Faith and the Child Penalty: Religious Affiliation and Gendered Earnings Losses After Childbirth

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Abstract

The relationship between parenthood and gendered labor market outcomes has been extensively studied, with the 'child penalty'—defined as the effect of having children on mothers' labor earnings relative to their partners'—documented in many countries. While prior research has explored institutional and normative drivers of this gap, the role of religious affiliation remains understudied, particularly at the population level. Religious beliefs shape both fertility decisions and labor market behavior and hence are potentially an important factor shaping heterogeneity in the size of the child penalty. Using comprehensive Austrian register data, this study provides novel evidence on the intersection of religious affiliation and the child penalty. Our results indicate that religious affiliation acts as a moderator of child penalties. Women with a religious affiliation, particularly those belonging to the Catholic majority, experience substantially larger earnings losses following childbirth compared to their secular peers. A decade after the birth of the first child, the woman's share of the couple's joint labor income declines by around 25 percentage points among couples where both partners are Catholic, compared to 18 percentage points among religiously unaffiliated couples. These findings underscore the importance of cultural factors in shaping the economic consequences of motherhood.

Keywords: Child penalty, gender earnings gap, religion

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Introduction

Parenthood is recognized as a key driver of persistent gender disparities in earnings (Cortés and Pan, 2023). While the birth of a child has only a limited impact on fathers' earnings, mothers typically experience a substantial and sustained decline in earnings, leading to a significant 'child penalty' (Kleven et al., 2024a; Musick et al., 2020). Using event-study designs, numerous studies have quantified the magnitude of child penalties revealing considerable variation across countries (Kleven et al., 2019a). Initial research focused on the pathways through which the child penalty operates: whether primarily through reduced labor supply, lower hourly wages (Kleven et al., 2019b), or occupational changes following childbirth (Yu and Hara, 2021). Subsequent work has examined the mitigating role of family-friendly policies. In the case of Austria, there is no indication that reforms to parental leave or childcare provisions that were aimed to facilitate maternal employment have reduced the child penalty over time (Kleven et al., 2024b). However, other policies — such as more flexible school schedules (Duchini and Van Effenterre, 2024) — have been associated with smaller penalties for mothers.

As the role of policy seems to be limited, several authors (Kleven et al., 2024b; Rellstab, 2023; Kleven et al., 2024c) argue that social norms regarding children and the roles of mothers in child-rearing and gainful employment are the primary factors contributing to a sustained child penalty over time. In this paper, we explore the role of religious affiliation in understanding the child penalty for the case of Austria. Religious beliefs and doctrines with respect to gender roles, family values and maternal labor market behaviors may be significant contributors to the formation of social norms. Other studies investigated the impact of progressive beliefs in the family on the child penalty in European countries (Moriconi and Rodríguez-Planas, 2021). Casarico and Lattanzio (2023) find that the penalty is smaller in more conservative regions in Italy. Jessen (2022) explores differences between East and West Germany with a focus on different norms in former communist East Germany. Aside from Rabaté and Rellstab (2022), who compare child penalties across Dutch municipalities with varying religious compositions, there is a lack of research examining the role of religious beliefs and denominations in shaping the child penalty.

The role of religion can be manifold: on the one hand, religious couples often have a stronger family orientation (Kposowa and Aly Ezzat, 2019), more conservative views on gender roles (Seguino, 2011), lower education and thus lower job attachment or higher fertility rates (McQuillan, 2004). All these reasons may lead to a higher child penalty for mothers who are more religious. A Russian case study finds that while a father's religiosity negatively impacts maternal employment, a mother's religiosity does not (Lebedinski et al., 2023). This highlights the need to consider both parents' religious involvement when analyzing female labor market outcomes after childbirth.

The concept of the 'child penalty' refers to a comparison of women with their partners in terms of how their earnings trajectories are affected by childbearing. This is in contrast to the concept of the 'motherhood penalty' which refers to a comparison of women who become mothers with those who do not (Budig and England, 2001). Empirically, this can be captured also by analyzing women's earnings before and after childbirth (e.g., Cukrowska-Torzewska and Matysiak, 2020; England et al., 2016; Gangl and Ziefle, 2009; Mari and Cutuli, 2021). This study is concerned with child penalties. In particular, it takes a couple-level perspective and uses couples as the relevant unit of analysis to see how childbearing affects within-couple earnings inequality (Cheng and Zhou, 2024; Dotti Sani, 2015; Musick et al., 2020; Musick et al., 2022; Nylin et al., 2021; Steiber et al., 2024). This diverges from classical child penalty analyses that examine how earnings of average women evolve relative to those of average men around the time of childbearing—without matching individuals to their partners (e.g., Kleven et al., 2019b).

This study examines the child penalty at the couple level, focusing on how childbearing affects within-couple earnings inequality, thereby shedding light on the dynamics of relative economic status and gender relations within families. This focus is important as gender dynamics may differ significantly between more and less religious couples (Brooks, 2023). Additionally, we examine the distinct effects of having a religious mother versus a religious father (Lehrer, 1995), as well as the influence of religious homogamy—couples sharing the same religion—compared to religiously mixed couples. These questions necessitate the use of couple-level data.

We analyze administrative data from Austria, covering all births in the country between 1990 and 2007. This comprehensive dataset enables us to calculate child penalties for mothers with different religious affiliations. Austria is an interesting case for studying the influence of religion on couples' the labor market behavior. Compared to other Western European or, in particular, Northern European countries, Austrians have been found to be relatively more religious (Höllinger and Makula, 2021). In contrast to the United States, where evangelical denominations often promote a conservative religious culture with clear implications for gender inequality (Glass and Nath, 2006), Austria's historically dominant religion, Catholicism, aligns more closely with Protestant traditions (Zulehner, 2020). Protestants (Lutherans) in Austria tend to be less observant, participating less in religious life and expressing weaker religious beliefs than others (Höllinger, 2022; Lois, 2011).

Our findings show that women with religious affiliations—particularly within the majority Catholic population, experience substantially larger declines in earnings following childbirth compared to their secular counterparts. The magnitude of this disparity is considerable: a decade after the birth of the first child, the woman's share of the couple's joint labor income falls by approximately 25 percentage points in couples where both partners are Catholic, compared to an 18 percentage points decline in couples with no religious affiliation. These results offer important insights into how cultural and religious factors shape the economic consequences of motherhood.

Religious affiliation and maternal employment

Religious affiliation can exacerbate the child penalty on women's earnings relative to men through multiple mechanisms. First, religious individuals typically exhibit stronger family orientations and place greater value on family and maternal childrearing (Kposowa and Aly Ezzat, 2019; Stokes and Ellison, 2010). Particularly within conservative denominations, traditional attitudes toward gender roles prevail (Seguino, 2011), encouraging women to prioritize familial responsibilities over career advancement. Religiously reinforced gender norms may legitimize or even foster preferences for gender disparities in household roles and women's economic dependence on their partners (Barringer et al., 2013; Eliason et al., 2017; Stewart et al., 2023). Consequently, religious women may be more likely to

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reduce work hours or exit the labor market entirely after having children, intensifying their wage penalty relative to secular women (Lehrer, 2010; 2004).

Second, religious women tend to have higher fertility rates and shorter intervals between births (McQuillan, 2004), leading to longer or repeated career interruptions and cumulative wage disadvantages. The timing and spacing of births significantly impact labor market outcomes, as postponing childbirth reduces wage gaps (Tyrowicz and van der Velde, 2022). Secular women, who more often delay motherhood than their religious counterparts, may thus experience comparatively smaller penalties. The pay advantage of women who enter motherhood late cannot be explained by factors such as the total number of children or couple's marital status (Wei-hsin Yu and Kuo, 2024).

Third, religious women's earlier initiation of family formation and lower emphasis on attaining high earnings can translate into lower educational attainment and reduced labor market experience relative to their secular counterparts (Glaeser and Sacerdote, 2008; Gemar, 2024; Hungerman, 2011; Kaufmann, 2008; Lehrer, 2004; McQuillan, 2004). [1] Limited education and shorter job tenure before motherhood diminish formal and informal employment rights, weakening women's prospects for rehiring or career advancement post-childbearing (Skirbekk, 2022; Peri-Rotem, 2016; Baudin, 2015; Philipov and Berghammer, 2007).

Fourth, religious communities offer strong social support networks, facilitating women's decisions to prioritize childcare over professional careers, thereby further intensifying wage penalties (Putnam et al., 2012). Social support and the strength of social norms are interlinked. Given that most religions emphasize the importance of family, secular women are likely to be less likely to marry. Moreover, affiliation with a religious faith tends to increase the perceived and social costs of marital dissolution. Empirical evidence supports this notion, as studies consistently find that Roman Catholic and Protestant marriages in the United States are less likely to end in dissolution compared to other unions (Lehrer, 2004; Vaaler et al., 2009). From this we may hypothesize that women in secular unions are less likely to be married and if they are, more likely to separate from their partners

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[1] Schwadel suggests a negative association between education and religious non-affiliation.

(Kalmijn et al., 2005; Tuttle and Davis, 2015). As non-married women and the divorced have less access to the father's earnings to cover living expenses, they are likely stronger invested in the labor market, leading to smaller child penalties (although empirical evidence for this is limited, e.g. Budig and England (2001) find smaller child penalties for never married women but not for the divorced).

Fifth, research using fictitious job applications shows that employers discriminate against mothers relative to equally qualified childless women, especially for jobs that involve time pressure, collaboration, travel or professional/managerial tasks (Ishizuka, 2021). Among mothers, it may be the more religious ones, who experience greater discrimination from employers when applying for jobs or for promotions (Mohanty, 2023; Carvalho and Sacks, 2021; Weichselbaumer, 2020).

Sixth, policy-related factors such as parental leave duration significantly affect child penalties. Penalties tend to increase markedly with longer parental leaves (Mari and Cutuli, 2021; Del Rey et al., 2021; Agüero et al., 2020). So, if religious mothers disproportionately utilize extended leaves (Petts, 2017), they may face a larger child penalty. Religious orientations might also influence paternal leave patterns, as more religious and traditional fathers may take shorter parental leaves, indirectly exacerbating mothers' income penalties (Dunatchik and Özcan, 2021). Again, religious orientation of the couple with respect to gender roles may play a role here: more religious fathers may take less parental leave, leading to a higher child penalty.

By contrast, secular women often possess higher education and participate more actively in career-oriented jobs with rising income profiles (Horwitz, 2021; Peri-Rotem, 2020; Hackett et al., 2016). Although higher education and incomes have been found to be associated with greater absolute wage losses upon motherhood (England et al., 2016), women's higher education and higher pre-birth incomes are associated with a lower child penalty, i.e. smaller earnings losses among women relative to their partners (Steiber et al., 2024). Secular women are more likely to work full time, to have higher hourly earnings and a higher likelihood to work post-childbearing (Mosca and Wright, 2018; Merouani and Perrin, 2022; Sitzmann and Campbell, 2021; Herzer, 2019; Horwitz, 2021; Hackett et al., 2016). We would thus expect secular women to experience smaller child penalties.

Secularization is an ongoing demographic trend across many Western countries (Hardy et al., 2020; Stonawski et al., 2015). In Austria, the share of non-religious individuals increased from 12% to 22% between 2001 and 2021, especially among young individuals and individuals in reproductive ages (Statistics Austria, 2025). Continued secularization could influence overall child penalty magnitudes, potentially reducing aggregate wage gaps related to parenthood over time.

The Austrian Context

Child penalties observed in Nordic countries are generally smaller than those found in continental European countries, including Austria (Kleven et al., 2019a), where traditional gender norms significantly shape policy frameworks and restrict maternal employment (Steiber et al., 2016). In the Austrian system, mothers typically are on mandatory maternity leave for eight weeks preceding a birth and for another eight weeks following a birth, and this leave entails full wage replacement. After maternity leave, parents are offered long parental leave for up to two years since the early 1990s. To encourage fathers' participation in parental leave, a reform was implemented in 1996 that required fathers to utilize at least six months of parental leave for the couple to jointly qualify for the full two-year leave entitlement. Yet, this policy reform primarily resulted in a reduction of mothers' parental leave durations without significantly increasing fathers' uptake (Lalive and Zweimüller, 2009). Another policy reform relevant for this study's observation period was implemented in 2002, extending parental leave duration to 30 months for one parent or 36 months if shared between parents. This extension led to a decline in employment rates among mothers with children aged 18-30 months (OECD, 2007). Throughout the 1990s and 2000s, the Austrian parental leave system has been characterized by generous provisions regarding leave duration and job protection, but considerably less generosity concerning financial compensation (Thenner, 1999). Parental leave benefits have been provided as flat-rate payments, offering relatively low wage replacement rates, thereby creating substantial opportunity costs, particularly for higher-earning parents.[2] Despite the lower attractiveness of the system for women with

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[2] Wage replacement has been improved for higher-earning women only in 2009.

higher earnings potential, Austrian mothers across various social strata tend to take extensive periods of parental leave. This can be attributed to prevailing social attitudes, which remain skeptical toward institutional childcare and strongly favor maternal caregiving (Steiber et al., 2016). Although Austria offers a wide range of publicly subsidized pre-school facilities for children aged three to six, the availability of nursery places for children under the age of three remains limited. Furthermore, the opening hours of nurseries, kindergartens, and schools are often insufficient to support full-time employment, necessitating reliance on private childcare arrangements. Consequently, maternal employment rates in Austria are traditionally low in the early phase of children, they rise once children reach school age, yet a large share of mothers—including those with higher educational attainment—continue to work part-time even as their children enter school (Berghammer, 2014; Riederer and Berghammer, 2020).

Compared to other European countries, Austria can be considered moderately Roman Catholic. It has a lower proportion of religiously unaffiliated individuals than countries such as France or the United Kingdom, but a higher proportion than more religious nations like Poland, Italy, or Ireland. Similar patterns are evident in religious practices, including attendance at religious services and frequency of prayer (Höllinger and Makula, 2021). Roman Catholics remain the largest religious community in Austria, although their share of the population has declined significantly—from 78% in 1991 to 55% in 2021. In contrast, the proportion of people with no religious affiliation rose from 9% to 22% over the same period; the group of Muslims (from 4% to 8%) and Orthodox Catholics (2% to 5%) also grew substantially between 2001 and 2021 (Statistics Austria, 2025). Assuming constant secularization, Goujon et al. (2007) projected that the unaffiliated would constitute 22–24% of the population by 2051, with larger shares predicted based on alternative migration and secularization patterns. This shift reflects not only a decline in formal religious affiliation but also a broader erosion of religiosity. Potančoková and Berghammer (2014) document a decline in religiousness within the group of Roman Catholics, reflected in declining attendance at religious services.

Data and Sample

The empirical foundation of this study is the Austrian Social Security Data Set (ASSD) (Zweimüller et al., 2009). This employer-employee linked dataset integrates administrative records derived from Austrian social security records, supplemented with information from tax registers and vital statistics, including births, marriage and divorce records. The ASSD provides records of all births occurring in Austria between 1990 and 2007. This dataset is uniquely valuable as it combines birth records with individual employment histories and earnings data from both pre- and post-childbirth periods. Such integration allows for a thorough analysis of labor market dynamics related to childbirth.

The dataset covers approximately 85% of the Austrian labor force. It focuses on private-sector employees, excluding civil servants, the self-employed, and farmers. Annual earnings information in the ASSD corresponds to gross wages from dependent employment and do not include social transfers such as unemployment benefits, maternity benefits, or parental benefits. This emphasis on market incomes is well suited for analyzing child penalties, as these penalties capture gendered adjustments in labor market behavior after childbirth.

The sample for this study includes all first births among couples residing in Austria from 1990 to 2007. Following Kleven et al. (2019a), couples are identified as the child's parents in the dataset, regardless of their co-residence or marital status.[3] We constructed a balanced sample, ensuring the availability of employment status and annual earnings data for both parents for five years before and 11 years after the birth (Kleven et al., 2019a; Kleven et al., 2019b). Given the lack of information on income from self-employment in the ASSD, couples whose income includes earnings from self-employment are excluded from the analysis. The sample is further restricted to mothers and fathers aged between 20 and 45 at first birth, ensuring they remain within working age throughout the observation period. Finally, we limit our sample to couples in which the mother's religious affiliation is identified as Roman Catholic, Protestant, or unaffiliated.

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[3] The sample specifically includes the mother's first birth; however, for some fathers, this may not be their first child. Restricting parental age to 20–45 years at the time of first birth substantially reduces the likelihood that the father already has previous children.

We omit Muslims from the analyses, as for this group, we lack data on early life factors, confounders and pre-immigration status for a large share of our sample. Moreover, as they tend to have low labor force participation prior to childbirth and therefore often lack pre-birth earnings; as a result, their estimated child penalties are minimal and not meaningfully comparable to those of non-Muslim women.

These restrictions yield a core estimation sample comprising 293,431 births and, thus, parental couples, corresponding to approximately 3.2 million couple-year observations (see Table A3 in the appendix). Additional analyses are carried out for a subsample of 201,607 couples where information on both parents' religious affiliations is available.[4]

Unlike Kleven et al. (2019a), who define event time (t) based on calendar years relative to the year of childbirth, our event study centers around the exact date of the first birth. Specifically, earnings data are structured into precise 12-month intervals surrounding the birth date. For instance, if a couple's first child was born on June 1, 2000, earnings at event time t_{-1} represent the sum of earnings from June 1, 1999, to May 31, 2000. Consequently, event time t_0 corresponds to the period when the child is below one year of age, with t_1 beginning on the child's first birthday. The event time (t) spans from -5 to +10, with t_{10} starting with the child's 10th birthday, i.e. denoting the eleventh year of the child's life.

We estimate child penalties based on annual gross labor earnings, excluding transfer incomes but including zero earnings for periods of labor market non-participation. Earnings data are available annually, according to calendar years, whereas our analysis is based on 12-month periods around the precise date of childbirth. Therefore, annual earnings for each event time (t) are computed as weighted averages of earnings from the two calendar years that overlap the relevant 12-month period. For instance, for parents whose first child was born on June 1, 2000, earnings at event time t_{-1} cover the period from June 1, 1999, to May 31, 2000, calculated as a weighted average comprising 7/12 of earnings from 1999 and 5/12 from 2000.

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[4] Religious affiliation information is available for most mothers. However, for fathers, such information is recorded only if the parents are married or if the father explicitly declared his religion at the time of acknowledging paternity.

Earnings below the marginal employment threshold are not directly recorded and thus are imputed using the maximum annual earnings that an individual can receive while being marginally employed.[5] Conversely, earnings above the maximum contribution base are subject to top-coding.[6] Although we do not implement a top-coding correction in this analysis, the robustness of child penalty estimated for Austria when applying the top-coding correction used by Kleven et al. (2019a), is documented in Steiber et al. (2024). Religion is treated as a time-invariant characteristic measured at the time of first childbirth, classified into three categories: (1) Roman Catholic, (2) Protestant, and (3) unaffiliated.

Study Design and Methodology

Our analytical strategy involves two approaches to studying child penalties. First, we apply an event study approach based on data for couples based on which we compute the woman's share of couple's joint earnings as the dependent variable (Musick et al., 2020). Second, using a cross-sectional dataset in wide format, we compute an estimate of the child penalty for each couple (i.e., the woman's share of a couple's joint income at t_{10} compared to t_{-2}) and use this as the dependent variable in a multi-variate regression approach that allows testing differences in the magnitude of child penalties across social groups (in our case: religious groups), while controlling for compositional effects and testing for mediation (Steiber et al. (2024).

The event study approach relies on couple-level data (Angelov et al., 2016; Musick et al., 2020), i.e. the couple serves as the unit of observation, and the primary outcome of interest is the woman's proportion of the couple's total earnings at each event time t_i. The following regression is estimated at the couple-level, separately for each religious affiliation:

$$S_{cst} = \sum_{j \neq -2} \alpha_j * I[j = t] + \sum_k \beta_k * I[k = motherage_{cs}] + \sum_\gamma \gamma_\gamma * I[\gamma = s] + v_{cst} \qquad (1)$$

The outcome variable S_{cst} represents the woman's share of total earnings within couple c, in year s, and at event time t. The regression model includes event time dummies (first term on the right-hand side), dummies for the mother's age (second term), and year fixed effects (third term). The event dummy at t_{-2} is omitted and serves as the reference period. The long-run child penalty Pt_{10} captures the percentage decline in the woman's earnings share at $t10$ relative to t_{-2}. Since we use a balanced panel—ensuring that the sample composition remains constant over time—the model does not include couple fixed effects. Instead, the influence of couple-couple characteristics is examined in a multivariate framework. The event study and estimation of Pt_{10} is carried out for subsamples of the study population stratified by the couple's religiosity to test whether the size of the child penalty differs between Catholics, Protestants and the unaffiliated.

Some prior studies using event study approaches have used sample splits to compare average child penalties across educational groups or across geographical units (e.g., Angelov et al., 2016; Artmann et al., 2022; Kleven, 2022; Kleven et al., 2019a). A limitation of these approaches is that the analysis of heterogeneity in the size of the child penalty across socio-demographic groups remains descriptive; it remains unclear what drives differences in the average child penalty across groups. For this reason, we complement the event study analysis with a multivariate regression analysis that allows us to explore the specific factors contributing to the variability in child penalties across groups.

In the multivariate regression analysis, the dependent variable P_c is calculated for each couple as the difference in the woman's share of couple earnings between period t_{10} and period t_{-2}. P_c is negative on average, indicating a loss of the woman's earnings share related to childbirth (with a mean of -17 percentage points, Table A1). It is modelled in an ordinary least squares framework including mother's $religion_m$ as the central predictor, controlling for the child's year of birth and regional fixed effects for 99 political districts in Austria:

$$P_c = \beta_0 + \beta_1 * religion_m + \gamma * X_c + u_c \qquad (2)$$

Additional covariates are added to subsequent models, including characteristics of the couple at the time of the first birth, i.e. the highest educational attainment of mother and father, parents' age at first birth, the couple's marital status at first birth, and mother's nationality. In an additional model, we assess the role played by subsequent births of the mother to explain differences across religious affiliation groups. In a second set of models, with a somewhat smaller sample of couples for which we have data on both partners' religion, we include the couples' composition of religious affiliation as the central predictor instead of mothers' religion, i.e. comparing homogamous couples with mixed couples in terms of religious affiliation. Finally, in light of ongoing secularization trends, we estimate models for two birth cohorts (i.e. children born in the 1990s or 2000s) to test differences in the effect of religion over time.

Results

Figure 1 presents inflation-adjusted annual earnings trajectories for couples, grouped by the mothers' religious affiliation. It displays the earnings trajectories of women and men among couples where the mother is (a) Roman Catholic, (b) Protestant or (c) unaffiliated. Earnings for both genders are tracked from five years before childbirth to ten years after. In each panel, men's earnings are represented by the blue line, women's earnings by the red line, and the green dotted line indicates the woman's share of the couple's joint labor income.

Overall, the earnings pattern is broadly similar across religious affiliation groups. Fathers' annual earnings increase steadily over time, though the rate of growth gradually slows. The paternity premium refers to the economic advantage men tend to experience after becoming fathers, reflected in higher wages compared to non-fathers, potentially due to increased motivation (e.g., men taking on a role of being a family breadwinner after having children and down-prioritizing other life goals) or employer biases favoring fathers (e.g., employers seeing fathers as deserving higher income; see Jalovaara and Fasang, 2020). Our measure of the child penalty is based on the relative income loss of women within households – and may reflect not only maternal income losses but could also be influenced by paternal income growth. As shown in Figure 2, however, paternal income continues to exhibit a similar growth as it did prior to childbirth.

Starting from a slightly lower level, mothers' earnings also rise in the years leading up to childbirth, closely tracking their partners' earnings. However, immediately after the birth (t_0), mothers' earnings drop sharply—falling to nearly zero—as most take parental leave during the child's first year.[7] From t_1 onwards, maternal earnings start to recover in all groups; however, the rebound is least pronounced among Roman Catholic mothers. This pattern is also reflected in the green dotted line representing the woman's share of the couple's total earnings. Prior to childbirth, women's earnings share hovers around 45% across all groups. After childbirth, it falls steeply, and recovers to approximately 27% for Catholic mothers, 29% for Protestant mothers, and 32% for unaffiliated mothers.

Figure 2 shows the calculated child penalties from the event study, together with their (small) standard errors. About a decade after the birth of the first child, the child penalty stands at 23.3 pp for Catholic mothers, 21.1 pp for Protestant mothers, and 18.5 pp for unaffiliated mothers (panel a). In the subsample of couples, for whom religious affiliation is available for both partners, we find that among religiously homogamous couples, i.e. where both partners share the same affiliation (panel b), the disparities are even more pronounced: Compared to unaffiliated couples with a child penalty of 18.3 pp, the penalty stands at 24.9 pp for Roman Catholic couples and 22.6 pp for Protestant couples. The larger differences in the size of child penalties across homogamous couples suggest an additional influence of the father's religious affiliation on the economic consequences of parenthood. [8]

The event studies shown in Figure 2 account for age and time trends but do not adjust for compositional differences in terms of partners' educational attainment, nationality, or marital status between subsamples of couples, defined by their religious affiliation. For instance, the lower child penalty estimate for unaffiliated women may be attributable to their higher educational levels on average compared to religious women. Moreover, secular and religious couples may differ with regard to the number of children born within the observation period. To investigate compositional effects and mediating factors, we

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[7] Note that – due to our time definition – in year t=-1 mothers typically experience some months of mandatory pre-birth maternity leave, reducing their annual wage income.

[8] As the sample in panel (b) is smaller, we replicated panel (a) with this smaller sample: changes in the child penalty are the same as shown in panel (a).

employ a series of OLS regressions to disentangle the influence of religious affiliation on the magnitude of the child penalty from the effects of other covariates (Table 1). In this multivariate framework, the dependent variable is the child penalty, measured as the change in the woman's average share of the couple's earnings between t_{+10} and t_{-2}. The average child penalty amounts to 17 percentage points (pp), with positive coefficients signifying a decrease in the size of the penalty relative to the reference group.

In the first model, the mother's religious affiliation is the sole predictor, and we control for the year of the childbirth and district of residence (column 1). The subsequent models additionally include her educational background (column 2) and the education of the father (column 3). Next, we include mother's and father's age and their marital status at birth of the first child as well as dummies for nationality groups as additional control variables. The covariate effects in the regressions shown in Table 1 behave as expected: tertiary educated mothers experience a smaller child penalty on average, whereas fathers' higher education is associated with a larger penalty. This aligns with a strong female education gradient in the size of the child penalty (Steiber et al., 2024). Younger maternal age and higher paternal age at first birth are associated with smaller penalties

Regarding religion effects, the first model confirms the event study result: relative to Catholic mothers, the penalty experienced by Protestant mothers is on average 2 pp lower, and the one experienced by unaffiliated mothers is on average 3.7 pp lower. Adding covariates in subsequent models – in particular nationality of the mother - reduces these differences to 1 pp and 1.6 pp, respectively.

In Column (7) we also include information about whether and when a second or third child arrives. This post-event outcome – subsequent fertility – may be shaped by the size of the penalty after the first birth and associated behavioral changes; therefore, subsequent fertility can be considered a mediating factor. The regression estimates show a positive association between the arrival of additional children and a larger penalty. Moreover, we see that a longer interval between the first and the second child is also associated with a larger penalty. Controlling for subsequent fertility shows that Protestant mothers tend to face a somewhat larger penalty than unaffiliated mothers due to their higher levels of

subsequent fertility (cf. Table A1 in the appendix) and also a large part of the difference between Catholic and unaffiliated mothers is explained by such fertility differences.

Table 2 presents a related analysis that focuses on the combined religious affiliations of both the mother and the father, by including all possible pairings of parental religious backgrounds. Using couples in which both parents are Roman Catholic as the reference category, we find that the father's religious affiliation plays a comparably strong role in shaping the child penalty as the mother's: If one Roman Catholic partner matches with an unaffiliated one, the penalty is around 4 pp lower as compared to a Roman Catholic couple. Across all model specifications, couples in which both partners are unaffiliated experience a significantly smaller child penalty—approximately up to 6.4 pp lower—compared to partnerships where both parents are Roman Catholic. Effects for religious affiliation are significantly smaller if we control for post-birth behavior, like having additional children; as the prevalence of having additional children is heavily related to religious affiliation, such a reduction is to be expected.

Figure 3 shows that our results remain largely unchanged when we concentrate on married couples in the first place[9], who did not divorce over the ten-year period. For such couples, a potential union dissolution cannot play a role. Here, we see a similar child penalty of Roman Catholic and Protestant mothers, whereas the child penalty of an unaffiliated mother is around 7 pp lower. For comparison we show results for parents who were initially married but divorced at some point in the ten-year period after childbirth. A decade following the birth of their first child, 13% of Roman Catholic mothers are divorced from their spouses, while Protestant and unaffiliated mothers are more likely to divorce within ten years (17% and 23%, respectively). Comparing couples who did not divorce over ten years after childbirth with couples who divorced at some point in time, we see strong differences. Among the religious couples, the child penalty of divorced parents is only half as much as the penalty among never-divorced couples (0.27 versus 0.14 for Roman Catholics and 0.27 versus 0.12 for Protestants). This speaks towards a drastically changed role of the female partner resulting in increased female labor force participation after divorce (Raz-Yurovich, 2011). This change in the child penalty is much

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[9] Around 51 percent of couples are married at the time of the first birth.

lower for unaffiliated women (0.20 to 0.16), which is basically due to the significantly lower child penalty of never-divorced unaffiliated women. Child penalty patterns for divorced couples are indistinguishable with respect to their religious affiliation.

Religious differences in child penalties have shifted over time. Figure 4 compares child penalties for children born in the 1990s versus the 2000s, revealing two key trends. First, child penalties have declined. For instance, among Roman Catholic mothers, the penalty dropped from 0.27 pp in the 1990s to 0.22 pp in the 2000s, a pattern mirrored in other religious groups. Second, the influence of religious affiliation on the size of the child penalty has shrunk. In the 1990s, Roman Catholic and Protestant mothers experienced nearly identical penalties (0.27 and 0.26, respectively), but by the 2000s, the penalty for Protestant mothers had declined to the level of unaffiliated mothers (0.20 vs. 0.19).

Conclusion

Our results suggest that secular women may indeed experience smaller wage penalties after childbirth compared to religious women, though the effects weaken somewhat with the inclusion of additional controls. These findings align with previous research indicating that religious affiliation can influence women's labor market decisions and outcomes (Pastore and Tenaglia, 2013) and that the economic position and outcomes of religious women are closely tied to their childbearing histories. A part of these differences in the child penalty may stem from higher fertility rates and shorter time intervals between births among more religious couples leading to longer or repeated career interruptions and cumulative wage disadvantages.

The study's implications extend beyond the Austrian context, contributing to our understanding of how cultural and religious factors shape women's work-family tradeoffs in modern societies. If religious women consistently experience larger child penalties, this could contribute to gender wage gaps and economic inequalities between secular and religious populations. Moreover, the child penalty is not a uniform phenomenon; its magnitude and characteristics may be influenced by religious norms and practices. While traditional interpretations of religious doctrines often exacerbate these penalties, progressive policies and shifting cultural attitudes may mitigate their impact.

If policy makers would seek a way to reduce the child penalty among religious women, one could consider developing context-specific workplace interventions; improve child-care facilities to promote support for working women, particularly to cater for the needs among those who are more religious. In many cases, different attitudes of more or less religious women towards career interruptions and working hours are not due to a varying availability of child-care facilities or worse labor market options, but to different preferences towards a life-work balance.

Limitations and Future Directions

This study has several limitations. First, there is a potential selection bias due to missing information in the data on fathers' religious affiliation in unmarried couples and the absence of earnings data for the self-employed. Second, data constraints prevented the inclusion of religious groups common among migrant populations—particularly Muslims, as well as Orthodox Christians, Hindus, Buddhists, and other minority religions. This is a significant limitation, as these groups exhibit distinct fertility behaviors, educational profiles, gender norms, and labor force participation patterns. In the Austrian context, the exclusion of Muslim couples is particularly notable. This omission does not stem from sample size limitations, but rather from the difficulty of estimating meaningful child penalties for women with very low employment rates and minimal earnings prior to childbirth. Since these women often do not experience earnings losses after having children, their estimated child penalties would appear small but would not be comparable to those of other groups. Future research should aim to include these communities to capture the full spectrum of religious influence. Third, we use administrative data on religious affiliation, but lack information on religiosity, religious practice, and belief systems—factors that likely shape childbearing and labor market behavior through interactions of theological interpretation with cultural norms. Finally, as secularization progresses, fertility rates may decline, and child penalties could become smaller for religious mothers as well as for their non-religious counterparts. Trend associated with secularization merit further investigation to better understand the evolving relationship between religion and the the economic consequences of motherhood.

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Figure 1: Male and female earnings trajectories and the woman's share of couple earnings, by religious affiliation.
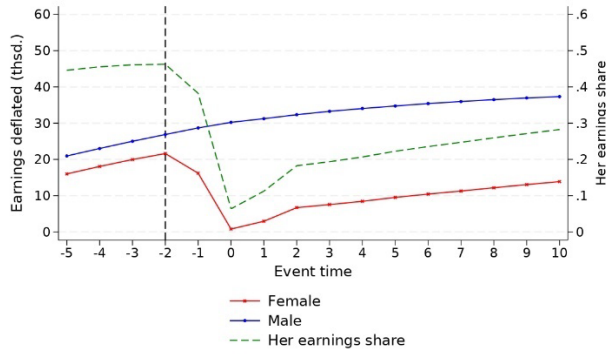
(a) Roman Catholic
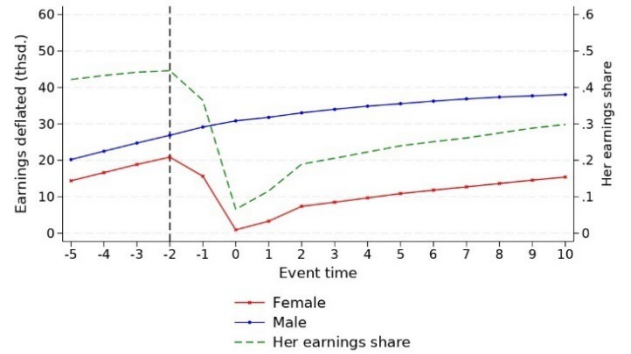
(b) Protestant
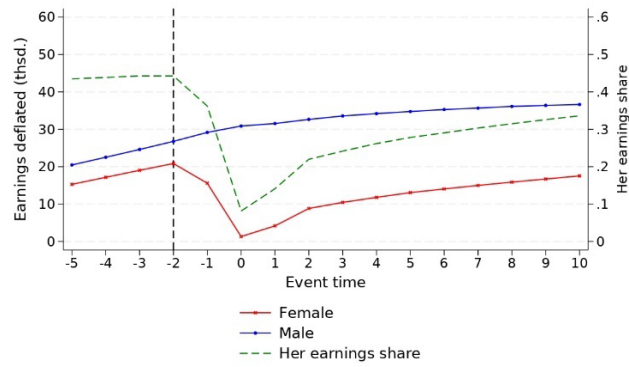
(c) Unaffiliated

Notes: Average annual earnings are adjusted for inflation (using CPI with base year 2015). Note that the woman's average earnings share at t_i (green) is not equivalent to her average earnings at t_i (red) divided by couple's joint earnings at t_i (sum of blue and red).

Figure 2: Child penalty in annual earnings, by mother's religious affiliation
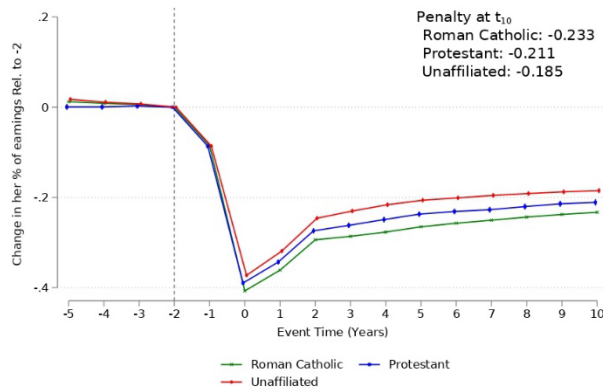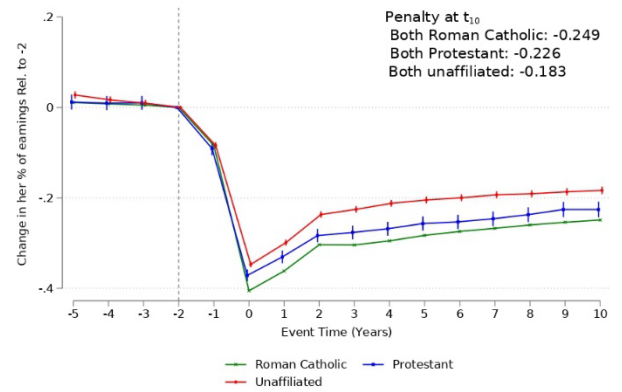
(a) Mother's religious affiliation   (b) Same religious affiliation of parents

Notes: The figure shows event time coefficients estimated from Eq. 2 based on couple-level data. Panel A shows the size of child penalties by mother's religious affiliation, while Panel B presents them by religious affiliation among same-faith parents.

Figure 3: Child penalty in annual earnings for married and divorced couples, by mother's religious affiliation
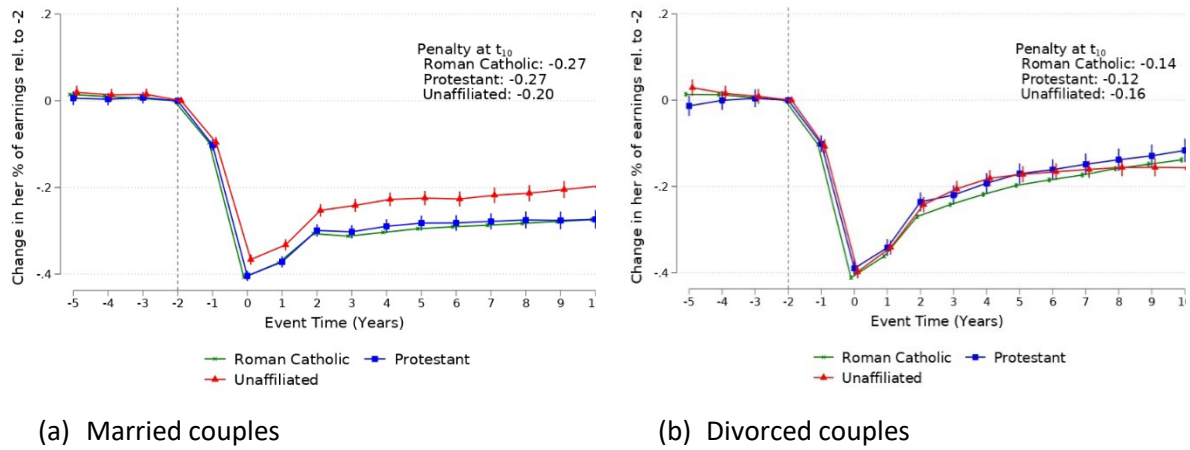
(a) Married couples

(b) Divorced couples

Notes: The figure shows event time coefficients estimated from Eq. 2 based on couple-level data. Panel A shows the size of child penalties by mother's religious affiliation for married couples, while Panel B presents them by religious affiliation for couples divorcing at some point in the ten years after birth of the first child.

Figure 4: Child penalty in annual earnings in 1990s and 2000s, by mother's religious affiliation
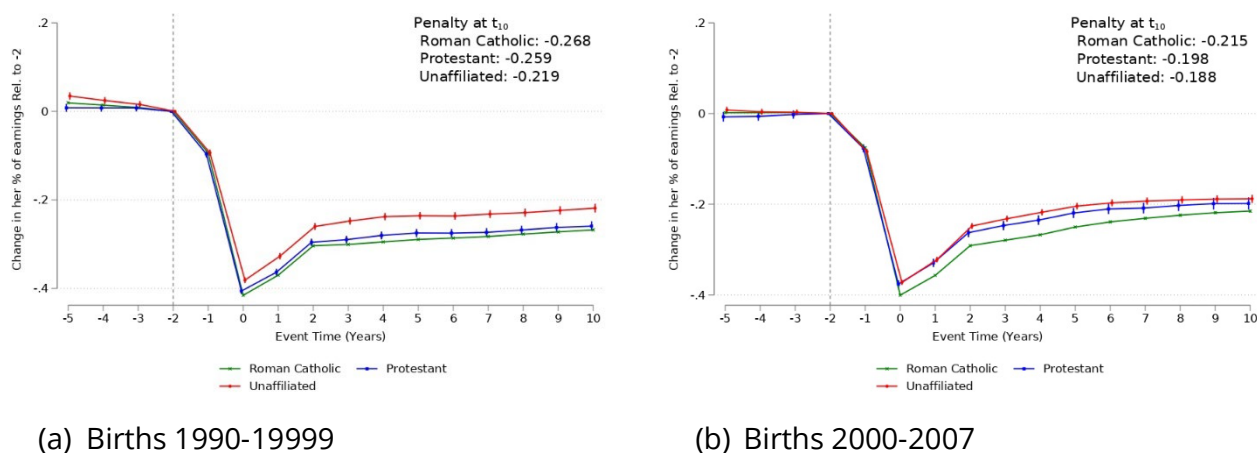
(a) Births 1990-19999

(b) Births 2000-2007

Notes: The figure shows event time coefficients estimated from Eq. 2 based on couple-level data. Panel A shows the size of child penalties by mother's religious affiliation for births occurring in the period 1990-1999 and Panel B presents them for births in the period 2000-2007.

Table 1: Linear models of the child penalty at t_{10} relative to t_{-2} by mother's religious affiliation

|	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Protestant	0.020***	0.017***	0.020***	0.019***	0.019***	0.010***	0.009***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
Unaffiliated	0.037***	0.034***	0.035***	0.033***	0.033***	0.016***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Mother compulsory		0.052***	0.047***	0.044***	0.044***	0.022***	0.014***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Mother high school		0.009***	0.021***	0.019***	0.019***	0.019***	0.027***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Mother tertiary		0.061***	0.109***	0.105***	0.105***	0.104***	0.122***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Father compulsory			0.013***	0.002	0.002	-0.019***	-0.020***
			(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Father high school			-0.030***	-0.017***	-0.017***	-0.017***	-0.012***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Father tertiary			-0.104***	-0.100***	-0.100***	-0.100***	-0.083***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Mother's age at first birth				-0.007***	-0.007***	-0.006***	-0.010***
				(0.000)	(0.000)	(0.000)	(0.000)
Father's age at first birth				0.009***	0.009***	0.009***	0.008***
				(0.000)	(0.000)	(0.000)	(0.000)
Married at first birth					-0.001	0.000	0.005***
					(0.001)	(0.001)	(0.001)
Second birth within two years of first childbirth							-0.079***
							(0.002)
Second birth within three to five years of first childbirth							-0.091***
							(0.001)
Second birth within six to ten years of first childbirth							-0.116***
							(0.002)
Third birth within two years of first childbirth							-0.108***
							(0.002)
Observations	293431	293431	293431	293431	293431	293431	293431
Dummies for nationality	-					X	X
R-squared	0.029	0.045	0.050	0.060	0.073	0.073	0.117

Notes: Table shows results from regressions (OLS) on the change in her relative earnings from t_{10} to t_{-2}. We include dummies for nationalities, whether the mother was from Western Europe, Eastern Europe, Turkey, or from other regions of the world. Reference groups include Roman Catholic for mother's religion, Austrian for mother's nationality, and vocational degree for parents' educational levels. Variables included in all regressions and not shown in table: year of birth fixed effects and district fixed effects. Mean (SD) of outcome: -0.17 (0.29). *** p<0.001, ** p<0.01.

Table 2: Linear models of the child penalty at t_{10} relative to t_{-2}, by mother's and father's religious affiliation.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Mo: Roman catholic, fa: Protestant	0.011**	0.010	0.013***	0.010**	0.011**	0.015***	0.008
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Mo: Roman catholic, fa: unaffiliated	0.042***	0.042***	0.041***	0.033***	0.034***	0.038***	0.028***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Mo: Protestant, fa: Roman catholic	0.020***	0.018***	0.020***	0.019***	0.019***	0.010**	0.007
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Mo: Protestant, fa: Protestant	0.030***	0.025***	0.030***	0.026***	0.027***	0.007	0.010
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Mo: Protestant, fa: unaffiliated	0.048***	0.045***	0.045***	0.038***	0.039***	0.035***	0.030***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Mo: unaffiliated, fa: Roman catholic	0.037***	0.036***	0.038***	0.036***	0.038***	0.020***	0.010
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Mo: unaffiliated, fa: Protestant	0.045***	0.043***	0.049***	0.043***	0.045***	0.035**	0.025*
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Mo: unaffiliated, fa: unaffiliated	0.064***	0.061***	0.060***	0.054***	0.056***	0.028***	0.019***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Mother compulsory		0.060***	0.056***	0.052***	0.053***	0.024***	0.017***
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Mother high school		0.006***	0.018***	0.016***	0.016***	0.016***	0.024***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Mother tertiary		0.057***	0.100***	0.097***	0.097***	0.095***	0.112***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Father compulsory			0.007	-0.002	0.003	-0.025***	-0.025***
			(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Father high school			-0.025***	-0.016***	-0.016***	-0.015***	-0.011***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Father tertiary			-0.090***	-0.088***	-0.087***	-0.084***	-0.068***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Mother's age at first birth				-0.007***	-0.007***	-0.006***	-0.010***
				(0.000)	(0.000)	(0.000)	(0.000)
Father's age at first birth				0.010***	0.010***	0.009***	0.008***
				(0.000)	(0.000)	(0.000)	(0.000)
Married at first birth					0.029***	0.045***	0.023***
					(0.002)	(0.002)	(0.001)
Second birth within two years of first childbirth							-0.075***
							(0.002)
Second birth within three to five years of first childbirth							-0.084***
							(0.002)
Second birth within six to ten years of first childbirth							-0.110***
							(0.002)

Third birth within two years of first childbirth							-0.106***
							(0.002)
Observations	201607	201607	201607	201607	201607	201607	201607
Dummies for nationality	-					X	X
R-squared	0.038	0.067	0.067	0.074	0.087	0.091	0.129

Notes: Table shows results from regressions (OLS) on the change in her relative earnings from t_{10} to t_{-2}. We include dummies for nationalities, whether the mother was from Western Europe, Eastern Europe, Turkey, or from other regions of the world. Reference groups include Roman Catholic for mother's religion, Austrian for mother's nationality, and vocational degree for parents' educational levels. Variables included in all regressions and not shown in table: year of birth of child fixed effects and district fixed effects. Mean (SD) of outcome: -0.18 (0.29). *** $p<0.001$, ** $p<0.01$.

Table A1: Descriptive statistics - by mother's religious affiliation

	Total	Roman Catholic	Protestant	Unaffiliated
	N=293,431	N=254,103	N=13,511	N=25,817
Share of mother's earnings at t-2	0.46 [0.23]	0.46 [0.23]	0.45 [0.24]	0.44 [0.27]
Share of mother's earnings at t=10	0.29 [0.26]	0.28 [0.25]	0.30 [0.26]	0.34 [0.28]
Mother's annual earnings at t_{-2}*	21,517	21,620	20,861	20,848
	[12,459]	[12,083]	[13,605]	[15,162]
Mother's annual earnings at t_{10}*	14,265	13,872	15,401	17,537
	[14,044]	[13,687]	[14,905]	[16,390]
Mother Austrian	92.56%	94.53%	84.47%	77.41%
Mother's age at first birth	26.42	26.23	26.81	28.08
	[4.26]	[4.16]	[4.41]	[4.73]
Education				
mother compulsory	6.31%	6.35%	4.43%	6.95%
mother vocational	55.59%	57.14%	50.57%	42.95%
mother high school	24.03%	23.63%	25.02%	27.47%
mother tertiary	14.07%	12.89%	19.99%	22.62%
Mother's tenure last employer before birth	6.83	6.9	6.35	6.33
	[4.75]	[4.71]	[4.72]	[5.04]
Duration of maternity leave at first birth	631.61	630.48	622.49	649.05
	[191.37]	[189.88]	[191.18]	[206.18]
Father's annual earnings at t_2*	26,864	26,873	26865.41	26,777
	[15,643]	[15,397]	[16,309]	[17,576]
Father's annual earnings at t_{10}*	37,302	37,330	38,032	36,636
	[19,388]	[19,166]	[19,885]	[21,189]
Father Austrian	91.56%	92.90%	90.24%	79.94%
Father's age at first birth	29.12	28.94	29.46	30.71
	[4.92]	[4.83]	[5.10]	[5.39]
Education				
father compulsory	2.91%	2.77%	2.10%	4.78%
father vocational	63.22%	64.93%	57.72%	49.20%
father high school	20.16%	19.78%	20.78%	23.59%
father tertiary	13.71%	12.52%	19.41%	22.43%
Father's tenure last employer before birth	6.83	6.9	6.35	6.33
	[4.75]	[4.71]	[4.72]	[5.04]
Change in her earnings share b/n $t_{10} - t_{-2}$	**-0.17**	**-0.18**	**-0.15**	**-0.11**
	[0.29]	[0.29]	[0.30]	[0.33]
2nd birth within 2 years of 1st childbirth	17.65%	17.94%	17.83%	14.64%
2nd birth within 3-5 years of 1st childbirth	39.52%	40.55%	37.11%	30.69%
2nd birth within 6-10 of 1st childbirth	11.73%	11.90%	11.55%	10.16%
3rd birth within 2 years of 1st childbirth	15.09%	15.49%	14.03%	11.71%
Married at first birth	51.29%	51.60%	52.09%	47.79%
Divorced at t_{10}	13.80%	12.99%	17.25%	23.07%
Cohort 1990 - 1999	57.85%	59.29%	59.89%	42.65%
Cohort 2000 - 2007	42.15%	40.71%	40.11%	57.35%

Notes: The table reports characteristics at the individual level by religious affiliation of the mother.
* Annual earnings include zeros and are adjusted for inflation (using CPI with base year 2015).

Table A2: Tabulation of mother's and father's religion

		Father				
		Roman catholic	Protestant	Unaffiliated	Missing	Total
Mother	Roman Catholic	158360	5740	11406	78597	254103
	Protestant	5665	2352	1257	4237	13511
	Unaffiliated	4801	648	11378	8990	25817
	Total	168826	8740	24041	91824	293431

Notes: The table reports the absolute number of child births by parental religious affiliation.

Table A3

Initial Sample	644,659	100.00%
Father unknown	41,483	6.41%
No education data on parents	11,535	1.84%
Age restrictions	64,615	10.02%
Balanced	188,748	29.28%
Religion restrictions mother	44,547	6.91%
Religion restrictions father	91,824	14.24%
Final Sample	201,607	31.27%