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Abstract

We present evidence that shared institutional and economic contexts may be at least as important as culturally rooted gender equality norms for the size of the motherhood penalty. Our study covers child migrants and children of immigrants in Sweden, and while the results point to a moderate but statistically robust negative association between source country gender equality and the labor market impact of motherhood, the overall picture is more one of similarity across highly diverse groups. All groups of mothers exhibit qualitatively comparable labor market trajectories following first childbirth, but penalties are somewhat greater among those descending from the most gender unequal societies.

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1 Introduction

A rapidly growing literature highlights the role of parenthood in explaining gender gaps in the labor market. In particular, a significant body of evidence suggests that having children has substantial and long-lasting effects on the labor market outcomes of women, but typically not on those of men. This so called "motherhood penalty" has been documented in a large number of countries with varying institutional, social, and economic conditions (Kleven et al., 2019; Dotti Sani, 2015; Kleven, Landais and Leite-Mariante, 2023).[1] Recent evidence from the US suggests that the penalty is substantial also where one could expect it to be less extensive, e.g. due to strong (relative) female labor market positions (Almond, Cheng and Machado, 2023).

Despite its pervasiveness, the underlying mechanisms driving the motherhood penalty are much less well understood. We explore the effect of gender equality norms on the size of the motherhood penalty, studying family formation among former child migrants and children of immigrants in Sweden 1990–2021. The analysis uses the fact that people of different backgrounds who reside in the same country face similar institutions and economic conditions, but are potentially exposed to different cultural factors depending on their ancestry. Thus, we combine the estimation of child penalties using an event study design with the epidemiological approach (Hofstede, 2001; Inglehart and Baker, 2000).

Our general approach in combination with rich population-wide administrative data from a country characterized by substantial and diverse immigration over several decades, provides the opportunity to investigate the role of norms at different levels. In addition to the cultural factors captured by the epidemiological approach, there may be context-specific norms affecting all families. In our setting, similarities in motherhood penalties across groups that differ in background characteristics can be seen as indications on such influences. Moreover, at the micro level, family-specific norms could operate across generations. By investigating the role of grandmother labor market outcomes, and their interaction with background-related gender norms, we uncover how norms at different levels influence individual behavior.

The event study approach to measure the labor market impact of parenthood outlined by Kleven, Landais and Søgaard (2019) has been proven relevant in many settings and powerful in terms of its strikingly clear results.[2] The idea of comparing individual trajectories around the time of first childbirth to a counterfactual established by those who have not yet given birth, is in many ways appealing. Yet, some methodological concerns apply, not least when using across-group variations to elicit the role of norms. The concept of a penalty is dependent on there being something to lose. If gender norms affect employ-

[1] Examples of countries include Sweden (Angelov, Johansson and Lindahl, 2016), Denmark (Kleven, Landais and Søgaard, 2019; Lundborg, Plug and Rasmussen, 2017), Norway (Bütikofer, Jensen and Salvanes, 2018), Finland (Sieppi and Pehkonen, 2019), Spain (de Quinto, Hospido and Sanz, 2021), and the US (Chung et al., 2017). See also Kleven, Landais and Leite-Mariante (2023) for a comparison of child penalties in employment across the world.

[2] There is an ongoing methodological discussion in the literature; see e.g. Bensnes, Huitfeldt and Leuven (2023) and Melentyeva and Riedel (2023) for recent contributions.

ment and earnings already before having children, a comparison of child penalties may underestimate their true influence. The epidemiological approach also entails a trade-off between on-the-one-hand studying people strongly affected by the origin culture, and on-the-other including individuals that are comparable in individual characteristics and exposure to host context factors.[3]

Focusing on child migrants and children of immigrants gives comparability in terms of institutional and overall societal exposure during adolescence and early adulthood. By documenting pre-child differences and supplementing the baseline estimates by a coarsened exact matching approach to study child penalties among individuals with similar status and characteristics, we illuminate the potential influences of norms in a more complete way.

We estimate total child penalties over a ten-year period after first childbirth and relate this penalty to measures of gender inequality based on country of ancestry. Similar to e.g. Nollenberger, Rodríguez-Planas and Sevilla (2016) and Blau et al. (2020), we use the Global Gender Gap Index (GGI) from the World Economic Forum to measure culture and gender norms. The GGI takes into account social, political, and economic equality across the genders. We show that this measure is highly correlated with female relative labor force participation rates, which has been the main measure of gender inequality or norms used in the literature. We rank countries according to their GGI score and divide them into 12 groups.[4]

Our baseline findings point to origin related norms as determinants of the motherhood penalty (MP), but also show that mothers of diverse backgrounds exhibit striking similarities in a shared context. Further analyses reinforce that the story is more one of similarities than of differences, while not completely ruling out the influence of group-specific cultural norms.

We show that origin country GGI is related to pre-child female labor market outcomes also among the child migrants and children of immigrants constituting our main sample. The rank correlation between the gender equality index and labor income two years prior to first child birth is 0.35. Although substantial, the fact that this correlation is smaller than for the first generation (0.75) shows that integration across generations decreases the significance of source country factors.[5] Mothers originating in countries characterized by unequal gender norms are slightly younger at first childbirth, have more children on average, and exhibit a greater age difference to their spouses. But there is no association

[3]For example, correlations between source country child penalties and those observed among people migrating as adults may reflect country/gender-specific determinants of pre-child investments and decisions, rather than norms influencing behavior in the host country. Furthermore, the often long process of labor market assimilation among immigrants (Duleep, 2015) also raises issues about comparable baseline trajectories of treated and controls.

[4]The division of groups is computer driven and based on having as similar-sized groups as possible conditional on the GGI ranking (see Table C7).

[5]Within country groups, the correlation in outcomes (measured at age 45 for the first generation and two years prior to first childbirth for the main sample) across generations is moderate: 0.32 for years of education and 0.30 for earnings.

between GGI and educational attainment in our main sample.

Event study estimates (following Kleven, Landais and Søgaard (2019)) by ancestry/origin suggest a non-linear association between the estimated earnings penalty and the GGI index. While the penalties in the three most unequal quantiles is about 45 percent, it is stable around 40 percent for higher quantiles. A negative association is also present in specifications controlling for other source region factors in terms of GDP and average fertility rates. Employment penalties over the 10-year period show an even stronger association with the gender equality measure of the region of origin. In general, the estimates confirm the presence of a substantial motherhood penalty in the Swedish context of comparatively strong family-friendly institutions and otherwise limited gender gaps. All origin groups exhibit a sharp income drop after child birth and incomplete long-term recovery.

As discussed above, the potential penalty from parenthood depends on the point of departure: If you earn very little, you don't have much to lose. Pre-child differences across groups can thus affect patterns of estimated penalties. Using coarsened exact matching we therefore compare deviations between the penalty of each GGI group and a sample of Sweden-origin mothers similar in terms of own and partner income and age. Results show that while a moderate gradient remains driven by the least gender equal source countries, increasing comparability means an even stronger similarity in maternal earnings trajectories. Our investigation of family-level vs. broader origin influences points in the same direction. Regardless of source country gender norms, there is a negative association between the magnitude of the child penalty in our main sample of second-generation mothers and the labor market position of their first-generation mothers.

Taken together, the results show that motherhood penalties are arguably more similar than different across groups characterized by highly diverse backgrounds. This suggests that reforms affecting common conditions in the host context are likely to have similar impacts in groups with varying background. The findings also suggest that differential responses to parenthood related to cultural background are not a main driver of gender earnings gaps being particularly large in some immigrant communities. Our results do not, however, rule out that gender norms are a key driver for the widely observed difference in the parenthood penalty across genders, but instead point to that these norms may be formed and operate largely within the shared context.

Our paper contributes to the literature on the mechanisms behind the child penalty. Previous work gives little support to biology in terms of pregnancy related factors when comparing penalties in families with adopted and biological children (Kleven, Landais and Søgaard, 2021), or to gender-based comparative advantage when examining differences across heterosexual and same-sex couples (Andresen and Nix, 2022; Moberg, 2016). Variations in family policies have also been shown to have limited explanatory power for the long-run effects of children on women's earnings (see e.g. Kleven et al., 2022; Schönberg and Ludsteck, 2014; Lalive and Zweimüller, 2009; Lalive et al., 2014).[6]

[6]There is also evidence that women (in the US and UK) systematically underestimate the employment effects of motherhood, and that women and men tend to express more traditional values after becoming

Norms and culture are factors receiving increasing attention in the general literature on gender labor market disparities.[7] The epidemiological approach has been used to study a variety of outcomes including female labor force participation and fertility (Guiso, Sapienza and Zingales, 2006; Fernández, 2011; Giuliano, 2021). By culture, one typically refers to a collection of beliefs and preferences; in this context those specifically related to gender norms. Norms are usually proxied with past female labor force participation rates from individuals' country of ancestry (Fernandez and Fogli, 2009) or (as in our case) with summary measures of overall gender inequality.

In the context of motherhood penalties, Kleven et al. (2019) show a positive relationship between child penalties and elicited gender norms across countries, which is consistent with an important role for gender norms. Boelmann, Raute and Schönberg (2021) find that East German mothers return to work sooner than West German mothers (living within the same commuting zone) even two decades after reunification, suggesting a strong persistence of the culture in which women were raised. Kleven (2023) shows that child penalties correlate with gender norms in the US. Building on the epidemiological approach, the study also finds strong associations between source region/country child penalties and the penalties among movers/migrants. Similarly, Moriconi and Rodríguez-Planas (2024) find a positive relationship between progressive gender norms and the probability that a mother with children under the age of five is employed, among native women across 186 European regions.

The literature on the role of culture in determining women's labor supply exploiting source country characteristics is by construction often related to the labor market integration of immigrant women (Blau, Kahn and Papps, 2011; Blau, 2015; Blau and Kahn, 2015; Finseraas and Kotsadam, 2017; Neuman, 2018; Antecol, 2000; Fortin, 2005). A typical finding is that the labor market performance in the host country is positively associated with the female labor force participation in the source country. There are also investigations of other outcomes using epidemiological measures; e.g. do Blau et al. (2020) find that US immigrants allocate tasks within the household differently depending on the characteristics of their source countries. Other studies focus on intergenerational transmission of roles and attitudes (Bredtmann, Höckel and Otten, 2020; Farré and Vella, 2013; Fernández, Fogli and Olivetti, 2004; Bütikofer, 2013; Bredtmann and Otten, 2023). These studies tend to find that source country gender roles strongly influence immigrant behavior in the receiving country, whereas the impact on the second generation varies across studies.

Previous work thus suggests that there exists a factor, i.e., culture or gender norms, that is distinguishable from human capital or social capital, which affects economic behavior. At the same time, these studies also document that culture is malleable; there is substantial evidence of cultural assimilation among second generation populations. Similarly, studies

parents (Kuziemko et al., 2018).

[7] Despite significantly converging roles of men and women in the labor market and society, there are still sizable gender gaps in employment, wages, and representation in top jobs in virtually all countries (Olivetti and Petrongolo, 2016; Petrongolo, 2019; Bertrand, 2020; Goldin, 2023; Cortés and Pan, 2023)

on intergenerational transmissions of attitudes document significant effects of parents' attitudes and behaviors on those of their children. Overall, this literature establishes an important role of culture for economic outcomes, and of both vertical and horizontal transmission of norms and culture.

2 Data

We use administrative data on the Swedish population from several registers linked by unique identifiers. The data include annual information on all individuals aged 16–74 from 1990 to 2021 and have been compiled and pseudonymized by Statistics Sweden into collections held by the Institute for Evaluation of Labor Market and Education Policy (IFAU). There is detailed information on earnings, parental benefits, educational attainment, social benefits, and family relationships. All nominal variables are adjusted for inflation using the 2018 consumer price index. Earnings are taken from tax registers and are winsorized at the 99.5% level. The main outcome is annual earnings (income from employment). We also study employment, full-time equivalent monthly wages, and a labor income measure adding parental benefits (income from job-protected parental leave plus temporary leave to care for sick children) to earnings.

The annual data are merged with multigenerational information on child-parent relationships. Households are defined as a man and a woman with a joint child. Men and women are included from five years before the birth of their first child to up to ten years after. This means we include child births occurring over the time period 1990–2021. It does not have to be the first child for both the man and the woman, but only the first child for the focal person. The number of children is the number of own children, not the number of children in the household.

Individuals are excluded from the panel in years when they are studying (defined through the receipt of student benefits and loans). Otherwise, we place no restrictions on positive earnings or relationship status, which means that all individuals are included as long as they are in the population registers. If an individual dies or moves out of Sweden, they are included up to that point. Therefore, an individual does not have to be in the data for all 16 years (around childbirth) to be included in the analysis. Thus, the analysis is based on an unbalanced panel of individuals.

We have information on the place of birth of the individuals and the place of birth of their parents (if the individual is born in Sweden) for all individuals. To identify gender norms, we primarily use the Global Gender Gap Index (GGI) from the World Economic Forum (World Economic Forum, 2023). Countries are ranked according to the level of gender inequality in that country according to the GGI (see Table C7).[8]

[8]If there are few people from a specific source country, the place of birth is grouped into a larger group of countries (a region). Since the gender norms are given at the country level, and in a few cases we only have the *region* of birth, we have weighted the GGI according to the number of immigrants from that country relative to the other countries in that region. Hence, the weights are proportional to the number of immigrants in Sweden during our period of analysis. Moreover, some countries are not included in the

Our main analysis focuses on individuals at most ten years old at immigration (child migrants) and children of immigrants (second-generation). A Sweden-born individual is defined as second-generation if both of the individual's parents were born outside of Sweden. To classify origin, we use the place of birth for child migrants and the place of birth of the individual's mother for second-generation individuals. We pool the samples of child migrants and second generation immigrants according to these definitions, and refer to the pooled sample as the group with immigrant background, and the sample of Sweden-born individuals with Sweden-born parents as natives.

3 Research design

3.1 Baseline analysis

We follow previous literature (Angelov, Johansson and Lindahl, 2016; Kleven, Landais and Søgaard, 2019) by estimating child penalties using an event study design including individuals that have children at some point. Identification comes from individuals of the same age in the same calendar year, but with a first child born at a different age since all individuals in the regressions have children at some point. Identification therefore comes from variation in the treatment timing, i.e. at which age they have their first child. Following Kleven et al. (2019), we add calendar year dummies and age dummies to control flexibly for business cycle trends and life cycle trends:

$$Y_{it} = \boldsymbol{\beta}' \boldsymbol{D}_{it}^{\text{Event}} + \boldsymbol{\gamma}' \boldsymbol{D}_{it}^{\text{Age}} + \boldsymbol{\lambda}' \boldsymbol{D}_{it}^{\text{Year}} + \varepsilon_{it}, \tag{1a}$$

where Y_{it} is the labor market outcome of interest (primarily labor income) for individual i in event time t. Boldface is used to denote vectors, where $\boldsymbol{D}$ refers to vectors of a full set of dummies for event time, age, and calendar year. Individuals are included from five years before first birth to ten years after. Event time $t = -1$ is omitted to provide the baseline. We also follow Kleven, Landais and Søgaard (2019) and convert the coefficients to percentage effects using the following specification:

$$P_{it} \equiv \frac{\tilde{\beta}_t}{\boldsymbol{E}[\tilde{Y}_{it} \mid t]}, \tag{1b}$$

where $\tilde{Y}_{it}$ is the predicted counterfactual outcome of having children. Standard errors are clustered at the individual level and robust to heteroskedasticity.

Within this framework, we need to assume that the timing of births is random conditional on age and calendar year. Although it is impossible to formally test the validity of this assumption, pre-trends indicate whether the decision to have children is clearly correlated with unobservable characteristics that matter for labor market outcomes in the period prior to parenthood. Positive pre-trends are common in the literature on child penalties

Global Gender Gap Index. In these cases we have imputed a GGI score based on the Gender Development Index (GDI), female labor force participation rate, fertility rate, and GDP for the country. For the countries that are grouped together and for the countries where GGI is imputed, see Table C7.

(Kleven et al., 2019; Andresen and Nix, 2022). For Sweden, positive pre-trends appear to be driven by students; see Figure C1. Excluding students (identified by the reception of student benefits) from the sample means that there are no longer any pre-trends. Note, though, that the size of the estimated child penalties are unaffected by this restriction. Comparing the pre- and post-period, it seems that individuals in Sweden (both women and men) tend to wait with having children until they are done with their studies. Moreover, very few individuals become students after they have children. This pattern could potentially be driven by the fact that the relatively generous scheme for parental benefits is tied to earnings, generating strong economic incentives to enter the labor market before entering parenthood.

Earnings are stable until the birth of the first child and thereafter drop sharply. It is therefore unlikely that the short-run earnings drop after entering parenthood is due to something else than the event of having children. The flat pre-trends signify that the decision to enter parenthood is not driven by labor market outcomes, e.g., by waiting for promotion or having children as a response to becoming unemployed. In the long-run, we are not able to rely on the smoothness assumption to the same extent, and interpreting the long-run penalties requires stronger assumptions.

To compare across regional origins, we run Equation 1a for each regional group separately. That means that we allow non-parametric variation in terms of period (calendar year), cohort (year of birth for first child), and life-cycle (age of parenthood) across groups. Hence, we allow for the groups to differ in their counterfactual earnings trajectories. Given that we have essentially no pre-trends for any group, the common trend assumption within each group holds. To compare regional groups we again make the transformation in Equation 1b, which means that we compare the impact of children relative to the expected earnings for each GGI category. To relate child penalties to the level of gender equality in the source region we take the average of the estimated child penalties over the 10-year horizon following the birth of the first child, and plot it against the GGI rank.

3.2 Other source country characteristics

Given that we use variation in regional origin as a measure of gender norms, we need to make sure that we are capturing differences in gender norms from the source country and not something else that correlates with these gender norms. Following Blau et al. (2020), we consider regional rankings in terms of GDP per capita and fertility. We run a series of regressions relating the outcome to GGI, GDP per capita, and the fertility rate, interacted with age and calendar year. The most extensive specification is:

$$Y_{it}^{j} = \alpha + \sum_{k=1}^{3} \beta_k D_i^{\text{Post}} \times X_k^j + \sum_{k=1}^{3} \gamma_k \boldsymbol{D}_i^{\text{Age}} \times X_k^j + \sum_{k=1}^{3} \lambda_k \boldsymbol{D}_i^{\text{Year}} \times X_k^j + \tau \boldsymbol{D}_i^{\text{Event}} + \varepsilon_{it} \quad (2)$$

for individual i, with parental region j, in event time t, where $X_1^j = \text{GGI}^j$, $X_2^j = \text{GDP}^j$, and $X_3^j = \text{Fertility}^j$.

3.3 Matched comparisons

To address the concern that the GGI groups may differ in characteristics (e.g. labor market attachment prior to parenthood) potentially related to the impact of family formation, we conduct an additional analysis in which we compare each GGI group with a matched group of native parents (born in Sweden with two Sweden-born parents). We use a coarsened exact matching following the procedure described in Blackwell et al. (2009) and Iacus, King and Porro (2012). We match on age, calendar year, educational attainment, and pre-parenthood earnings. As the characteristics of both the father and mother are potentially important, we match on the earnings and education level of both parents. We use one-to-one matching, i.e. only individuals with a perfect match are included, and the rest are excluded. To enable exact matching, earnings are binned into quintiles, while age and calendar year are binned into groups of five years. Given the large number of individuals in the native population, the number of individuals that needs to be excluded in the immigrant background group is relatively small (see Table C5).

4 Description

This section first presents statistics at the country group level underlying the ranking in terms of gender equality norms. Then we discuss individual and household characteristics of the sample used in the main analysis.

4.1 Gender equality ranking and other country characteristics

Table C7 presents the (parental) birth country groups used in creating the gender equality ranking. The World Economic Forum's gender gap index (GGI) discussed in Section 2 places Iraq at the bottom of gender equality and Iceland at the top. While there is some variation, countries in the Middle East are often found in the lower end of the ranking, whereas Northern European (in particular Nordic) countries are typically found in the upper part. The GGI is strongly correlated with other indicators of inequality, and also with economic development. High GGI values are associated with higher GDP per capita, and with lower fertility rates. In the analysis we will use both the ranking and the values for GGI (and other indicators).

4.2 Characteristics of the main sample

Table 1 displays characteristics for mothers in the main analysis sample. We divide the group of immigrant background (arriving before age 10 or born in Sweden) into high and low GGI countries, where the former constitute about two thirds of the sample, containing 52,883 mothers of immigrant background. The number of native mothers included amount to 809,936.

Immigrant mothers are on average almost one year younger than natives at first childbirth, and those originating in countries with less equal gender norms are also substan-

Table 1: Descriptive characteristics—Women

	Immigrants			Natives
	All	Low GGI	High GGI	
Age	27.23	26.68	27.39	28.06
	(4.89)	(4.56)	(4.97)	(4.75)
Age difference to partner	2.73	3.21	2.59	2.57
	(4.25)	(4.13)	(4.27)	(4.13)
Number of children	2.04	2.17	2.00	2.05
	(0.72)	(0.74)	(0.71)	(0.67)
Years of education	11.92	12.16	11.86	12.40
	(2.10)	(2.19)	(2.07)	(2.12)
Quantile of income	45.34	40.91	46.63	50.63
	(24.34)	(25.79)	(23.75)	(22.66)
Observations	52,883	11,867	41,016	809,936

Notes: The table shows descriptive statistics for our main analysis sample of women. Age is measured at the year of first childbirth. Number of children is the total number of children within eight years from first childbirth. Years of education are measured two years prior to first childbirth. Quantile of income is the income percentile two years prior to the first childbirth. Women with immigrant backgrounds are divided into two groups depending on being in the upper or lower part of the distribution in terms of source region GGI. See Table C7 for a ranking of source regions according to GGI. Low GGI are countries in the lower half of the ranking (1–46) and High GGI are countries in the upper half (47–92). See also Tables C1 and C2 for descriptive statistics for each GGI quantile in our main analysis samples and Tables C3 and C4 for descriptive statistics for the same GGI quantiles for 1st generation immigrants at age 45.

tially younger than those from more equal origins. They also exhibit a somewhat larger age difference to their partners, although the numbers are between 2.57 and 3.21 in all subgroups. The data show no strong signs of differences in completed fertility, although the figure is highest in the low GGI category (2.17 compared to 2.00 among the high GGI mothers).

Turning to earnings two years prior to first childbirth, we find that the region of origin differences typically seen among adult migrants are present also in our sample of child migrants and children of immigrants. Earnings are lower among individuals of immigrant background than among natives, and particularly among those originating in countries classified as less gender equal. Statistics based on the less crude grouping (Table C6), suggests a rank correlation between the GGI and individual earnings of 0.36. At first glance, this pattern is consistent with women originating in less equal countries prioritizing labor market outcomes to a lesser degree. However, the other statistics in Table 1 signal that it may be premature to assign all of the differences to gender equality norms.[9]

Most of the previous work using the epidemiological approach to study gender norms and the outcomes of immigrant women in the labor market have focused on first generation (adult) migrants. While we believe there are good reasons to focus an analysis of child penalties on the child migrants and the second generation (e.g. alleviating concerns about delayed fertility due to unobserved circumstances for adult migrants), comparing outcomes across generations within the region of origin groups is relevant. In Table C6, we document that the characteristics at the country of origin level among females of immigrant background are highly correlated across the first and second generations. Also, they are strongly associated with patterns in the region of origin. For example, the pre-child income of mothers in our main sample has a correlation of 0.30 with the income of women in the first generation, and a similar correlation with source country GDP and GGI. Years of education is related across generations (correlation coefficient 0.32), and negatively associated with fertility rates in the source region. The latter variable exhibits a positive association with the number of children born in the first and second generation of migrants to Sweden, however declining over generations.

5 Results

This section presents the results from the empirical analysis outlined in Section 3. First, we consider child penalties among mothers of different origins and their correlation with gender equality norms as reflected in the GGI. After a graphical representation of the baseline estimates and the associations, we investigate whether the link between gender equality classifications and child penalties can be explained by other source region characteristics. We then perform a matched analysis comparing immigrant mothers to natives with similar individual and partner outcomes prior to first childbirth. This analysis ad-

[9]The fact that mothers in the low GGI group have slightly higher education may seem surprising at first glance. A contributing factor is likely that many of them originate in refugee groups with higher education, whereas the high GGI category more often descend from less educated labor migrants.

dresses the concern that there may be adaptations due to gender norms already before family formation, and the possibility that child penalties are dependent on the point of departure (e.g. how much one stands to lose or that work-life adaptation opportunity varies with earnings levels). Finally, we present supplementary results on fatherhood penalties and on the importance of family-specific vs. overall gender norms by relating the motherhood penalty to the relative income of grandparents in groups of varying origin.

5.1 Source region norms and the motherhood penalty

5.1.1 Baseline results

The upper graph of Figure 1 displays the event study graphs for motherhood penalties (MP) by GGI quantile group in the main sample. The first thing to notice is that all the categories exhibit the same characteristic pattern of a substantial drop in earnings, and an incomplete earnings recovery, over the first ten years following first childbirth. In other words, mothers of varying background in Sweden share similarities not only with each other, but with mothers around the world

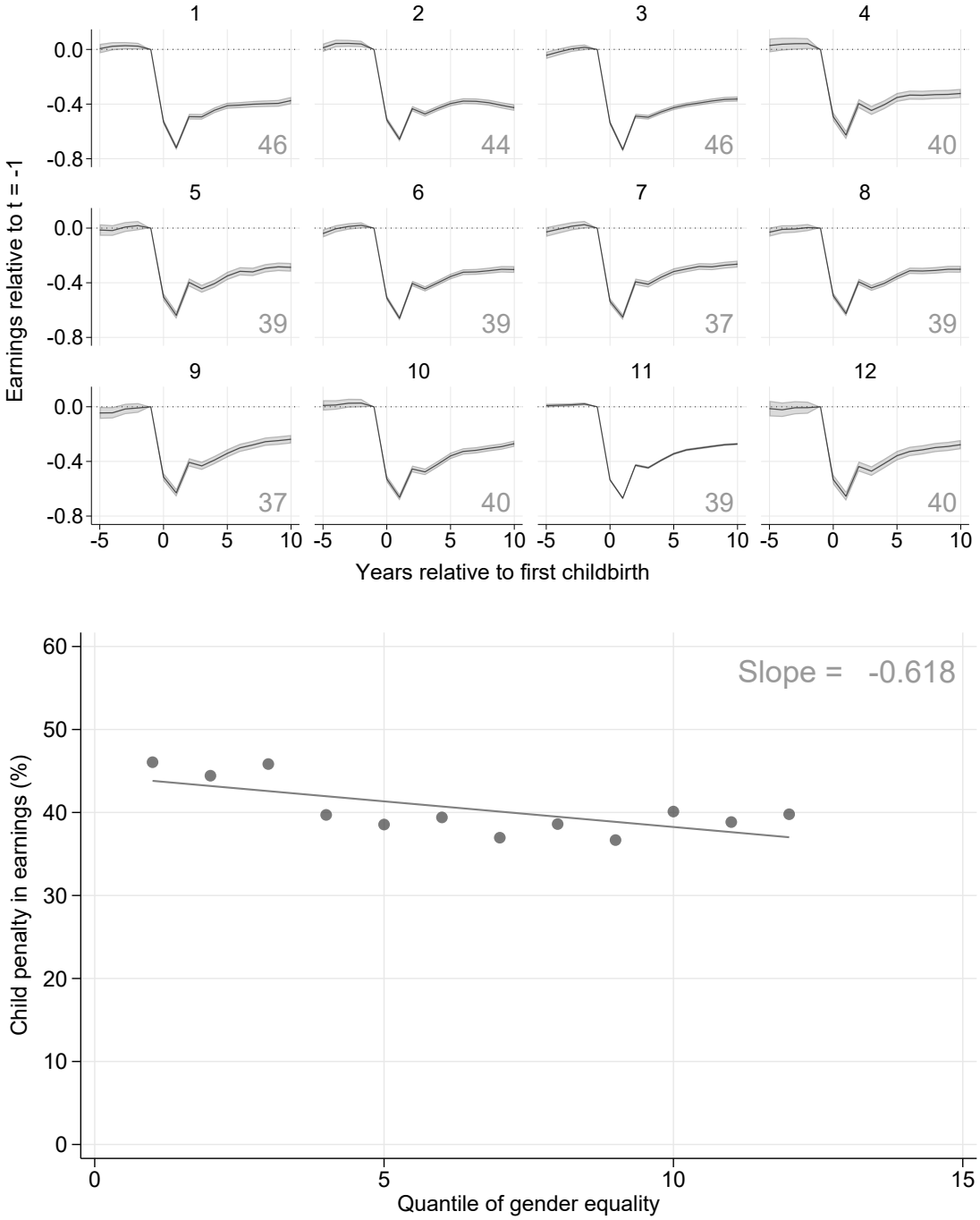
As seen in the lower panel of Figure 1, illustrating the association between the estimated penalties (over the 10-year period) and the GGI ranking, there appears to be some source region gender equality norms also among mothers fully or to a large degree grown up in the same broader Swedish context. The estimated earnings loss varies from 46 percent in the 1st and 3rd quantile, to 37 percent in the 7th and 9th quantile. The estimated slope for the 12 quantiles is -0.618 percentage points per step in the ranking. However, it seems like the association is nonlinear and driven entirely by the difference between quantile 1–3 and the higher GGI groups.

Further analyses reveal that a substantial GGI gradient in the motherhood penalty remains if one includes parental benefits in the income measure (Figure A1), with estimated impacts ranging between 33 and 24 percent over the 10-year window. There are also indications of particularly strong extensive margin responses in the least gender equal country groups, with employment effects reaching 25 percentage points relative to pre-child levels (Figure A2). For full-time equivalent wages and contracted work hours (percent of full-time), the estimated impact of motherhood is smaller but also exhibits a negative association with GGI (Figure A3 and A4).

5.1.2 Other source country characteristics

It is possible that the gender equality index is correlated with and captures other source country characteristics than gender norms. The first column of Table 2 displays estimates of Equation 2 described in Section 3, interacting the event (*Post*, which is first childbirth) with the linear GGI rank variable. Note that the estimations also allow both age and year effects to vary with GGI background. The point estimate suggests that moving up one step in the ranking means slightly below SEK 500 higher annual earnings post motherhood on average, i.e. a smaller child penalty. Columns 2 and 3 perform the same analysis,

Figure 1: Motherhood earnings penalties



Notes: The upper graph shows the estimated child penalties in earnings for the main sample, by region of (parental) origin. See Section 3 for details. The lower graph displays the average penalty over the 10-year horizon following family formation by the GGI rank of the source country. The regression line represents a linear prediction.

but replaces GGI with source country GDP and fertility rates, respectively. Estimates suggest that people with a family background in richer countries experience smaller child penalties, and those originating where fertility is higher have stronger penalties. Columns 4–6 combine the source country variables. The estimated impact of gender norms is not much affected by controlling for the other source region characteristics.[10]

[10]It could be noted that the sign of the fertility estimates changes when one accounts for GDP and the GGI ranking.

Table 2: Mothers' earnings: GGI and other source country characteristics

	(1) Income	(2) Income	(3) Income	(4) Income	(5) Income	(6) Income
Event × Rank	490.3***			355.1***	474.6***	377.9***
	(10.95)			(21.89)	(19.01)	(22.97)
Event × GDP		746.0***		248.1***		331.2***
		(18.37)		(34.72)		(39.91)
Event × Fertility			-641.8***		-36.62	124.5***
			(17.08)		(29.65)	(34.90)
Post	✓	✓	✓	✓	✓	✓
GGI	✓			✓	✓	✓
GDP		✓		✓		✓
Fertility			✓		✓	✓
Year	✓	✓	✓	✓	✓	✓
Year × GGI	✓			✓	✓	✓
Year × GDP		✓		✓		✓
Year × Fertility			✓		✓	✓
Age	✓	✓	✓	✓	✓	✓
Age × GGI	✓			✓	✓	✓
Age × GDP		✓		✓		✓
Age × Fertility			✓		✓	✓
Event time dummies	✓	✓	✓	✓	✓	✓
Observations	835520	811001	834922	811001	834922	810403

Standard errors in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01.

Notes: This table shows the regressions following Equation 2. Post is a dummy variable for being in a time post childbirth. GGI, GDP, and Fertility are rank variables for source region characteristics. Event time dummies are dummy variables for event time, where event is birth of the first child. Age and Year are indicator variables.

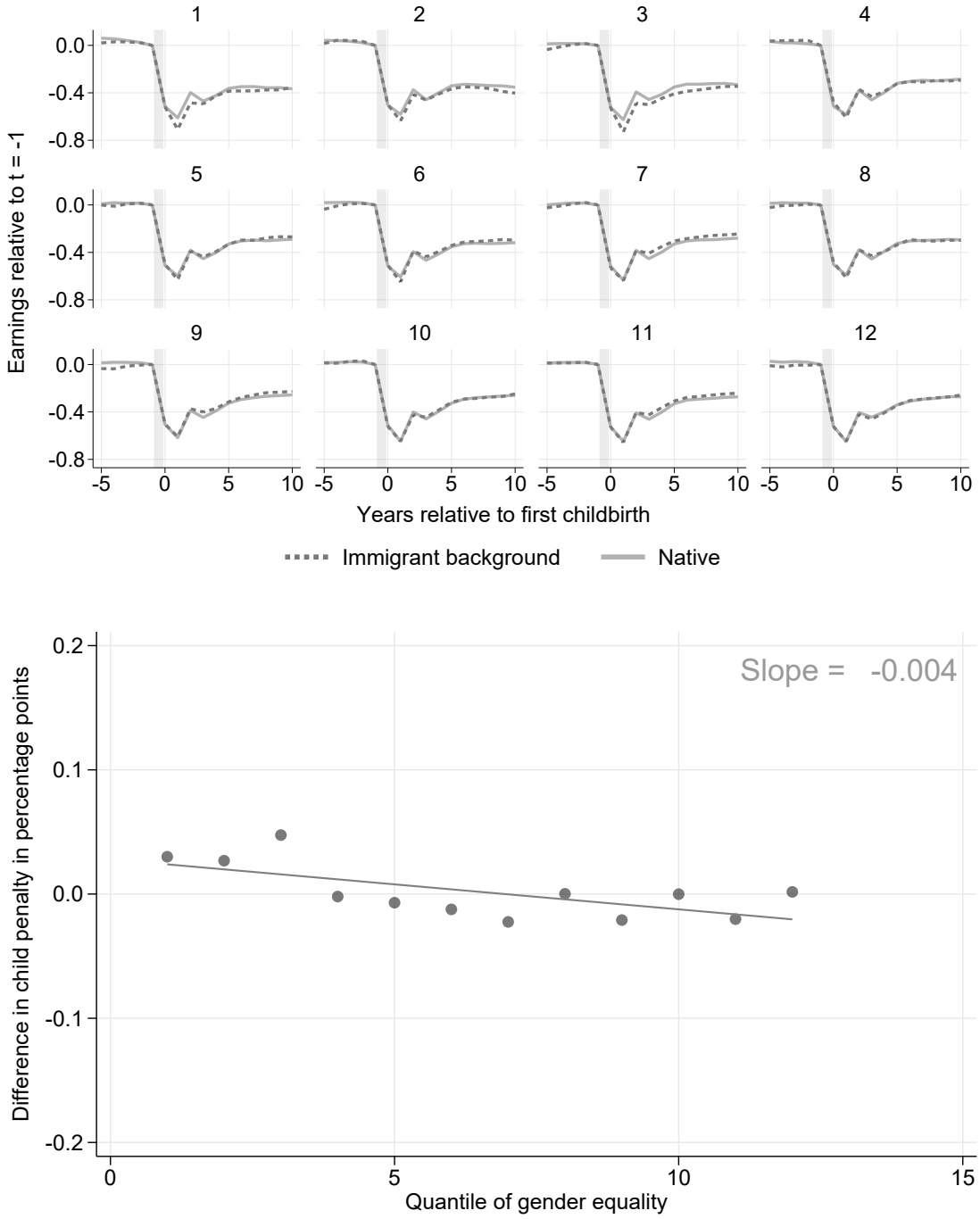
5.1.3 Matching on pre-child differences

The results presented so far are generally in line with the hypothesis that gender norms, captured by differences in source region characteristics, are related to the magnitude of the motherhood penalty. However, the observed gradient in the motherhood penalty by GGI category may also be driven by pre-existing differences, e.g. in the baseline level of earnings across individuals with varying backgrounds (Kleven, 2023). We saw in Table 1 that earnings two years before child birth differs substantially across low- and high-GGI mothers on the one hand, and between mothers of immigrant background to native mothers, on the other. To explore the role of baseline differences, we begin by performing an analysis comparing mothers of immigrant background to native mothers with similar own and partner economic status prior to having their first child, using Coarsened Exact Matching (CEM).

As discussed in the introduction, the event study approach to studying the labor market impact of parenthood builds on certain assumptions that could be questioned, in particular when making comparisons across groups and linking findings to cultural norms. It is possible that norms affect behavior already before family formation and that we therefore miss some of its impact. However, a basic idea in previous work emphasizing the role of parenthood for explaining gender gaps is that the event makes (traditional) norms salient. Systematic pre-child differences in socioeconomic status may also relate to expected effects in more mundane ways, e.g. by simply reflecting how much earnings one can lose, or affecting the bargaining position (or joint optimization) within households.

Figure 2 displays results from specifications using the CEM approach outlined in Section 3. For each GGI category, we compare the earnings profiles to a sample containing mothers of Swedish background matched on own and partner characteristics. A first impression is that when narrowing down the comparison to mothers with similar characteristics, most of the immigrant categories closely mirror their Sweden-origin counterparts. Close inspection, however, reveals that there is a tendency for low-GGI mothers to recover slightly less well compared to their observationally similar counterparts among natives, and for high-GGI mothers to outperform the comparison groups. This results in the gradient visible in the lower graph (lower panel, Figure 2), where a DiD-type comparison going from the bottom to the top of the ranking implies a change of about -0.04 in the motherhood penalty. In other words, some of the association seen in the baseline results is no longer present in this comparison, although there is still a gradient. In particular, this gradient seems driven by a difference between the source-country groups with the lowest GGI values compared to the remaining groups; where the latter exhibit no apparent gap in the motherhood penalty relative to their observationally similar native counterparts, while the former do.

Figure 2: Comparison with natives with similar income level—Women



Notes: Outcome is earnings. The upper figure shows the results from our matched specification where we have matched each regional group to a sample of natives with similar characteristics. The lower figure shows the estimated difference in percentage points between the estimated child penalties in earnings for our main analysis sample (with an immigrant background) and the matched sample of natives. A positive difference means that the child penalty is higher for the group with an immigrant background, and a negative difference means the opposite.

5.2 Supplementary results and variations

5.2.1 Comparison to fatherhood penalties

Sweden is a rare case of having a fatherhood penalty in earnings (Kleven et al., 2019; Sundberg, 2024), and it seems that this phenomenon is present also among fathers of immigrant origin (see panel (a) in Figure B1). Moreover, performing an analysis of fatherhood penalties using the same classifications methods as above reveals a GGI gradient in fatherhood penalties similar to what we see for mothers (see panel (b) in Figure B1). If the gradient in motherhood penalties documented above is indeed driven by gender norms, we would expect an opposite sign for the fatherhood penalty gradient with respect to GGI, i.e., more gender equal norms being associated with larger fatherhood penalties. We do, however, emphasize that there are cases where pre-trends for fathers may be a concern for the interpretation of the estimates. This could signal that the identifying assumption of exogenous timing of parenthood is not fulfilled in certain socioeconomic and demographic strata. When repeating the coarsened exact matching exercise for fatherhood, i.e., comparing with native fathers with similar income levels, the gradient of fatherhood penalties with respect to GGI is non-existing (Figure B2).

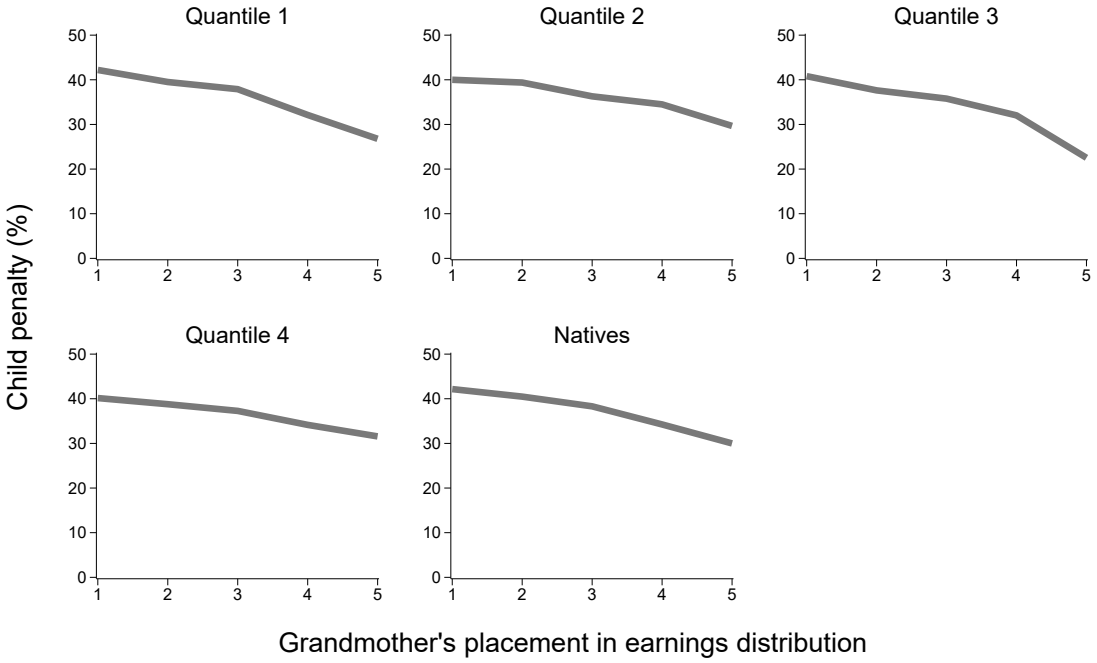
5.2.2 Family and origin norms

Another dimension in which the impact of gender norms on child penalties can be examined is by focusing on the relative income of grandparents (Kleven, Landais and Søgaard, 2019). Figure 3 shows the child penalties when our main analysis sample of women is disaggregated both by the region of origin (quintiles for GGI) and by their mothers' position in the earnings distribution in Sweden. The idea is to investigate whether women who grew up with less traditional (family-oriented) gender norms in their household, i.e. their mothers were more career-oriented, also have a lower child penalty. The consistent negative slope in the size of the child penalty relative to the grandmother's position in the earnings distribution suggests that this is indeed the case. This aligns with the idea that the size of child penalties for women are partly determined by within-family transmission of gender norms from parents to their children. The finding that regardless of GGI origin, the child penalties incurred by women are similarly related to how career-oriented their mothers were, adds to the broader picture of more similarity than difference in the responses to family formation.

6 Conclusions

The consequences of parenthood for women's labor market outcomes are in focus for a very active field of research. The so-called motherhood penalty has emerged as an empirical regularity across countries and socioeconomic groups. Our study contributes to this literature by investigating similarities and differences in the impact of parenthood among mothers and fathers sharing a common institutional and economic context in a

Figure 3: Grandmothers placement in earnings distribution (main sample by GGI)



Notes: The figures show the total child penalty (average over the 10 years following first childbirth) for women relative to their mother's placement in the earnings distribution. The figures are separated based on the GGI in source region. The lower figure in the middle shows the same but for natives.

comparatively gender equal society, while potentially entering adulthood with differing norms regarding gender roles through their background in different parts of the world.

We show that the main sample consisting of child migrants and children of immigrants in Sweden show pre-parental similarities not only with first generation adult migrants sharing their geographic origin, but also with the gender equality indicators seen among the populations of these countries. Thus, descriptions using our data appear to confirm previous research suggesting that there is a link between source country characteristics and migrant outcomes, potentially reflecting deeply rooted cultural norms and values. With this perspective, it is striking how similar the impact of motherhood is across groups of very different background in terms of gender equality. The earnings trajectories after first birth follow very similar profiles, and all country of origin groups experience long-term losses. One interpretation is that welfare state and labor market institutions shape behavior and limit the influence of inherited norms and values.

Nevertheless, our baseline findings suggest a negative association between the gender equality rank of the source region and the size of the child penalty in earnings. This association cannot fully be explained by other source region characteristics included in the analysis, and is seen also in employment and wages. However, matched comparisons between native and immigrant-background mothers similar in age and pre-child economic status indicates that the gradient is partly accounted for by differences in baseline earnings and characteristics across groups. But there is still a moderate gap in the motherhood

penalty between women originating in the least gender equal countries relative to their native counterparts. A corresponding analysis of matched comparisons of fathers, on the other hand, reveal no gradient in the fatherhood penalty with respect to source country gender inequality.

Our interpretation is that motherhood penalties are arguably more similar than different across groups characterized by highly diverse backgrounds, captured by country of origin gender equality, and reflected in pre-child outcomes. This suggests that reforms affecting common conditions in the host context are likely to have similar impacts in groups with varying background. The findings also suggest that differential responses to parenthood related to cultural background are not a main driver of gender earnings gaps being particularly large in some immigrant communities.

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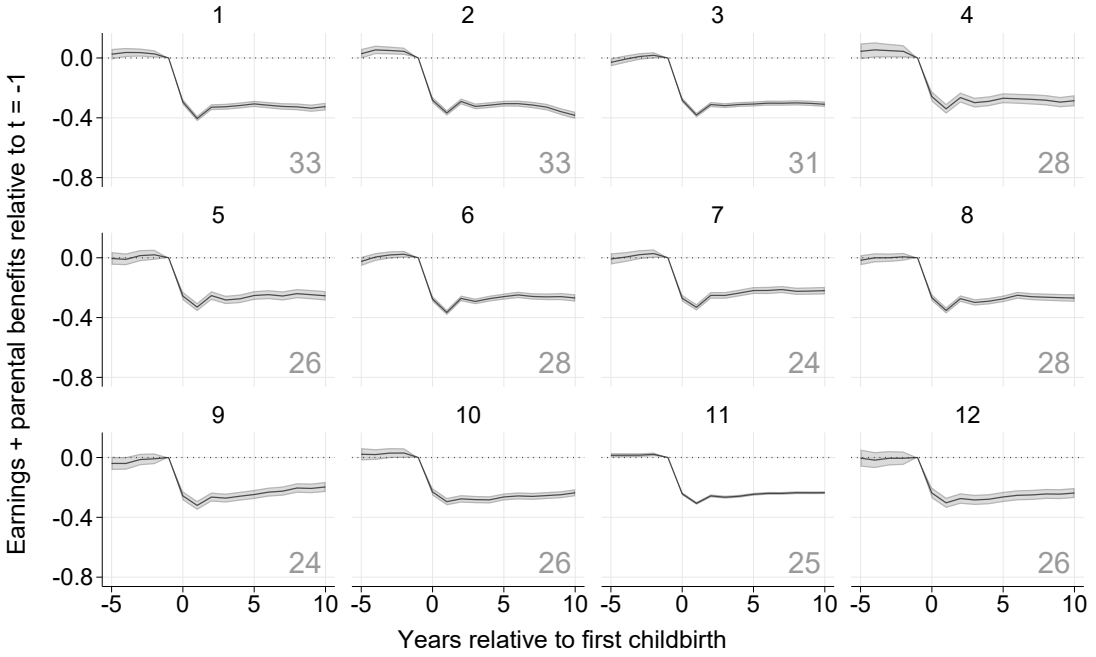
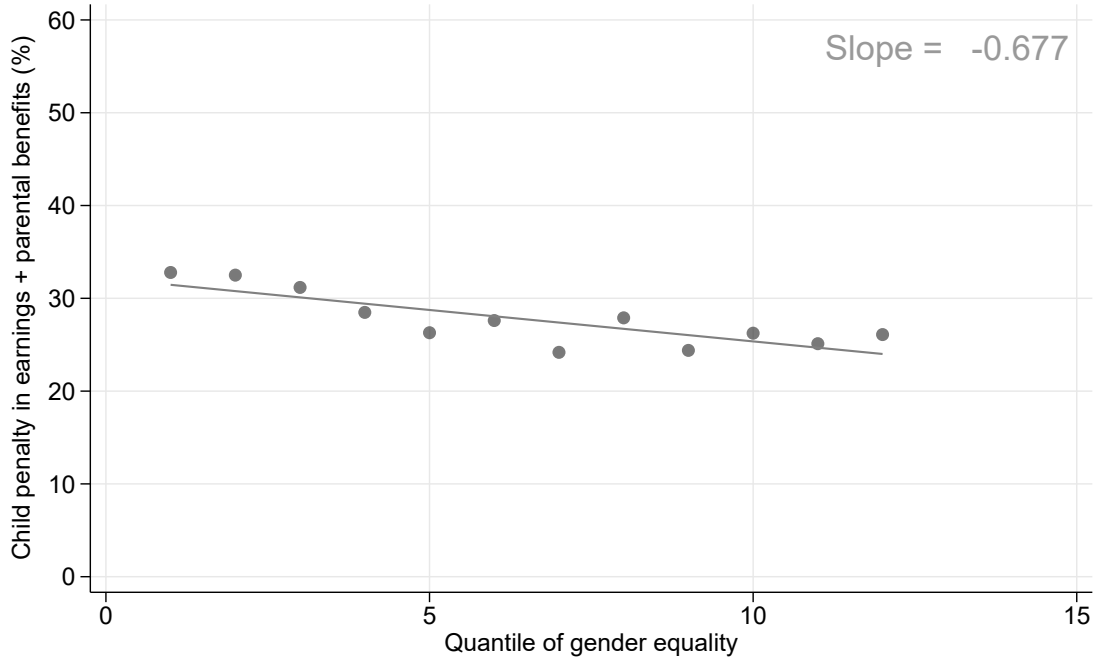
Appendix A: Variations on motherhood penalties

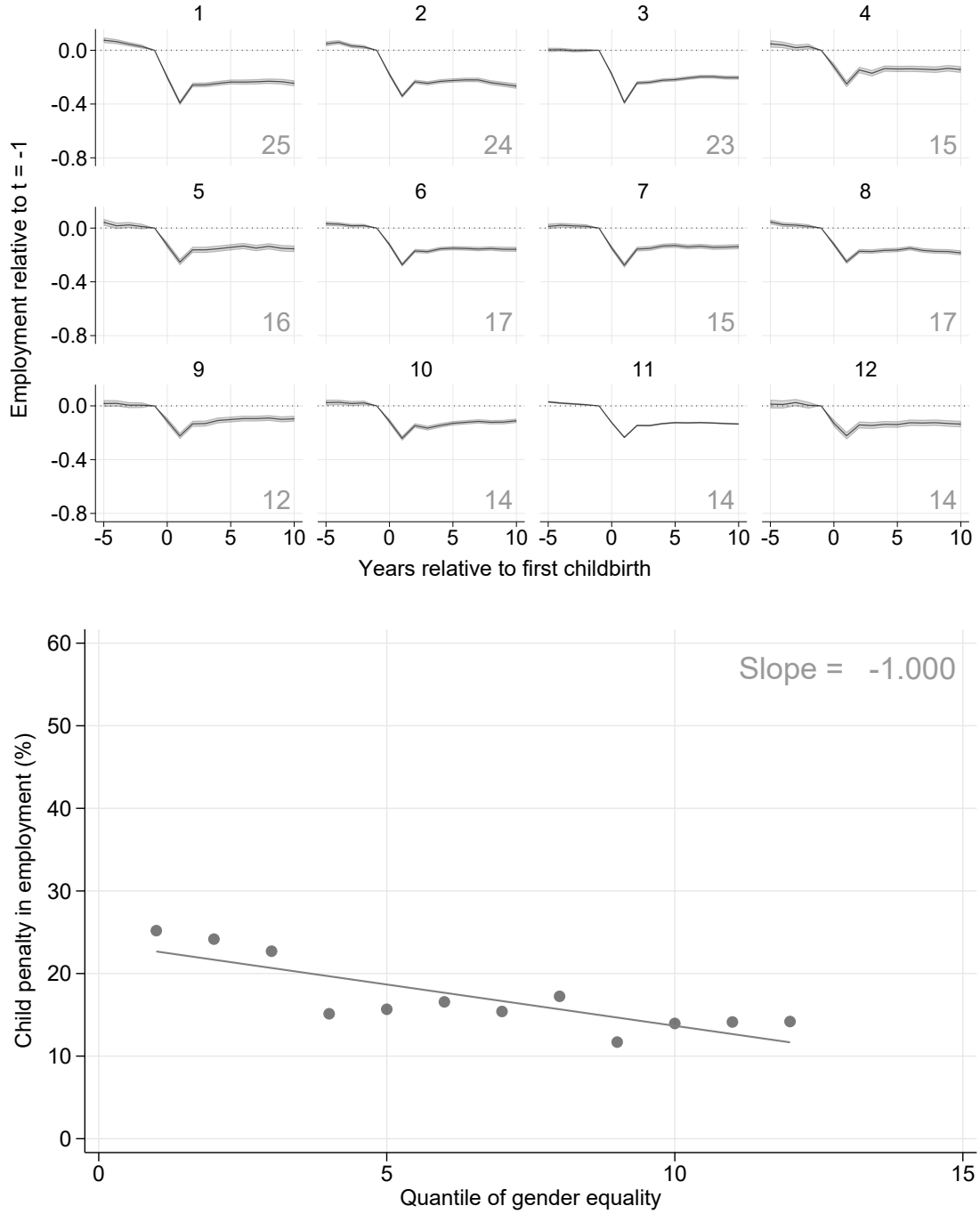
Figure A1: Motherhood penalty—Earnings + parental benefits.





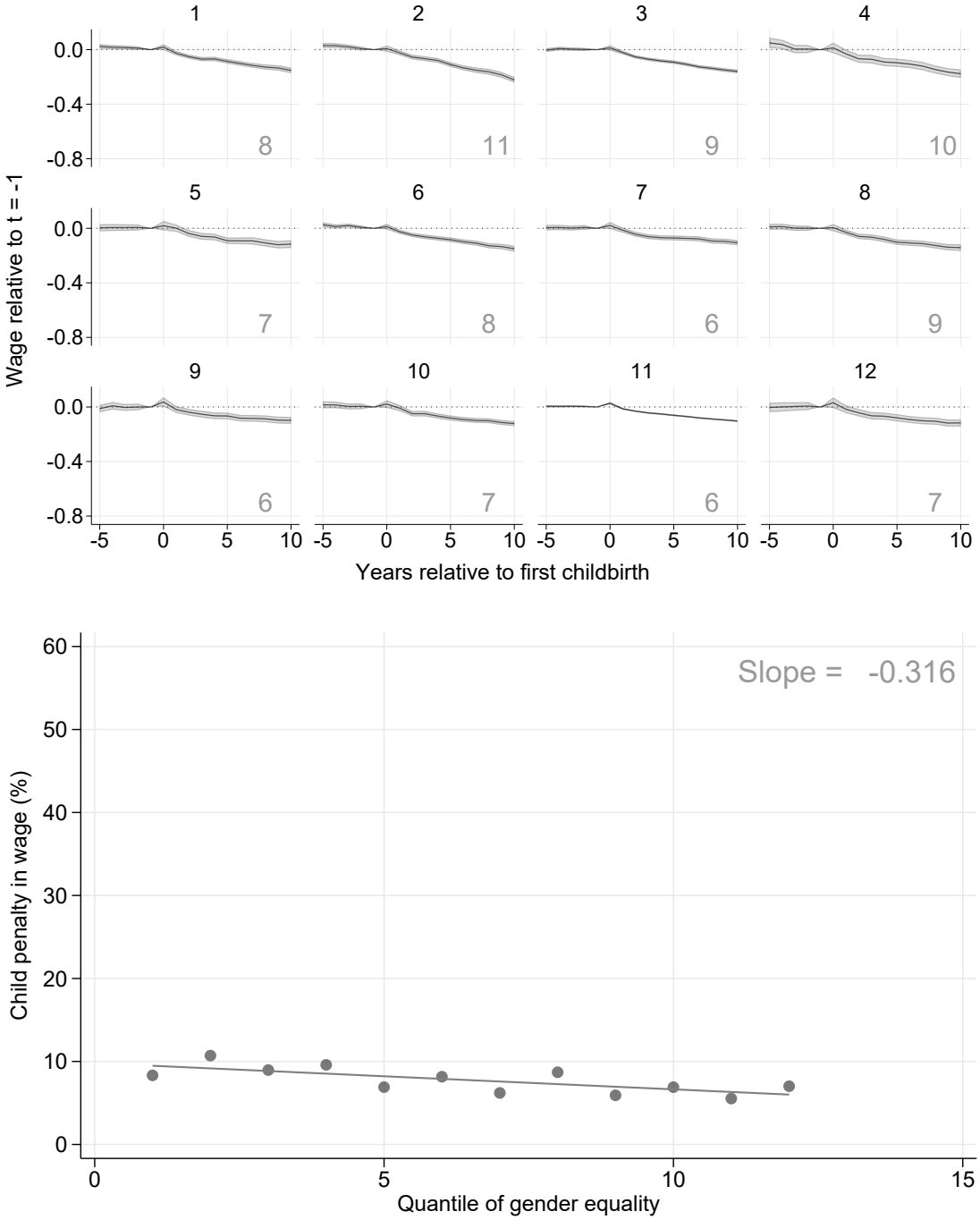
Notes: The upper graph shows the estimated child penalties in income for the main sample, by region of (parental) origin. See Section 3 for details. The lower graph displays the average penalty over the 10-year horizon following family formation by the GGI rank of the source country. The regression line represents a linear prediction.

Figure A2: Motherhood penalty—Employment



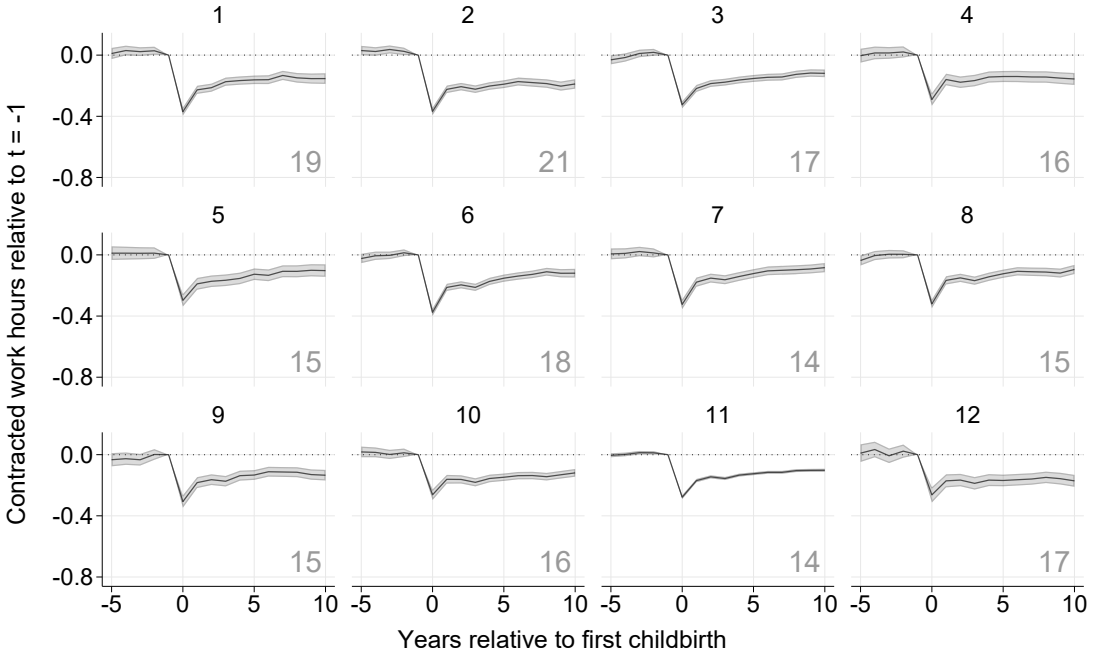
Notes: The upper graph shows the estimated child penalties in employment for the main sample, by region of (parental) origin. Employment is defined as not being in the lowest two deciles in the income distribution in a given year. See Section 3 for details. The lower graph displays the average penalty over the 10-year horizon following family formation by the GGI rank of the source country. The regression line represents a linear prediction.

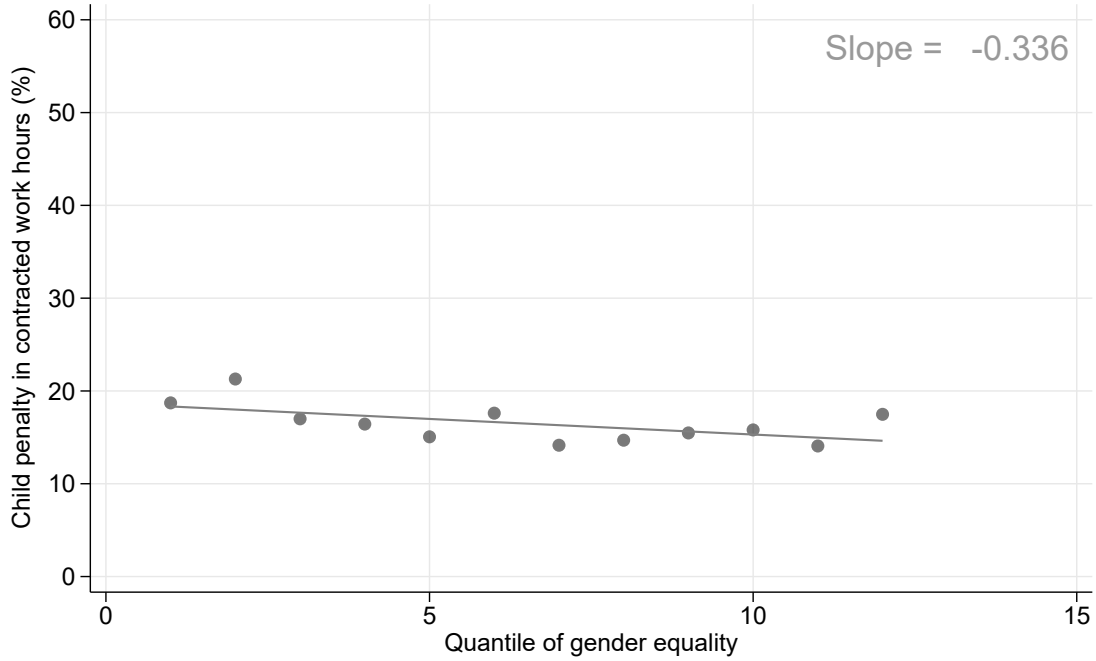
Figure A3: Motherhood penalty—Wages



Notes: The upper graph shows the estimated child penalties in contracted wages for the main sample, by region of (parental) origin. See Section 3 for details. The lower graph displays the average penalty over the 10-year horizon following family formation by the GGI rank of the source country. The regression line represents a linear prediction.

Figure A4: Motherhood penalty—Hours

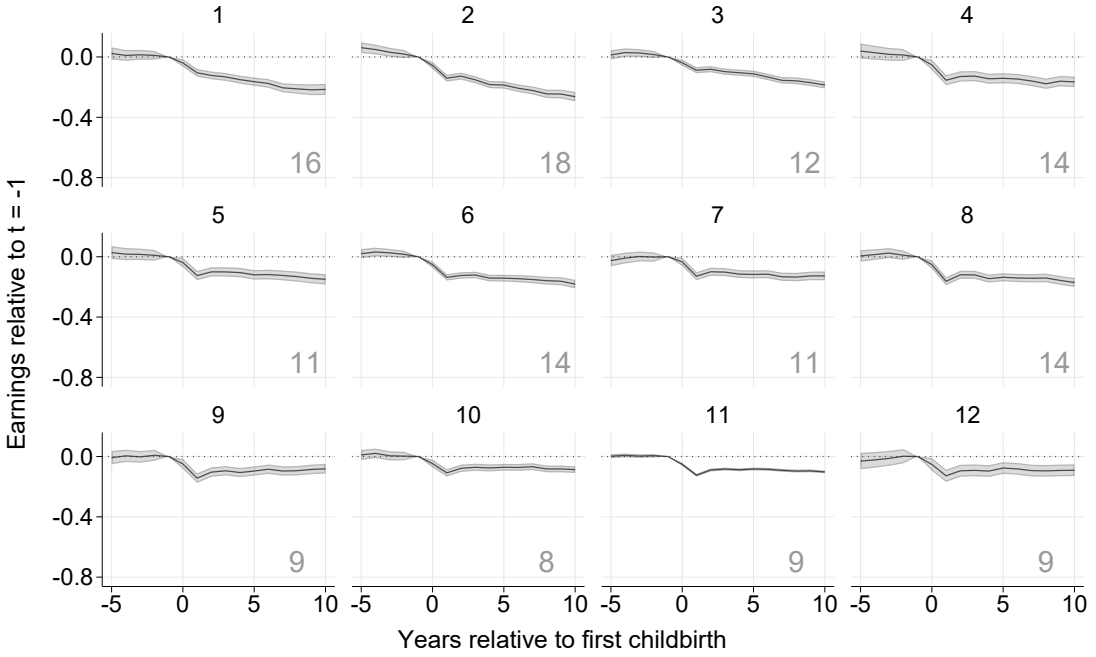


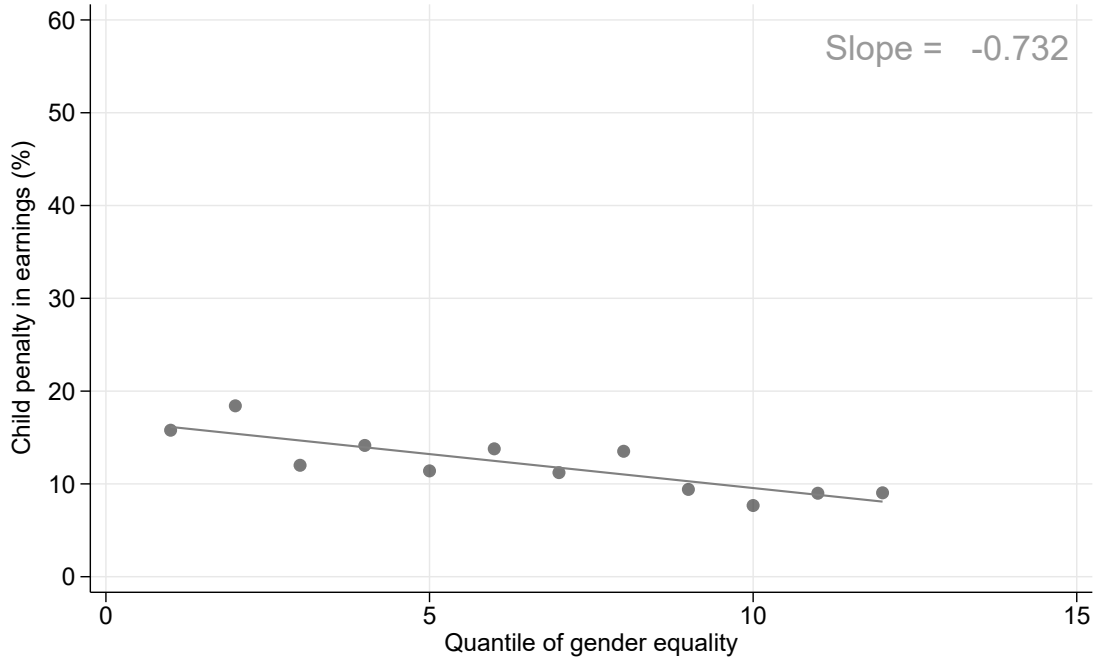


Notes: The upper graph shows the estimated child penalties in contracted work hours for the main sample, by region of (parental) origin. See Section 3 for details. The lower graph displays the average penalty over the 10-year horizon following family formation by the GGI rank of the source country. The regression line represents a linear prediction.

Appendix B: Fatherhood penalties

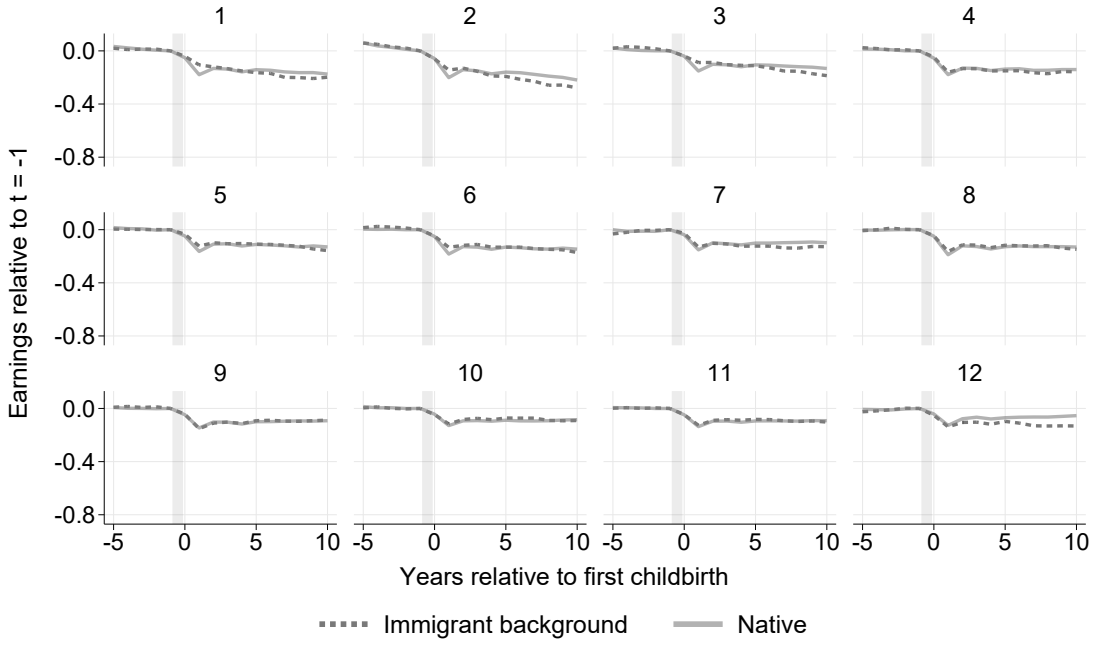
Figure B1: Fatherhood penalty—Earnings

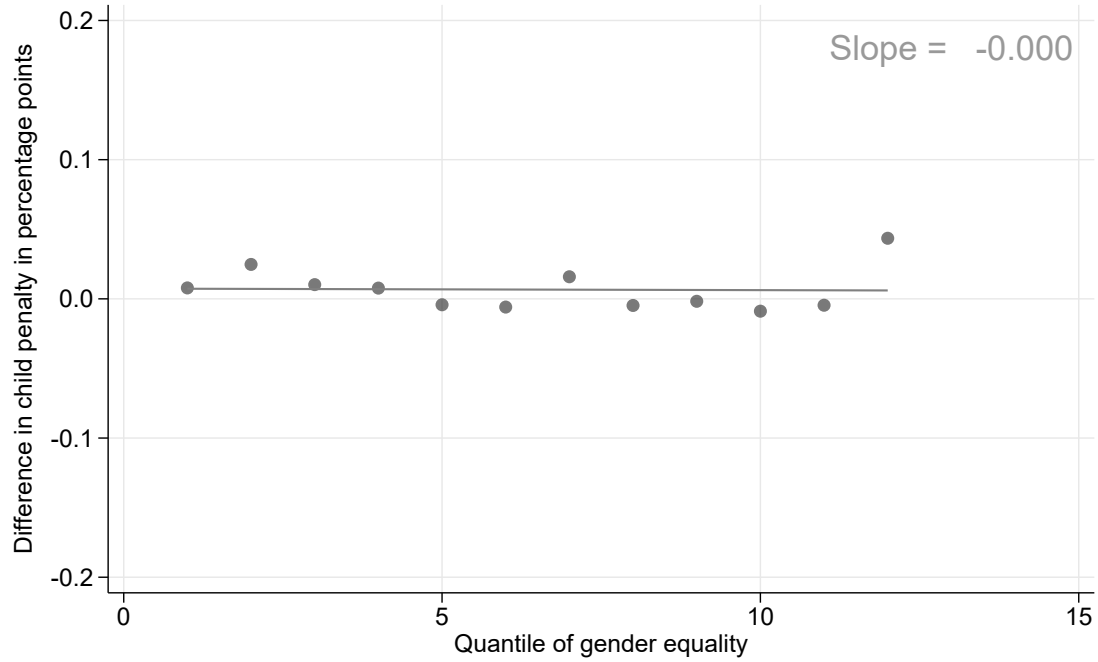




Notes: The upper graph shows the estimated child penalties in earnings for men, by region of (parental) origin. See Section 3 for details. The lower graph displays the average penalty over the 10-year horizon following family formation by the GGI rank of the source country. The regression line represents a linear prediction.

Figure B2: Comparison with natives with similar income level—Men



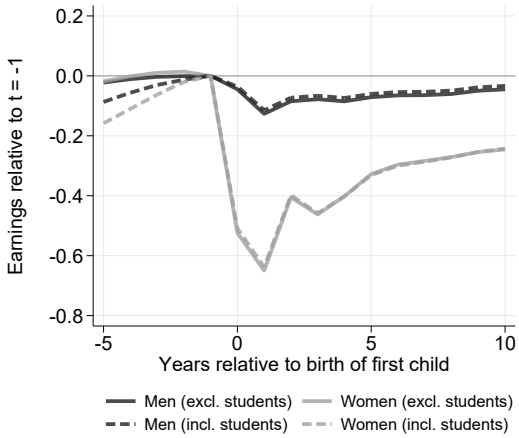


Notes: The upper figure shows the results from out matched specification where we have matched each regional group to a sample of natives with similar characteristics. The lower figure shows the estimated difference in percentage points between the estimated child penalties in earnings for our main analysis sample (with an immigrant background) and the matched sample of natives. A positive difference means that the child penalty is higher for the group with an immigrant background, and a negative difference means the opposite.

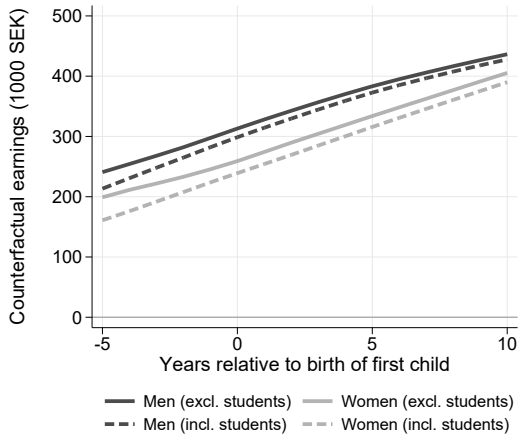
Appendix C: Additional figures and tables

Figure C1: Student restriction

(a) Child penalties



(b) Counterfactual earnings



Notes: The figures shows a comparison when running the main Equations 1a and 1b when including our excluding students from the population. The left figure shows the estimated child penalties and the right figure shows the estimated counterfactual earnings.

Table C1: Descriptive Statistics—Women (main sample)

GGI Quantile	Years of Education	Quantile of Income	Number of Children	Single Household
1	11.97	33.91	2.288	0.223
2	12.31	38.20	2.219	0.238
3	11.82	37.95	2.277	0.201
4	12.59	50.13	1.981	0.238
5	12.43	45.52	2.020	0.195
6	12.42	45.50	2.024	0.229
7	11.83	40.81	2.009	0.316
8	12.82	47.57	1.992	0.253
9	12.57	51.13	1.949	0.230
10	11.86	49.26	2.016	0.222
11	11.67	47.16	1.999	0.246
12	11.76	47.44	2.017	0.269
Total	11.92	45.51	2.044	0.240

Notes: The table includes foreign born individuals with an age at immigration ≤ 10 and second generation immigrants (both parents foreign born, region of ancestry is source country of the mother). The country groups are listed in ascending order according to a weighted Global Gender Gap Index (2020). See Table C7 for a list of countries included in each quantile. Quantile of Income is the income percentile two years prior to first childbirth. Number of Children is the total number of children within 8 years from mother's first child. Single Household is equal to one when the parent is registered as a "single household with a child aged ≤ 18," 8 years from the first child's birth.

Table C2: Descriptive Statistics—Men (main sample)

GGI Quantile	Years of Education	Quantile of Income	Number of Children	Single Household
1	11.57	42.10	2.280	0.287
2	11.81	42.01	2.234	0.289
3	11.29	39.92	2.279	0.212
4	12.41	56.50	1.986	0.247
5	11.99	49.82	2.028	0.211
6	12.15	53.47	2.036	0.235
7	11.56	44.09	2.034	0.371
8	12.58	53.19	1.996	0.280
9	12.30	58.09	1.995	0.231
10	11.74	59.37	1.978	0.218
11	11.44	55.96	1.956	0.277
12	11.69	55.99	1.989	0.269
Total	11.65	53.20	2.019	0.264

Notes: See notes for Table C1.

Table C3: Descriptive Statistics—Women (1st generation immigrants at age 45)

GGI Quantile	Years of Education	Quantile of Income	Number of Children	Single Household
1	11.75	25.68	1.851	0.176
2	12.33	37.02	2.079	0.257
3	10.56	30.55	2.666	0.299
4	13.31	40.01	1.644	0.220
5	11.89	38.29	1.736	0.253
6	12.19	45.04	1.643	0.232
7	12.62	45.51	1.896	0.331
8	13.24	45.21	1.514	0.256
9	13.30	44.34	1.500	0.210
10	14.05	46.62	1.667	0.178
11	13.02	55.03	2.075	0.277
12	12.94	51.27	2.100	0.251
Total	12.44	40.10	1.852	0.239

Notes: The table includes foreign born individuals at age 45. The country groups are listed in ascending order according to a weighted Global Gender Gap Index (2020). See Table C7 for a list of countries included in each quantile. Quantile of Income is the income percentile two years prior to first childbirth. Number of Children is the total number of children within 8 years from mother's first child. Single Household is equal to one when the parent is registered as a "single household with a child aged $\leq$ 18," 8 years from the birth of mother's first child.

Table C4: Descriptive Statistics—Men (1st generation immigrants at age 45)

GGI Quantile	Years of Education	Quantile of Income	Number of Children	Single Household
1	11.79	29.33	2.126	0.147
2	12.15	39.28	2.220	0.227
3	11.18	36.33	2.833	0.270
4	12.97	46.48	1.943	0.218
5	11.52	44.93	1.916	0.242
6	12.19	52.47	1.858	0.202
7	12.12	51.95	2.213	0.367
8	12.88	50.01	1.590	0.231
9	13.17	54.32	1.689	0.225
10	13.82	53.90	1.658	0.181
11	11.94	57.55	2.004	0.297
12	12.74	56.94	1.940	0.239
Total	12.22	43.96	2.061	0.222

Notes: See notes for Table C3

Table C5: Descriptive statistics on pre-parenthood characteristics for matched sample

	Immigrant background								Native		
	Matched					Unmatched			Matched		
GGI Quantile	Number	Fraction	Income	Education	Age	Income	Education	Age	Income	Education	Age
1	11901	0.820	248644	12.79	25.59	248444	12.91	25.76	250160	12.86	25.76
2	14308	0.816	278794	13.25	26.78	275023	13.34	27.00	277195	13.29	26.83
3	19174	0.828	223538	12.37	25.63	223026	12.45	25.85	224979	12.45	25.69
4	5272	0.818	276370	13.21	27.56	270819	13.32	27.94	271641	13.21	27.55
5	6834	0.818	250644	12.95	27.17	248000	13.08	27.53	251744	12.99	27.11
6	12316	0.849	264198	13.15	26.14	261944	13.25	26.44	263527	13.16	26.26
7	9718	0.858	228039	12.40	26.18	227767	12.52	26.60	229934	12.50	26.08
8	10818	0.821	280767	13.39	27.26	274202	13.48	27.64	277579	13.41	27.26
9	5687	0.811	250035	12.89	27.67	246354	13.05	28.34	250575	12.95	27.55
10	8971	0.842	217156	12.20	27.19	215597	12.39	27.80	217949	12.30	27.13
11	61908	0.859	216304	12.08	26.52	215493	12.19	26.97	217146	12.18	26.46
12	4030	0.851	213249	12.09	26.54	211452	12.24	27.03	213112	12.20	26.46
Total	374423	0.840	237116	12.54	26.51	235690	12.66	26.89	237366	12.61	26.50

Notes: This table shows pre-parenthood characteristics for the matched sample of individuals. The first column shows the number of observations. Note that individuals are matched in the pre-parenthood period and are matched on all five years (if the individual is included in all years in the pre-period.) The number of observations is the number of individual–years. The fraction shows the percentage of individuals that are successfully matched to a native. Income is annual earnings given in SEK (in 2018 price levels). Education is given as years of education. Regional groups are ranked according to GGI.

Table C6: Correlations: Mothers, 1gen and countries of origin

	Educ. (2nd gen.)	Earnings. (2nd gen.)	No. Children (2nd gen.)	Educ. (1st gen.)	Earnings. (1st gen.)	No. Children (1st gen.)	GGI rank	GDP rank	Fertility rank
Educ. (2nd gen.)	1.00								
Earnings. (2nd gen.)	0.58***	1.00							
No. Children (2nd gen.)	-0.01	-0.30**	1.00						
Educ. (1st gen.)	0.32**	0.50***	-0.29**	1.00					
Earnings. (1st gen.)	-0.01	0.30**	-0.33**	0.58***	1.00				
No. Children (1st gen.)	-0.33**	-0.51***	0.37***	-0.66***	-0.43***	1.00			
GGI rank	-0.02	0.35**	-0.21	0.55***	0.75***	-0.42***	1.00		
GDP rank	0.08	0.38***	-0.17	0.61***	0.49***	-0.38***	0.61***	1.00	
Fertility rank	-0.07	-0.43***	0.29**	-0.61***	-0.55***	0.52***	-0.58***	-0.86***	1.00

Notes: This table shows the correlations between background and source country characteristics for 1st and 2nd generation immigrants.

Table C7: Source country characteristics

	GGI rank	GGI quantile	GGI value	GDP per capita	Relative FLFP	Fertility rate
Iraq	1	1	0.530	10565	0.104	5.882
Pakistan	2	1	0.564	4690	0.166	6.164
Syrian Arab Republic	3	1	0.567	.	0.284	5.309
Congo	4	2	0.578	1098	0.998	6.746
Iran	5	2	0.584	12389	0.121	4.691
Afghanistan	6	2	0.587	2065	0.192	7.466
State of Palestine	7	2	0.593	6245	0.167	6.718
Saudi Arabia	8	2	0.599	46962	0.184	5.911
Lebanon	9	2	0.599	14552	0.267	3.372
Somalia	10	3	0.603	867	0.323	7.398
Morocco	11	3	0.605	7537	0.290	4.047
Eritrea	12	3	0.609	.	0.811	6.496
Sudan	13	3	0.617	4186	0.306	6.152
Jordan	14	3	0.623	10071	0.156	5.521
Gambia	15	3	0.628	2223	0.659	6.096
Egypt	16	3	0.629	11763	0.293	4.580
Other Northern Africa	17	3	0.634	11723	0.167	4.740
Nigeria	18	3	0.635	5135	0.824	6.490
Türkiye	19	3	0.635	28199	0.421	3.107
Tunisia	20	4	0.644	10756	0.296	3.476
Japan	21	4	0.652	41380	0.648	1.540
Other Western Asia 2	22	4	0.660	48667	0.488	3.880
Other Western Africa	23	4	0.666	3840	0.801	6.179
Uzbekistan	24	4	0.666	7014	0.658	4.072
India	25	4	0.668	6714	0.357	4.045
Kenya	26	4	0.671	4330	0.908	6.066
Rest of Middle Africa	27	4	0.671	4852	0.905	6.384
Republic of Korea	28	4	0.672	42719	0.641	1.570
China	29	4	0.676	16092	0.864	2.309
Hungary	30	4	0.677	32554	0.747	1.870
Other Southern Asia	31	5	0.677	4693	0.869	5.208
Sri Lanka	32	5	0.680	13070	0.574	2.483
Other Western Asia 1	33	5	0.690	14248	0.727	2.556
Brazil	34	5	0.691	14764	0.502	2.902
Other Central Asia	35	5	0.695	17652	0.747	3.352

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Table C7—Continued from previous page

	GGI rank	GGI quantile	GGI value	GDP per capita	Relative FLFP	Fertility rate
Other South-East Asia	36	5	0.695	22936	0.641	3.561
Viet Nam	37	5	0.700	8041	0.890	3.553
Greece	38	5	0.701	29723	0.537	1.390
Other Western Europe	39	6	0.701	47464	0.609	2.171
Ethiopia	40	6	0.705	2221	0.740	7.246
Russian Federation	42	6	0.706	27211	0.778	1.892
Czechia	43	6	0.706	40696	0.734	1.900
Italy	44	6	0.707	42675	0.528	1.330
Thailand	45	6	0.708	18453	0.788	2.113
North Macedonia	46	6	0.711	16600	0.637	2.206
Bosnia and Herzegovina	47	6	0.712	14897	0.592	1.772
Other Eastern Asia	48	7	0.713	59586	0.601	1.292
Peru	49	7	0.714	12854	0.586	3.912
Uganda	50	7	0.717	2187	0.807	7.091
Slovakia	51	7	0.718	31871	0.817	2.090
Croatia	52	7	0.720	28754	0.682	1.630
Ukraine	53	7	0.721	12809	0.811	1.844
Chile	54	7	0.723	24968	0.426	2.579
Other South America 1	55	8	0.724	11637	0.568	3.615
Romania	56	8	0.724	29858	0.822	1.830
US	57	8	0.724	62631	0.746	2.081
Bangladesh	58	8	0.726	4754	0.280	4.495
Central America	59	8	0.727	12567	0.447	4.052
Bulgaria	60	8	0.727	23192	0.881	1.820
Other Eastern Africa	61	8	0.730	3178	0.917	6.411
Bolivia	62	8	0.734	8724	0.689	4.890
Poland	63	8	0.736	33121	0.766	2.060
Netherlands	64	9	0.736	56629	0.611	1.620
Serbia	65	9	0.736	18292	0.713	.
Caribbean and Bermuda	66	9	0.738	16919	0.583	2.352
Other South America 2	67	9	0.740	22219	0.596	2.828
Slovenia	68	9	0.743	38906	0.793	1.460
Portugal	69	9	0.744	34880	0.663	1.560
Austria	70	9	0.744	55833	0.621	1.460
Oceania	71	9	0.744	46710	0.694	2.039
Lithuania	72	9	0.745	37063	0.761	2.030
Other Eastern Europe	73	9	0.748	18009	0.808	2.015

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Table C7—Continued from previous page

	GGI rank	GGI quantile	GGI value	GDP per capita	Relative FLFP	Fertility rate
Belgium	74	9	0.750	51743	0.602	1.620
Estonia	75	9	0.751	36830	0.747	2.050
Colombia	76	9	0.758	14585	0.605	3.082
UK	77	9	0.767	46406	0.702	1.830
Albania	78	9	0.769	13671	0.736	2.978
Canada	79	9	0.772	49007	0.762	1.830
Southern Africa	80	9	0.775	12350	0.588	4.061
Switzerland	81	9	0.779	70920	0.711	1.580
Philippines	82	9	0.781	8915	0.613	4.320
France	83	10	0.781	45834	0.707	1.770
Denmark	84	10	0.782	57678	0.827	1.670
Latvia	85	10	0.785	30859	0.750	2.020
Germany	86	10	0.787	53639	0.623	1.450
Spain	87	11	0.795	40806	0.501	1.360
Ireland	88	11	0.798	87786	0.513	2.110
Sweden	89	.	0.820	52531	0.876	2.130
Finland	90	11	0.832	48689	0.820	1.780
Norway	91	12	0.842	64453	0.784	1.930
Iceland	92	12	0.877	56914	0.838	2.300

Notes: The table shows the source region characteristics for the regions in our main analysis sample. * means that the value on GGI is imputed (see Section 2 for imputation details). Regions are ranked in ascending order according to their Gender Gap Index in 2020 (World Economic Forum). Relative FLFP is the female to male labor force participation rate in 1990 (World Bank). GDP per capita in 1990 (World Bank), and fertility rate in 1990 (World Bank).