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Serena Canaan
Simon Fraser University and IZA

Anne Sophie Lassen
Copenhagen Business School

Philip Rosenbaum
Copenhagen Business School

Herdis Steingrimsdottir
Copenhagen Business School

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Maternity Leave and Paternity Leave: Evidence on the Economic Impact of Legislative Chances in High Income Countries*

Labor market policies for expecting and new mothers emerged at the turn of the nineteenth century. The main motivation for these policies was to ensure the health of mothers and their newborn children. With increased female labor market participation, the focus has gradually shifted to the effects that parental leave policies have on women's labor market outcomes and gender equality. Proponents of extending parental leave rights for mothers in terms of duration, benefits, and job protection have argued that this will support mothers' labor market attachment and allow them to take time off from work after childbirth and then safely return to their pre-birth job. Others have pointed out that extended maternity leave can work as a double-edged sword for mothers: If young women are likely to spend months, or even years, on leave, employers are likely to take that into consideration when hiring and promoting their employees. These policies may therefore end up adversely affecting women's labor market outcomes. This has led to an increased focus on activating fathers to take parental leave, and in 2019, the European Parliament approved a directive requiring member states to ensure at least two months of earmarked paternity leave. The literature on parental leave has proliferated over the last couple of decades. The increased number of studies on the topic has brought forth some consistent findings. First, the introduction of short maternity leave is found to be beneficial for both maternal and child health and for mothers' labor market outcomes. Second, there appear to be negligible benefits from a leave extending beyond six months in terms of health out-comes and children's long-run outcomes. Furthermore, longer leaves have little, or even adverse, influence on mothers' labor market outcomes. However, some evidence suggests that there may be underlying heterogeneous effects from extended leaves among different socioeconomic groups. The literature on the effect of earmarked paternity leave indicates that these policies prove effective in increasing fathers' leave-taking and involvement in childcare. However, the evidence on the influence of paternity leave on gender equality in the labor market remains scarce, and somewhat mixed. Finally, recent studies that focus on the effect of parental leave policies for a firm find that in general, firms are able to compensate for lost labor when their employees go on leave. However, if firms face constraints when replacing employees, it could negatively influence their performance.

JEL Classification: J08, J12, J13, J22, J23

Keywords: parents, children, family, gender, parental leave, maternity leave, paternity leave, health, income, employment, demography

Corresponding author:
Serena Canaan
Department of Economics
American University of Beirut
P.O.Box 11-0236
Riad El-Solh
Beirut 1107 2020
Lebanon

E-mail: sc24@aub.edu.lb

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One of the most notable changes in the labor market over the last century has been the significant rise in female labor force participation. As a result, parental leave systems have become increasingly important and are now a critical component of labor market policies in most high-income countries. Today, all OECD countries apart from the United States have federally funded parental leave programs. However, these programs vary substantially in terms of key features, such as duration and benefits. For example, the length of paid parental leave in Spain and the Netherlands is 16 weeks, while the total paid leave in countries such as Finland, Hungary, Estonia, and the Slovak Republic is more than 160 weeks. Moreover, policies have changed significantly and rapidly over the last decades. In 1980, the average duration of paid leave in the OECD was 14 weeks, compared to over 53 weeks on average in 2018. Another major change in parental leave systems is the recent focus on incentivizing fathers to take leave. Norway was the first country to introduce a fathers' quota (paternity leave earmarked for fathers) in 1993 and was soon followed by other countries such as Sweden, Iceland, and Spain. In 2015, three-quarters of OECD countries provided at least a few days of paid leave that can only be used by a father, and in 2019, the European Parliament approved a directive requiring member states to ensure at least two months of earmarked paternity leave.

Evaluating the effects of different parental leave policies is a complex task. First, the aim of parental leave policies is multifaceted. Initially, the main motivation for parental leave provisions was to ensure the health and survival of infants and to allow mothers to recover after childbirth. More recently, increased attention has focused on the influence of family policies on labor market outcomes and gender equality. Additionally, governments need to consider other factors such as firms' productivity and government expenditures. Second, the effects of parental leave policies can depend significantly on the setting. More specifically, the impact of extending maternity leave can depend on social norms, availability of daycare, and how long the initial leave is, and it can vary by demographic group as well. Further, parental leave policies can vary along several dimensions, such as the length of leave, benefits, eligibility, and division of childcare responsibilities between parents.

This review focuses on studies that allow for causal inference. Many of the articles included in this review apply regression discontinuity (RD), a difference-in-differences (DD) approach, or a combination of the two, to study the effects of policy reforms. When done well, and with appropriate data, using within-country policy changes has important advantages. When policy reforms happen unexpectedly, there is limited scope for manipulation into treatment and arguably little reason for concern about omitted variable bias. The studies therefore

provide a causal estimate of the effects of the policy change on those parents who just became eligible compared to those just rendered ineligible. However, these studies also have limitations that are important to keep in mind. First, they do not capture broader effects. For example, a parental leave policy can affect employers' expectations about the behavior of *all* women in the labor market, which will affect outcomes for both the treatment and the control group. Second, these studies rely on the immediate effectiveness of the policies. If, for example, following a reform introducing earmarked paternity leave, fathers' use of paternity leave increases only gradually, a study applying RD or DD may underestimate the true impact of the policy. Finally, it is important to keep in mind that these studies estimate the average treatment effect, referring to the weighted average effect on people who changed their behavior after the policy reform and those who did not. Any effect on the outcome of interest depends on the uptake rates and which part of the population exhibits the behavioral change.

The studies reviewed in this chapter focus on different settings and time periods. Dissimilarities in labor market policies, social norms, and other factors can play a significant role in outcomes and interact in various ways with different parental leave systems. However, the review highlights some key findings in the literature that are remarkably consistent across contexts. First, the introduction of short leaves is found to be beneficial, both in terms of health outcomes for mothers and their children, and in terms of mothers' labor market outcomes. Second, there are negligible benefits of leave beyond six months in terms of health outcomes. Longer leave often has an adverse effect on mothers' wages and employment, while appearing to have little effect on children's long-term outcomes. However, there is some evidence that there may be underlying heterogeneous effects for different socioeconomic groups.

The results on the effects of paternity leave are more mixed. While earmarked paternity leave proves effective in terms of increasing the uptake rate of fathers, the magnitude of its success in doing so varies tremendously across settings, and the evidence of its effect on labor market outcomes for both men and women is mixed. However, the majority of studies find that introduction of earmarked paternity leave increases paternal involvement in childcare, but to a lesser extent in other household tasks. If fathers are more involved in childcare, this might affect child outcomes, but very few studies investigate this possibility. However, those that do explore this idea find positive effects and highlight potential complementarities from paternal and maternal care. Moreover, there are important spillovers to other aspects of family life—most notably, to couple stability and fertility. However, the evidence remains scarce and somewhat mixed, underscoring the need for further research to understand the influence of paternity leave on family outcomes.

Finally, several recent studies focus on the consequences of parental leave on firms. The general finding from this literature is that firms are able to compensate for the lost labor input from having employees go on leave by hiring more employees or increasing work hours of other workers. These measures help firms to avoid incurring losses in their overall performance. However, firms may face certain barriers to replacing the lost labor input from leave-taking, resulting in negative effects on their performance.

The aim of this review is to provide a comprehensive overview of recent research on the impact of parental leave policies on key outcomes such as children's health and development, mothers' health, parents' labor market outcomes, societal norms, gender roles, gender equality, and their influence on firms' outcomes. This analysis will complement previous surveys found in the literature: First, Olivetti & Petrongolo (2017) share a detailed overview of the historical background of family policies in high income-countries with a focus on parental leave, childcare, and early childhood education. They survey the literature on the effects of these policies on fertility and women's labor market outcomes. Second, Rossin-Slater (2018) provides an excellent review of the literature on the influence of maternity leave and family policies on children's health and mothers' labor market outcomes. Third, Berlinski & Vera-Hernández (2019) summarize the literature on various family policies, including maternity leave, on child development.

In this review, we broaden the focus and bring in recent developments in the literature. In particular, we summarize the literature on (i) the impact of family leave policies on firm outcomes, (ii) the impact of policies that target fathers' leave-taking, and (iii) the role of norms, gender roles, and intra-household bargaining. The review starts with an overview of the history and motivation behind maternity leave policies. Next, we review the effects of maternity leave on maternal health, child health and development, fertility, couple stability, and mothers' labor market outcomes. We move on to present the more recent history of paternity leave and summarize how paternity leave schemes affect both fathers' and mothers' earnings and family outcomes. We then summarize the papers that evaluate the effect of leave policies on firms and employers. Lastly, we conclude by outlining suggestions for future research.

Maternity Leave

Overview of History and Purpose

Labor market policies for expecting and new mothers emerged at the turn of the nineteenth century, following the Industrial Revolution and urbanization, when women increasingly began to work outside of their homes. The main purpose of these policies was to protect the health of mothers and their newborn children. In 1877, Switzerland was the first country to prohibit employment of pregnant women two weeks prior to and six weeks after childbirth, through the Swiss Factory Act of 1877. Similar laws were passed in Germany in 1878, Hungary in 1884, Austria in 1885, the Netherlands in 1889, Norway in 1892, Sweden in 1900, Denmark in 1901, and Greece in 1912 (Wikander et al., 1995).

In the beginning, these laws focused on employment prohibition around childbirth, but these policies evolved to enable voluntary leave from work, consisting of job protection and, in some cases, income support. Most of these policies were formulated with the underlying assumption that a male breadwinner was earning a sufficient family wage, which arguably underscored women's roles as wives and mothers (Wikander et al., 1995). By the mid-twentieth century, the focus of family leave policies shifted toward women's rights and gender equality. In light of this change, parental leave systems became a means for women to reconcile their jobs and family life. Sweden introduced three months of maternity leave in 1955, followed by Norway in 1956, Finland in 1964, and Denmark in 1967 with payment equivalent to unemployment insurance or sickness benefits (Datta Gupta et al., 2008).

The first proposal to introduce mandated parental leave from the EU Commission in 1983 was an effort to promote equal opportunity by ensuring that leave could be used by either parent. However, the proposal was rejected, and the EU directive on parental leave was not adopted until 1996 (Fusulier, 2011). When adopted, most EU member states had already implemented some form of shareable parental leave. In 1974, Sweden was the first country to introduce shared parental leave. Slovenia and France followed in the same year, and Norway did so in 1977 (Kamerman & Moss, 2011). However, mothers almost exclusively used parental leave rights. By 1990, all OECD countries except Australia, New Zealand, Switzerland, and the United States offered at least 12 weeks of paid leave. In 2013, 98 countries provided at least 14 weeks of employment protection, and 74 countries provided at least two-thirds of the women's pre-birth earnings for at least 14 weeks (Addati et al., 2014). Figure 1 shows the duration of provision of paid leave and job protection across the OECD countries in

2018. Givati & Troiano (2012) propose that parts of the variation across the globe stem from societal tolerance of gender-based discrimination. Measuring attitudes with a language-based measure, they show that societies with less tolerance provide longer leave.

The U.S. remains an outlier. It is the only high-income country in the world with no national provided paid parental leave system. During the 1970s, 23 U.S. states passed laws that prohibited health insurance companies from treating pregnancy differently from comparable illnesses, and federal law (PDA, 1978/9) outlawed employer discrimination of pregnant women more broadly. However, until 1993, there was no national employment protection during the weeks before and after childbirth. The Passage of the Family and Medical Leave Act (FMLA) in 1993 ensured any parent the right to unpaid family leave for up to 12 weeks per year. Over the last few years, several states have introduced paid family leave (PFL) programs. The first of these programs emerged in California in 2004, where employees became eligible for up to 6 weeks of leave with partial wage replacement. Similar programs were subsequently implemented in New Jersey in 2009, Rhode Island in 2014, and New York in 2018—where new parents could receive paid leave for up to 6, 4, and 8 weeks, respectively.

Generally, due to the timing of the introduction and development of parental leave schemes around the world, most modern studies evaluating the effects of introducing a short maternity leave are conducted with U.S. data, while studies on the extension of leave programs stem mainly from Europe.[1] Table 1 contains an overview of the reforms evaluated in the studies reviewed in this section, with details on leave duration, compensation, and eligibility.

Mothers' Health Outcomes

Although maternity leave policies initially stemmed from a desire to ensure the health of mothers and their newborn children, the evidence on the causal influence of leave on maternal health remains surprisingly scarce. Existing studies primarily focus on the effects of extending the current leave on mothers' mental health. Overall, studies indicate that the introduction of leave proves beneficial for mothers' health outcomes, while extending parental leave beyond six months appears to have a negligible effect. However, the average treatment effect may conceal heterogeneity within the effects of extended leave, and some evidence points to health benefits of a longer leave for women in lower SES groups.

Bullinger (2019) examines the effects of introducing 6 weeks of paid leave in California in 2004, which effectively increased the average time that women stayed at home after birth

[1] A few papers have also focused on early reforms in European countries to study the effect of introducing a relatively short leave Bütikofer et al. (2021) study the influence of introducing paid parental leave in Norway in 1977, and Gregg et al. (2007) examine the introduction of job protection and 6 weeks of wage compensation in the UK in 1979.

from 3 weeks to 6 weeks. She found that self-reported mental health and ability to cope with day-to-day demands improved among mothers after the reform. Chatterji & Markowitz (2005) and Chatterji & Markowitz (2012) also focus on leave duration in the U.S. They use variation in state leave policies as an instrument for maternity leave length (the average leave length in their sample is 9 weeks) and find that longer leave correlates with decreased depressive symptoms and improved self-reported health. Guertzgen & Hank (2018) study the expansion of paid leave in Germany from two to six months in 1979 and find that longer leave correlates with a higher incidence of long-term sickness and absence from work, while pointing out that this likely stems from the impact on selection into the labor market. Avendano et al. (2015) look at changes in the duration of paid maternity leave in several European countries between the 1960s and 1990s. In 1960, the duration of full-wage weeks ranged from 2 to 16 weeks, and by the end of their study period, it ranged from 8 to 16 weeks. They find that women who had access to more generous leave policies when they had their first child were less likely to experience depressive symptoms at age 50.

A recent paper by Bütikofer et al. (2021) significantly contributes to this literature by estimating the influence of both introducing and extending paid leave on a range of maternal health outcomes. In July of 1977, Norway introduced a 4-month paid leave along with 12 months of unpaid leave. Before the policy change, working mothers only had access to 12 weeks of leave. With the reform, benefits increased from sickness benefits to full wage replacement. Observing women at approximately age 40, the study found that the reform improved health outcomes such as BMI, blood pressure, pain, and mental health. The study also explores the impact of several later leave expansions, each of which increased the duration of paid leave by 2 weeks, and found no further improvements in the health outcomes.

Studies that focus on expanding leave length beyond 6 months suggest negligible benefits result in terms of mothers' health. Baker & Milligan (2008b) study the effects of extending paid maternity leave in Canada from 6 to 12 months. They look at mothers' outcomes 7–24 months after giving birth and find no effect on self-reported health, depression, or other postpartum problems. Dagher et al. (2014) use employer policies as an instrument for maternity leave duration and find a U-shaped relationship between leave duration and postpartum depressive symptoms, with minimal symptoms occurring for mothers who had around 6 months of leave. However, a study that examines a reform in Denmark (Beuchert et al., 2016) suggest that health benefits may result from a longer leave for some women. In 2002, the reform in Denmark increased the length of parental leave with full benefit compensation and effectively increased the average leave duration from 244 days to 276 days. The study finds that the increased

length of maternity leave reduced hospital admissions and the probability that mothers would receive antidepressants in the first three years after giving birth and that these effects are driven by mothers with less than 10 years of schooling. Finally, Liu & Skans (2010) find no evidence that increasing parental leave in Sweden from 12 to 15 months has any effect on mothers being hospitalized due to mental disorders within 3, 6, or 16 years after giving birth.

Children's Health and Development

In the early days of parental leave policies, the central objective was to ensure infants' health and survival. More recent years have brought an increased focus on children's developmental outcomes. One argument that has been made for a longer parental leave is that increased parental time may have benefits in terms of cognitive development, which may influence later life outcomes such as schooling and income. The evidence suggests that introducing a short parental leave does indeed have significant benefits in terms of infant health outcomes and can bring health benefits later on by decreasing the risk of children being overweight or diagnosed with ADHD. The evidence on the impact of longer leave is more mixed. Overall, it appears to have no effect in terms of development and schooling outcomes. However, there is evidence that long leave may prove beneficial in terms of schooling outcomes for children born in higher SES families, while it adversely affects verbal development for children in low SES families.

Several studies that use cross-country comparisons suggest that longer maternity leave is associated with lower infant and child fatalities (see Ruhm, 2000; Tanaka, 2005; Heymann et al., 2011). Causal evidence indicates that the effect of introducing a short leave may differ from that of extending a longer leave. Studies from the U.S. show that ensuring that mothers can stay with their children during the first several weeks after birth has a significant and positive effect on infant health. Rossin (2011) evaluates the effects of the Family and Medical Leave Act (FMLA) in 1993 in the U.S., which mandated a minimum of 12 weeks of unpaid maternity leave for eligible women. She finds that the reform led to small increases in birth weight, decreased the likelihood of premature birth, and significantly decreased infant mortality among college-educated and married mothers, who were most able to take advantage of the unpaid leave. Stearns (2015) studies the effects of the temporary disability insurance (TDI) programs in the U.S. In 1978, these programs began providing wage replacement benefits to pregnant women for 6–12 weeks. This reform particularly benefitted women who could not have afforded to take leave before. The study find that the TDI benefits reduced incidences of

low birth weight and early-term birth, and that it had the greatest impact among unmarried and black mothers. The California Paid Family Leave (PFL) program, implemented in 2004, allowed parents up to 6 weeks of paid leave with a newborn. This increased leave-taking by mothers by 3–6 weeks (from a baseline of approximately 3 weeks). Pihl & Basso (2019) find that this reform decreased hospital admissions, and Bullinger (2019) finds it improved overall child health.

There is less evidence on the long-term health benefits of introducing a relatively short maternity leave. Lichtman-Sadot & Bell (2017) investigate the effect of PFL on various health outcomes when children are between five and six years of age. They find that the reform reduced the risk of children being overweight or being diagnosed with ADHD, hearing problems, or communication problems. Parents who had children after the introduction of PFL were also more likely to assess their child's overall health more positively and less likely to report a history of frequent ear infections. The researchers find that these effects are driven by children from less advantaged backgrounds, consistent with the finding that PFL has the greatest effect on leave-taking among mothers who could not afford to take unpaid leave.

While the studies from the U.S. look at the impact of providing a short leave, research from Canada and Europe focuses on the effects of extending maternity leave beyond the first several weeks after birth. Baker & Milligan (2008b) examine the effects of extending paid maternity leave in Canada from 6 to 12 months and find no influence on children's overall health in the first 24 months after birth. In a follow-up study, Baker & Milligan (2010) find no significant effects on child development, specifically in measures of temperament and motor and social development. When studying the 2002 reform in Denmark, Beuchert et al. (2016) estimate the effect on children's inpatient hospital admissions and ER visits within one year and within three years from birth and find no significant effect. Danzer et al. (2020) estimate the effect of extending parental leave in Austria from one year on children's health outcomes. Importantly, they explore regional variation in the availability of formal childcare. When studying the heterogeneous effects of extending the duration of parental leave on children's outcomes, it is critical to consider what is being replaced with the increased time that children have with their parents,[2] yet this is rarely addressed. However, the findings of Danzer et al. (2020) highlight the importance of considering this factor, as they show that the extended leave had a positive effect on children's health outcomes only in regions where formal childcare

[2]See e.g., Blanden & Rabe (2021) for an overview on the heteregoneity of the impact of childcare, depending on the family's SES, the quality of the childcare, and whether the childcare is replacing informal or parental care

was not readily available.

One mechanism through which longer maternity leave could affect infant health outcomes is by allowing mothers to breastfeed for longer periods. Huang & Yang (2015) look at the impact of PFL on breastfeeding practices in California and find that the reform led to a 10 to 20 percentage point increase in breastfeeding rates 3, 6, and 9 months after the birth of a child. Studying the same reform, Pac et al. (2019) also find a positive effect on breastfeeding, with a significantly larger effect for disadvantaged mothers. Baker & Milligan (2008b) find that the reform in Canada, which extended paid leave from 6 to 12 months, increased the duration of breastfeeding by more than one month. However, using this exogenous shock to assess the benefits of breastfeeding, their evidence suggests that, at least after six months, the benefits of increased duration of breastfeeding are trivial.

Several studies have explored the influence of parental leave on children's long-run outcomes. Carneiro et al. (2015) study the 1977 law change in Norway, which introduced 4 months of paid maternity leave (and 12 months of unpaid leave). They find that the reform led to a 2 percentage point reduction in high school dropout rates and a 5 percent increase in wages at age 30. This effect is driven by families with fewer resources, where the mother would have taken very little unpaid leave before the policy change. In contrast, Rasmussen (2010) investigates a policy change in Denmark in 1984 that increased parental leave from 14 to 20 weeks and find no significant effect on children's long-term educational outcomes. Furthermore, Dahl et al. (2016) evaluate the effect of increasing paid leave in Norway from 18 to 35 weeks and find no effect on children's schooling. Liu & Skans (2010) look at the effect of extending parental leave in Sweden from 12 to 15 months. They find no effect on hospitalizations within 3, 6, and 16 years after birth. Furthermore, they find no overall effect on children's school performance. However, they find positive effects on test scores among children of highly educated mothers. Dustmann & Schönberg (2012) assess the effects of three policy changes in Germany: The first expanded paid leave from 2 to 6 months in 1979, the second extended the leave further to 10 months in 1986, and finally, a reform in 1992 extended the paid leave to 18 months. They find no evidence that any of these reforms improved children's schooling outcomes; in fact, they observe that the 1992 expansion may even have lowered children's educational attainment. Baker & Milligan (2015) estimate the effect of increasing maternity leave in Canada to 12 months and find no positive effect on cognitive and behavioral development of children when they reach ages four and five. Further, they uncover a small negative effect on PPVT (Peabody Picture Vocabulary Test) scores among boys. Similarly, Canaan (2019) investigates the effect of a French reform that extended leave

duration from 16 weeks to 3 years and finds that it harmed children's verbal development at the age of six.

Danzer & Lavy (2018) study the influence of extending paid leave in Austria from 12 to 24 months. They find no significant overall effect on children's standardized test scores, but similar to Liu & Skans (2010) they find significant positive effects for children of highly educated mothers, especially for boys. Furthermore, they find a negative effect on the schooling outcomes of children whose mothers have lower levels of education—and in particular, for boys. In a forthcoming paper, Danzer et al. (2020) estimate the impact of the same reform on children's labor market outcomes and find no effects and no indication of a systematic pattern with respect to SES of the mother or the child's gender. Finally, Ginja, Jans, & Karimi (2020) investigate a policy change in Sweden that allows mothers higher benefits for a subsequent child without reestablishing eligibility through market work, if two births occur within a pre-specified interval. They find that this policy improves the schooling outcomes of the older child, likely due to increased maternal time.

Several countries have mandatory prenatal leave to protect the health of pregnant workers and their unborn children. Ahammer et al. (2020) study the effects of a policy reform in Austria that extended the mandatory prenatal leave from 6 to 8 weeks on children's short- and long-run outcomes. They find that the reform had no influence on children's health outcomes in the short- or long-run, and no impact on their future labor market outcomes. Furthermore, they find no effect on maternal health and subsequent fertility.

Fertility and Marriage

Parental leave policies affect the cost of having a child and might therefore affect family outcomes such as fertility and marriage decisions. Several studies have investigated the influence on fertility of a reform in Germany in 2007 that significantly increased the benefits for higher-earning women while decreasing the benefits for lower-earning women. This reform also reduced the total period of leave duration and implemented paternity leave. Disentangling the effects of these changes proves difficult. Raute (2019) documents a fertility increase of 23% among women with tertiary education, while Kluve & Schmitz (2018) observe that the policy reform reduced subsequent fertility among younger mothers. Cygan-Rehm (2016) find that the reform had a negative impact on fertility among low-income mothers.

Lalive & Zweimüller (2009) and Danzer et al. (2020) consider the effect of extending maternity leave in Austria from 12 to 24 months. While Lalive & Zweimüller (2009) find an increased probability that couples will have a second child within 10 years of the birth of their

first child, Danzer et al. (2020) show no significant effects on completed fertility when they extend the horizon to 17 years after birth. They do not find that the reform had an overall influence on divorce probabilities, but document an increased probability that mothers who were unmarried at the time of birth would get married.[3] Liu & Skans (2010) observe no influence of extending the maternity leave in Sweden to 15 months on parental fertility or divorce rates, and similarly, Dahl et al. (2016) find no effect of extending the maternity leave in Norway from 18 to 35 weeks on completed fertility, marriage, or divorce.

Mothers' Labor Market Outcomes

Having children has an immense influence on women's labor market outcomes both in the short- and long-run (Angelov et al., 2016; Lundborg et al., 2017; Kleven et al., 2019). This reality has spurred an increased interest in reforms in high-income countries. Policymakers face difficult tradeoffs, as parental leave programs often aim to accommodate multiple concerns such as child and parental welfare, parental labor market outcomes, gender inequality, firm productivity, and governmental expenditures. Wage compensation is often combined with job protection schemes to ensure that parents can afford to take the leave and return to the labor market afterward. Proponents argue that generous parental leave policies promote gender equality and increase women's earnings by allowing mothers to retain valuable firm- or occupation-specific human capital and match-specific human capital after childbirth. However, it is precisely these longer spells of job absenteeism that opponents worry about. They argue that more time away from work lowers women's future labor market outcomes through human capital depreciation and possibly discrimination. In this section, we will review the literature on how a variety of parental leave policies affect mothers' and fathers' labor market outcomes.

A range of cross-country comparative studies, using variation in the availability and length of leave provision across countries, finds that paid leave is associated with somewhat higher female employment rates (Jaumotte, 2003; Pettit & Hook, 2005). In a prominent early study, Ruhm (1998) investigates the effect of parental leave on female employment and wages from 1969–1993 in nine European countries that experienced significant changes in their respective parental leave policies. He finds that entitlement to short periods of paid leave, totaling around three months, lead to an approximately 3–4% increase in female employment rates but little or no effect on wages. On the other hand, entitlement to longer parental leaves of more than nine months had no additional impact on employment but a significant negative

[3] They only observe a significant effect on marriages in communities where nurseries are available.

impact of about 3% on female wages. Work covering additional countries and later years broadly confirms Ruhm's findings (e.g., Ruhm & Teague, 1995; Thévenon & Solaz, 2013; Blau & Kahn, 2013). Cross-country studies also suggest that parental leave length affects women across SES levels differently. Long leave schemes increase labor market participation but decrease earnings for highly educated women relative to other women (Cipollone et al., 2014; Olivetti & Petrongolo, 2017).

Even though these rigorous studies provide strong comparisons of parental leave policies across countries, some concerns remain about the causal interpretation of cross-country studies. These studies are prone to overstating the true influence of parental leave since the extensions of this leave often happened over a period of time during which other family-friendly policies were implemented as well. Parental leave can vary in length, extent of job protection, income support, eligibility rules, and availability to either parent. The rules and costs governing preschool education and childcare also vary considerably across countries. Some countries have enabled direct family transfers and tax allowances to low-income working parents, differing in rules and magnitudes.

A large branch of the literature has addressed this challenge by focusing on one country and considering policy changes to elicit the causal effect of parental leave policies. Reviewing the results of various studies analyzing parental leave reforms in different countries confirms the overall findings from the cross-country studies. Overall, a concave relationship exists between the length of parental leave and mothers' labor market outcomes. Introducing and extending parental leave rights and wage compensation for up to six months improves mothers' labor market outcomes. Prolonging these rights for a year seems to have little effect, and extending them to a year or longer seems to have an adverse effect on women's wages and employment. Formal rights to maternity leave make it easier for mothers to maintain an attachment to their pre-birth job and employer, meaning that mothers do not have to start over when they return to the labor market after their childbirth and childrearing period. Where these rights already exist, however, extensions of the maternity leave period from a certain point on can have the opposite effect.

Introduction of Short Programs

Generally, introducing a short paid parental leave scheme has been shown to improve mothers' labor market outcomes. Several studies have examined the labor market consequences of the United States' first explicit paid parental leave policy implemented in California in 2004. Rossin-Slater et al. (2013) show that the implementation of this program doubled the use

of parental leave by Californian women from 3 to 6 weeks on average, and that this change primarily resulted from the greater uptake by less privileged mothers. They estimate that this change increased the weekly work hours of employed mothers of one- to three-year-old children by 10–17%. Most studies on this reform confirm these findings and show an increase in the labor supply on both the intensive and extensive margins in the short-run, while highlighting that mothers' likelihood of returning to their pre-leave firm increased (Baum & Ruhm, 2016; Bana et al., 2020). Conversely, a new study by Bailey et al. (2019) finds no evidence that this reform improved women's labor market outcomes and further claims that women making use of the improved leave provision experience a lower employment rate and wages 6–10 years after birth. Baker & Milligan (2008a) find similar effects when studying the introduction of 18 weeks of parental leave in Canada, which led to a sharp decrease in job separations. Gregg et al. (2007) show that the British introduction of job protection and 6 weeks of wage compensation in 1979 significantly increased mothers' labor market attachment in the years after childbirth, where many moved from unemployment into part-time positions. On the contrary, the German extension of paid leave and job protection from 2 to 6 months in 1979 led to a decrease in mothers' employment by 1–2% at 52 and 76 months after childbirth, although the effect does not persist in the long-run (Guertzgen & Hank, 2018; Dustmann & Schönberg, 2012).

Extending Parental Leave Up to 12 Months

Many countries have expanded their parental leave schemes over time, and the results suggest that little or no effect on mothers' labor market outcomes occurs until the duration of leave approaches one year in length. Focusing on the pre-1993 policy reforms in Norway, Dahl et al. (2016) find that expansions in government-funded maternity leave from 18 to 35 weeks had little effect on a wide variety of outcomes, including parental earnings and labor market participation in the short- or long-run. Datta Gupta et al. (2008) show that maternity leave approaching a year in length affects Danish mothers' wages negatively. Nielsen et al. (2004) suggest that the adverse effect is mainly driven by women employed in the private sector, while they find no negative effect of a longer leave for mothers in the public sector. They also find that the potentially higher wage compensation during pregnancy and better postpartum career opportunities in the public sector attract pregnant women to shift to the public sector.

In Norway, Corekcioglu et al. (2021) find that the extension of maternity leave from 30 to 52 weeks in 1993 did not help women reach top positions within their organization and indicates that it may even make them less likely to do so. Small but adverse effects on labor

market attachment linked to a 52-week parental leave are also found in Germany (Schönberg & Ludsteck, 2014). Stearns (2018) is able to separately identify the effects of extending wage compensation and job protection to 52 weeks in Great Britain and finds that access to longer paid maternity leave increases the probability of returning to work in the short-run, but not in the long-run. In contrast, making job protection available to new mothers significantly increases maternal employment rates and job tenure five years after childbirth. Longer leave therefore seems to increase mothers' labor market attachment but decrease mothers' chances of career success in terms of promotions to managerial positions.

Extending Parental Leave Beyond 12 Months

In general, studies examining the effects of a parental leave that extends beyond a year find adverse effects on mothers' labor market outcomes. A range of studies examine the French 1994 reform that extended the period of paid leave for families with two children to three years and find that the reform induced women to exit the labor market and incur a wage penalty if returning to work, both in the short-run (Piketty, 2005; Canaan, 2019) and in the long-run (Lequien, 2012). Using German data, Ejrnæs & Kunze (2013) find that the increase in leave duration of up to 36 months led to detrimental effects on employment and wages for mothers. Using survey data, Gangl & Ziefle (2015) show that the expansion of leave duration changed German mothers' work-family preferences. The affected women reported lower levels of work commitment and fewer held a full-time position. In the same setting, Schönberg & Ludsteck (2014) find that the adverse effects on the labor market are mainly short-term effects. In particular, they find that increased leave duration reduced employment rates and earnings for up to 6 years after childbirth, but with smaller effects in the longer-run. The same has been found in Austria, where an extension of paid leave from one to two years reduced mothers' earnings in the short-term but had no longer-term effects (Lalive & Zweimüller, 2009).

Mullerova (2017) examines a parental benefit reform that took effect in the Czech Republic in 1995, extending the universal parental leave benefits from three to four years while keeping the job protection period at three years. She finds that mothers' probability of employment fell by 15–25% at the end of their parental leave and persisted at the same level more than two years later. Bičáková & Kalíšková (2019) evaluate the same reform as well as a later reform in 2008. The second reform allowed women to choose an alternative setup that shortens the paid leave from four to three or two years while keeping the overall amount of financial benefits received virtually unchanged. The job protection remained set at three years. Their findings demonstrate that the second reform had the opposite effect of the first, although with a much

smaller impact.

A shortening of the parental leave also had a positive effect on German mothers. In 2007, Germany modernized its parental leave system, replacing the previous lengthy but low benefit leave—which specifically targeted low-income families—with a 12-month universal (in principle) leave offering much more generous coverage. The new benefits were dependent on pre-birth earnings, which meant that women with high labor market participation received a higher wage replacement rate. The empirical results indicate that the reform proved effective, leading to a 12% increase in mothers' employment probability after the end of the benefit period (Kluve & Tamm, 2013) and a positive influence on employment three to five years after childbirth for women with relatively high levels of education (Bergemann & Riphahn, 2015). However, these results do hide substantial heterogeneity, as women who were employed prior to giving birth increased their leave duration with the reform (Kluve & Tamm, 2013). Welteke & Wrohlich (2019) argue that the increase in benefits particularly encouraged high-income mothers to stay at home for the first 12 months following childbirth. By considering the increase in leave duration among working women and identifying female coworkers who had a child after the reform, they find substantial spillovers among the coworkers who took a longer leave themselves. The initial effect of the reform on new mothers' use of this leave and absenteeism from the labor market is therefore greater than what is identified when only looking at women in the reform window.

Summary

The surveyed research on the effects of maternity leave suggests significant benefits result from introducing a short leave, while the evidence of benefits for extending a longer leave is more mixed.

The literature on health outcomes provides compelling evidence for the beneficial effect on both maternal and child health of the introduction and expansion of a short maternity leave. The beneficial impact of leave extending beyond six months is more ambiguous, and some evidence suggests that policies implementing longer leave may increase inequality. In terms of health outcomes, low-income mothers benefit more from the provision and extension of paid leave. However, in terms of children's long run outcomes, such as test-scores, the benefits of leave extensions appear to be concentrated among those with highly educated mothers. Extending leave duration may therefore strengthen the relationship between maternal SES and child outcomes.

Introducing maternity and family leave entitlements generally appears to improve moth-

ers' job continuity. The evidence shows that extending these provisions for up to six months improves mothers' labor market outcomes, but longer leave might have an adverse long-term effect on wages, employment, and career opportunities, especially when the leave extends for a year or more. The evidence also suggests that there are heterogeneous effects of different parental leave schemes. Offering universal paid leave increases use of leave by low-earning women, while longer paid leave and job protection periods may harm highly educated mothers' careers the most. In particular, women working in the private sector may experience diminished chances of reaching top positions when the paid leave duration increases. Expanding eligibility can also increase fertility, which might in turn lower mothers' long-term earnings due to the labor cost of additional children.[4]

Paternity Leave

As mothers remain the primary users of shareable leave, policymakers have to a greater extent started to target fathers. The primary goal of recent paternity leave policies has been to involve fathers more in childcare and other tasks in the household to alleviate some of the responsibility carried by mothers. Indeed, correlative studies show that leave-taking fathers are more involved in subsequent childcare (e.g., Nepomnyaschy & Waldfogel, 2007; Boll et al., 2014). If this relationship is causal, non-transferable paternity leave and equal sharing of parental leave should decrease household specialization. This could stem both from a direct effect on parents' labor supply and outcomes as well as a more indirect effect through changing norms and behaviors that can alter the division of labor within the household. Extensive causal evidence reveals the impact on earnings of both mothers and fathers, but perhaps due to data availability, the effect on time spent on childcare and housework has been less studied. Moreover, studies have shown an effect on fertility and couple stability. Paternal engagement has a positive association with child development (Sarkadi et al., 2008; del Carmen Huerta et al., 2013) and improves later father-child relationships (Petts et al., 2020). The causality and selection aspects of this finding have only been disentangled in a few papers.

Overview of History and Purpose

The recent focus on involving fathers in parental leave-taking stems mainly from gender equality concerns. According to the EU Commission, shared responsibility between parents should be an essential part of strategies to increase equality between men and women in the labor

[4]For more on this mechanism see the section on paternity leave and fertility

market and to ensure fathers' opportunity for time with their newborn child (Council of the European Union, 2019). A non-transferable (earmarked) paternity leave has been introduced sporadically since the 1990s but now often serves as a central element when modernizing the parental leave system in most OECD countries. A short paternity leave around the time of birth was introduced in Finland in 1978 and in Sweden in 1980.[5] Norway became the first country to introduce earmarked paternity leave in 1993, followed by Sweden in 1995. In 2000, Iceland passed a law that earmarked one-third of a 9-month-long parental leave to fathers. In 2021, the leave was extended to 12 months, earmarking 6 months to each parent, albeit with the possibility of transferring 6 weeks from one parent to the other. Figure 1 contains an overview of father-specific leaves in OECD countries in 2018.

While earmarked paternity leave has been praised for being an effective tool, uptake rates differ significantly by country. The Icelandic policy has proven most successful, bringing a more than 80%-point jump in uptake rates (Olafsson & Steingrimsdottir, 2020). Within Europe, the German and Danish introduction of parental leave has been the least effective. The German introduction of 2 months of paternity leave led to a jump of approximately 12 percentage points (Kluve & Tamm, 2013). The introduction of earmarked paternity leave took place in 2007 as a part of the modernization of the German parental leave system, which also shortened the leave duration and made benefits dependent on pre-birth earnings. The Danish introduction of 2 weeks of paternity leave in 1998 implied an increase of approximately two days of the average leave taken by fathers, and the abolishing of the earmarked leave in 2002 barely altered the average leave duration (Andersen, 2018).

Analyzing the effect of the Californian Paid Family Leave Program—the first in the U.S.—Bartel et al. (2018) report an increase in paternity leave uptake of 0.9%-points. Using within-U.S. variation of employment protection covering fathers, Han et al. (2009) show that American men are insensitive to legislation enabling leave. As an arguably closer comparison to the US, Patnaik (2019) reports an increase in uptake rates of more than 50 percentage points after a reform in Quebec, which introduced 5 weeks of paternity leave. Moreover, important differences appear to exist between the introduction and the expansion of paternity leave. Evaluating two subsequent reforms in Sweden, Duvander & Johansson (2012) find the introduction of the first month of paternity leave in 1995 to have twice as great an effect as the expansion to two months in 2002. They also evaluated "a gender equality bonus" in 2006, which provided mothers with a tax credit if they shared leave equally, and find close to no

[5] Very few papers have studied the effect of simultaneous leave. Persson & Rossin-Slater (2019) and Fontenay & Tojerow (2020) find that simultaneous leave improves maternal health in Sweden and Belgium, respectively. Andersen (2018) uses a series of reforms in Denmark, including the introduction of paternity leave around childbirth and find a positive effect on mothers' income.

effect on fathers' leave duration. Table 2 contains an overview of the reforms, fathers' use of leave prior to the reforms, and the reforms' effect across countries.

Many studies have explored which factors and characteristics make fathers use parental leave. Using Swedish data, Ma et al. (2019) find that men who are young, foreign-born, or earn a low income are less likely to take leave, explaining that this results from unstable labor market conditions. Descriptive evidence also highlights the importance of workplace characteristics (e.g., Naz, 2010; Bygren & Duvander, 2006; Geisler & Kreyenfeld, 2019; Kaufman & Petts, 2020) as well as relative income within couples, education levels, and number of previous children. Finally, the leave system itself plays an important role in uptake. Hook (2006) illustrate that paternity leave serves as an effective policy tool for increasing paternal involvement. Ray et al. (2010) emphasize how generosity and gender-egalitarian design of policy interrelate. Jørgensen & Søgaard (2021) document that uptake of paternity leave may be sluggish if benefits paid to fathers are low, highlighting the importance of wage replacement rates in influencing uptake of leave. Using data from 21 European countries, Castro-García & Pazos-Moran (2016) show that fathers take leave when it is non-transferable and payments are generous, while only a small minority take other types of leave. Mussino et al. (2019) compare the use of paternity leave among migrants in two culturally and economically similar countries—namely, Sweden, with a long paternity leave, and Finland, with a short paternity leave—and find that migrants' leave behavior is much more similar to the population in their country of residence than their country of birth, showing that policies enabling paternity leave are crucial for fathers' uptake of leave.

Gender Equality in Time Allocation and Labor Market Outcomes

Paternity leave policies might affect gender equality via two channels: first, by improving women's labor market earnings relative to men's, and second, by increasing the time fathers spend on childcare and other tasks in the home. In most settings, gender equality improves with the introduction of paternity leave. Importantly, this is rarely driven by a meaningful reduction in fathers' earnings, but rather, by a positive effect on mothers' earnings and labor supply combined with more paternal involvement at home.

Looking at the introduction of earmarked paternity leave in Norway in 1993, Cools et al. (2015) find no effect on Norwegian fathers' work hours and yearly earnings, and Kotsadam & Finseraas (2011) discover that paternity leave leads to a more equal division of specific tasks in the household. Rege & Solli (2013) find that Norwegian fathers' earnings are reduced with their uptake of leave, and by employing time-use data, they argue that this is driven by

increased long-term paternal involvement, where fathers shift time and effort from the market to home production. Combined, these papers report that household specialization decreases with the introduction of paternity leave. Moreover, girls born immediately after the reform are less likely to do household work in adolescence (Kotsadam & Finseraas, 2013), showing that the equal sharing of household tasks persists into the next generation.

Dahl et al. (2014) document another type of social spillover. They find peer effects in workplace and family networks, as both brothers and coworkers of fathers initially affected by paternity leave reform take a longer leave themselves when they have a child. This effect depends on the strength of ties, with larger point estimates for brothers than coworkers. Moreover, the effect is transmitted in networks, creating a snowball effect that amplifies the initial impact of the reform and peer influence. Peer behavior likely provides fathers with relevant information about paternity leave, eventually leading to new norms of increased paternal involvement.

A related study by Johnsen et al. (2020) investigate the variations of relative leave induced by the reform and also find effects on coworkers caused by the leave-taking behavior of fathers. They observe that fathers' own leave-taking does not affect their labor market trajectory when controlling for their relative eligibility status within the firm. However, fathers have higher earnings if a larger share of their coworkers is eligible for paternity leave. This suggests that paternity leave may negatively affect fathers' earnings by causing them to lose out on high-wage positions to competing coworkers who do not take leave. Importantly, this effect is driven by the difference in eligibility and, in turn, leave-taking behavior. Dahl et al. (2014) show that the effect of the policy change might be greater than what is found when only comparing the couples with children born around the reform implementation period. Similarly, Johnsen et al. (2020) demonstrate that fathers other than those in the treatment group are affected by the reform. Norway further extended its paternity leave duration from 6 to 10 weeks in 2009, but Hart et al. (2019) find no effect on fathers' or mothers' subsequent earnings.

Sweden followed Norway's lead by introducing four weeks of paternity leave in 1995. Johansson (2010) investigates the influence of the reform and finds that it had a negative although statistically insignificant effect on fathers' earnings. Using the same reform, Avdic & Karimi (2018) also report a small reduction in fathers' earnings, along with a small reduction in mothers' earnings, which is mainly driven by mothers' increase the use of unpaid leave. By using a measure of absenteeism from work in order to care for sick children, Ekberg et al. (2013) find that the reform did not have a long-term influence on paternal involvement in childcare and uncover no effect on earnings of either mothers or fathers. Druedahl et al.

(2019) use the Danish introduction of 2 weeks of earmarked paternity leave in 1998 and find that women's earnings increased significantly while men's dropped (albeit insignificantly). They explain that this effect is primarily driven by families wherein women are employed in the private sector.

Most studies on this topic have focused on the absolute duration of leave, whereas the relative difference in length of leave between the parents can act as an important driver of the gender wage gap, since it may determine the division of labor within the household. Andersen (2018) examines five separate Danish parental leave reforms and observes that an increase in paternity leave relative to maternity leave leads to higher earnings for mothers. Pylkkänen & Smith (2004) compare Sweden and Denmark, which are culturally and ideologically similar but differ remarkably in parental leave policies over time, Sweden has provided much longer maternity and paternity leave than Denmark. They conclude that longer fathers' leave shortens the mothers' period away from work.

While evidence from outside Scandinavia remains more limited, existing studies from Spain, Canada, and Germany all find evidence that lower gender specialization results from earmarked paternity leave. Couples affected by the reforms are more likely to move toward a dual-earner, dual-caregiver model. Farré & González (2019) use time-use data to investigate the effect of the Spanish introduction of two-week paternity leave on fathers' participation in childcare and demonstrate that eligible fathers increase their time spent on childcare compared to ineligible fathers. They find that fathers' earnings are unaffected and a positive effect on mothers' earnings occurs, driven by a reduction in unpaid leave.

Analyzing Quebec's introduction of five weeks paternity leave, Patnaik (2019) uses within-country variation in Canada. She documents that the time mothers spend on paid work and the time fathers spend on household responsibilities, including childcare, increased, with no effect on fathers' time spent on paid work. Using the same reform, Wray (2020) shows that fathers increased the time spent on solo parenting without their partner present.

A policy change in 2007 that introduced paternity leave in Germany simultaneously introduced changes in compensation rates and a shortening of total leave from 24 months to 14 months, making it difficult to separate the effects of the different changes. Tamm (2019) relies on within-father differences between first and subsequent children and reports that fathers' leave-taking increases the time allocated to childcare after their leave. Mothers' working hours increased and fathers' hours were reduced after a paternity leave, but these labor market effects are short-lived. Using a more standard reform evaluation framework to address the same reform, Kluve & Tamm (2013) find a small and insignificant effect on fathers' time

allocated to housework. Using survey data from West Germany, Schober (2014) finds that fathers with children born just after the 2007 reform spend more time on childcare compared to those with children born before the reform, with no effect on housework. Similar to the evidence from Norway, spillovers to individuals in close proximity to the affected fathers seem to occur. Unterhofer & Wrohlich (2017) find that grandparents - in particular grandmothers - alter their view in support of working mothers when their son is given the opportunity to take paternity leave.

Fertility and Marriage

Since paternity leave can affect the household division of labor and shift the cost of childcare from mothers to fathers, it might also affect other family outcomes such as fertility and divorces. The transition to paternity leave can have mixed effects on fertility. On one hand, it can increase fertility, as having children becomes less costly for mothers' careers. However, if mothers' labor market attachment increases—and thus, their opportunity cost of subsequent children does too—fertility might decrease. Changes in costs for fathers should have symmetrical effects. The empirical evidence also shows that multiple effects are at play and findings of the effect of paternity leave on fertility are mixed. Several studies have investigated the effect on the risk of couple dissolution, and all but one study find that paternity leave has a stabilizing effect.

Doepke & Kindermann (2019) reveal that the distribution of the parental burden is a key determinant of fertility. Farré & González (2019) find that two weeks of paid paternity leave in Spain reduces fertility, driven by a postponement of subsequent childbirths. They suggest that higher opportunity costs for mothers reduce fertility desires, but also mention that increased paternal involvement might lower fathers' fertility desire as the costs related to childcare become more salient. Using Norwegian data covering a period of 25 years and exploring regional variation in uptake rates, Lappegård & Kornstad (2020) find that higher uptake rates correlate with higher fertility. This effect is particularly strong for second births. Evaluating the introduction and extension of paternity leave in Norway, Cools et al. (2015) and Hart et al. (2019), respectively, do not find any effect on fertility. Using the Belgian introduction of a short paternity leave around the time of childbirth, Fontenay & Tojerow (2020) find that birth spacing increased as a result of this leave-taking. As mentioned, the German reform in 2007, which increased replacement rates of benefits but lowered total leave duration while earmarking two months to fathers, also affected fertility. Raute (2019) shows that the reform increased fertility particularly among highly educated mothers. Cygan-Rehm

(2016) finds that spacing between births increased, driven by low-income mothers.

Olafsson & Steingrimsdottir (2020) investigate the effect of the 2001 Icelandic paternity leave reform and find that this reform reduces separations for up to 15 years following childbirth, with greater effects within the first 5 years. They find larger effects in households where the mother has a higher or similar educational attainment as the father. In households where the father is more educated than the mother, the long-term effect on marital stability is negative. Margolis et al. (2021) investigate the introduction of paid paternity leave in Quebec. This reform also expanded eligibility and increased compensation rates for both mothers and fathers. They report lower separation rates in the first five years after childbirth and no difference in the following three years. Proxying gender norms with household characteristics, they find that both paternity leave uptake and separation rates are greater among couples that are likely to hold more egalitarian views.

Farré & González (2019) also investigate divorce rates and report that up to three years after childbirth, paternity leave appears to have a stabilizing effect on marriages, but the effect is insignificant in the following three years. There is no effect on divorces in Norway from the implementation of paternity leave (Cools et al., 2015) or its extension from 6 to 10 weeks (Hart et al., 2019), although Kotsadam & Finseraas (2011) show lower levels of self-reported conflict after its introduction. Cygan-Rehm et al. (2018) evaluate the German introduction of paternal leave and find that the reform reduced the risk of single motherhood. The effects are driven by households where mothers are working. As paternity leave was introduced at the same time as other changes to the leave system, the researchers cannot disentangle its effect from that of related policies, but they conclude that their findings indicate mothers' improved financial situation and increased paternal involvement in childcare.

Contrasting these findings of either no or positive effects on marital stability is one paper with Swedish data. Avdic & Karimi (2018) investigate the introduction of parental leave and observe an increase in divorces within the first five years of the child's life among low-income mothers, showing that couples who would likely have split up later drive this result. They also investigate the extension of earmarked paternity leave from one to two months in 2002 and find no effect on divorces. When comparing the results across countries, the effects on female labor market outcomes and income might be important. Farré & González (2019) and Patnaik (2019) find a positive effect on labor supply of women in Spain and Quebec.

The German reform increased benefits for a subset of households (e.g., Cygan-Rehm et al., 2018; Kluve & Tamm, 2013). However, Avdic & Karimi (2018) find an increase in unpaid maternity leave. While the reforms used in these studies all offered paid paternity leave, the

different responses by the households and other details of the reforms led to opposite effects on household income in Sweden compared to the other countries.

Gender norms provide another potential mechanism for reconciling the findings across countries. When children are born, most couples reorganize their lives toward more traditional family patterns, and this might cause conflict in couples that hold egalitarian views. Paternity leave might then have a stabilizing influence on these couples, but a destabilizing influence on couples who prefer a high degree of specialization. The results from Sweden are potentially driven by households that would have chosen a more "conservative" allocation of time, while the heterogeneous results reported by Cygan-Rehm et al. (2018), Margolis et al. (2021), and Olafsson & Steingrimsdottir (2020) show that stabilizing effects appear greater in couples that are more likely to hold egalitarian views. Proposing a framework wherein some couples specialize while others do not, González & Zoabi (2021) revisit the Spanish reform of 2007. They identify the part of the population wherein the reform had the greatest effect on decreased specialization and document decreased fertility and an increase risk of divorce.

Children's Health and Development

Involving fathers more in early childcare might affect child outcomes along several dimensions, such as health and educational outcomes. Only a few studies have investigated this possibility, but they suggest a complementary relationship between maternal and paternal care. Cools et al. (2015) study the introduction of one month of paid paternity leave in Norway in 1993 and find that children's school performance at age 16 improves as a result of this program. They observe the most concentrated effect in families in which the father is better educated than the mother and highlight the importance of the idea that the effect of increasing paternal care will depend on the relative quality of the care it is replacing. The size of their estimates is larger than that reported by Liu & Skans (2010), who study an expansion of maternity leave in Sweden from 12 to 15 months. The reform studied by Cools et al. (2015) introduced 4 weeks of paid paternity leave on top of an existing 12-month leave scheme almost solely used by mothers. They argue that the non-trivial effect is likely driven by the long-term effect of the reform on household specialization and paternal involvement found in other studies (e.g., Kotsadam & Finseraas, 2011; Rege & Solli, 2013).

Using the Swedish introduction of paternity leave, which simultaneously reduced the total shareable leave, Ekberg et al. (2013) find that both the male share of child sick days and the total number of sick days are unaffected by the reform. Also using Swedish data and the introduction of *double days* in 2012, Persson & Rossin-Slater (2019) investigate the effect of

the reform on child and maternal health. The reform allowed parents to be on leave at the same time and also allowed them to take leave intermittently, implying that fathers could choose, on a day-to-day basis, to stay home with the mother and child. They find a positive effect on maternal health measured by decreased contact with health providers and a drop in usage of prescription drugs, but no effect on child health. The double days are therefore used when the mother is unavailable to care for the child due to being sick. Similar to the research of Cools et al. (2015), this finding speaks to the potential synergistic effect of maternal and paternal care.

Summary

Earmarked paternity leave can increase fathers' use of parental leave and family involvement, in turn ameliorating mothers' household burdens while increasing their labor market participation and work hours. The literature reviewed herein shows that the introduction of paternity leave entitlements increases fathers' usage of leave. Most studies have found that an increase in paternal involvement in childcare results from paternal leave-taking, but the evidence on labor market effects for both mothers and fathers is mixed. In most cases, mothers' labor supply and earnings rise with the increase in paternity leave. Studies of the earliest introduction of earmarked leave in Norway and Sweden have found a small reduction in fathers' earnings, but more recent introductions of earmarked leave found no effect on fathers' earnings. Moreover, there are important spillovers to other aspects of family life—most notably, couple stability and fertility. Few studies have investigated the effect of paternity leave on child outcomes, but the findings on paternity leave suggest that there are important complementarities between maternal and paternal care.

Parental Leave: Firms' Perspective

While a large body of work explores how parental leave affects households, less is known about their consequences for employers. In most countries, employers do not have to pay for the wages of workers on leave, as these are typically funded through the social insurance system. However, employers may bear more indirect costs. More specifically, a worker's absence due to parental leave leads to a decrease in the firm's labor input. The costs of parental leave for the firm thus depend on its ability to effectively replace this lost labor input. This in turn hinges on the availability of substitutes for the absent worker within the firm or in local labor markets. Recently, a number of studies have examined the implications of parental leave for

employers in different settings. In general, studies have focused on how employers are affected by (i) the introduction of short periods of paid parental leave, (ii) reforms that extend the duration of paid leave, and (iii) employee leave-taking.

Introduction of Paid Leave

While the United States is the only OECD country with no national paid parental leave, several U.S. states have recently introduced paid family leave (PFL) — which provided researchers with the opportunity to evaluate how the introduction of leave affects employers. In 2004, California became the first state to give employees the right to take up to 6 weeks of partially paid leave. Other states followed, with New Jersey mandating up to 6 weeks of paid leave in 2009, and Rhode Island and New York introducing 4 and 8 weeks of leave in 2014 and 2018, respectively.

Using firm-level data from 2010 to 2018, Goldin et al. (2020) provide descriptive evidence on the type of U.S. firms that offer paid parental leave (PPL). They find that firms with generous PPL tend to hire more workers who invest in firm-specific human capital, and that they tend to be larger and have a younger workforce compared to other firms. Other studies focus on how employers are affected by the introduction of paid leave. Using surveys and in-depth interviews with employers, early descriptive evidence indicates that businesses in California and New Jersey saw either positive or no noticeable changes in profitability, turnover, employee productivity, and morale (Appelbaum & Milkman, 2011; Milkman & Appelbaum, 2013; Lerner & Appelbaum, 2014). These results align with studies that place more emphasis on identifying causal effects. Bedard & Rossin-Slater (2016) use an employer fixed effects model along with administrative panel data from California and find that employees' leave-taking slightly reduces firms' wage bill and increases turnover. Several other studies use a difference-in-differences design that compares the change in employer outcomes in a state where PFL was introduced with that of neighboring states, before and after PFL enactment. Bartel et al. (2016) surveyed small- and medium-sized food services and manufacturing businesses in Rhode Island, Connecticut, and Massachusetts in 2013 and 2015. They find that Rhode Island's PFL enactment had no significant effect on businesses' turnover, as well as employee productivity and morale. Bartel et al. (2021) also conducted a survey among employers in Pennsylvania and New York from 2016 to 2019. Their results show that New York's PFL did not change turnover, employee performance, or the characteristics of the firms' workforce. Furthermore, firms with more than 50 employees reported an increase in the ease of handling employee absences.

A recent study by Goodman et al. (2020) further shows that short periods of paid leave do not hurt employers, even when they have to pay for part of the wages of workers on leave. They focus on the 2017 introduction of the San Francisco Paid Parental Leave Ordinance, which requires employers to supplement California's 6-week partial wage replacement. This guarantees employees access to fully paid leave —the first such program in the United States. Despite an increase in availability of paid leave, San Francisco employers report no changes in their performance or employees' wellbeing.

Overall, these studies indicate that the *introduction* of short periods of paid leave does not significantly alter how businesses rate the performance and wellbeing of their workers.

Extensions in Duration of Paid Leave

Other work examines how employers are affected by reforms that increase the length of paid parental leave. Studies typically leverage reforms that unexpectedly extended the duration of paid leave. The unexpected nature of these reforms implies that firms are unable to plan in advance for worker absence, which can in turn limit their ability to efficiently compensate for lost labor input and can therefore hurt their performance. Ginja, Karimi, & Xiao (2020) focus on such a reform in Sweden, which extended the duration of paid leave from 12 to 15 months. The researchers find that the reform induces mothers to take an additional 2.5 months of leave, but it also raises their likelihood of switching to another firm. Firms then make costly adjustments to compensate for the sudden increases in turnover and employees' leave duration: They hire more temporary and permanent workers and raise work hours of coworkers of women on leave — resulting in a significant increase in the total wage bill. Following these adjustments, manufacturing firms experience drops in revenues, sales, and value added by labor input — suggesting that replacement workers are less productive than women on leave.

Another study by Gallen (2019) looks at a 2002 unexpected expansion in the length of paid parental leave from 10 to 32 weeks in Denmark. She shows that small firms are more likely to shut down within five years of being exposed to the leave extension. Coworkers of women on leave see no significant changes in their earnings or employment rate, but they delay the timing of their own leave-taking and take more sick days due to the reform.

Finally, Huebener et al. (2021) evaluate a German reform that increased the amount of wage replacement for employees on leave from 3 to 12 months. They demonstrate that firms experience drops in their employment and wage bill while an employee is on leave—suggesting that they are unable to fully compensate for the lost labor input. Further, the researchers

find suggestive evidence that firms are more likely to discriminate in their hiring against women of childbearing age. Taken together, these studies indicate that firms cannot effectively compensate for the lost labor input and experience a deterioration in their performance when exposed to unexpected extensions in the duration of parental leave.

Leave-Taking Events

While reforms that change parental leave entitlements can have significant effects on employer outcomes, the event of having an employee take leave (versus not take leave) is equally consequential. Furthermore, the influence of leave-taking on firms can be different than the effect of the introduction or extension in the duration of paid leave. In the absence of changes in parental leave regulations, firms anticipate the timing and length of employee leave-taking, which can allow them to better plan for worker absence.

Using Danish administrative data from 2001 to 2013, Brenøe et al. (2020) examine how small firms cope with having a female employee give birth and take parental leave. They use a dynamic difference-in-differences design that compares employers of women who give birth to employers of women who do not give birth over the next few years. They first document that employers of women who give birth are exposed to an average of nine and a half months of leave. Firms adjust to this leave-taking by hiring temporary workers and increasing retention and work hours of employees in the same occupation as the women on leave. As a result, firms' total work hours remain unchanged—which indicates that these adjustments were effective at compensating for employee absence. The costs of these adjustments appear minimal. Despite increasing earnings of coworkers of women on leave, firms see no significant changes in their total wage bill. They also do not experience significant changes in their overall performance as measured by their output, profits, and likelihood of survival.

Replaceability of Workers on Leave

The costs of parental leave for firms depend on how well they can replace the absent workers. This in turn could be determined by labor market conditions and constraints facing the firm at the time of leave-taking. A recent study from Denmark highlights how labor market conditions may affect firms' ability to adjust to leave-taking. Friedrich & Hackmann (2021) investigate how a one-year extension in the duration of paid leave in 1994 (from 28 weeks of paid leave) affected hospitals and nursing homes. They show that the program led to a significant increase in nurses' leave-taking. Because of stringent labor market regulations, employers were unable to replace nurses on leave—which led to a decrease in nurse employment. This in turn resulted

in a significant drop in the quality of care provided by hospitals and nursing homes.

Another study suggest that the high costs of hiring and dismissing workers may limit firms' ability to replace leave-takers. Schmutte & Skira (2020) find that in Brazil—a country with rigid labor laws—firms exposed to leave-taking only slightly increase their hiring and could not replace the absent worker at a one-to-one rate. Ginja, Karimi, & Xiao (2020) also provide evidence that labor market conditions affect how firms replace workers on leave. They show that in thick local labor markets, employers mainly increase hiring of new workers and do not change their existing workers' work hours—with the opposite effects occurring in thin labor markets. citehueb2021 sshow that firms adjust by using both internal and external substitutes. Their findings reveal that firms use replacement hires more often when they have few internal substitutes (i.e., workers in the same occupation). They show that workers postpone their return from leave when internal substitutes are available. By exploiting an increase in the duration of paid leave, they demonstrate that this relationship between internal substitution and leave duration is greatly reduced, suggesting that coordination between workers and firms grows distorted by the increase in leave duration.

Finally, the substitutability of a firm's employees affects how they fare with a coworker's leave-taking. Ginja, Karimi, & Xiao (2020) show that firms with a high fraction of same-occupation employees primarily increase work hours of their employees in response to leave-taking, while other firms rely more heavily on new hires. Brenøe et al. (2020) further find that firms with no other workers in the same occupation as the absent employee cannot fully adjust to leave-taking—despite having anticipated the leave. More specifically, the researchers show that these firms experience declines in their total work hours, wage bill, sales, gross profits, and survival.

Summary

In general, firms are able to adjust to worker absence due to parental leave. They compensate for the lost labor input by hiring new employees and/or increasing the work hours of existing employees. These adjustments are not costly and prevent firms from incurring losses in terms of their overall performance. However, certain factors—such as unexpected leave-taking, lack of substitutes for the worker on leave within the firm or in local labor markets, and high costs of hiring or dismissing new workers—may limit employers' ability to replace workers on leave. This can result in high replacement costs and negative effects on firms' performance.

Much progress has recently been made in studying firms' response to parental leave, but some questions remain open. First, several U.S. studies show that the introduction of paid

leave does not change employers' rating of their performance. However, the lack of administrative data in these settings prevents us from understanding how employers adjust to the introduction of leave, and how this affects the labor supply and wellbeing of other workers. Second, there remains no conclusive evidence on whether parental leave-taking results in statistical discrimination against women. Indeed, employers may limit the hiring and promotion of women of childbearing age in order to reduce their exposure to any consequences of parental leave-taking.

Conclusions and Future Research

Parental leave policies have evolved tremendously since the mid 20th century. Following women's entrance into the labor market, the focus of parental leave policies has changed from mother and child survival to parental labor market outcomes, family welfare, and child development. It is therefore important to evaluate various outcomes when examining parental leave policies.

Overall, parental leave policies prove highly important in helping parents to balance between job and family welfare responsibilities upon having children. Women are still the primary caregivers of newborn babies, and thus, most leave policies remain targeted toward mothers. In general, we observe an inverted U-shaped relationship between length of parental leave and most of the outcome variables. First, the introduction of short paid leave improves mothers' labor market outcomes as well as their own health and the health of their children. Second, the findings show that extending the leave beyond six months has negligible effects on child development and the health of both mothers and children, while long-term leave affects mothers' wages and employment negatively. Few studies focus on the heterogeneous effects of a long parental leave. Interestingly, the existing studies find that a parental leave that extends beyond six months negatively affects the income of highly educated women with specialized jobs the most. Long parental leave brings health benefits for women in lower SES groups but not for women in higher SES groups. Furthermore, it appears that a long parental leave may prove beneficial in terms of schooling outcomes for children born in higher SES families, while it adversely affects children in low SES families. The heterogeneous effects of family leave policies hold critical importance, and ample need remains for more studies on this topic.

The evidence on the effects of paternity leave is more mixed. Overall, studies show that introducing earmarked paternity leave proves effective in increasing fathers' uptake rates and

childcare involvement. The evidence on mothers' and fathers' labor market outcomes varies across countries and policies. Findings show no to small positive effects of paternity leave on mothers' earnings and no to small negative effects on fathers' earnings. Paternity leave is also found to increase family stability and fertility, but again, the small amount of existing literature provides mixed findings on these topics. The non-monetary effects of the different types of earmarked paternity leave are in general understudied, and more studies are required to make an overall conclusion.

Economists have only recently begun to study the effects of parental leave on firm performance, and many effects remain vastly understudied. In general, recent studies find that firms are able to compensate for the lost labor input from leave-taking employees, usually through hiring and increasing the workload for the remaining workers. However, firms that need to replace leave-taking employees in highly educated and specialized positions face higher replacement costs, which in turn can negatively affect productivity and firm performance.

Most studies thus far focus on the length and inter-parental distribution of parental leave. We suggest that a demand exists for more studies focusing on the compensation rate and eligibility of the leave-taking workers. Over time, various reforms in different countries have changed the compensation rate for the entire duration of paid parental leave or parts thereof. It would be fruitful to gain a deeper understanding of how compensation rates affect uptake rates and the division of leave between the parents as well as the effects on parental and child welfare. Along those lines, it would also prove interesting to study leave-taking behavior and fertility when eligibility for receiving parental leave benefits changes. Eligibility rules have largely changed over time and vary across countries. While some countries have no eligibility requirements, in others, the parents need to have been in a full-time position for a year before becoming eligible for parental leave benefits. As future stories explore such research directions, decision-makers, firms, and individual workers will have a more well-rounded body of evidence to draw from in making decisions regarding parental leave.

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Figures and Tables

TABLE 1: Maternity and parental leave reforms, by country and reform

Reform	Details	Paper
Norway (1977)	Paid leave extended from 12 to 18 weeks. Eligibility dependent on prior employment. 100 % replacement, increased from health insurance. Job protection extended from 3 to 12 months.	Bütikofer et al. (2021) Carneiro et al. (2015)
Norway (1987-91) Norway (1992)	Paid leave gradually extended from 18 to 35 weeks. Extended paid leave from 42 to 52 weeks. 80 % replacement, 100 % if leave duration is shortened. Eligibility depends on prior employment.	Kotsadam & Finseraas (2013); Corekcioglu et al. (2021); Dahl et al. (2016)
United States (1978)	Expansion of the Temporary Disability Insurance covering birthgiving mothers receiving 6-12 weeks of leave with 50-66 % replacement.	Stearns (2015)
United States (1993)	Introduction of the Family Medical Leave Act that provides 12 weeks of job protection. Eligibility depends on employment time at the workplace and workplace size.	Rossin (2011)
California (2004)	Introduction of 16 weeks of paid family leave at 55% compensation rate.	Appelbaum & Milkman (2011); Milkman & Appelbaum (2013); Rossin-Slater et al. (2013); Lerner & Appelbaum (2014); Baum & Ruhm (2016); Bailey et al. (2019); Bullinger (2019); Pihl & Basso (2019); Bana et al. (2020)
New Jersey (2009)	Six weeks of additional paid family leave on top off on top of TDI, at 2/3 wage compensation.	Appelbaum & Milkman (2011); Lerner & Appelbaum (2014)
Rhode Island (2014)	Four weeks of additional paid family leave on top. on top of TDI, at 60 % wage compensation.	Bartel et al. (2016)
New York (2018)	Eight weeks of paid family leave in 2018, 10 in 2019, and 12 in 2021, at wage compensation of 50 % in 2018 and 67 % in 2021.	Bartel et al. (2021)
Sweden (1979)	Employment requirement relaxed for parity > 1.	Ginja, Jans, & Karimi (2020)
Sweden (1989)	Paid job-protection extended to 15 months.	Liu & Skans (2010)
Germany (1979)	Paid job protection extended from 2 to 6 months. Benefits replacing income in the first three months and being provided at a flat rate for the remaining 3 months of 1/3 the average national income.	Dustmann & Schönberg (2012) Guertzgen & Hank (2018)
Germany (1986-92)	Paid leave gradually extended from 6 to 24 months.s Job protection gradually extended to 36 months. No employment criteria for benefits.	Dustmann & Schönberg (2012); Gangl & Ziefle (2015); Ejrnæs & Kunze (2013); Schönberg & Ludsteck (2014)
Germany (2007)	Paid leave reduced from 2 to 1 year at 67 % replacement of income. Flat rate for those without employment history. Introduction of 2 months paternity leave.	Raute (2019); Kluve & Schmitz (2018); Cygan-Rehm (2016); Kluve & Tamm (2013); Bergemann & Riphahn (2015); Cygan-Rehm et al. (2018) Huebener et al. (2021)

TABLE 1: Maternity and parental leave reforms, by country and reform (continued)

Reform	Details	Paper
United Kingdom (1979)	29 weeks of job protection and wages. 6 weeks at 90% wage compensation and 29 weeks at a flat rate.	Gregg et al. (2007)
United Kingdom (1994)	Expanded eligibility. 90 % replacement for 6 weeks; flat rate for 12 weeks. Eligibility dependent on prior employment.	Stearns (2018)
United Kingdom (2000)	Paid leave extended to 6 months. Increased duration of the flat rate. Job protection increased to 1 year.	Stearns (2018)
Denmark (1984)	Extension from 14 to 20 weeks at 90 % replacement	Andersen (2018); Rasmussen (2010)
Denmark (1994)	Paid leave extended from 24 to 76 weeks 90 % replacement for 24 weeks, then 60 % Eligibility depends on prior employment.	Datta Gupta et al. (2008); Friedrich & Hackmann (2021); Andersen (2018)
Denmark (2002)	Increased compensation. 90 % replacement for 46 weeks. Job protection for 60 weeks.	Beuchert et al. (2016); Andersen (2018); Gallen (2019)
Austria (1990)	Paid job-protection extended from 1 to 2 years. 100 % replacement for 8 weeks, then a flat rate Eligibility dependent on prior employment. Employment requirement relaxed for parity > 1	Danzer & Lavy (2018); Lalive & Zweimüller (2009); Danzer et al. (2020)
Austria (1996)	Paid job-protected leave reduced to 18 months.	Lalive & Zweimüller (2009)
Canada (2000)	Paid leave extended from 6 to 12 months at 55 % replacement. Eligibility dependent on prior employment.	Baker & Milligan (2008a); Baker & Milligan (2008b); Baker & Milligan (2010)
France (1994)	Increased paid leave from 10 weeks to 3 years. Extended from second to third births. Flat rate benefit. Eligibility depends on prior employment.	Piketty (2005); Lequien (2012); Canaan (2019)
Czech Republic (1995)	Extension of flat rate benefit from 3 to 4 years. No job protection the fourth year. No eligibility requirement.	Mullerova (2017); Bičáková & Kalíšková (2019)
Czech Republic (2008)	Possibility to shorten leave to 3 or 2 years. Total benefits kept constant.	Bičáková & Kalíšková (2019)

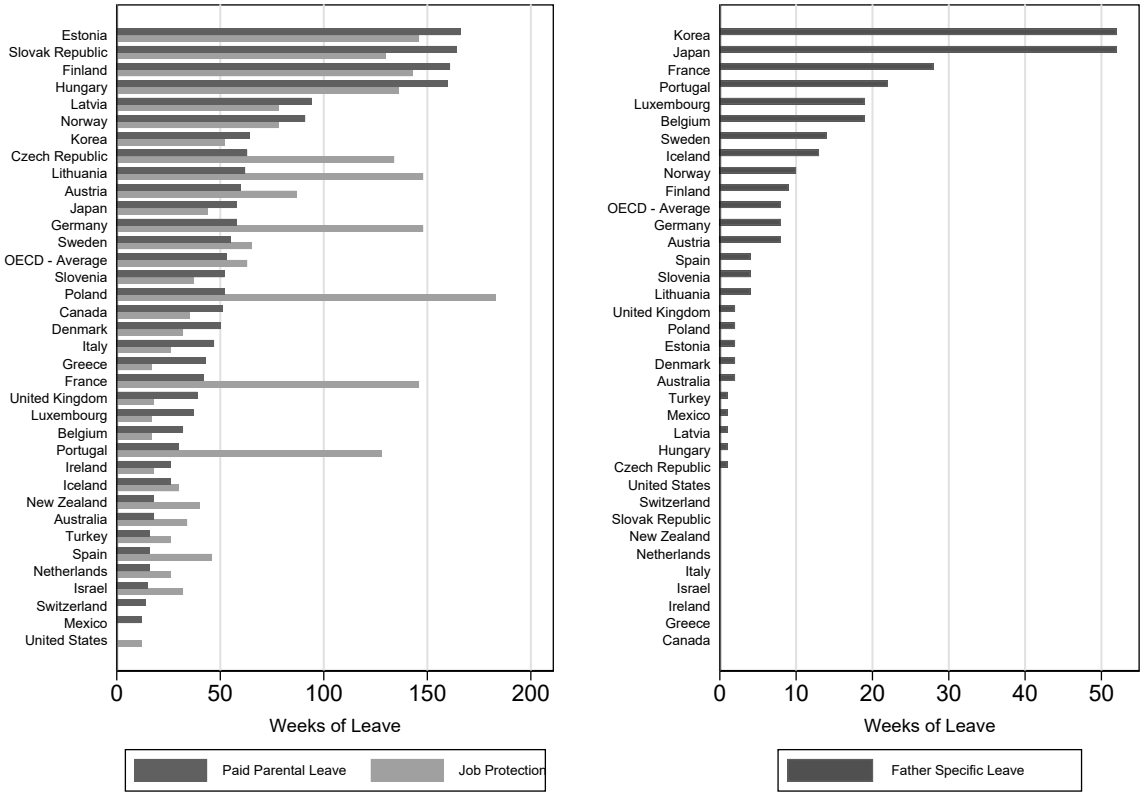
Note: This table is not meant to be an exhaustive list of reforms by country, but rather it contains the reforms utilized by the studies included in this review.

TABLE 2: Fathers' take-up of earmarked paternity leave ('Daddy Quotas') upon reform implementation, by country and reform

Reform		Replacement rate	Prior take-up	Reform effect	Paper
Norway (1993)	Introduction (4 weeks)	80-100 % of former earnings*	3 %	32 %-point	Dahl et al. (2014);
				25 %-point	Cools et al. (2015); Johnsen et al. (2020)
					Lappegård & Kornstad (2020)
Norway (2002)	Extension (2 weeks)		65 %		Lappegård & Kornstad (2020)
Norway (2009)	Extension (4 weeks)		75 %	3 weeks	Hart et al. (2019)
					Lappegård & Kornstad (2020)
Sweden (1995)	Introduction (1 month)	80 % of former earnings*	30-38 days	50 %-point	Ekberg et al. (2013)
				15 days	Avdic & Karimi (2018)
				10 days	Duvander & Johansson (2012)
Sweden (2002)	Extension (1 month)		37 days	5 days	Duvander & Johansson (2012)
Sweden (2008)	"Gender Equality" bonus	Tax credit per day used by father	48 days	No effect	Duvander & Johansson (2012)
Denmark (1998)	Introduction (2 weeks)	90 % of former earnings*	12-15 days	1-3 days	Andersen (2018);
					Druedahl et al. (2019)
Denmark (2002)	Removal (2 weeks)		14-22 days	Small reduction	Andersen (2018); Beuchert et al. (2016)
Iceland (2001)	Introduction (3 months)s	80 % of former earnings*	~ 0	82.4-86.6 %-point	Olafsson & Steingrimsdottir (2020)
Canada (2006)	Introduction (5 weeks)s	70 % of former earnings*	22 %	53.6 %-point	Patnaik (2019); Wray (2020);
					Margolis et al. (2021)
Spain (2007)	Introduction (2 weeks)	100 % of former earnings*	~ 0	55 %-point	Farré & González (2019)
				6-8 days	González & Zoabi (2021)
Germany (2007)	Introduction (2 months)	67 per cent of net earnings*	4 %	12 %-point	Kluve & Tamm (2013); Schober (2014);
					Unterhofer & Wrohlich (2017); Tamm (2019);
					Cygan-Rehm (2016); Raute (2019)
United States (1993)	Introduction (12 weeks)	Unpaid leave w. job protection	7.2 %	3.9 %-point	Han et al. (2009)
California (2003)	Introduction (6 weeks)	55 % wage replacement*	2 %	0.9 %-point	Bartel et al. (2018)

*Benefits are capped at a ceilings.
Note: This table is not meant to be an exhaustive list of reforms by country, but contains the reforms utilized by the studies included in this review.

Figure 1: Leave Provision in the OECD in 2018



Source: OECD https://stats.oecd.org/index.aspx?queryid=54760
Figure produced by authors