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Abstract

This study examines how first childbirth affects the labour market outcomes of women and men in Indonesia. Drawing on Indonesia Family Life Survey (IFLS) longitudinal data and an event-study framework, the analysis traces how parents' labour market outcomes evolve around first childbirth. A staggered difference-in-differences (DiD) design estimates the event-time-specific effects by comparing new parents with individuals who have not yet become parents, while conditioning on pre-birth characteristics. The event study plots a large and persistent child penalty starting in year 2 for mothers but a muted effect on fathers. In the staggered DiD results, mothers experience sharp declines in formality and in the intensive earnings margin. In urban areas, penalties for mothers start later but persist, whereas in rural areas mothers appear better able to stabilize their labour market outcomes. By contrast, rural fathers gradually experience modest increases in formal employment and earnings, reinforcing gendered specialisation within households.

Keywords: Child Penalty; Event-Study Labour Force Participation; Staggered Difference-in-Differences

JEL: J12, J13, J22

1 Introduction

Despite notable progress in women's educational attainment—now approaching that of men (Klasen, 2025; Schwab et al., 2017; Kunze, 2017)—and in their political representation (Aspinall et al., 2021), the magnitude and persistence of child penalties in low- and middle-income countries remain poorly understood. Much of the existing literature (Kleven et al., 2019; Zhou et al., 2022; Zhang et al., 2024; Cortés and Pan, 2023; Coran et al., n.d.) examines high-income settings, where employed mothers benefit from more extensive institutional support through measures such as parental leave and subsidized childcare. By contrast, developing countries typically confront greater challenges due to weaker social protection systems, a larger share of informal employment, and deeply rooted gender norms.

Child penalties denote the long-run decline in mothers' earnings and employment prospects following childbirth (Klasen, 2025), whereas fathers may, in some cases, gain a child-related premium in labour market outcomes if intra-household specialization leads to stronger incentives for investing in the husband's career (Becker, 1981). Indonesia offers a particularly compelling case, given its persistently low and stagnant female labour force participation (Cameron et al., 2019) despite sustained economic growth. This pattern is further shaped by widespread informal employment (Rothenberg et al., 2016) and powerful family expectations surrounding domestic work and caregiving (Kercheval et al., 2012). The extended family, which is frequently called upon to provide childcare (Andrina and Kusumandari, 2022), may simultaneously mitigate some constraints while also reinforcing the very dynamics that generate child penalties.

In this research, we utilize the established methodologies outlined in Kleven et al. (2024) and AguilarGomez et al. (2026) to describe outcome dynamics around the first birth. Using an event-study framework applied to longitudinal data from the Indonesia Family Life Survey (IFLS), we analyze earnings, labour force participation, and formality as the primary outcome variables. Unlike previous studies (Kleven et al., 2019; Lebedinski et al., 2023; Kleven et al., 2024; Zhou et al., 2022; Zhang et al., 2024; Cortés and Pan, 2023; Coran et al., n.d.), our research addresses the ambiguous potential counterfactual by considering the two potential biases between the forbidden comparisons and contamination or anticipation bias by Staggered Difference-in Differences (DiD) method. This approach enables us to observe individuals and couples over several years both before and after the birth of their first child, while controlling the initial or pre-birth characteristics to obtain comparable groups of treatment and control. Two comparison groups are being considered in this study. First, the not-yet treated parents whom become parents later. Second, the never treated or childless couples whom observed as couples that never have children during time of observation.

Moreover, this study follows Kleven et al. (2019) uses a calendar-year framework, in which treatment timing is defined by the calendar year of first birth and event time is indexed to calendar time. This design makes it possible to explicitly incorporate year-specific shocks, macroeconomic conditions, and institutional developments that may jointly influence fertility choices and labour market outcomes. In contrast, the prior study by Fajardo-Gonzalez et al. (2024), which also examined the parenthood penalty in Indonesia, uses an age-based event-time framework, in which treatment timing is defined by an individual's age at first birth and outcomes are compared among individuals observed at the same age.

Although marriage is an important life transition, this article focus on childbearing because the first birth directly changes time constraints and caregiving responsibilities, which theory and evidence suggest are the primary drivers of persistent gender gaps in labour outcomes (Kleven et al., 2024). In addition, marriage and first birth often occur close in time, making marriage-based estimates more susceptible to confounding by fertility-related changes (Killewald, 2013).

Our baseline analysis describes that mothers significantly drop their labour supply while men gain a little benefits after the birth of their first child. Even though women's earnings and career trajectories have positive values prior to this event. By employing event study following Kleven et al. (2019) on parents sample, on average, women experience a reduction in extensive earnings by approximately 50 percent following childbirth, in comparison to the baseline period. This gap arises from two main sources: firstly, there is an 6 percentage point decrease in women's labour force participation rate; secondly, there is a 5 percent decrease in the likelihood of holding formal employment. Indonesia shows different results with previous studies (Kleven et al., 2024; Kleven et al., 2019; Cortés and Pan, 2023; Zhang et al., 2024; Lebedinski et al., 2023; Coran et al., n.d.) when child penalty directly drop since year 0. In contrast, Indonesian mothers tend to delay the negative effect of giving birth up to two years and they are observable for all labour outcomes.

Nevertheless, the event-study analysis only illustrates the dynamic effects of childbirth on mothers' and fathers' labour market outcomes. Staggered DiD is applied by comparing parents with appropriate control groups. Relative to not-yet parents, some indications of a fatherhood premium appear, although the slight and gradual improvements in fathers' labour market outcomes are insignificant. In contrast, motherhood is associated with a marked decline in women's labour supply. From the second year after childbirth onward, women's probability of labour force participation falls by up to 5 percentage points, their likelihood of having a formal job drops by around 5 percentage points, and their log earnings decline by about 50 percent for unconditional log earnings and nearly 100 percent for conditional log earnings.

Importantly, the penalty delays are emerged in our main analysis. The child penalty start emerge at year 1 and year 2, instead of the year of the first child birth. This findings are different with previous studies (Kleven et al., 2019; Cortés and Pan, 2023; Melentyeva and Riedel, 2025) that the penalty pronounced since year 0. When the analysis is split by urban and rural residence, earnings delays emerge only in urban areas. Urban women defer the negative earnings impact of childbirth for up to two years, after which their earnings continue to decline, while men experience substantial wage gains after seven years. In rural areas, however, such delayed penalties for mothers are not observed. This contrast suggests that differences in childcare arrangements and labour market environments shape the magnitude of the child penalty.

The delayed onset of child penalties among urban mothers likely reflects an initial adjustment period in which women remain formally attached to their pre-birth jobs, supported by maternity leave (Albanesi et al., 2023) as well as benefits and job protection (Lalive et al., 2011; Setyonaluri et al., 2023). Over time, however, rigid work rules and procedure (Glass, 1998), commuting costs (Le Barbanchon et al., 2020), and limited childcare service in urban labour markets (O'Donnell et al., 2022) make the combination of full time employment and caregiving increasingly difficult, leading to sustained reductions in labour supply and formality. By contrast, rural mothers exit the labour market more

quickly but also return earlier, consistent with more flexible and easily re-entered employment opportunities and stronger extended family support (Cameron et al., 2017).

This study offers three primary contributions to the existing literature. First, in contrast to Kleven et al. (2019), this study employs a modern Difference-in-Differences (DiD) approach to construct a more appropriate control group for comparison. Second, compared to Fajardo-Gonzalez et al. (2024), this study examines a broader set of labour market outcomes—namely formality, earnings at the extensive margin, and earnings at the intensive margin—to better capture the magnitude of the child penalty. Finally, in terms of empirical specification, this study adopts a calendar-year framework, which more effectively controls for prevailing labour market conditions, rather than the age-based specification used in Fajardo-Gonzalez et al. (2024).

The rest of this study is structured as follows: Part 2 explain the literature review on child penalty and gender labour outcomes. Part 3 discusses the data and measurement. Part 4 outlines the empirical strategy. Part 5 presents the results and robustness checks, and Part 6 concludes with policy implications.

2 Literature Review

2.1 Child Penalty in Developed and Developing Countries

The arrival of a first child often signifies a major shift in women's careers. Significant "child penalties" refer to ongoing reductions in mothers' earnings and employment compared to men and childless women (Klasen, 2025; Angelov and Lindahl, 2016; Costa Dias et al., 2020; De Quinto et al., 2021). The child penalty has been extensively examined in developed countries, typically using the event-study framework introduced by Kleven et al. (2019). For example, Angelov and Lindahl (2016) analyze Sweden, Zhang et al. (2024) and Zhou et al. (2022) focus on China, Hwang and Yoo (2025) study South Korea, Lebedinski et al. (2023) investigates Russia, while Coran et al. (n.d.) examines Denmark and Cort'es and Pan (2023) the United States. The findings indicate striking similarities in how children affect overall labour outcomes, yet they also show large differences in the size of these effects for mothers and fathers. While becoming a parent for the first time has virtually no impact on fathers in any of the countries studied, it is linked to an immediate, steep, and lasting decline in mothers' labour outcomes.

Some extended analyses support a causal reading of these event-study results. Lundborg et al. (2017) uses an instrumental variables approach that exploits variation in in vitro fertilization (IVF) treatment among childless women in Denmark to identify the causal impact of having children on subsequent career outcomes. They find that women who successfully conceive via IVF experience persistently lower earnings as a consequence of motherhood. Complementary evidence from Melentyeva and Riedel (2025), who apply a Stacked DiD design and account for

heterogeneity in mothers' age at first birth, indicates substantially larger post-childbirth earnings losses of around 20 percent.

In developing countries, some research has been discussed the child penalty. A summary of this evidence can be found in Aguero et al. (2012), which uses an instrumental variable infecundity shock to study wage penalty in 21 developing countries. In the sample, the typical woman earns \$2.70 per day (in 2006 constant dollars). Each extra child is linked to a reduction of \$0.48 in daily earnings, which shrinks to \$0.16 once they account for differences in location, age, education, and marital status. In Latin America, Villanueva and Lin (2020) found mothers earn less after childbirth that ranging from 12 percent in Brazil to 21 percent in Chile. In Indonesia, Fajardo-Gonzalez et al. (2024) utilizes Indonesia Family Life Survey (IFLS) data and Staggered Difference-in Differences to estimate the impact of childbirth on parent's working status. Both of fathers and mothers experience drop of their working status probabilities by unconditional parallel pre-trend assumption. Almost 17 percentage point decline experience by mother in the probability of having job after giving a birth.

Bertrand (2020) explains the mechanism of motherhood penalty. Many mothers reduce their work hours, take extended career breaks, or exit the workforce entirely after having a child. Furthermore, finding affordable and high-quality childcare can be difficult, making it even harder for women to remain in the workforce or advance in their careers. Not only reducing the intensity of working, the hourly earnings also decline following to motherhood. Many new mothers switch from private sector to public sector employment in search of more flexibility (Mas and Pallais, 2017) These structural, cultural, and institutional elements collectively create ongoing barriers to women's career progression, restricting their chances to assume leadership roles or enhance their economic status after becoming mothers (Zhou et al., 2022).

Different with mothers, fathers may benefit from positive labour market outcomes in the form of a child-related wage premium when intra-household specialization directs incentives toward prioritizing the husband's career advancement (Becker, 1981). Early caregiving arrangements can become entrenched over time as mothers repeatedly assume these responsibilities and are increasingly perceived as the most efficient caregivers (Bianchi, 2011; Coltrane, 2000).Goldin et al. (2022) identify a "fatherhood premium" that is larger in occupations requiring long working hours, suggesting productivity gains resulting from a stronger focus on market work. As with the child penalty, the fatherhood premium remains underexplored in developingcountry contexts where most research emphasizes the gender gap in labour outcomes between men and women. This study instead investigates in greater detail the magnitude of the penalty borne by mothers and the corresponding premium accrued by fathers.

2.2 Gendered Labour Market Outcomes in Indonesia

Indonesia has experienced persistently low female labour force participation (LFP) for decades (Cameron et al., 2019). Female LFP has hovered below that of men for over 17 years. In 2024, 56.42% of women participated in the labour force compared to 84.66% of men (Indonesia Statistics Agency, 2025). In Indonesia, increased educational opportunities for girls, reduced rates of early marriage, and lower fertility have not led to changes in women's labour force participation in the same way they have in other countries (O'Donnell et al., 2022). Therefore, on average, women earn about 23% less than men (ILO and UN Women, 2020).

Several factors related to gender disparities in labour market outcomes can be traced to individual, household, or broader national factors. Cameron et al. (2019) identified three main drivers of female labour participation: (1) educational achievement, especially influenced by parents' experiences—mothers' careers often inspire daughters; (2) marital status—married women are less likely to work because household duties mainly fall to them, reducing their paid working hours; and (3) having children, which greatly decreases women's participation. This highlights the need for accessible childcare, from relatives or formal services, to support women's employment (Schaner and Das, 2016).

Indonesia's labour market is characterized by high levels of female employment in the informal sector and limited institutional support for working parents. Cameron et al. (2017) shows that, within the formal sector, women at the lower end of the wage distribution face a substantially larger gender wage gap compared to women in higher-paying positions. In the informal sector, where most women are employed, the gender wage gap is wide and remains relatively constant across workers. Sectoral segregation was evident in 2007, and the service, trade, and retail sectors have since expanded, with women increasing their share of employment in these areas (Cameron et al., 2017). Despite this, the labour market remains unsupportive of mothers. Maternity leave lasts only three months and mostly covers women in formal employment (*Republic of Indonesia Law Number 13 of 2003* (n.d.)), while affordable public childcare is scarce. In rural areas, extended families frequently step in to provide childcare, partly mitigating these constraints. In contrast, in urban areas, the nuclear family typically assumes primary caregiving responsibilities, often leading women to leave the labour force after childbirth (D. Nafi, 2024).

Research on women and employment in Indonesia finds that family responsibilities are the primary reason for women's low rates of economic participation (Widarti, 1998; Feridhanusetyawan and Aswicahyono, 2001; Schaner and Das, 2016; Cameron et al., 2019). Women's familial roles have been socially framed through the ideology of *kodrat* (biological/natural disposition), promoted under the New Order regime (Setyonaluri et al., 2021). Within this ideology, the state defines women primarily as child-bearers who are responsible for caring for the family and children (Kercheval et al., 2012). This framing is reflected also in the 1974 Indonesian Marriage Law, which designates men as the heads of families and women as their supporters. Such a framework arguably releases women from the formal

obligation to provide financial support and places the breadwinner role squarely on men (Utomo, 2012; Setyonaluri et al., 2021).

Taken together, these conditions make Indonesia a particularly relevant context for investigating how becoming parents, especially mothers, influences Indonesian workers' labour outcomes. This study makes three main contributions to the existing literature. First, comparing to Kleven et al. (2019), a modern DiD method is applied to have a better control group to compare with. Second, this study uses more labour outcomes (formality, extensive margins earnings, and intensive margin earnings) to identify the child penalty compare to Fajardo-Gonzalez et al. (2024). In empirical specification, this study using calendar-year specifications, which better account for prevailing labour market conditions rather than age-based specification that used in Fajardo-Gonzalez et al. (2024).

3 Data

3.1 Data and Sample Selection

This study uses data from the Indonesia Family Life Survey (IFLS), which covers 83% of the Indonesian population (RAND, 2009). Relying on the labour module and its retrospective questions spanning the years 1988 to 2014, the samples are restricted in 15 to 45 years old, individual-years observations and consist of married individuals from heterosexual couples. Data collected over 26 years by combining retrospective questions with an unbalanced panel comprising 106,629 mother-years and 77,246 father-years. We omitted from our sample all individuals who had already become parents before their first interview in the IFLS.

3.2 Variables and Measurements

Outcome Variables labour market outcomes are captured using three main variables: individual monthly log earnings, labour force participation, and job formality. Earnings are calculated by adding log wage income to log self-employment income, and include both agricultural activities (such as farming, fishing, gardening, and livestock) and non-agricultural work. In addition, log earnings are defined both conditional and unconditional on employment status. This distinction can be used to identify the effects of childbirth on the extensive and intensive margins.

3.3 Descriptive Statistics

Table 1 presents the average characteristics of parents compared with all couples in the IFLS aged 15 to 45. Column (i) reports women's characteristics and column (ii) men's, while column (iii) focuses on mothers and column (iv) on fathers. Overall, married women earn about one-third less than married men. On average, women's Labour Force Participation (LFP) and likelihood of working in the formal sector are lower than those of men. When comparing mothers specifically to all women, certain indicators are slightly lower for mothers. These include female formality

(0.16 for mothers vs. 0.17 for all women), years of schooling (7.45 for mothers vs. 8.00 for women overall), and individual earnings (189,324 Rupiah for mothers vs. 209,731 Rupiah for women).

For husbands, a comparable pattern holds: fathers exhibit a somewhat higher labour force participation rate (0.83) than men overall (0.78) and a modestly greater share of formal employment (0.40 for fathers vs. 0.38 in the full married male sample). However, in most other dimensions, the full sample tends to display more favorable characteristics than fathers. The data further indicate that parents are more likely to live in rural areas, while the full sample is more concentrated in urban locations. Fathers earn less on average, with an income of 574,463 Rupiah, compared to 734,586 Rupiah for the overall male sample. In terms of education, the men in the full sample also have more schooling, averaging 0.6 additional years compared to the fathers group alone.

Consistent with these patterns, households in the parents group are generally larger than those in the full sample. This is expected, since the presence of children increases average household size. Larger families in rural areas may also be linked to cultural preferences for extended family living arrangements or economic conditions in which multiple generations pool resources. In urban areas, higher housing costs and different lifestyle preferences tend to be associated with smaller households and a greater share of non-parents. Given the smaller household sizes and higher earnings in the full sample, household per capita expenditure differs substantially between the all-couples group and the parents-only group.

Table 1: Summary Statistics

	Women	Men	Mothers	Fathers
Individual Earnings (Rupiah per Month)	209731.1 (678873.9)	734586.6 (1220004)	189324.2 (631415)	574463.8 (1068741)
labour Force Participation	0.45 (0.49)	0.78 (0.41)	0.49 (0.49)	0.83 (0.36)
Formal Jobs (1=yes, 0=no)	0.17 (0.37)	0.38 (0.48)	0.16 (0.37)	0.40 (0.49)
Urban (1=yes, 0=no)	0.51 (0.49)	0.52 (0.49)	0.49 (0.49)	0.49 (0.49)
Age	32.29 (7.45)	34.44 (6.60)	32.92 (7.44)	35.01 (6.60)
Age at First Marriage	20.80 (5.99)	26.23 (4.82)	20.32 (5.00)	24.56 (4.07)
Age of Having First Child	25.03 (6.67)	28.65 (5.61)	25.03 (6.67)	28.65 (5.61)
Years of Schooling	8.00 (4.41)	8.86 (4.29)	7.45 (4.35)	8.26 (4.36)
Household size	4.89 (1.92)	4.85 (1.93)	4.94 (1.84)	4.89 (1.88)
Household Per Capita Expenditures (Rupiah Monthly)	488907.7 (660117.8)	486838 (658222.8)	408904.2 (625403)	382506.2 (605286)

Observations	171,304	137,046	106,629	77,246
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Note: The table shows the mean and standard deviation (in parentheses). All of the labour market outcomes are replacing 0 if numbers are missing.

4 Empirical Strategy

The main model 1 is designed to measure the dynamic impact of childbirth on labour market outcomes. This is done using an event study approach, which tracks how outcomes dynamics before and after the birth of a child without mixing in the behavior of the childless. The method follows Kleven et al. (2019), allows for a detailed analysis of the child penalty over time. By following individuals over a period surrounding childbirth, the study can accurately describe not only the immediate changes but also the longer-term consequences of parenthood on earnings, labour participation, and employment type. In this baseline model, we only observe parents who had their first child between ages 15 and 45, and the results are purely descriptive because the analysis does not involve comparison with a counterfactual. Thus, it is hard to establish the causal inference

from the event study design.

$$Y_{ist}^g = \alpha_{ist} + \underbrace{\sum_{j \neq -1} \beta_j^g 1\{E_{it} = j\}}_{\text{Event-time relative to child birth}} + \underbrace{\sum_k \theta_k^g 1\{k = age_{is}\}}_{\text{Dummy age}} + \underbrace{\sum_y \gamma_y^g 1\{y = s\}}_{\text{Dummy Year}} + \omega_i + v_{ist}^g$$

where Y_{ist}^g denotes labour outcomes for individual i in year s and at event time t . The model is estimated separately for women and men g . Child born in a household in individual i at E_{it} . The parameter of interest is β_j^g is the coefficients of a set of indicator variable, excluding $j \neq -1$. This parameter is a burden faced by women or father what the literature commonly terms the child penalty. We omit the event time dummy at $j = -1$ as one year before child birth including mother's month conceptions as the baseline to measure child penalties. ω_i is the individual-level fixed effects. If β_j^g is negative, child penalty of a mother/father will be compared to their initial condition at $j = -1$ before the child is born.

The sample is restricted to mothers and fathers in heterosexual couples. By including a complete set of age dummies, we control non-parametrically for underlying life-cycle trends and by including a full set of yearly date, we account non-parametrically for time trends such as wage inflation and business cycles and allow them to affect men and women differently. Standard errors are clustered at the household level. Figure 1 through Figure 4 present the findings from the event study approach.

However, the combination of event-study and Two Way Fixed Effects (TWFE) has several pitfalls and already highlighted by Sun and Abraham (2021), De Chaisemartin and D'haultfoeuille (2020), and GoodmanBacon (2021). They emphasize that effect heterogeneity across time can generate multiple problems in event-study frameworks, which form the basis for estimating child penalties. One central issue is that of forbidden comparisons, which arise when we neglect the effects for individuals who have not yet received the treatment, in this context, individuals who have not

yet had a child during the observation window. Forbidden comparisons also occur when individuals who are always treated are included, namely those who are already parents at the start of the observation period (Melentyeva and Riedel, 2025).

Second, there is heterogeneity in the characteristics of the treatment effects, which will be absorbed if the estimation strategy does not account for differences in behaviour between mothers and fathers, as well as across different regional contexts at the time of childbirth (Bensnes et al., 2023; Melentyeva and Riedel, 2025; Sun and Abraham, 2021). Finally, there is a risk of contamination that may bias the estimated effects, for instance through anticipation behaviour among mothers with lower levels of education or higher income (Zhou et al., 2022; Cortés and Pan, 2023). Consequently, additional quasi-experimental methods are required to obtain more robust estimates.

For identification, we use a staggered DiD based on $ATT(g, t)$ that compares parents in cohort g with units that are not yet treated at time t . This design provides a counterfactual that is better aligned in the life cycle and avoids the forbidden comparisons that often arise in Two Way Fixed Effect (TWFE) event studies. We are aware of two sources of bias. First, forbidden comparisons in TWFE can inadvertently use early-treated units as “controls” for later-treated units, producing spurious pre-trends. Our $ATT(g, t)$ estimator avoids this problem. Second, anticipation and contamination can occur if households adjust before birth or if future parents dominate the control group. We examine leads $j < 0$, apply not-yet-treated units as the primary control.

Related study (Fajardo-Gonzalez et al. (2024)) on the parenthood penalty in Indonesia employ an agebased event-time framework, in which the timing of treatment g is defined by the individual’s age at first childbirth and outcomes are compared across individuals at the same age. This life-cycle-oriented approach is well suited to analyze behavioral adjustments associated with aging into parenthood. This chapter adopts a calendar-year framework following Kleven et al. (2019), where treatment timing (g) is defined by the year of first childbirth and event time is measured relative to calendar time. This choice allows the analysis to explicitly account for year-specific shocks, macroeconomic conditions, and institutional changes that may simultaneously affect fertility decisions and labour market outcomes. To address potential life-cycle heterogeneity inherent in a calendar-year design, the analysis conditions on pre-birth characteristics and includes age controls, ensuring comparability across cohorts. Both approaches are complementary, and the calendar-year framework adopted here is particularly appropriate for a policy-relevant analysis in a setting characterized by substantial macroeconomic and institutional variation.

The staggered DiD approach relies on two key assumptions. First, the parallel trend assumption that require individuals who give birth in cohort g and those who have not yet been treated by time t follow parallel trend (Roth et al., 2023). In the absence of childbirth, future parents and not-yet-parents are assumed to experience the same evolution in labour market outcomes, conditional on observable characteristics X_i^{pre} :

$$E[Y_{it}(0) - Y_{i,t-1}(0) \mid g_i = g, X_i^{pre}] = E[Y_{it}(0) - Y_{i,t-1}(0) \mid g_i > t, X_i^{pre}]$$

where $Y_{it}(0)$ is the potential outcome in the absence childbirth.

In this study, identification relies on a conditional parallel trends assumption, whereby treated and notyet-treated individuals are compared after conditioning on pre-birth characteristics rather than through statistical trimming or exclusion of outliers. A key concern is that households entering parenthood may differ systematically from those who have not yet had children, particularly in terms of pre-birth economic readiness. More financially secure households may be more likely to transition into parenthood, creating potential selection into fertility. To mitigate this concern, the analysis conditions on a set of pre-birth household and individual characteristics, denoted by X_i^{pre} , including baseline economic status. These characteristics are fixed or measured prior to childbirth and include years of education, birth cohort, urban or rural residence, household size, residence in Java versus outside Java, total years of work experience, and age at marriage. Nevertheless, unobserved differences in fertility preferences, expected future income, or other unmeasured factors may still affect the estimates.

Second, the method relies on the no anticipation assumption (Melentyeva and Riedel, 2025; Roth et al., 2023). For all $t < g$: $Y_{it}(0) = Y_{it}$ childbirth does not affect labour outcomes before it occurs. It implies that LFP, earnings, and formality do not change in advance of childbirth because of the upcoming birth. We allow the anticipation around $k = -1$.

Thus, treatment status D_{it} on (i, t) as follow:

$$D_{it} = 1\{t \geq g_i\} \quad (2)$$

Potential outcome is $Y_{it}(1)$ if treated and $Y_{it}(0)$ if not treated. The estimated treatment observed:

$$Y_{it} = D_{it}Y_{it}(1) + (1 - D_{it})Y_{it}(0) \quad (3)$$

Individual average treatment effect, usually denoted as:

$$ATT(g, t | X_i^{pre}) \equiv E[Y_{it}(1) - Y_{it}(0) | g_i = g, t \geq g, X_i^{pre}] \quad (4)$$

For relative time dynamics, define $k = t - g$. The average effect at each event time is

$$ATT(k | X_i^{pre}) \equiv E_g[ATT(g, g + k | X_i^{pre})] \quad (5)$$

Identification relies on cohort-specific conditional parallel trends, comparing parents in cohort g to individuals who have not yet had children at time t . The design allows for heterogeneous and dynamic treatment effects relative to childbirth and avoids forbidden comparisons inherent in two-way fixed-effects (TWFE) event studies. We assess the no-anticipation assumption by examining pre-birth event-time coefficients and interpret any deviations as evidence of selection or pregnancy effects rather than post-treatment bias. Moreover, our strategy does not assume that fertility timing is fully random or perfectly controlled. Instead, it assumes that, absent childbirth, treated and comparison groups would have followed parallel trends in labour outcomes after conditioning on fixed effects and baseline characteristics.

Control Group Choices

At the heart of an event study research design is the selection of a valid control group made up of non-treated individuals. TWFE event study yields unbiased estimates of treatment effects under three key assumptions, commonly known as no anticipation, parallel trends, and no variation across cohorts (Sun and Abraham, 2021). The no-anticipation assumption requires that no individual is influenced by the treatment before the treatment actually occurs. The parallel-trends assumption requires that the outcome trajectory of the control group represents the counterfactual path that the treated group would have followed in the absence of treatment. The second assumption is particularly critical for choosing a control group, as it demands that outcome paths for treatment and control groups are generally comparable in the untreated state. Last assumption requires that each cohort experiences the same path of treatment effects for homogeneity to hold. Consequently, the pronounced variation in maternal outcomes across urban and rural settings and parental cohorts has substantial implications for control group selection, since these differences undermine the comparability of mothers facing different normative environments across locations and cohorts. In what follows, we examine the validity of the most common and readily available control groups in light of this heterogeneity in maternal characteristics.

Never Treated or Childless Couples Using childless women as a control group requires assuming that mothers and non-mothers are comparable and follow similar trends over time, and that there is no anticipation of not receiving treatment. Given the endogeneity of fertility choices, these assumptions are unlikely to be satisfied. Lundborg et al. (2024) exploit the specific context of in vitro fertilization success to estimate the career consequences of childbirth, conditional on undergoing IVF, and Gallen et al. (2025) use failures of oral contraception to identify the effects of unplanned pregnancies and childbirth on labour market outcomes. In a broader sample of mothers, however, it is difficult to disentangle random shocks from selection into fertility. Relying on childless women as the control group ignores the deliberate choice to remain childless for career-related reasons, whereas Steinhauer (2018) shows that gender roles, childlessness, and labour market choices are interrelated. In addition, it overlooks heterogeneity among childless individuals: some actively choose not to have children, while others would have liked to but were unable to. The outcome paths of childless women who know they will remain childless (e.g., for medical reasons) or explicitly plan not to have children are therefore unlikely to mirror the counterfactual trajectories that mothers would have experienced in the absence of children.

Not-yet Treated The not-yet treated are men and women who later having children. In Indonesia, fertility is nearly universal, and the marriage-to-first-birth interval is relatively short. This uniformity especially the intention and ability of having children makes this group is cleaner for being a counterfactual. In addition, the not-yet-treated units provide a counterfactual that is more life-cycle comparable than nevertreated units. This group is used in the dynamic matching approaches by Fitzenberger et al. (2013) and Fitzenberger and Seidlitz (2023). In contrast with Melentyeva and Riedel (2025), when the timing of childbirth is correlated with some important characteristics of mothers such as their labour

market outcomes. In our time observations (1988 to 2014), Indonesian women are unlikely to delay marriage and having a child (Spagnoletti et al., 2018; Muharomah and Zimmerman, 2025).

Given the large informal sector and urban-rural heterogeneity, we use the parents-only event study to map dynamics, while the staggered DiD serves as the main empirical strategy. Our main specification uses not-yet-treated units as the control. As a robustness exercise, we also report estimates that use never-treated units or childless couples.

5 Results

5.1 The Dynamics of Indonesian Couples Labour Market Outcomes

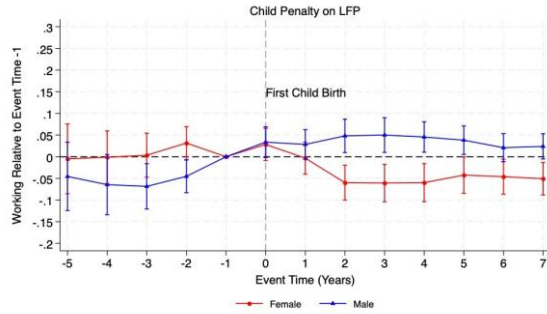


Figure 1: Labour Force Participation

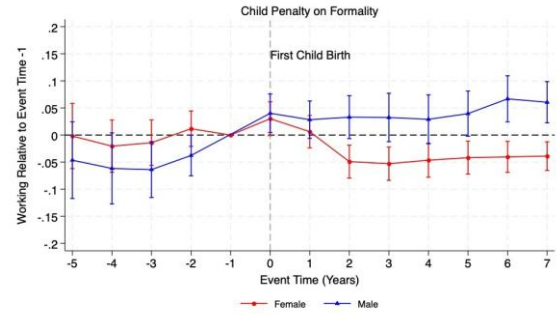


Figure 2: Formality (Unconditional)

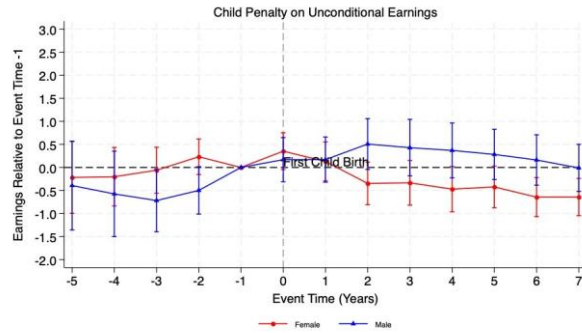


Figure 3: Monthly Individual Log Earnings (Unconditional on Employment)

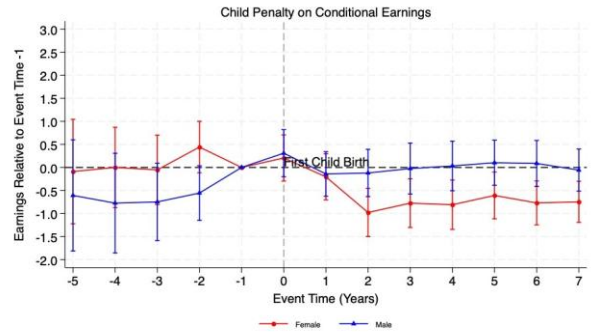


Figure 4: Monthly Individual Log Earnings Conditional

The figures above follow Equation 1 as a dynamics map of childbirth on parents' labour outcomes. Figure 1 shows the labour force participation plots 5 years before childbirth to 7 years after childbirth. The Figure 2 plots the probability of working in formal jobs and Figure 3 pictures the monthly individual log earnings on unconditional employment status. The last figure, Figure 4 shows monthly log earnings if they are working or conditional on employment status. The blue line represents the men and red line for women.

Mothers experience a significant decline in employment probability, decreasing by roughly 6 percentage points from the second year after birth onward. This reduced likelihood of employment persists at least through the seventh year post-birth. The drops on all labour outcomes appear since year 2, indicating that mother delaying their status on

their labour outcomes. These findings are different with previous literature (Kleven et al., 2019) that directly reduce since the mothers give a birth.

Fathers, by contrast, exhibit 2 to 4 percentage points positive change employment rates during the same period. The pattern is much the same when focusing specifically on formal employment: mothers' probability of holding a formal job drops by about 2 to 5 percentage points relative to their pre-birth baseline, beginning in year (0) and continuing through year (+7). In contrast, fathers see an improvement in formal job participation, rising by approximately 4 to 7 percentage points after the child's birth.

When examining log earnings, there are changes for either mothers or fathers before the birth, suggesting pre-existing trends. In the year 2 mothers' earnings drop for about 40 percent below and subsequently decline to 60 percent compared to the pre-birth baseline. While males report insignificant but have positive plot after childbirth.

The findings suggest that in Indonesia, mothers have negative impact of motherhood. Mothers' earnings are driven less by women leaving the labour force altogether and more by changes in the amount or type of work undertaken, such as shifting to enter the less formal jobs. The patterns differs markedly from trends documented in high-income countries like the U.S. (Cort'es and Pan, 2023) and Denmark (Kleven et al., 2019), where the advent of the first child leads to notable reductions since year 1 following childbirth.

These contrasting dynamics highlight the role of contextual factors such as labour market flexibility (Glass, 1998), the strength of informal employment (Cameron et al., 2017), and cultural expectations regarding women's work (Utomo, 2012). In Indonesia's case, the prevalence of informal jobs may afford mothers some adaptability in balancing paid work and caregiving responsibilities (Cameron et al., 2017), even if it comes at the cost of reduced earnings. However, this flexibility may also limit mothers' opportunities for career advancement and stable income growth, reinforcing persistent gender gaps.

5.2 Staggered DiD Estimation Results: Not-Yet Treated Control Group

Recognizing the limitations of the TWFE and event study approach, this study employs a staggered DiD design as main empirical specification. Fertility is a life-changing event (Baxter et al., 2015), in the data, outcomes are relatively stable before childbirth and then shift after the birth. Our identification does not rely on random fertility timing; it requires that treated and comparison groups would have followed similar trends in the absence of childbirth, conditional on fixed effects and baseline characteristics. After incorporating several control variables, the two key assumptions are satisfied. Figure 5 indicates that the parallel pre-trend assumption holds, as the estimates are close to zero before treatment. In addition, there is no evidence of anticipation effects: both men and women do not adjust their labour market outcomes prior to childbirth ($k = 0$), especially at $k = -2$.

For fathers, labour market responses to first childbirth are statistically insignificant but modest and unfold gradually over time. There is no evidence of an immediate increase in labour force participation, formal employment, or earnings following childbirth. Instead, the estimates suggest a slow upward adjustment in labour market attachment, with

positive effects on participation and earnings-intensive margins. In particular, at first, males show a modest but statistically significant increase in labour market attachment for men in the early post-birth period ($k = 0-2$). Beyond this window, the estimates become less precise and do not provide strong evidence of persistent gains.

Moreover, fathers react to greater household responsibilities by working more in their current jobs. The findings show that, after the birth of a child, men's adjustments occur mainly along the intensive margin, rather than through movements into the extensive margin or into formal employment. Although shifts in formal employment status are small and typically estimated with low precision, earnings conditional on being employed display more robust increases. This pattern is consistent with both the structure of the Indonesian labour market and men's position in the life cycle at the time of first childbirth. As most men transition into fatherhood after establishing stable and secure employment, major job transitions become less likely (Astone and Peters, 2014). Instead, adjustments occur primarily along the intensive margin, with increases in hours (Dermott, 2006) and effort (Astone et al., 2010) being more readily accommodated within existing formal and informal jobs, particularly in a context where barriers to formal employment limit rapid job switching.

In contrast, Fajardo-Gonzalez et al. (2024) find both Indonesian men and women experience a child penalty on their LFP after having a child. Both this chapter and Fajardo-Gonzalez et al. (2024) rely on not-yet-treated individuals as the control group and condition on pre-birth characteristics. The divergence in findings instead reflects differences in the time dimension and the implicit estimand. While the age-based event-study framework aligns individuals by life-cycle stage, the calendar-year design adopted in this chapter captures men's labour supply responses to contemporaneous economic conditions surrounding childbirth. Given that male labour force participation is already high at prime working ages, age-based designs may yield small or insignificant effects, whereas calendar-year specifications are more likely to detect short-run adjustments in labour supply and earnings following the birth of a child. Following childbirth, men may increase labour supply or adjust earnings in response to heightened household financial needs (Astone and Peters, 2014). These adjustments occur within a narrow time window surrounding childbirth and are closely tied to prevailing labour market conditions. In age-based designs that align individuals by life-cycle stage, such short-run responses may be attenuated or averaged out, particularly given the already high labour force attachment of men at prime working ages.

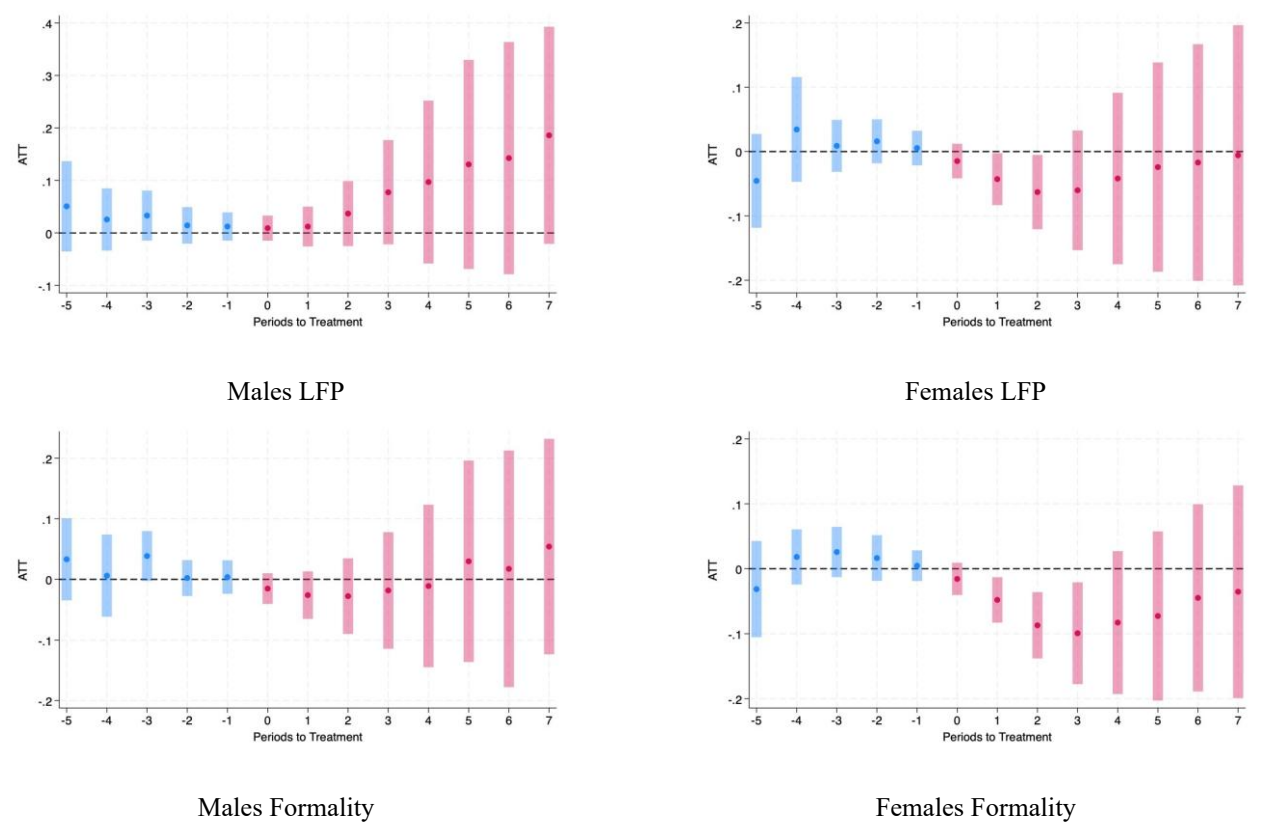
Mothers face a different trajectory. Following childbirth, their labour outcomes decline and are only significant in the medium term. They tend to withdraw from the labour market, with their probability of employment falling significantly by about 5 percentage points in year 2 or in the medium term, before starting to re-enter in year 7, although this latter effect is not statistically significant. Regarding formality, there is a significant decline of around 10 percentage points in the medium term, suggesting that remaining in formal employment is challenging and that many mothers either become unemployed or move into informal work.

Relative to not-yet mothers, extensive-margin earnings for mothers decline by around 50 percent, significantly, from year 0 to year 2, and these reductions persist through year 7. Indicating important intensive-margin losses (hours/wages/occupation) in addition to exit. These findings align with Kleven et al. (2019), who document that

motherhood reduces earnings by about 50 percent, with effects persisting for seven years. However, some evidence of convergence appears on the intensive margin: although statistically insignificant, mothers who remain employed begin to catch up around year 3, as the gap closes to the zero line and the estimated ATT narrows but continually declines, reaching negative 200 percent in year 7.

Overall, the staggered DiD estimation reveals strongly asymmetric labour market responses to the first birth for women and men. Whereas women face substantial and medium-term declines in their labour market outcomes, men show no detectable impact of becoming fathers, with statistically insignificant changes in their labour market outcomes. The results for women are highly consistent with existing evidence for Indonesia. Both this chapter and the findings in Fajardo-Gonzalez et al. (2024) document a substantial and persistent motherhood penalty in labour market participation. In both analysis, the penalty emerges after first childbirth and remains economically meaningful for several years, indicating that the negative impact of motherhood on women’s labour outcomes is robust across alternative identification strategies.

The medium-term effects can be explained by a decreasing number of not-yet-treated controls over calendar time, because more units become treated as time progresses. This is a natural feature of staggered DiD designs. As a result, identification is strongest in earlier years, while estimates in later periods rely on a smaller pool of not-yet-treated units and may therefore be less precise. To maintain support in later periods, the analysis also considers never-treated units as an additional comparison group in Figure 8, while interpreting late-period estimates with greater caution.



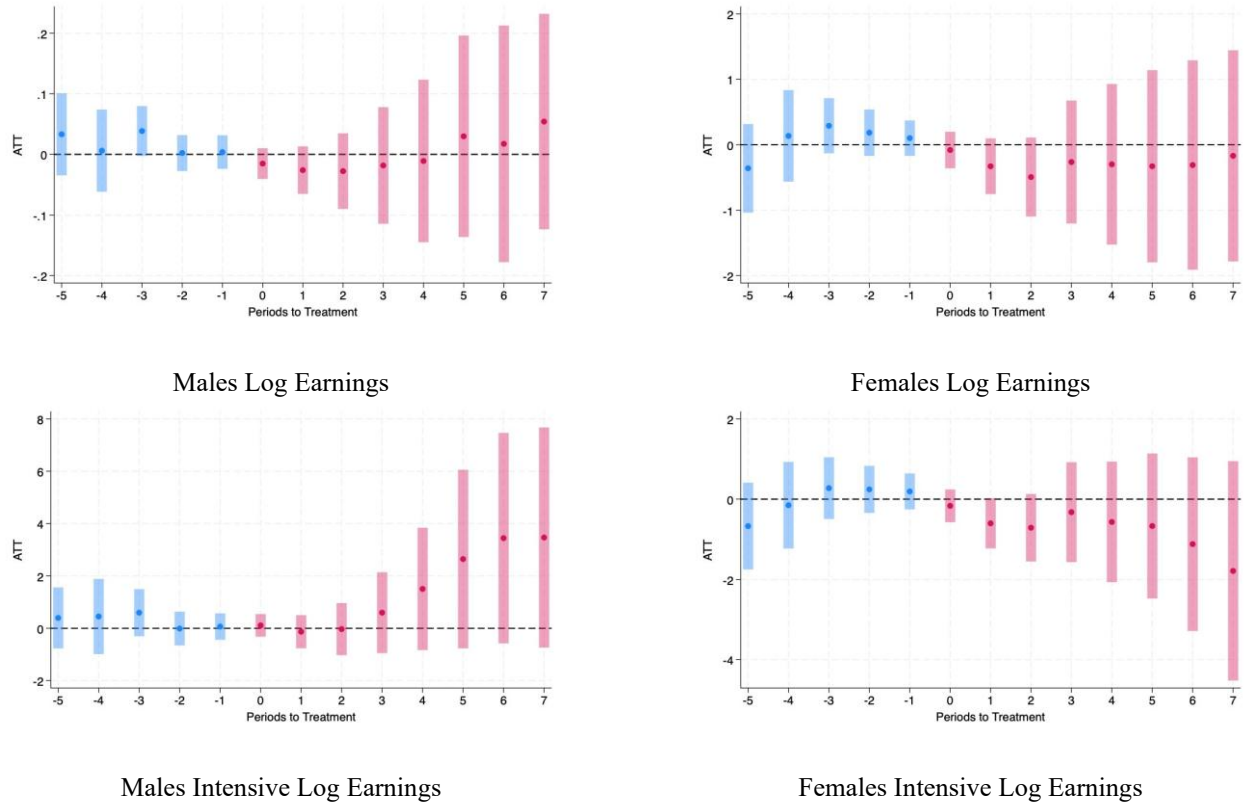


Figure 5: The Effects of Childbirth on Labour Outcomes

5.3 Urban-Rural Setting Heterogeneity

Assessing differences on urban and rural settings is essential, as disparities in childcare choices and labour market prospects can affect the degree of the child penalty. Table 2 shows that the characteristics of wives and husbands in urban and rural area. Examining these contrasts provides insight into how local support systems and economic contexts impact gendered labour outcomes in Indonesia. Urbanization has led to major shifts in lifestyles, geographic mobility, and economic pressures. An increasing number of migrant families now live far from their extended families and rely primarily on the nuclear family, particularly in childcare responsibilities. While extended families continue to play a role in certain situations, urbanization has transformed traditional childcare arrangements into ones that are more centered on smaller, nuclear family units (D. Nafi, 2024).

Table 2: Urban-Rural Characteristics

	Urban	Rural
Individual Earnings (Rupiah per Month)	251558.2 (728414.1)	160834.9 (554504)
labour Force Participation	0.37 (0.49)	0.45 (0.49)
Formal Jobs (1=yes, 0=no)	0.20 (0.39)	0.12 (0.33)
Age	32.69 (7.41)	31.82 (7.87)
Years of Schooling	9.69 (4.24)	6.83 (4.04)
Years of experience	13.45 (10.66)	14.87 (11.91)
Household size	5.24 (2.11)	5.03 (2.06)
Household Per Capita Expenditures (Rupiah Monthly)	526935.7 (715336)	382265.6 (513692.1)
Living with Grandparents (1=yes, 0=no)	0.13 (0.34)	0.16 (0.36)
Living with other adult female member (1=yes, 0=no)	0.67 (0.46)	0.71 (0.45)

Note: The table shows the mean and standard deviation (in parentheses). All of the labour market outcomes are replacing 0 if numbers are missing.

We distinguish between urban and rural areas based on differences in local support systems and economic environments. This study uncovers these differences by comparing the labour-market outcomes of mothers and fathers. We estimate the effects separately and use parents who have not yet been treated as the counterfactual group. Moreover, different job characteristics across urban-rural settings also need to be considered. Urban is dominated with strict and formal jobs, while rural jobs are predominantly by the flexible working hours and informal sectors (Manning, 2018; World Bank, 2010).

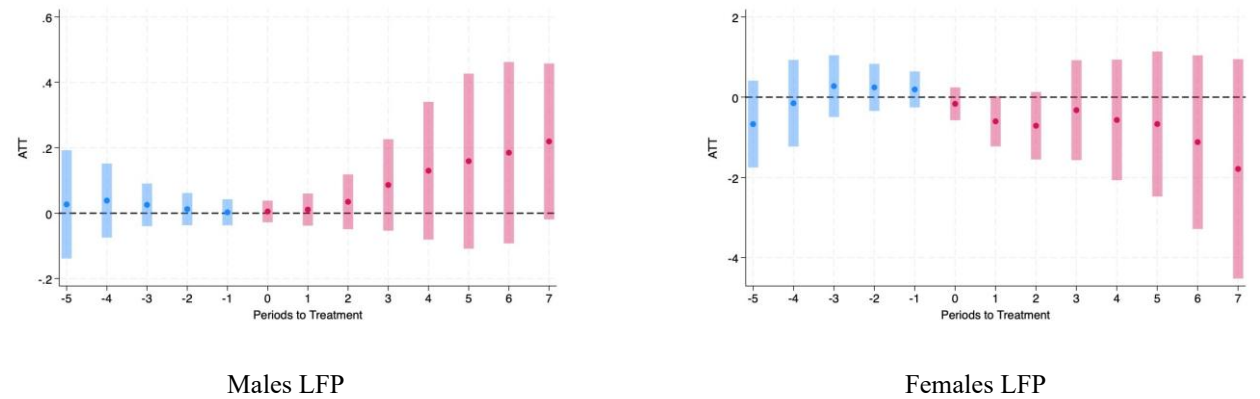
Different trajectories are pronounced on urban setting analysis in Figure 6. Overall, fathers have more stable labour market outcomes. By becoming a father, they not tend to change their labour supply around the year of the childbirth. In contrast, mothers experience a decline in their likelihood of employment: their LFP drops by 5 percentage points in year 2, and they only re-enter the labour market by year 3. This pattern, consistent with Cameron et al. (2019), has contributed to stagnant female labour force participation in Indonesia. Urban mothers tend to move from formal to informal employment, or into non-employment, starting from year 1 after childbirth, probability drops almost 20 percentage points in year 2, and continuing through the end of the observation period. Furthermore, urban mothers experience a decline in log earnings from year 1—about 50 percent—and continue to suffer negative earnings effects

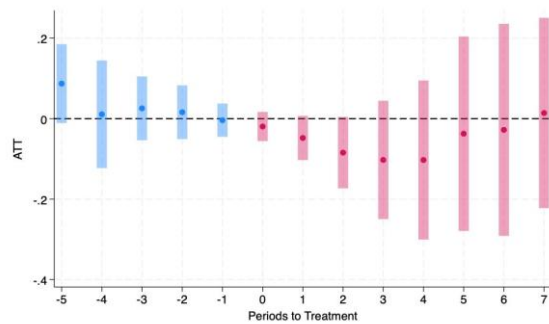
over the full observation window. Only the ATT in year 2 and 3 are statistically significant, showing a 70 to 80 percent decline, whereas in the other years after childbirth there is no significant decrease in urban mothers' log earnings.

In rural area in Figure 7, father tend to shift their job into more formal jobs by around 10 percentage points, starting from year 3 following the year of child birth. Moreover, fathers who remain working also gain positive benefits. The fatherhood premium persists in marginal intensive earnings, and remains statistically significant, up to year 7. Both LFP and extensive log earnings for rural fathers, are not statistically significant but has positive trajectories. Conversely, rural mothers appear better able to stabilize their labour market outcomes. Mothers' LFP not significantly changing their career. Their working status are not affected by childbirth. Rural mothers not significant change their formality, they keep remain in their initial jobs since the year of child birth.

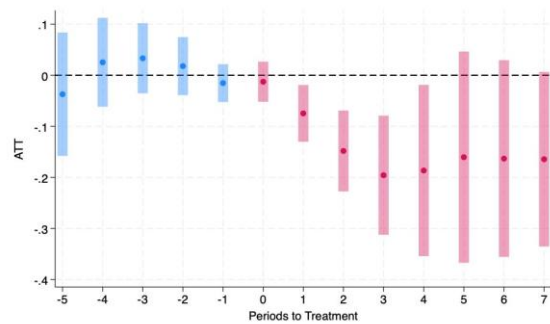
The slower emergence or delayed of child-related earnings penalties for urban mothers likely reflects an initial phase of adjustment, during which women stay formally employed in their pre-birth positions, supported by maternity leave (Albanesi et al., 2023) and a combination of job protection and benefit payments (Lalive et al., 2011; Setyonaluri et al., 2023). Over time, however, inflexible work rules and procedures (Glass, 1998), commuting burdens (Le Barbanchon et al., 2020), and scarce affordable childcare options in urban labour markets (O'Donnell et al., 2022) make it increasingly hard to combine full-time work with caregiving, resulting in persistent declines in both labour supply and formal employment. In contrast, rural mothers tend to withdraw from the labour market sooner but also re-enter more quickly, which aligns with the presence of more flexible, easily accessible jobs and stronger support from extended family networks.

Taken together, these patterns indicate that regional context shapes parental employment in ways that are more favourable to rural than to urban mothers. Rural work tends to be more flexible, largely concentrated in family enterprises and agriculture, which facilitates women's temporary withdrawal and subsequent reentry into the labour market (Cameron et al., 2017). This flexibility, combined with lower exit costs and the presence of extended family nearby, allows rural women to adjust their labour force participation earlier than their urban counterparts. This finding also suggests that mothers sort into lower-paying but more flexible and family-friendly jobs and workplaces (Bertrand et al., 2010; Bolotnyy and Emanuel, 2022; Goldin, 2014). At the same time, rural jobs frequently lack formal protections (Manning, 2018), weakening incentives to stay in formal employment. Overall, these forces contribute to earlier adjustments in women's labour outcomes in rural regions.

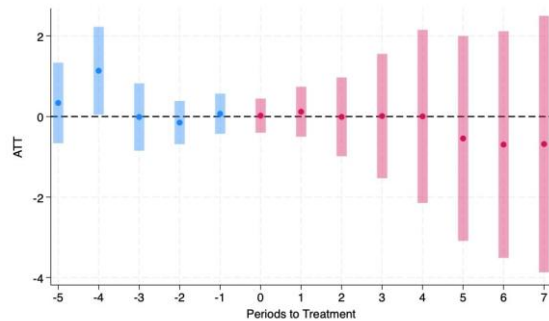




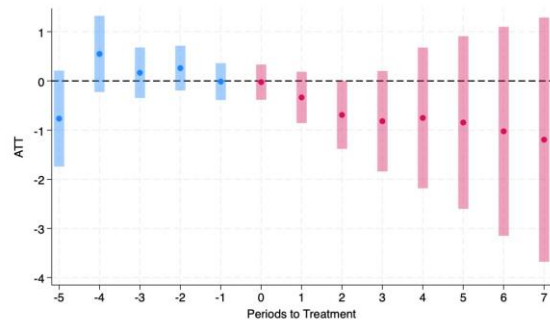
Males Formality



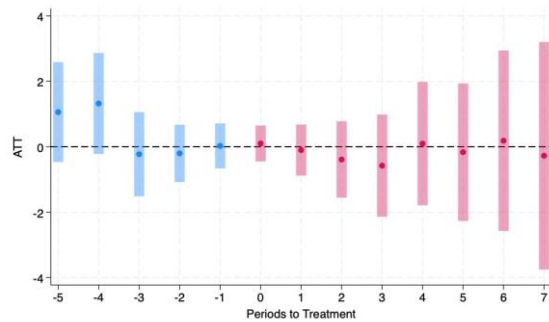
Females Formality



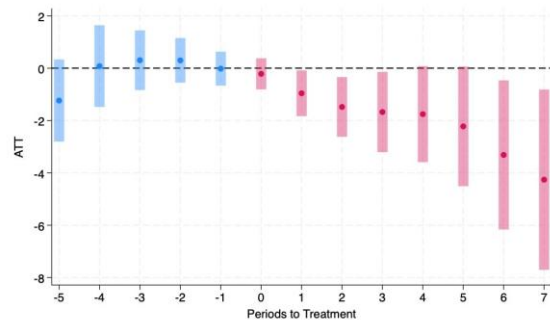
Males Log Earnings



Females Log Earnings

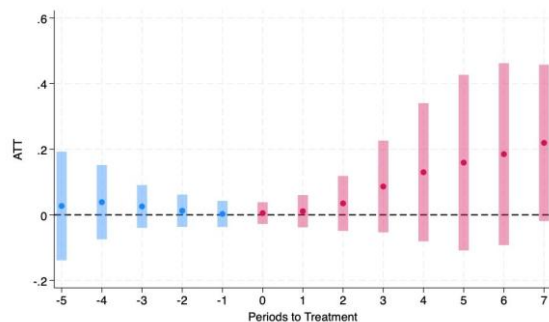


Males Intensive Log Earnings

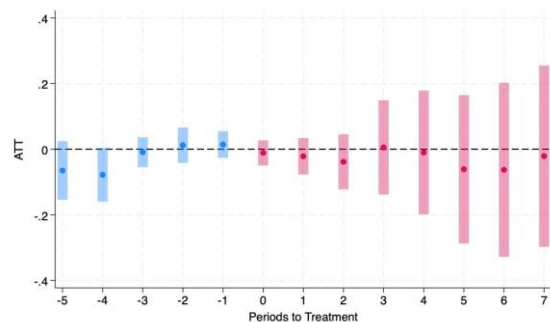


Females Intensive Log Earnings

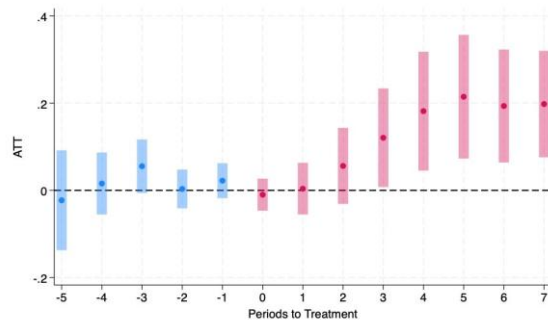
Figure 6: Child Penalty in Urban Setting



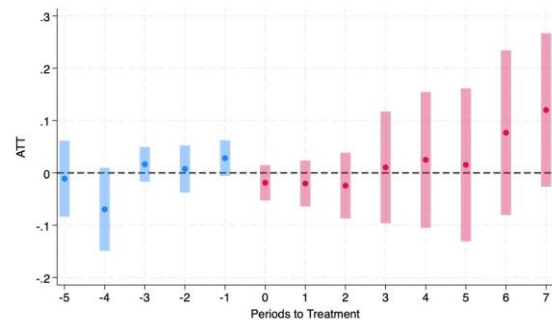
Males LFP



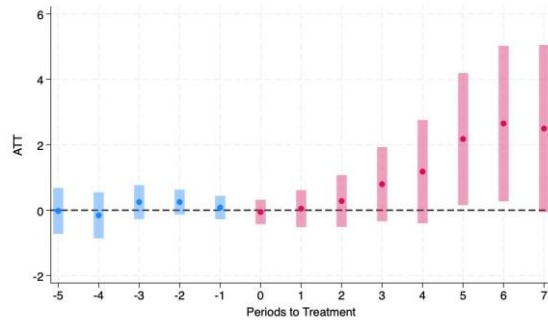
Females LFP



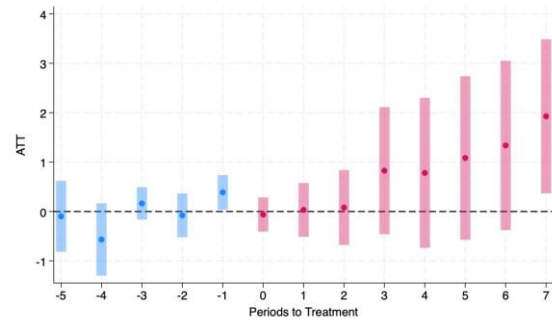
Males Formality



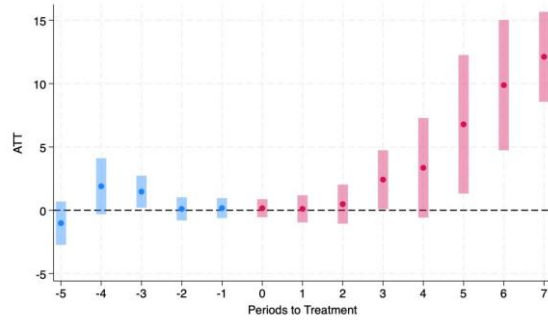
Females Formality



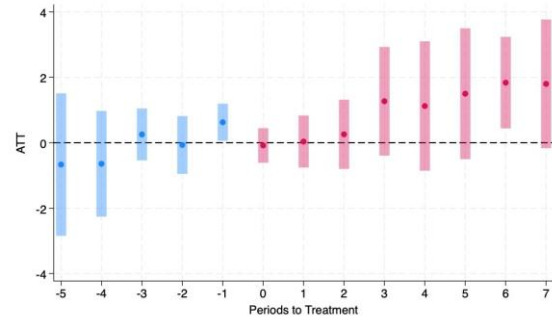
Males Log Earnings



Female Log Earnings



Males Intensive Log Earnings



Females Intensive Log Earnings

Figure 7: Child Penalty in Rural Setting

Never Treated Control Group

This section demonstrates that selecting appropriate control groups is crucial in this study. By comparing parents to childless couples, we identify two key assumptions of the staggered DiD framework that are not satisfied. According to Figure 8, for both men and women, the parallel pre-trend assumption fails, indicating that there is anticipation behavior prior to childbirth. Nonetheless, a substantial motherhood penalty across all labour market outcomes emerges more clearly when mothers are compared to childless women.

Mothers experience a 6 percentage points of their probability in labour market and significantly persistent through 7 years. In terms of formality, mothers tend to exit the formal job by 7 to 8 percentage points since year 2, and gradually reduce through 7 years into 12 percentage points. In their unconditional earnings, compared to childless wife, a 60 percent drop clearly emerge at year 2 and significantly consistent to year 7 and reach over 140 percent. Lastly, regarding mothers conditional earnings, mother who keep their working status experience drop their earnings around 50 percent

at year 2. This implies that the difficulties encountered by mothers after childbirth appear more pronounced when contrasted with women who remain childless, underscoring how different methodological choices can shape the interpretation of the findings. In contrast, the impact on men's labour outcomes is relatively small. Compared to childless husbands, fathers gain their positive likelihood of labour force participation up to 6 percentage points at second year. The earnings intensive margins are significantly gained by fathers when comparing to the husbands without children. The remaining fathers labour outcomes do not provide causal evidence of the effect of having a first child.

6 Conclusion

This study provides new evidence of the enduring impact of child penalties in Indonesia by employing an event study and Staggered Difference-in-Differences approach on the IFLS panel dataset. The analysis demonstrates that having a child leads to substantial and lasting adverse effects on Indonesian mothers' employment trajectories and little effects on fathers' labour outcomes. Notably, the divergence in work outcomes between mothers and both fathers and childless women emerges only after childbirth in the event study design, validating the study's identification strategy.

Quantitatively, the results show that, on average, Indonesian mothers experience a decline on their medium term ATT in labour force participation by about 5 percentage points, a fall in formal sector employment by roughly 5 points, and a substantial reduction in log earnings—50 percents—in year 1, when compared to their own pre-childbirth status. The primary drivers of reduced earnings among mothers are decreases in workforce participation and exits from formal job roles. By contrast, fathers' responses are modest, with work outcomes evolving only gradually over time. There is no indication of an immediate rise in labour force participation, formal employment, or earnings after the birth of a child, reinforcing the gender gap associated with parenthood.

A closer look at urban and rural differences reveals noteworthy variation in both the timing and scale of the child penalty. In urban areas, the negative impact is initially muted, with penalties becoming more pronounced from the second year onward—possibly due to protections like maternity leave and job protection, which temporarily buffer mothers from immediate job loss. In contrast, rural mothers encounter setbacks almost immediately, a pattern likely influenced by the prevalence of informal or family-run businesses and closer family networks. However, rural mothers are also more likely to recover their earnings as their children grow, thanks in part to flexible job arrangements and familial support. These disparities point to the significant influence of local labour market structures and social supports in shaping parental employment outcomes, helping to explain the persistence of gender inequality in Indonesia, even as women's educational attainment continues to grow.

A limitation of this study is the restricted ability to generalize the characteristics of each job sector. Certain sectors, such as agriculture, provide flexible working hours that can support women and lower the probability that they exit employment. In contrast, other sectors, including manufacturing and services, lack such flexibility, which may hinder

women's ability to remain in the workforce after childbirth. Moreover, the pregnancy anticipation might need to be considered by further research. As some women in Indonesia take their career break during the pregnancy period. Another limitation of this article is that working hours could not be employed as a labour outcome or as a control variable, due to the limited number of observations responding to the IFLS retrospective questions.

Since mothers primarily face setbacks from reduced formal employment and workforce participation, implementing measures that support job retention after childbirth could make a significant difference, particularly in urban settings. As many mothers move to informal work or leave their jobs due to childcare responsibilities, expanding access to affordable childcare and enabling more flexible work arrangements in cities could also help. For rural areas, targeted support for self-employment and family business initiatives would allow mothers to balance earning an income with caregiving duties. Additionally, policies that promote fathers' parental leave or encourage more balanced household decision-making could help to share the impact of parenthood more equally between both parents/

References

- Aguero, J. M., Marks, M., & Raykar, N. (2012). *The Wage Penalty for Motherhood in Developing Countries*.
[https://conference.nber.org/confer/2013/CHEDs13/Aguero Marks Raykar.pdf](https://conference.nber.org/confer/2013/CHEDs13/Aguero%20Marks%20Raykar.pdf)
- Aguilar-Gomez, S., Arceo-Gomez, E. O., & De la Cruz Toledo, E. (2026). Inside the black box of child penalties: Unpaid work and household structure. *Journal of Development Economics*, 178. <https://doi.org/10.1016/j.jdeveco.2025.103554>
- Albanesi, S., Olivetti, C., & Petrongolo, B. (2023). Families, labor markets, and policy. In *Handbook of the economics of the family* (pp. 255–326, Vol. 1). Elsevier. <https://doi.org/10.1016/bs.hefam.2023.01.004>
- Andrina, M., & Kusumandari, S. A. (2022, September). The Struggle for Adequate Childcare in Indonesia: Working Parents need Backup. <https://www.policyforum.net/the-struggle-for-adequate-childcarein-indonesia/>
- Angelov, N., & Lindahl, E. (2016). Parenthood and the Gender Gap in Pay. *Journal of Labor Economics*, 34(3), 545–579. <https://doi.org/10.2307/26553218>
- Aspinall, E., White, S., & Savirani, A. (2021). *Journal of Current Southeast Asian Affairs Women's Political Representation in Indonesia: Who Wins and How?* (Tech. rep. No. 1).
- Astone, N. M., Dariotis, J. K., Sonenstein, F. L., Pleck, J. H., & Hynes, K. (2010). Men's work efforts and the transition to fatherhood. *Journal of Family and Economic Issues*, 31(1), 3–13. <https://doi.org/10.1007/s10834-009-9174-7>
- Astone, N. M., & Peters, H. E. (2014). Longitudinal influences on men's lives: Research from the transition to fatherhood project and beyond. *Fathering*, 12(2), 161–173. <https://doi.org/10.3149/fth.1202.161>
- Baxter, J., Buchler, S., Perales, F., & Western, M. (2015). A life-changing event: First births and men's and women's attitudes to mothering and gender divisions of labor. *Social Forces*, 93(3), 989–1014. <https://doi.org/10.1093/sf/sou103>

- Becker, G. (1981). *A Treatise on the Family*. National Bureau of Economic Research, Inc. <https://EconPapers.repec.org/RePEc:nbr:nberbk:beck81-1>
- Bensnes, S., Huitfeldt, I., & Leuven, E. (2023). *Reconciling Estimates of the Long-Term Earnings Effect of Fertility* (tech. rep.). www.iza.org
- Bertrand, M. (2020). Gender in the Twenty-First Century. *AEA Papers and Proceedings*, 110, 1–24. <https://doi.org/10.1257/pandp.20201126>
- Bertrand, M., Goldin, C., & Katz, L. F. (2010). Dynamics of the Gender Gap for Young Professionals in the Financial and Corporate Sectors. *American Economic Journal: Applied Economics*, 2(3), 228–255. <https://doi.org/10.1257/app>
- Bianchi, S. M. (2011). Family Change and Time Allocation in American Families. *The ANNALS of the American Academy of Political and Social Science*, 638(1), 21–44. <https://journals.sagepub.com/doi/10.1177/0002716211413731>
- Bolotnyy, V., & Emanuel, N. (2022). Why Do Women Earn Less than Men? Evidence from Bus and Train Operators. *Journal of Labor Economics*, 40(2), 283–323. <https://doi.org/10.1086/715835>
- Cameron, L., Suarez, D. C., & Rowell, W. (2019). Female Labour Force Participation in Indonesia: Why Has it Stalled? *Bulletin of Indonesian Economic Studies*, 55(2), 157–192. <https://doi.org/10.1080/00074918.2018.1530727>
- Cameron, L., Suarez, D. C., Sandilans, E., & Rowell, W. (2017). *Women's Economic Participation in Indonesia: A study of gender inequality in employment, entrepreneurship, and key enablers for change* (tech. rep.). Monash University. <https://www.monash.edu/business/cdes/assets/documents/publications2/Womens-economic-participation-in-Indonesia-June-2017.pdf>
- Coltrane, S. (2000). Research on Household Labor: Modeling and Measuring the Social Embeddedness of Routine Family Work. *Journal of Marriage and Family*, 62, 1208–1233. <https://onlinelibrary.wiley.com/doi/10.1111/j.1741-3737.2000.01208.x>
- Coran, A., Laczek, M. C. F., & Miserocchi, F. (n.d.). *Childhood Environment and Motherhood Penalties* (tech. rep.).
- Cortés, P., & Pan, J. (2023). Children and the Remaining Gender Gaps in the Labor Market†. *Journal of Economic Literature*, 61(4), 1359–1409. <https://doi.org/10.1257/jel.20221549>
- Costa Dias, M., Joyce, R., & Parodi, F. (2020). The gender pay gap in the UK: children and experience in work. *Oxford Review of Economic Policy*, 36(4), 855–881. <https://doi.org/10.1093/oxrep/graa053>
- D. Nafi, Y. K. (2024, July). Kegagalan UU KIA Merespons Perubahan Sosial. <https://www.hukumonline.com/berita/a/kegagalan-uu-kia-merespons-perubahan-sosial-lt66a1de04ce071/?page=1>
- De Chaisemartin, C., & D’haultfoeuille, X. (2020). American Economic Association Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects. *Source: The American Economic Review*, 110(9), 2964–2996. <https://doi.org/10.2307/26966322>

- De Quinto, A., Hospido, L., & Sanz, C. (2021). *The child penalty in Spain* (tech. rep.).
- Dermott, E. (2006). What's parenthood got to do with it?: Men's hours of paid work. *British Journal of Sociology*, 57(4), 619–634. <https://doi.org/10.1111/j.1468-4446.2006.00128.x>
- Fajardo-Gonzalez, J., Hasanbasri, A., & Rios-Avila, F. (2024). *Is There a Gendered Parenthood Penalty in Indonesian Labor Markets?* (Tech. rep.). <http://www.worldbank.org/prwp>.
- Feridhanusetyawan, T., & Aswicahyono, H. (2001). *Gender Assessment of the Indonesian Labour Market*, Institute of Southeast Asian Studies for East Asian Development Network.
- Fitzenberger, B., & Seidlitz, A. (2023, January). *Changing Fertility and Heterogeneous Motherhood Effects: Revisiting the Effects of a Parental Benefits Reform*, Institute for Employment Research. https://population-economics.committee.socialpolitik.de/sites/default/files/2023-02/Fitzenberger_Changing%20Fertility.pdf
- Fitzenberger, B., Sommerfeld, K., & Steffes, S. (2013). Causal effects on employment after first birth - A dynamic treatment approach. *Labour Economics*, 25, 49–62. <https://doi.org/10.1016/j.labeco.2013.05.003>
- Gallen, Y., Joensen, J. S., Johansen, E. R., & Veramendi, G. F. (2025, September). *The Labor Market Returns to Delaying Pregnancy * Federal Reserve Bank, and CEMFI. Thank you to* (tech. rep.). <https://doi.org/http://dx.doi.org/10.2139/ssrn.4554407>
- Glass, J. L. (1998). *Family Responsive Policies and Employee Retention Following Childbirth** (tech. rep. No. 4). <https://academic.oup.com/sf/article/76/4/1401/2233778>
- Goldin, C. (2014). A grand gender convergence: Its last chapter. *American Economic Review*, 104(4), 1091–1119. <https://doi.org/10.1257/aer.104.4.1091>
- Goldin, C., Kerr, S. P., & Olivetti, C. (2022, August). *When the Kids Grow Up: Women's Employment and Earnings across the Family Cycle* (tech. rep.). <http://www.nber.org/papers/w30323>
- Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, 225(2), 254–277. <https://doi.org/10.1016/j.jeconom.2021.03.014>
- Hwang, J., & Yoo, I. (2025). *The Motherhood Effect on Earnings amid Declining Fertility: Evidence from Korea* (tech. rep.). Rockwool Foundation Berlin. www.rfberlin.com
- ILO & UN Women. (2020, September). *id-Gender-Pay-Gap-Statistic-in-Indonesia-September-2020* (tech. rep.) <https://asiapacific.unwomen.org/sites/default/files/Field%20Office%20ESEAAsia/Docs/Misc/2020/09/id-Gender-Pay-Gap-Statistic-in-Indonesia-September-2020.pdf>
- Indonesia Statistics Agency. (2025). *Tingkat Partisipasi Angkatan Kerja Menurut Jenis Kelamin*. <https://www.bps.go.id/id/statistics-table/2/MjIwMCMY/tingkat-partisipasi-angkatan-kerja-menurutjenis-kelamin.html>
- Kercheval, J., Markowitz, D., Monson, K., & Read, B. (2012, July). *Women in Leadership: Research on Barriers to Employment and Decent Work for Women. Literature Review*. www.ilo.org/publns

- Killewald, A. (2013). A Reconsideration of the Fatherhood Premium: Marriage, Coresidence, Biology, and Fathers' Wages. *American Sociological Review*, 78(1), 96–116. <https://doi.org/10.1177/0003122412469204>
- Klasen, S. (2025). The Impact of Gender Inequality on Economic Performance in Developing Countries. 43, 46. <https://doi.org/10.1146/annurev-resource>
- Kleven, H., Landais, C., & Leite-Mariante, G. (2024). The Child Penalty Atlas. *Review of Economic Studies*. <https://doi.org/10.1093/restud/rdae104>
- Kleven, H., Landais, C., & Sogaard, J. E. (2019). Children and gender inequality: Evidence from Denmark. *American Economic Journal: Applied Economics*, 11(4), 181–209. <https://doi.org/10.1257/app.20180010>
- Kunze, A. (2017). The gender wage gap in developed countries. <https://doi.org/10.1093/oxfordhb/9780190628963.013.11>
- Lalive, R., Steinhauer, A., Zweimu"ller, J., Blau, D., Piketty, T., Saez, E., & Stevenson, B. (2011). Parental Leave and Mothers' Careers: The Relative Importance of Job Protection and Cash Benefits. <https://doi.org/10.5167/uzh-51546>
- Le Barbanchon, T., Rathelot, R., & Roulet, A. (2020). Gender Differences in Job Search: Trading off Commute Against Wage. *The Quarterly Journal of Economics*, 136(1), 381–426. <https://doi.org/10.1093/qje/qjaa033>
- Lebedinski, L., Perugini, C., & Vladislavljevi'c, M. (2023). Child penalty in Russia: evidence from an event study. *Review of Economics of the Household*, 21(1), 173–215. <https://doi.org/10.1007/s11150-022-09604-y>
- Lundborg, P., Plug, E., & Rasmussen, A. W. (2017). Can women have children and a career? IV evidence from IVF treatments. *American Economic Review*, 107(6), 1611–1637. <https://doi.org/10.1257/aer.20141467>
- Lundborg, P., Plug, E., & Rasmussen, A. W. (2024). *Is There Really a Child Penalty in the Long Run? New Evidence from IVF Treatments* (tech. rep.). www.iza.org
- Manning, C. (2018). Jobs, Wages, and Labor Market Segmentation. In E. Ginting, C. Manning, & K. Taniguchi (Eds.), *Indonesia: Enhancing productivity through quality jobs* (pp. 68–98). <https://doi.org/http://dx.doi.org/10.22617/TCS189213-2>
- Mas, A., & Pallais, A. (2017). Valuing alternative work arrangements. *American Economic Review*, 107(12), 3722–3759. <https://doi.org/10.1257/aer.20161500>
- Melentyeva, V., & Riedel, L. (2025). *Child Penalty Estimation and Mothers' Age at First Birth* (tech. rep.). www.rfberlin.comwww.cream-migration.org
- Muharomah, S., & Zimmerman, L. A. (2025). Determinants of contraceptive use prior to onset of childbearing among ever-married women in Indonesia: a secondary data analysis. *BMC Women's Health*, 25(1). <https://doi.org/10.1186/s12905-025-03724-0>
- O'Donnell, A., Dudu, H., Romagosa, H. R., Shanahan, K., Britton, J., & Tas, E. (2022). *Economic Gains from Investing in Childcare: the Case of Indonesia* (tech. rep.). World Bank. Jakarta.

- Republic of Indonesia Law Number 13 of 2003* (tech. rep.). (n.d.). <https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://peraturan.bpk.go.id/Download/31128/UU%2520Nomor%252013%2520Tahun%25202003.pdf&ved=2ahUKEwjD3qGy7aCQAxVwnK8BHdiqDGcQFnoECBkQAQ usg=AOvVaw1Jbn6mExv2zuETiox8cvpr>
- Roth, J., Sant'Anna, P. H., Bilinski, A., & Poe, J. (2023). What's trending in difference-in-differences? A synthesis of the recent econometrics literature. *Journal of Econometrics*, 235(2), 2218–2244. <https://doi.org/10.1016/j.jeconom.2023.03.008>
- Rothenberg, A. D., Gaduh, A., Burger, N. E., Chazali, C., Tjandraningsih, I., Radikun, R., Sutera, C., & Weilant, S. (2016). Rethinking Indonesia's Informal Sector. *World Development*, 80, 96–113. <https://doi.org/10.1016/j.worlddev.2015.11.005>
- Schaner, S., & Das, S. (2016). *Female Labor Force Participation in Asia: Indonesia Country Study* (tech. rep.). www.adb.org
- Schwab, K., Samans, R., Zahidi, S., Leopold, T., Ratcheva, V., Hausmann, R., & Tyson, L. (2017). *The Global Gender Gap Report 2017 Insight Report* (tech. rep.). https://www3.weforum.org/docs/WEF_GGGR_2017.pdf
- Setyonaluri, D., Aninditya, F., Srikandi Radjiman, D., Fasikha, E., Fajri, N., Aryaputra, C., & Tsuruga, I. (2023). *Maternity leave in metropolitan Indonesia: Evidence on duration, benefits and job protection* (tech. rep.). International Labour Organization. www.ilo.org/publns.
- Setyonaluri, D., Nasution, G., Ayunisa, F., Kharistiyanti, A., & Sulistya, F. (2021). *Social Norms and Women's Economic Participation in Indonesia* (tech. rep.). <https://investinginwomen.asia/wpcontent/uploads/2023/05/Lembaga-Demografi-Faculty-of-Economics-and-Business-Universitas-Indonesia-Social-Norms-and-Womens-Economic-Participation-1.pdf>
- Spagnoletti, B. R. M., Bennett, L. R., Kermode, M., & Wilopo, S. A. (2018). 'I wanted to enjoy our marriage first... but I got pregnant right away': A qualitative study of family planning understandings and decisions of women in urban Yogyakarta, Indonesia. *BMC Pregnancy and Childbirth*, 18(1). <https://doi.org/10.1186/s12884-018-1991-y>
- Steinhauer, A. (2018). *Working Moms, Childlessness, and Female Identity*, SciencesPo. www.sciencespo.fr/liepp
- Sun, L., & Abraham, S. (2021). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, 225(2), 175–199. <https://doi.org/10.1016/j.jeconom.2020.09.006>
- Utomo, A. J. (2012). Women as Secondary Earners: Gendered preferences on marriage and employment of university students in modern Indonesia. *Asian Population Studies*, 8(1), 65–85.
- Villanueva, A., & Lin, K. H. (2020). Motherhood wage penalties in Latin america: The significance of labor informality. *Social Forces*, 99(1), 59–85. <https://doi.org/10.1093/sf/soz142>

Widarti, D. (1998). Determinants of Labour Force Participation by Married Women: The Case of Jakarta.

Bulletin of Indonesian Economic Studies, 34(2), 93–120.

World Bank. (2010, June). *Indonesia Jobs Report Towards Better Jobs and Security for All* (tech. rep.). <https://documents1.worldbank.org/curated/en/772831468039057243/pdf/563480WP0Indon1cutive0Summary0FINAL.pdf>

pdf

Zhang, M., Wang, Y., & Hou, L. (2024). Gender norms and the child penalty in China. *Journal of Economic Behavior and Organization*, 221, 277–291. <https://doi.org/10.1016/j.jebo.2024.03.011>

Zhou, X., Ye, J., Li, H., & Yu, H. (2022). The rising child penalty in China. *China Economic Review*, 76. <https://doi.org/10.1016/j.chieco.2022.101869>

sn-bibliography

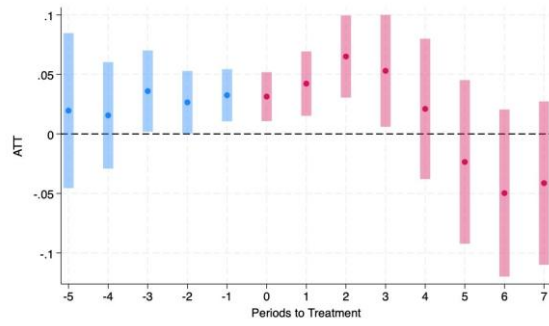
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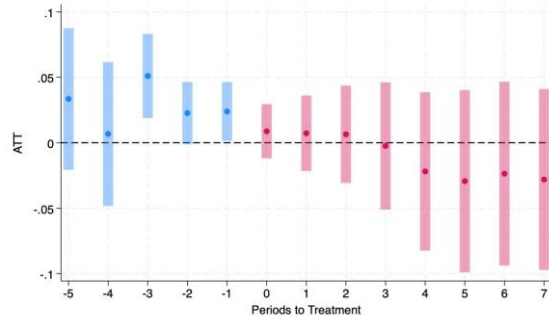
Author Contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Ariska Nur Fajar Rini. The first draft of the manuscript was written by Ariska Nur Fajar Rini. All authors read and approved the final manuscript

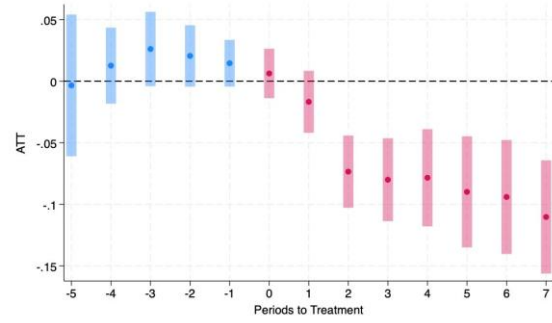
Appendix



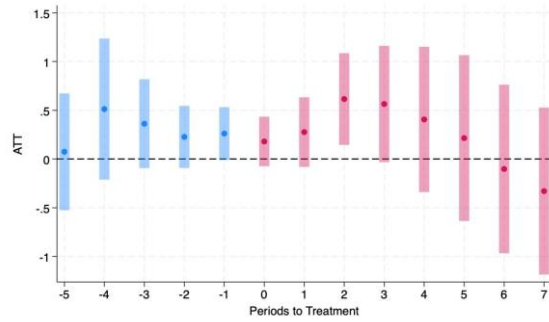
Males LFP



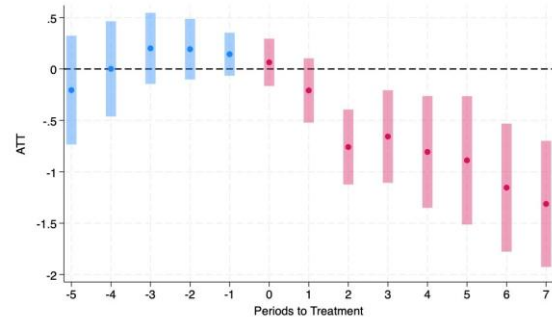
Females LFP



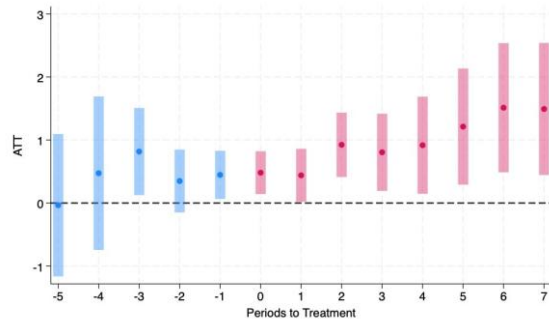
Males Formality



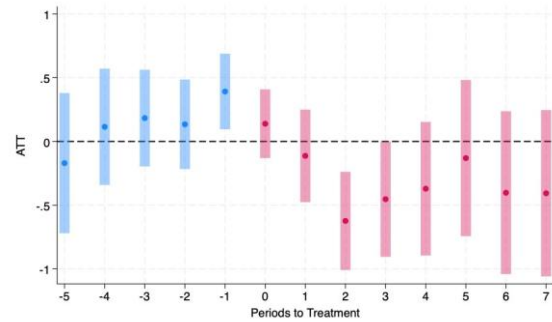
Females Formality



Males Log Earnings



Females Log Earnings



Males Intensive Log Earnings

Females Intensive Log Earnings

Figure 8: Never Treated as Control Group