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Motherhood and the Allocation of Talent

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In this paper we show that motherhood triggers changes in the allocation of talent in the labor market beyond the well-known effects on gender gaps in employment and earnings. We use an event study approach with retrospective data for 29 countries drawn from SHARE to assess the labor market responses to motherhood across "talent" groups, i.e. groups with different educational attainment, relative performance in math by the age of 10, and personality traits. We find that while even the most talented women—both in absolute terms and relative to their husbands—leave the labor market or uptake part-time jobs after the birth of the first child, all men, including the least talented, stay employed. We also find that motherhood induces a negative selection of talents into self-employment. Although these results are observed in all 29 countries, there is some heterogeneity in the magnitude of the motherhood effects. We find larger motherhood effects in countries with more conservative social norms and, to a less extent, with weaker policies regarding work-life balance. Overall, our results suggest relevant changes in the allocation of talent caused by gender differences in nonmarket responsibilities that can have sizable impacts on aggregate market productivity.

KEYWORDS
Child penalty, Part-time, Self-employment, Motherhood, Allocation of Talent

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Maternidad y Asignación del Talento

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En este trabajo mostramos que la maternidad desencadena cambios en la asignación del talento en el mercado laboral más allá de los efectos bien conocidos sobre las brechas de género en el empleo y los ingresos. Utilizando un enfoque de estudio de eventos y datos de 29 países extraídos de SHARE, evaluamos las respuestas en resultados laborales a la maternidad para distintos grupos de "talentos". Encontramos que aun cuando las mujeres más talentosas —tanto en términos absolutos como relativo a sus maridos— abandonan el mercado laboral o aceptan trabajos de tiempo parcial después del nacimiento del primer hijo, todos los hombres, incluidos los menos talentosos, permanecen empleados. También encontramos que la maternidad induce una selección negativa de talentos en el autoempleo. Aunque estos resultados se observan en los 29 países, existe cierta heterogeneidad entre países. Encontramos mayores efectos en países con normas sociales más conservadoras y, en menor medida, con políticas más débiles en materia de conciliación familia-trabajo. En general, nuestros resultados sugieren cambios en la asignación de talento causados por diferencias de género en responsabilidades fuera del mercado laboral, con potenciales impactos en la productividad agregada.

KEYWORDS

Penalidad por Maternidad, Trabajo a tiempo parcial, Autoempleo, Maternidad, Asignación de talento

1 | INTRODUCTION

In the last decades of the 20th century, around 20% of European women with a college degree stayed out of the labor force, whereas most men (95%), regardless of their level of education, had a job (see Figure 1). Such underutilization of women's human capital decreases aggregate productivity and limits economic growth (Hsieh et al., 2019). We claim that motherhood not only underlies this phenomenon but it also affects the allocation of talent in the labor market. Besides shrinking the size of the labor market, we show that motherhood: i) causes many talented women to stay home and; ii) changes the occupational choices of those women who decide to remain employed.

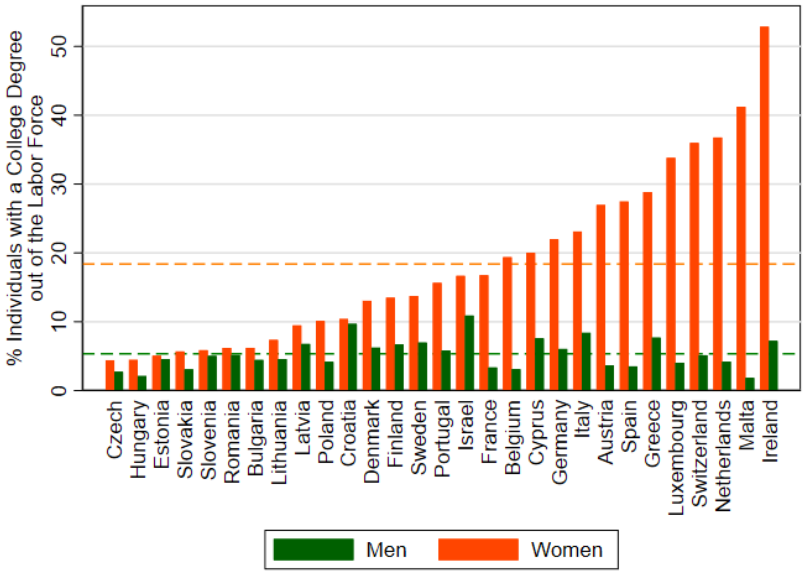


FIGURE 1 Underutilization of Human Capital in the Labor Market.

Notes: Figure shows the percentage of men and women aged 25-60 with a college degree who were out of the labor force in the period 1960-2000. Own elaboration using data from wave 3 of the Survey of Health, Ageing and Retirement in Europe (SHARE) Job Episodes Panel.

Based on harmonized data for 29 countries from the *Survey of Health, Ageing and Retirement in Europe* (SHARE) and following an event study approach around the birth of the first child as in Kleven et al. (2019b), we find effects of motherhood on the allocation of talent in the labor market in addition to the well-known effects on gender gaps in employment and earnings. We analyze a broad set of labor market outcomes related to occupational choices: part-time employment, self-employment, and the number of jobs held until a given moment of time. To assess whether motherhood affects the allocation of talent we study the effects of motherhood on labor market outcomes for different "talent" groups by exploiting the richness of the SHARE dataset regarding human capital information. As proxies of talent we use educational attainment, predetermined cognitive ability—relative performance in math at the age of 10— and socio-emotional skills—personality traits from the five-factor model of personality, known as the Big-Five model. Somewhat loosely, we use the term "talent" throughout the paper when referring to education attainment, relative performance in math and certain personality traits. To the best of our knowledge, this is the first paper showing a link between the arrival of children and the allocation of talent in the labor market.

We start by providing evidence about the well documented effect of motherhood on labor force participation and employment. Our results for the pooled sample of 29 countries show a 25% drop in women's probability of working upon motherhood, which falls close to the upper end of the [-40%,-20%] interval found in the literature (Kleven et al., 2019a; Kuziemko et al., 2018; Berniell et al., 2021b). We then show that motherhood affects labor market decisions that lead to a large representation of women among part-time and self-employed workers.[1] Results from our pooled sample show a sharp increase of close to 60% of both part-time and self-employment shortly after the birth of the first child. Importantly, all motherhood effects remain of the same order of magnitude 15 years later. On the contrary, fathers show no response to childbirth either in the short- or the long-term. Shifts into part-time and self-employment, together with interruptions in labor force participation, may also lead to women accumulating a greater number of different jobs throughout their lives. Indeed, we find that 15 years after the birth of the first child the number of jobs taken by women increases by 15% compared to only 7% for men, which may reflect that mothers face greater job instability.

Next, we turn to study how the arrival of the first child alters what we refer to as the allocation of talent in the labor market. We show that motherhood disrupts the allocation of talent in the labor marketbecause: (i) whereas all women—even the most talented—show large motherhood effects in the extensive and intensive margins of labor supply, there are no effects on either the most or the least talented men; more importantly, this result holds within couples, even when the wife has more human capital than the husband; and (ii) of those women who remain in the labor market it is the least entrepreneurial the more likely to become self-employed upon motherhood.[2] These results strongly suggest motherhood leads to a misallocation of talent in the labor market. Our evidence on job instability complements our findings, since instability is associated with a reduction in productivity, as it leads to the loss of experience and of specific skills.[3]

Our work is related and contributes to different strands of the literature. The first part of our study adds to previous work showing that the search for a more flexible time schedule explains why mothers of young children opt for part-time jobs (Paull, 2008). In fact, the child penalty literature has previously documented a motherhood effect on working hours and/or part-time employment (e.g., Kleven et al., 2019b and Berniell et al., 2021b), but except for Berniell et al. (2021b), self-employment as a labor market outcome is absent from these papers.[4] Moreover, the few papers addressing specifically the effect of the first child on the participation of women in jobs with more flexible working schedules have focused

[1] According to Eurostat data, in Europe over 77% of part-timers and roughly a third of self-employed are women.

[2] Abundant literature shows the contribution of entrepreneurial and managerial skills to firms' productivity. For instance, Bender et al. (2018) show that management practices are strongly associated to productivity levels and that a large share of this correlation is attributable to the human capital of the managers of the firm. Bruhn et al. (2018) present the positive results on proxies of total factor productivity of a randomized intervention (one year of management consulting services) that increased entrepreneurs' skills and improved their managerial practices. Levine and Rubinstein (2020) find that the human capital, measured by educational attainment as well as by indicators of cognitive and non cogntive skills, of more successful entrepreneurs (incorporated) is considerable higher than the human capital of salaried workers or the unincorporated self-employed.

[3] For instance, Adda et al. (2017) find that the greater part of the career costs of children—losses in lifetime labor earnings—can be explained by the intermittency or reduced labor supply, while the remainder part is due to wage changes as a result of lost investments in skills and depreciation. Also, Jung and Kuhn (2019) show that accounting for job stability is important to explain differences in labor earnings over the life-cycle.

[4] To the best of our knowledge, there are no previous works studying the link between motherhood and job instability. However, de Quinto et al. (2020) find an increase in fixed term contracts associated to motherhood, which is consistent with greater job instability.

on a single country or on a small set of countries (Berniell et al., 2021b; de Quinto et al., 2020; Kleven et al., 2019b). A strength of our analysis is that it covers a large set of countries, which also allows us to explore how the effects of motherhood correlate with social norms and family policies. We show that societies with more conservative social-norms and/or weaker policies regarding work-life balance are characterized by larger motherhood effects on employment. This is made possible because SHARE has the unique advantage of using the same questionnaire across all countries to collect information on all the important life events—including parenthood and labor histories—, hence avoiding issues of heterogeneity across questionnaires or survey methods.

Our analysis of changes in the allocation of talent at the onset of motherhood also relates to recent literature showing large impacts on aggregate productivity and welfare from gender differences in non-market responsibilities. Hsieh et al. (2019) show how a sizable part of aggregate growth from 1960 to 2010 in the US can be explained by the increasing presence of women and black men in occupations from which they were basically banned in the past. Even though women are able to access the labor market, Goldin (2014) and Erosa et al. (2020) argue that the greater time that women allocate to non-market activities may in part explain the existing misallocation.[5] Our work states that this misallocation arises from motherhood and the non-market responsibilities that come with it. Moreover, we show that not only does misallocation result from changes in the extensive and intensive margins of labor supply, but also occurs along a different dimension of occupational choice, such as becoming self-employed.

In the remainder of the paper we start by describing the empirical strategy and the data in Section 2. In Section 3 we assess the motherhood effects on employment, part-time work, self-employment, and job instability for the pooled sample of 29 countries as well as by country, and relate the results to gender norms and family-friendly policies. In Section 4 we analyze how motherhood disrupts the allocation of talent, assessing labor market responses to the birth of the first child across groups with different educational attainment and predetermined cognitive and socio-emotional skills. Finally, in Section 5 we present our main conclusions.

2 | EMPIRICAL STRATEGY

2.1 | Event Study Specification

We adopt the event study approach used in Kleven et al. (2019b) to estimate the impact of the first child—i.e., the first live birth—on mothers' and fathers' labor outcomes. Identification rests on the assumption that labor market outcomes are uncorrelated with the timing of the first birth, conditional on becoming a parent within our sample period and several controls.[6]

Consider a panel of $i = 1, ..., N$ individuals observed for all or some $t = 1, ..., T$ calendar periods (years). Individual i becomes parent for the first time in calendar period E_i, and positive (negative) $e_{it} = t - E_i$ is the number of years since (before) the birth of the child. Let τ be the relative period or event time index, such that $\tau = 0$ denotes the year of birth of the first child. The relative time index allows us to compare individuals with the same

[5] For instance, misallocation and gender wage gaps may arise because children generate career interruptions of mothers at a stage of their life cycle when substantial accumulation of human capital takes place (Erosa et al., 2016).

[6] Kleven et al. (2019b) show that this approach performs well in identifying both short- and long-run effects of children on women's earnings and labor force participation compared to widely used alternative approaches, such as instrumental variables and differences-in-differences. For a formal discussion about the identifying assumptions in an event study see Borusyak et al. (2021) and Sun and Abraham (2020).

exposure to parenthood even if their children were born in different calendar years. We model outcome Y for individual i in county c and calendar time t as:

$$Y_{itc} = \sum_{\tau \neq -1} \beta_\tau I(\tau = e_{itc}) + \sum_j \gamma_j I(j = age_{itc}) + \sum_y \delta_y I(y = t) + \sum_s \lambda_s I(s = c) + \varepsilon_{itc}. \quad (1)$$

The first term on the right hand side includes event time dummies. The event time coefficients β_τ for $\tau \geqslant 0$ capture the post-child effects.[7] We set $\tau = -1$ as the omitted category, thus all β_τ are measured relative to the year before the first child was born. The following terms include a full set of age-in-years dummies, calendar year dummies, and country dummies. As usual in the related literature, we convert level effects to percentage effects relative to the counterfactual outcome without children. Formally, the percentage effect for each event time τ is given by $P_\tau = \frac{\hat{\beta}_\tau}{E[\tilde{Y}_{itc}|\tau]}$, where $\tilde{Y}_{itc}$ is the predicted outcome at event time τ from model (1) when subtracting the event time terms.

The dependent variable Y represents our four labor market outcomes of interest: (i) whether the individual was working at time t; (ii) whether the individual was working part-time at time t; (iii) whether the individual was self-employed at time t; and (iv) the number of jobs held up to period t.

2.2 | Data and sample

We use data from the SHARE Job Episodes Panel, which is a single retrospective panel dataset built from waves 3 and 7 of the Survey of Health, Ageing and Retirement in Europe (SHARE).[8] SHARE is a harmonized panel of about 140,000 individuals aged 50 and over in 28 European countries and Israel. What makes waves 3 and 7 of SHARE special is that respondents were asked about their life history including working life and fertility history through a retrospective questionnaire. Our sample is drawn from the 28,465 individuals interviewed in wave 3 (SHARELIFE) and the 62,561 individuals who participated in the life history interview in wave 7, i.e., SHARE respondents taking part in wave 7 who had not participated in wave 3. We merge these data with information on those same respondents from the regular waves of SHARE in order to have information on their socio-demographic characteristics and other variables.

Built in this way, the retrospective panel dataset contains yearly information at the individual level. Each respondent contributes with as many observations as the years of age from her/his birth to the age at the time of interview. In particular, the dataset contains yearly information that allows us to construct our four labor market outcomes of interest: employment status, self-employment, part-time employment, and the number of jobs held up to a certain year. Employment status for each individual-year is defined based on the start and end year of each job spell. The dummy variable *employed* takes the value 1 if the respondent in a given year was working and 0 otherwise. The other three outcomes are defined for working individuals only, by attaching job characteristics to each job spell. Based on the job title employee, civil servant, or self-employed we generate the dummy variable *self-employed*.[9] The dummy variable *part-time* takes the value 1 if the individual was

[7] Long-term effects will also capture the impact of children born after the first child.

[8] Specifically, we use the Job Episodes Panel release 7.1.0 (DOI: 10.6103/SHARE.jep.710). See Brugiavini et al. (2019) for methodological details.

[9] Self-employment includes working for family business. SHARE questionnaires recover information of whether the self-employed are own-account workers or whether they have employees. However, this information is only asked to those who are employed at the moment of the interview and not included in the job histories

working part-time in the corresponding job spell. Finally, we construct the variable *number of jobs* that counts the number of different jobs held up to time t and which we interpret as a measure of job instability. The data also include information on the dates of birth of children.[10]

Using SHARE allows us to estimate both short- and long-term effects of motherhood on labor market outcomes for the 29 countries using the same data, hence avoiding issues of heterogeneity across questionnaires or survey methods. The richness of the SHARE questionnaire also allows us to explore potential mechanisms to explain differences in labor market responses to motherhood across and within countries. For instance, we use cognitive abilities at age 10, data on educational attainment, and the Big Five personality traits data collected in wave 7, to show how motherhood leads to inefficient choices regarding labor supply and—for those women who remain in the labor force after motherhood—the type of job.[11,12] Had we used administrative data to carry out our analysis, we would have been restricted to a small sample of countries. Even within this reduced sample, we would have had to deal with problematic discrepancies across countries, as ways of computing or reporting labor force status may differ. Moreover, administrative data do not record informal work arrangements, whose incidence varies across countries and affect men and women differently. Survey data has additional perks: it allows us to access information that does not exist in administrative data, such as any subjective question, personality traits, childhood circumstances, etc.[13]

Our sample includes only those individuals we observe at least once before and once after becoming parents, and whose age at the birth of the first child is over 16 years old. The resulting sample contains 45,326 women (1,327,120 person-year observations) and 33,683 men (1,082,997 person-year observations), who had children at some point before the retrospective interview takes place. The number of observations for each individual ranges from 20 years before to 20 years after the birth of their first child. All 29 countries are

questionnaire. Hence, the SHARE Job Episodes Panel does not allow to distinguish between own account self-employment and incorporated entrepreneurship. Using the main SHARE survey, waves 1, 2, 4, 5 and 6, we computed the percentage of own-account workers—as opposed to employers—among the self-employed at the time of the interview by gender and country. On average, own-account working women represent 69% of self-employed women.

[10] Dates of birth of children are asked independently from information on work history, i.e., instead of asking whether the person was employed before and after having a child, respondents are asked in two separate sections about the dates of birth of their children on the one hand, and about the dates of start and end of each of the jobs they had in their life on the other hand.

[11] Data on math ability at the age of 10 is only available for 15 of the 29 countries.

[12] One novelty of the SHARE wave 7 questionnaires is that they introduced the 10-item Big Five Inventory to measure personality. This Inventory identifies several personality variables and groups them into personality constructs: openness to experience, extroversion, neuroticism, conscientiousness, and agreeableness. For methodological details about the 10-item Big Five Inventory in SHARE wave 7 see Chapter 2.3 of Bergmann et al. (2019).

[13] Of course this comes at a cost, as several concerns usually emerge when using survey data. First, the reliability of a survey depends on both the precision of respondents'assessments and the distribution of errors originating during the interviews. In other words, if measurement errors are non-classical, inference is problematic. One study (Bingley and Martinello, 2014) used an individual linkage with extremely precise Danish administrative registers to perform an internal validation study of SHARE in Denmark data for education, labor market status and gross household income. Where they find measurement error (in schooling only), it is modest, small and insignificant. They conclude that "unlike income validation studies for the US Panel Study of Income Dynamics and the Health and Retirement Study, we find that SHARE Denmark income measurement error is classical." Another common issue, in retrospective studies more particularly, is recall bias, which occurs when respondents provide erroneous responses due to their inability to recall past events. As established in Mazzonna and Havari (2011), which assesses the internal and external consistency of some measures of childhood health and socio-economic status, respondents seem to remember well their health status and living conditions between ages 0-15.

part of the sample: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and Switzerland.

Tables A.1 and A.2 in the Appendix describe the samples for the pool of countries (pooled sample) and for each country, respectively, in the year prior to the birth of the first child. In our pooled sample, 91% of men were working at that time, compared with 72% of women; self-employment was higher among men, so was the number of jobs held up to that time, while part-time jobs were more prevalent among women. On average, women first became mothers when they were 24.4 years old (the range varies from 22.2 in Romania and Bulgaria to 26.8 in Ireland), while men first became fathers when they were 27.5 years old. Figure A.1 in the Appendix shows the distribution of age at first birth for men and women across countries. Our sample is made of cohorts born mostly between the 1920s and the 1960s, with an emphasis on early baby-boomers (average year of birth around 1947, as shown in Table A.1). Most individuals in our sample gave birth to their first children between the 1950s and the 1980s. Figure A.2 in the Appendix shows the whole distribution of years of birth of the first child for the sample of women, with the average in 1972. Hence, our results may be envisioned as the effects of motherhood for women who had their first baby in the early 1970s.

3 | MOTHERHOOD EFFECTS ON EMPLOYMENT, PART-TIME EMPLOYMENT, SELF-EMPLOYMENT, AND JOB INSTABILITY

3.1 | Main results on all countries pooled together

In this section we first present the results from estimating equation (1) on the pooled sample of all 29 countries for our four outcome variables: (i) employment status, (ii) part-time employment, (iii) self-employment, and (iv) number of jobs held up to period t. Figures 2a, 2b, 2c, and 2d show the normalized estimates of the β_τs (i.e., $P_\tau = \frac{\hat{\beta}_\tau}{\bar{Y}}$) for outcomes (i)-(iv), respectively, from five years prior to the birth of the first child to 15 years afterwards. These normalized coefficients are to be read relative to the year before birth ($\tau = -1$).

Our estimates of short- and long-run motherhood effects on the probability of working, -25% for $\tau = 1$ and -21% for $\tau = 15$ (see Figure 2a), fall close to the upper end of the [-40%,-20%] interval found in the literature (Kleven et al., 2019b; Kleven et al., 2019a; Kuziemko et al., 2018; Berniell et al., 2021b; and Kleven et al., 2021).[14,15] Our results also point to a sharp increase, larger than 50%, of both part-time employment and self-employment immediately after the birth of the first child. Importantly, 15 years after motherhood, all labor market responses remain of the same order of magnitude.[16] Results for men reveal

[14] The small labor market effects at $\tau = 0$ reflect several situations. For example, some women in the sample became mothers in the beginning of that year, others may have stopped working before the birth of the child while pregnant and yet others were not pregnant in the beginning of the year and kept on working until their baby was born at the end of the year.

[15] One challenge when trying to pin down the causal effect of the birth of a first child on labor market outcomes is that it may be hard to disentangle that effect from that of marriage, as marriage and childbirth tend to almost coincide in time. In Berniell et al. (2021a) we assess whether the large labor market effects we find can be attributed to marriage by comparing women that become mothers in the first two years after marriage and those that become mothers afterwards. We find that although marriage has an effect, the magnitude is much smaller compared with the effect of the first child. Based on this evidence we discard a narrative centered on marriage rather than motherhood bearing the responsibility of women exiting the labor force or going into more unstable forms of employment.

[16] Long-term effects also capture the impact of children born after the first child. To assess to what extent

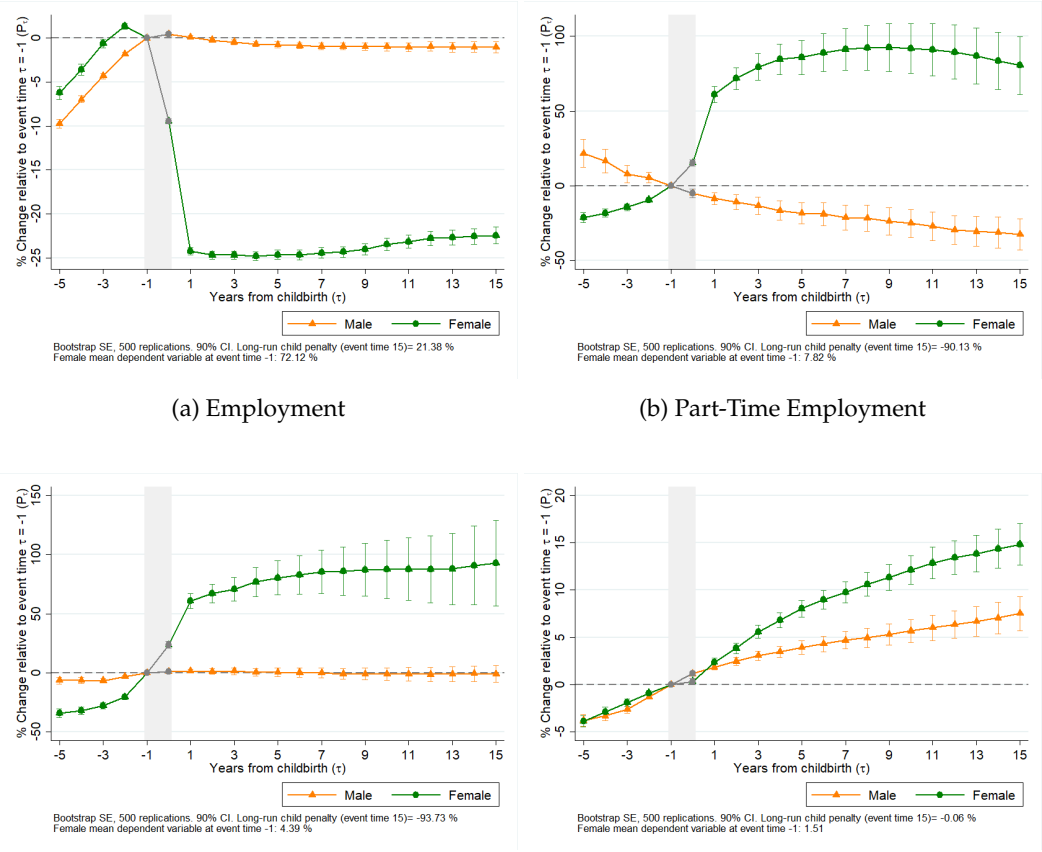
a zero immediate effect of fatherhood on employment and self-employment, and a small negative effect on part-time employment, which follows the slightly negative prebirth trend. Likewise, the effect on employment, although very small (around -1% in the long-run), eventually becomes statistically significantly negative for men. The transition to fatherhood is, therefore, smooth for all three outcomes in contrast to the abrupt transitions to motherhood.

The instability of employment is captured by our fourth outcome measure, namely the number of jobs held up to a given period (see Figure 2d). Despite an initial common trend in the number of jobs, women face increased instability of employment relative to men after the birth of the first child, to the extent that 15 years afterwards the average number of jobs held by women (relative to the number held up to $\tau = -1$) increases by 15% whereas over the same period that of men increases only by 7%. Moreover, while in the case of men the number of jobs evolves smoothly through time, for women it stalls during pregnancy, to jump abruptly immediately after the first birth: from this point onward, a growing gap between men and women emerges. We interpret this evidence as higher job instability for women after motherhood, which could be due to job changes when searching for more flexibility, such as moves to part-time work and self-employment, or to career interruptions due for example to the lack of job-protection leave.[17]

A potential concern with our estimates regarding part-time, self-employment and number of jobs is that the estimated effects may also capture selection effects because all three outcomes are conditional on being employed. However, since the existing evidence supports a positive selection into employment (for a review of the literature see Blau and Kahn, 2017), our estimates would be a lower bound of the true impact of children on these outcomes.

subsequent children have a differentiated effect, we run separate regressions for women who have a single child and for women who have more children. They show a common short-term impact of motherhood for the first child that decreases in time for the only-child group whereas it persists in the long-run for the other group. Because the two groups of women may be very different, these results are only suggestive and need to be interpreted with caution. The different long-run responses to motherhood may be due to the cumulative effect of subsequent children but heterogeneous effects between the two groups cannot be ruled out. Results available upon request.

[17] Note that our measure of "number of jobs" does not change when women return to the same job after short leaves due to child birth.



(a) Employment

(b) Part-Time Employment

(c) Self-Employment

(d) Number of Jobs

FIGURE 2 Parenthood Effects on Labor Outcomes, Pooled Sample of 29 Countries.

Notes: These graphs show the normalized effects P_τ, which result from estimating equation (1) for mothers and fathers separately in the pool sample of 29 countries. The outcome variables are employment status, working part-time, being self-employed, and the number of jobs held. The last three outcomes are conditional on being employed. See Section 2 for definitions. The standard errors were computed using 500 (clustered by individual) bootstrap samples.

3.2 | Gender norms and family policies as potential drivers of heterogeneity across countries

When repeating the estimation of equation (1) country by country, we confirm that motherhood decreases the probability of working in all countries, but the magnitude of the effects shows considerable variation along both the extensive and intensive margins of labor supply. The short- (one year post birth) and the long-run (15 years post first birth) estimated motherhood effects on employment for all 29 countries are displayed in Figure 3.[18] A few stand-alone countries, such as Malta, Ireland, and the Netherlands, hold the

[18]Our country by country estimates of motherhood effects are slightly different from those obtained previously in the literature for a subset of countries because i) our results pertain to an earlier time period; ii) they are not net of the effect on men, as in Kleven et al. (2019a) for example, which is often zero in our estimates. With a 15-year horizon, our estimates of -20 and -27% for Denmark and Sweden are higher in absolute terms than those found in Kleven et al. (2019a) (-13 and -7%) over a 10 year horizon; we find a -18 and -42% motherhood effect for Germany and Austria, where their estimates are -30 and -27%; we find a -48% effect for Ireland, and we do not provide estimates for the US and the UK as these countries are not part of SHARE. Figure A.3 in the Appendix displays the motherhood effects on employment for each country from five years before to fifteen years after the birth of the first child. Country by country results for the other outcomes are available upon

largest motherhood effects in terms of employment, followed by other Western European countries such as Switzerland, Luxembourg, and Austria. Northern countries exhibit lower motherhood effects, followed by Eastern countries, among which Baltic countries, with close to zero effects.[19,20]

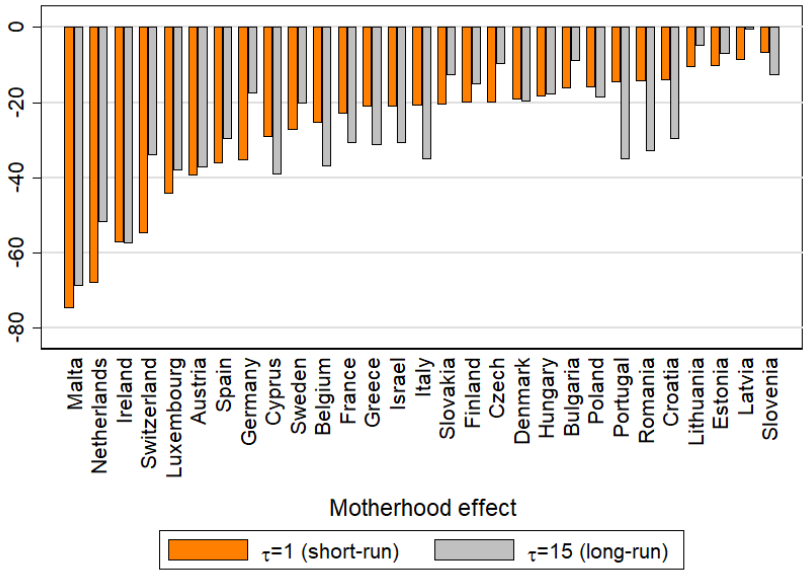


FIGURE 3 Short- and Long-Run Motherhood Effects on Employment by Country.

Notes: This graph shows the normalized effects P_τ for the year immediately after motherhood ($\tau = 1$) and 15 years after motherhood ($\tau = 15$), which result from estimating equation (1) for mothers by country. The outcome variable is employment status. The standard errors for each country were computed using 150 (clustered by individual) bootstrap samples. All estimates are statistically significant at 10%, except for Latvia.

At the country level, larger drops in women's employment upon motherhood tend to be observed where more women enter self-employment or part-time work, conditional on remaining in the labor force. As Figure 4 shows, there is a strong negative correlation between the motherhood effects on the different labor market outcomes estimated above, suggesting that all these employment responses to motherhood may share common drivers. One obvious example is given by Eastern countries, which were all part of the Soviet bloc at the time these mothers had their first baby: the small motherhood effects are very likely the result of socialist policies aimed at reaching gender equality during the Soviet era since female labor participation was considered key in the industrialization process and in the achievement of economic growth (Brainerd, 2000; Sattar, 2012; Khitarishvili, 2019).[21]

request.

[19] The evolution of motherhood effects also differs across countries: for example, Portugal, Romania, Croatia and Italy show increasing motherhood effects both in absolute and relative terms, while Germany, Slovakia, Spain and Sweden see a reduction of motherhood effects with time.

[20] Despite considerable variation across countries, certain regional patterns emerge as shown in Figures A.4, A.5, A.6 and A.7 in the Appendix. For instance, Figure A.4 shows that Western Europe displays the largest motherhood effect in employment, close to -40% while Eastern countries exhibit the lowest motherhood effect on employment of around -15%. South European countries and Northern countries have a similar motherhood effect on employment of roughly -20%.

[21] The 1936 Soviet Constitution was one of the earliest examples of gender equality legislation by explicitly recognizing equal labor rights and the right to equal pay for the work of men and women. In line with these

We explore gender norms and family policies as two potential drivers of these motherhood effects that could explain the differential impact of motherhood across countries. Gender norms may impact women's decisions regarding the labor market inasmuch as that they mold expectations about child rearing. Given gender norms, family policies may foster women's participation in the labor market by helping parents balance work and family life. However, assessing to which extent gender norms and family policies explain how women's response to motherhood differs is difficult, as government policies and political regimes have been shown to trigger changes in social norms (Bertrand, 2011; Goldin and Katz, 2002; Goldin, 2006). It is therefore relevant to look both at how gender-role attitudes and family policies correlate with motherhood effects, which is possible given the large set of countries for which we are able to estimate the latter. The analysis is carried out separately for Eastern countries given that they were ruled by very different economic and political institutions under the period of analysis.

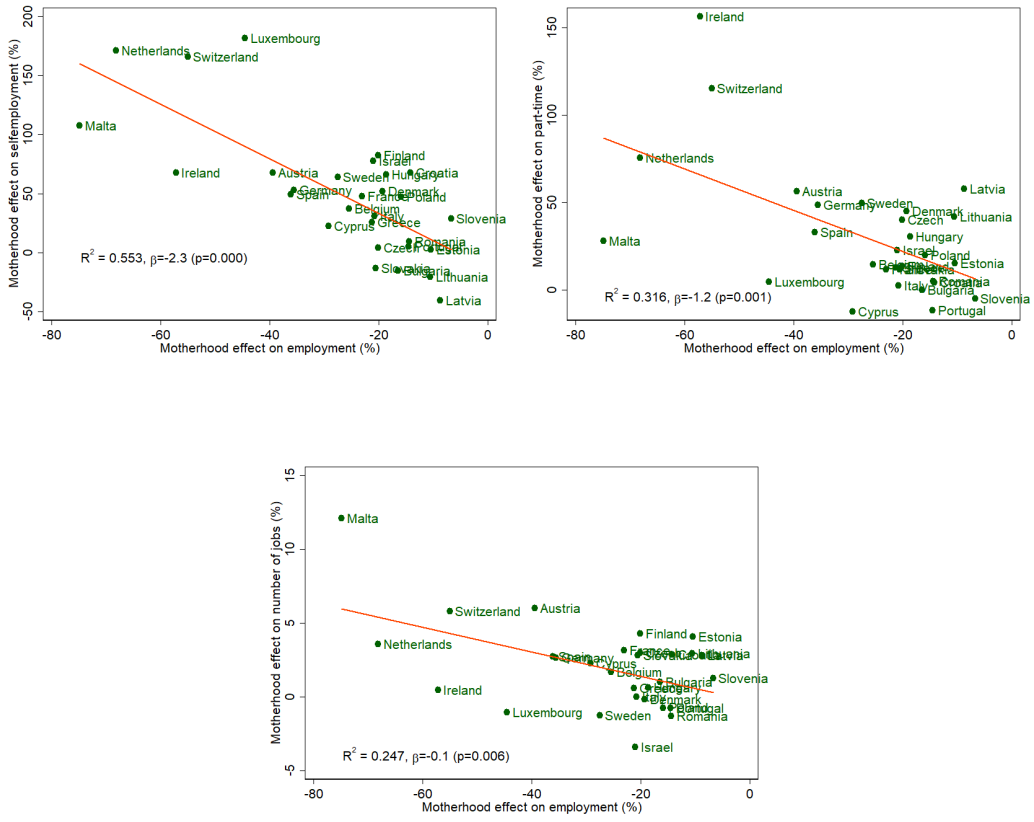


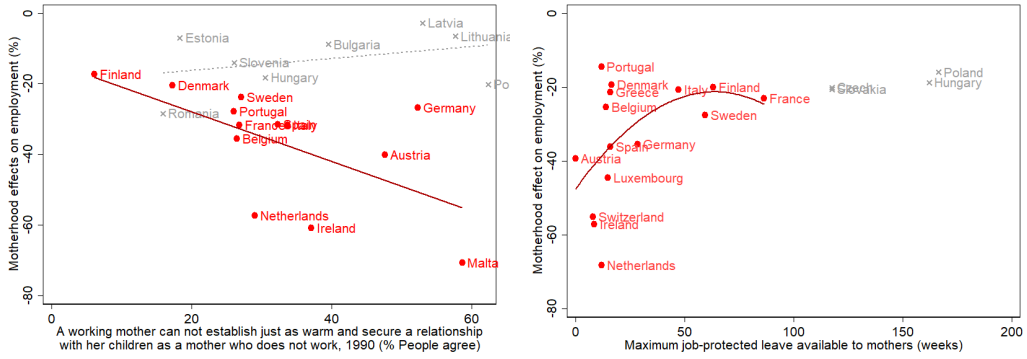
FIGURE 4 Correlations Between Short-Run Motherhood Effects Across Countries.

Notes: These graphs show the normalized effects P_τ for the year immediately after motherhood ($\tau = 1$), which result from estimating equation (1) for mothers by country.

Attitudes are elicited from the European Values Survey of the year 1990. We focus on one particular question, whether a working mother is able to establish just as warm and

objectives, the Soviet government adopted a series of measures, such as the establishment of a universal child care system (Khitarishvili, 2019).

secure a relationship with her children as a non-working mother.[22] When plotted against motherhood effects on employment, a very clear picture emerges as shown in Figure 5a. Among non-Eastern countries (red solid line), we find a strong association between the share of people who agree with the statement—i.e., working mothers cannot establish just as warm and secure a relationship—and the size of the motherhood effects. In other words, the more conservative views the country holds, the larger the negative effects of motherhood on employment. It is important to note, however, that this strong correlation vanishes when considering only ex-Communist countries (gray dashed line).[23] In fact, in these countries, gender norms do not seem to play a relevant role in molding mother's labor outcomes. This is related to the small effects of motherhood on labor market outcomes and, as stated before, is probably the result of the Socialist policies that were in place in these countries when these women became mothers.



(a) Motherhood Effects and Gender-Role Attitudes

(b) Motherhood Effects and Family-Friendly Policies

FIGURE 5 Motherhood Effects on Employment, Gender-Role Attitudes and Family-Friendly Policies Across Countries.

Notes: These graphs show the normalized effects P_τ for 10 years (5a) and 1 year (5a) after motherhood, which result from estimating equation (1) for mothers by country. The outcome variable is employment status. On the horizontal axis of Figure (5a), we show the percentage of people agreeing with the statement "a working mother cannot establish just as warm and secure a relationship with her children as a non-working mother" in each country in 1990 (data source is the European Value Survey). The horizontal axis of Figure (5b) shows the variable "Maximum job-protected leave available to mothers" measured in weeks from Olivetti and Petrongolo, 2017.

Family-friendly policies could also play a role in explaining the cross-country heterogeneity of motherhood effects, given that they are usually aimed at encouraging female labor supply. Following Olivetti and Petrongolo (2017), we explore the cross-country correlation between one of these policies—maximum weeks of job-protected leave available to mothers, regardless of income—and the motherhood effect on employment. We also make use of their historical data, and compute its average from 1970 to 1989, given that it is the closest period

[22] Very similar results are found when considering the level of agreement to the statement "a preschool child is likely to suffer if his or her mother works". See Figure A.12 in the Appendix.

[23] Using similar variables from the Eurobarometer 1999 and the European Values Survey 2008 we show that the results remain virtually unchanged, indicating that norms change slowly across time (See Figure A.11 in Appendix). In fact, even though the fraction of individuals who agree with the statement decreases across time for all countries, the ranking of countries is very similar across periods. The Spearman's rank correlation coefficients are very high and statistically significant: 0.64 between 1990 and 1999, 0.87 between 1999 and 2008 and 0.68 between 1990 and 2008. This is relevant for our analysis, given that the motherhood effects plotted correspond mainly to women that became mothers during the seventies.

to our analysis for which we have information. The simple correlation plotted in Figure 5b confirms findings from Olivetti and Petrongolo (2017) of a non monotonic relationship between the duration of maternity leave and female employment in non-Eastern countries: while motherhood effects decrease with the length of job-protected maternity leave, there is a threshold beyond which that protection is ineffective.[24,25] As for Eastern countries, the four of them for which we have information show very generous maternity leave schemes which may be connected to the very low motherhood effects (Brainerd, 2000). However, information is rather scarce to carry out a sound analysis.

Our findings are compatible with both gender norms and policies having to do with motherhood effects: the more conservative a society, and the less "family-friendly" government policies are, the larger the motherhood effects on labor market outcomes. Regardless of the deep causes that could be driving the motherhood effects, in the next section we focus on its consequences on the allocation of talent.

4 | MOTHERHOOD EFFECTS ON THE ALLOCATION OF TALENT IN THE LABOR MARKET

So far, we have shown that upon motherhood women either stop working or opt for alternative modes of employment—i.e., part-time and self-employment—that offer more flexible arrangements in terms of working hours.[26] Although part-time employment allows for reduced and more flexible work schedules, it is also characterized by lower earnings, underutilization of skills, and scant human capital accumulation.[27] In the same way, self-employment provides greater flexibility but certain entrepreneurial skills are needed to succeed.[28] Also, we have shown that motherhood leads to more job instability. This constitutes a first piece of evidence suggesting that the arrival of the first child may lead to a misallocation of talent since job changes usually lead to a loss of experience and of specific skills (Topel, 1991; Kambourov and Manovskii, 2009).

We now move one step forward and study more directly how motherhood affects the allocation of talent in the labor market by analyzing if more skilled women either drop the labor force or sort into occupations that may entail an underutilization of their human capital. Indeed, Figure 6 shows that there is a strong positive correlation across countries between the size of the motherhood effect on employment estimated for each of the 29 countries in our sample and the percentage of women with a college degree out of the labor force—a measure that can be broadly interpreted as a proxy of underutilization of women's

[24] Figure A.10 in the Appendix shows the correlation between the duration of maternity leave and the other labor market outcomes explored: part-time and self employment, and the number of jobs. Results are consistent with our finding for employment: longer maternity leave seems to be correlated with lower levels of all three outcomes up to a threshold.

[25] It is important to note, however, that recent evidence for Austria finds almost no effect of the large expansion of parental leave since the 1950s on gender gaps (Kleven et al., 2020).

[26] SHARE data for those who are still working at the time of the interview show that self-employment leads to a larger dispersion of working hours. Figure A.8 in the Appendix reveals a distribution of hours worked per week for non-self-employed men and women bunched around 40 hours whereas it is more dispersed for the self-employed, particularly for self-employed women.

[27] For instance, Manning and Petrongolo (2008) find wage penalties for female part-time workers that suggest that their skills are not being fully used.

[28] A related literature shows that self-employment is many times an alternative to part-time when downgrading is either absent or less visible. However, this option is risky and, on average, also considerably worse remunerated than a salaried full-time job (Hamilton, 2000; Yurdagul, 2017; Poschke, 2013b). Self-employment also works as an alternative to unemployment for individuals with low skills, as shown in several papers discussing this possibility in general and for women in particular (Carrasco and Ejrnæs, 2012; Wellington, 2006; Poschke, 2013a).

talent.[29] In what follows we show that behind this correlation there is a causal effect of motherhood on the allocation of talent in the labor market.

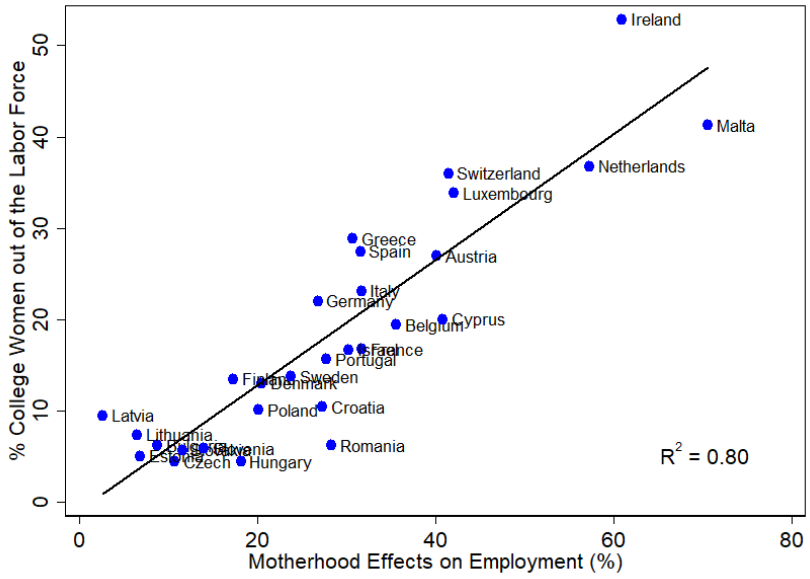


FIGURE 6 Motherhood Effects and Underutilization of Women's Human Capital in the Labor Market.

Notes: This figure shows the cross-country correlation between the percentage of women with a college degree who are out of the labor force and the motherhood effects on employment obtained in Section [Results]. For the former, we take womens aged 25-60 in the period 1960-2000 based on data from the Survey of Health, Ageing and Retirement in Europe (SHARE) Job Episodes Panel.

Taking advantage of the rich information available in SHARE and SHARELIFE, we construct three measures of talent based on educational attainment, a measure of predetermined cognitive skills—math ability at age 10—, and personality traits. We then estimate heterogeneous impacts of the arrival of the first child across groups of individuals with different levels of talent. We consider that parenthood causes a disruption in the allocation of talent in the labor market if the following situations arise in response to the first childbirth: (i) high skilled individuals reduce their labor supply relatively more than other less talented individuals; and (ii) of those who remain in the labor market it is the least entrepreneurial the more likely to become self-employed.

4.1 | Talent and labor supply

We first explore whether motherhood causes individuals with high cognitive abilities to reduce their labor supply, either by exiting the labor market or by reducing their working hours relatively more than individuals with low cognitive skills. Accordingly, we define two groups based on individuals' educational attainment: those with some college education and those without college education. Because education is a product of ability and opportunities, we also look at math ability at age 10 which is more likely to capture innate cognitive ability. We thus define a high-ability group that includes those individuals who by the age of 10

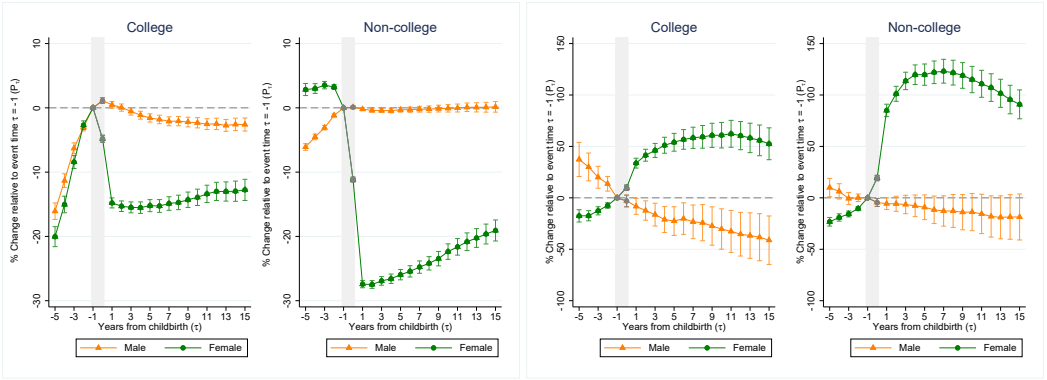
[29] Note that this measure of underutilization of human capital in Figure 6 only considers the extensive margin of labor supply. If we were to include in this measure the intensive margin as well, underutilization would be even larger.

were high-achievers in math and a low-ability group of those who were not high-achievers by that age.

Although the drop in labor supply upon motherhood is larger for the less educated women (Figures 7a and 7b) as well as for those that were non-high achievers in math during childhood (Figures 7c and 7d), the motherhood effect is still large and significant for the most talented women. On the contrary, we find almost no effect on fathers irrespective of their educational attainment and math ability: the results show a null immediate impact of fatherhood on employment (Figures 7a and 7c) and a small negative trend—though not always significant—on part-time employment that follows the slightly negative prebirth trend (Figures 7b and 7d). More importantly, we find similar results in a within-couple analysis. We divide all heterosexual couples in our data into three groups: (1) couples where the woman is more educated—and potentially more productive in the labor market—than the man, (2) couples where the woman has the same education level as the man, (3) couples where the woman has less education than the man. Figure 8 shows that for all three groups there is a large negative impact of motherhood on women's labor supply—both at the extensive and extensive margins—and almost no impact on fathers'.[30] Therefore, while even the most talented women—both in absolute terms and relative to their husbands—leave the labor market or start working fewer hours after the birth of the first child, all men, including the least talented, stay employed. These results highlight the substantial underutilization of skills of many talented women in the labor market, while many less talented men remain in the labor force.

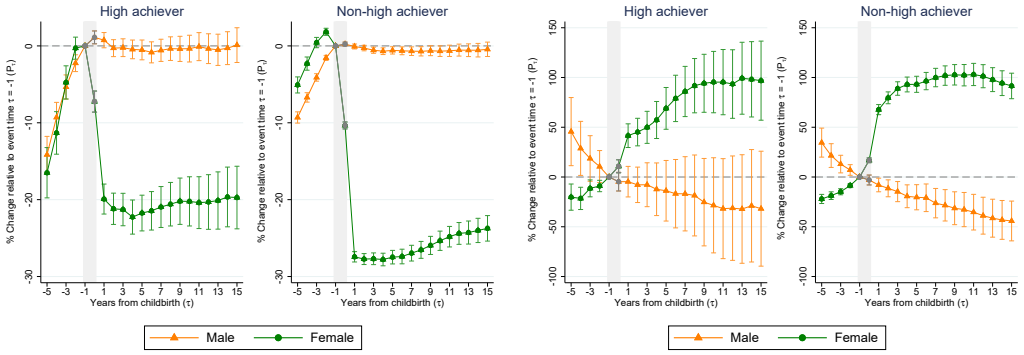
[30] We find similar results when comparing women with their male partners according to their math ability at the age of 10 (see Figure A.9 in the Appendix). For this analysis, however, we only have information for 15 of the 29 countries, resulting in more imprecise estimates of the motherhood effects.

Panel 1: Education



(a) Employment (b) Part-time

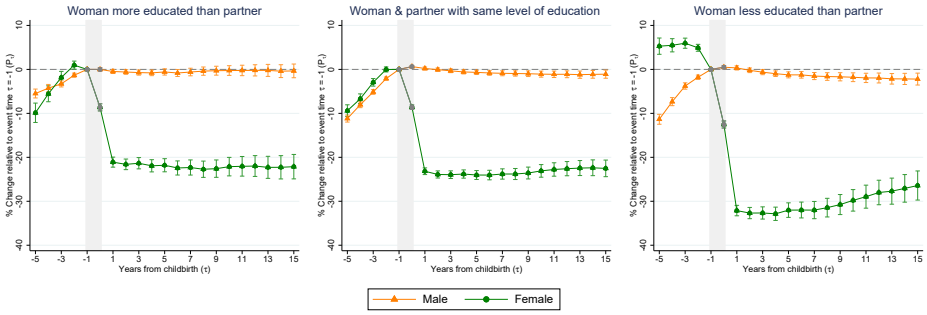
Panel 2: Mathematical relative performance at age 10



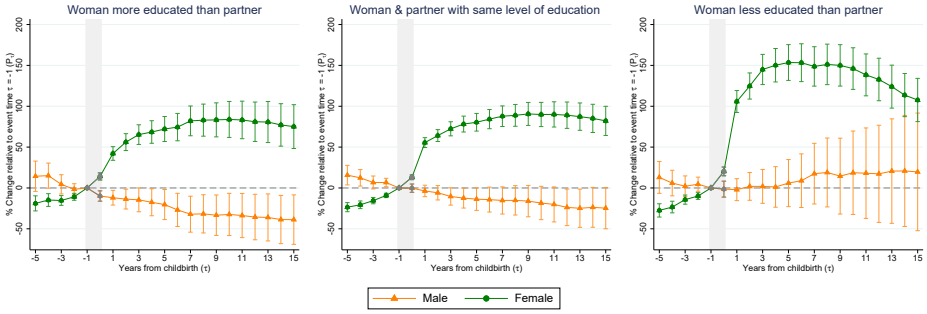
(c) Employment (d) Part-time

FIGURE 7 Parenthood Effects on Labor Supply by Education and Relative Performance in Math.

Notes: These graphs show the normalized effects P_τ, which result from estimating equation (1) separately for mothers and fathers, for high and low level of education (Figures a and b) and for high and non-high achievers in math (Figures c and d), in the pool sample of 29 countries and 15 countries, respectively. The outcome variables are employment status and working part-time (this last outcome is conditional on being employed). See Section 2 for definitions. 90% confidence intervals were computed using standard errors clustered by individual.



(a) Employment



(b) Part-time Employment

FIGURE 8 Parenthood Effects on Labor Supply by Spousal Education Gap.

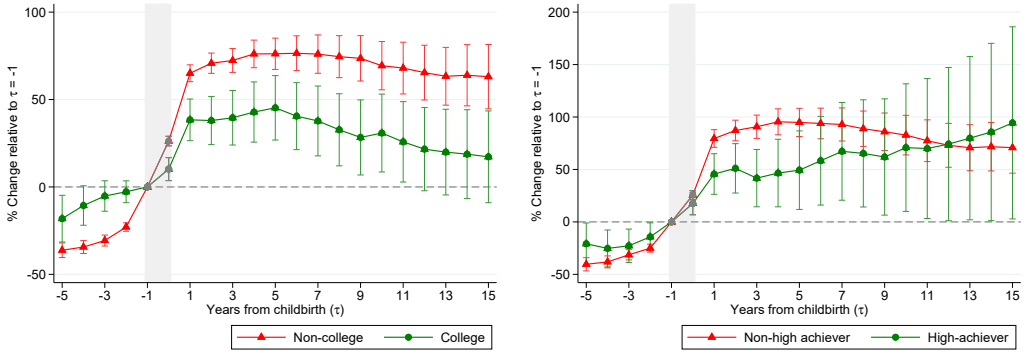
Notes: These graphs show the normalized effects P_τ, which result from estimating equation (1) separately for mothers and fathers for couples where women are more educated than their male partners (first column), couples where women are equally educated than their male partners (second column), and couples where women are less educated than their partners (last column), in the pool sample of 29 countries. The outcome variables are employment status, working part-time, being a self-employed (these last two outcomes are conditional on being employed) and the number of jobs held up to period t. See Section 2 for definitions. 90% confidence intervals were computed using standard errors clustered by individual.

4.2 | The allocation of entrepreneurial ability

As we have shown, the birth of the first child results in a sharp increase in the probability of becoming self-employed among mothers—but not among fathers (see Figure 2c). As the literature reveals, however, not all self-employment is successful, and several authors claim there is a positive relationship between educational level and successful self-employment. For instance, Levine and Rubinstein (2017) find that more successful entrepreneurs—i.e., incorporated—tend to be more educated and, as teenagers, scored higher on learning aptitude tests. Similarly, Hartog et al. (2010) find that mathematical ability has a higher return in entrepreneurship than in wage employment. In general, the empirical literature, as reviewed by Van der Sluis et al. (2008), finds a strong positive association between education and entrepreneurial performance. The literature has also shown that non-cognitive skills such as certain personality traits are important to succeed as an entrepreneur (Levine and Rubinstein, 2017; Caliendo et al., 2020). Therefore, to assess whether self-employment is a potential channel of misallocation of talent upon motherhood, we explore whether women

choosing self-employment are relatively more or less endowed with entrepreneurial talent proxied by educational attainment, math ability at age 10, and certain personality traits.

We start by looking at motherhood effects on self-employment by education and math ability at childhood. Figures 9a and 9b show that, conditional on working, women who were less educated or less able at math at the age of 10 are more likely to become self-employed after the birth of the first child.[31]



(a) Education (b) Mathematical ability at age 10

FIGURE 9 Heterogeneous Impacts of Motherhood on Self-employment by Cognitive Ability.
Notes: These graphs show the normalized effects P_τ, which result from estimating equation (1) for mothers, for high and low level of education (Figure a) and for high and non-high achievers in math (Figure b), in the pool sample of 29 countries. The outcome variable is being a self-employed (this outcome is conditional on being employed). See Section 2 for definitions. 90% confidence intervals were computed using standard errors clustered by individual..

To explore the effect of motherhood on the selection into self-employment across individuals with different personality traits we take advantage of the information contained in SHARE regarding the five-factor model of personality, known as the Big-Five model. The Big Five has been the predominant model of personality traits since the 1980s. This taxonomy arranges a variety of personality variables into concise personality constructs—openness to experience, extroversion, neuroticism (or its opposite: emotional stability), conscientiousness, and agreeableness—, which have been found to influence career choice and work performance (Kerr et al., 2017). An important feature of these personality traits is that they have been shown to be quite stable in time (e.g., Cobb-Clark and Schurer, 2012; Terracciano et al., 2010).

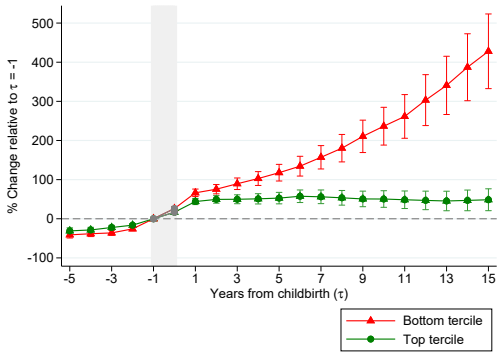
Caliendo et al. (2014) and Caliendo et al. (2020) find that openness to experience, which describes an individual's ability to seek new experiences and to explore novel ideas, is positively associated with both entry into self-employment and business survival. Caliendo et al. (2020) also find that extraversion is negatively related to firm performance, proxied by business survival, whereas none of the remaining factors of the Big Five model is associated with either entry into self-employment or business survival.[32] According to Figures 10a and 10b it is the less entrepreneurial-able (less opened to experience and more extraverted) women who are more likely to become self-employed upon motherhood.[33] Figures 10c and

[31] To keep the exposition of results simple, in this analysis of self-employment we do not show results for fathers, for which we do not find any type of heterogeneous effects across groups defined according to cognitive ability and personality traits.

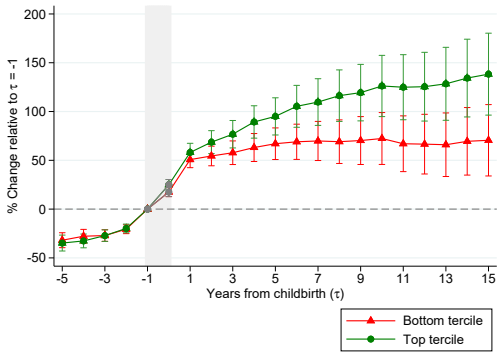
[32] Extraversion implies an energetic approach towards the social and material world and includes traits such as sociability, activity, assertiveness, and positive emotionality (Kerr et al., 2017).

[33] Interestingly, we do not observe heterogeneous impacts of motherhood on employment across groups defined

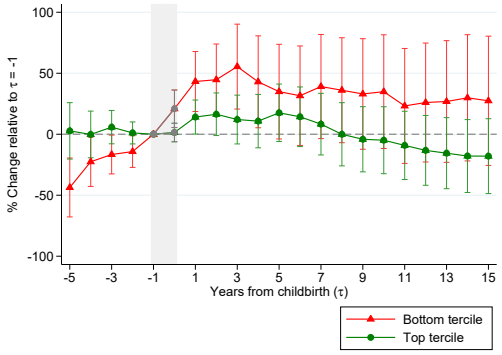
10d show that these results hold true even if we restrict the sample to women with college education, who are the most likely to engage in activities that require more entrepreneurial skills (these estimates are less precise because we narrowed the sample to women with college).



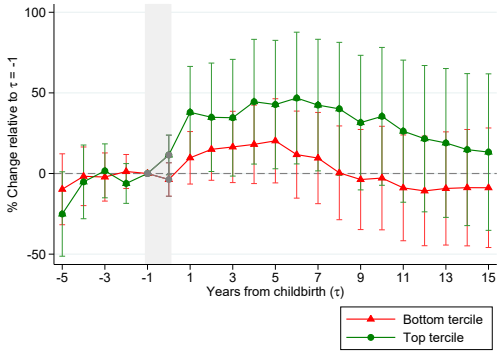
(a) Self-employment, according to "openness to experience"



(b) Self-employment, according to "extraversion"



(c) Self-employment, according to "openness to experience"(sample of women with college)



(d) Self-employment, according to "extraversion" (sample of women with college)

FIGURE 10 Heterogeneous Impacts of Motherhood According to Personality Traits.

Notes: These graphs show the normalized effects P_τ, which result from estimating equation (1) for mothers, for high and low levels of openness to experience (Figures a and b) and for high and low levels of extraversion (Figures c and d), in the pool sample of 29 countries. The outcome variables are employment status and being a self-employed (this last outcome is conditional on being employed). See Section 2 for definitions. 90% confidence intervals were computed using standard errors clustered by individual.

Summing up, when using college education, early math ability, and certain personality traits as proxies for entrepreneurial skills, we find that motherhood induces a negative selection of talents into self-employment.

4.3 | Discussion

Our analysis focuses on understanding how parenthood affects the allocation of talent in the labor market. So far we have shown that the arrival of the first child leads to a misuse

by women's personality traits. Results available upon request.

of human capital in the market economy by pushing out of the market many talented women and biasing their occupational choices after childbirth. Thus, we should expect that the large cross-country variation in the size of the motherhood effect showed in this paper explains part of the variation in the GPD across countries. But, of course, a missing piece to judge whether this evidence also implies a misallocation of talent between market and non-market activities is the (unobservable) gender difference in home production productivity. At the extreme, to judge whether there is misallocation taking into account the whole economy, we could just consider the within couple comparative advantages between fathers and mothers. For example, if women had a relative advantage in childcare, it may be efficient that they stay home even when they are more productive in the market than their partners. Although conclusive evidence regarding this matter is not present in the literature, recent research provides some hints. On the one hand, the more classical explanation of comparative advantages based on mother's biological link to their children does not seem to hold. According to Kleven et al. (2021), motherhood effects are virtually identical when comparing biological and adoptive mothers, ruling out the potential effects induced by physical changes. Moreover, it would be difficult to reconcile the claim of biological differences driving comparative advantages with the wide range of variability in the effects of motherhood that we find across countries, even when comparing individuals with similar skills. It would require to make the assumption that innate comparative advantages in home production vary geographically.

On the other hand, differences in comparative advantages in home production may arise from nurture, rather than nature. In fact, as we show, motherhood effects are related to social norms and policies. However, as Cortés and Pan (2020) note, comparative advantages should be quite considerable to account for the very large effects of motherhood in the labor market. For instance, consider the case of women with more education than their husbands: they show absolute advantages in the labor market yet we find large negative effects upon motherhood and none effect for fathers. How much larger should their absolute advantages in home production be so as to offset their advantages in labor market skills and therefore explain the negative effects found?

The absence of clear evidence regarding women's comparative advantage in home production suggests that it is probable that our results are also indicative of a misallocation of talent between market and non-market activities.

5 | CONCLUSION

During the last decades of the 20th century women's participation in labor markets was limited, even among the more educated. This underutilization of human capital hinders economic growth. Using restrospective data from SHARE for a harmonized sample of 28 European countries and Israel, we show that motherhood is—at least in part—responsible for this.

We estimate motherhood effects for all 29 countries in the sample and show not only that they are widespread and significant (25%), but also that they remain of the same order of magnitude 15 years after the first child is born. More importantly, we show that motherhood effects go beyond labor market participation decisions to substantially affect the uptaking of alternative modes of employment that are characterized by flexible or reduced work schedules but that are usually associated to lower pay and worse carreer prospects. For instance, part-time and self-employment increase on average by close to 60% upon motherhood. We are able to go further than the current available evidence and show that these effects on women's labor market upon motherhood are neither specific to a

country or to a subset of countries. Nonethesless, we find that the magnitude of these effects seems to be related to country-specific features such as social norms and the adoption of gender-friendly policies.

More novel, we show that motherhood entails changes in women's allocation of talent. The arrival of the first child increases job instability for women relative to men, associated to a loss of experience and of specific skills. Furthermore, based on three alternative measures of talent/ability (educational attainment, ability at math by age 10, and personality traits) we find evidence of large effects in the allocation of talent of women upon motherhood: very high-skilled women, even those that show higher levels of ability than their male partners, face higher probabilities of leaving the workforce or reducing working hours while the least entrepreneurial women are more likely to enter self-employment. In as much as no effects are found for men, these results suggest that parenthood produces misallocation of talent in the labor market. Furthermore, given the absence of conclusive evidence regarding female advantages in home production, these long-run impacts of motherhood are probably indicative of misallocation of talent between market and non-market activities. These inefficiencies, adding to the worrying evidence on gender gaps, participate to justifying the incremental costs of policies aimed at reducing them.

APPENDIX: FIGURES AND TABLES

TABLE A.1 Descriptive Statistics, Pooled Sample

	Mothers	Fathers
Socio-demographic characteristics		
Parent's year of birth	1947.52	1946.65
	(10.88)	(10.03)
Age	23.42	26.52
	(4.53)	(5.06)
1st child's year of birth	1970.93	1973.17
	(11.48)	(10.76)
Age at first child	24.42	27.52
	(4.53)	(5.06)
First childs year of birth	1971.93	1974.17
	(11.48)	(10.76)
College graduate	0.24	0.28
	(0.43)	(0.45)
Labor characteristics		
In the labor force	0.74	0.92
	(0.44)	(0.28)
Employed (unconditional)	0.72	0.91
	(0.45)	(0.28)
Self-employed	0.04	0.08
	(0.20)	(0.28)
Part-time	0.08	0.02
	(0.27)	(0.14)
Number of jobs	1.51	1.76
	(0.89)	(1.06)
No. of individuals	45,326	33,683

Notes: This table uses data from SHARE Waves 3 and 7. Columns 1 and 2 show, separately for mothers and fathers, the mean and SD (in parentheses) of socio-demographic and labor market variables one year before the birth of the first child ($\tau = -1$). Part-time, self-employed, and number of jobs are computed for those who are employed. The sample includes parents observed at least once before and at least once after childbirth. Sample is restricted to mothers and fathers whose age at first childbirth is over 16 years old.

TABLE A.2 Descriptive Statistics, Pooled Sample

	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Israel	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	Switzerland
Socio-demographic characteristics																													
Parent's year of birth	1945	1947	1951	1951	1949	1946	1948	1947	1951	1946	1947	1946	1948	1944	1947	1947	1950	1950	1951	1951	1944	1950	1949	1952	1956	1948	1944	1944	1945
	(10.06)	(11.83)	(10.21)	(9.79)	(11.34)	(9.44)	(11.50)	(10.50)	(10.14)	(11.57)	(10.62)	(11.52)	(8.41)	(9.46)	(9.76)	(10.85)	(10.92)	(11.09)	(9.48)	(9.37)	(9.11)	(11.07)	(8.97)	(10.22)	(8.95)	(9.87)	(11.61)	(9.98)	(10.93)
Age	23.01	24.03	21.25	22.02	23.27	22.00	23.90	23.22	24.45	23.67	23.40	24.40	22.01	25.85	23.48	24.33	23.35	23.32	24.88	24.16	24.61	22.31	23.29	21.24	22.43	22.30	24.57	24.24	25.36
	(4.82)	(4.32)	(3.92)	(3.99)	(4.75)	(3.88)	(4.45)	(4.27)	(5.42)	(4.67)	(4.63)	(4.95)	(3.94)	(4.88)	(4.81)	(4.59)	(4.54)	(4.22)	(4.71)	(4.19)	(4.26)	(3.84)	(4.33)	(3.79)	(4.16)	(3.93)	(4.48)	(4.89)	(4.62)
1st child's year of birth	1968	1971	1972	1973	1972	1968	1972	1970	1975	1969	1971	1970	1970	1970	1970	1971	1973	1974	1976	1975	1968	1972	1973	1973	1978	1970	1969	1968	1971
	(10.86)	(12.67)	(11.14)	(10.65)	(12.41)	(9.89)	(12.93)	(10.52)	(11.93)	(12.69)	(11.43)	(11.59)	(9.02)	(10.14)	(10.89)	(11.87)	(10.76)	(11.03)	(10.97)	(10.52)	(9.88)	(11.56)	(9.26)	(10.58)	(9.99)	(9.73)	(11.87)	(11.16)	(12.11)
Age at first child	24.01	25.03	22.25	23.02	24.27	23.00	24.90	24.22	25.45	24.67	24.40	25.40	23.01	26.85	24.48	25.33	24.35	24.32	25.88	25.16	25.61	23.31	24.29	22.24	23.43	23.30	25.57	25.24	26.36
	(4.82)	(4.32)	(3.92)	(3.99)	(4.75)	(3.88)	(4.45)	(4.27)	(5.42)	(4.67)	(4.63)	(4.95)	(3.94)	(4.88)	(4.81)	(4.59)	(4.54)	(4.22)	(4.71)	(4.19)	(4.26)	(3.84)	(4.33)	(3.79)	(4.16)	(3.93)	(4.48)	(4.89)	(4.62)
Firt child's year of birth	1969	1972	1973	1974	1973	1969	1973	1971	1976	1970	1972	1971	1971	1971	1971	1972	1974	1975	1977	1976	1969	1973	1974	1974	1979	1971	1970	1969	1972
	(10.86)	(12.67)	(11.14)	(10.65)	(12.41)	(9.89)	(12.93)	(10.52)	(11.93)	(12.69)	(11.43)	(11.59)	(9.02)	(10.14)	(10.89)	(11.87)	(10.76)	(11.03)	(10.97)	(10.52)	(9.88)	(11.56)	(9.26)	(10.58)	(9.99)	(9.73)	(11.87)	(11.16)	(12.11)
College graduate	0.24	0.31	0.18	0.14	0.15	0.13	0.44	0.44	0.45	0.21	0.26	0.15	0.19	0.55	0.43	0.09	0.49	0.46	0.18	0.08	0.18	0.15	0.05	0.11	0.11	0.18	0.09	0.41	0.23
	(0.43)	(0.46)	(0.39)	(0.35)	(0.36)	(0.34)	(0.50)	(0.50)	(0.50)	(0.40)	(0.44)	(0.36)	(0.39)	(0.50)	(0.50)	(0.29)	(0.50)	(0.50)	(0.39)	(0.27)	(0.39)	(0.36)	(0.21)	(0.31)	(0.31)	(0.38)	(0.29)	(0.49)	(0.42)
Labor characteristics																													
In the labor force	0.85	0.76	0.77	0.65	0.45	0.90	0.78	0.87	0.80	0.75	0.83	0.40	0.86	0.80	0.57	0.59	0.85	0.87	0.73	0.51	0.74	0.76	0.52	0.60	0.86	0.78	0.56	0.83	0.82
	(0.36)	(0.43)	(0.42)	(0.48)	(0.50)	(0.30)	(0.41)	(0.34)	(0.40)	(0.43)	(0.38)	(0.49)	(0.35)	(0.40)	(0.49)	(0.49)	(0.36)	(0.34)	(0.45)	(0.50)	(0.44)	(0.43)	(0.50)	(0.49)	(0.35)	(0.41)	(0.50)	(0.38)	(0.38)
Employed (unconditional)	0.85	0.74	0.73	0.55	0.42	0.90	0.77	0.86	0.80	0.74	0.82	0.35	0.85	0.79	0.56	0.52	0.85	0.85	0.73	0.44	0.74	0.74	0.50	0.59	0.85	0.74	0.54	0.83	0.82
	(0.36)	(0.44)	(0.44)	(0.50)	(0.49)	(0.30)	(0.42)	(0.34)	(0.40)	(0.44)	(0.38)	(0.48)	(0.35)	(0.41)	(0.50)	(0.50)	(0.36)	(0.36)	(0.45)	(0.50)	(0.44)	(0.44)	(0.50)	(0.49)	(0.36)	(0.44)	(0.50)	(0.38)	(0.39)
Self-employed	0.05	0.07	0.01	0.01	0.10	0.00	0.04	0.00	0.03	0.05	0.02	0.29	0.00	0.03	0.03	0.11	0.00	0.00	0.04	0.03	0.05	0.13	0.12	0.02	0.00	0.01	0.10	0.02	0.05
	(0.22)	(0.25)	(0.11)	(0.10)	(0.30)	(0.07)	(0.19)	(0.05)	(0.18)	(0.21)	(0.13)	(0.45)	(0.04)	(0.17)	(0.17)	(0.31)	(0.05)	(0.06)	(0.19)	(0.17)	(0.21)	(0.33)	(0.32)	(0.13)	(0.04)	(0.08)	(0.30)	(0.14)	(0.21)
Part-time	0.07	0.17	0.05	0.02	0.06	0.03	0.13	0.02	0.06	0.09	0.12	0.10	0.03	0.05	0.17	0.11	0.02	0.02	0.09	0.06	0.18	0.03	0.04	0.03	0.03	0.02	0.09	0.16	0.16
	(0.26)	(0.37)	(0.21)	(0.13)	(0.24)	(0.18)	(0.34)	(0.12)	(0.24)	(0.28)	(0.33)	(0.30)	(0.16)	(0.21)	(0.37)	(0.31)	(0.14)	(0.14)	(0.29)	(0.23)	(0.38)	(0.17)	(0.20)	(0.16)	(0.18)	(0.13)	(0.28)	(0.36)	(0.37)
Number of jobs	1.53	1.53	1.18	1.16	1.25	1.23	2.20	1.49	1.89	1.60	1.46	1.15	1.34	1.81	1.57	1.46	1.42	1.42	1.50	1.36	2.03	1.29	1.31	1.14	1.04	1.26	1.38	1.95	2.23
	(0.84)	(0.83)	(0.47)	(0.44)	(0.52)	(0.53)	(1.48)	(0.79)	(1.11)	(0.90)	(0.79)	(0.48)	(0.62)	(1.09)	(1.03)	(0.76)	(0.71)	(0.70)	(0.80)	(0.64)	(1.15)	(0.60)	(0.76)	(0.42)	(0.20)	(0.55)	(0.67)	(1.21)	(1.39)
No. of individuals	1,888	2,911	1,012	1,222	678	2,843	1,943	2,879	966	2,369	2,311	2,008	855	407	974	2,597	1,006	1,186	598	537	1,033	2,822	255	1,113	966	1,991	2,701	1,944	1,311

Notes: This table uses data from SHARE Waves 3 and 7. Each column shows, for each country in the sample, the mean and SD (in parentheses) of socio-demographic and labor market variables one year before the birth of the first child ($\tau = -1$). Part-time, self-employed, and number of jobs are computed for those who are employed. The sample includes parents observed at least once before and at least once after childbirth. Sample is restricted to mothers and fathers whose age at first childbirth is over 16 years old.

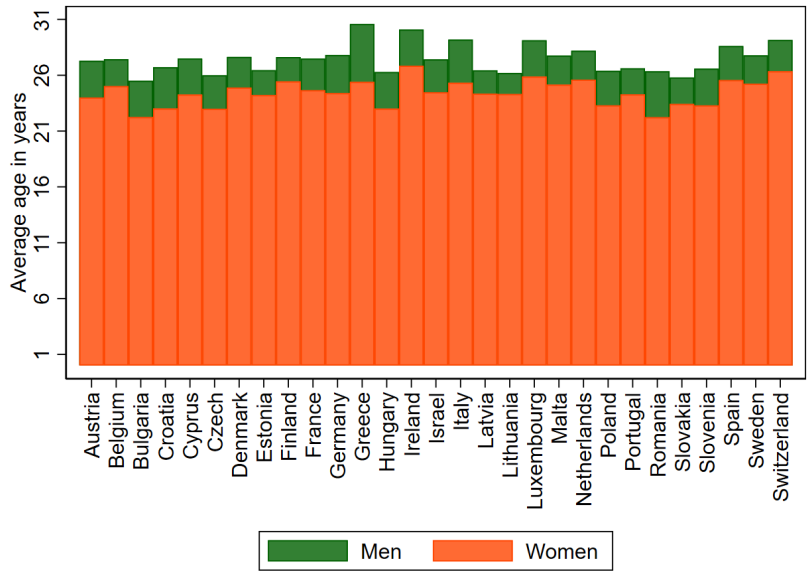


FIGURE A.1 Age at First Birth.

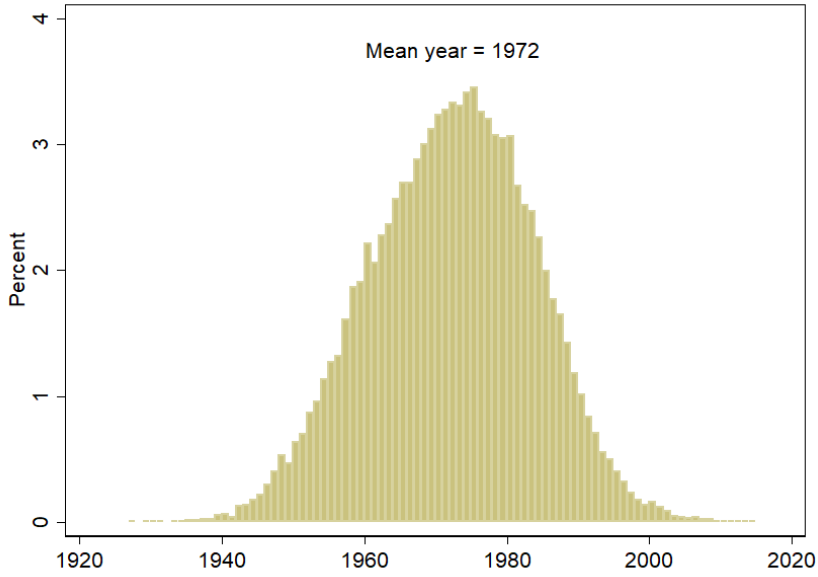


FIGURE A.2 Year of First Birth (Women).

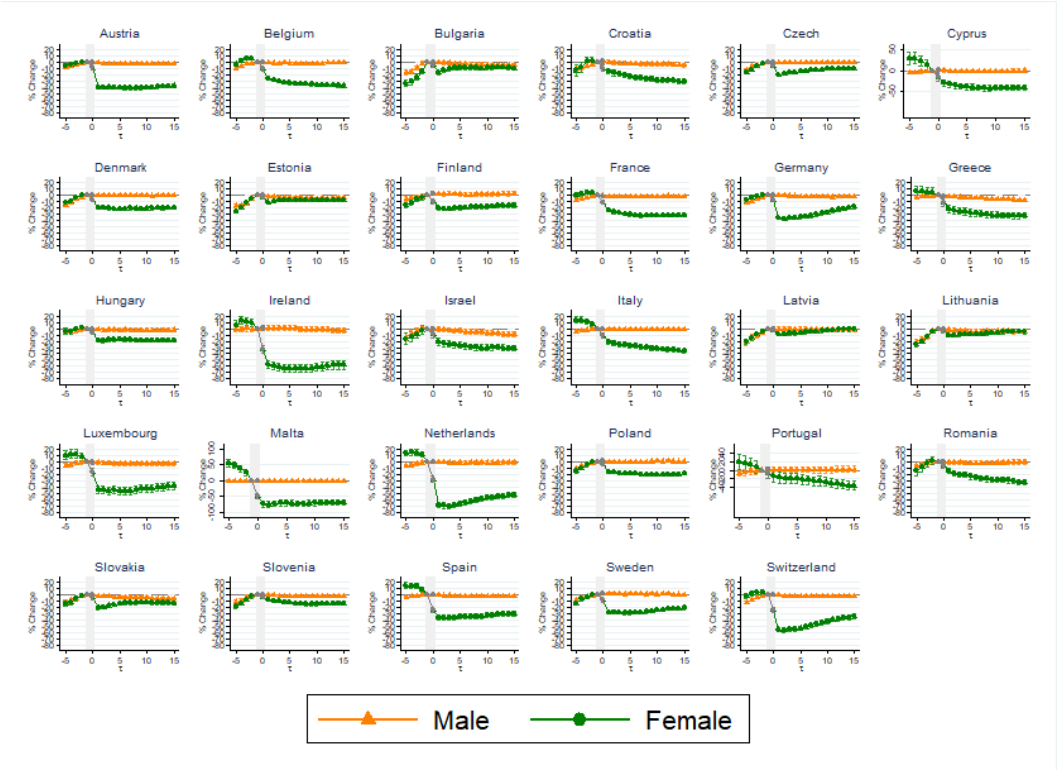


FIGURE A.3 Parenthood Effects on Employment by Country.

Notes: These graphs show the normalized effects P_τ, which result from estimating equation (1) separately for mothers and fathers. The outcome variable is employment status. See Section 2 for definitions. 90% confidence intervals were computed using standard errors clustered by individual.

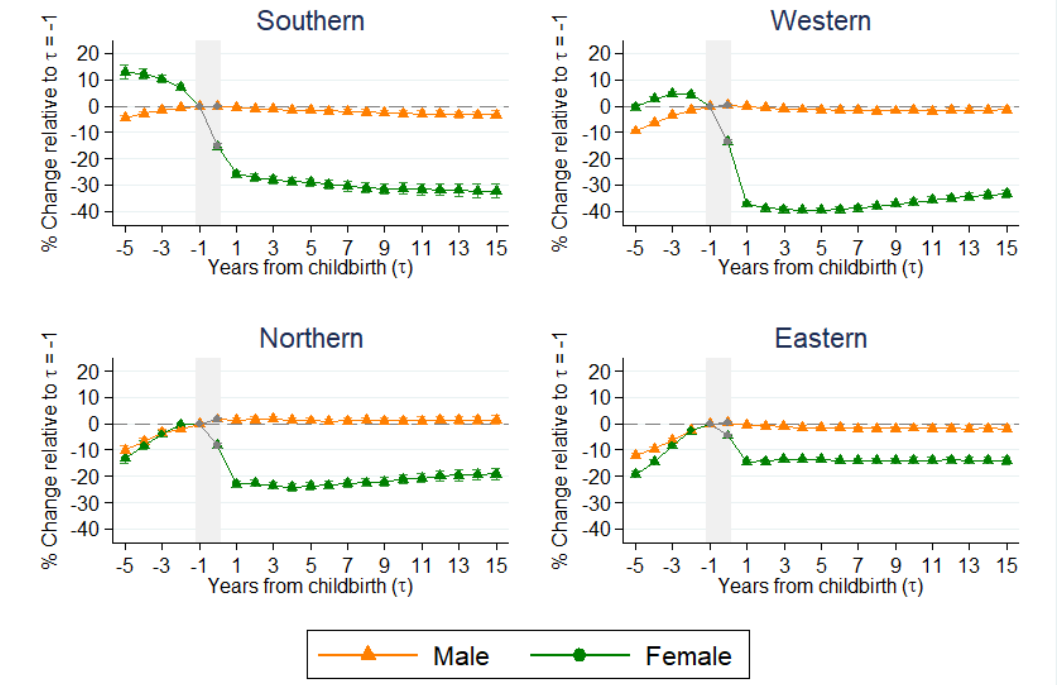


FIGURE A.4 Parenthood Effects on Employment by Region.

Notes: These graphs show the normalized effects P_τ, which result from estimating equation (1) for mothers and fathers separately on pooled data for four groups of countries. The dependent variable is employment status. Western Europe includes: Austria, Belgium, France, Germany, Ireland, Luxembourg, The Netherlands, and Switzerland. Northern Europe includes Denmark, Finland and Sweden. Southern Europe includes: Cyprus, Greece, Israel, Italy, Portugal and Spain. Eastern Europe includes: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. Malta is not included in any of the geographical clusters. Regressions are estimated separately for males and females. The standard errors were computed using 500 (clustered by individual) booststrap samples.

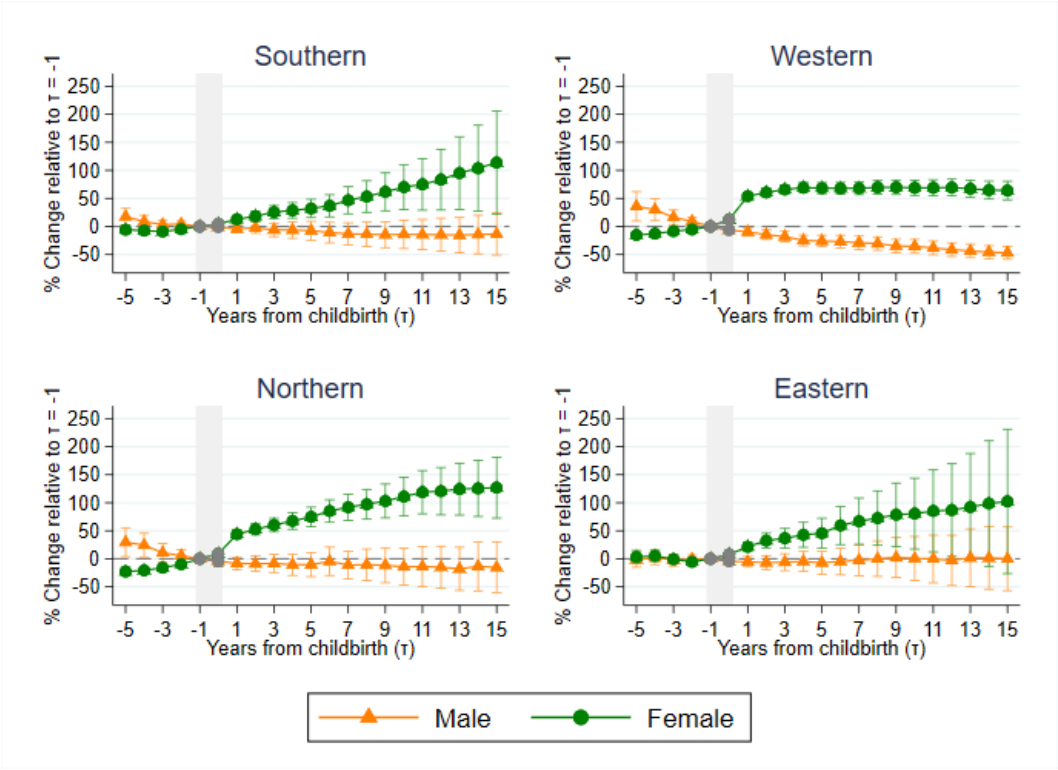


FIGURE A.5 Parenthood Effects on Part-Time Employment by Region.

Notes: The graph shows the estimated values of $P_\tau = \frac{\hat{\beta}_\tau}{\bar{Y}}$ from estimation of equation (1) on pooled data for four groups of countries. The dependent variable is a dummy variable for whether the individual is working part-time conditional on working. Western Europe includes: Austria, Belgium, France, Germany, Ireland, Luxembourg, The Netherlands, and Switzerland. Northern Europe includes Denmark, Finland and Sweden. Southern Europe includes: Cyprus, Greece, Israel, Italy, Portugal and Spain. Eastern Europe includes: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. Malta is not included in any of the geographical clusters. Regressions are estimated separately for males and females. The standard errors were computed using 500 (clustered by individual) booststraps.

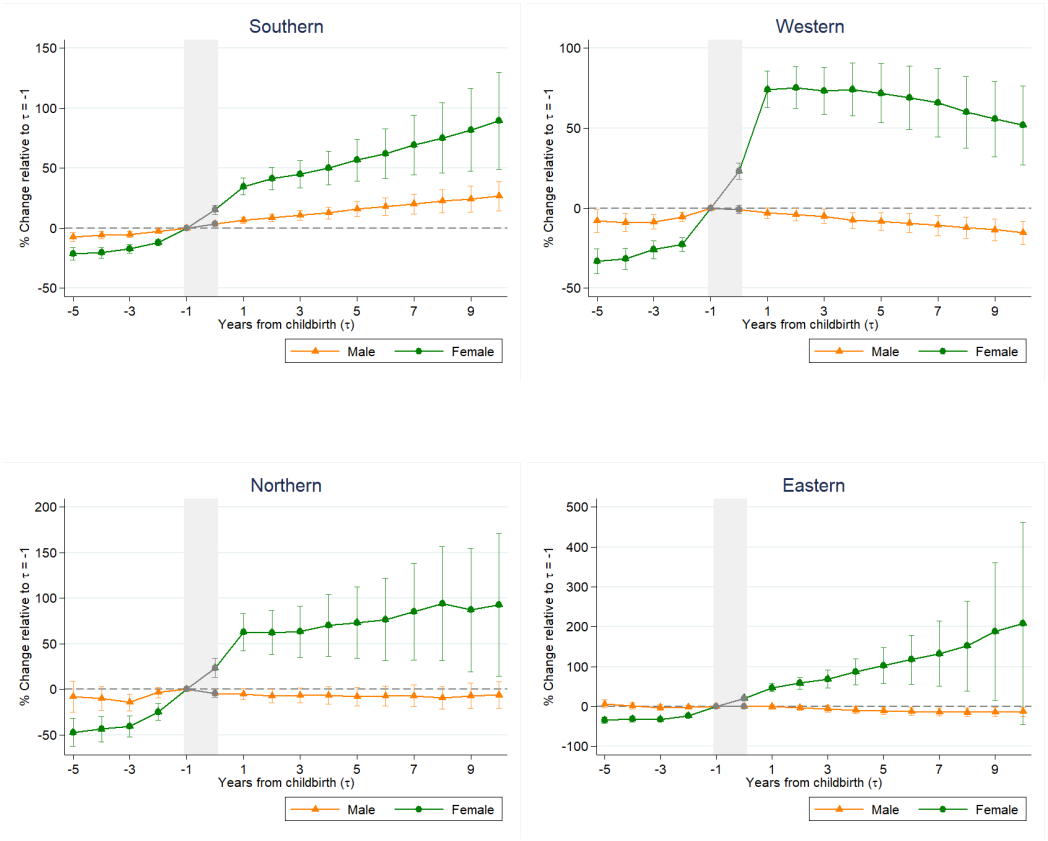


FIGURE A.6 Parenthood Effects on Self-Employment by Region. *Notes:* The graph shows the estimated values of $P_\tau = \frac{\hat{\beta}_\tau}{\bar{Y}}$ from estimation of equation (1) on pooled data for four groups of countries. The dependent variable is a dummy variable for whether the individual is self-employed conditional on working. Post parenthood periods were restricted to 10 because large standard deviations after period 10 widen the y-axis scale and complicated the reading and interpretation of the effects. Western Europe includes: Austria, Belgium, France, Germany, Ireland, Luxembourg, The Netherlands, and Switzerland. Northern Europe includes Denmark, Finland and Sweden. Southern Europe includes: Cyprus, Greece, Israel, Italy, Portugal and Spain. Eastern Europe includes: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. Malta is not included in any of the geographical clusters. Regressions are estimated separately for males and females. The standard errors were computed using 500 (clustered by individual) booststraps.

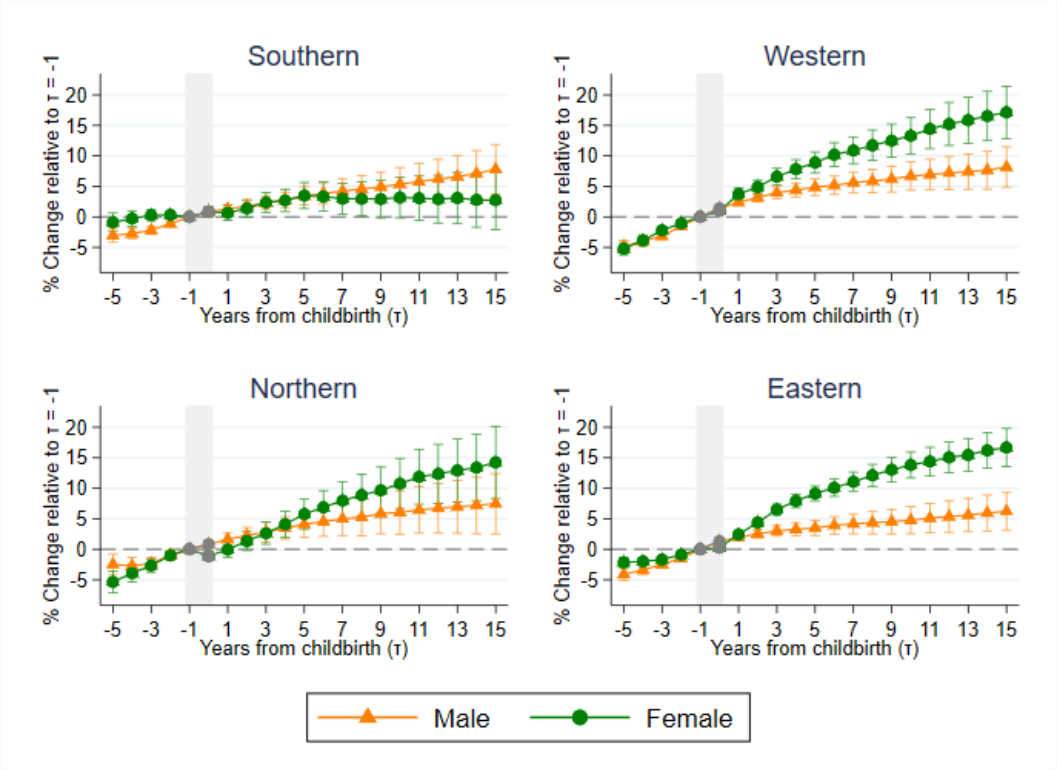
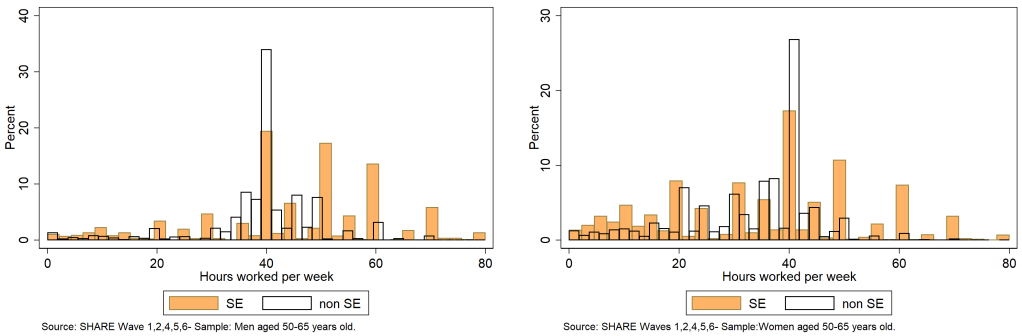
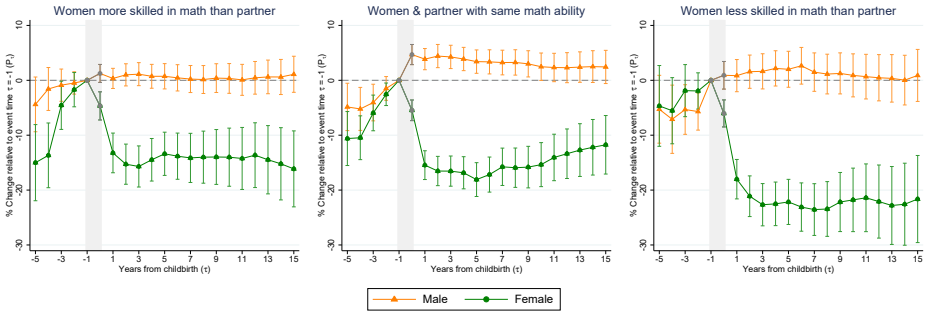


FIGURE A.7 Parenthood Effects on Number of Jobs by Region. *Notes:* The graph shows the estimated values of $P_\tau = \frac{\hat{\beta}_\tau}{\bar{Y}}$ from estimation of equation (1) on pooled data for four groups of countries. The dependent variable is the accumulated number of jobs up to that time. Western Europe includes: Austria, Belgium, France, Germany, Ireland, Luxembourg, The Netherlands, and Switzerland. Northern Europe includes Denmark, Finland and Sweden. Southern Europe includes: Cyprus, Greece, Israel, Italy, Portugal and Spain. Eastern Europe includes: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. Malta is not included in any of the geographical clusters. Regressions are estimated separately for males and females. The standard errors were computed using 500 (clustered by individual) booststraps.

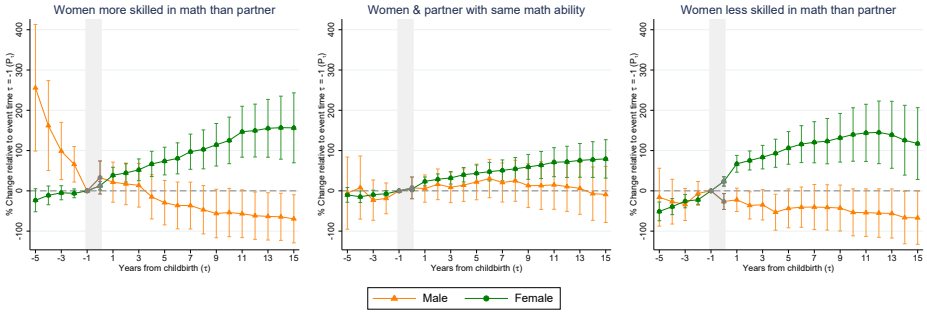


(a) Men (b) Women

FIGURE A.8 Hours Worked per Week by Self-Employed Status. *Notes:* These graphs show the distribution of hours worked by self-employed and non self-employed workers, for men and women aged 50-65 years old. The data source is the main SHARE survey, waves 1, 2, 4, 5 and 6, as this information is not included in the SHARE Job Episodes Panel.

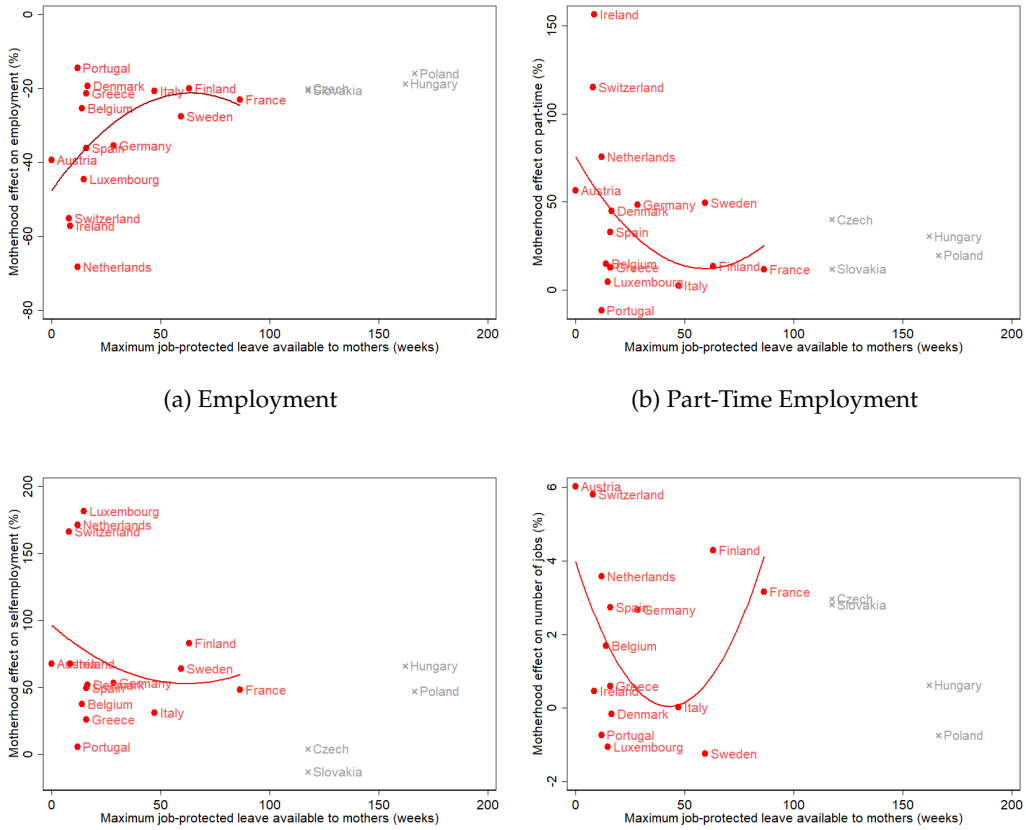


(a) Employment



(b) Part-time Employment

FIGURE A.9 Parenthood Effects on Labor Supply by Spousal Math-Ability Gap . *Notes:* These graphs show the normalized effects P_τ, which result from estimating equation (1) separately for mothers and fathers for couples where women have higher math ability at age 10 than their male partners (first column), couples where women have similar math ability than their male partners (second column), and couples where women have less math ability than their partners (last column), in the pool sample of 29 countries. The outcome variables are employment status, working part-time, being a self-employed (these last two outcomes are conditional on being employed) and the number of jobs held up to period t. See Section 2 for definitions. 90% confidence intervals were computed using standard errors clustered by individual.



(a) Employment

(b) Part-Time Employment

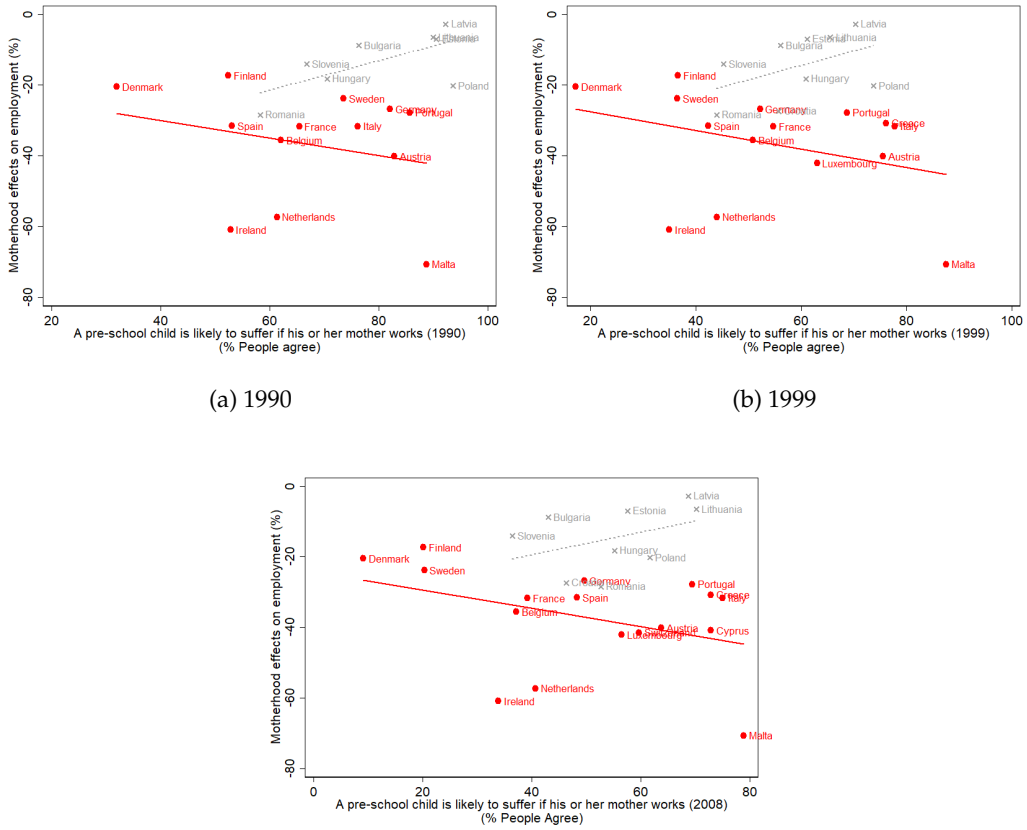
(c) Self-Employment

(d) Number of Jobs

FIGURE A.10 Short-run Motherhood Effects on All Four Outcomes and Family-Friendly Policies. *Notes:* The graph shows the estimated values of $P_\tau = \frac{\hat{\beta}_\tau}{\bar{Y}}$ for $\tau = 1$ from estimation of equation (1) for each country and for the following four outcome variables in the vertical axis: (1) whether or not the individual is working; (2) whether or not the individuals is working part-time (conditional on working); (3) whether or not the individual is self-employed (conditional on working); (4) the cumulative number of jobs held. On the horizontal axis, we show the variable "Maximum job-protected leave available to mothers" measured in weeks from Olivetti and Petrongolo, 2017.

(a) 1999 (b) 2008

FIGURE A.11 Long-Run Motherhood Effects and Gender-Role Attitudes Across Countries: "A Working Mother Cannot Establish Just as Warm and Secure a Relationship with Her Children as a Non-working Mother". *Notes:* These graphs show the normalized effects P_τ for 10 years after motherhood ($\tau = 10$), which result from estimating equation (1) for mothers by country. The outcome variable is employment status. On the horizontal axis, we show the percentage of people agreeing with the statement "a working mother cannot establish just as warm and secure a relationship with her children as a non-working mothe" in each country. Panel A shows percentage of agreement in 1999 and Panel B in 2008. Data sources are European Value Survey for 2008 and Eurobarometer for 1999.



(a) 1990

(b) 1999

(c) 2008

FIGURE A.12 Long-Run Motherhood Effects and Gender-Role Attitudes Across Countries: "A Preschool Child is Likely to Suffer if His or Her Mother Works". *Notes:* These graphs show the normalized effects P_τ for 10 years after motherhood ($\tau = 10$), which result from estimating equation (1) for mothers by country. The outcome variable is employment status. On the horizontal axis, we show the percentage of people agreeing with the statement "a preschool child is likely to suffer if his or her mother works" in each country. Panel A shows percentage of agreement in 1990, Panel B in 1999 and Panel C in 2008. Data sources are European Value Survey for 1990 and 2008 and Eurobarometer for 1999.

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REFERENCES

Adda, J., Dustmann, C. and Stevens, K. (2017) The career costs of children. *Journal of Political Economy*, **125**, 293–337.

Bender, S., Bloom, N., Card, D., Van Reenen, J. and Wolter, S. (2018) Management practices, workforce selection, and productivity. *Journal of Labor Economics*, **36**, S371–S409.

Bergmann, M., Scherpenzeel, A. and Börsch-Supan, A. (2019) SHARE wave 7 methodology: Panel innovations and life histories. *Munich: MEA, MPI for Social Law and Social Policy*.

Berniell, I., Berniell, L., de la Mata, D., Edo, M., Fawaz, Y., Machado, M. and Marchionni, M. (2021a) Motherhood or marriage effects? *Manuscript*.

Berniell, I., Berniell, L., de la Mata, D., Edo, M. and Marchionni, M. (2021b) Gender gaps in labor informality: The motherhood effect. *Journal of Development Economics*, **150**, 102599.

Bertrand, M. (2011) New perspectives on gender. In *Handbook of labor economics*, vol. 4, 1543–1590. Elsevier.

Bingley, P. and Martinello, A. (2014) Measurement error in the survey of health, ageing and retirement in europe: A validation study with administrative data for education level, income and employment. *Work Pap Ser*, 16–2014.

Blau, F. D. and Kahn, L. M. (2017) The gender wage gap: Extent, trends, and explanations. *Journal of Economic Literature*, **55**, 789–865.

Borusyak, K., Jaravel, X. and Spiess, J. (2021) Revisiting event study designs: Robust and efficent estimation. *Unpublished working paper, version may 19, 2021*.

Brainerd, E. (2000) Women in transition: Changes in gender wage differentials in eastern europe and the former soviet union. *ILR Review*, **54**, 138–162.

Brugiavini, A., Orso, C. E., Genie, M. G., Naci, R. and Pasini, G. (2019) Combining the retrospective interviews of wave 3 and wave 7: The third release of the SHARE job episodes panel. *Tech. rep.*

Bruhn, M., Karlan, D. and Schoar, A. (2018) The impact of consulting services on small and medium enterprises: Evidence from a randomized trial in mexico. *Journal of Political Economy*, **126**, 635–687.

Caliendo, M., Fossen, F. and Kritikos, A. S. (2014) Personality characteristics and the decisions to become and stay self-employed. *Small Business Economics*, **42**, 787–814.

Caliendo, M., Goethner, M. and Weißenberger, M. (2020) Entrepreneurial persistence beyond survival: Measurement and determinants. *Journal of Small Business Management*, **58**, 617–647.

Carrasco, R. and Ejrnæs, M. (2012) Labor market conditions and self-employment: a Denmark-Spain comparison. *IZA Journal of Labor Policy*, **1**, 13.

Cobb-Clark, D. A. and Schurer, S. (2012) The stability of big-five personality traits. *Economics Letters*, **115**, 11–15.

Cortés, P. and Pan, J. (2020) Children and the remaining gender gaps in the labor market. *NBER Working Paper*, **No. 27980**.

Erosa, A., Fuster, L., Kambourov, G. and Rogerson, R. (2020) Hours, occupations, and gender differences in labor market outcomes. *Working Papers 23636*, National Bureau of Economic Research.

Erosa, A., Fuster, L. and Restuccia, D. (2016) A quantitative theory of the gender gap in wages. *European Economic Review*, **85**, 165–187.

Goldin, C. (2006) The quiet revolution that transformed women's employment, education, and family. *American economic review*, **96**, 1–21.

— (2014) A grand gender convergence: Its last chapter. *American Economic Review*, **104**, 1091–1119.

Goldin, C. and Katz, L. F. (2002) The power of the pill: Oral contraceptives and women's career and marriage decisions. *Journal of political Economy*, **110**, 730–770.

Hamilton, B. H. (2000) Does entrepreneurship pay? an empirical analysis of the returns to self-employment. *Journal of Political economy*, **108**, 604–631.

Hartog, J., Van Praag, M. and Van Der Sluis, J. (2010) If you are so smart, why aren't you an entrepreneur? returns to cognitive and social ability: Entrepreneurs versus employees. *Journal of Economics & Management Strategy*, **19**, 947–989.

Hsieh, C.-T., Hurst, E., Jones, C. I. and Klenow, P. J. (2019) The allocation of talent and us economic growth. *Econometrica*, **87**, 1439–1474.

Jung, P. and Kuhn, M. (2019) Earnings losses and labor mobility over the life cycle. *Journal of the European Economic Association*, **17**, 678–724.

Kambourov, G. and Manovskii, I. (2009) Occupational specificity of human capital. *International Economic Review*, **50**, 63–115.

Kerr, S. P., Kerr, W. R. and Xu, T. (2017) Personality traits of entrepreneurs: A review of recent literature. *Tech. rep.*, National Bureau of Economic Research.

Khitarishvili, T. (2019) Gender pay gaps in the former Soviet Union: a review of the evidence. *Journal of Economic Surveys*, **33**, 1257–1284.

Kleven, H., Landais, C., Posch, J., Steinhauer, A. and Zweimüller, J. (2019a) Child penalties across countries: Evidence and explanations. *AEA Papers and Proceedings*, **109**, 122–26.

Kleven, H., Landais, C., Posch, J., Steinhauer, A. and Zweimüller, J. (2020) Do Family Policies Reduce Gender Inequality? Evidence from 60 Years of Policy Experimentation. *Working Paper No. 28082*, National Bureau of Economic Research.

Kleven, H., Landais, C. and Søgaard, J. E. (2019b) Children and gender inequality: Evidence from Denmark. *American Economic Journal: Applied Economics*, **11**, 181–209.

Kleven, H., Landais, C. and Søgaard, J. E. (2021) Does biology drive child penalties? evidence from biological and adoptive families. *American Economic Review: Insights*, **3**, 183–98.

Kuziemko, I., Pan, J., Shen, J. and Washington, E. (2018) The mommy effect: Do women anticipate the employment effects of motherhood? *NBER*, **No. 24740**.

Levine, R. and Rubinstein, Y. (2017) Smart and illicit: who becomes an entrepreneur and do they earn more? *The Quarterly Journal of Economics*, **132**, 963–1018.

— (2020) Selection into entrepreneurship and self-employment. *CEPR working paper*.

Manning, A. and Petrongolo, B. (2008) The part-time pay penalty for women in Britain. *The economic journal*, **118**, F28–F51.

Mazzonna, F. and Havari, E. (2011) Can we trust older people's statements on their childhood circumstances? evidence from SHARELIFE. *Tech. rep.*

Olivetti, C. and Petrongolo, B. (2017) The economic consequences of family policies: lessons from a century of legislation in high-income countries. *Journal of Economic Perspectives*, **31**, 205–30.

Paull, G. (2008) Children and women's hours of work. *The Economic Journal*, **118**, F8–F27.

Poschke, M. (2013a) Entrepreneurs out of necessity: a snapshot. *Applied Economics Letters*, **20**, 658–663.

— (2013b) Who becomes an entrepreneur? labor market prospects and occupational choice. *Journal of Economic Dynamics and Control*, **37**, 693–710.

de Quinto, A., Hospido, L. and Sanz, C. (2020) The child penalty in spain. *Banco de Espana Occasional Paper*.

Sattar, S. (2012) Opportunities for men and women: Emerging Europe and Central Asia. *Report*, World Bank.

Van der Sluis, J., Van Praag, M. and Vijverberg, W. (2008) Education and entrepreneurship selection and performance: A review of the empirical literature. *Journal of Economic Surveys*, **22**, 795–841.

Sun, L. and Abraham, S. (2020) Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*.

Terracciano, A., McCrae, R. R. and Costa Jr, P. T. (2010) Intra-individual change in personality stability and age. *Journal of research in personality*, **44**, 31–37.

Topel, R. (1991) Specific capital, mobility, and wages: Wages rise with job seniority. *Journal of political Economy*, **99**, 145–176.

Wellington, A. J. (2006) Self-employment: the new solution for balancing family and career? *Labour Economics*, **13**, 357–386.

Yurdagul, E. (2017) Production complementarities and flexibility in a model of entrepreneurship. *Journal of Monetary Economics*, **86**, 36–51.