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Gendered labour market dynamics across generations: Parental and local determinants of the daughter-son pay gap*

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Abstract

We examine how parental and local factors shape the gender pay gap between daughters and sons. Maternal labor market attachment significantly reduces gender disparities as it increases daughters' earnings in adulthood relative to that of sons. We find that maternal employment has minimal effects on pre-parenthood earnings gaps. However, it substantially mitigates post-parenthood disparities as daughters return to the labour market more quickly after childbirth. Paternal employment in manufacturing and construction is linked to larger gender pay gaps and lower likelihoods of sons taking paternity leave. At the municipal level, higher female employment rates and education levels are associated with narrower gender gaps, whereas conservative norms and manufacturing employment exacerbate them.

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1 Introduction

Austria has one of the largest child penalties among European countries (Kleven et al., 2024). While men and women typically have similar career trajectories before parenthood, the birth of a child leads to sharp and persistent differences in their careers. These child penalties significantly contribute to gender inequality, affecting labour market attachment, earnings, and career progression. If women base their career expectations on their mothers' experience, such disparities are likely to perpetuate across generations. For instance, observing mothers withdraw from the workforce due to high child penalties or limited childcare options may discourage daughters from pursuing careers, working full-time, or even having children.

The strong intergenerational correlation in labour market outcomes, even after accounting for shared genetic influences, highlights the critical role of environmental and social factors in shaping economic success. We examine how parental and municipality-level characteristics influence a child's labour market outcomes, using comprehensive administrative data from Austria. We estimate these effects separately for pre-parenthood and parenthood earnings, focusing on gender differences. In Austria, the employment rate of women with young children is relatively low, with part-time employment being particularly prevalent. Between 1995 and 2022, the employment rate of women (aged 15–64) with at least one child under 15 increased from about 50% to 71%, driven largely by part-time work (Statistik Austria, 2024*a*). This contrasts sharply with Nordic countries, where maternal employment rates are higher and part-time work is considerably less common (OECD, 2024).[1] However, part-time work, which often provides fewer opportunities for skill development and career progression, may reinforce intergenerational norms that constrain women's labour market prospects.

A growing literature finds that women's employment decisions are also shaped by intergenerational transfers of gender norms, e.g., Haaland et al. (2018) or Alesina et al. (2013).[2] If women's

[1] A 'skill shortage" in Austria, driven by the retirement of "baby boomer" cohorts, has prompted policymakers to propose solutions to increase female labour force participation (Austrian Court of Audit, 2024). For example, the Austrian chancellor recently suggested providing a €1,000 bonus to incentivise women to transition from part-time to full-time employment (Hofer, 2024).

[2] See also *inter alia* Antecol (2000); Bertrand et al. (2016); Brandén et al. (2025); Crompton and Harris (1998); Fernández et al. (2004); Fernández (2013); Fogli and Veldkamp (2011); Folke and Rickne (2016); Olivetti et al. (2013).

labour market decisions are partially shaped by these transfers, the gender gap in working hours, earnings, and pensions is unlikely to narrow without targeted interventions. Eppel et al. (2024) show that women's lower labour force participation—partly driven by a lower statutory retirement age, longer career interruptions, and part-time work—contributes to a significant gender pension gap. Evidence from other contexts supports these findings. For example, Lindquist et al. (2015) use Swedish adoption data and attribute two-thirds of the intergenerational association in entrepreneurship to factors arising after birth. Similarly, Kleven et al. (2019) find that the labour supply of maternal grandmothers (relative to grandfathers) strongly correlates with their daughters' child penalties, while the correlation is weaker or insignificant for paternal grandparents. Together, these studies highlight the importance of understanding how gender norms and family behaviours shape labour market outcomes across generations.

Using the 1970 British Cohort Study, Johnston et al. (2014) document the strong correlation between mothers' and their children's attitudes towards gender roles. Furthermore, Johnston et al. (2014) show that maternal attitudes towards gender roles predict daughters' labour supply, but not their sons', and the labour supply of mothers predicts their daughters' labour supply independently of attitudes, although to a lesser extent than norms. Farré and Vella (2013) use an Australian longitudinal household survey and find a similar positive correlation between mothers' labour supply and their children's attitudes towards gender roles. Furthermore, they show that sons with more traditional mothers are also more likely to be in relationships with women with lower labour market attachment. Similarly, Johnston et al. (2014) find that maternal labour supply is positively correlated with sons' and daughters' hours worked, but sons of mothers with more egalitarian views work fewer weekly hours on average, suggesting a more balanced intra-household distribution of unpaid work. Fernández et al. (2004) find that having a working mother increases the probability that a man's spouse works by 32 percentage points (from 39% to 71%) in the US. Similarly, Kawaguchi and Miyazaki (2009) find that Japanese men whose mothers worked when they were aged 15 are more likely to have wives who work and are also more likely to have progressive views about gender roles. Johnston et al. (2014) show that liberal mothers are much more likely to work full-time after birth than mothers with traditional views.

The role of neighbourhoods in intergenerational mobility has also been well-documented. Chetty and Hendren (2018) show that children's exposure to "good neighbourhoods" significantly impacts future earnings in the US. To establish a causal link between neighborhood quality and future earnings, the authors employ a movers design that exploits variation in children's ages at the time of relocation. Similarly, Coran et al. (2023) estimate the effect of exposure to high motherhood penalty regions on mothers' own child penalties in Denmark. They find that greater exposure increases child penalties, but does not affect pre-birth earnings. The impact is stronger, the younger the individual at the time of moving. It is associated with negative outcomes such as lower education, less-educated spouses, reduced spousal income, and a higher likelihood of residing in high-penalty areas before childbirth.

Haaland et al. (2018) examine the role of parental characteristics and childhood municipality factors in predicting gender differences in labour market outcomes between daughters and sons. Their findings highlight strong correlations between parental and child labour market outcomes, with particularly pronounced links between mothers and daughters. Specifically, mothers who consistently worked when their children were aged 10 to 16 significantly reduced the daughter-son gap in full-time employment rates. The study also finds that the gap in full-time employment and earnings gaps between daughters and sons is greater in conservative municipalities. The gender gaps are smaller in municipalities with higher female labour force participation rates. Additionally, daughters are more likely to work full-time the higher the mother's earnings relative her partner. However, not only daughters' perception of gender roles might be shaped by their parents' labour force decisions, but also sons'. Indeed, the accessibility of parental leave for fathers is frequently discussed as a challenge to (current) gender norms (Engeman, 2022) and may possibly lead to a more equal division of household chores, including the raising of children.

We build on the empirical framework of Haaland et al. (2018) who examine the intergenerational correlation between maternal labour market attachment during a child's adolescence (ages 10–14) and differences between daughters and sons in labour market outcomes at age 40. Using Austrian administrative data, we find similar patterns. The gender pay gap in children's adult earnings is smaller when their mothers were consistently employed between their ages of 10 and 14. We find

that daughters of always-working mothers earned 7% more than sons, while daughters of mothers with irregular employment during this period earned 4% more. Local characteristics also play a critical role: the gender earnings gap is narrower in municipalities with higher female employment rates and a more educated population, but it is wider in conservative municipalities.

Our second contribution extends this analysis by examining intergenerational correlations in earnings before and after entering parenthood. Specifically, we estimate the earnings gap three years before and five years after individuals become parents. Our findings reveal that maternal labour market attachment and municipality-level characteristics have minimal influence on earnings gaps prior to parenthood but play a significant role in shaping post-parenthood disparities. Notably, the parenthood earnings gap is 14% larger in conservative municipalities compared to liberal ones, whereas pre-parenthood earnings are unaffected by the degree of conservativeness. Furthermore, daughters of mothers who always worked earn 14% more, and those whose mothers have an A-levels qualification earn 5% more during parenthood relative to sons.

By exploiting the full employment history of mothers from the child's age 3 to 14, we further show that the longer the maternal employment during childhood, the higher the daughter's earnings during adulthood relative to sons. Being in employment as early as the child is eligible for kindergarten (3 to 5 years of age) further reduces the parenthood pay gap as compared to later returns to the labour market.

Paternal labour market characteristics, especially the father's industry of employment, also shape gender disparities. Daughters earn 10% less compared to sons when the father worked in manufacturing, high-skill services, or construction. Local economic structures and cultural norms further influence these outcomes. High levels of womens' employment and education narrow the gender pay gap and conservative voting patterns widen it. Furthermore, higher shares of employment in manufacturing at the municipality level increase the earnings gap. These results hold after controlling for fathers' earnings and the municipality's earnings level. Father's firm-level characteristics do not change the earnings gap. This result contrasts with the findings of Haaland et al. (2018), who report insignificant effects of the municipality's industry share on the gender pay gap in Norway. This difference could suggest that the expansion of the manufacturing sector has had a

stronger cultural impact in Austria than in other countries.

Finally, we extend the analysis to examine intergenerational patterns in paternity leave uptake and child penalties. Sons of highly educated parents are significantly more likely to take paternity leave, while the father's employment in certain sectors, such as construction and low-skill services, reduces this likelihood. Maternal employment does not impact son's decision to take paternity leave. In contrast, daughters benefit from maternal employment and education in reducing their likelihood of experiencing severe child penalties, defined as large earnings drops post-birth.

2 Data

Our main data source is the Austrian Social Security Database (ASSD). The ASSD is a large employer-employee dataset that covers the universe of all private sector employees (Zweimüller et al., 2009). We construct child-parent pairs using unique identifiers for both parents and the child. The data contain information on the location of residence, which allows us to merge these data with municipality-level census data (Statistik Austria, 2024*b*) and election results (SORA, 2019).

The data limit the range of cohorts we can link to their parents. First, the sample is representative of the full population only for cohorts born after 1976. Second, for younger cohorts, fewer years of observations are available as the last year of our observations is 2021. Consequently, our main sample includes all persons born between 1977 and 1981, as we can follow them up to age 40, by which point most women have completed their fertility.

Our sample consists of child-parent pairs where the child was born between 1977 and 1981 and can be linked to both parents. We further require that at least one parent had positive earnings during the period when the child was between 10 and 14 years old.[3] We measure the child's labour market outcome when they were between 36 and 40 years of age. We augment these data with parental labour market information when the child was 10 to 14 years old. The sample contains

[3]Intergenerational links are based on data from child support records. In Austria, every child is eligible for child support, independent of parental income or other characteristics. Child support is paid to the mother of the child in most cases. For the cohorts of our sample, child support amounted to more than €1,200 per child annually (in 2007 prices), and parents have a strong incentive to claim the transfer (Austrian Parliament, 2008).

150,000 child-parents pairs with an equal number of daughters and sons.

To focus on pre-birth and post-birth labour market outcomes, we construct a second sample where we keep only those children from the sample who became a parent by 2015. This second sample includes 83,700 child-parent pairs, comprising 44,700 daughters and 39,000 sons. The restriction to children who became parents by 2015 ensures at least five years of post-birth activity but excludes individuals from child cohorts who became parents relatively late. For the cohort born in 1981, we include child-parent pairs if the child became a parent by age 34, while for the oldest cohort, born in 1977, we include pairs where the child became a parent by age 38. Conditional on becoming a mother before 2022, approximately 80% of women born in 1981 had their first child by age 34, compared to 96% of women born in 1977 who had their first child by age 38. For men, these percentages are about 5 percentage points lower. Consequently, the sample represents approximately 90% of the 1977–1981 cohorts on average, excluding the 10% who had their first child at a relatively later age.

The sample is further restricted to child-parent pairs where the child was employed for at least two years and earned, on average, more than the threshold for marginal employment (€24,000 p.a. in 2010 prices) during the three years preceding parenthood. Due to the limited availability of earnings data for civil servants, farmers, and the self-employed, we exclude child-parent pairs with such employment spells during the periods used to calculate our main variables. Specifically, we exclude a child-parent pair if the mother was a civil servant, farmer, or self-employed when the child was between 10 and 14 years old. Since we focus primarily on maternal labour market attachment, we do not apply these restrictions to fathers. A child-parent pair is also excluded if the child held such a labour market status between ages 36 and 40 (for the full sample) or during the three years preceding parenthood and five years after their first birth (for the sample of children who became parents).

2.1 Descriptive Statistics

Table 1 provides descriptive statistics for the full and restricted samples. Earnings are strictly positive for all observations in the full sample due to the employment requirement of at least half

a year between ages 36 and 40, but can be zero for the sample of children who became parents. Note that income from maternity and parental leave does not count as earnings. Table 1 shows that women earned 40% less than men during age 36 to 40. The earnings difference in the 3 years prior to parenthood are around 17% lower and 76% lower in the first five years of parenthood. A large part of the earnings drop during parenthood can be attributed to mothers' lower employment duration. Mothers were employed on average about 5 months per year, compared to 10 months for fathers.

The parental employment characteristics are calculated for each child separately, resulting in intra-family variation in these characteristics. Around 23% of the children's mothers were never in employment, about half had been working for less than four years, and 27% were always employed when the child was aged between 10 and 14 years. On average, mothers were employed about 4 months per year, compared to fathers who were employed on average 10 months per year. Fathers' earnings were approximately four times greater than mothers' earnings. Note that this number is downward biased to zero earnings of fathers who are farmers, civil servants or self-employed. One-third of the mothers had completed high school or a higher education, compared to one-quarter of the fathers.

The municipality-level variables are from census data in 1991, i.e., when the cohort of 1977 (1981) was aged 14 (10) years. Most of their parents were aged between 30 and 49 at the time. The census data indicate that in 1991, 63% of women aged 30 to 49 were in employment and 12% of the population aged 30 to 49 had a university degree. Information on the conservative vote share is based on the average of the 1983, 1986, and 1990 national election results. On average, 49% voted for the Conservative Party (ÖVP) or the far-right party (FPÖ). See McGann and Kitschelt (2005) for an overview of political parties in Austria.

3 Analysis

We estimate the labour market outcomes Y of child i in municipality m, based on a set of parental characteristics:

Table 1: Sample averages and t-test: parental earnings

	Full Sample			First Birth Sample		
Variable	Daughter	Son		Daughter	Son	
Children Variables						
annual earnings ('000), age 36-40	19.52	34.49	****	14.84	34.51	****
daily earnings, age 36-40	67.66	109.92	****	60.22	117.13	****
days in employment, age 36-40	275.81	304.60	****	241.99	288.93	****
birthyear	1979.27	1979.25	***	1979.21	1979.16	****
annual earnings, pre FB				24.33	28.71	****
annual earnings, post FB				7.72	31.76	****
days in employment, post FB				145.08	291.05	****
post rel. to pre FB earnings (%)				32.25	120.59	****
Parental Variables (child age 10-14)						
M: annual earnings	8.49	8.08	****	8.38	7.98	****
M: employment duration	168.45	163.13	****	168.19	163.21	****
M: always work	0.33	0.31	****	0.33	0.32	****
M: irreg work	0.41	0.41	ns	0.40	0.40	ns
M: never work	0.26	0.28	****	0.27	0.28	***
M: high educ	0.37	0.36	****	0.37	0.35	****
F: annual earnings	22.27	22.51	**	22.79	22.75	ns
F: employment duration	239.87	243.93	****	244.00	246.25	*
F: high educ	0.31	0.30	****	0.31	0.29	****
Municipality Levels						
mun: emp rate women	63.00	62.95	ns	62.37	62.28	ns
mun: conservative (share)	49.74	49.73	ns	50.86	50.80	ns
mun: high educ (share)	12.32	12.24	*	11.88	11.75	**
N obs	75,004	75,678		45,676	40,124	

Note:
All variables are expressed as annual averages. Earnings are reported in euros and adjusted to 2010 prices. "Pre FB" and "Post FB" refer to the three years prior to and five years following the first birth, respectively. "M" and "F" denote mother and father, respectively. "Mun" represents municipality-level variables measured in 1991. The municipality employment rate of women indicates the share of women aged 30 to 49 in a given municipality who are employed. The high education share represents the proportion of individuals aged 30 to 49 with a university degree. The conservative share reflects the percentage of votes cast for conservative parties in the elections of 1983, 1986, and 1990. Columns 4 and 7 present the results of t-tests comparing daughters and sons. Significance levels are denoted as follows: textitns = not significant; * ($p < 0.05$); ** ($p < 0.01$); *** ($p < 0.001$); **** ($p < 0.0001$).

$$Y_i = \beta_m + \beta_1 \cdot \text{Daughter}_i + \beta_2 \cdot X_i + \beta_3 \cdot \tilde{X}_i + \beta_4 \cdot \tilde{X}_i \cdot \text{Daughter}_i + \beta_5 \cdot \text{Daughter}_i \cdot X_m + \epsilon_i \quad , \quad (1)$$

where the binary indicator *Daughter* indicates the sex of the child (1 = female, 0 = male). X_i is a set of parental and personal characteristics. $\tilde{X}_i$ is the subset of parental characteristics which we expect to have a differential impact for daughters and sons such as parental education and maternal labour market attachment. The coefficients of interest, β_4 and β_5, capture the differential impact of parental and municipal variables on daughters relative to sons, that is the gender gap in employment. β_m are municipality fixed-effects, and ϵ_i is the error term. In all specifications we use fixed effects for the birthyear of the child, the birth order, the number of siblings and the interaction between number of siblings and birth order in addition to municipality fixed effects.

3.1 Results

3.1.1 Maternal employment and the children's gender pay gap

The estimates of the correlation between parental characteristics and their child's average earnings at ages 36 to 40, including the differentiated effects by the child's gender, are presented in Table 2. In our preferred specification, as detailed in column 6, the reference group consists of sons of never working mothers with low education. Thus, the estimate for the daughter variable indicates that daughters of never working mothers and low education earn 61% less than sons within this reference group. In this specification, we control for parental education, maternal labour market attachment, and the interaction of these factors with the child's gender. Additionally, the model incorporates municipal characteristics, such as the average education level, conservative vote share, and female employment rates interacted with the child's gender. Our findings indicate that maternal labor market attachment significantly reduces the gender earnings gap. When a mother has always worked during her child's ages of 10 to 14, daughters earn 7% more relative to sons, which translates into a 3 percentage point (pp) reduction in the gender pay gap. Even when maternal employment was irregular during this period, daughters still experience a 4% earnings increase relative to sons, narrowing the gap by 1.8 pp. These results suggest that higher maternal labor market attachment mitigates gender disparities in earnings, with the strongest effects observed when mothers are consistently employed. We find that parental education increases earnings, but does not alter the

gender pay gap. When looking at the base effect of maternal labour market attachment on sons' earnings, earnings is unchanged for sons whose mother has always been working relative to sons whose mother never worked, but earnings are 4% lower for sons whose mother worked irregularly compared to sons of never working mothers.

Table 2: Child's log earnings at ages 36-40

	base	interact	emp_women	conservative	high_educ	all_mun_vars	sibling	sibling_famfe	d_s_fam_fe
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)
daughter	-0.63***	-0.72***	-1.4***	-0.34***	-0.87***	-0.93***	-0.91***	-0.99***	-83.4
	(0.01)	(0.01)	(0.05)	(0.04)	(0.02)	(0.04)	(0.05)	(0.10)	(397.8)
M: always work	0.03***	-0.03***	-0.007	-0.02***	-0.02***	-0.003	0.0008		
	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.008)		
M: irreg work	-0.02***	-0.06***	-0.05***	-0.05***	-0.06***	-0.04***	-0.04***		
	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.008)		
M: always work × daughter		0.12***	0.08***	0.10***	0.10***	0.07***	0.07***	0.05*	0.05**
		(0.009)	(0.010)	(0.009)	(0.010)	(0.009)	(0.01)	(0.02)	(0.03)
M: irreg work × daughter		0.08***	0.05***	0.06***	0.07***	0.04***	0.04***	0.03	0.03
		(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.01)	(0.02)	(0.02)
F: high educ	0.09***	0.08***	0.09***	0.08***	0.09***	0.09***	0.10***		
	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.008)		
M: high educ	0.08***	0.07***	0.07***	0.07***	0.08***	0.08***	0.07***		
	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)		
M: high educ × daughter		0.03***	0.01	0.02***	0.008	0.008	0.02**	0.02	0.01
		(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.01)	(0.02)	(0.02)
F: high educ × daughter		0.01	-0.005	0.009	-0.01	-0.01	-0.02	-0.01	-0.009
		(0.009)	(0.009)	(0.008)	(0.009)	(0.008)	(0.01)	(0.02)	(0.03)
mun: women emp rate × daughter			0.01***			0.007***	0.007***	0.007***	
			(0.0009)			(0.0008)	(0.0008)	(0.002)	
mun: conservative × daughter				-0.007***		-0.005***	-0.005***	-0.005***	
				(0.0006)		(0.0005)	(0.0005)	(0.001)	
mun: high educ × daughter					0.01***	0.006***	0.005***	0.008***	
					(0.001)	(0.001)	(0.001)	(0.003)	
Dep var mean (daughter)	4.4	4.4	4.4	4.4	4.4	4.4	4.3	4.3	4.3
Dependent variable mean	4.6874	4.6874	4.6874	4.6874	4.6874	4.6874	4.5924	4.5924	4.5924
Observations	148,128	148,128	148,128	148,128	148,128	148,128	94,794	94,794	94,794
Adjusted R^2	0.19845	0.19959	0.20515	0.20423	0.20289	0.20778	0.23686	0.30023	0.30292
Birthyear, birth order, family size FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Family FE								✓	✓
Municipality × daughter FE									✓
Sample restriction: daughter & son							✓	✓	✓

Notes: The coefficients represent marginal effects estimated using OLS regressions with robust standard errors (shown in parentheses), adjusted for clustering at the municipality level. Statistical significance is denoted as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the log of the child's earnings at ages 36–40. The variable Daughter indicates female children. Parental variables, Always work and Irregular work, reflect labor force participation when the child was aged 10–14. High educ indicates parents with a university degree. Municipality-level covariates include the female employment rate, the proportion of individuals with a university degree, and the vote share for conservative parties. Interaction terms capture differential effects for daughters compared to sons. All models control for birth order, family size, the interaction of birth order and family size, child's birth cohort, child's birth year, and municipality fixed effects. Family fixed effects are applied in columns (viii) and (ix). Column (ix) additionally includes interaction fixed effects between the municipality and Daughter. The sample in columns (vii) through (ix) is restricted to families with at least one daughter and one son.

Turning to the implications of municipality-level factors, we find that a higher employment rate of women aged 30 to 49 and a higher share of the population with a university degree decrease the gender pay gap. The earnings gap between sons and daughters is 6 percentage points (pp) smaller for children born in municipalities at the 75th percentile of the women's employment rate distribution and 1 pp smaller for those in municipalities at the 75th percentile of the higher education share distribution, relative to children born at the 25th percentile. Thus, growing up in a municipality

with high employment rates of women (compared to a municipality with low employment rates) reduces the gender pay gap by more than having an always-working mother (compared to having a never-working mother). In contrast, the earnings gap is 3 pp higher for children growing up in a municipality at the 75th percentile of the conservative vote share distribution relative to a municipality at the 25th percentile. The results remain qualitatively similar when we use earnings at age 40 or employment durations between ages 36 and 40 as the dependent variables.

Columns 7 to 9 show the robustness of our results for different specifications of the estimating equation. The results remain stable when the sample is restricted to families with at least one son and one daughter (Column 7). The findings are robust to including family fixed effects (Column 8). This specification uses intra-family variation in the mother's labour market attachment across siblings. The coefficients are somewhat smaller and the standard errors are larger than in our baseline specification, reducing the statistical precision of the estimate. However, the results remain of similar magnitude and statistically significant at the 10% level. This result indicates that family-specific characteristics alone do not explain the results. Instead, the variation in the mother's labour market attachment is driving the results. Additionally, incorporating an interaction term for municipality and the child's gender (Column 9) rules out the possibility that the effect is driven by municipality-specific differences in gender dynamics.[4]

Our results are comparable to Haaland et al. (2018) who find that always working mothers increase daughter's likelihood to work full-time at age 40 by 7 percentage points. They also find that sons are only moderately more likely to work full-time when their mothers were always working when they were children (+2%) than when they were not.

Since earnings at age 36 to 40 are strongly determined by fertility and the corresponding labour market decisions of parents, we want to investigate the effect of parental and municipality level characteristics separately for earnings prior to parenthood and earnings during parenthood. To do so, we restrict the sample to only include children who have already become parents themselves. Instead of measuring earnings at ages 36 to 40, we calculate the earnings before and after entering parenthood. Pre-parenthood earnings are the average annual earnings of the 3 years prior to the

[4]The sample used in Columns 7 to 9 10 includes, in addition to children born between 1977 and 1981, their siblings born between 1975-1976 and 1982-1985 to increase intra-family variation.

first birth and parenthood earnings are the average earnings of the 5 years after the first birth. The results for pre-parenthood earnings are presented in Table 3. According to our preferred specification in column 6, the results show that in this sample the daughters of low educated and never working mothers earn on average 23% less than sons within this reference group in the three years prior to their first birth. Pre-first birth earnings are 2.4% higher for daughters compared to sons when their mothers were consistently employed during the children's ages of 10 to 14, narrowing the gap by 1.8 pp. Furthermore, parental education is strongly positively correlated with children's earnings before their first birth. Sons of fathers with an A-level qualification earn 9% more, while sons of mothers with an A-level qualification earn 6% more compared to those whose parents have lower educational attainment. The effect of parental education is even stronger for daughters: having a mother (father) with an A-level qualification increases their earnings by an additional 3% (1%). The results also indicate that higher female employment rates and higher education levels at the municipality level are associated with slightly higher pre-first-birth earnings for daughters relative to sons. Daughters in municipalities at the 75th percentile of the women's employment rate (higher education share) distribution earn 1.2% (1.8%) more than those in municipalities at the 25th percentile, narrowing the gender earnings gap by 1.4 pp and 0.7 pp, respectively. The degree to which the municipality voted for conservative parties has no differentiated effect for daughters. Thus, we find that higher maternal labour market attachment, higher municipality level female employment rate and higher education at the municipality level reduce the pre-parenthood gender gap. In contrast to our findings for earnings at age 36 to 40, the conservative vote share does not change the pre-parenthood gender pay gap. Figure 1 compares the size of the effects from Table 2 (left panel) and Table 3 (centre panel) and shows that the effect sizes are much smaller for pre-parenthood earnings than for earnings at age 36 to 40.

In a next step, we estimate the impact of parental and municipality effects on the child's parenthood earnings. Note that we estimate the effect on the log parenthood earnings, thus only daughters and sons who have recorded earnings in the five years during parenthood are included, this is around 90% of the sample used for the results in Table 3.

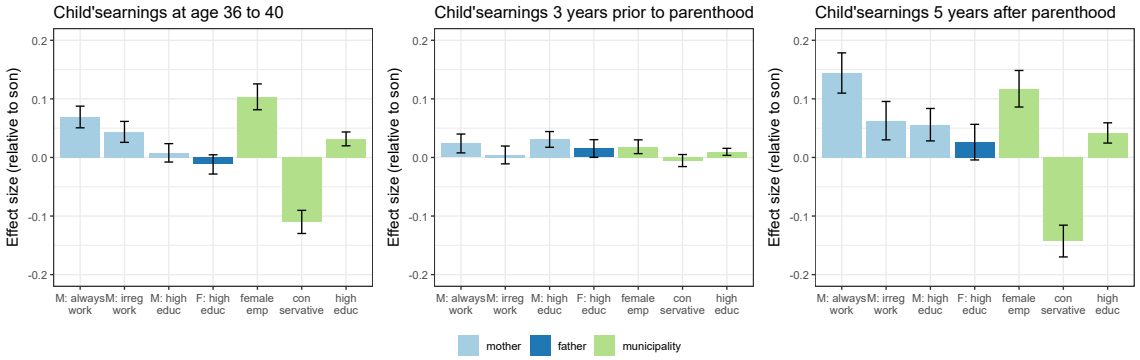
The results in Table 4 show that daughters' cumulative earnings of low educated and never

Table 3: Child's log earnings prior parenthood

	base	interact	emp_women	conservative	high_educ	all_mun_vars	sibling	sibling_famfe	d_s_fam_fe
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)
daughter	-0.16***	-0.19***	-0.30***	-0.15***	-0.22***	-0.27***	-0.25***	-0.23**	18.4
	(0.004)	(0.007)	(0.02)	(0.02)	(0.008)	(0.03)	(0.03)	(0.10)	(394.9)
M: always work	0.005	-0.01*	-0.008	-0.01*	-0.01	-0.008	-0.01		
	(0.004)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.008)		
M: irreg work	-0.02***	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***		
	(0.004)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)		
M: always work × daughter		0.03***	0.02***	0.03***	0.03***	0.02***	0.02**	0.04	0.05
		(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.03)	(0.04)
M: irreg work × daughter		0.009	0.005	0.008	0.007	0.004	0.004	0.02	0.02
		(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.02)	(0.03)
F: high educ	0.10***	0.09***	0.10***	0.09***	0.10***	0.10***	0.10***		
	(0.005)	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)	(0.008)		
M: high educ	0.09***	0.07***	0.07***	0.07***	0.07***	0.07***	0.06***		
	(0.004)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)		
M: high educ × daughter		0.04***	0.03***	0.03***	0.03***	0.03***	0.04***	0.05*	0.05
		(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.02)	(0.03)
F: high educ × daughter		0.02***	0.02**	0.02***	0.01**	0.01**	0.01	0.02	0.02
		(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.03)	(0.03)
mun: women emp rate × daughter			0.002***			0.001***	0.0007*	-0.0002	
			(0.0003)			(0.0004)	(0.0004)	(0.001)	
mun: conservative × daughter				-0.0007***		-0.0002	-0.0001	-0.0003	
				(0.0002)		(0.0002)	(0.0003)	(0.0008)	
mun: high educ × daughter					0.003***	0.002***	0.002**	0.002	
					(0.0005)	(0.0006)	(0.0007)	(0.002)	
Dep var mean (daughter)	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Dependent variable mean	4.2669	4.2669	4.2669	4.2669	4.2669	4.2669	4.2393	4.2393	4.2393
Observations	84,084	84,084	84,084	84,084	84,084	84,084	58,819	58,819	58,819
Adjusted R^2	0.06646	0.06723	0.06764	0.06733	0.06760	0.06774	0.08406	0.14018	0.10679
Birthyear, birth order, family size FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Family FE								✓	✓
Municipality × daughter FE									✓
Sample restriction: daughter & son							✓	✓	✓

Notes: The coefficients represent marginal effects estimated using OLS regressions with robust standard errors (shown in parentheses), adjusted for clustering at the municipality level. Statistical significance is denoted as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the log of the child's earnings three years prior to parenthood. The variable Daughter indicates female children. Parental variables, Always work and Irregular work, reflect labor force participation when the child was aged 10–14. High educ indicates parents with an A-levels qualification degree. Municipality-level covariates include the female employment rate, the proportion of individuals with a university degree, and the vote share for conservative parties. Interaction terms capture differential effects for daughters compared to sons. All models control for birth order, family size, the interaction of birth order and family size, child's birth cohort, child's birth year, and municipality fixed effects. Family fixed effects are applied in columns (viii) and (ix). Column (ix) additionally includes interaction fixed effects between the municipality and Daughter. The sample in columns (vii) through (ix) is restricted to families with at least one daughter and one son.

Figure 1: Gender pay gap based on earnings at age 36 to 40, pre-parenthood and during parenthood



Notes: Child's earnings are measured in logs. The effect size for municipality level characteristics are calculated as the product of the marginal effect and the distance between the 75th and 25th percentile of the respective variable.

working mothers in the five years after their first birth are on average 86% lower than sons'. This gap is 2 pp smaller when the mothers were always working. The parenthood earnings gap between daughters and sons is reduced by 1 pp for children of mothers who worked irregularly. The base effect for sons suggests that always (irregular) working mothers reduces sons earnigns by 2% (5%) relative to sons of never working mothers. The gap is further reduced for children of mothers with an A-levels qualification (6%). Fathers with such a qualification reduce the gender gap by only 2% (significant at the 10% level). This results suggest that sons' parenthood earnings are negatively affected by mothers with greater labour market attachment and that maternal education is more important in reducing the gender gap than father's education.

The earnings gap between sons and daughters is greater in conservative municipalities than in more liberal municipalities. The parenthood earnings gap is 1.3 pp higher in municipalities at the 75th percentile of the conservative vote share than in municipalities at the 25th percentile. Similarly, the higher women's employment rate and the more formally educated the population in the municipality, the lower the gender gap in earnings. Moving from the 25th percentile to the 75th percentile in the employment rate (percent highly educated) distribution narrows the pay gap by 2.6 pp (0.6 pp). The right panel in Figure 1 visualises the effect size. These results are robust to including family fixed effects and interacted municipality gender of child fixed effects (Column 8 to

9).

Table 4: Child's log earnings during parenthood

	base (i)	interact (ii)	emp_women (iii)	conservative (iv)	high_educ (v)	all_mun_vars (vi)	sibling (vii)	sibling_famfe (viii)	d_s_fam_fe (ix)
daughter	-1.6***	-1.8***	-2.6***	-1.3***	-2.0***	-2.0***	-2.0***	-2.0***	106.3
	(0.02)	(0.02)	(0.07)	(0.05)	(0.02)	(0.07)	(0.07)	(0.25)	(778.0)
M: always work	0.05***	-0.06***	-0.03***	-0.04***	-0.04***	-0.02**	-0.01		
	(0.009)	(0.010)	(0.010)	(0.010)	(0.01)	(0.009)	(0.01)		
M: irreg work	-0.02**	-0.07***	-0.05***	-0.06***	-0.06***	-0.05***	-0.03***		
	(0.008)	(0.009)	(0.008)	(0.008)	(0.009)	(0.008)	(0.01)		
M: always work × daughter		0.21***	0.16***	0.18***	0.19***	0.14***	0.11***	0.08	0.08
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.07)	(0.09)
M: irreg work × daughter		0.11***	0.07***	0.08***	0.09***	0.06***	0.04*	0.04	0.04
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.07)	(0.08)
F: high educ	0.14***	0.11***	0.12***	0.11***	0.13***	0.12***	0.13***		
	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.01)		
M: high educ	0.12***	0.08***	0.08***	0.08***	0.09***	0.09***	0.08***		
	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.01)		
M: high educ × daughter		0.08***	0.06***	0.07***	0.06***	0.06***	0.08***	0.10	0.11
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.06)	(0.08)
F: high educ × daughter		0.05***	0.04**	0.05***	0.02	0.03*	0.008	0.02	0.03
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.07)	(0.08)
mun: women emp rate × daughter			0.01***			0.008***	0.007***	0.007**	
			(0.001)			(0.001)	(0.001)	(0.004)	
mun: conservative × daughter				-0.009***		-0.007***	-0.007***	-0.007***	
				(0.0008)		(0.0006)	(0.0007)	(0.002)	
mun: high educ × daughter					0.02***	0.008***	0.009***	0.009	
					(0.002)	(0.002)	(0.002)	(0.007)	
Dep var mean (daughter)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Dependent variable mean	4.1465	4.1465	4.1465	4.1465	4.1465	4.1465	4.0720	4.0720	4.0720
Observations	77,863	77,863	77,863	77,863	77,863	77,863	54,050	54,050	54,050
Adjusted R^2	0.45846	0.46014	0.46310	0.46298	0.46207	0.46482	0.46979	0.44959	0.41707
Birthyear, birth order, family size FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Family FE								✓	✓
Municipality × daughter FE									✓
Sample restriction: daughter & son							✓	✓	✓

Notes: The coefficients represent marginal effects estimated using OLS regressions with robust standard errors (shown in parentheses), adjusted for clustering at the municipality level. Statistical significance is denoted as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the log of the child's earnings in the first five of parenthood. The variable Daughter indicates female children. Parental variables, Always work and Irregular work, reflect labor force participation when the child was aged 10–14. High educ indicates parents with an A-levels qualification degree. Municipality-level covariates include the female employment rate, the proportion of individuals with a university degree, and the vote share for conservative parties. Interaction terms capture differential effects for daughters compared to sons. All models control for birth order, family size, the interaction of birth order and family size, child's birth cohort, child's birth year, and municipality fixed effects. Family fixed effects are applied in columns (viii) and (ix). Column (ix) additionally includes interaction fixed effects between the municipality and Daughter. The sample in columns (vii) through (ix) is restricted to families with at least one daughter and one son.

These findings suggest that both maternal labour market attachment and local characteristics play a significantly larger role in determining parenthood earnings than pre-parenthood earnings. To further investigate the mechanisms, we estimate the model for different dependent variables and present thre results in Table 6 in the Appendix. The dependent variable in columns 3 and 4 of Table 6 is the probability of experiencing a low child penalty. A child has a low child penalty if her average annual earnings during the first five years of parenthood exceeds 40% of average pre-parenthood earnings. The results are consistent with those obtained when using parenthood earnings as the dependent variable in Table 4. Daughters of always-working mothers are 6 percentage points more likely to experience a lower child penalty than sons. Since approximately 31% of

mothers have a low child penalty, this corresponds to a relative increase of 20%.

A high child penalty can result from both low employment duration and low daily earnings for example due to part-time work. Columns 1 and 2 of Table 6 present results using employment duration during parenthood as the dependent variable. Daughters of always-working mothers narrow the employment gap between daughters and sons by 0.25 years, representing a 12% increase relative to the average employment duration of 1.9 years. Columns 5 and 6 report results based on the probability of experiencing a low child penalty in daily earnings. This measure compares average daily earnings during parenthood to pre-parenthood daily earnings. A low child penalty in daily earnings is defined as a decline of less than 25%. Daughters of always-working and irregularly-working mothers are 2 percentage points more likely to experience a low child penalty in daily earnings. However, this effect is not robust when family fixed effects are included, suggesting that maternal labour market attachment influences a daughter's employment duration more strongly than her daily earnings.

3.1.2 Maternal employment in early childhood

Haaland et al. (2018) measured maternal labour market attachment during the child's ages of 10 to 16 due to data limitations. We extend their approach by using the full employment history of mothers between the child's ages of 3 to 14, allowing us to assess the role of maternal employment across different stages of the child's development. Column 1 of Table 5 replicates the results of column 6 in Table 4, presenting only the coefficients for the gender earnings gap associated with maternal employment.

In column 2, we categorise the number of years a mother worked during the child's ages of 3 to 14 into the following groups: never worked, up to two years, up to five years, up to nine years, and up to twelve years. Employment between 9 and 12 years implies that the mother returned to the labour market when the child became eligible for kindergarten (ages 3 to 5). Only around 20% of mothers returned to the labour market at this stage and remained employed consistently thereafter. Additionally, having more children significantly restricts the potential number of years in employment.

The results in column 2 indicate that longer maternal employment is significantly associated with a reduction in the gender earnings gap. Mothers with up to two years of employment do not exhibit a statistically significant effect on the gap. In contrast, those who worked up to five years reduced the gap by 9.4%. For mothers with up to nine years of employment, the gap decreased by 12%. These findings suggest a positive relationship between maternal employment duration and a narrowing of the gender earnings gap. Notably, for mothers who worked more than nine of the thirteen years, the effect doubled, reducing the gap by 22%. The coefficients for maternal employment during the ages of 10 to 14, which were significant in earlier analyses, lose their significance when we account for the total years a mother worked between the child's ages of 3 to 14. This suggests that variation in the employment intensity at age 10 to 14 has no additional effect to the overall duration of maternal employment.

Columns 3 and 4 explore whether varying intensities of maternal employment (always and irregularly working) during the ages of 3 to 5 and 6 to 9 yield additional effects on the gender gap, beyond the total years of employment. Among these, only the coefficient for mothers who consistently worked during the ages of 3 to 5 is statistically significant, reducing the gap by 4.6%. These results suggest a nonlinear effect of maternal labour market attachment on the gender earnings gap: no changes for short maternal employment durations, reductions of approximately 10% for 2 to 9 years of employment, and reductions of around 20% for employment covering more than three-quarters of the parenthood period.

Finally, column 6 adds family fixed effects to test whether intra-family variation in maternal employment duration may explain these results. The results show that only children of mothers who worked more than nine years have a lower gender gap.

In Columns 4 to 6, we perform the same robustness checks as in our main tables: restricting the sample to families with at least one son and one daughter, adding family fixed effects, and interacting municipality indicator variables with the indicator variable daughter. In these specifications, only the interaction between daughters and always-working mothers at ages 3 to 5 remains statistically significant at the 5% level, with a larger effect size than in the main specification: Daughters whose mothers were always working between ages 3 and 5 experience a 25% increase in post-first-birth

Table 5: Post first birth earnings: Maternal employment measured at different age of child

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
daughter	-1.98***	-1.97***	-1.97***	-1.96***	-1.97***	-2.04***
	(0.069)	(0.070)	(0.070)	(0.070)	(0.070)	(0.251)
M: always work (age 10 to 14) × daughter	0.144***	-0.019				
	(0.018)	(0.028)				
M: irreg work (age 10 to 14) × daughter	0.063***	-0.005				
	(0.017)	(0.022)				
M: emp 2 years × daughter		0.040	0.029	0.031	0.037*	0.104
		(0.025)	(0.023)	(0.023)	(0.022)	(0.108)
M: emp 5 years × daughter		0.093***	0.076***	0.078***	0.087***	0.073
		(0.025)	(0.020)	(0.022)	(0.019)	(0.091)
M: emp 9 years × daughter		0.121***	0.089***	0.092***	0.110***	0.114
		(0.028)	(0.023)	(0.030)	(0.020)	(0.100)
M: emp 12 years × daughter		0.222***	0.165***	0.183***	0.206***	0.236***
		(0.033)	(0.029)	(0.040)	(0.021)	(0.090)
M: always work (age 3 to 5) × daughter			0.046**			
			(0.023)			
M: irreg work (age 3 to 5) × daughter			0.027			
			(0.018)			
M: always work (age 6 to 9) × daughter				0.024		
				(0.035)		
M: irreg work (age 6 to 9) × daughter				0.018		
				(0.022)		
Dep var mean (daughter)	3.34	3.34	3.34	3.34	3.34	3.27
Dependent variable mean	4.1465	4.1468	4.1468	4.1467	4.1468	4.0723
Observations	77,863	77,340	77,103	77,073	77,340	53,663
Adjusted R^2	0.46482	0.46532	0.46527	0.46518	0.46524	0.45049
Birthyear, birth order, family size FE	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	✓
Family FE						✓
Sample restriction: daughter & son						✓

Notes: The coefficients represent marginal effects estimated using OLS regressions with robust standard errors (shown in parentheses), adjusted for clustering at the municipality level. Statistical significance is denoted as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

earnings compared to sons of always-working mothers and daughters of never-working mothers.

This suggests that maternal labour market attachment during a child's early years is more predictive of daughters' post-first-birth earnings than maternal labour market attachment during later childhood.

3.1.3 Paternal employment and the regional economic structure

Section 3.1.1 demonstrated that maternal labour market attachment increases daughters' earnings during parenthood, but has little effect on sons' earnings. In this section, we examine whether or not paternal labour market characteristics—such as employment duration, industry, and firm environment—also contribute to the gender pay gap in parenthood earnings.[5]

To examine the impact of these factors, we extend our main model by including variables related to fathers' employment duration, industry sector, and firm characteristics, such as the firm's gender pay gap and the proportion of women employed. Since the focus of this analysis is on earnings during parenthood, it is important to isolate the effect of paternal variables on earnings prior to parenthood. For this purpose, we control for pre-parenthood earnings. Table 7 shows the results of the interacted terms in our model.[6]

The findings indicate that, unlike maternal labour market attachment, paternal labour market attachment does not have a differential effect on the earnings of daughters and sons. However, the father's industry of employment significantly influences the gender pay gap. Specifically, employment in the manufacturing, high-skill service, and construction sectors is associated with a roughly 10% increase in the gender pay gap in parenthood earnings.

To determine whether these effects are driven by firm-specific rather than sectoral factors, we control for the father's firm-level gender pay gap and the share of women employed in the firm. These firm-level variables, however, are not statistically significant. We also account for the share of employees working in the manufacturing, high-skill service, and public service sectors at the municipality level. Including these variables reduces the size of the coefficients only marginally.

[5] We also tested the impact of mothers' industries on the gender pay gap and found no significant effects.

[6] Variables presented in Table 4 are included in the model, but the coefficients are not shown due to space reasons and the fact that their sizes are hardly affected by the additional variables

As shown in the right panel of Figure 2, the higher the share of employees in the manufacturing and high skill service sector, the higher the gender pay gap. Moving from the 25th percentile of the manufacturing (high skill service) share distribution to the 75h percentile increases the gender pay gap by 9% (12%). Further controlling for the earnings level at the municipality (column 5) and father's earnings (column 6) further decreases the coefficient, of paternal sector, but remain at around 10%.

As illustrated in the right panel of Figure 2, a higher share of employees in the manufacturing and high-skill service sectors at the municipality level is associated with a larger gender pay gap. Moving from the 25th to the 75th percentile of the distribution of manufacturing (high-skill service) employment share increases the gender pay gap by 9% (12%). Further controlling for the municipality's average earnings level (column 5) and the father's own earnings (column 6) slightly reduces these coefficients to approximately 10%.

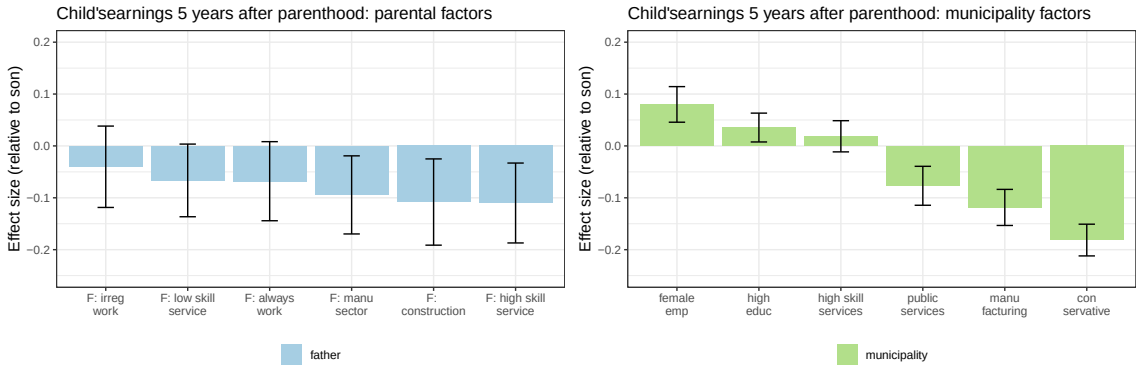
The sectoral effects identified here extend beyond earnings levels and the broader local economic structure. Adding these variables does not significantly alter the coefficients for municipality-level characteristics reported above. Specifically, the negative effect of the conservative vote share becomes more pronounced (increasing from -14% to -18%), while the effect of the high-education share remains stable (at 4%), and the effect of the share of women in employment decreases slightly (from 11% to 7%).

3.1.4 Child penalty and paternity leave

One potential approach to reducing the earnings gap between mothers and fathers is to increase paternal engagement in childcare responsibilities. Greater involvement by fathers may enable mothers to return to the labor market more quickly. In this section, we examine the role of intergenerational and regional factors in shaping two key outcomes: the likelihood of sons taking paternity leave and the extent to which daughters experience lower child penalties.

To achieve this, we use the full model from the previous section (Table 7), excluding interaction terms, and split the sample into sons and daughters. We then separately estimate the probability of sons taking paternity leave and the probability of daughters having a lower child penalty—defined

Figure 2: Paternal and municipality factors in explaining the parenthood gender pay gap



Notes: The reference sector is public services and the reference category for father's employment intensity is working less than 2 years. Child's earnings are measured in logs. The effect size for municipality level characteristics are calculated as the product of the marginal effect and the distance between the 75th and 25th percentile of the respective variable.

as less than two-thirds of the average child penalty among mothers.

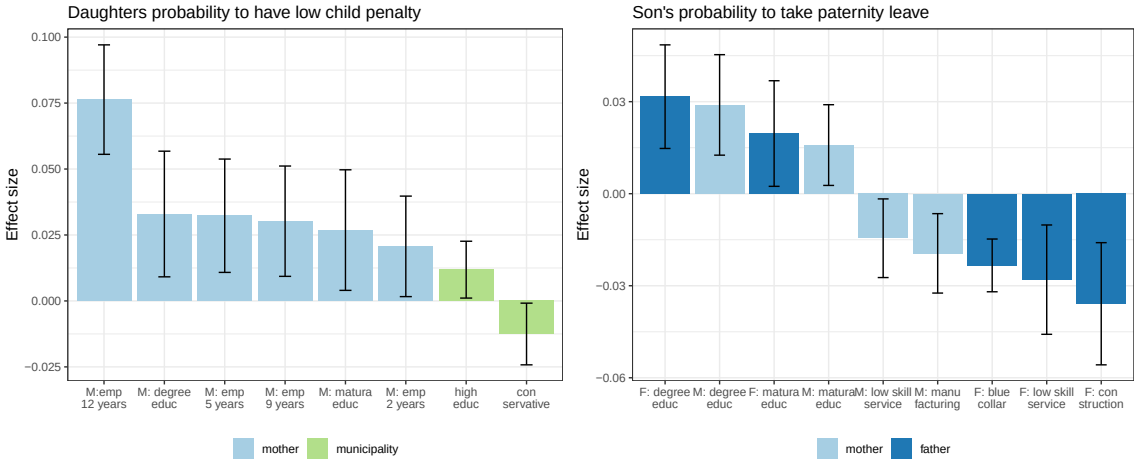
Figure 3 displays the significant predictors for both cases. The left panel highlights that maternal employment is the strongest predictor of whether a daughter experiences a smaller drop in earnings after entering parenthood. Daughters of mothers who worked for more than nine years when the child was aged three to four are 7.5 percentage points—or 23%—more likely to have a low child penalty compared to daughters of mothers who never worked. Additionally, daughters of mothers with a university degree (A-level qualification) are 3 percentage points (2.5 percentage points) more likely to have a low child penalty. Moreover, maternal employment for more than five years or more than nine years increases this probability by 3 percentage points.

The right panel of Figure 3 identifies significant predictors for sons taking paternity leave. Sons of fathers or mothers with a university degree are 3 percentage points more likely to take paternity leave than those whose fathers have the lowest level of education—a substantial increase of approximately 40%, given that only 7.5% of sons take paternity leave. Fathers or mothers with secondary education increase their sons' likelihood to take paternity leave by 1.5 percentage points.

Fathers' employment sector play an important role in determining the probability of taking paternity leave. Sons of fathers who worked in the construction sector or low-skill service sector are 3 percentage points less likely to take paternity leave compared to sons of fathers who were

employed in the public service sector. Sons of blue-collar fathers are 2 percentage points less likely to take paternity leave than sons of white-collar fathers. Similarly, the employment sector of their mother influences this likelihood. Sons of mothers who were employed in manufacturing or low-skill service sectors are 1.5 percentage points less likely to take paternity leave than sons of mothers who worked in the public service sector. These results complement the findings of Fuchs et al. (2021) and Murillo Huertas et al. (2017), who show that child penalties are most pronounced in regions dominated by manufacturing industries.

Figure 3: Factors influencing daughters' earnings drop after parenthood and sons' likelihood of taking paternity leave



Notes: The reference sector is public services and the reference category for father's employment intensity is working less than 2 years. The effect size for municipality level characteristics are calculated as the product of the marginal effect and the distance between the 75th and 25th percentile of the respective variable.

4 Conclusions

We follow Haaland et al. (2018) and examine the intergenerational transmission of labour market outcomes and the role of gender norms in shaping economic behaviours. Using comprehensive administrative data from Austria, we find that maternal labour market attachment significantly reduces the gender pay gap of daughters and sons. Our analysis extends the scope of intergenerational research by evaluating outcomes around before and after the child's parenthood. While maternal

labour market attachment has a minimal effect on children's pre-parenthood earnings gaps, it substantially increases parenthood disparities. These effects suggest that mothers strongly influence their daughters' labour market attachment, particularly during their daughter's parenthood. We find only small effects for sons which is consistent with gendered norms and differences in their transmission.

Our results further highlight the critical role of local factors in addition to parental factors in shaping labour market outcomes. Municipalities with higher shares of children in higher education and greater employment in business service sectors are associated with narrower gender earnings gaps. Conversely, regions with higher employment in manufacturing sectors and greater conservative voting patterns experience wider gaps. These findings point to the interaction between local economic structures and cultural norms in perpetuating or mitigating gender disparities.

We also provide new evidence on factors influencing sons' likelihood of taking paternity leave. Sons of university-educated parents are significantly more likely to take paternity leave. However, paternal employment in sectors such as construction and low-skill services decreases the probability of paternity leave uptake, underscoring the influence of sectoral norms on caregiving behaviors. This highlights the need to address workplace norms and sectoral dynamics to promote greater gender equality in caregiving roles.

While our findings provide robust insights into intergenerational labour market dynamics, the analysis is constrained to the first five years following parenthood due to data limitations. Extending the observation period could shed light on long-term effects, particularly on career progression and cumulative earnings gaps. Our results highlight the significant influence of paternal employment sectors on parenthood outcomes, with employment in manufacturing, high-skill services, and construction associated with larger gender pay gaps. Further research is needed to explore the underlying dynamics within these sectors. Furthermore, the results also imply that changes in regional sectoral composition are likely to influence gender disparities over time, a topic that remains understudied in the intergenerational context

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A Appendix

Table 6: Alternative dependent variables: Post first birth

	emp duration		P(low annual penalty)		P(low daily penalty)	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
daughter	-2.49***	-2.13***	-0.737***	-0.728***	-0.808***	-0.741***
	(0.097)	(0.233)	(0.028)	(0.061)	(0.029)	(0.068)
M: always work	-0.042**		-0.013***		0.001	
	(0.019)		(0.004)		(0.003)	
M: irreg work	-0.078***		-0.009***		-0.001	
	(0.017)		(0.003)		(0.003)	
F: high educ	0.007		-0.005		0.007***	
	(0.015)		(0.003)		(0.002)	
M: high educ	0.005		-0.004		0.004*	
	(0.016)		(0.003)		(0.002)	
M: always work × daughter	0.223***	0.257***	0.059***	0.071***	0.023***	0.015
	(0.028)	(0.067)	(0.007)	(0.019)	(0.007)	(0.021)
M: irreg work × daughter	0.114***	0.089	0.034***	0.027*	0.020***	0.004
	(0.024)	(0.061)	(0.006)	(0.016)	(0.006)	(0.018)
M: high educ × daughter	0.064***	0.102*	0.024***	0.030*	-0.0004	-0.005
	(0.022)	(0.058)	(0.006)	(0.015)	(0.006)	(0.018)
F: high educ × daughter	0.089***	0.052	0.021***	0.020	-0.006	0.011
	(0.021)	(0.068)	(0.006)	(0.018)	(0.007)	(0.021)
mun: women emp rate × daughter	0.006***	0.0001	0.003***	0.003***	0.003***	0.002**
	(0.001)	(0.003)	(0.0004)	(0.0009)	(0.0006)	(0.001)
mun: conservative × daughter	-0.007***	-0.009***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.0009)	(0.002)	(0.0003)	(0.0006)	(0.0003)	(0.0007)
mun: high educ × daughter	0.014***	0.015***	0.004***	0.003	0.005***	0.006***
	(0.002)	(0.006)	(0.0008)	(0.002)	(0.0009)	(0.002)
Dep var mean (daughter)	1.90	1.76	0.309	0.268	0.325	0.303
Dependent variable mean	2.8762	2.8928	0.59487	0.59567	0.64296	0.66028
Observations	81,861	21,773	83,531	22,217	75,942	20,031
Adjusted R^2	0.39282	0.37550	0.40700	0.39497	0.46140	0.38576
Birthyear, birth order, family size FE	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	✓
Family FE		✓		✓		✓

Standard-errors in parentheses. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1, M: mother, F: father, mun: municipality level. .

Table 7: Child's log earnings during parenthood

	F: sector (i)	mun:sector (ii)	pre FB earn (iii)	mun:earnings (iv)	f:earnings (v)	mun:daughter (vi)
F: always work × daughter	-0.10**	-0.08*	-0.10***	-0.10**	-0.07*	-0.05
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
F: irreg work × daughter	-0.05	-0.05	-0.06	-0.06	-0.04	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
F: blue collar × daughter	0.04**	0.03*	0.04**	0.03*	0.01	0.006
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
F: construction × daughter	-0.12***	-0.14***	-0.11***	-0.12***	-0.11**	-0.09**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
F: high skill service × daughter	-0.14***	-0.14***	-0.12***	-0.12***	-0.11***	-0.10**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
F: low skill service × daughter	-0.08**	-0.10**	-0.07*	-0.07*	-0.07*	-0.06
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
F: manufacturing × daughter	-0.18***	-0.15***	-0.10***	-0.10***	-0.09**	-0.09**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
F: no sector × daughter	0.57*	0.59**	0.59**	0.60**	0.58*	0.59*
	(0.30)	(0.29)	(0.30)	(0.30)	(0.30)	(0.32)
F: other sectors × daughter	-0.10**	-0.10**	-0.10**	-0.10**	-0.09*	-0.08*
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
mun: women emp rate × daughter	0.007***	0.007***	0.007***	0.005***	0.005***	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	
firm F: gender gap × daughter	0.18***	0.10*	0.08	0.06	0.05	-0.008
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
firm F: share women × daughter	0.06	0.05	0.02	0.01	-0.006	0.008
	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
mun_kindergarden_type = fullday × daughter		-0.16***	-0.15***	-0.12***	-0.12***	
		(0.04)	(0.04)	(0.04)	(0.04)	
mun_kindergarden_type = halfday × daughter		-0.11***	-0.08**	-0.07*	-0.07*	
		(0.04)	(0.04)	(0.04)	(0.04)	
mun: manufacturing share × daughter		-0.01***	-0.01***	-0.009***	-0.009***	
		(0.001)	(0.001)	(0.001)	(0.001)	
mun: high skill business share × daughter		0.005	0.003	0.006	0.006	
		(0.005)	(0.005)	(0.005)	(0.005)	
mun: public service × daughter		-0.008***	-0.009***	-0.008***	-0.008***	
		(0.002)	(0.002)	(0.002)	(0.002)	
C: pre FB earnings × daughter			0.15***	0.15***	0.15***	0.15***
			(0.02)	(0.02)	(0.02)	(0.02)
mun: avg daily earnings (fathers) × daughter				-0.34***	-0.32***	
				(0.09)	(0.09)	
mun: avg daily earnings (mothers) × daughter				0.27***	0.27***	
				(0.06)	(0.06)	
F: daily earnings × daughter					-0.08**	-0.07**
					(0.03)	(0.03)
Dep var mean (daughter)	3.3	3.3	3.3	3.3	3.3	3.3
Dependent variable mean	4.1356	4.1356	4.1356	4.1344	4.1343	4.1343
Observations	54,423	54,423	54,423	53,430	53,421	53,421
Adjusted R^2	0.48037	0.48194	0.55032	0.54946	0.54986	0.55195
Birthyear, birth order, family size FE	✓	✓	✓	✓	✓	✓
F:emp,sector,collar	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	✓
Parent education, mother emp	✓	✓	✓	✓	✓	✓
Municipality × daughter FE						✓
emp_years_mother_314_nr:daughter fixed effects	✓	✓	✓	✓	✓	✓
mun_kindergarden_type fixed effects		✓	✓	✓	✓	✓

Notes: The coefficients represent marginal effects estimated using OLS regressions with robust standard errors (shown in parentheses), adjusted for clustering at the municipality level. Statistical significance is denoted as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the log of the child's earnings in the first five of parenthood. The base group for father's employment intensity is employment of less than two years, the base group for the sector of employment is public services. The table only shows the coefficients on the interaction terms while it includes the full set of interacted variables. Thoe model also controls for maternal employment and parental education. M: mother, F: father, C: child, firm: firm level, mun: municipality level.