

Paradox or Mitigation? Childless and Parent Gender Gaps across British, Finnish, and German Wage Distributions

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Part of the welfare paradox is that generous family policies increase private sector employer discrimination particularly against higher-wage women. We argue instead that bundles of generous policies mitigate gender productivity differences among parents, and in turn the discrimination also affecting childless women. We test these assertions by estimating the two gaps across the British, Finnish, and German private sector wage distributions using 2000–2018 panel data and unconditional quantile regression. Because of smaller motherhood penalties below the median, parenthood gaps are smallest in Finland and Germany. In contrast, fatherhood premiums constitute most of the parenthood gap for high-wage German and British women, whereas high-wage British women are disadvantaged by motherhood penalties and fatherhood premiums. The childless gap is also smaller across the bottom of the Finnish and German wage distributions. Overall, our advanced modeling strategy finds strong support for the mitigating effects of generous family policies on gender wage gaps.

Researchers generally agree that family policies such as publicly subsidized childcare and moderate length paid parental leaves encourage women's labor force attachment (Boeckmann, Misra, and Budig 2015; Del Boca Pasqua and Pronzato 2009; Evertsson et al. 2009; Hook and Paek 2020; Korpi, Ferrarini, and Englund 2013). Greater labor force attachment increases women's wages as it increases their accumulated work experience and opportunities for on-the-job training (Mincer and Ofek 1982). Yet a counterargument is that bundles of generous family policies inhibit women's earnings attainment

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under a “welfare state paradox” (Mandel and Semyonov 2005, 2006). Part of the paradox is due to the larger public sector of generous welfare states pulling more low-skilled women into employment and luring high-skilled women into lower-paying public sector jobs (Mandel and Semyonov 2005, 2006). Another part of the paradox is that generous parental leaves increase private sector employer discrimination, undermining especially high-wage women’s access to the most lucrative jobs (Mandel and Semyonov 2005, 2006). Most tests of the paradox have been limited to cross-sectional analyses of older data, with some finding that gender earnings gaps are larger for high-skilled women in generous welfare states (Mandel 2012; Mandel and Semyonov 2005; Mandel and Shalev 2009), while others do not (Grönlund and Magnusson 2016; Korpi et al. 2013). No study to date has offered evidence on within-sector dynamics.

We take a first step in doing so by investigating the private sector gender wage gap with recent data. We focus on the private sector only because wage inequality is greater and discrimination more likely than in the public sector (Korpi et al. 2013; Mandel and Semyonov 2005, 2006; Petersen, Penner, and Høgsnes 2014). Second, we differentiate between private sector gender wage gaps among parents and those among childless individuals. Gender wage gaps net of individual characteristics are attributed to a mix of gender differences in unmeasured productivity associated with parenthood, and employer discrimination that affects all women throughout their careers regardless of parental status. Family policies target parents’ labor force attachment and productivity, varying the wage effects associated with motherhood (Budig, Misra, and Boeckmann 2016; Halldén, Levanon, and Kricheli-Katz 2016; Petersen et al. 2014) and fatherhood (Cooke 2014; Morosow and Cooke 2021). Most tests of the paradox used data from the 1990s, which was prior to the expansion and take-up of fathers’ paid family leaves during the 2000s. Recent research highlights that those fathers who take parental leave are more likely to equally share housework and childcare afterwards (Almqvist and Duvander 2014; Bünning 2015; Evertsson, Boye, and Erman 2018; Huerta, et al. 2013), and likewise incur wage penalties (Albrecht, Thoursie, and Vroman 2015; Evertsson 2016; Morosow and Cooke 2021). We do not directly test the impact of leave provisions on wages but draw on this evidence to contend that in the more recent period, welfare states with generous bundles of dual-earning and dual-caring policies should mitigate the *relative* gender differences in productivity associated with parenthood, not exacerbate them for high earners as argued under the paradox. Over time, the reduction in gender differences in relative parental productivity should reduce the statistical discrimination that affects women also when childless.

The third contribution is the improved empirical strategy for testing the arguments. We use a case-oriented approach, comparing parenthood and childless gender wage gaps in Finland, Germany, and the United Kingdom. The countries are representative of liberal, social-democratic, and conservative

welfare regimes, respectively (Esping-Andersen 1999). Specific to family policies, they reflect different “constellations” of dual-earning and dual-caring policy supports (Finland), historically traditional but since the 2000s offering more dual-earning and dual-caring supports (Germany), and market-oriented (United Kingdom) (Korpi et al. 2013; Mandel and Shalev 2009).

The case approach enables us to use 2000–2018 national panel data that not only updates tests of the paradox, but also allows us to control for selection into parenthood on wage growth as well as levels using fixed effects with group slopes (FEGS). Doing so accounts for most of the fatherhood premium in several countries (Icardi, Hägglund, and Fernández-Salgado 2022; Ludwig and Brüderl 2018). No study to date, however, has estimated parenthood gaps with an FEGS model. Finally, country differences in average levels of wage inequality can mask the magnitude of relative gender gaps within countries. We therefore standardize estimates of parenthood and childless gaps across each country’s wage distribution by using unconditional quantile regression (Firpo, Fortin, and Lemiux 2009).

Explaining Gender Wage Gaps

Family predicts gender wage inequalities in industrial societies. One reason for this could be gender differences in who becomes parents (selection). Lower-earning women may be more likely to become mothers, whereas high-earning men may be more likely to become fathers. Yet children may also have a causal effect on women and men’s wages. Under a gender division of paid and unpaid labor, women more likely interrupt their accumulation of work experience, work fewer hours, or accept lower-paying jobs for more flexibility to balance work and family, and do most of the housework and childcare (Becker 1985; de Linde Leonard and Stanley 2020). Becker (1985) claims that the effort required to care for the family negatively affects productivity even when working the same hours as someone who does no domestic work. Conversely, the persistent norm of men as family breadwinners may encourage fathers to work harder, seek out promotions, or otherwise increase their economic contribution to the family (Koslowski 2011). Fathers’ greater contribution to housework and childcare should reduce any wage advantage (Becker 1985).

Gender differences in the impact of children on accumulated experience and labor supply therefore account for much, but not necessarily all, of motherhood wage penalties (de Linde Leonard and Stanley 2020; Gangl and Ziefle 2009) and fatherhood wage premiums (Koslowski 2011; Petersen et al. 2014). Controlling as well for selection on wage levels explains very little of the motherhood penalty (de Linde Leonard and Stanley 2020). In contrast, controlling for selection on wage levels as well as growth accounts for most of the fatherhood premium in the United States (Ludwig and Brüderl 2018), Finland, Germany, and the United

Kingdom (Icardi et al. 2022). Any remaining wage gap after controlling for selection and observed individual characteristics is often attributed to (unmeasured) gender productivity differences and/or employer discrimination (de Linde Leonard and Stanley 2020; Petersen et al. 2014).

Policy Context and Gender Wage Gaps

Policy and cultural contexts affect the gender wage gap by affecting parents' relative time allocations between work and family, and, in turn, productivity. The individual policies most frequently studied are subsidized early childhood education and care (ECEC) and paid family leaves. Subsidized ECEC reduces the gender division of labor because it shifts caring responsibilities from the home to the public sector (Del Boca et al. 2009; Hegewisch and Gornick 2011; Hook and Paek 2020; Olivetti and Petrongolo 2017). Most research finds that the availability of subsidized ECEC reduces women's or mothers' earnings disadvantage (Budig et al. 2016; Halldén et al. 2016; Olivetti and Petrongolo 2017; but see Brady, Blome, and Kmec 2020).

Paid maternity and parental leaves may enhance women's labor force attachment by creating a bridge between work and family (Boeckmann et al. 2015; Hook and Paek 2020; Olivetti and Petrongolo 2017). This increases mothers' accumulated work experience, which should reduce the motherhood wage penalty. Evidence is mixed on whether this is the case and if effects vary with the length of maternal leave (Brady et al. 2020, no; Budig et al. 2016, yes; Halldén et al. 2016, yes; Olivetti and Petrongolo 2017, yes but only when limiting the country selection). Father-only leaves expanded during the 2000s and reduce the impact of childbearing on women's work interruptions and encourage more equal sharing of childcare afterwards (Korpi et al. 2013). Evidence of this is most consistent. Fathers' leaves reduce their own wages (Albrecht et al. 2015; Evertsson 2016; Morosow and Cooke 2021), and one study shows they also reduce the motherhood wage penalty (Budig et al. 2016).

In all, the array of policies first introduced in the Nordic countries that combine generous paid family leaves for both parents and subsidized care for children younger than three became the policy benchmark for enhancing gender employment equality (European Commission 2016; Korpi et al. 2013). Yet Mandel and Semyonov (2005, 2006) question whether generous family policies support women's greater labor force participation while paradoxically thwarting women's, and especially the most skilled women's, earnings attainment.

The Welfare State Paradox

The paradox is argued because generous family policies (i) increase female labor supply; (ii) increase women's public sector employment, and (iii) increase private sector discrimination (Mandel and Semyonov 2005, 2006). Regarding the first mechanism, policies that increase labor supply decrease

wages because they increase competition in the labor market and draw in the least-skilled people. The policy “push” on women’s employment was strong into the 1990s, but now market forces equally “pull” more women into employment (Hook and Paek 2020). Consequently, Mandel and Shalev (2009) concede that female labor force participation rates are now similar across the most and least generous welfare states, negating this dynamic of the welfare paradox.

The argument for the impact of the public sector is that state provision of family services creates public sector feminized care jobs for less-skilled women and managerial positions for high-skilled women (Mandel and Semyonov 2005). Greater collective bargaining coverage in the public sector raises wage floors while lowering wage ceilings (Blau and Kahn 1996; Mandel and Shalev 2009). The growth in low-skill public sector jobs covered by collective agreements is thought to account for smaller gender wage gaps for low-skilled women in generous welfare states (Korpi et al. 2013; Mandel 2012), although neither of these studies differentiate public from private sector wage gaps.

Despite lower wage ceilings, the public sector is attractive to high-skill mothers because it offers more flexible work arrangements and greater security (Esping-Andersen 1999; Mandel and Semyonov 2005). This contributes to what Mandel and Semyonov (2006) argue are larger gender wage gaps for high-skilled workers in more generous welfare states. However, they include public sector employment only as a country indicator in their assessments, and it has little impact on the gender wage gap (Mandel and Semyonov 2005, 963), or women’s high-wage managerial employment (Mandel and Semyonov 2006, 1945). Further exploration of theorized public sector gaps must be left to future papers.

We instead focus on the third argued mechanism: generous family policies of the Nordic model increase private sector employment discrimination especially against high-skilled women (Mandel 2012). Wage inequality and discrimination are generally greater in the private than public sector, especially at the top of the wage distribution (Mandel and Shalev 2009; Petersen et al. 2014).

Private Sector Discrimination in Context

Employee absences are costly to employers (Mincer and Ofek 1982). If women as a group are more likely than men to periodically exit employment or reduce their productivity after having children, this can lead to statistical discrimination against women based on employers’ expectations of their average productivity (England 1992; Phelps 1972). As all prime-age women are potentially mothers, discrimination also negatively affects women when they are childless (England 1992; Glass and Fodor 2011; Mandel and Semyonov 2005).

Under the welfare paradox, the Nordic model of family policies increases private sector employer statistical discrimination because it more deeply institutionalizes women’s family-related employment absences (Mandel 2012;

Mandel and Semyonov 2005, 2006; Mandel and Shalev 2009). Higher-wage women are hurt the most because employers lose more return on investment as the workers' skills depreciate (Glass and Fodor 2011; Mandel 2012; Mandel and Semyonov 2005, 2006; Mandel and Shalev 2009). It is also more difficult to temporarily replace the most skilled workers to accommodate anything but a short break (Glass and Fodor 2011). In addition, higher-wage workers more likely supervise other workers, so their absence may affect the productivity of subordinates.

Employers have many ways to enact discrimination even in the presence of anti-discrimination laws. First, women in generous welfare states may be less likely to be hired for high-skilled positions than men (Mandel and Semyonov 2006). Experimental studies of hiring discrimination do not support this conjecture. Mothers are significantly less likely to be called back than childless women for a medium-skilled job in Germany (Hipp 2020) and the United States (Correll, Benard, and Paik 2007), but childless women are as or more likely to be called back than men in both countries. In addition, a Swedish study finds neither gender nor parental differences in callbacks across a range of occupational skill levels (Bygren, Erlandsson, and Gähler 2017).

Women may be more likely to be hired, however, in lower-paying firms (Petersen et al. 2014). Even if hired in the same firms, women can be offered lower starting wages than men, put on lower internal career ladders, and denied training, promotion, or other career possibilities for maximizing wages (Acker 2006; Glass and Fodor 2011). In all, the paradox is that the institutionalization of women's right to family leave could lead to larger gender wage gaps at the top of the private sector wage distribution in more as compared with less generous welfare states (Mandel 2012; Mandel and Semyonov 2005, 2006; Mandel and Shalev 2009).

There are no tests of private sector wage gaps in the welfare paradox literature, and evidence on pooled cross-sectional data from the 1990s into the early 2000s is mixed. Mandel and Semyonov (2005) claim support for the paradox for more skilled workers when expressing the gap as gender differences in standardized wage percentile rankings, and other studies find support when comparing binary low- versus high-education differences in the gender earnings gap (Grönlund and Magnusson 2016; Mandel 2012). Using conditional quantile regression, however, Korpi, Ferrarini, and Englund (2013) conclude that the hourly gender wage gap is not significantly larger at the top of the combined public and private wage distribution in the most as compared with least generous welfare states.

Paradox or Mitigation?

We contend the welfare paradox vis-à-vis private sector discrimination needs to be tested now that generous welfare states have evolved to encourage

fathers' caring in addition to mothers' employment. To do so, we follow [Petersen, Penner, and Høgsnes \(2014\)](#) and differentiate between the gender wage gap among parents and that among the childless. We do not test for specific leave effects but draw on the evidence presented to argue that countries with bundles of generous family policies that include earnings-related leaves for both parents coordinated with subsidized ECEC should mitigate relative gender productivity differences among parents. In turn, this should reduce statistical discrimination that is based on relative gender parental productivity differences, which affects women's wages beginning when they are childless. The ways and extent to which the policy context mitigates productivity differences, however, likely vary across the wage distribution.

How Policies Mitigate Low-Wage Women's Wage Gap

Both proponents of the paradox ([Mandel 2012](#)) and its critics ([Korpi et al. 2013](#)) conclude (although did not test) that low-wage women enjoy smaller wage gaps in generous welfare states because they are more likely to be employed in public sector jobs. We do not assess public sector gaps either but contend that the policies supporting mothers' labor force attachment are important for narrowing parenthood and gender wage gaps for lower-wage women in the private sector. Why? Because these are the women most likely to be out of the labor market or interrupt employment without policy supports as they lack high-wage women's resources for balancing work and family ([Budig and Hodges 2010](#)). This means private sector employers likely view them as the least reliable female employees absent policy supports.

For one, subsidized ECEC reduces the likelihood of low-wage mothers having an unreliable patchwork of formal care, family, and friends ([Budig and Hodges 2010](#)). In addition, it eliminates the out-of-pocket costs of childcare especially for very young children, which constitute a much larger share of low-earning women's wages ([Del Boca et al. 2009](#); [Evertsson et al. 2009](#); [Hook and Paek 2020](#)). Subsidized ECEC therefore reduces lower-wage mothers' opportunity costs of employment and significantly increases not only their labor force participation, but full-time employment ([Hook and Paek 2020](#)).

Paid family leaves with generous earnings replacement rates also encourage pre-birth employment for lower-skilled women. A recent comparative study finds that in countries with lower levels of income inequality as typically found in generous welfare states, the availability of long paid leave significantly increases lower-skilled mothers' employment ([Hook and Paek 2020](#)). Consequently, contexts with extensive supports for maternal employment increase low-wage mothers' labor force attachment, leading to greater accrued experience and possibilities for work-provided training that predict greater wages ([Mincer and Ofek 1982](#)). This suggests:

Hypothesis 1a: The parenthood gender wage gap at the bottom of the private sector wage distribution will be smaller in country contexts with bundles of more generous family policies.

Increasing the work continuity and reliability of low-wage mothers should ultimately also improve private sector employer expectations about all low-wage women's potential productivity. This would reduce discrimination against these women. Consequently:

Hypothesis 1b: The childless gender gap at the bottom of the private sector wage distribution will be smaller in country contexts with bundles of more generous family policies.

How Policies Mitigate High-Wage Women's Wage Gap

Policy supports for maternal employment are less critical for the labor force attachment of high-wage women, because these women are already more career-oriented and have greater financial resources for balancing work and family (Budig and Hodges 2010; Evertsson et al. 2009; Hook and Paek 2020). They are less reliant on public ECEC (Del Boca et al. 2009; Evertsson 2009; Hook and Paek 2020; Pettit and Hook 2009), although some studies find they are more likely to take advantage of subsidized care where it is available instead of paying for it privately (Olivetti and Petrongolo 2017; Pettit and Hook 2009).

In addition, because taking time away from their jobs is more costly for high- than low-wage mothers, high-wage mothers tend to take shorter leaves around childbirth than lower-waged mothers regardless of policy context (Evertsson et al. 2009). Nevertheless, the paradox argument asserts high-wage women in generous welfare regimes will be penalized more harshly by private sector employers who view the institutionalized right to family leaves as incompatible with the demands of professional positions (Glass and Fodor 2011; Mandel 2012; Mandel and Semyonov 2005). Supporting this is the evidence that high-wage (Albrecht et al. 2015) and highly educated Swedish mothers (Evertsson 2016) incur larger wage penalties than low-wage or less-educated mothers taking similar length parental leaves. However, in their over-time study of Norwegian white-collar workers, Petersen et al. (2014) find that the average motherhood penalty decreased during the period of family policy expansion in the late 1980s to early 1990s. These findings indicate that these policies reduce high-skilled mothers' *relative* productivity disadvantage vis-à-vis high-skilled men.

Further reducing gender differences in relative productivity is the expansion of well-paid, father-only parental leaves encouraging dual caring that have more recently become a hallmark of the Nordic model (European Commission 2016; Grönlund, Halldén, and Magnusson 2017; Hegewisch and Gornick 2011; Korpi et al. 2013). Not only do paternity and father-only

parental leaves encourage men to interrupt employment around a birth, but fathers who take parental leave are more likely to equally share housework and childcare afterwards (Almqvist and Duvander 2014; Bünning 2015; Evertsson et al. 2018; Huerta et al. 2013). Work interruptions and doing more domestic tasks should reduce fathers' wages just as they are argued to reduce mothers' (Becker 1985; Mincer and Ofek 1982). Indeed, Morosow and Cooke (2021) find that Finnish fathers who take the father-only parental leave have decreasing wage trajectories in the years afterward as compared with fathers who take no leave or only short paternity leave.

One might counter that, as Mandel and Semyonov (2005) noted for the 1990s, fathers' leave entitlement and use are only a fraction of mothers' in even the most generous policy contexts. Nonetheless, take up of father leaves has been steadily increasing and fathers' wage penalties for taking leaves are greater than mothers', and larger for more advantaged fathers (Albrecht et al. 2015; Evertsson 2016). For example, Albrecht, Thoursie, and Vroman (2015: Table A3) estimate that Swedish mothers' total wage penalty for taking family leave in the late 1990s was nil at the bottom of the wage distribution and increased to a penalty of less than 1 percent at the top. Swedish fathers took significantly less leave, but their total penalty for doing so is also insignificant at the bottom of the wage distribution and 1.2 percent at the top (Albrecht et al. 2015: Table A4). In other words, the magnitude of the wage penalty faced by high-wage Swedish fathers for their short leaves is larger than that faced by high-wage mothers for their longer leaves.

We draw on this evidence to assert that the expansion of dual-caring policies in generous welfare states over time should be countervailing any impact generous maternal leaves have on gender differences in relative work productivity associated with family among higher-wage workers. Note we use the word "countervail" and not eradicate. This means the parenthood gap is not eliminated but should be no greater in generous policy contexts as argued under the paradox:

Hypothesis 2a: The parenthood gender wage gaps at the top of the private sector wage distribution will be no larger in countries with more generous family policies than in less generous contexts.

The source of private sector employer discrimination under the paradox is that rights to paid parental leave institutionalize women's family-related absences. Fathers' guaranteed leave rights taken by a growing share of especially advantaged men increase the norm of fathers as carers, thereby institutionalizing their family-related absences as well. This should reduce employers' beliefs about men in general being significantly more productive than women. To be clear, women still face discrimination for their continued primary responsibility for care work in all affluent economies, penalties that increase as women's wages increase. We simply contend

that the discrimination already faced by childless women will be no greater in countries with generous bundles of family policies:

Hypothesis 2b: The childless gender wage gap at the top of the private sector wage distribution will be no larger in countries with generous bundles of family policies than in countries with less generous family policies.

One existing study does not support this hypothesis. [Petersen et al. \(2014\)](#) find that although the average Norwegian motherhood penalty among white-collar workers decreased during the period of family policy expansion to the 1990s, the gap between single childless persons increased sharply. They interpret the childless gap, as do we, as the extent of underlying gender discrimination not directly related to parenthood. These findings suggest another trade-off, with policies minimizing relative productivity differences between high-skilled parents (as with H2a), but at a possible cost of greater underlying gender discrimination (evident in a larger childless gap and against H2b). These results are for one country into the early 1990s, however, before expansion of fathers' leaves. We compare parenthood and childless gender gaps since 2000 in three countries to see if the high-wage equality trade-off is more generalized.

Country Cases

Comparative cross-sectional studies often use a variable-oriented approach to assess the impact of specific policies on gender employment outcomes ([Boeckmann et al. 2015](#); [Brady et al. 2020](#); [Budig et al. 2016](#); [Hook and Paek 2020](#); [Olivetti and Petrongolo 2017](#)). One problem with this approach is that individual countries offer a mix of family and other policies with competing wage effects, such as the positive effect of subsidized ECEC and potentially negative impact of long parental leave ([Hegewisch and Gornick 2011](#)). Countries also vary in the labor market arrangements and cultural norms regarding family in terms of traditional to egalitarian divisions of household labor ([Petersen et al. 2014](#)). Therefore, a case-oriented approach is more suitable for assessing how gender wage gaps vary across contexts ([Hegewisch and Gornick 2011](#); [Korpi et al. 2013](#); [Mandel and Shalev 2009](#)). We choose Finland, Germany, and the United Kingdom, which represent different types of welfare regimes ([Esping-Andersen 1999](#)) and sets of policy supports for more or less dual earning and caring ([Korpi et al. 2013](#); [Ray, Gornick, and Schmitt 2010](#)). We summarize the country policy bundles here; specifics and gender employment outcomes circa 2010 (the approximate mid-point in the panel data) are presented in [table 1](#).

Like its Nordic neighbors, social-democratic Finland was among the first countries to support dual earning and caring with universal well-paid

maternity, paternity, and parental leave with mothers' right to job reinstatement, and guaranteed access to subsidized full-time childcare for children younger than three (Grönlund et al. 2017; Ray et al. 2010; Salmi et al. 2018). Because Finnish children are entitled to subsidized full-time childcare upon parents' return from leave, Finland invests the greatest percentage of GDP in ECEC of the three countries, three times that in Germany and six times that in the United Kingdom (table 1).

To encourage more equal caring responsibilities, Finnish fathers are entitled to not only paternity leave, but were also offered two bonus weeks of parental leave in 2003 and two more in 2010 if they took at least two weeks of the gender-neutral parental leave when mothers have returned to work (OECD 2017). In 2013, differentiating between the two types of leaves was dropped and Finnish fathers are instead eligible for a total of nine weeks leave (OECD 2017). More controversially, Finland also offers a home care allowance (HCA) paid at a flat rate that allows one parent to care for the child in lieu of using the public childcare up until the child's third birthday (Salmi et al. 2018). About half of children younger than three are covered by the HCA, with mothers the usual carer (Salmi et al. 2018).

Germany also offers generous family policies, although historically West German policies reinforced a strong male breadwinner/female carer model (Cooke 2011). These policies included family wages paid to men, one of the longest child-rearing leaves in Europe, and only part-time ECEC for older children (Cooke 2011; Ray et al. 2010; Trappe, Pollmann-Schult, and Schmitt 2015). A policy sea-change started in the 2000s to encourage greater employment among more skilled German mothers. The 2005 Day-care Expansion Act pledged public childcare for children younger than three, although coverage is still uneven (Schober et al. 2020; Trappe et al. 2015).

More dramatically, in 2007, Germany replaced its flat-rate child-raising allowance with an earnings-based parental leave scheme for twelve months following maternity leave, which adds two bonus months if the other parent takes some of the leave (OECD 2017; Schober et al. 2020). By 2016, the mean duration of leave among German fathers was 3.4 months, as compared with the 13.4 months among mothers (Schober et al. 2020). In further support of our mitigation argument, Mari and Cutuli (2021) show the German motherhood wage penalty lessened after the policy changes, primarily because of mothers' shorter employment interruptions and longer work hours. Despite these progressive policy changes, the employment rate of German mothers with young children as of 2010 was still the lowest of the three countries (table 1).

In contrast to Finland and Germany, the United Kingdom offers more means-tested policy supports to families and little public provision of childcare (Cooke 2011). Maternity leaves are not generous, although fathers in 2003 gained a statutory right to take two weeks of it at a flat rate (Baird and O'Brien 2015). Unfortunately, the UK government does not routinely collect

Table 1. Finnish, German, and British Key Indicators, 2010 or as noted

| | Finland | Germany | UK |
|--|---|-----------------|--|
| <i>Paid parental leaves</i> | | | |
| Maternity leave, weeks paid | 18 | 14 | 39 |
| % prior earnings | 66% | 100 | 6 weeks @ 90%, 33 flat rate ⁽¹⁾ (plus 13 unpaid) |
| Earnings-related parental leave, weeks paid | 26 | 52 + 8 | 0 |
| % prior earnings | 66 | 67 | – |
| Job protection | Up to child's 3 rd birthday | Up to 36 months | Up to 52 weeks |
| Paternity/father-targeted parental, weeks paid | 7 | 0/8 | 2 |
| Fathers' leave, % prior earnings | 66 | 67 | Flat rate ⁽¹⁾ |
| <i>ECEC</i> | | | |
| Public childcare spending as % GDP (2015) | 0.6 | 0.2 | 0.1 |
| % children 0 to 2 in full-time ECEC (2011) | 20 | 15 | 5 |
| % children 0 to 2 in part-time ECEC (2011) | 6 | 9 | 30 |
| <i>Labor market</i> | | | |
| 90/10 household income ratio | 3.2 | 3.6 | 4.1 |
| % maternal employment, youngest child 0-2 | 49 | 45 | 56 |
| % female employment part-time | 16 | 38 | 39 |

Sources: Leave information from OECD family database PF2.5; maternal employment rates from LMF_1_2; spending on ECEC from PF3.1 (<http://www.oecd.org/els/family/database.htm>). Percentage of children in ECEC from Eurydice (2014: 65) which includes public and private formal care. Part-time employment rates from OECD.stats (<https://data.oecd.org/emp/part-time-employment-rate.htm>). 90/10 equivalized household income ratio from LIS key figures (<https://www.lisdatacenter.org/data-access/key-figures/>). All accessed 6 June 2021.

(1) The UK flat rate for both maternity and paternity leave in 2010 was £128.73/week.

Notes: The above figures for Germany reflect a dramatic shift in family leave policy implemented in 2007, when the above earnings-related benefits replaced a means-tested child-raising benefit of either DM900 for ten months or DM600 for twenty-two months taken up until the child's second birthday, with additional unpaid leave available for up to a total of thirty-six months (which could be taken up until the child was eight).

information on take up of the different leaves (Atkinson, O'Brien, and Koslowski 2021). Although parents' total postnatal leave entitlement is 13.9 months, public ECEC provision does not dovetail with it. Instead, UK ECEC is limited to part-time, part-year places for three- and four-year-old children (Atkinson, O'Brien, and Koslowski 2021). In all, UK family policies are consistently ranked among the least generous in Europe, with families instead relying more on market and informal supports (Baird and O'Brien 2015; Ray et al. 2010). The reliance on the market, however, pulls more mothers with young children into employment than in the other two countries (table 1).

With these differing country policy constellations, our mitigation argument indicates the parent (H1a) and childless (H1b) gender gaps will be smallest across the bottom of the private sector wage distribution in Finland followed by Germany, and largest in the United Kingdom. In contrast to the paradox argument, the mitigation argument further predicts little difference across countries in the magnitude of the parent (H2a) or childless (H2b) gender gaps at the top of the wage distribution.

Method

Data and Sample

To test our hypotheses, we select 2000–2018 panel data from the British Household Panel Survey merged with the UK Household Longitudinal Study (UKHLS), the German Socio-Economic Panel (GSOEP), and the Finnish FOLK population register merged with Structure of Earnings survey data. The analytical sample includes 18- to 45-year-old employed women and men who are childless when they first enter the sample, excluding the self-employed, full-time students and limited to private sector employees. Our final analytical samples consist of 1,035 British women and 1,384 British men (14,240 British person-years), 329,188 Finnish women and 379,469 Finnish men (4,484,470 Finnish person-years), and 3,023 German women and 3,663 German men (34,814 German person-years) working in the private sector. Table A1 in the Supplementary data details how many individuals are lost with each exclusion criterion and because of missing data.

Variables

The dependent variable is the natural log of gross hourly wages in 2015 prices based on the Consumer Price Index. Hourly wages are the best measure of the productivity referenced in our hypotheses. The primary independent variables for estimating the childless and parent gaps are an indicator for gender (1 = female), a dummy for when the first child is born and staying 1 thereafter to indicate parenthood, and an interaction between the two variables. For estimating the childless gap, we follow Petersen et al. (2014) and use the panel data to create a dummy variable indicating if individuals (all of whom entered

the panel when childless) ever subsequently became a parent during the panel. We add this variable, *everparent*, when estimating the childless gender gap to control some for unmeasured differences in the individuals who plan on becoming parents, for example in their work effort prior to the first birth. The childless wage gap is our proxy for gender discrimination across the career, net of individual characteristics or motivation differences related to future planned childbearing.

Including further controls provides clearer comparisons of differences in gender hourly wage gaps across countries, net of national differences in the socio-demographic composition of the workforce (Budig et al. 2016; Mandel 2012). These include time-varying measures of partnership status (married, cohabiting, divorced or separated, single (referent)), education categories (with an upper secondary category referent), and an estimate of experience. Like Petersen et al. (2014), we first take the Mincerian approximation of an individual's age minus years of education minus six for the pre-compulsory schooling years, and the square of this. This approximation works less well for women, who are more likely to interrupt their work trajectory. We therefore create a dummy equal to 1 for each year a sample member was out of the labor market for any reason. These are subtracted from the annual Mincerian approximation and its related square. We also reduce experience for periods when mothers are on parental leave, noted in the British and German data and estimated as one year in Finland when children are age zero as Finnish mothers on leave are reported as working.

The adjusted experience variable does not capture full-time equivalent experience if an individual works part-time. As a further improvement on Petersen et al. (2014), we therefore include an indicator for whether men or women work part-time (fewer than thirty hours per week). Final controls are for region and period, the latter to control for business cycle effects and changing policy environments. Descriptive statistics are in the [Supplementary data Table A2](#).

Analytical Strategy

The overall level of wage equality in a country affects gender wage gaps, with the estimates of the gap conflating the impact of wage compression policies with family policies (Mandel and Semyonov 2005). Consequently, we standardize country comparisons by estimating wage gaps at designated percentiles of each country's private sector wage distribution using quantile regression. Some studies have used conditional quantile regression (Albrecht et al. 2015; Budig and Hodges 2010; Korpi et al. 2013), but this provides estimates conditional on the other covariates in the model that can affect interpretation (Firpo, Fortin, and Lemiux 2009).

We instead follow other recent studies of parental wage effects (i.e., Cooke 2014; England et al. 2016) and use the unconditional quantile regression

(UQR) estimator developed by [Firpo, Fortin, and Lemieux \(2009\)](#) to estimate two models. Details of the method and the related model equations are in the online supplement (Section B). The first model estimates the gender gap among the childless using UQR at the 10th, 20th, 30th, 40th, 50th, 60th, 70th, 80th, and 90th quantiles of each country's private sector wage distribution, including the everparent and all other control variables. Clustered standard errors control for multiple observations of individuals in the panel. This is our estimate of underlying gender discrimination net of parental effects that affects all women throughout their careers.

To estimate the parenthood gap, along with the motherhood and fatherhood wage effects that comprise it, we run a UQR model with traditional fixed effects to control for stable unobserved characteristics associated with wage levels ([Borgen 2016](#)). However, recent studies show that controlling for selection on both wage level and growth using FECS accounts for much of the average fatherhood premium in the United States ([Ludwig and Brüderl 2018](#)), and in the United Kingdom, Finland, and Germany ([Icardi et al. 2022](#)). See the online supplement (Section B) for greater discussion of FE versus FECS models. We therefore also use UQR with FECS (by adding interactions between everparent and the two experience measures to the FE model) to estimate the parenthood gap, and motherhood and fatherhood wage effects at the 10th, 20th, 30th, 40th, 50th, 60th, 70th, 80th, and 90th quantiles of each country's private sector wage distribution. Robust standard errors are used for both the FE and FECS estimates.

We exclude controls for occupations as these are endogenous to wages. Additional analyses (available upon request) show that including occupations reduces primarily the childless gaps as would be expected, but does not alter the fundamental patterns discussed next. A more thorough discussion and test of [Mandel and Semyonov's \(2006\)](#) occupational arguments are beyond the scope of this article.

Results

We exponentiate the estimates in the text to interpret them as the predicted percentage shifts in parenthood and childless gender wage gaps at each quantile. We limit discussion to the 20th to 80th quantiles as measurement error is extreme at the two tails ([England et al. 2016](#)). Coefficients including at the 10th and 90th can be found in the [Supplementary data \(tables A3 and A4\)](#).

Parenthood Gender Wage Gaps

[Figure 1](#) diagrams the parenthood gap net of control variables, as well as motherhood and fatherhood wage effects from the FE (top panel) and FECS (bottom panel) models, along with the 95 percent confidence intervals of the estimates. These highlight that the UK and German standard errors are very

large, indicating there is more uncertainty in the estimates than in Finland. Full FEQS model results are in the [Supplementary data \(table A3\)](#).

The top panel of [figure 1](#) reveals that the parenthood gender gap across the wage distribution from the FE model is appreciably smaller in Finland and Germany. Indeed, the United Kingdom is the only country with a large parenthood gender gap across the bottom of the wage distribution. The UK also has a much larger gap at the median than in Finland or Germany. However, although substantively these results support Hypothesis 1a that parenthood

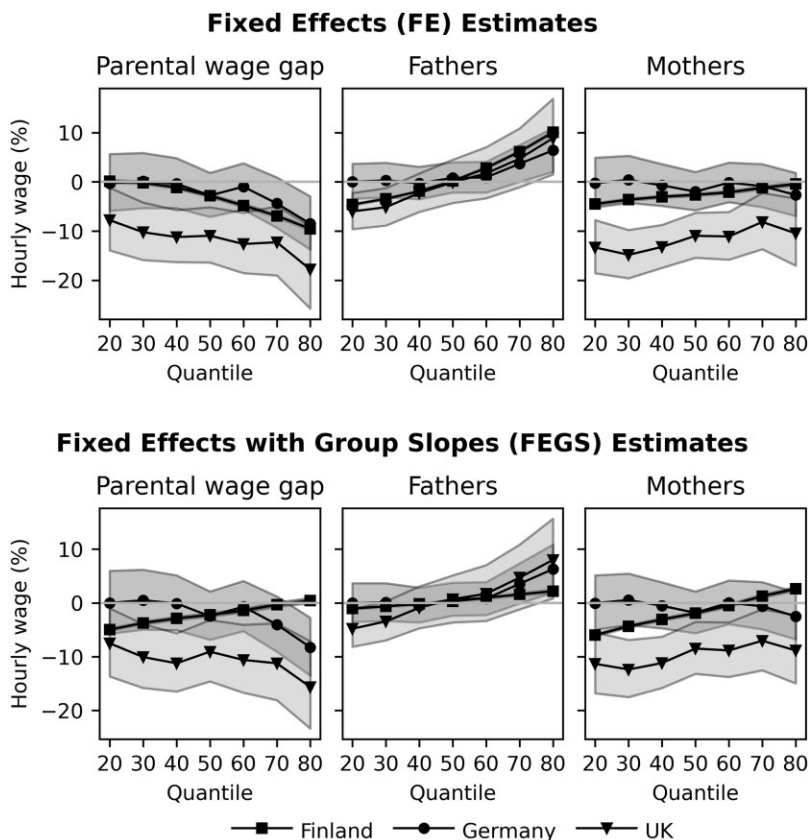


Figure 1. The parenthood gap and fatherhood and motherhood wage effects across Finnish, German, and British private sector wage distributions, 2000–2018.

Notes: UQR estimates (exponentiated) of predicted gender hourly parenthood wage gaps and separate motherhood and fatherhood wage effects with 95 percent confidence intervals from FE and FEQS models with robust standard errors, controlling for marital status, education, accumulated experience and its square, part-time work, region, and period. See also [table A3](#) in the [Supplementary data](#).

gaps at the bottom of the distribution would be smaller in countries with more generous policies, the uncertainty in the German and UK estimates means we cannot claim the parenthood gaps statistically differ.

Parenthood gaps from the FE model in all three countries are larger at higher wage levels. At the 80th quantile, the UK parenthood gap is roughly twice as large as Finnish and German parenthood gaps, although confidence intervals again overlap. Hypothesis 2a that the parenthood gap among high-wage workers will not be greater in more generous policy contexts is therefore strongly supported in the FE model.

The fatherhood and motherhood plots reveal the sources of these parenthood gaps as a more granular test of hypotheses. Most of the UK parenthood gap is driven by a motherhood gap across the wage distribution that is substantially larger than in Finland and Germany until the 70th quantile. This offers stronger support for Hypothesis 1a that the private sector gap is smaller for lower-wage mothers in generous policy contexts. Among men, fatherhood predicts no wage increase among lower-wage German men, and it predicts significantly lower wages among Finnish and UK fathers earning below the median. In Finland, parenthood similarly disadvantages both genders at the 20th quantile. In the United Kingdom, while both low-wage parents are disadvantaged, low-wage mothers' penalty is more than twice as large as low-wage fathers' penalty.

Across the top of the wage distribution, in contrast, fatherhood predicts higher wages in all three countries. Among women, German mothers' wage penalties do not increase as wages increase and in Finland, the motherhood penalty decreases as wages increase. This is further strong support for Hypothesis 2a that higher-wage mothers in more generous contexts do not face larger wage gaps than in less-generous contexts. Therefore, in Finland and Germany, the parenthood gap at the top of the distribution in FE models is a story of fathers' advantage, not mothers' disadvantage.

The bottom panel of [figure 1](#) displays the FEGS coefficients. These show that also controlling for selection on wage growth (in addition to levels as in FE models) slightly alters the country patterns. The German and UK parenthood gaps and motherhood and fatherhood wage effects are not substantially constituted by differences in wage growth between parents and childless individuals. Conversely, some of the Finnish motherhood penalty across the wage distribution is explained by differences in wage growth. In all, though, Finnish and German motherhood gaps still significantly differ from those in the United Kingdom at the 30th and 40th quantiles in the FEGS models. This still provides some support for Hypothesis 1a net of advanced controls for selection.

Controlling for differences in wage growth almost eliminates the fatherhood premium at the top of the Finnish wage distribution. The net result of this is that there is no Finnish parenthood gender gap at the top of the distribution. The German parenthood gap at the top remains somewhat larger than

the other countries because of German fathers' wage advantage. In contrast, the UK parenthood gap at the top of the distribution is due to both mothers' disadvantage and fathers' advantage. These results indicate the Nordic model, once controlling more thoroughly for selection, eliminates productivity differences among the highest-wage mothers and fathers. This strongly supports the mitigation over the paradox argument for higher-wage parents (H1a).

Childless Gender Wage Gaps

Figure 2 diagrams the childless gender wage gap, with full model results in [Supplementary data table A4](#). The childless gender gap is larger than the parenthood gender gap in all three countries, except for the highest-wage UK women (this is also true when comparing the cross-sectional gap in [Supplementary data table A4](#)). This differs from [Petersen et al. \(2014\)](#), but they did not control for selection into parenthood, work interruptions, or reduced work hours that account for most of motherhood ([Gangl and Ziefle 2009](#)) and fatherhood wage effects ([Icardi et al. 2022](#)). Below the median, the childless gap like the parenthood gap is largest in the United Kingdom. The childless gap is significantly smaller in Finland and Germany at the bottom of the wage distribution. These results support Hypothesis 1b, that this proxy of private sector employer discrimination would be smaller in the more generous welfare states.

At the median and above, the German childless gap is smallest until the 80th quantile. At the 50th through 70th quantiles, the magnitude of the Finnish and UK childless gender gaps are similar. At the 80th quantile, the UK childless gap is slightly smaller than in Finland and Germany as predicted under the paradox, but the confidence intervals overlap above the 30th quantile. Consequently, Hypothesis 2b is also supported, that this proxy for private sector employer discrimination against the highest-wage women would not be greater in more generous welfare states.

Discussion and Conclusions

Promotion of gender equality with generous family policies is a hallmark of the Nordic model ([Korpi et al. 2013](#)). Mandel and colleagues' ([Mandel and Semyonov 2005, 2006](#)) assertion that this model undermines women's earnings attainment by exacerbating private sector employer discrimination is therefore provocative. Yet most tests of the paradox were done on quite old data before the expansion of fathers' family leaves, and never assessed private sector gaps specifically. We asserted that contexts with generous family policies can mitigate gender differences in relative productivity associated with parenthood. In time, this should reduce the associated statistical discrimination indicating underlying gender discrimination that affects childless women as well. We did not test specific policies, but instead used a case approach to

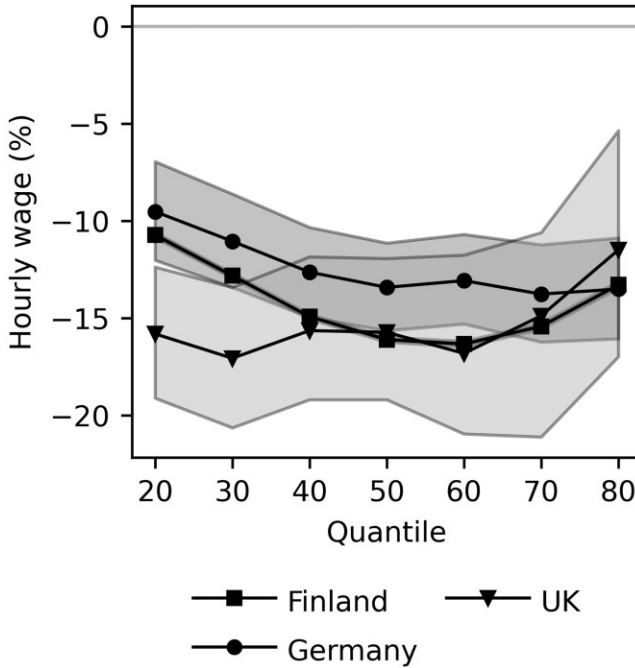


Figure 2. Childless gender wage gaps across Finnish, German, and UK private sector wage distributions, 2000–2018.

Notes: UQR estimates (exponentiated) of childless gender hourly wage gaps with 95 percent confidence intervals, controlling for marital status, education, accumulated experience and its square, part-time work, whether they become a parent in the future, region, and period, from pooled OLS models with clustered standard errors. See also [table A4](#) of the [Supplementary data](#).

contrast parenthood and childless gender wage gaps in Finland, Germany, and the United Kingdom. The empirical tests across the private sector wage distribution in each country using panel data and controlling for selection into parenthood are the most rigorous in the welfare paradox literature to date.

The unconditional quantile regression estimates generally support the mitigation argument, although German and UK confidence intervals are large. The United Kingdom has the largest parenthood gap across the distribution, fueled by the largest motherhood wage penalty until the 70th quantile. Motherhood penalties across the bottom of the distribution are smallest in Germany, and slightly larger in Finland. The German results are consistent with [Mari and Cutuli's \(2021\)](#) findings of a significant reduction of the German motherhood penalty after the policy reforms. Future research might explore if the Finnish home care allowance, similar to Germany's earlier extended maternity leave,

undermines the wage benefits of the earnings-related leaves and subsidized ECEC especially for low-wage Finnish women, as argued by [Morgan and Zippel \(2003\)](#) more generally for paid childcare leave programs. Nonetheless, German mothers more likely work part-time than Finnish mothers, so the parenthood gap would be larger had we compared earnings rather than hourly wages. Hourly wages, however, are the better indicator of productivity we sought to compare here. A more appropriate way to assess the impact of the HCA is to compare the Finnish hourly wage results over time with Norway and Sweden, both of which have at times offered cash-for-care leaves.

At the top of the wage distribution, the parenthood gap is largest in the United Kingdom, constituted by large motherhood penalties and large fatherhood wage premiums. The parenthood gap at the top is somewhat smaller in Germany primarily because the motherhood penalty is smaller. It is smallest in Finland because both fatherhood premiums and motherhood penalties at the top of the distribution are negligible once controlling for selection on wage growth and level. This is strong support for our mitigation argument that generous family policies of the Nordic model reduce the relative gender productivity differences associated with children.

Our unique modeling strategy reveals that an important aspect of this is that, once accounting for selection, high-wage Finnish fathers' wage advantage dissipates. This suggests encouraging fathers' equal caring roles is an important policy lever for greater gender wage equality. Yet these effects are not yet evident at the 80th quantile in Germany, where fathers' leaves are more recent. Further research should investigate whether Finnish effects on fathers are evident in other countries as they expand fathers' paid family leaves, much as [Petersen, Penner, and Høgsnes \(2014\)](#) found Norwegian mothers' wage penalties attenuated over the period of family policy expansion in the twentieth century.

The second dynamic of the mitigation argument is that reducing relative gender productivity differences among parents should shift private sector employers' perceptions that lead to statistical discrimination, the underlying gender discrimination affecting childless women as well. We find strong support for this argument among lower-wage workers, for whom the private sector childless gender gap is significantly smaller in Finland and Germany than in the United Kingdom. These country patterns of childless gender gaps highlight that the benefits of generous policies for lower-earning women are not limited to the expansion of good-paying public sector jobs as argued by Mandel and colleagues ([Mandel and Semyonov 2005, 2006](#); [Mandel 2012](#); see also [Korpi et al. 2013](#)). Low-earning women in the private sector also benefit, which we attribute to the policy support for their enhanced labor force participation and commitment.

The childless gender gap increases across the upper half of the wage distribution in Finland and the United Kingdom, but not Germany. At the top, however, the childless gender gap does not differ significantly across the three countries. In all, we find no evidence that private sector employer statistical

discrimination is greater in Finland and Germany than the United Kingdom, to the extent the childless wage gap is an acceptable proxy for discrimination.

Using the childless wage gap as a proxy for employer discrimination affecting all women is a limitation of the research. People who intend to have a family may already make employment choices in anticipation of this that correlate with wages (Petersen et al. 2014). We controlled for this by including an indicator of future parenthood in our OLS models. Yet our results run contrary to experimental studies that find mothers but not childless women are less likely to be called back for a job in Germany (Hipp 2020) and the United States (Correll et al. 2007). Correspondence studies, however, do not follow applicants to see who is hired, their offered starting wages, or subsequent internal job ladders.

We did not find the trade-off between reducing motherhood penalties for higher-wage Finnish and German women and an increasing childless gap that Petersen, Penner, and Høgsnes (2014) find among white-collar Norwegian workers into the early 1990s. Nevertheless, the childless gender gap is generally larger than the parent gap across the wage distribution and countries. This differs from Petersen, Penner, and Høgsnes (2014), where the parenthood gaps are larger than the childless gaps. But they did not control for selection into parenthood, or mothers' employment interruptions and reduced work hours, which account for most of motherhood (Gangl and Ziefle 2009) and fatherhood wage effects (Icardi et al. 2022).

In any event, our results negate the welfare state paradox arguments regarding relative parental productivity and private sector employer discrimination. Additional research might assess if the other paradox arguments about public sector gaps and patterns of occupational segregation are applicable in the twenty-first century as well. Our generally positive results about the gender wage gap impact of generous welfare states, however, should be considered in light of the pandemic. The pandemic increased gender disparities among parents in most countries, with women assuming the bulk of care and home-schooling when childcare centers and schools closed.¹ The pandemic therefore highlights the fragility of the institutional supports for gender equality even in the most generous welfare states.

Notes

1. For a summary of the evidence, see <https://www.mckinsey.com/featured-insights/future-of-work/covid-19-and-gender-equality-countering-the-regressive-effects#>, accessed 23 March 2021.

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Supplementary Data

[Supplementary data](https://www.socpol@oup.com) can be found at <https://www.socpol@oup.com>.

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