

CEP Discussion Paper No 1464

January 2017

**The Economic Consequences of Family Policies:
Lessons from a Century of Legislation in High-Income
Countries**

**Claudia Olivetti
Barbara Petrongolo**

Abstract

We draw lessons from existing work and our own analysis on the effects of parental leave and other interventions aimed at aiding families. The outcomes of interest are female employment, gender gaps in earnings and fertility. We begin with a discussion of the historical introduction of family policies ever since the end of the nineteenth century and then turn to the details regarding family policies currently in effect across high-income nations. We sketch a framework concerning the effects of family policy to motivate our country- and micro-level evidence on the impact of family policies on gender outcomes. Most estimates of the impact of parental leave entitlement on female labor market outcomes range from negligible to weakly positive. The verdict is far more positive for the beneficial impact of spending on early education and childcare.

Keywords: parental leave, childcare, family policies, gender gaps
JEL codes: J13; J16; J18

This paper was produced as part of the Centre's Labour Markets Programme. The Centre for Economic Performance is financed by the Economic and Social Research Council.

Acknowledgements

We wish to thank Claudia Goldin and the editors of the Journal for Economic Perspectives for valuable comments and suggestions, and Marco Ghiani and Xirong Lin for excellent research assistance.

Claudia Olivetti, Boston College and CEPR. Barbara Petrongolo, Queen Mary University, CEPR and Centre for Economic Performance, London School of Economics.

Published by
Centre for Economic Performance
London School of Economics and Political Science
Houghton Street
London WC2A 2AE

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission in writing of the publisher nor be issued to the public or circulated in any form other than that in which it is published.

Requests for permission to reproduce any article or part of the Working Paper should be sent to the editor at the above address.

© C. Olivetti and B. Petrongolo, submitted 2017.

Among the most remarkable changes in the labor markets of high-income nations during the past century have been the rise in the female workforce and the narrowing of gender gaps in schooling and earnings. At the same time, government mandates and firm policies regarding families expanded. In some instances, legislation was preceded by great economic change, as when the spread of industrialization in the nineteenth century led to calls for restrictions on female work. Other legislation resulted from social and political change, as occurred during the women's movement of the 1960s and 1970s. Demographic change also played a role as nations have sought to address declining fertility or when dictatorships desired to increase population. By the early twenty-first century, most high-income countries have put into effect a host of generous and virtually gender-neutral parental leave policies and family benefits, with the multiple goals of gender equity, higher fertility and child development. But what have been the effects?

Proponents typically emphasize the contribution of family policies to the goals of gender equity and child development, enabling women to combine careers and motherhood, and altering social norms regarding gender roles. Opponents often warn that family policies may become a long-term hindrance to women's careers because of the loss of work experience and the higher costs to employers that hire women of childbearing age.

Understanding the causal impact of family policies on gender outcomes has faced two main challenges. First, family legislation is complex. Parental leave can vary in length, job protection, income support, and availability to either parent. The rules and costs governing preschool education and childcare vary considerably across countries. Some have enabled direct family transfers and tax allowances to low-income working parents, differing in rules and magnitudes. Recent and increasingly common mandates are the right to part-time work and flexible working time. A further complication is that policies should not be analysed in isolation. If a nation passes longer parental leave entitlements, the effects will be determined in part by benefit coverage during leave and the cost and availability of childcare services once leave entitlements expire.

A second challenge is determining cause-and-effect relationships. For example, the evolution of social norms towards more egalitarian gender roles may induce both family legislation and higher female labor force participation. An empirical approach that attributes the entire increase in female participation to the passage of the legislation will overstate its impact.

Existing research has tackled these issues at both the country and the individual levels. The country-level approach captures the impacts of policies, based on between and

within-country variation in intervention, exploiting internationally consistent data on a variety of labor market outcomes. This approach has the advantage of considering an array of policy interventions and interdependencies among them, as well as general equilibrium effects of the policies. But such measurement is invariably coarse and the identification of the causal impacts of interest can be problematic. Since we will show some estimates based on country level data, we will need to emphasize these limitations throughout our discussion.

The micro-level approach evaluates the causal impact of specific policies within a country by combining rich micro data with variation from natural experiments, such as the lengthening of leave policy or the provision of paid leave. The approach generally considers just one policy intervention at a time, but detailed characterization of the institutional environment allows for more meaningful comparisons.

We draw lessons here from existing work and our own analysis on the effects of parental leave and other interventions aimed at aiding families. The outcomes of interest are female employment, gender gaps in earnings and fertility. We begin with a discussion of the historical introduction of family policies ever since the end of the nineteenth century and then turn to the details regarding family policies currently in effect across high-income nations. We sketch a framework concerning the effects of family policy to motivate our country- and micro-level evidence on the impact of family policies on gender outcomes. Most estimates range from negligible to a small positive impact. But the verdict is more positive for the impact of spending on early education and childcare.

Historical Background

While all developed countries now have in place some form of parental leave policy and family transfers, the path to policy adoption has differed widely across countries in its timing and political rationale. In the mid-19th century, early efforts to regulate working conditions in industrialized (or industrializing) countries often encompassed special provisions for female work. Britain and Switzerland pioneered this movement, by introducing specific restrictions on female work shifts since the 1840s. Starting around mid-19th century, virtually all US states gradually adopted legislation on maximum weekly hours for women, and most western economies restricted the employment of married women in general or in specific professions. Later in the century, Germany, Sweden, Austria, Belgium, Netherlands, Denmark and Switzerland introduced explicit regulations for (mostly unpaid) maternity

leave, followed by France, United Kingdom, Italy, Spain, and Greece in the early 20th century.¹

The emphasis in early legislation was mostly about protecting physically weaker workers from extreme working conditions, and concerns for the health of mothers and children typically led to bans on female employment within a few weeks of birth. Mandated leave was only sporadically accompanied by job protection or income support. Unions often latched onto such special provisions for women in order to lobby for a shorter workweek for men (Goldin 1988). In 1919, the International Labor Organization advocated maternal rights to 12 weeks' leave from work around the time of birth, combined with job protection and partial income support. While maternal leave was ratified in most member countries, job and income protections did not become the norm until much later in the 20th century.²

In the 1950s, the design of family policies across Europe emphasized traditional gender roles, and explicitly protected women in their capacities as wives and mothers. During World War II, women in countries with high rate of male mobilization had filled jobs in male-dominated sectors like manufacturing, transportation, and military industry. Despite these developments – or sometimes as a response to them - family policy legislation in some European countries often seemed designed to re-affirm women's household roles. For example, some countries extended leave rights without granting job protection (Ruhm 1998, and references therein), which can be interpreted as encouraging women to take leave, while raising uncertainty about the ability to return to work in a similar position.

The late 1960s and 1970s brought important changes in maternity leave provisions and set the basis for a wider selection of modern family policies. The sharp rise in female labor market participation generated greater demands for maternity leave provisions as a way to reconcile careers and motherhood. Countries that had adopted maternity leave earlier often extended these provisions substantially, while other countries like Canada and Australia introduced such provisions. Most high-income countries combined leave periods with job protection and increased income support during employment breaks. Sweden was the first country to introduce explicit paternity leave rights in 1974, allowing mother and father to share six months of parental leave. Other European countries started to supplement “maternity leave,” available to mothers around the time of childbirth, with “parental leave,” available to both parents during a child’s early years (as reported in the OECD Family

¹ See Wilkander, Kessler-Harris and Lewis (1995).

² In Appendix Table A1, available online with this paper at <http://e-jep.org>, we report a summary of early legislation based on a comparative study published by the US Department of Labor Children’s Bureau (Harris 1919).

Database “PF 2.5 Annex: detail of change in parental leave by country.”) These changes, together with the decline in the manufacturing sector and the weakening of trade unions, contributed to eroding the male breadwinner model in most high-income countries.

The United States notably lagged behind these general trends. Back in 1919, the Children’s Bureau published a comparative study of “Maternity Benefit System in Certain Foreign Countries” (Harris 1919), which stated that the report was commissioned “in the hope that the information might prove useful to the people of one of the few great countries which as yet have no system of State or national assistance in maternity – the United States.” Despite having in place equal pay legislation since 1963, and maternity leave legislation in a few states starting in the late 1960s, the only maternity provision adopted at the federal level until the 1990s was the Pregnancy Discrimination Act of 1978, prohibiting unequal treatment of pregnant women. Parental leave rights were introduced in the United States with the passage of the Family and Medical Leave Act of 1993, allowing eligible employees to up to 12 weeks of unpaid leave for pregnancy and newborn care. A major selling point emphasized by its proponents was its claimed beneficial impact – beyond mothers' welfare and careers – on child development, reduced abortions, and men's access to leave (Anthony 2008). Opposition was driven to a large extent by its perceived costs to employers. Currently 25 states, most notably California, have more generous parental leave provisions than the federal law.

In 1996, the EU Directive on Parental Leave ratified rights to at least three months' parental leave for childcare purposes, over and above maternity leave rights, seeking to “facilitate the reconciliation of parental and professional responsibilities for working parents.” The EU Directive also encouraged member states to limit transferability of each parent’s rights across parents, so as to achieve a more equal participation of parents to childcare. The 2010 Parental Leave Directive further extended leave rights to four months. Pro-natal motives often underpinned the recent waves of parental leave and other family policy reforms, with the aim to cope with falling birth rates below replacement levels and demographic aging in several European countries (Raute 2015).

While maternity or parental leave has historically been the most important dimension of family policies, the introduction of leave rights was followed, with long and varying lags, by other family-friendly policies such as public or subsidized child-care, workplace practices such as part-time work or flexible working time, and in-work benefits for parents. The rationale behind these policies was often to encourage fertility while limiting the career penalty of motherhood.

Family Policies in OECD Countries

At present, all high-income industrialized countries have in place paid maternity leave rights (with the exception of the United States where this is unpaid), and provide some support, in cash or kind, for child care. Table 1 provides a snapshot of some key family policies in a recent cross-section of developed economies, including the US, Canada, Australia, Japan and 11 large European countries. All indicators reported are obtained from the OECD Family Database and Social Expenditure database and refer to the latest available year, between 2011 and 2015.³

Countries are organized in decreasing order of duration of job-protected leave provisions for mothers, which is reported in column 1. This includes maternity leave and the maximum job-protected parental leave available to mothers for home care of children, whether or not income support is also included. For simplicity we will refer to this variable as “parental leave.” The median parental leave is about 60 weeks, with very wide variation across countries, summarised by a standard deviation of almost exactly one year. Germany, France, Spain and Finland have leave entitlements above three years, followed by Norway and Sweden with around 20 months of entitlement. At the other extreme, the United States has 12 weeks of parental leave. While this figure refers to federal entitlements, there are currently 25 states that have expanded in some way or another upon federal legislation. Interestingly, cross-country variation in parental leave rights is much wider than in other labor market institutions such as the unemployment benefit replacement ratio and the tax wedge – and, as we will discuss later, wider than in gender employment outcomes.⁴

Variation in maternity leave provisions around the time of childbirth, shown in column 2, is modest in comparison, with most countries ranging between 14 and 22 weeks. As shown in column 3, on average about one-third of this time must be taken before birth. The bans that some countries have on working during late pregnancy are likely a vestige of

³ Table A2, available online with this paper at <http://e-jep.org>, reports this information for a larger sample of 30 OECD countries.

⁴ The cross-country coefficient of variation in the length of parental leave is between 2 and three times the coefficient of variation in the unemployment benefit replacement ratio or the tax wedge (indicators from OECD Benefit and wage data: <http://www.oecd.org/els/benefits-and-wages-statistics.htm>, and Tax Wedge data: <https://data.oecd.org/tax/tax-wedge.htm>, 2014). While leave entitlements are a good predictor of the percentage of employed women who are on leave during the first year after birth, representing a measure of their take-up rate, the corresponding correlation (measured on 18 countries for which data on take-up is available) is only 0.44.

early legislation, from a time when a larger share of jobs, like many manufacturing jobs of the past, were physically strenuous.

In all countries except the United States, a substantial portion of parental leave is paid, as shown in column 4. Leave benefits are usually funded by (a combination of) social insurance systems and employee and employer social security contributions. The proportion of previous earnings replaced by maternity benefits is on average 52 percent, based on 2014 country-specific average earnings, as shown in column 5. According to column 6, paid leave entitlement for fathers is on average 11 percent of total paid entitlement per household. Wherever parental leave is available, entitlement is not entirely transferable between parents (see OECD, 2016, for details).

Column 7 reports data on public expenditure on early childhood and educational care, in cash or kind (or, for brevity, “early childhood spending”). This is on average 0.8 percent of country-specific GDP, but up to 2% in Denmark, and above 1% in the rest of Scandinavia, the UK and France. North American and southern EU countries have the lowest rates of early childhood spending. In the United States, early childhood spending is 0.4 percent of GDP.

The final column of Table 1 reports an indicator of work time flexibility, which is only available for EU member states. On average, 56 percent of firms across EU countries offer employees the opportunity to accumulate days off and to vary the start and end of daily work. This proportion falls below 40 percent in southern Europe and rises above 75 percent in Scandinavia.

In comparing family policies in Table 1, it’s important to bear in mind that the introduction of parental leave rights and family-related subsidies has often been accompanied by or has followed changes in a country’s social norms and attitudes towards gender roles in the home and the market. For example, while family policy legislation in the post-war period reflected the role of women as primary providers of child and home care, women’s movements of the late 1960s contributed to introduce the first elements of equal parental treatment in family intervention. In reality, different countries may be adopting, say, generous parental leave acting out of quite different motivations, and it would not be clear a priori whether this is more in line with paternalistic considerations of protecting the “weak” or goals of gender equality.⁵

⁵ Previous work has shown that countries with more conservative gender norms exhibit lower female employment rates, higher gender gaps in college education, and disproportionately lower marriage rates for highly-educated women (see, among others, Fortin, 2005, and Bertrand et al., 2016). However, less is known about how family policies correlate to such norms.

To give an example, women in Denmark and Italy have very similar entitlement to parental leave around 50 weeks, with nearly identical replacement ratios. However, maternity leave extensions in Italy happened mostly before the 1960s, with long mandatory absence periods before and after birth, especially in manufacturing and agriculture, and no provisions for fathers. In Denmark, the bulk of parental leave legislation came into play after 1960, during decades of rapidly evolving social norms, and with limited substitutability between maternal and paternal leave rights. Comparable maternal leave rights are currently coexisting with relatively gender-biased norms in Italy – where, according to the European Value Survey, 70% of the population agree or strongly agree with the statement “Pre-school children suffer from a working mother”, but with much more gender-neutral attitudes in Denmark – where only 10% of the population do so. In fact, cross-country evidence does not reveal any clear-cut association between the generosity of parental leave and answers to gender-related survey questions.⁶ However, countries with more conservative views on men and women’s roles in society tend to spend less on early childhood education and care, and are less likely to accommodate flexible working arrangements.

Framework

Most family policies are intended to encourage female labor supply. For example, subsidized childcare seeks to provide direct substitutes for maternal childcare. Maternity leave seeks to enable mothers to stay attached to the labor market during temporary interruptions of employment, while retaining firm-specific or occupation-specific human capital. Similar arguments can be made for flexible or part-time work arrangements. However, extended maternity leave may have detrimental effects on female labor supply in the long-run if it induces women to stay out of work for long enough, or repeated, periods in a way that hinders them from re-entering employment on the same pre-maternity track.

Besides these first-order impacts on labor supply, family policies may feed into labor demand decisions via at least two channels. On the one hand, insofar as part of the costs of these arrangements directly or indirectly trickles down on employers, the demand for female labor (and especially for women of child-bearing age) would be negatively affected. On the

⁶ In Table A3 of the online Appendix, we show bilateral correlations between each policy indicator reported in Table 1 and several qualitative measures of gender norms from the World Values Survey and the European Values Study.

other side, if family policies effectively ease continuity of employment for mothers, and their enhanced labor market attachment is incorporated into employers' beliefs, the extent of statistical discrimination (if any) against women would be reduced, with beneficial effects on labor demand for women.

In a competitive labor market with imperfect substitution of inputs, the change in the gender wage ratio as a result of family policies is theoretically ambiguous, depending on the relative shifts in labor supply and labor demand and the context in which such shifts occur. For example, if equal pay legislation effectively prevents a fall in female wages, then policies that would raise the cost of hiring women may lead to a fall in female employment at constant wages. Similar effects are to be expected in the presence of union contracts or binding minimum wages. In most countries considered, collective wage negotiations set gender-neutral, industry-specific wage floors. If such floors are above equilibrium wages, most of the effect of family legislation would show up in gender differences in employment rates.

The case of in-work government benefits for lower-wage workers is different, as it implies an increase in female labor supply, at no extra cost for employers, leading to an increase in employment and a fall in wages paid by employers to such workers (unless such wages are sticky downward).

If the labor market is not perfectly competitive—for instance, due to job search frictions and imperfect labor mobility—policies that ease continuity of job-workers relationships could be especially valuable in allowing women to retain their match-specific search capital after childbirth. In this setting, firms would have a degree of monopsony power and workers would be paid below their marginal product, according to the wage elasticity of labor supply to the individual employer (Manning, 2003). In this case, the costs of family policies may be absorbed by the wedge between the wage and the marginal product, without a detrimental impact on female employment. In particular, Manning (2003, ch. 7) argues that, as women with domestic responsibilities may be relatively more restricted in commuting time, hours of work and other non-wage attributes, their labor supply to the individual firm may be less wage-elastic than male labor supply, implying a higher wedge for women than for men.

In summary, the introduction of family policies might be expected to lead to an increase in female employment and possibly a fall in female relative wages, depending on wage elasticities of labor demand and supply. As these elasticities may vary with skill, age and family composition of women, the effects of policy intervention may be heterogeneous

along these and other dimensions. Wage effects may be mitigated or even reversed whenever continuous labor market attachment or labor market experience is highly valuable, as in the presence of search frictions, high returns to actual labor market experience and feedback mechanisms onto employers' beliefs. On the other hand, theories of gender statistical discrimination suggest that these policies might backfire by reinforcing employers' beliefs and social norms regarding women's comparative advantage in childcare and home production more generally.

Cross-Country Evidence

Given wide international variation in family policies, several papers have compared institutions and gender labor market outcomes across high-income OECD countries. In a prominent early study, Ruhm (1998) examined the effect of parental leave on female employment and wages during 1969-1993 in nine EU countries that experienced significant changes in their respective leave mandates. His analysis indicates that short periods of paid entitlement around three months lead to a 3 to 4 percent rise in female employment rates, with little impact on wages, while longer entitlements of more than nine months lead to negligible additional impact on employment but sizeable negative impacts of about 3 percent on female wages. Such employment effects can be generated by stronger labor market attachment during job-protected leave and the right of mothers to return to pre-birth jobs, as well as entitlement effects for women who would not otherwise participate in the labor force but intend to accumulate work experience to later qualify for leave benefits. Detrimental wage effects after long periods of absence may be driven by loss of actual labor market experience, as well as and nonwage costs to firms such as disruption and replacement costs. Given the employment effects of leave, changes in wages may also result from the outward shifts in female labor supply and/or selection effects on the composition of female employment.

There are caveats to a causal interpretation of these results, duly noted by Ruhm (1998). In particular, the estimates overstate the true impact of leave rights in so far as their extension is accompanied by the implementation of other family-friendly policies, such as subsidized childcare. Furthermore, female labor supply shifts may create political support for

parental leave rights and lead simultaneously to both extended rights and higher female employment rates.

The general approach in Ruhm (1998) has been extended by later work to cover more recent years, a wider set of countries, and a richer set of institutions. Thévenon and Solaz (2012) broadly confirm Ruhm's findings on a cross-section of 30 countries observed between 1970 and 2010. Using data on a sample of 17 high-income OECD countries for 1990-2010, Blau and Kahn (2013) find that gender gaps in both employment and wages shrink with parental leave rights, the generosity of benefits, the right of part-time work, and equal treatment legislation (although only the effects of the latter two are statistically significant). The authors conclude that the expansion of these policies outside the United States is an important factor behind weaker female employment growth in the United States since the early 1990s, relative to other OECD countries. Cipollone, Patacchini, and Vallanti (2014) find evidence of heterogeneous policy effects by showing that female participation of medium- and highly-educated women is more responsive to family-oriented policies – as measured by a synthetic index encompassing parental leave, family subsidies and elderly subsidies – than participation of less-educated women.

A few papers have exploited the staggered introduction of parental leave rights across geographies within a country. Baum (2003) focuses on the partial state-level adoption of leave rights in the United States, ahead of the Family and Medical Leave Act in 1993, and fails to detect any significant impact of leave rights on employment or wages of mothers. Using a similar approach, Han et al. (2009) detect detrimental employment effects of parental leave and welfare benefits, and positive effects of childcare spending, for single mothers and the less-skilled. Baker and Milligan (2008) finds that the introduction of leave rights in Canadian provinces delays return to work of mothers shortly after birth, but eases returns to the pre-birth employer.

Below we complement existing cross-country evidence by bringing together data on 30 countries that are currently in the OECD. Figure 1 summarizes evidence on female employment in these countries since the 1970s (or the 1980s wherever earlier data are not available). The employment rate is measured as the number of individuals aged 25-54 who are employed, divided by the relevant population. Countries are ranked in ascending order of female employment in the 2010s, ranging from 28% in Turkey to 79% in Iceland. The average employment rate in the sample is currently 60%, with a standard deviation of 10%. The US female employment rate of 62% is just above the sample average. Scandinavian countries rank towards the top of the chart, followed by most English-speaking countries,

while southern European countries and lower income countries rank towards the bottom. In relative terms, there is much wider variation in parental leave rights across these countries than in female employment. In most countries, female employment has increased in recent decades, from 49% on average in the 1980s to 60% in the 2010s. However, there is no evidence of narrowing differences in female employment across countries. Until the 1990s, the female employment rate in the US was among the highest in this sample of countries, but it actually declined since then, from about 66% in the 1990s to about 62% in the 2010s, and now ranks very close to the sample median.

Data on labor market outcomes and institutions are brought together in Table 2, in which six family policies are considered. The four columns show four different outcomes: the female employment rate; the gender gap in employment – measured by the difference between male and female employment rates; the gender wage gap – computed as the log of the ratio between median earnings of working age men and women for full-time employees; and the total fertility rate – defined as the total number of children that would be born to each woman throughout her childbearing years. The table reports raw correlations between such average outcomes for 2010-2014, and the family policy indicators reported in Table 1.

The first two policy choices, maximum weeks of leave available to mothers and total paid leave available to mothers, have a negative, statistically significant correlation with the gender gap in employment. These correlations are overall robust, i.e. they're not driven by any small subset of countries in particular, as it can be grasped visually in Figure 2, which plots the gender gap in employment rates against the maximum weeks of job-protected leave available to mothers. The length and financial coverage of parental leave are also negatively correlated to the rate of fertility, but such correlations are entirely driven by the presence of the four eastern European countries in our sample, that are characterized by record low fertility and generous leave provisions. If one removes Poland, Czech Republic, Hungary and Slovakia from this sample, the correlation between the fertility rate and the length of parental leave becomes small and statistically insignificant.

The next two policy choices, paid leave for fathers and the average payment to mothers as a share of average earnings, are not significantly associated with any of the outcome variables. The final two policy choices, spending on early childhood education and care and the index of workplace flexibility, are positively correlated to female employment and negatively correlated to the employment gap. These correlations are very strongly significant and robust to the exclusion of (small) geographic clusters of countries. Early childhood spending is the only one of these policies to have a positive (and robust)

correlation with the fertility rate. None of the policy variables are significantly correlated with the gender earnings gap.⁷

We have explored these correlations further, looking at different groups of women. When we differentiate relevant outcomes across three skill groups—below secondary education, secondary education, and tertiary education—the results show that only for the less-skilled are female earnings higher in countries with flexible working arrangements. On the other hand, correlations with employment outcomes are consistent across the skill distribution.⁸

We next look at the impact of family policies on gender outcomes exploiting their evolution over time, and controlling for country and year fixed-effects – while bearing in mind the caveats to a causal interpretation of coefficients expressed above. The results are reported in Table 3, which considers the same four outcomes as in Table 2: the female employment rate, the gender gap in employment and earnings, and the total fertility rate. For each outcome, we use two alternative specifications. The first specification (columns 1, 3, 5 and 7) only controls for the maximum job-protected leave and its square, allowing for nonlinearities in the effect of parental leave on various outcomes as in Ruhm (1998). The second specification also controls for the percentage of the total leave that is income-protected, the average replacement ratio, and the percentage of GDP that is spent on early years education. While it is important to control for other family policies, as well as parental leave, because of possible correlation between their timings of introduction, one should bear in mind that this reduces our sample size by about one third, as the average replacement ratio is not available for 8 countries in our sample.⁹

⁷ Note that variation in parental leave may itself induce mechanical variation in measured employment rates, as the employment count includes individuals at work in a reference week, as well as those who were temporarily absent from work, and parental leave is among named reasons for such temporary absence. Thus an individual who is not working t months after childbirth may be classified as employed in a country with leave entitlement longer than t , and nonemployed in a country with shorter entitlement, despite performing the same activity in the two contexts. We then compare male and female ILO employment rates to employment rates obtained by classifying as nonemployed any individual temporarily absent from work due to parental leave. We can only perform this exercise for countries covered by the Eurostar Labor Force Survey and the United States, based on the Current Population Survey. Excluding workers on parental leave barely alters male employment rates, with the exception of Iceland and Sweden, with relatively generous paternity leave provisions and high take-up rates. By contrast, female employment rates would be on average 2 percentage points lower with the second definition of employment status – ranging between 3.3 percentage points in Austria and Scandinavian, to virtually zero in the United States. For details, see Table A4 in the online Appendix, in which countries are sorted according to the discrepancy between the two alternative employment measures for women.

⁸ For details of these additional correlations, see Table A5 of the online Appendix.

⁹ These are: Czech Republic, Hungary, Iceland, Korea, Mexico, Poland, Slovakia and Turkey. The replacement ratio data for 1970-2010 are available from the Max Planck Institute for 22 countries, while OECD data on replacement ratios are only available for 2015. If one drops the replacement rate from the regressions, while still

Results reported in the first two columns confirm Ruhm's (1998) findings of a non-monotonic relationship between the duration of parental leave and female outcomes. In our case, however, this holds irrespective of whether the leave is paid, while Ruhm's analysis focuses on paid leave. Our estimates in the full specification of column 2 imply that female employment rises with job-protected parental leave up to 50 weeks and declines thereafter. Quantitatively, however, this effect is small – with a maximum 1.6 percentage point gain, corresponding to 3 percent of the sample average.¹⁰ If the US – with currently 12 weeks of entitlement – were to extend entitlement to 70 weeks as in Sweden, the resulting gain in US female employment would be 1.4 percentage points. Conditional on the length of leave entitlements, female employment falls with the percentage of the total leave that is paid and the average replacement ratio, and rises with early years spending. Half a percentage point increase in early years spending (corresponding to roughly its standard deviation in this sample) is associated to 1.8 percentage point increase in female employment.

Column 3 of Table 3 shows results for the difference between male and female employment rates. Because this is a gender gap, it also takes into account the effects, if any, of parental leave on male employment rates. The coefficients on parental leave rights are smaller (in absolute value) than in column 1, which is consistent with a finding that male employment responds to the length of parental leave in the same direction as female employment, but with reduced magnitude. The estimated effect of parental leave becomes non significantly different from zero in column 4, whose sample is restricted to the set of countries for which information on the replacement ratio is available.

Columns 5 and 6 show results for earnings gaps, measured as gender differences in median log annual earnings for fulltime workers, and thus encompassing differences in weeks worked as well as differences in weekly wages. Wage effects may in turn be driven by both a causal impact of policy on wages of those in employment, and the changing composition of employment along wage characteristics. The specification in column 5 shows evidence of closing earnings gaps during the first eight months of parental leave, but quantitatively this effect is tiny and non significantly different from zero. The impact of parental leave on the earnings gap becomes significant and sizeable in the specification of column 6. One possible explanation for the different results is that the results of column 6 are obtained after dropping

controlling for the percentage of parental leave that is income-protected and early years spending, the estimated effect of parental results is very similar to the one obtained when parental leave is the only included regressor.

¹⁰ Based on a specification of the relationship between employment and parental leave duration of the type: $y = \beta_1 w - \beta_2 w^2 / 100$, where y denotes employment rates and w denotes weeks of parental leave, the maximum employment effect is detected in correspondence of $w = 50 \beta_1 / \beta_2$ weeks, and it is equal to $25 \beta_1^2 / \beta_2$.

from our working sample countries without available information on the replacement ratio, which happen to have systematically lower rates of union density than the rest of the countries.¹¹ In other words, the results of column 6 are obtained on a sample of countries with a lower average incidence of binding union contracts than those of column 5, and thus provide evidence of a more sizeable wage response to policy in a context in which wages are relatively more flexible. Overall, coefficients on parental leave denote a stronger effect on earnings gaps in column 6 than on employment gaps in column 4, which implies that wage gaps are also closing for a wide range of parental leave durations.

Column 6 also shows evidence of a relatively strong effect of early years spending on closing earnings gaps, which is larger than the corresponding effect on employment gaps in column 4. By the same logic, this implies that wage gaps are predicted to shrink with childhood spending.

In columns 7 and 8, we show that the effect of parental leave on fertility is also non-monotonic, but quantitatively this is negligible throughout, independent of the specification used, consistent with Shim's (2014) finding that fertility decisions are not much responsive to parental leave unless leave is also adequately paid. Early childhood spending has a sizeable correlation with raising fertility, with one extra percentage point of GDP spending associated with 0.2 extra children per woman. The results reported in column 9 are overall consistent with Adema, Ali and Thévenon's (2014) findings that public spending on family benefits and the duration of paid child-related leave for mothers is significantly associated with an increase in the total fertility rate.

In Table 4, we consider heterogeneous policy effects by educational attainment. The sample size is much smaller, due to more limited availability of outcome data, and to save on degrees of freedom we only report specifications based on the whole sample, which only control for parental leave entitlements. For simplicity we do not report regression results for employment gaps, and we cannot report results for fertility, as the fertility rate is only available for the overall population. Thus, the focus here is on female employment and earnings gaps. The notable result from these skill-specific regressions is that the beneficial effects of leave entitlement on female employment are mostly confined to less-skilled women, while high-skill women see their relative earnings fall as a consequence of longer entitlements.

¹¹ Average union density in the Czech Republic, Hungary, Iceland, Korea, Mexico, Poland, Slovakia and Turkey is 21% (down to 12% excluding Iceland), against 31% in the other countries in our sample.

Taken together, these findings suggest that moderate job-protected leave entitlements — up to about 1 year in our estimates — are associated with higher female employment while not having much correlation with fertility. However, beneficial effects are driven by the low-skill subsample, with possibly detrimental effects for the more educated. Longer and more generously paid entitlements may instead be detrimental for female employment at all skill levels. These effects are consistent with a pattern of progressive labor market detachment during long periods of absence, potentially combined with negative feedback effects on employers' beliefs about work attachment. For college-educated women, longer parental leave seems instead associated to wider earnings gaps. The returns to job-specific experience for this group is plausibly higher than for the less-skilled, and skilled women have more to lose from missed opportunities of career advancements. The one indicator that is across the board associated to more equal gender outcomes is spending in early childhood education and care. Presumably the availability of cheap substitutes to maternal care encourages female labor supply with positive, rather than negative, effects on the accumulation of actual experience.

Micro-level Studies

The micro-level approach aims to identify the causal impact of family policies on several labor market outcomes by focusing on specific country reforms and combining rich micro data – often social security records with detailed information on births, working hours, earnings, and leave take-up – and variation from natural experiments. In this section, we discuss available micro-level evidence on the impact of parental leave, subsidized childcare, and in-work benefits.

Maternity and Parental Leave

A few decades ago, a major Austrian reform extended the duration of parental leave from one to two years for children born after July 1, 1990. Lalive and Zweimueller (2009) used the period before and after this time as a natural experiment for analyzing the effects of these changes in entitlement on fertility and mothers' labor market outcomes. Based on variation across births on either side of policy introduction, the authors detect substantial fertility effects of leave extension, accounting for 12 additional children per 100 women. Extended leave also delays return to work of mothers, even after the benefits are exhausted,

resulting in significant reductions in female employment and earnings during the first three years after birth, but only minor effects beyond three years. While fertility effects are stronger for women with below-median pre-birth earnings, the short-run reduction in earnings is larger for high-wage than low-wage women. Later Austrian reforms of 1996 and 2000 shortened and extended, respectively, entitlement to replacement benefits, leaving job protected leave unchanged, and Lalive et al. (2013) estimate that longer cash benefits significantly delay return to work of mothers when leave is job-protected, but less so once job protection has expired.

Germany enacted five major expansions in maternity leave coverage between 1979 and 1993, which led to gradual and staggered extensions in job-protected leave from 2 to 36 months, and in the time of receipt for cash benefits from 2 to 24 months. Schoenberg and Ludsteck (2014) find that extension of coverage at short durations leads to small delays in return to work, and extension at long durations lead to larger delays, but it has almost no effect on employment rates and earnings for women more than three years after childbirth. However, extensions of cash benefits beyond the job protection period produce significant long-run employment and earnings losses for affected mothers, which suggests a role for job guarantees in avoiding long-lasting negative effects of benefit extensions.

Norway enacted a series of seven expansions in paid maternity leave, which nearly doubled from 18 weeks in 1977 to 35 weeks in 1992. Dahl et al. (2016), using a regression discontinuity approach based on timing of births, find that the leave expansion didn't crowd out unpaid leave, thereby substantially expanding maternal time at home and out of the labor market in the months following birth, without a reduction in household income. Other than delaying the return to work, the reforms did not have a discernible impact on female labor supply in the long-run, fertility, marriage, divorce or children's schooling outcomes. The authors also note that the extension in paid leave implied regressive transfers towards eligible women, who had systematically higher income than the non-eligible, and hence conclude that available evidence on social benefits and redistribution may not support the case for extensions to maternity leave.

In a 2007 reform, Germany linked maternity benefits to pre-birth income for up to 14 months after birth, thus raising the financial incentives to take-up parental leave for higher-earning women. This reform appears to have significantly delayed the return to work of affected mothers during the first year after birth, but enhanced female employment in the medium run (Kluve and Tamm, 2013). Medium run employment gains however seem to be limited to part-time jobs, with no discernible impact on full-time employment (Kluve and

Schmitz, 2014). Raute (2015) investigates fertility effects of the 2007 German reform and finds sizeable fertility gains for women with above-median earnings and older women.¹²

While most high-income countries currently have in place leave provisions for fathers, their relatively recent introduction, as well as their more limited take-up rate, imply that the evaluation of their effects on female outcome is still in its infancy. Available evidence shows that the introduction of one month of exclusive paternity leave in Sweden in 1995 increased fathers' time off work after birth, while it did not alter fathers' share of child care, as measured by their take-up rate of leave of care of sick children (Eckberg et al, 2013). To date there is thus no evidence of beneficial impacts on paternity leave rights on mothers' careers, but the recent extension of exclusive father's leave in other European countries will hopefully produce further evaluations of their impact on mothers' labor market outcomes.

Subsidized Childcare

In several countries, parents returning to work after childbirth continue to receive state support in the form of subsidized or publicly provided child care and preschool programs. For the United States, Cascio and Schanzenbach (2013) evaluate the impact of the introduction of universal pre-school for four year-olds in Oklahoma and Georgia since the 1990s, and find only mild evidence of such programs on maternal labor supply, exploiting both state-level variation in policy adoption and age targets. Despite a substantial increase in pre-school enrollment among four year-olds, maternal employment gains are limited to the less-skilled and only during the first few years after the program is in place. Other studies have found that kindergarten increases maternal labor supply. Gelback (2002) uses quarter of birth as an instrument for when children enrol in kindergarten, based on the fact that many states determine kindergarten enrolment based on a child's birthdate, and finds using data from the 1980 Census that child enrolment in kindergarten substantially raises weekly hours, annual weeks and employment rates for single mothers, but less so for married mothers. Similar qualitative effects of kindergarten subsidies are documented by Cascio (2009), who looks at staggered patterns of state-level provision of subsidies to school districts providing kindergarten in the 1960s and 1970s.

¹² The discussion here is not intended to be a comprehensive literature review. See, among others, Geyer et al. (2015) for an analysis of the employment effects of higher leave benefits in Germany and Asai (2015) for a similar study on Japan. Rossin-Slater, Ruhm and Waldfogel (2013) show that the expansion of paid leave policy in California did not have a negative impact on employment.

The Canadian province of Québec introduced child-care subsidies for four year-olds in 1997, combined with wider availability and high quality of service. Lefebvre and Merrigan (2008) find a sizeable impact of this scheme on maternal outcomes of Québec mothers relative to other provinces, leading to 8 percentage points higher labor force participation, and 231 extra annual hours. In follow-up work, Lefebvre, Merrigan and Verstraete (2009) and Haeck, Lefebvre and Merrigan (2015) find that these beneficial effects for mothers' outcomes persist in the long-run.

Norway undertook a large-scale expansion in subsidized public childcare in 1975. Havnes and Mogstad (2011,a) find that despite a high take-up rate, subsidies did not encourage maternal employment, by largely crowding-out informal childcare arrangements. Similar conclusions for more recent years are drawn by Givord and Marbot (2015) for the French case, in which an average 50 percent subsidy to childcare spending introduced in 2004 only raised female participation by 1 percentage point. Bettendorf et al. (2015) and Nollenberger and Rodríguez-Planas (2015) detect slightly stronger effects for the Netherlands and Spain, respectively.

Unsurprisingly, micro-level studies finds relatively smaller effects of childcare subsidies in countries with relatively low childcare costs at baseline (like Norway and France) than in countries in which the cost of childcare is higher (e.g. the US and Canada).

In-work Benefits

By providing tax credits (mostly) to low-income workers with children, in-work benefits combine poverty alleviation with incentives to work. Brewer et al. (2009) and Blundell and Hoynes (2004) provide cross-national overviews on in-work benefits.

Although these tax credits are not primarily targeted to female labor force participation, eligibility and take-up rates are higher among mothers than fathers. A large literature has examined the labor supply effects of the Earned Income Tax Credit (EITC) in the United States, most notably for single mothers. Nichols and Rothstein (2016) survey this literature and highlight a consensus around the sizeable positive effects of the EITC on the labor supply of single mothers, especially for the less-skilled, with most estimates ranging between 3-6 extra percentage points of participation (for example, Hotz and Scholz 2003). The effects of interest are mostly identified via an expansion of the EITC for multi-children households, or via state-level changes in the generosity of benefits. The estimated effects are quite different for married women: Eissa and Hoynes (2004) find evidence of small

disincentive effects on the participation rate of married women, consistent with the fact that the EITC raises average taxation on the secondary earner's earnings. Hotz and Scholz (2003), Nichols and Rothstein (2016), and references in those papers offer detailed discussion of the effects of the EITC on work, poverty, health and family outcomes.

In the United Kingdom, the main in-work benefit is the Working Family Tax Credit, introduced in 1999, and its effects on the labor supply of various groups (most notably single mothers) was evaluated both via simulations based on structural models of labor supply (Blundell et al. 2000; Brewer et al. 2006) and differences-in-differences models based on comparisons with mothers living in couple and/or single women without kids (for example, Francesconi and van der Klaauw 2007; Gregg, Harkness, and Smith 2009). The consensus from this literature is that the WFTC raised the employment rate of lone mothers by 4-5 percentage points, although the interpretation of difference in difference estimates may be complicated by the existence of trending differences in the labor force behavior of treatment and control groups, and the introduction of other welfare policies that were phased in at the same time as the WFTC, including the Childcare Credit and the New Deal for Lone Parents.

Overall, the available micro-level studies find beneficial effects of in-work benefits on female employment, although these effects are typically sizeable only for single mothers.

Multiplier Effects

While legislation on family policies typically defines eligible groups, based for example on age or cohort of children and/or family income, social interactions across peers may affect policy take-up and labor market outcomes beyond the targeted population. Failing to recognize such interdependencies (if any) has implications for the evaluation of policy intervention, as outcomes for control groups may be contaminated by interactions with the treatment group, and a comparison of outcomes between treatment and control groups would yield a downward-biased estimate of policy impact.

Contamination from the treated to the non-treated population may result from sharing information about the characteristics and availability of a certain family policy, or learning about its effects on outcomes for one's peers. Progress in the identification of these effects has been limited by well-known problems. There is the "reflection problem" of drawing an inference about how one group affects another, so-called because when two groups are changing at the same time—like your reflection changes in the mirror when you move—figuring how one group affects the other is problematic (Manski 1993). Similar issues arise

because of correlated unobservable characteristics, endogenous group membership, and the difficulties of observing peer groups in available data (Dahl, Lochen, and Mogstad 2014).

In Norway, after the introduction of one extra month of parental leave for fathers of children born after April 1, 1993, Dahl, Lochen and Mogstad (2014) sought to estimate peer effects in the take-up rate of parental leave. Before 1993, parents could share without restrictions a parental leave of given length, while the introduction of an exclusive “daddy month” was supposed to promote gender equality in the household. Taking advantage of the timing of the reform, the authors identify peer effects in the take-up rate of parental leave among both workplace and family networks using a regression discontinuity design. Their results show evidence of substantial peer effects in both networks, as co-workers and brothers of fathers induced to take-up leave by the reform became 10 and 15 percentage points more likely, respectively, to take paternity leave out of the (nonexclusive) parental quota. These effects – which are amplified over time – are interpreted as evidence of transmission of information about costs and benefits of paternal leave, eventually leading to a redefinition of social norms about parents’ roles. Welteke and Wrohlich (2016) highlight similar spillover effects in the take-up rate of parental leave among mothers, following the 2007 German reform discussed above. Future research should continue looking for potential peer effects and network effects in other programs.

Drawing lessons from macro and micro studies

While both the macro and micro literatures tend to find overall positive effects of subsidized childcare on female employment, the discussion above illustrates that no obvious consensus emerges from the literature that has studied the labor market impact of parental leave rights and benefits. Cross-country studies, with weaker identification, point to a positive correlation with maternal employment rates, albeit this effect is limited to short or intermediate leave durations, and mostly applies to less-skilled women, with virtually no impact for the more educated. Extremely long leave durations seem instead to have inhibitive effects. On the other hand, studies on micro data tend to find that parental leave mostly delays return to work, with no discernible effects on employment rates in the long run.

Several factors may potentially explain such discrepancies. First, the beneficial impact of maternity leave may be overestimated in cross-country studies insofar as exogenous shocks to female labor force participation induce family-friendly legislation via political support and/or changes in social norms towards gender roles. Second, Ruhm (1998) does detect positive effects of short-lived parental leave (around three months), and our more

recent estimates find positive effects up to 1 year and negative effects afterwards, but widespread extensions to leave rights in most countries have inevitably shifted the focus of later studies based on micro data towards variations in parental leave at much longer durations, up to three years. Thus, it might be possible that the availability of some job protection, relative to no protection at all, would ensure continuity of employment and discourage transitions out of the labor market, while further extensions would simply delay return to work without further gains in employment. Third, cross country studies often provide joint perspectives on various family-oriented policies, and Blau and Kahn (2013) find that parental leave has no significant impact on female participation once other policy instruments are controlled for. On the other hand, micro-level studies that compare employment outcomes for treated and non-treated parents may underestimate the impact of policy reforms if the behavior of treated parents induces changes in the behaviour of the non-treated via learning, imitation and other spillover mechanisms.

Conclusions

What can we learn from the evolution of family policies across high-income economies? It is a complex tale in which changing economic, cultural and political economy considerations appear to shape (and be shaped) by these policies. No obvious consensus on the labor market impact of parental leave rights and benefits emerges from the empirical literature. Although there are some exceptions, it seems fair to summarize that cross-country studies tend to find more positive effects on female employment than micro-level studies for relatively short leave durations, and more negative effects for longer entitlements. Employment and earnings impacts tend to be positive for the less-skilled, possibly with a negative effect on the earnings of high-skill women. In a nutshell, the evidence that extended parental leave rights have an overall positive effect on female outcomes is mixed.

The policies with the strongest evidence for reducing gender disparities seem to be childhood education (in both cross-country and micro data) and in-work benefits (in the micro data). A potential common theme here is that making it easier to be a working mother may matter more than the length of leave or the payments that new parents receive while out of the labor force.

The United States has been an outlier in the adoption of family policies across high-income countries since the turn of the twentieth century. As Goldin and Mitchell argue in this symposium, the female labor force participation in the US has evolved into a pattern with very high rates of employment early in the life cycle, but sharply declining with motherhood, which is being progressively delayed. The cross-country and micro-level evidence has not found an overall strong connection between maternity leave and female labor force participation. But possibly the relatively short leave entitlements available to mothers in the United States contributes to this life cycle pattern of delaying motherhood, with persistently low rates of participation while women are in their 30s and 40s.

References

- Adema, W., N. Ali and O. Thévenon (2014), “Changes in Family Policies and Outcomes: Is there Convergence?” OECD Social, Employment and Migration Working Papers, No. 157, OECD Publishing. <http://dx.doi.org/10.1787/5jz13wllxgzt-en>.
- Anthony, Deborah J. 2008. “The Hidden Harms of the Family and Medical Leave Act: Gender Neutral versus Gender Equal”. *Journal of Gender, Social Policy and the Law* 16: 459-501.
- Asai, Yukiko, 2015. “Parental leave reforms and the employment of new mothers: quasi-experimental evidence from Japan.” *Labour Economics*. 36, 72–83.
- Baker, Michael and Kevin Milligan. 2008. “How Does Job Protected Maternity Leave Affect Mothers' Employment?” *Journal of Labor Economics* 26: 655-691.
- Baum II, Charles. 2003. “The Effect of State Maternity Leave Legislation and the 1993 Family and Medical Leave Act on Employment and Wages”. *Labour Economics* 10: 573-596.
- Bertrand, Marianne, Patricia Cortes, Claudia Olivetti and Jessica Pan. 2016. “Social Norms, Labor Market Opportunities, and the Marriage Market Penalty for Skilled Women.” NBER Working Paper 22015.
- Blau, Francine and Lawrence Kahn. 2013. “Female Labor Supply: Why is the United States Falling Behind?” *American Economic Review Papers and Proceedings* 103: 251-256.
- Bettendorf, Leon J.H., Jongen, Egbert L.W., Muller, Paul, 2015. “Childcare Subsidies and Labour Supply – Evidence from a Dutch Reform”. *Labour Economics* 36: 112–123.
- Blundell, R., A. Duncan, J. McCrae and C. Meghir. 2000. “The Labour Market Impact of the Working Families' Tax Credit.” *Fiscal Studies* 21: 75-104.
- Blundell, R. and H. Hoynes. 2004. “Has In-work Benefit Reform Helped the Labour Market?” In R. Blundell, D. Card and R. Freeman (eds.) *Seeking a Premier League Economy*, pp. 411-460. Chicago: University of Chicago Press.
- Brewer, M., A. Duncan, A. Shepard and M. J. Suarez. 2006. “Did Working Families' Tax Credit Work? The Impact of In-work Support on Labour Supply in Great Britain.” *Labour Economics* 13: 699-720.
- Brewer, M., M. Francesconi, P. Gregg and J. Grogger. 2009. “Feature: ‘In-work’ Benefits Reform in a Cross-National Perspective - Introduction”. *Economic Journal* 119: F1-F14.
- Cascio, Elizabeth. 2009. “Maternal Labor Supply and the Introduction of Kindergartens into American Public Schools.” *Journal of Human Resources*, 44:1 (Winter), 140-170
- Cascio, Elizabeth and Diane Schanzebach. 2009. “The Impacts of Expanding Access to High-Quality Preschool Education.” *Brookings Papers on Economic Activity*, Fall: 127-178.
- Cipollone, Angela, Eleonora Patacchini and Giovanna Vallanti. 2014. “Female Labor Market Participation in Europe: Novel Evidence on Trends and Shaping Factors.” *IZA Journal of European Labor Studies*: 3-18.

Dahl, Gordon, Katrine Løken and Magne Mogstad. 2014. "Peer Effects in Program Participation." *American Economic Review* 104: 2049-2074.

Dahl, Gordon, Katrine Løken, Magne Mogstad and Kari Vea Salvanes. 2016. "What is the Case for Paid Maternity Leave?" *Review of Economics and Statistics* 98: 655-670.

Eissa, Nada and Hilary Hoynes. 2004. "Taxes and the Labor Market Participation of Married Couples: The Earned Income Tax Credit." *Journal of Public Economics* 88: 1931-1958.

Ekberg, John, Rickard Eriksson and Guido Friebel. 2013. "Parental Leave — A Policy Evaluation of the Swedish "Daddy-Month" Reform". *Journal of Public Economics* 97: 131-143.

EUROPEAN AND WORLD VALUES SURVEYS FOUR-WAVE INTEGRATED DATA FILE, 1981-2004, v.20060423, 2006. Aggregate File Producers: Análisis Sociológicos Económicos y Políticos (ASEP) and JD Systems (JDS), Madrid, Spain/Tilburg University, Tilburg, The Netherlands. Data Files Suppliers: Analisis Sociologicos Economicos y Politicos (ASEP) and JD Systems (JDS), Madrid, Spain/Tilburg University, Tilburg, The Netherlands/ Zentralarchiv fur Empirische Sozialforschung (ZA), Cologne, Germany:) Aggregate File Distributors: Análisis Sociológicos Económicos y Políticos (ASEP) and JD Systems (JDS), Madrid, Spain/Tilburg University, Tilburg, The Netherlands/Zentralarchiv fur Empirische Sozialforschung (ZA) Cologne, Germany.

Fortin, Nicole. 2005. "Gender Role Attitudes and the Labour Market Outcomes of Women across OECD Countries." *Oxford Review of Economic Policy* 21: 416-438.

Francesconi, M. and W. van der Klaauw. 2007. "The Socioeconomic Consequences of 'In-work' Benefit Reform for British Lone Mothers." *Journal of Human Resources* 42: 1-31.

Flood, Sarah, Miriam King, Steven Ruggles, and J. Robert Warren. *Integrated Public Use Microdata Series, Current Population Survey: Version 4.0*. [Machine-readable database]. Minneapolis: University of Minnesota, 2015.

Gauthier, A.H. 2011. Comparative Family Policy Database, Version 3 [computer file]. Netherlands Interdisciplinary Demographic Institute and Max Planck Institute for Demographic Research (distributors).

Gelbach, Jonah B. 2002. "Public Schooling for Young Children and Maternal Labor Supply." *American Economic Review* 92: 307-322.

Geyer, Johannes, Haan, Peter, Wrohlich, Katharina, 2015. "The effects of family policy on maternal labor supply: combining evidence from a structural model and a quasi-experimental approach." *Labour Economics* 36: 84-98.

Givord, Pauline and Claire Marbot. 2015. "Does the Cost of Child Care affect Female Labor Market Participation? An Evaluation of a French Reform of Childcare Subsidies". *Labour Economics* 26: 99-111.

Goldin, Claudia. 1988. "Maximum Hours Legislation and Female Employment: A Reassessment." *Journal of Political Economy* 96: 189-205.

Goldin, Claudia and Josh Mitchell. "The New Lifecycle of Women's Employment: Disappearing Humps, Sagging Middles, Expanding Tops." *This Journal*.

Gordon B. Dahl, Katrine V. Løken, Magne Mogstad and Kari V. Salvanes. 2016. "What is the case for Paid Maternity Leave?" *Review of Economics and Statistics*, forthcoming.

Gregg, Paul, Susan Harkness and Sarah Smith. 2009. "Welfare Reforms and Lone Parents in the UK". *The Economic Journal* 119: F38-F65.

Harris, Henry J. 1919. "Maternity Benefit System in Certain Foreign Countries." US Department of Labor, Children's Bureau. Legal Series No. 3, Bureau Publication No. 57, Washington, Government Printing Office.

Haeck, Catherine, Pierre Lefebvre and Philip Merrigan (2015). "Canadian Evidence on Ten Years of Universal Preschool Policies: The Good and the Bad". *Labour Economics* 36: 137-157.

Han, Wen-Jui, Christopher Ruhm, Jane Waldfogel and Elizabeth Washbrook. 2009. "Public Policies and Women Employment after Childbearing". NBER Working Paper No. 14660.

Havnes, Tarjei and Magne Mogstad. 2011, a. "Money for Nothing? Universal Child Care and Maternal Employment." *Journal of Public Economics* 95: 1455-1465.

Hotz, Joseph V. and John K. Scholz. 2003. "The Earned Income Tax Credit." In *Means Tested Transfer Programs in the United States*, ed. R. Moffitt, 141--197. Chicago: University of Chicago Press.

Kluge, Jochen and Sebastian Schmitz. 2014. "Social Norms and Mothers' Labor Market Attachment. The Medium-run Effects of Parental Benefits," Discussion Paper 481, Ruhr Economic Papers.

Kluge, Jochen and Marcus Tamm. 2013. "Parental Leave Regulations, Mothers' Labor Force Attachment and Fathers' Childcare Involvement: Evidence from a Natural Experiment." *Journal of Population Economics* 26: 983-1005.

Lalive, Rafael and Josef Zweimüller. 2009. "How Does Parental Leave Affect Fertility and Return to Work? Evidence from Two Natural Experiments." *Quarterly Journal of Economics* 24: 1363-1402.

Lalive, Rafael, Analía Schlosser, Andreas Steinhauer and Josef Zweimüller. 2013. "Parental Leave and Mother's Post Birth Careers: The Relative Importance of Job Protection and Cash Benefits." *Review of Economic Studies* 81: 219-265.

Lefebvre, Pierre and Philip Merrigan. 2008. "Child-Care Policy and the Labor Supply of Mothers with Young Children: A Natural Experiment from Canada." *Journal of Labor Economics* 23: 519-548.

Lefebvre, Pierre, Philip Merrigan and Matthieu Verstraete. 2008. "Dynamic Labour Supply Effects of Childcare Subsidies: Evidence from a Canadian Natural Experiment on Low-Fee Universal Child Care". *Labour Economics* 16: 490-502.

Manning, Alan. 2003. *Monopsony in Motion*. Princeton: Princeton University Press.

- Manski, Charles. 1993. "Identification of Endogenous Social Effects: The Reflection Problem." *Review of Economic Studies* 60: 531-542.
- Nichols, Austin and Jesse Rothstein. 2016. "The Earned Income Tax Credit." In Robert A. Moffitt, (ed.), *Economics of Means-Tested Transfer Programs in the United States*. Chicago: University of Chicago Press.
- Nollenberger, Natalia, Rodríguez-Planas, Nuria, 2015. "Full-time universal childcare in a context of low maternal employment: quasi-experimental evidence from Spain." *Labour Economics*. 36, 124–136.
- OECD (2014), OECD Social Expenditure Database (SOCX), www.oecd.org/social/socialpoliciesanddata/social-expenditure-databasesocx.htm.
- OECD-Social Policy Division-Directorate of Employment, Labour and Social Affairs (2016), Family Database, "PF2.5. Trends in parental leave since 1970" and "PF2.5 Annex: Detail of Change in Parental Leave Policy, pp. 1-49" (Annex last updated 01/07/2014). www.oecd.org/els/social/family/database
- Raute, Anna. 2015. "Can Financial Incentives Reduce the Baby Gap? Evidence from a Reform in Maternity Leave Benefits". Mimeo.
- Rossin-Slater, Maya, Christopher J. Ruhm and Jane Waldfogel. 2013. "The Effects of California's Paid Family Leave Program on Mothers' Leave-Taking and Subsequent Labor Market Outcomes". *Journal of Policy Analysis and Management* 32: 224-245.
- Rothstein, Jesse. 2010. "Is the EITC as good as an NIT? Conditional cash transfers and tax incidence." *American Economic Journal: Economic Policy* 2: 177-208.
- Ruhm, Christopher. 1998. "The Economic Consequences of Parental Leave Mandates: Lessons from Europe". *Quarterly Journal of Economics* 113: 285-317.
- Schönberg, Uta and Johannes Ludsteck. 2014. "Expansions in Maternity Leave Coverage and Mothers' Labor Market Outcomes after Childbirth". *Journal of Labor Economics* 32: 469-505.
- Shim, Joyce (2014), "Family Leave Policy and Fertility Rates in OECD Countries including East Asia." Paper presented at the Population Association of America 2014 Annual Meeting, Boston, MA. <http://paa2014.princeton.edu/papers/140973>
- Thévenon, O. and A. Solaz (2012), "Labour Market Effects of Parental Leave Policies in OECD Countries", OECD Social, Employment and Migration Working Papers, No. 141, OECD Publishing. <http://dx.doi.org/10.1787/5k8xb6hw1wjf-en>.
- Welteke, Clara and Katharina Wrohlich. 2016. "Peer Effects in Parental Leave Decisions". IZA Discussion Paper 10173.
- Wilkander Ulla, Alice Kessler-Harris and Jane E. Lewis. 1995. *Protecting Women: Labor Legislation in Europe, the United States and Australia, 1880-1920*. University of Illinois Press.

Appendix: Variable definitions

1. Institutions

Maximum job-protected leave available to mothers, regardless of income (weeks) is the maximum number of weeks of employment-protected parental leave available to mothers, regardless of income support. This is the sum of weeks of maternity leave, parental leave and home care. In countries where the entitlement to parental leave lasts up until the point at which the child reaches a certain age (as is the case in Germany, for example, where one parent is entitled to leave until the child's third birthday), any weeks of maternity leave that can be taken after the birth are subtracted from the duration of the parental leave. Data on leave entitlements are from the OECD Family database. See OECD "Annex to PF2.5 Trends in leave entitlements around childbirth," for further details.

- **Maternity Leave (weeks):** Is the total number of weeks of maternity leave available to employed women, regardless of income support. These are defined as employment-protected leaves of absence for employed women at around the time of childbirth, or adoption (in some countries). In many cases maternity leaves provide an entitlement to a certain number of weeks of leave just before as well as immediately after the birth. Almost all OECD countries provide women with some form of leave around childbirth. However, in some countries there is no separate regulation for maternity leave with stipulations integrated into parental leave schemes. The approach taken by the OECD is to classify any weeks of parental leave reserved for the exclusive use of the mother around childbirth as maternity leave, even if the entitlement is technically part of the parental leave program.
- **Parental and home care leave:** Parental leaves usually follow maternity and in some cases paternity leave (see below), and provide employed parents with a prolonged employment-protected leave of absence in order to care for young children. Some countries also offer home care leaves (sometimes also called child care leaves or child raising leaves) following the expiry of parental leave. These home care leaves typically allow at least one parent to remain at home with employment-protection until the child is two and in some cases three years of age.

Total paid leave available to mothers (weeks) is the number of weeks for which a mother can receive payments from the benefit attached to or associated with parental leave, regardless of the period of employment protection. Any weeks of maternity leave that can be taken after the birth are subtracted from the duration of parental leave payments in countries where payments last up until the child reaches a certain age. When several payments options are available, the highest paid (often shortest) payment option is coded.

Total paid leave available to fathers as % total paid leave available to both parents: It is calculated as the total number of weeks of employment-protected leave reserved (or effectively reserved) for the exclusive use of the father that are paid divided by the sum of total paid leave available to mothers and total paid leave available for the exclusive use of fathers.

Average payment rate for mothers in Table 1-3 and A2 is obtained from the OECD Family database, PF2.1 Key characteristics of parental leave systems. It is computed as:

$$\frac{ml_{payRate} * ml_{weeks} + pl_{payrate} * pl_{weeks}}{ml_{weeks} * 1 + pl_{weeks} * 1}$$

where

- $ml_{payRate}$: The "average payment rate" refers to the proportion of previous earnings replaced by the benefit over the length of the paid leave entitlement for a person earning 100% of average national (2014) earnings. If this covers more than one period of leave at two different payment rates then a weighted average is calculated based on the length of each period. In most countries benefits are calculated on the basis of gross earnings, with the "payment rates" shown reflecting the proportion of gross earnings replaced by the benefit. In Austria, Chile, Germany and Romania (parental leave only) benefits are calculated based on previous net (post income tax and social security contribution) earnings, while in France benefits are calculated based on post-social-security-contribution earnings. Payment rates for these countries reflect the proportion of the appropriate net earnings replaced by the benefit. Additionally, in some countries maternity and parental benefits may be subject to taxation and may count towards the income base for social security contributions. As a result, the amounts actual amounts received by the individual on leave may differ from those shown in the table.
- ml_{weeks} : paid maternity leave length, in weeks.
- $pl_{payrate}$: paid parental and home care leave available to mothers, average payment rate.
- pl_{weeks} : paid parental and home care leave available to mothers length, in weeks.

Times series data on mother's average payment rate (Table 4 and 5) are from the Max-Planck-Institute "Comparative Maternity, Parental, and Childcare Leave and Benefits Database".

The average payment rate is computed as:

$$\frac{ml_wks * ml_pay + pl_wks * pl_pay + cc_wks * cc_pay}{ml_wks * 1 + pl_wks * 1 + cc_wks * 1}$$

where:

- ml_wks : total number of weeks of maternity leave
- ml_pay : cash benefits paid during maternity leave (%female wages in manufacturing)
- pk_wks : total number of weeks of parental leave
- pl_pay : cash benefits paid during parental leave (% of female wages in manufacturing)
- cc_wks : total number of weeks of childcare leave
- cc_pay : cash benefits paid during childcare leave (% of female wages in manufacturing)

See <http://www.demogr.mpg.de/cgi-bin/databases/FamPolDB/index.plx>.

Childhood Education and Care (%GDP) is a type of program belonging to the OECD Social Expenditure dataset. It measures the family early childhood education and care measured in percentage of gross domestic product. ECEC has two types of expenditures: Benefits in kind and Cash benefits. Public expenditure on childcare and early educational services is all public financial support (in cash, in-kind or through the tax system, see PF3.4) for families with children participating in formal daycare services (e.g. crèches, day care centres and family day care for children under 3) and pre-school institutions (including kindergartens and day-care centres which usually provide an educational content as well as traditional care for children aged from 3 to 5, inclusive). Public spending on childcare support per child relates to the expenditure on childcare divided by the number of children in that country aged under three, while public spending on pre-school care and education per child is calculated by dividing public spending on educational institutions by the number of children enrolled in those programmes.

2. Outcomes

Employment to population ratio by gender is from the OECD Labor database. The employment rate refers to the number of people employed divided by the relevant population. The employed are defined as those who work for pay or profit for at least one hour a week, or who have a job but are temporarily not at work due to illness, leave or industrial action. Data are for men and women aged 25-54 and are available for the period 1970-2014.

http://stats.oecd.org/Index.aspx?DataSetCode=LFS_SEXAGE_I_R

Employment to population by gender and educational attainment is obtained from the OECD Employment database. This indicator shows the employment/population ratios by education, grouped in three categories: below upper secondary, upper secondary non-tertiary, or tertiary. The employment rate is computed as a percentage of the population aged 25-64. The employed are defined as those in this age group who work for pay or profit for at least one hour a week, or who have a job but are temporarily not at work due to illness, leave or industrial action. Source: OECD (2016), Employment by education level (indicator). DOI: 10.1787/26f676c7-en (Accessed on 16 June 2016)

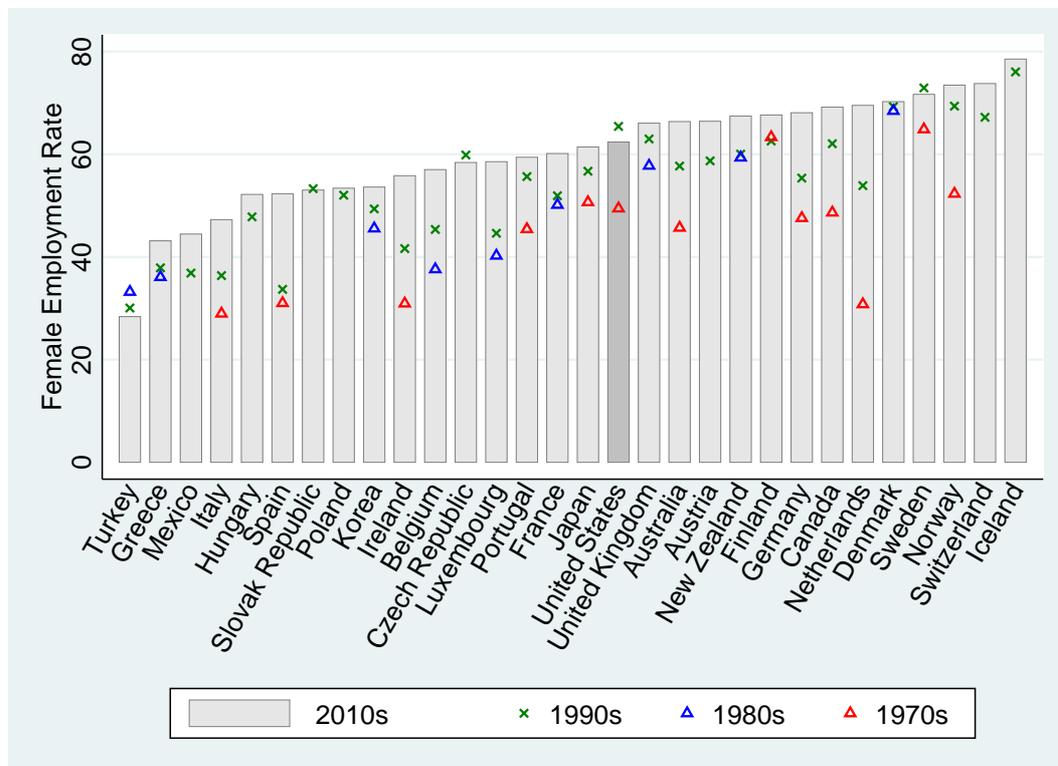
Gender wage gap is from the OECD Employment database. The OECD statistic is calculated as the gender difference between median earnings of men and women divided by median male earnings. For most countries these are gross earnings of full-time wage and salary workers, though the definition may slightly vary from country to country (see OECD, 2016, Gender wage gap (indicator). doi: 10.1787/7cee77aa-en. Accessed on 16 June 2016). Data are for full-time employees for the period 1970 to 2013. In our analysis we use a transformation of the OECD statistics. That is, the male-female log wage differential.

Gender wage gap by education is from the OECD Education database. It is available as the average annual earnings of women as a percentage of men's earnings, by level of educational attainment (below upper secondary, upper secondary non-tertiary, or tertiary) for workers aged 25 to 64. The data are available for the period 1997 to 2013. Note that this data does not refer to full-time, full-year workers. Source: OECD (2012), Table A8.3a. Differences in earnings between women and men (2010 or latest available year) in Education at a Glance 2012, OECD Publishing, Paris.

DOI: <http://dx.doi.org/10.1787/eag-2012-table78-en>

TFR (Total Fertility Rate) is obtained from the OECD Demography database. The total fertility rate in a specific year is defined as the total number of children that would be born to each woman if she were to live to the end of her childbearing years and give birth to children in alignment with the prevailing age-specific fertility rates. It is calculated by totaling the age-specific fertility rates as defined over five-year intervals. This indicator is measured in children per woman. Source: OECD (2016), Fertility rates (indicator). DOI: 10.1787/8272fb01-en (Accessed on 16 June 2016).

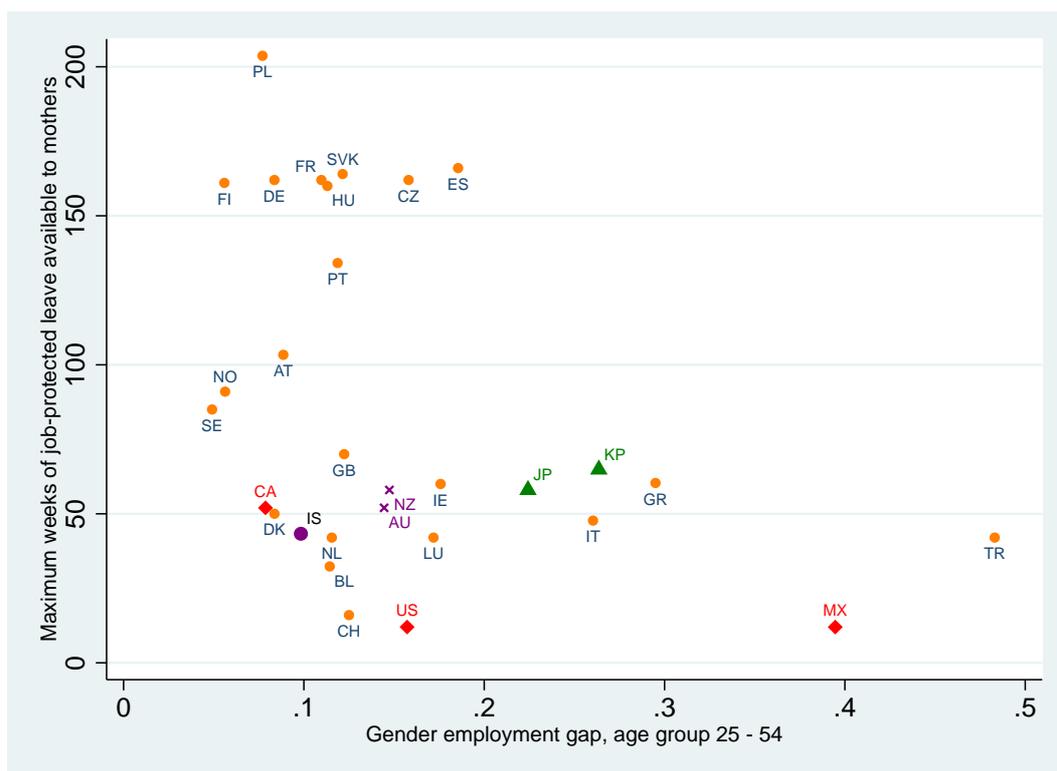
Figure 1: Evolution of Female Employment Rates: 1970s to 2010s



Notes: The figure reports average employment rates for women aged 25–54, by decade. The employed are defined as those who work for pay or profit for at least one hour a week, or who have a job but are temporarily not at work due to illness, leave or industrial action. We report female employment since the 1970s or the earliest available decade.

Sources: OECD Employment Database, http://stats.oecd.org/Index.aspx?DataSetCode=LFS_SEXAGE_I_R, 2016.

Figure 2: Employment gap and maximum length of job-protected leave for mothers



Notes: The figure plots the gender gap in employment rates (as defined in Figure 1) against the maximum weeks of job-protected leave available to mothers.

Sources: OECD Employment Database, http://stats.oecd.org/Index.aspx?DataSetCode=LFS_SEXAGE_I_R, 2016. OECD, Family Database, Public policies for families and children (PF), indicator “PF2.5. Trends in parental leave policies since 1970,” 2016.

Table 1: Cross-country variation in family friendly policies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>country</i>	Maximum job-protected leave for mothers (weeks)	Total maternity leave (weeks)	Pre-birth leave (% maternity leave)	Total <i>paid</i> leave available to mothers (weeks)	Average Payment Rate for Mothers (% of average, 2014, national earnings)	Total paid leave available to father (% total paid leave for both parents)	Early childhood education and care (%GDP)	Accumulate days off /vary start/end of daily work (% companies)
Spain	166	16	63	16	100	12	0.6	34.07
France	162	16	38	42 / 110	44.7	40 / 33	1.2	54.29
Germany	162	14	43	58	73.4	13	0.5	62.00
Finland	161.03	17.5	29	161.03	26.5	5	1.1	86.05
Norway	91	13	23	91	50.0	10	1.2	.
Sweden	85	15.6	45	60	63.4	14	1.6	74.18
United Kingdom	70	52	21	39	31.3	5	1.1	46.83
Greece	60.33	43	19	43	53.9	1	0.1	20.60
Japan	58	14	43	58	61.6	47	0.4	.
Australia	52	6	100	18	42.0	10	0.6	.
Canada	52	17	47	52	52.6	0	0.2	.
Denmark	50	18	22	50	54.1	4	2	76.91
Italy	47.7	21.7	18	47.7	52.7	0	0.6	39.96
Netherlands	42	16	38	16	100	2	0.9	66.48
United States	12	0	0	0	0	0	0.4	.

Notes. Column (1): Maximum number of weeks of employment-protected parental leave available to mothers, regardless of income support. This is the sum of weeks of maternity leave, parental leave and home care. Column (2): Total number of weeks of maternity leave available to employed women, regardless of income support. These are defined as employment-protected leaves of absence for employed women at around the time of childbirth, or adoption (in some countries). Column (3): Percentage of total weeks of maternity leave that a woman is allowed to take before the expected date of childbirth. Column (4): Total number of weeks for which a mother can receive payments from the benefit attached to or associated with parental leave, regardless of the period of employment protection. (5) Ratio of number of weeks of employment-protected leave reserved (or effectively reserved) for the exclusive use of the father that are paid divided by the sum of total paid leave available to mothers and total paid leave available for the exclusive use of fathers. In column (4) and (5) we report two statistics for France. The first number refers to families with one child, the second to families with two children. (6): The "average payment rate" is the proportion of previous earnings replaced by the benefit over the length of the paid leave entitlement for a person earning 100% of average national (2014) earnings. If this covers more than one period of leave at two different payment rates then a weighted average is calculated based on the length of each period. Column (7) government spending in early childhood education and care measured (in percentage of gross domestic product) is the sum of benefits in kind and cash benefits (see appendix for details). Column (8): Percentage of companies in the European Company Survey (administered by the European Foundation for the Improvement of Living and Working Condition, Eurofound) that report providing the possibility to accumulate hours for days off (full or half days) and to vary the start and end of daily work to at least some employees. Time period: Latest year available. This is 2015 for column (1) to (6), 2011 in column (7) and 2013 in column (8).

Sources: Column (1) to (5) OECD, Family Database, Public policies for families and children (PF), indicator "PF2.5. Trends in parental leave policies since 1970." Column (6): OECD, Family Database, Public policies for families and children (PF), indicator "PF2.1 Key characteristics of parental leave systems." Column (7) OECD, Social Expenditure database "PF3_1 Public spending on childcare and early education, in percentage of GDP" (December 2014). Column (8): OECD Family database – The labour market position of families (LMF), indicator "LMF2.4 Family-friendly workplace practices based on European Company Survey, 2013." See <http://www.oecd.org/els/family/database.htm> and www.oecd.org/social/expenditure.htm.

Table 2: Correlations between family friendly policies and women's outcomes

	Female Employment Rate	Gender Gap		Total Fertility Rate
		Employment	Earnings	
Maximum weeks of job-protected leave available to mothers	0.188 (0.320) 30	-0.385 (0.036) 30	-0.134 (0.482) 30	-0.472 (0.009) 30
Total paid leave available to mothers (weeks)	0.205 (0.278) 30	-0.320 (0.085) 30	0.018 (0.925) 30	-0.372 (0.043) 30
Average payment rate, mothers (% average earnings)	-0.103 (0.590) 30	0.175 (0.355) 30	-0.108 (0.570) 30	-0.134 (0.480) 30
Total paid leave available to fathers (% total paid leave)	0.151 (0.426) 30	-0.034 (0.859) 30	0.298 (0.110) 30	-0.129 (0.496) 30
Early childhood education and care (% GDP)	0.513 (0.004) 30	-0.466 (0.009) 30	-0.153 (0.419) 30	0.396 (0.030) 30
Accumulate days off <i>and</i> vary start/end of daily work, (% companies)	0.735 (0.000) 21	-0.657 (0.001) 21	0.275 (0.228) 21	0.195 (0.396) 21

Notes. For each institution/outcome combination we report the correlation coefficient, its p-value (in parentheses) and the number of observations. Coefficients in bold are statistically significant. The employment rate by gender refers to the number of individuals aged 25-54 who are employed, divided by the relevant population. The employed are defined as those who work for pay or profit for at least one hour a week, or who have a job but are temporarily not at work due to illness, leave or industrial action. The gender gap in employment is male-female difference in employment rates. The wage gap is computed as the log of the gender ratio between median earnings of working age men and women. Data on earnings are for full-time employees. The total fertility rate is defined as the total number of children that would be born to each woman if she were to live to the end of her childbearing years and give birth to children in alignment with the prevailing age-specific fertility rates. See notes to Table 1 for sources and definition of family friendly policies indicators. Time period: All outcomes are 2010-2014 averages. Sources: OECD (2016) Employment Database, http://stats.oecd.org/Index.aspx?DataSetCode=LFS_SEXAGE_I_R. OECD, 2016, Gender wage gap (indicator). doi: 10.1787/7cee77aa-en. OECD (2016), Fertility rates (indicator). DOI: 10.1787/8272fb01-en.

Table 3: Family friendly policies and women's outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Female employment rate		Employment gap		Earnings gap		Fertility rate	
Maximum weeks of job-protected leave	0.113*** (0.019)	0.063** (0.029)	-0.050*** (0.018)	0.023 (0.022)	-0.011 (0.033)	-0.210*** (0.033)	0.002 (0.001)	-0.001 (0.001)
Maximum weeks squared/100	-0.078*** (0.010)	-0.062*** (0.014)	0.043*** (0.010)	0.012 (0.011)	0.016 (0.016)	0.108*** (0.016)	0.001 (0.001)	0.001** (0.001)
Percentage of total leave that is paid		-0.037*** (0.008)		0.029*** (0.006)		0.006 (0.008)		0.002*** (0.000)
Average payment rate		-0.036*** (0.011)		0.027*** (0.008)		0.012 (0.019)		0.000 (0.000)
Early childhood education and care		3.613*** (0.903)		-1.587*** (0.564)		-2.852** (1.258)		0.270*** (0.024)
Constant	43.955*** (1.561)	47.007*** (2.016)	41.954*** (1.913)	37.892*** (2.497)	44.709*** (0.936)	52.367*** (1.144)	2.810*** (0.117)	1.753*** (0.057)
R-squared	0.914	0.921	0.931	0.944	0.943	0.967	0.718	0.692
<i>Mean of dependent variable</i>	<i>54.8</i>	<i>55.1</i>	<i>20.6</i>	<i>21.0</i>	<i>23.4</i>	<i>23.7</i>	<i>1.9</i>	<i>1.7</i>
Observations	1,026	667	1,026	667	545	340	1,325	806
Time period	1970-2014	1970-2010	1970-2014	1970-2010	1970-2013	1970-2010	1970-2014	1970-2010
Number of countries	30	22	30	22	30	22	30	22

Notes: Robust standard errors in parentheses. All specifications include country and year effects. The average payment rate is from the Max Planck Institute's Comparative Family Policy Database (Gauthier, 2011). It's computed as a weighted average of payment rates for maternity leave, parental leave and childcare leave with weights given by the length of each leave type. The cash benefits are expressed as a percentage of the average female wage in manufacturing. See notes to Table 1 and 3 for all other variables definitions and sources. Percentage of total leave that is paid is the ratio of total paid leave available to mothers to maximum weeks of job-protected weeks (paid/unpaid) available to mothers.

Table 4: Family friendly policies and gender gaps by educational attainment

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Less than Upper Secondary</i>		<i>Upper Secondary, non tertiary</i>		<i>Tertiary</i>	
	Female employment rate	Earnings Gap	Female employment rate	Earnings Gap	Female employment rate	Earnings Gap
Maximum weeks of job-protected leave	0.164** (0.083)	-0.112 (0.152)	0.097 (0.060)	0.062 (0.114)	-0.011 (0.046)	0.232** (0.107)
Maximum weeks squared/100	-0.171*** (0.059)	-0.257** (0.130)	-0.097* (0.054)	-0.122 (0.081)	-0.054* (0.030)	-0.138* (0.078)
Constant	47.872*** (3.274)	62.487*** (5.852)	63.132*** (2.013)	50.854*** (4.537)	79.560*** (1.736)	39.626*** (4.955)
R-squared	0.946	0.840	0.956	0.883	0.921	0.758
<i>Mean of Dependent Variable</i>	46.6	44.3	65.7	40.0	78.7	42.6
Observations	492	300	504	300	504	300
Time period	1997-2013	1997-2013	1997-2013	1997-2013	1997-2013	1997-2013
Number of countries	30	29	30	29	30	29

Notes: Robust standard errors in parentheses. All specifications include country and year effects. See notes to table 1, table 4 and table A2 for variable definitions and data sources. In column 1 data for Japan are only available from 1997 to 2001. Iceland is excluded from the sample in column (2), (4) and (6).

Table A1: Pre-1969 trends in maternity leave legislation

Country	Year	Maternity Leave (weeks)		Mandated (Y/N)		Job-Protection	Paid	Source of payment
		Post-birth	Total	Pre-birth	Post-birth	(Y/N)	(Y/N; %)	
<i>Panel A: 1870 - 1940</i>								
Austria	1985	4	.		Y	.	.	
	1988	4	.		Y	Y	Y	
	1917	6	.		Y	Y	Y; 60%	Employer (1/3); insured person (2/3)
Belgium	1889	.	4		N	.	.	
Denmark	1892	.	1.1		N	.	Y	Voluntary sickness societies subsidized by the State
	1901	4	.	.		Y	.	
	1915	1.4	.	.		Y	Y	National Government
	1933	.	2		Y	.	Y	National Government
Finland	1917	4	.	.	.	.	.
	1919	6	.	.	.	.	.
	1922	6	.	.	.	Y	.	
	1937	6	.	.	.	Y	Y	Maternity allowance
France	1909	.	8	.	.	Y	N	
	1913	4	8	.	Y	Y	Y	Mutual aid societies (subsidized by the national or local Government); Ministry of Education for teachers maternity leave.
Germany	1878	3	.	.	Y	N	.	
	1900	6	.	.	Y	N	Y	
	1908	6	8	Y	Y	N	Y	Employer (1/3); insured person (2/3); persons who insure voluntarily must pay the entire cost of their insurance.
	1924	6	14	Y	Y	Y	Y	
Greece	1910	.	.	Y	.	.	N	
	1921	6	12	N	Y	Y	Y	Public funds or insurance
Italy	1902	4	.	.	Y	.	N	
	1910	4	.	.	Y	Y	Y	Employee and owner of establishment pay half and half; the National Government also adds support
	1934	6	10	Y	Y	Y	Y	
Mexico	1917	4	4	N	Y	.	Y; 100%	
Netherlands	1889	.	4	Y	.	.	.	
	1913						Y; 100%	Compulsory sickness insurance: one-half paid by the employer and one-half by the insured person
	1919	8	10	Y	Y	.	.	

Table A1 (continued.): Pre-1969 trends in maternity leave legislation

Country	Year	Maternity Leave (weeks)		Mandated (Y/N)		Job-Protection	Paid	Source of payment
		Post-birth	Total	Pre-birth	Post-birth	(Y/N)	(Y/N; %)	
Norway	1892	6	.	.	Y (4 weeks)	.	N	.
	1909	6	.	.	Y	Y	Y;60%	Compulsory sickness insurance paid by: (1) The insured, 60%; (2) the employer, 10%; (3) the local government, 10%; (4) the National Government, 20%.
	1915	6	10	N	Y	Y	Y	Add voluntarily insurance paid by: (1) The insured, 70%; (2) the local government, 10%; (3) the National Government, 20%.
Poland	1924	10	12	N	.	.	Y; 100%	.
Spain	1900	.	.	.	.	Y	.	.
	1907	6	.	.	Y	Y	.	.
Sweden	1891	4	.	.	Y	.	N	.
	1937	6	12	Y	Y	Y	N	.
Switzerland	1877	>=6	8	N	Y	.	N	.
	1914	6	.	.	N	Y	Y	Dues of the members and the subsidy of the Federal Government
	1920	6	8	Y	Y	Y	Y	Dues of the members and the subsidy of the Federal Government
Turkey	1930	3	6	Y	Y	.	.	.
	1936	3	6	Y	Y	.	Y;50%	.
	1945	3	6	Y	Y	.	Y;70%	Maternity insurance
Great Britain	1891	4	.	.	Y	N	N	.
	1911	4	.	.	Y	Y	Y	Dues paid by husband and wife
	1918						Y	Women's equalization fund; Contingencies fund; Central fund; National insurance.
<i>Panel B: Post-WWII - 1969</i>								
Austria	1957	6	12	Y	Y	Y	Y	Unemployment benefits
	1961		48	.	.	Y	Y	Unemployment benefits
Belgium	1954		4	N	N	.	Y	.
	1967	8	.	N	Y	Y	.	.
Czech Republic	1956	.	18	N	N	Y	Y	Sickness insurance
	1965	>=6	12	Y	Y	Y	Y	Sickness insurance
Denmark	1960		14	.	.	N	Y	National Government
Finland	1964	6	9	.	.	Y	.	.

Table A1 (continued): Pre-1969 trends in maternity leave legislation

Country	Year	Maternity Leave (weeks)		Mandated (Y/N)		Job-Protection (Y/N)	Paid (Y/N; %)	Source of payment
		Post-birth	Total	Pre-birth	Post-birth			
France	1946	4	14	.	Y	Y	Y	Mutual aid societies (National or local Government); Teacher's maternity leave annual budget of the ministry of education
Germany	1968	8	14	Y	Y	Y	Y	Social security system and employers
Ireland	1952	.	12	.	.	.	Y	Maternity allowance
	1968	.	12	.	.	.	Y	Compulsory insurance & Maternity allowance
Iceland	1946						Y	.
	1954				N			.
Italy	1950	8	20 (industry); 16 (agriculture); 14 (other)	Y	Y	Y	Y; 80% of earnings in private sector; lump-sum in agriculture	.
Japan	1947	5	.	.	Y	Y	.	.
Netherlands	1966	8	10	Y	Y	.	Y	.
Norway	1956	6	12	N	Y	Y	.	.
Portugal	1963	.	8.6	.	.	.	Y; 100%	Maternity reserve funds
	1966	.	8.6	.	.	Y	Y; 100%	Maternity reserve funds
Spain	1966						Y; 75%	Social security system
Sweden	1955	.	24	.	.	.	Y	.
	1963	.	24	.	.	.	Y; 80%	.
Turkey	1950	3	6	Y	Y	.	Y	.
	1967	3	6	Y	Y	.	Y; 66%	.
UK	1948	.	13	.	.	N	Y	Maternity allowances
	1953	.	18	.	.	N	Y	Maternity allowances

Sources: Harris (1919) and OECD Family Database, "PF2.5 Annex: Detail of Change in Parental Leave Policy," www.oecd.org/els/social/family/database

Table A2: Cross-country variation in family friendly policies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>country</i>	Maximum job-protected leave for mothers (weeks)	Total maternity leave (weeks)	Pre-birth leave (% maternity leave)	Total <i>paid</i> leave available to mothers (weeks)	Average Payment Rate for Mothers (% of average, 2014, national earnings)	Total paid leave available to father (% total paid leave for both parents)	Early childhood education and care (%GDP)	Accumulate days off /vary start/end of daily work (% companies)
Poland	203.67	26	8	52	80	4	0.5	43.97
Spain	166	16	63	16	100	12	0.6	34.07
Slovak Republic	164	34	24	164	32.0	0	0.4	54.49
Czech Republic	162	28	21	110	51.1	0	0.4	59.64
France	162	16	38	42 / 110	44.7	40 / 33	1.2	54.29
Germany	162	14	43	58	73.4	13	0.5	62.00
Finland	161.03	17.5	29	161.03	26.5	5	1.1	86.05
Hungary	160	24	17	160	44.5	1	0.6	33.94
Portugal	134.14	6	0	30.14	66.1	41	0.4	34.54
Austria	103.33	16	50	60	85.3	13	0.5	77.50
Norway	91	13	23	91	50.0	10	1.2	.
Sweden	85	15.6	45	60	63.4	14	1.6	74.18
United Kingdom	70	52	21	39	31.3	5	1.1	46.83
Korea	64.86	12.9	50	64.86	39.0	45	0.8	.
Greece	60.33	43	19	43	53.9	1	0.1	20.60
Ireland	60	42	5	26	35.0	0	0.5	43.86
Japan	58	14	43	58	61.6	47	0.4	.
New Zealand	58	16	38	16	47.9	0	1.1	.
Australia	52	6	100	18	42.0	10	0.6	.
Canada	52	17	47	52	52.6	0	0.2	.
Denmark	50	18	22	50	54.1	4	2	76.91
Italy	47.7	21.7	18	47.7	52.7	0	0.6	39.96
Iceland	43.3	13	33	26	63.8	33	1.6	48.23
Luxembourg	42	16	50	42	62.1	39	0.5	65.57
Netherlands	42	16	38	16	100	2	0.9	66.48
Turkey	42	16	50	16	66	0	0	24.69
Belgium	32.33	15	40	32.33	46.4	37	0.7	52.28
Switzerland	16	16	0	14	56.8	0	0.3	.
Mexico	12	12	50	12	100	8	0.6	.
United States	12	0	0	0	0	0	0.4	.

Notes. Column (1): Maximum number of weeks of employment-protected parental leave available to mothers, regardless of income support. This is the sum of weeks of maternity leave, parental leave and home care. Column (2): Total number of weeks of maternity leave available to employed women, regardless of income support. These are defined as employment-protected leaves of absence for employed women at around the time of childbirth, or adoption (in some countries). Column (3): Percentage of total weeks of maternity leave that a woman is allowed to take before the expected date of childbirth. Column (4): Total number of weeks for which a mother can receive payments from the benefit attached to or associated with parental leave, regardless of the period of employment protection. (5) Ratio of number of weeks of employment-protected leave reserved (or effectively reserved) for the exclusive use of the father that are paid divided by the sum of total paid leave available to mothers and total paid leave available for the exclusive use of fathers. In column (4) and (5) we report two statistics for France. The first number refers to families with one child, the second to families with two children. (6): The "average payment rate" is the proportion of previous earnings replaced by the benefit over the length of the paid leave entitlement for a person earning 100% of average national (2014) earnings. If this covers more than one period of leave at two different payment rates then a weighted average is calculated based on the length of each period. Column (7) government spending in early childhood education and care measured (in percentage of gross domestic product) is the sum of benefits in kind and cash benefits (see appendix for details). Column (8): Percentage of companies in the European Company Survey (administered by the European Foundation for the Improvement of Living and Working Condition, Eurofound) that report providing the possibility to accumulate hours for days off (full or half days) and to vary the start and end of daily work to at least some employees. Time period: Latest year available. This is 2015 for column (1) to (6), 2011 in column (7) and 2013 in column (8).

Sources: Column (1) to (5) OECD, Family Database, Public policies for families and children (PF), indicator "PF2.5. Trends in parental leave policies since 1970." Column (6): OECD, Family Database, Public policies for families and children (PF), indicator "PF2.1 Key characteristics of parental leave systems." Column (7) OECD, Social Expenditure database "PF3_1 Public spending on childcare and early education, in percentage of GDP" (December 2014). Column (8): OECD Family database – The labour market position of families (LMF), indicator "LMF2.4 Family-friendly workplace practices based on European Company Survey, 2013." See <http://www.oecd.org/els/family/database.htm> and www.oecd.org/social/expenditure.htm.

Table A3: Correlations between gender norms and family friendly policies

	Maximum job-protected leave for mothers (weeks)	Total maternity leave (weeks)	Paid leave available to mothers (weeks)	Average payment rate, mothers (% ave earnings)	Paid leave available to fathers (% total paid leave)	Early Childhood Education and Care (% GDP)	Accumulate days off and vary start/end of daily work (% companies)
Percentage of individuals who agree/strongly agree with statement:							
<i>A woman has to have children to be fulfilled</i>	0.208 (0.289) 28	-0.003 (0.988) 27	0.177 (0.367) 28	0.053 (0.788) 28	0.154 (0.435) 28	-0.238 (0.223) 28	-0.486 (0.026) 21
<i>Men make better political leaders than women</i>	0.011 (0.953) 30	-0.174 (0.366) 29	-0.012 (0.949) 30	0.016 (0.933) 30	-0.003 (0.988) 30	-0.247 (0.190) 30	-0.362 (0.107) 21
<i>University is more important for a boy</i>	-0.018 (0.923) 30	-0.205 (0.287) 29	-0.042 (0.824) 30	0.183 (0.332) 30	0.072 (0.706) 30	-0.288 (0.123) 30	-0.398 (0.074) 21
<i>Pre-school children suffer from working mom</i>	0.077 (0.693) 29	0.141 (0.474) 28	-0.011 (0.957) 29	0.154 (0.426) 29	0.013 (0.948) 29	-0.620 (0.000) 29	-0.557 (0.009) 21
<i>Men are better than women in business</i>	0.039 (0.870) 20	-0.040 (0.870) 19	0.152 (0.524) 20	0.044 (0.854) 20	0.235 (0.319) 20	-0.456 (0.043) 20	-0.593 (0.055) 11

Notes. For each institution/gender norm combination we report the correlation coefficient, its p-value (in parentheses) and the number of observations. Coefficients in bold are statistically significant. Data on gender attitudes are from the European Values Study Group and World Values Survey Association. All the qualitative variables are recoded as binary indicators, where 1=agree and 0=disagree. For the first question people are classified as agreeing with the statement if they answered 1 = "yes" (as opposed to 0= "not necessary"). For the remaining questions people with codes 1="strongly agree" and 2="agrees" are both coded as agreeing with the statement. Source: EUROPEAN AND WORLD VALUES SURVEYS FOUR-WAVE INTEGRATED DATA FILE, 1981-2004, v.20060423, 2006. See notes to Table 1 for sources and definition of the family friendly policies indicators.

Table A4: Employment rates under alternative definitions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Standard ILO definition: Employed if at work or temporarily absent		Employed if at work or temporarily absent, excluding those on maternity/parental leave		Employment change under two definitions		Total Fertility Rate
	Male	Female	Male	Female	(3)-(1)	(4)-(2)	
Iceland	0.8973	0.8115	0.8562	0.7471	-0.0411	-0.0644	2.123
Sweden	0.8800	0.8217	0.8681	0.7763	-0.0119	-0.0454	1.910
Austria	0.8953	0.7876	0.8948	0.7497	-0.0005	-0.0379	1.415
Denmark	0.8813	0.8165	0.8768	0.7782	-0.0045	-0.0383	1.840
Norway	0.8811	0.8250	0.8755	0.7867	-0.0055	-0.0383	1.928
Luxembourg	0.9140	0.7122	0.9119	0.6869	-0.0021	-0.0253	1.597
Ireland	0.8152	0.6719	0.8148	0.6483	-0.0004	-0.0236	2.035
Finland	0.8519	0.8018	0.8489	0.7782	-0.0030	-0.0237	1.847
Italy	0.8547	0.5927	0.8546	0.5790	-0.0001	-0.0137	1.392
United Kingdom	0.8676	0.7468	0.8669	0.7310	-0.0008	-0.0158	1.885
Germany	0.8618	0.7510	0.8610	0.7364	-0.0008	-0.0146	1.370
France	0.8763	0.7603	0.8752	0.7455	-0.0011	-0.0147	1.988
Poland	0.8209	0.6996	0.8208	0.6873	-0.0001	-0.0122	1.342
Czech Republic	0.9102	0.7441	0.9102	0.7314	0.0000	-0.0127	1.447
Netherlands	0.9097	0.7889	0.9096	0.7770	-0.0001	-0.0119	1.760
Belgium	0.8599	0.7313	0.8591	0.7206	-0.0008	-0.0107	1.820
Spain	0.8108	0.6481	0.8101	0.6407	-0.0006	-0.0075	1.380
Portugal	0.8548	0.7491	0.8541	0.7409	-0.0008	-0.0082	1.370
Switzerland	0.9298	0.7945	0.9297	0.7862	-0.0001	-0.0083	1.490
Slovak Republic	0.8394	0.7110	0.8394	0.7041	0.0000	-0.0069	1.345
Greece	0.8729	0.6078	0.8728	0.6029	-0.0001	-0.0048	1.432
United States	0.8219	0.7112	0.8217	0.7071	-0.0003	-0.0041	2.020
Hungary	0.7994	0.6735	0.7994	0.6703	0.0000	-0.0033	1.308

Notes: Column (1) to (6): Sample include individuals aged 25 to 54 for the years 2006-2011. Data for the US are from the Current Population Survey. For all other countries we use Eurostat Labour Force Survey. Column (1) and (2): In the Current Population Survey individuals are classified as employed if EMPSTA=10 (at work) or 12 (has job not at work last week). In the Eurostat LFS individuals are classified as working if WSTATOR=1 (currently working) and 2 (temporarily absent from job during the reference week). Column (3) and (4): We exclude from the employed people who have a job but were not at work because they were on maternity/parental leave. In the CPS these are people coded as EMPSTA=12 and WHYABSNT=09. In the Eurostat LFS this are people with WSTATOR=2 and NOWKREAS=5 (on maternity leave) or 6 (on parental leave). Column (7): The total fertility rate is defined as the total number of children that would be born to each woman if she were to live to the end of her childbearing years and give birth to children in alignment with the prevailing age-specific fertility rates. Sources: Current Population Survey (Flood et al., 2015). European Union (EU) labour force survey (EU-LFS). OECD (2016), Fertility rates (indicator). DOI: 10.1787/8272fb01-en.

Table A5: Correlations between Family Policies and Labor Market Outcomes by Educational Attainment

	Female Employment Rate			Gender Gap: Employment			Gender Gap: Wages		
	<Secondary	Secondary	Tertiary	<Secondary	Secondary	Tertiary	<Secondary	Secondary	Tertiary
Maximum weeks of job-protected leave available to mothers	-0.274 (0.150) 29	0.050 (0.795) 30	0.143 (0.452) 30	-0.455 (0.013) 29	-0.298 (0.110) 30	-0.171 (0.367) 30	-0.014 (0.947) 25	-0.307 (0.1355) 25	0.074 (0.724) 25
Total paid leave available to mothers (weeks)	-0.264 (0.167) 29	0.062 (0.744) 30	0.012 (0.945) 30	-0.438 (0.018) 29	-0.198 (0.294) 30	0.033 (0.864) 30	-0.142 (0.500) 25	-0.214 (0.304) 25	0.348 (0.088) 25
Average payment rate, mothers (% average earnings)	0.064 (0.740) 29	-0.021 (0.911) 30	0.099 (0.605) 30	0.254 (0.183) 29	0.128 (0.499) 30	-0.093 (0.627) 30	-0.193 (0.354) 25	-0.334 (0.102) 25	-0.393 (0.052) 25
Total paid leave available to fathers (% total paid leave)	0.418 (0.024) 29	0.152 (0.422) 30	-0.064 (0.735) 30	-0.182 (0.344) 29	-0.126 (0.506) 30	0.203 (0.283) 30	0.044 (0.834) 25	0.170 (0.416) 25	-0.178 (0.395) 25
Early childhood education and care (% GDP)	0.544 (0.002) 29	0.607 (0.000) 30	0.562 (0.001) 30	-0.347 (0.065) 29	-0.466 (0.009) 30	-0.429 (0.018) 30	-0.388 (0.055) 25	-0.150 (0.473) 25	-0.173 (0.409) 25
Accumulate days off <i>and</i> vary start/end of daily work, (% companies)	0.471 (0.031) 21	0.659 (0.001) 21	0.687 (0.001) 21	-0.455 (0.038) 21	-0.550 (0.010) 21	-0.532 (0.013) 21	-0.460 (0.047) 19	-0.124 (0.613) 19	-0.098 (0.690) 19

Notes: For each institution/outcome combination we report the correlation coefficient, its p-value (in parentheses) and the number of observations. Coefficients in bold are statistically significant. Employment rates by gender and educational attainment refer to the number of individuals aged 25-64 in a given gender/education group who are employed, divided by the relevant population. Educational attainment is grouped in three categories: below upper secondary, upper secondary non-tertiary, or tertiary. The employed are defined as those who work for pay or profit for at least one hour a week, or who have a job but are temporarily not at work due to illness, leave or industrial action. The gender employment gap is computed as male-female difference in employment rates. The gender earnings gap is the log of the ratio between the average annual earnings of women and men, by level of educational attainment for workers aged 25 to 64. *Sources:* OECD (2016), Employment by education level (indicator). DOI: 10.1787/26f676c7-en (Accessed on 16 June 2016). OECD (2012), Table A8.3a. Differences in earnings between women and men (2010 or latest available year) in Education at a Glance 2012, OECD Publishing, Paris. DOI: <http://dx.doi.org/10.1787/eag-2012-table78-en>. See notes to Table 1 for sources and definition of the family policies indicators.

CENTRE FOR ECONOMIC PERFORMANCE
Recent Discussion Papers

1463	Claudia Hupkau Marion Leturcq	Fertility and Mothers' Labor Supply: New Evidence Using Time-to-Conception
1462	Clement Bellet	The Paradox of the Joneses: Superstar Houses and Mortgage Frenzy in Suburban America
1461	Georg Graetz Guy Michaels	Is Modern Technology Responsible for Jobless Recoveries?
1460	Thomas Breda Alan Manning	Diversity and Social Capital within the Workplace: Evidence from Britain
1459	Monica Langella Alan Manning	Diversity and Neighbourhood Satisfaction
1458	Giordano Mion Luca David Opromolla Alessandro Sforza	The Diffusion of Knowledge via Managers' Mobility
1457	Kristian Behrens Giordano Mion Yasusada Murata Jens Suedekum	Distorted Monopolistic Competition
1456	Tony Beaton Michael P. Kidd Stephen Machin Dipa Sarkar	Larrikin Youth: New Evidence on Crime and Schooling
1455	Andrew Eyles Stephen Machin Sandra McNally	Unexpected School Reform: Academisation of Primary Schools in England
1454	Rabah Arezki Thiemo Fetzer Frank Pisch	On the Comparative Advantage of U.S. Manufacturing: Evidence from the Shale Gas Revolution

1453	Randolph Bruno Nauro Campos Saul Estrin Meng Tian	Foreign Direct Investment and the Relationship Between the United Kingdom and the European Union
1452	Stephen J. Redding Esteban Rossi-Hansberg	Quantitative Spatial Economics
1451	Elias Einiö	The Loss of Production Work: Evidence from Quasi-Experimental Identification of Labour Demand Functions
1450	Marcus Biermann	Trade and the Size Distribution of Firms: Evidence from the German Empire
1449	Alessandro Gavazza Simon Mongey Giovanni L. Violante	Aggregate Recruiting Intensity
1448	Emmanuel Amissah Spiros Bougheas Fabrice Defever Rod Falvey	Financial System Architecture and the Patterns of International Trade
1447	Christian Fons-Rosen Vincenzo Scrutinio Katalin Szemeredi	Colocation and Knowledge Diffusion: Evidence from Million Dollar Plants
1446	Grace Lordan Jörn-Steffen Pischke	Does Rosie Like Riveting? Male and Female Occupational Choices
1445	Stephen J. Redding David E. Weinstein	A Unified Approach to Estimating Demand and Welfare
1444	Anna Valero John Van Reenen	The Economic Impact of Universities: Evidence from Across the Globe

The Centre for Economic Performance Publications Unit

Tel 020 7955 7673 Fax 020 7404 0612

Email info@cep.lse.ac.uk Web site <http://cep.lse.ac.uk>