contrast, does not rest on the claim that married men are more productive than single men. It puts forth that employers consciously favor married men, either as a reflection of societal norms, which stress the value of marriage (taste discrimination), or due to statistical discrimination, where married men correctly or erroneously are seen on average to be better employees, but where no attempt is made to assess which married and which single men are more productive. Additionally there may be nonconscious sources of discrimination, as stressed in much recent psychological, legal, and sociological scholarship (e.g., Greenwald and Krieger 2006), with same effects as the conscious taste and statistical discrimination.

2.2   WOMEN AND FAMILY

The same set of ideas as for men have been put forth to explain the female marital premium and motherhood penalty. They work better for explaining the motherhood penalty, as the premium to marriage is rather small for women.

The *selection* hypothesis puts forth that women who get children are less productive than women who don't, even prior to marriage, sometimes referred to as the unobserved heterogeneity hypothesis (Budig and England 2001).

The *treatment* hypothesis argues that upon motherhood women become less productive. Two separate mechanisms have been proposed. A first mechanism involves lower work effort, either in same workplace for same employer, or through changing to less demanding and lower-paying jobs. A second mechanism is lower human capital accumulation, through gaining less experience, training, and education upon

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motherhood.

The *discrimination* hypothesis puts forth that employers treat women with children differently. As in the case of men, this may arise from two separate motivations: plain animus, so-called taste discrimination, or statistical discrimination. And as for men, there may be nonconscious sources of differential treatment. Discrimination can arise at the point of hire, in promotion, or in differential pay for the same work.

While these ideas typically are used to explain the relationship between family and wages for both men and women, it needs to be added that the issues for women are considerably more complex. They involve a set of sequential decisions made under significant uncertainty and partial knowledge about future personal, organizational, and societal conditions.

2.3   IMPLICATIONS: DIVERGENT CAREER TRAJECTORIES FROM FAMILY

The implications of the hypotheses for the gender wage gap are obvious. Most analyses report that men gain substantially from marriage, while women gain less. Men gain marginally from having children, while women lose substantially. Even from a hypothetical initial position of gender wage parity while single and childless, the net effect is that a substantial wage gap develops as men and women marry and have children. Table 1 summarizes the core implications.

(Table 1 about here)

We have already established, in two separate reports, that men and women who marry and become parents both are positively selected. They make higher wages even before making those transitions, but men much more so than women. For women there are however major negative treatment effects once they become mothers. These results establish the dynamics separately for each sex, but do not speak to the broader concern: The implications for gender gap.

2.4   THE ROLE OF SORTING

Regardless of the precise mechanisms producing the premia and penalties it is instructive to ask, Where do these premia and penalties arise? Do they arise at the level of employers, from differential pay, wage growth, and promotions of the various groups in same occupation and establishment? Or do they arise in the sorting of employees on occupations and establishments, with differentials in which groups are hired and promoted into the higher-paying establishments, occupations, and occupation-establishment units?

And if the penalties arise due to sorting, does the sorting come from employee choice in which establishments and occupations to work in, or does it come from employer choices favoring fathers over mothers, etc.?

2.5 Family Policies and What They Do

How the family operates and its relationship to work is amenable to change from two important sources. The first broad source is family policies, of which four have been identified as important for the family gap (Waldfogel 1998*a*, pp. 141–145; Dex and Joshi 1999, pp. 655–656; Gornick and Meyers 2003, chap. 8).

The *first* major public policy is paid parental leave—maternity and paternity—preferably with a portion reserved for fathers. In many countries, including those in Scandinavia, this is financed through social insurance; tax contributions paid by all employers and employees regardless of whether they employ parents or are parents. The central cost borne by employers is prolonged absence of their employees after childbirth; practically all mothers take the leave and increasingly fathers do the same.

Maternity leave allows women to keep their jobs while they take time off to care for children and to keep a portion of their salary. Attractive job matches can be maintained and permanent employment secured. For women, lengthy maternity leave can however lessen their human capital accumulation, through loss of work experience and training. Paternity leave leads to a more equal distribution of work in the household and thus lessens some of the workload on the mother. It moreover strengthens the bond between fathers and children, also a policy goal in some countries.

The *second* major policy is publicly provided and subsidized child care at high quality and low cost. This allows mothers to return to work soon after pregnancy, and leads to less loss of human capital. A problem in Scandinavia is that hours at child care facilities are short, in Norway typically open only between 7–7:30am and 5pm, which is good for children, but does not help careers of parents, especially not in high-paying professional jobs.[1] In the U.S., child care facilities can be open for much longer hours, which may help the highly educated in careers and earnings.

A *third* policy is cash benefits and tax breaks for children. These make it easier to have children and may have pronatal effects. Whether they do much for the family gap is less clear. Their impact may in fact be negative, as they may encourage lengthy career breaks.

A *fourth* major policy arises in the realm of employment regulation and organizational practices, namely availability of part-time jobs and jobs with flexible hours

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[1]Hours are similar in Finland (7am to 5pm) but longer in Denmark (7am to 6pm) and Sweden (6:30am to 6pm). See Gornick and Meyers (2003, Tab. 7.9, pp. 230–231).

and work schedules. Availability of part-time work and flexible hours may facilitate labor-force attachments for mothers, especially of small children. These policies are implemented by employers. But they can be influenced by public policy as well. The tax system is here important. Part-time work is often cheaper to provide in Scandinavia than the U.S. since benefits such as medical insurance are paid for on a pro-rated basis, is compulsory, and covers everyone: employers pay a fixed percent of the employee's received wages, as opposed to paying a fixed premium for a health insurance plan, independent of earnings.

The two first policies are important around the period of childbirth and up until school age. The third and fourth policies have consequences for a longer period. Tax breaks and cash benefits are often given up until age 18 for child. Flexible hours may be attractive also for families with teenage children living at home.

While most Scandinavian family policies are gender neutral, their first-order impact is primarily on mothers, making it easier to combine family and careers, where female labor-force participation rates now are close to male rates, though with higher rates of part-time work for women. The second-order impact is however on the adjustments fathers make. In passing Norwegian family legislation an explicit goal expressed during parliamentary debates was to redefine the family institution, by shifting the culture around how families operate. Internationally, Norway—along with Sweden, Canada and the U.S.—has one of the most equal divisions of household labor (Hook 2006, Fig. 1, p. 650; see also Fuwa 2004, Tab. 2, p. 757), and along with Sweden scores at the top of the Gender Empowerment Measure of the *Human Development Report* (United Nations Development Program 1998).

There are also externalities of such policies, principally for children, their most important target. Parental leave results in parents spending more time with children, while publicly supported child care results in the opposite. The needs and interests of children can conflict with achieving gender equality (e.g., Presser 1995).

2.6   Cultural Transformations

A second source of change in the family gap comes from broad-scale cultural transformations over the last thirty years concerning the role men take in the family in both household work and caring for children. Such cultural changes may also put pressures on legislating new policies, and policies in turn may lead to changes in culture and hence the relationship between family and work.

The *first* major change is in the distribution of household labor. Over the last thirty years in many Western societies—including the U.S., Norway and Scandinavia more generally—men have increased the number of hours they spend doing household

chores. Women have conversely decreased their hours. The net effect is that the gender gap in household hours has decreased sharply, as has the total number of household hours. Much of the closing of the gap must be due to cultural changes, but some of it is also brought about by necessity through rising female labor-force participation rates.

The *second* major change is in the institution of fatherhood. Fathers spend more time taking care of children today than thirty years ago. Here the trend in many countries has been the opposite of that in housework: total parental time devoted to children has gone up. The role of family policies in causing these changes is difficult to assess, but some portion of changes is clearly unrelated to family policies since changes have occurred at a significant scale also in countries with limited family policies.

The statistics are revealing. In the U.S., average household work for married mothers decreased from 34.5 to 19.4 hours per week between 1965 and 2000, while among married fathers it increased from 4.4 to 9.7 hours, an increase in the share done by men from 13 to 33% (Bianchi, Robinson, and Milkie 2006, p. 93, Tab. 5.1). In the same period men more than doubled the time spent on child care and women increased it with about 20%, with similar changes in many other rich countries (Bianchi et al. 2006, p. 64, Tab. 4.1, pp. 159–160, Figs. 9.1–9.2). With respect to total hours spent on household tasks and caring for children, the percent of hours done by men increased from 20 to 28 to 38 from 1975 to 1985 to 2000, with similar increases in Norway, from 30 to 35 to 38 percent from 1980 to 1990 to 2000 (Hook 2006, Fig. 1B, p. 650). A central reason for the more equal distribution of domestic tasks in North America and Scandinavia is that the amount of household work done by women is much lower there than in most other countries. Parity in housework and taking care of children has yet to be achieved, but the changes are substantial, and the number of total hours on paid and unpaid work is in the U.S. now almost identical for men and women among married parents, but with men doing more paid and women more unpaid work (Bianchi et al. 2006, pp. 116–117, Tab. 6.1).

2.7   Summary of Research Evidence

Two significant research streams investigate the relationships between family and wages for men alone or women alone, sometimes even in same paper (Hersch and Stratton 2000; Budig and England 2001; Davies and Pierre 2005). Explicit attention to the impact on the gender gap is however less common. We focus here those contributions.

Waldfogel (1998*b*, p. 533) reports that about 40–50% of the gender wage gap in

the UK and the U.S. is due to family situation: "men receive a premium if they are married" and "women are penalized if they have children." Another 30–40% of the wage gap is due to loss of labor force experience.

Harkness and Waldfogel (2003) report gender wage gaps by parenthood status in seven industrialized countries, finding that the impact of motherhood on the gender wage gap is largest in the U.S. and UK, the countries with the least extensive family policies.

Whitehouse (2002) reports the family gaps for Australia and UK. She finds similar impacts in the two countries of parenthood status on the gender wage gap among full-time employees, but much larger penalties in the UK among part-time employees.

Hundley (2000) compares the self-employed and employees in the U.S. He finds a much larger impact of having children on the gender wage gap among the self-employed, both on annual earnings and imputed hourly earnings. For example, among persons with three or more children, female earnings as percent of male earnings is 50% among self-employed versus 67% among employees.

No study has used matched employer-employee data to analyze the premia and penalties. These are required for ascertaining whether there is different pay for the same work for the same employer, that is, whether productivity differences and/or discrimination could have arisen at that level. Nor has any study addressed the role of sorting on occupations and occupation-establishment units. And there is no documentation of the evolution of the premia and penalties over time, of the extent to which they have changed as family policies have been unrolled.

3   SETTING AND DATA

National Setting

Norwegian family policies have been considerably more elaborate than in most other countries, though not at the level of Swedish policies. They include paid parental leave, with some portion reserved for fathers, so as to strengthen the bond between fathers and children and thereby creating entirely new norms for fatherhood (Leira 2002, chap. 4). They include tax and cash benefits for families with children. Most important, there is publicly supported child care at relatively low cost and high quality. Additionally, part-time and work at flexible hours are almost universally available, and with no wage penalty to being part-time employed. These are institutional arrangements central to lessening the family gap in pay and careers (Waldfogel 1998*a*; Gornick and Meyers 2003, chaps. 5 and 7).

With respect to parental leave, it was available for 18, 20, 22 weeks in 1977, 1987,

and 1988, with 100% pay since 1978. Since 1977 fathers could share the leave except for the first six weeks which were reserved for the mother. Between 1988 and 1993, parental leave was increased with a few weeks every year from 22 to 52 weeks at 80% pay or for 42 weeks at 100% pay up to a maximum amount (Rønsen and Sundström 2002). Four of those weeks are reserved for the father, whereas six weeks are reserved for the mother (Leira 2002, pp. 89, 95). In 1996, 69% of fathers took paid parental leave and about 7% of the parental leave days (Leira 2002, pp. 86, 91).

With respect to child care, 5% of preschoolers had access to publicly funded child care in 1973, 25% in 1983, and 32% in 1988. By 1995, 22% of 0–3 and 61% of 3–6 year olds attended publicly supported child care in Norway (Leira 2002, p. 62). Single parents pay lower fees. The cost of child care as percent of female earnings is 13 in Norway, while an entire 22 in the US (Waldfogel 1998a, Table 2).[2] Unlike other Scandinavian countries, access to child care is not a social right in Norway.

Data

We use matched employee-employer data on entire populations of white-collar employees in central sectors of the Norwegian economy in the period 1980–97. These allow us (1) to compare employees working in the same occupation for the same employer, and to make those comparisons between single, married, previously married, and those with and without children, (2) to assess the role of sorting, and (3) to analyze wage growth and promotions between years. Information is available on about 110,000 employees (40,000 women) and 3,000 establishments each year. We can follow the establishments and their employees from year-to-year, about 1.8 million person-years. We restricted the analysis to employees 20–50 years old, yielding about 1.4 million person-years. For each employee we have information on sex, occupation, rank in occupational hierarchy, age, part- versus full-time status, contractual hours worked, and monthly earnings from work on contracted hours, which excludes wages on overtime hours. The data have been matched to register data from the Central Bureau of Statistics on detailed educational attainment (length and type, 4 digit code), family or civil status (8 statuses), number and ages of children and adoptions. This gives annual educational, marital, and parental histories up to year 2000.

The data were collected from individual-level records kept by the establishments and compiled by the Norwegian Central Bureau of Statistics and the main employer's association in Norway, the Confederation of Business and Employers (NHO). Norwe-

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[2]Esping-Andersen (1999, p. 66, Tab. 4.4) in contrast argues and documents that net costs for child care in the U.S. are among the lowest internationally, stating that even in the absence of publicly provided child care "the United States offers a superior cost-subsidy mix"; as a percent of family income with costs equal to those in Denmark and France and lower than in Sweden.

gian employers are bound by law to collect and report the data (e.g., Central Bureau of Statistics 1991, pp. 120–123). They are used in wage bargaining and economic planning and should be reliable compared to information from sample surveys with personal reports of pay rates, hours worked, and occupation or position.[3]

These data on white-collar employees cover all occupational groups with a few exceptions: CEOs, working supervisors, top editors of newspapers, secretary to the editor of newspapers, and journalists. While working supervisors are excluded, supervisors in administrative positions are included.

The data come from a variety of industries: manufacturing, oil extraction, mining, quarrying, transportation, storage, communication, and other industries. Most of the industries outside the manufacturing sector are relatively small, but the hotel and research sectors count 2,201 and 4,771 employees respectively in 1990. This grouping of industries is used by the Norwegian Central Bureau of Statistics. It is the first sector to carry out wage negotiations and is thus central for wage setting in other sectors, and is typical of other major sectors in the economy. For our purposes it is a strategic sector. Of the seven sectors from which gender wage gaps were computed for 1990, it had the largest gaps at all levels, also the occupation-establishment level (Petersen, Snartland, Becken, and Olsen 1997). This ensures variation in the dependent variable especially at the occupation-establishment level, which also could show up in marital premia and parenthood penalties. The restriction of analyses to these white-collar employees probably leads to results with somewhat larger penalties than if additional employees had been included.

From the contractual monthly earnings and contractual hours worked we computed the hourly wage, which then refers to hourly wages paid on regular work hours, hence not mixing pay on regular and over-time hours. This is important since a central goal of the analysis is to assess whether employers pay mothers and non-mothers differently, in which case we need to measure the pay rate, not mixings the different rates from regular and overtime hours. Five marital statuses are distinguished: single, married, separated, divorced, and widower. Among the married, separated, and divorced, we include a few hundred employees in same-sex unions that were still intact ("married"), "separated", and "divorced"; these are legal categories in Norway. Including these cases does not affect the results. We coded three dummy variables for number of children aged 20 or younger: for one, two, or three or more such children. We experimented with a number of different codings for the children variables, such as number of children below age 6, between 6 and 15, and so forth. The alternative

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[3]The data are quite complete. For example, for the year 1992 we have complete data on 84% of the establishments and 94% of their white-collar employees.

codings make no substantive difference for the conclusions arrived at in the analyses.

The occupational code is quite detailed, with 201, 210, and 209 occupations in 1980, 1990, and 1997. We use data on employees in 155 of these occupations, for the simple reason that for those occupations a simple aggregation of 21 occupations exists, an aggregation which allows us to investigate promotions between years. It makes no substantive difference for the results whether we use 21, 155, or 210 occupations. The gaps between groups are slightly reduced when more occupations are used, but not the pattern of results. The coarser grouping of 21 occupations also helps avoid the otherwise large loss of number of observations when computing fixed-effects estimators at the occupation-establishment level. We need variation at the occupation-establishment level not only in marital status, but also in whether employees have 0, 1, 2, or 3+ children aged 20 or younger.

Table 2 provides descriptive statistics for our key variables, with annual averages reported separately for each of four periods, 1980–84, 1985–89, 1990–94, and 1995–97. Remarkably, the percent men with no children has stayed relatively stable over the period (increased from 25 to 30), while for women it has gone down quite strongly from 58 to 39. Wages are 18–19% higher for married and previously married men compared to single and childless men, and there are clear premia to children of roughly 10, 15, and 20 percent for 1, 2, and 3+ children. For women, the premia to marriage are much smaller, and there are also small premia to children, but that to a large extent reflects differences in experience between mothers and childless women. Women are promoted at a lower rate in all groups and all years. On average male employees are observed for nine years and female employees for eight years.

(Table 2 about Here)

Our data suffer from one significant weakness. We do not know which employees are cohabitating. For the employees who are recorded as single (i.e. not yet married), some are truly single, others are cohabitating. Cohabitation is important in Norway, increased over the period 1980–2000, and is more common in younger cohorts (Noack 2001). In 1990, about 58% of Norwegian men aged 20–66 were married and another 6% were cohabitating, with the remaining 36% being single, with similar percentages for women. In our data, 25% of men and 26% of women are recorded as single in 1995–97, but about one in six of the singles are probably cohabitating, which would yield correct percentages being single of about 21 and 22. While we are not aware of any Norwegian studies investigating wage premia for cohabitators, there are such male premia in Sweden of about 3% and in Denmark of 2% (Richardson 2002; Datta Gupta and Smith 2002), while the female premium in Denmark is about 1% (Datta

Gupta and Smith 2002).

Some biases arise from this misclassification, as documented by Cohen (2002) for men using U.S. data. If cohabitators enjoy wage premia similar to married employees, the cross-sectional analysis will overestimate the wages of single employees, while still correctly estimating the wages of married employees, and thus underestimating the wage differential, that is, the marital premium. To the extent that cohabitating employees are more like single employees in their economic success, there is no problem. In the within-individual analysis some employees will be misclassified as single while cohabitating, and if there are treatment effects of leaving singlehood, a similar underestimation occurs, but none if the entire premium is due to selection.[4]

4 Methods

The data have a unique multilevel structure. One level arises from the across-time dimension, the other level, at a given time point, arises from the nesting of employees within occupations and establishments. Most individuals are observed at several points in time, and some even every year in 1980–1997. This gives a standard panel data set-up (e.g. Hsiao 1985; Petersen 2004). Similarily, each establishment is observed at several points in time, as much as every year in 1980–1997. In a given year, we can account for the clustering of employees into establishments, occupations, and occupation-establishment units, using standard fixed-effects procedures.

For each of three dependent variables, we report a sequence of four regression equations. Each equation includes independent variables for education and imputed labor force experience plus dummy variables for marital status and dummy variables for the number of children below age 20. The first equation does not take into account where the employees work nor their occupations, the second controls for the establishment (workplace), the third for the occupation, and the fourth for the occupation-establishment unit. The second, third and fourth specifications are estimated using fixed-effects procedures. The four specifications will be referred as the *Population, Establishment, Occupation*, and *Occupation-Establishment* estimators.

Each coefficient estimated is significantly different from zero usually at a high level, often with z- or t-statistics of 40–50 and significance levels typically of .000001 or better. No point is served in reporting these significance levels. The huge z-statistics

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[4]In our analysis, the marital premia for men and women are about 6% and 2% respectively (see below). If one in three of single employees are cohabitating, and they earn the same premium as married employees, the bias will be 3.2% for men and 1% for women: We will estimate the marital premium for men to be 6% rather than the correct 9.2% and for women to be 2% rather than the correct 3%.

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reflect the large number of observations each year, not superior model specification.

The estimated equations and technical details are given in the Appendix. Below we give a verbal account.

Methods for Analyzing Total Effects on Wage Levels

The baseline analysis reports how wages depend on marital status and children, controlling for education and imputed labor force experience, at each of the four levels, population, establishment, occupation, and occupation-establishment.

From the multilevel structure of the data we can assess how the employee outcomes within establishments and occupations differ from those occurring across establishments and occupations. The estimates from the occupation-establishment analysis will address whether the marital and parenthood premia or penalties in wages are present when same work is done for the same employer.

The equations are estimated separately for each of the 18 years in the data. This allows us to assess possible changes over time, as implied by two of the hypotheses. To simplify presentation, we report the averages of the coefficients within each of four time periods, 1980–84, 1985–89, 1990–94, and 1995–97.

We include both men and women in the analysis, and include interaction terms between sex and the other variables, for marital status and children, but not for education and experience. We restrict the analyses here to units that are sex integrated at the relevant levels, at the establishment, occupation, and occupation-establishment levels.[5]

The dependent variable is the natural logarithm of the hourly wage. When small (e.g., less than .10 in absolute value), a coefficient can be interpreted as giving the relative change in the unlogged dependent variable from a one-unit increase in the independent variable, holding the other variables constant. We implicitly interpret this as the relative change in the mean of the unlogged wages, but correctly interpreted it gives the absolute change in the mean of logarithms of wages or the relative change in the geometric mean of unlogged wages (Joshi and Paci 1998, p. 160).

How to Think About the Various Sets of Coefficients

How should one then think about the various estimates we report? It is tempting to assume that the estimates including the most detailed set of fixed effects are the better ones.

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[5]The actual set of employees analyzed may in some cases therefore differ somewhat from that used in the analyses in the separate papers focusing on men alone and on women alone, because in these no restriction was imposed that units had to be sex integrated at the various levels.

We underline instead that it is not necessarily the case that one estimator is better than another. A more fruitful way to think about the estimators is that they report on different aspects of the data. No estimator is then necessarily better, they just answer different questions. By comparing changes in coefficients as one goes from the population-level estimator to the occupation- to the occupation-establishment-level estimators one will be able to assess at what levels differences between groups arise: From differential wages at say the occupation-establishment level, or from differential sorting of the groups on occupations and occupation-establishment units.

5   The Gender Wage Gap By Marital Status and Children

Table 3 reports the coefficients for marital status and children for men in Panel A, for women in Panel B, and the differences in coefficients in Panel C, for the four different periods and four different levels, in each regression adjusting for education and experience. Panel D gives the implications of these coefficients for the gender wage gap in the same four periods and at same four levels: The estimated female wages as proportion of estimated male wages for five groups of women and men: single, married, and married with 1, 2, and 3+ children.

(Table 3 about here)

For men, being married (or previously married) has positive and over time stable effects of 7.0–8.8% at the population level. These premia are 75–90% due to sorting on the higher-paying occupations and occupation-establishment units. At the latter level the premia are 1.0–1.8%. For fatherhood there are small premia of 2–3% for 2 and 3+ children, of which about 50% is due to sorting. At the occupation-establishment level the premia are 1–2%. As shown in separate analyses, about half of the marital premia reflect a selection effect: men who marry earn more also before they get married.

For women, the marital premia are less than 1% at all levels, while there are negative effects of post-marital states. For children there were substantial penalties of 4.3, 9.4, and 13.1% for 1, 2, and 3+ children in 1980–84, but these were cut in half by 1995–97 (to 2.7, 4.6, and 5.8%). At the occupation-establishment level, there were motherhood penalties in 1980–84 of 2.2, 5.4, and 6.9%, but these had vanished by 1995–97. For same work for same employer, mothers and nonmothers are paid equal wages. The decline in the children penalties over a short period is close to sensational.

Turning to Panel C, where women are compared to men, there is at the population level a clear penalty to being female of 8.9% in 1980–84 and 6.7% in 1995–97, but

smaller at the occupation-establishment level, of 5.0 and 2.5% in the two periods.

From marriage women lose relative to men. Men receive a substantial premium to marriage, women a much smaller premium, and the discrepancy between the two premia increases the gender wage gap: at the population level with 6.2% in 1980–84 and 8.6% in 1995–97. At the occupation-establishment level these differences are much smaller, but still contribute to the gender wage gap; the sex differential in marital premia is about half of the female penalty, and both have gone down over time.

From children, women incur further penalties relative to men. Fathers receive premia of 1–3%, while mothers are penalized. In 1980–84, the net wage differential induced by 1, 2, and 3+ children was 4.6, 12.1, and 15.8%, and even with differentials at the occupation-establishment level of 2.2, 5.4, and 6.9%. But by 1995–1997, these differentials were 2.7, 4.6, and 5.8% at the population level, and much smaller at the occupation-establishment level, at 0.8–1.7%.

The impact of these differentials on the gender wage gap is given in Panel D. At the population level, single women earned 91.1% of single men in 1980–84 and 93.3% in 1995–97, while among married employees women earned 84.9 and 84.7% of men in the same two periods. The sex differential in marital premia between women and men did about as much to the gender wage gap as the female penalty. In 1980–84, married women with 1, 2, and 3+ children earned 80.3, 72.8, and 69.1% of married fathers with same number of children. But substantial change had occurred by 1995–97, where gaps for 2 and 3+ children were almost ten percentage points lower, 80.1 and 78.9%.

To illustrate, while ignoring the role of selection versus treatment, consider two groups of women and men, both of whom are single and childless, but who then go on first to get married, followed by 1, 2, and 3+ children. Prior to marriage, at the population level, women earn 91.1% of men's wages. Upon marriage women lose considerably relative to men: In 1980–1984 men increased their wages with 7.0%, women increased their's by 0.8%, with the net result that the wage gap became larger, women earning 84.9% of men's wages, a gap that was entirely stable over the period. Adding 3+ children, men increase their wages with 2.7%, women decrease their's with 13.1%, thus increasing the gap with an additional 15% to 69.1%.

Turning to the key level in our analysis, the occupation-establishment level, the gaps for children are much smaller: From 91% to 86% for 1, 2, and 3+ children in 1980–84 but gaps that had changed to 95% in 1995–97. In the last period, the differential in the marriage premium does as much to the gender wage gap as the differential in premia and penalties to children. The problem is not that women lose

from having children, they do not at the occupation-establishment level. The problem is that men gain first from marriage and second from fatherhood.

In summary, the main mechanisms behind the gender wage gap at the population level at the end of the period are the still sizeable female penalty, the major male gain to marriage, the small female penalty to children and the small male reward to children, which when added up gives sizeable differences. At the occupation-establishment level, mothers are not penalize relative to nonmothers, that is, there is no differential treatment of the two groups, but husbands and fathers still reap wage premia, premia at the level of the penalty to being female. The motherhood penalty decreased dramatically over the period 1980–97 at both the population and occupation-establishment levels.

6   WAGE GROWTH AND PROMOTIONS

Given that the female penalties to children declined over the period, we investigate in this section the role of differentials in wage growth and promotions in closing the gaps. Table 4 has the same structure as Table 3, but now addressing wage growth between two adjacent years. Panel A gives the coefficients for men, Panel B for women, and Panel C for women compared to men. The analysis is restricted to employees who stayed in same establishment between two adjacent years.

(Table 4 about Here)

For men we see that most of the coefficients are close to zero, for both marital status and children, in all years and at all levels: wage growth differentials of 0.1–0.3%. For women, there are comparably small wage growth premia to marital status, but more substantial premia to children of 1.0–1.5% at all levels in 1980–89. But these premia had shrunk to 0.1–0.2% by 1995–97.

In Panel C, comparing women to men, we see a female penalty on wage growth of about 0.5–0.7% in all years, but that having children advantages women relative to men in 1980–89, and with no differentials in 1990–97.

Part of the catch up in wages between mothers and fathers between 1980 and 1990 was thus due to higher wage growth for mothers. For example, with wages growing with 1.1% more per year for mothers than fathers with 3+ children, there will be a relative wage gain of about 10% over a 10-year period, which was the exact reduction in the sex differentials for parents with 3+ children.

Turning to promotions, for identifying differential treatment by employers, we focus, as in the wage change analyses, on the subset of employees who stayed in the

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same establishment in two adjacent years, and now also in same career ladder. Table 5 gives the results.

(Table 5 about Here)

For men (Panel A), being married has a small positive effect on promotions at the population level, but larger positive effects at the occupation-establishment level, effects which declined at both levels over the period. Children had small positive effects at the population level early in period, had vanished by end of period, and at occupation-establishment level had no effects early in period but positive effects of about 1% at the end.

For women (Panel B), being married had positive effects of 1–2% at a levels in all years. Children had positive effects at population level, but mostly negative effects at occupation-establishment level.

Comparing women to men (Panel C), there are negative effects of being female at the population and occupation-establishment levels, effects that declined over the period, but at the latter level still sizeable at 2.5% in 1995–97: When 7.5% of the men are promoted, only 5.0% of the females are. Women receive a marital premium relative to men at the population level, but a penalty at the occupation-establishment level, but this had disappearred by 1995–97. For children, there are considerable population-level premia for women relative to men early in the period but not at the end. At the occupation-establishment level children have mostly negative effects, in 1995–97 of 1–2%.

In summary, comparing women to men, there are strong negative effects of being female on promotion. As late as 1995–97, single women are promoted at a lower rate than single men, at the population level with 2–3 percentage points, at the occupation-establishment level with 3.1 percentage points, almost half the male promotion rate. These differentials become higher with children. Among married employees with 1, 2, or 3+ children the promotion rate at the occupation-establishment level is 4.1, 5.2, and 4.4 percentage points lower for women than men.

Remarkably, the lower promotion rates for mothers do not translate into lower wage growth. Early in the period there was an advantage for women over men from having children: Marrried mothers with 2 or 3+ children received about 1% higher wage increases than the same group of fathers, but advantages that had disappeared by 1990–97. The promotion analysis is restricted to employees who stayed in same career ladder between two adjacent years, and hence captures less of the action than the wage growth analyses. Our discussion thus puts more emphasis on the latter.

7 Conclusion and Discussion

Summary

The processes that occur in the family are today probably the largest obstacle to continued progress in gender equality, with women suffering significant workplace penalties from motherhood, and men substantial premia to marriage, two diverging processes that combine to increase the gap between women and men. For understanding how to ameliorate these processes, one needs to identify both where they arise and the potential role of public policies.

We investigated first whether the premia and penalties to family situation arise from differential pay by employers or from differential sorting of employees on occupations and establishments, that is, the extent to which the premia and penalties possibly arise from discrimination in the workplace in wages, wage changes, and promotions. We next investigated changes in the premia and penalties over time during a period where significant family policies were unrolled. Data came from Norway from the years 1980–97, a country where public policy has made it easier to combine family and career, with the clearest first-order impact on mothers, but with possibly attendant increased pressures on fathers to be more active in the family sphere. To the extent that the motherhood penalties arise from household specialization, the penalties should have declined over time and be lower than in other countries.

We have four conclusions. First, there has been an enormous drop in the motherhood penalty from 1980 to the mid-1990s, at all levels. At the occupation-establishment level there was by the mid-1990s no wage penalty for mothers relative to non-mothers: Employers paid the same wages to both groups. For men, the substantial premia to marriage and small premia to fatherhood have been stable over the period, at all levels, but are much smaller at the occupation-establishment level.

Second, by the end of the period the wage gap between men and women from family situation does not principally arise from mothers being penalized. The main causes are the substantial rewards men reap first from being male and second from marriage and fatherhood. These rewards have been stable over time, while female penalties to children have dropped. The net effect is a drop in the gap between men and women from children, a gap that now is almost unrelated to motherhood status.

Third, with respect to growth in wages, there is a small female penalty in all years and all levels, of 0.5–0.7%, no sex differential or a small female advantage to being married, and a clear advantage for mothers over fathers early in the period (1980–89) of 1% per year. By the 1990s, these sex differentials from children had vanished, but there was still a penalty from being female, women received lower wage increases.

Fourth, there are substantial female penalties on promotion at all levels in all years. At the population level there are promotion advantages of mothers relative to fathers, but at the occupation-establishment level the opposite is the case. Remarkably, these penalties do not translate into lower wage increases. The reason is that promotions affect very few employees each year (5–7%), whereas wage increases affect almost all employees (90%). The former process gets washed out in the latter.

Discussion

What are the central implications? While family processes play a clear role in creating a gender gap in Norway, the gap is no longer due primarily to penalties from being a mother: Mothers and nonmothers receive the same wages, only small differences at the population level and no differences when employed in same occupation and establishment. The central causes of the gender wage gap are that men are rewarded first for being male and second for marriage and fatherhood.

It seems prudent then to conclude that family policies over a remarkably short historical period have eradicated the motherhood penalty, some 80% of it at the population level, and all of it at the occupation-establishment level, where there no longer is evidence of discrimination against mothers. Returning to Hakim's (2000, p. 240) discussion cited in the introduction that "Nordic egalitarian policies have failed" and that policies "to help reconcile work with family do have unintended side-effects", our conclusions are more optimistic, at least with respect to the wage costs to being a mother. But family policies have not eradicated the male premia to marriage and children. Nor are they likely to do so in the future. These premia come in part from selection, but to a large extent they are due to increased career aspirations and economic pressures induced by family situation, which in turn may be tied to rational adaptations in the family.

To the extent that the next frontier is solvable—that is, eradicating the male advantage arising from adaptations in the family—it requires transformations in how the family is run, not in how employers reward mothers and nonmothers. Whether this is a task for public policy can be questioned, and regardless of the answer, will likely engender much disagreement, and it is far from obvious what can be done: One pushes against the limits of governmental intervention, even in higly regulated social democratic societies. But were public policy to address more directly the internal adjustments in the family, one place to start would be the tax system. Perhaps incomes of fathers of small children should be taxed at a higher rate than incomes of mothers? Or perhaps payroll taxes levied on employers should be higher from employing fathers than mothers? Being a variant of the older but now practically defunct insti-

tution known as protective legislation (Wikander, Kessler-Harris, and Lewis 1995), it would immediately change the internal dynamics and bargains in the family. And as with many policies, there would be myriads of unintended consequences.

What lessons can we draw for the prospects of eradicating the family gap in the U.S., which along with the UK has the largest gap? While resources to enact extensive family legislation are plentiful, political will is lacking, having instead invested more heavily in equality legislation than almost any other country. But even with extensive family policies there are two institutional facts in contemporary U.S. society that leads one to a cautious assessment of their possible impact on the family gap.

The first institutional feature is that Americans work longer hours than almost anywhere else, while Norwegians and many Europeans work many fewer hours: On average 2,000 hours per year in the U.S. versus 1,500 in Norway. This makes it is easier in Scandinavia for women to come out on par with men. The time pressures on careers are less pronounced than elsewhere. And this especially affects men, who more often than elsewhere are culturally constrained in terms of how engaged they are expected to be in work and may also have preferences for lower hours.

The second institutional fact is that there is more wage inequality in the U.S. than Scandinavia, along with lower income taxes. This makes any wage gaps—between the sexes, between educational groups, etc.—larger in the U.S. than elsewhere (Blau and Kahn 1996). The two facts are also interrelated. Since the economic payoff to working at the upper part of the wage distribution is lower in Scandinavia than elsewhere, the incentives for putting in many work hours are also lower, and since the payoff is large at the upper part in the U.S. and quite low at the bottom, employees at both ends tend to put in many hours of work, at the top because it is so lucrative, at the bottom to make ends meet. The two institutional facts combine to create a lower gender gap for both hours worked and earnings among full-time employees in Scandinavia than elsewhere. This has nothing to do with less discrimination from employers. It arises from the fact of wage compression.

The institutional facts can work in many directions. On the one hand, high pay or the prospects of high pay gives incentives for women to be professionally active and successful in the top echelons of the occupational hierarchy, as illustrated by the relative lack of women in high occupational positions in Scandinavia compared to the U.S. (Wright, Baxter, and Birkelund 1995). On the other hand, high pay does not come without putting in the requisite hours, and for mothers that can work in the opposite direction, that they will opt out of those jobs. In the U.S. the former effect seems to dominate. With respect to the role of publicly provided child care, parents in the high-paying jobs are the one's the least in need of it, being able to

afford the costs, leaving less room for the impact of family policies. For women at the bottom of the wage distribution such policies could however do wonders.

As a conjecture, an economic system with lower wage inequality, lower work effort and especially fewer hours, may be the most conducive to solving the family gap in pay. These are the systems found today in Scandinavia, to a lesser extent in continental Europe, and not at all in the U.S. and UK. These institutional features, combined with extensive family policies, contribute to creating not only equality of treatment by sex but even equality of results. In this sense the vanguard for gender equality has now shifted from the U.S. to Northern Europe.

Appendix: Methods

The subscripts used are as follows: i for individuals, o for occupations, e for establishments, and t for years. The dependent variable is the logarithm of wages ($\ln w_{it}$) for individual i in year t, and the independent variables are collected in the vector x_{it}, which includes the constant 1.

In a cross-sectional analysis, separately for each year t we regress the logarithm of wages $\ln w_{it}$ on explanatory variables x_{it}, using four different specifications:

$$\ln w_{it} = \alpha_{P,t} x_{it} + \varepsilon_{it}, \tag{A1}$$

$$\ln w_{it} = \alpha_{E,t} x_{it} + \eta_{et} + \varepsilon_{iet}, \tag{A2}$$

$$\ln w_{it} = \alpha_{O,t} x_{it} + \eta_{ot} + \varepsilon_{iot}, \tag{A3}$$

$$\ln w_{it} = \alpha_{OE,t} x_{it} + \eta_{oet} + \varepsilon_{ioet}, \tag{A4}$$

where η_{et}, η_{ot}, and η_{oet} are fixed effects (i.e., of dummy variables) capturing establishment e, occupation o, and occupation-establishment unit oe, and ϵ_{it}, ϵ_{iet}, ϵ_{iot}, and ϵ_{ioet} are error terms. The subscripts to the α parameters indicate that these are different coefficients, pertaining to different levels, population, establishment, etc.

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Table 1

The Implications of the Three Hypotheses for the Wages of Men or Women Who Eventually Become Married and Become Parents: Relative to Themselves While Single, Relative to Men or Women Who Stayed Single, and Change in the Marital Premium and Parenthood Premium/Penalty Over Time

| | | Treatment | | | Discrimination | |
	Selection	Household Specialization	Human Capital Accumulation	More Work Effort	Animus	Statistical
For Men:						
Marital States						
Single	High Wage	Low Wage	Low Wage	Low Wage	Low Wage	Low Wage
Married	High Wage	High Wage	High Wage	High Wage	High Wage	High Wage
Post-Married	High Wage	Low Wage	High Wage	Unclear	High Wage	High Wage
Change Over Time	Zero	Decline	Zero	Decline	Decline	Zero
Fatherhood States						
No children	High	High	High	High	High	High
Children	High	High	High	High	High	High
Change over Time	zero	Decline	Decline	Decline	zero	zero
For Women:						
Marital States						
Single	High Wage	Low Wage	Low Wage	Low Wage	Low Wage	Low Wage
Married	High Wage	High Wage	High Wage	High Wage	High Wage	High Wage
Post-Married	High Wage	Low Wage	High Wage	Unclear	High Wage	High Wage
Change over Time	Zero	Decline	Zero	Decline	Decline	Decline
Motherhood States						
No children	Low	High	High	High	High	High
Children	Low	Low	Low	Low	Low	Low
Change over Time	zero	Decline	Decline	Decline	Decline	Decline

Note: For men, in the 42 cells, within the 7 rows the empirical implications differ in 9 cells. For the 24 cells for marital status, 6 cells give different implications. In Row 1, only cell 1 gives a different implication. In Row 2, all the cells are equal. In Row 3, cell 2 gives a different implication and cell 4 gives no implication. In Row 4, cells 1, 3, and 6 give different implications from cells 2, 4, and 5. For the 18 cells for fatherhood status, 3 cells give different implications. In Row 5, all cells are equal. In Row 6, all cells are equal. In Row 7, the implications in cells 1, 5, and 6 differ from those in cells 2, 3, and 4.

For women, in the 42 cells, within the 7 rows the empirical implications differ in 8 cells. For marital status, the implications are the same as among men, with the exception of Row 4, cell 6. For motherhood status, Row 5 gives a different implication in cell 1, for Row 6 cell 6 gives a different implication, and in Row 7 cell 1 gives a different implication.

Table 2
Descriptive Statistics: Computed Separately by Years, But Averaged Across Years within
Each of Four Periods (1980-1984, etc.)

| | 1980-1984 | | 1985-1989 | | 1990-1994 | | 1995-1997 | |
	Men	Women	Men	Women	Men	Women	Men	Women
Percent:								
Single	15.53	38.42	20.07	38.6	22.51	32.03	26.13	31.98
Married	79.26	48.68	73.52	47.34	69.79	54.3	65.62	54.56
Widowed	.25	0.87	.25	0.85	.27	0.76	.28	0.66
Divorced	3.15	8.93	4.19	10.14	5.21	10.06	5.96	10.33
Separated	1.80	3.09	1.97	3.07	2.22	2.85	2.02	2.47
No children	25.35	57.54	28.71	54.2	29.33	43.27	29.83	39.28
First child	19.06	21.14	20.43	23.51	22.20	27.17	21.19	25.3
Second child	37.81	16.35	35.64	18.46	33.60	24.48	32.54	28.25
Third+ child	17.78	4.97	15.22	3.82	14.86	5.08	16.44	7.16
Basic education	60.85	87.1	58.00	80.18	53.22	73.67	49.94	67.91
College	7.46	4.54	8.06	8.06	9.95	12.01	11.18	15
Graduate	2.03	0.6	3.28	1.64	4.87	2.68	5.87	3.75
Professional	24.34	2.39	25.43	5.03	27.63	7.58	29.48	10.01
Unknown	5.32	5.36	5.23	5.09	4.33	4.05	3.54	3.33
Percent Promoted Among:								
Single	12.89	8.52	9.87	7.93	9.48	7.64	10.70	7.81
Married	9.35	8.09	7.37	7.16	7.06	6.17	7.28	6.18
Widowed	6.05	7.37	4.21	5.29	5.64	3.94	7.95	3.13
Divorced	7.95	7.31	5.99	6.44	5.56	4.77	6.36	5.38
Separated	8.18	8.75	6.90	6.80	5.70	5.63	6.75	5.75
No children	12.27	8.39	9.68	8.03	8.56	7.02	9.67	7.19
First child	9.71	8.03	7.50	6.53	7.39	5.74	7.26	5.80
Second child	9.16	7.95	7.16	7.08	6.81	6.11	7.63	6.63
Third+ child	8.16	7.95	6.88	6.21	7.14	6.65	7.23	5.95
Wage relative to singles/childless:								
Married	1.20	1.06	1.20	1.08	1.19	1.06	1.20	1.06
Widowed	1.17	1.07	1.19	1.10	1.16	1.05	1.17	1.04
Divorced	1.18	1.09	1.16	1.10	1.14	1.05	1.13	1.03
Separated	1.18	1.06	1.19	1.07	1.15	1.05	1.15	1.03
First child	1.08	1.03	1.09	1.05	1.08	1.01	1.07	1.01
Second child	1.16	1.04	1.16	1.05	1.14	1.04	1.15	1.04
Third+ child	1.17	1.00	1.17	1.02	1.17	1.05	1.19	1.07
Experience								
mean	16.44	13.45	16.71	14.03	17.43	15.87	17.52	16.55
sd	7.83	8.67	7.94	8.87	7.80	8.57	7.73	8.19
N person-years	241277	70704	257754	92542	271703	129711	155867	78901
N individuals	80371	28870	88795	36668	86384	43445	66941	34500
N occupations	22	22	22	22	22	22	22	22
N establishments	3810	3227	4057	3442	4293	3878	3468	3213
N occ-est	23076	8244	23746	10206	33292	12226	17738	9781

Note: For each year in the data we computed the distributions (in percent) on marital status, parenthood status, educational attainment, and also means and standard deviations for experience. For employees who were present in data in at least two adjacent years, we computed the percent promoted between two years for each marital status and for each parenthood status. We also computed the average wage for each marital and parenthood status as proportion of average wage of single and childless employees. The statistics above have been computed separately for each year, but have then been averaged across years within each of four time periods. The five last lines of the table we give (1) the number of individual-years in each of the four time periods, (2) the number of distinct individuals in each of the four periods, (3) the number of occupations each year, (4) the average number of establishments each year within each of the four time periods,   (5) the average number of occupation-establishments units each year within each of the four time periods.   Note that on average, male employees are observed for a period of 9 years in the data and female employees for a period of 8 years.

Table 3: Effects of Marital Status and Children on Logarithm of Wage. Controls for Education and Experience. Men and Women Combined.

	1980-1984				1985-1989				1990-1994				1995-1997			
	Pop	Est	Occ	Occ-Est	Pop	Est	Occ	Occ-Est	Pop	Est	Occ	Occ-Est	Pop	Est	Occ	Occ-Est
Men compared to men																
Married	.070	.063	.029	.023	.079	.070	.028	.022	.088	.075	.027	.019	.088	.073	.024	.018
Divorced	.051	.032	.030	.009	.056	.035	.029	.011	.065	.047	.027	.013	.062	.045	.023	.010
Widowed	.050	.048	.020	.012	.074	.062	.037	.010	.072	.068	.024	.026	.068	.061	.005	.012
Separated	.063	.044	.028	.014	.077	.056	.032	.017	.078	.061	.034	.020	.071	.059	.022	.014
One under 20	.003	.013	-.001	.008	.000	.008	-.004	.002	.003	.012	-.002	.002	.006	.014	-.001	.006
Two under 20	.027	.039	.005	.016	.013	.024	-.002	.006	.010	.022	.000	.007	.019	.026	.003	.010
Three under 20	.027	.043	.001	.017	.014	.029	-.002	.013	.016	.028	.001	.009	.027	.032	.003	.013
Women compared to women																
Married	.008	-.003	.009	.003	.011	-.002	.011	.005	-.001	-.010	.008	.003	.002	-.007	.010	.005
Divorced	-.004	-.031	.012	-.005	.000	-.026	.013	-.004	-.013	-.031	.003	-.010	-.019	-.032	.000	-.010
Widowed	-.025	-.037	-.004	-.020	-.008	-.026	.007	-.001	-.019	-.030	.008	-.004	-.023	-.035	.017	.012
Separated	-.008	-.021	.007	.000	.004	-.018	.013	-.003	.001	-.023	.012	-.003	-.009	-.018	.002	-.005
One under 20	-.043	-.032	-.023	-.014	-.033	-.025	-.016	-.011	-.025	-.019	-.010	-.005	-.021	-.017	-.004	-.001
Two under 20	-.094	-.078	-.050	-.038	-.076	-.063	-.036	-.025	-.039	-.029	-.011	-.007	-.027	-.020	-.001	.001
Three under 20	-.131	-.115	-.067	-.052	-.116	-.104	-.055	-.040	-.058	-.048	-.012	-.014	-.031	-.024	-.001	-.003
Women compared to men																
Female	-.089	-.096	-.058	-.050	-.085	-.097	-.049	-.043	-.074	-.090	-.032	-.030	-.067	-.079	-.026	-.025
Married	-.062	-.066	-.020	-.020	-.068	-.072	-.017	-.017	-.090	-.084	-.020	-.017	-.086	-.080	-.015	-.013
Divorced	-.055	-.063	-.018	-.015	-.057	-.060	-.015	-.015	-.078	-.077	-.024	-.022	-.081	-.077	-.023	-.020
Widowed	-.075	-.085	-.024	-.032	-.083	-.089	-.030	-.011	-.091	-.099	-.016	-.030	-.091	-.095	.012	.000
Separated	-.072	-.065	-.022	-.014	-.073	-.074	-.019	-.020	-.077	-.083	-.022	-.023	-.079	-.077	-.020	-.018
One under 20	-.046	-.046	-.022	-.022	-.032	-.033	-.012	-.012	-.028	-.031	-.008	-.007	-.027	-.031	-.003	-.008
Two under 20	-.121	-.118	-.056	-.054	-.088	-.087	-.035	-.032	-.049	-.051	-.010	-.013	-.046	-.046	-.004	-.009
Three under 20	-.158	-.158	-.067	-.069	-.131	-.133	-.052	-.052	-.075	-.076	-.012	-.024	-.058	-.056	-.004	-.017
Estimated female wages as a proportion of male wages for 5 groups of men and women																
Single	.911	.904	.942	.950	.915	.903	.951	.957	.926	.910	.968	.970	.933	.921	.974	.975
Married	.849	.838	.922	.930	.847	.831	.934	.940	.836	.826	.948	.953	.847	.841	.959	.962
Married +																
One child	.803	.792	.900	.908	.815	.798	.922	.928	.808	.795	.940	.946	.820	.810	.956	.954
Two children	.728	.720	.866	.876	.759	.744	.899	.908	.787	.775	.938	.940	.801	.795	.955	.953
Three children	.691	.680	.855	.861	.716	.698	.882	.888	.761	.750	.936	.929	.789	.785	.955	.945

Note: In these analyses there are controls for education and experience. The regressions are estimated for men and women combined, with interaction terms between sex and marital status and between sex and children. Panel A give the effects for men. Panel B gives the effects for women, as the male effects plus the interaction effects. Panel C gives the interaction effects. Panel D gives the estimate of the female wages as percent of male wages. Analyses restricted to employees 20-50 years old.

Table 4: Effects of Marital Status and Children on Changes in Logarithm of Wage Between Two Adjacent Years. Wih Controls for Education and Experience. Employees Who Stayed in Same Establishment in Two Adjacent Years. Men and Women Combined.

	1980-1984				1985-1989				1990-1994				1995-1997			
	Pop	Est	Occ	Occ-Est	Pop	Est	Occ	Occ-Est	Pop	Est	Occ	Occ-Est	Pop	Est	Occ	Occ-Est
Men compared to men																
Married	.000	.001	.000	.001	.001	.001	.002	.003	.001	.001	.001	.001	-.001	-.002	-.001	-.001
Divorced	-.002	-.002	-.002	-.003	-.001	-.001	-.001	-.002	.000	-.001	.000	.000	-.001	-.002	-.001	-.001
Widowed	-.001	.000	-.003	-.001	.001	.001	.001	.001	.000	-.002	.000	.000	-.008	-.008	-.007	-.013
Separated	-.003	-.004	-.004	-.005	-.003	-.003	-.001	-.001	-.003	-.003	-.003	-.003	-.004	-.005	-.002	-.002
One under 20	-.001	-.001	-.001	.000	.000	.000	.000	-.001	-.001	.000	.000	.000	.000	.000	-.001	.000
Two under 20	-.001	-.001	-.001	-.002	.000	-.001	.000	-.001	.000	.000	.000	.000	.001	.002	.001	.001
Three under 20	-.002	-.001	-.001	-.002	.000	-.001	.000	-.002	.000	.000	.000	-.001	.001	.000	.000	.000
Women compared to women																
Married	.001	.001	.001	.000	.002	.003	.002	.002	.003	.002	.003	.002	.003	.002	.002	.002
Divorced	.004	.002	.004	.002	.004	.004	.004	.003	.003	.003	.003	.003	.005	.004	.005	.004
Widowed	.007	.006	.006	.008	.006	.006	.007	.007	.007	.007	.005	.005	.004	.004	.004	.004
Separated	.003	.001	.003	.000	.003	.003	.003	.001	.003	.003	.003	.002	.005	.004	.003	.002
One under 20	.002	.003	.002	.003	.002	.002	.002	.002	.000	-.001	.000	.000	-.002	-.002	-.002	-.001
Two under 20	.012	.012	.012	.012	.009	.009	.009	.009	.003	.003	.003	.002	.002	.003	.002	.002
Three under 20	.011	.013	.013	.015	.013	.012	.012	.010	.004	.003	.004	.003	.001	.002	.001	.001
Women compared to men																
Female	-.005	-.005	-.007	-.007	-.005	-.006	-.007	-.007	-.003	-.004	-.004	-.005	-.007	-.007	-.008	-.008
Married	.001	.000	.001	-.001	.001	.001	.001	.000	.002	.002	.002	.001	.004	.004	.003	.003
Divorced	.006	.004	.006	.005	.005	.006	.005	.005	.004	.004	.003	.003	.006	.006	.006	.005
Widowed	.008	.005	.009	.008	.005	.005	.006	.006	.007	.009	.005	.005	.011	.012	.010	.017
Separated	.006	.005	.007	.005	.006	.005	.004	.002	.006	.006	.006	.005	.009	.009	.005	.004
One under 20	.003	.004	.002	.003	.002	.002	.002	.003	.000	-.001	.000	-.001	-.002	-.002	-.001	-.001
Two under 20	.013	.013	.013	.014	.010	.009	.009	.010	.004	.002	.004	.002	.001	.001	.002	.001
Three under 20	.013	.015	.014	.016	.014	.013	.012	.012	.004	.003	.004	.004	.000	.001	.001	.000

Note: In these analyses there are controls for education and experience. The regressions are estimated for men and women combined, with interaction terms between sex and marital status and between sex and children. Panel A give the effects for men. Panel B gives the effects for women, as the male effects plus the interaction effects. Panel C gives the interaction effects. Employees stayed in same establishment in two adjacent years. Analyses restricted to employees 20-50 years old.

Table 5: Effects of Marital Status and Children on Promotion in Occupational Rank Between Two Adjacent Years. With Controls for Education and Experience. For Employees Who Stayed in Same Career Ladder Between Two Adjacent Years. And for Employees Who Stayed in Same Establishment Between Two Adjacent Years. Men and Women Combined.

	1980-1984				1985-1989				1990-1994				1995-1997			
	Pop	Est	Occ	Occ-Est	Pop	Est	Occ	Occ-Est	Pop	Est	Occ	Occ-Est	Pop	Est	Occ	Occ-Est
Men compared to men																
Married	.011	.010	.021	.031	.010	.009	.018	.022	.004	.002	.013	.017	-.002	-.005	.010	.007
Divorced	.005	.001	.013	.019	.006	.001	.010	.005	-.001	-.003	.006	.009	.002	.000	.012	.011
Widowed	.003	.010	.017	.044	-.009	-.010	-.001	.019	.002	-.008	.011	.003	.014	.009	.025	.001
Separated	.005	.000	.014	.011	.011	.007	.017	.019	-.005	-.006	.002	.007	-.002	-.004	.009	.000
One under 20	-.007	-.005	-.003	-.002	-.003	-.003	-.002	-.002	.003	.003	.004	.005	-.003	.000	-.002	.005
Two under 20	-.007	-.006	.000	-.003	-.004	-.003	-.001	-.001	.000	-.001	.003	.004	.002	.004	.006	.014
Three under 20	-.009	-.007	.002	.003	-.004	-.003	.000	.003	.004	.000	.007	.005	.000	-.001	.005	.008
Women compared to women																
Married	.018	.015	.018	.012	.021	.019	.025	.019	.015	.013	.014	.007	.014	.011	.011	.010
Divorced	.026	.021	.021	.012	.027	.024	.027	.014	.013	.012	.013	.002	.020	.019	.017	.011
Widowed	.043	.037	.038	.013	.025	.025	.025	.014	.013	.009	.013	.006	.004	.003	.000	-.018
Separated	.028	.021	.028	.005	.022	.018	.024	.010	.014	.012	.013	-.001	.015	.013	.014	.011
One under 20	.017	.013	.011	.008	.002	.003	-.001	-.004	-.002	-.003	-.006	-.007	-.003	-.003	-.007	-.007
Two under 20	.027	.027	.016	.006	.013	.014	.004	-.004	.004	.003	-.003	-.003	.004	.002	-.003	-.008
Three under 20	.034	.029	.016	-.010	.009	.006	-.008	-.016	.011	.005	.000	-.009	-.001	.001	-.008	-.008
Women compared to men																
Female	-.034	-.034	-.057	-.056	-.017	-.020	-.041	-.040	-.017	-.016	-.024	-.021	-.025	-.021	-.031	-.027
Married	.007	.006	-.003	-.018	.011	.011	.007	-.003	.011	.011	.001	-.010	.015	.016	.002	.002
Divorced	.021	.020	.008	-.007	.021	.022	.017	.009	.014	.014	.007	-.007	.018	.020	.006	.000
Widowed	.040	.026	.021	-.031	.034	.036	.026	-.006	.011	.016	.002	.002	-.010	-.007	-.024	-.019
Separated	.024	.021	.015	-.006	.011	.011	.008	-.008	.019	.018	.011	-.008	.017	.018	.005	.011
One under 20	.023	.017	.013	.010	.005	.005	.001	-.002	-.006	-.006	-.011	-.012	.000	-.003	-.006	-.011
Two under 20	.034	.033	.016	.008	.017	.017	.005	-.003	.004	.003	-.005	-.007	.002	-.002	-.008	-.021
Three under 20	.043	.035	.014	-.013	.013	.010	-.008	-.019	.008	.005	-.007	-.013	-.002	.002	-.012	-.017

Note: In these analyses there are controls for education and experience. The regressions are estimated for men and women combined, with interaction terms between sex and marital status and between sex and children. Panel A give the effects for men. Panel B gives the effects for women, as the male effects plus the interaction effects. Panel C gives the interaction effects. For Employees Who Stayed in Same Career Ladder Between Two Adjacent Years. And for Employees Who Stayed in Same Establishment Between Two Adjacent Years. Analyses restricted to employees 20-50 years old.