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Abstract

The study examines the impact of childbirth on household income and poverty during the crucial first 1,000 days of a child's life, using longitudinal data from the Household, Income, and Labour Dynamics in Australia Survey (2001-2021) and an event study approach. The birth of a first child results in a reduction in household gross income, with one-parent households experiencing, on average, a 27% decrease and two-parent households an 18% decrease. Within five years of the first child's birth, a substantial portion of households (37-40%) either remain in poverty or enter poverty. This is more common for one-parent (63-70%) than two-parent households (34-36%), with childbirth amplifying the likelihood of being in poverty by 0.17 and 0.10 percentage points, respectively. Furthermore, without government family payments, the average poverty rate increases from 26% for one-parent households and 10% for two-parent households before childbirth, to 63% and 20%, respectively, in the years following. With family payments, the average poverty rates after childbirth are 37% and 11%, respectively. This indicates that while government payments assist in mitigating poverty, they do not fully shield families from the risk of falling into poverty after childbirth.

JEL classification: J13, D1, I32

Keywords: Child poverty, household income, childbirth, HILDA survey, family benefits

Introduction

The first 1,000 days of life (conception to 2 years) represent a critical developmental period when the brain develops more rapidly than at any other time (Moore et al. 2017; The Lancet 2016). During this period, household income is a protective factor that contributes to children's optimal health and development (Cooper and Stewart 2020). In contrast, low household income and poverty can compromise brain growth (Hanson et al. 2016), and increase the risk of poorer socioemotional functioning, school failure, chronic disease, mental illness, reduced economic opportunity, and intergenerational adversity (Brinkman et al. 2013; Moore et al. 2017). A paradox of the first 1,000 days is that, during this period, when money arguably matters most, becoming a parent is associated with substantial drops in household income. Researchers seeking to understand the drivers of this "income penalty" commonly study parent gender and partner status, as well as sociodemographic factors such as pre-birth education and employment (Sigle-Rushton and Waldfogel 2007; Barbieri et al. 2012; Stanczyk 2016, 2020; Kleven et al. 2019a; Bahar et al. 2023). While the income penalty is important in and of itself, there is limited research examining how it relates to poverty risk.

Based on the Household, Income, and Labour Dynamics in Australia (HILDA) Survey 2001-2021, this paper aims to fill this gap by examining the effect of the arrival of the first child on household income and poverty¹. To estimate the impact of children on household income, we adopt a quasi-experimental approach based on event studies around the birth of the first child. For a five-year window, we find sharp effects: the arrival of the first child reduces household income between 16-18% (depending on the type of income). This drop in income is higher for one-parent households (23-27%) than for two-parent households (16-19%). Furthermore, we connect this drop in income with the risk of poverty around the time of childbirth. We show that 37-40% of households stayed or moved into or near poverty in each of the five years following the birth of the first newborn. Movement between poverty categories was substantially greater for one-parent than two-parent households. For one-parent households, 23-32% remained out of poverty, 4-6% moved out of poverty or near poverty, and 63-70% stayed in or moved into poverty or near poverty. In contrast, for two-parent households, 61-64% remained out of poverty, 2-4% moved out of poverty or near poverty, and 34-36% stayed in or moved into poverty or near poverty. We also use the event study approach to shed light on the probability of being in poverty as a result of parenthood. We find that this probability is, on average, 0.12 percentage points for all

¹ In this paper we use household and family interchangeably.

households, 0.17 percentage points for one-parent households and 0.10 percentage points for two-parent households.

Having estimated the effect of childbirth on income and poverty, we analyse the role of the Australian government's family payments in moderating poverty during the time around the first childbirth. We show that without family payments, the average poverty rate increases from 26% for one-parent households and 10% for two-parent households before childbirth, to 63% and 20%, respectively, in the years following. With family payments, the average poverty rates after childbirth are 37% and 11%, respectively. While family payments help reduce poverty among households around childbirth, these payments do not protect them from falling into poverty after childbirth. This demonstrates the potential of the Australian government's family payment system to further ameliorate child poverty. However, actions to reduce or eradicate child poverty will be more complex than increasing household income alone.

The paper is organized as follows. Section 2 synthesises the previous evidence. Section 3 presents the institutional context of the main Australian government family payments. Sections 4 and 5 describe the data and the event study methodology, respectively. Section 6 presents the results, Section 7 describes the implications, and Section 8 concludes.

Previous Research

The Relationship Between Financial Security and Child Outcomes

Evidence from systematic reviews of the positive relationship between household income in the first 1,000 days and children's development is steadily mounting (Siddiqi et al. 2018; Cooper and Stewart 2020). More recent studies include a quasi-experimental analysis of longitudinal administrative birth registry and hospital microdata from the United Kingdom (UK), which showed that universal child benefits (family payments) in pregnancy improved infant health, especially for those born to women with a low income (Reader 2023). In the US, the Baby's First Years randomised controlled trial (RCT) demonstrated that infants of low-income families who received monthly cash support had faster infant brain activity after one year, in a pattern associated with learning and development at later ages (Magnuson et al. 2023).

While the mechanisms are complex, there is a convergence in the literature that increased

household income benefits children directly through better food, stable housing, and healthcare (the "investment" model), and indirectly through improved parent mental health and capacity (the "family stress" model). These pathways are supported by Cooper and Stewart's (2020) systematic review, which found evidence for a positive causal effect of household income on children's cognitive, social-behavioural development and health, as well as an impact on mediating outcomes such as maternal mental health, parenting, and the home environment.

Household Income at Childbirth and the Roles of Gender and Partner Status

Across high-income countries, the start of parenthood is consistently associated with a reduction in household income (Sigle-Rushton and Waldfogel 2007; Barbieri et al. 2012; Stanczyk 2016; Kleven et al. 2019a; Stanczyk 2020; Bahar et al. 2023). This income penalty is commonly studied in terms of a gender difference between women and men and, as it is borne by women, has been termed the "motherhood penalty". Drawing on high quality panel data from six high-income countries, Kleven et al. (2019a) estimated the impact of the birth of the first child on the labour market trajectories of mothers and fathers. While earnings (defined as total labour income before taxes and transfers) for men and women followed similar trajectories before parenthood, women endured pervasive income penalties following the birth of their first child. Specifically, the long-run penalties for the two Scandinavian countries were 21% (Denmark) and 27% (Sweden); for the two German-speaking countries were 61% (Germany) and 51% (Austria); and for the two English-speaking countries were 44% (UK) and 31% (US). Using two longitudinal panel datasets (HILDA Survey and ALife), Bahar et al. (2023) reported comparable findings for Australia. Earnings for men and women were similar pre-parenthood; however, where women's earnings reduced by an average of 55% in the first five years of parenthood and 43% in the first ten years, men's earnings were unaffected.

Due to the complexity of the analyses and necessary sample sizes, the impact of subsequent births is less well studied. In an analysis of two-parent families represented in the German Socio-Economic Panel (1984-2005), Schulze (2010) showed that the drop in income was present for first but not subsequent births. In cross-sectional analysis of data on seven Western industrialized countries (Finland, Sweden, Germany, Netherlands, UK, US, Canada) from the Luxembourg Income Study database, Sigle-Rushton and Waldfogel (2007) modelled the incomes of cohabiting women with one or two children and compared them with those of child-free women. The authors found that cumulative gross and disposable incomes decreased with each birth. For example,

women with medium-level education (defined as high school and some higher education but not a bachelor's degree) who partner at age 24, have two children, and remain partnered, had cumulative incomes at age 45 years that were 64-80% the incomes of partnered, child-free women.

Harkness (2022) sought to explore how partner status relates to the income penalty using data from the longitudinal US Panel Survey of Income Dynamics (1990–2015). They demonstrated that women's income at the birth of their first child decreased 11% for those who were single and 26% for those who were married. When considered in terms of disposable income, these declines increased to 50% and 41% for single and married women, respectively. In contrast, men's earnings increased 10% following childbirth. Stanczyk's (2020) analysis of US Census data (1995-2013) investigated the month-to-month changes in household income in the year before and after birth. Consistent with the findings reported by Harkness (2022), Stanczyk (2020) showed that households experienced declines in income in the three months pre-birth, which reached lowest levels in the first and second months of the infant's life and did not recover in the year post-birth. The declines were most pronounced for the households of single parents.

Some studies investigate the role of socioeconomic status, assessed using proxies such as employment and education. However, whether these variables are analysed and how they are measured varies substantially. The modelling by Sigle-Rushton and Waldfogel (2007) found that income penalties were greater for women with high education compared with low or medium levels. Similarly, Schulze (2010) showed that the income penalty was only present for families where both parents were employed before birth. In contrast, Stanczyk (2020) found that the decline for households where the mother has high educational attainment started later and was less severe than households where the mother's educational attainment was lower. While understanding the roles of factors such as employment, income, gender, and partner status can highlight drivers of the income penalty, they do not necessarily indicate which families are raising their new children in financially precarious settings.

The Relationship Between Childbirth and Poverty Risk

Few studies have investigated how the change in household income at childbirth relates to poverty. In analysis of Italian data from the European Survey Statistics on Income and Living Conditions in the 2004-05 survey period, Barbieri et al. (2012) compared the risk of entering poverty between child-free families matched to those who had children. Poverty was defined as a

total disposable household income below 60% of the national median income. The authors found that the birth of a child increased the risk of entering poverty by 5%, and the risk of poverty at childbirth was greater for single-income households and those with precarious work. Overall, single mothers' equivalized incomes were approximately half of married women with children, and poverty rates were 26% and 3%, respectively. Harkness (2022) reported a similar finding in their analysis of US data. For married women, a first birth increased a women's risk of poverty by 2%. For women who had been partnered at childbirth and subsequently separated, this increased to 6%. And for single mothers having their first child, the poverty risk was higher again at 11%.

Child Poverty in Australia

Australia is a high-income country with universal health, education, and social services. Despite this, at least one in three families with children experience material deprivation, missing out on essential items such as food, stable housing and healthcare due to cost (Goodhue et al. 2021; Price et al. 2022). This experience appears particularly pronounced for families with children under five years of age (Gamarra et al. 2021). While children in one-parent families are three times more likely to live in poverty than two-parent households (39% versus 13%) (Poverty in Australia 2022), in absolute terms the majority of children living in poverty (82%) live with two parents. Even by the time Australian children start school, developmental inequities due to adverse social conditions such as poverty are evident. Children living in the least advantaged suburbs have three times the developmental vulnerability of the most (19% versus 7%) (AEDC 2021).

In Australia, there is increasing interest in equitable policy and supporting low-income families, evidenced by the national wellbeing budget and increases to childcare subsidies and minimum wage. The importance of early childhood and supporting parents is gaining prominence through the National Action Plan for the Health of Children and Young People (Australian Government, Department of Health and Aged Care 2020-2030), the proposed Early Years Strategy (Australian Budget October 2022-2023) and Plan for Affordable Child Care (Australian Department of Education, October 2022). The economic changes associated with childbirth are recognized through provisions around parental leave (tied to the minimum wage) and income support for parents in the form of a range of complex, interrelated tax concessions, income supplements and childcare subsidies. But how well are these policies buffering families from the risk of poverty? In the context of increasing inflation and cost of living, is there a case for investing more heavily in the early childhood period?

Australian Government Family Payments

A substantial international literature considers the impact of social welfare (state aid) (Aitken et al. 2015; Courtin et al. 2020; Simpson et al. 2021; Holdroyd et al. 2023; Hamilton et al. 2023), including impacts on income and poverty risk (Dahl et al. 2016; Stanczyk 2019; Harkness 2022). However, the differences between countries' eligibility requirements and the amounts of subsidies or payments makes it difficult to generalise the findings across different system and service contexts. Australia has a long history of complex social welfare. Intended as a social safety net, it offers a range of support to families incorporating cash transfers, income support payments, tax concessions, and a variety of community services delivered by federal and state governments. In this section we summarise the four payments that are relevant to the majority of families in the first postpartum years and that we explore in more detail in Section 6.

Family Tax Benefits, Part A (FTB Part A). This payment was introduced on 1 July 2000 to help eligible families with the cost of raising children and comprises two parts. FTB Part A depends on the taxable income of the family, the number and the ages of dependent children, and child support payments received. In 2023, for children aged 0-12 years, the maximum payment was \$213.36 per child per fortnight; for children aged 13-15 years, the maximum was \$277.48 per child per fortnight; for children aged 16-19 years (senior secondary school child), the maximum was \$277.48 per child per fortnight. Families can get the maximum rate of FTB Part A if their annual family's adjusted taxable income (ATI) is \$62,634 or less. The amount of FTB Part A reduces by 20 cents for each dollar of income over \$62,634 and by 30 cents for each dollar of income over \$111,398. This applies until the payment is nil (Service Australia 2022-2023).

Family Tax Benefits, Part B (FTB Part B). This payment was introduced on 1 July 2000. It is paid per-family (grandparent caregivers were also eligible) and provided extra income support to one-parent families and some two-parent families with one main income, who cared for a child for at least 35% of the time. The amount of FBT Part B depend on the age of the youngest child and the family's ATI. In 2023, the maximum rate per family each fortnight is \$181.44 (when the youngest child is 0 to 4 years of age) and \$126.56 (when the youngest child is 5 to 18 years of age). It is means tested; for one-parent families, capped at an annual ATI of less than \$112,578 and, for couples, capped at an annual ATI of less than \$112,578 (for the primary earner) plus annual ATI of less than \$32,303 (for the secondary earner with a young child under 5 year) or an annual ATI

of less than \$25,149 (for the secondary earner with a young child aged 5-13 years) (Service Australia 2022-2023).

Parenting Payment (PP). This income support payment is designed for people who have low incomes or are seeking employment while they are raising a young child. The payment is available to one-parent households with a child aged 0-14 years, or two-parent households with a child aged 0-6 years. The maximum fortnightly payments depend on income and assets and requires primary caregiving responsibilities. To be eligible in 2023, the gross salary for one-parent households is capped at \$2,686.60 per fortnight and required less than \$301,750 in assets for homeowners or \$543,750 for non-homeowners (noting home ownership was not counted as an asset). The maximum payment for one-parent households is \$970.20 per fortnight. For two-parent households, eligibility required a combined gross salary capped at \$2,649.17 per fortnight, with less than \$451,500 in assets for homeowners and \$693,500 for non-homeowners. The maximum payment in 2023 is \$686 per fortnight. For separated couples, the maximum is \$802.50 per fortnight (Service Australia 2022-2023).

Single Income Family Supplement (SIFS). This income support payment is an annual payment of up to \$300 for one-parent households who received the FTB for at least one child. In 2023, eligibility requires a taxable income for a primary earner of \$68,000-\$150,000 and below \$18,000 for a secondary earner (Service Australia 2022-2023).

Maternity Allowance or Baby Bonus. Maternity allowance was paid on the birth or adoption of a child to all recipients of FTB Part A up until 30 June 2004. It was replaced from 1 July 2004 with Maternity Payment, a universal tax-exempt lump-sum payment to families on birth or adoption of a child. On 1 July 2007, Maternity Payment was renamed the Baby Bonus and since 1 January 2009 has only been payable to families with incomes less than \$75,000 in the six months immediately following the birth or adoption of a child. It was also converted from a single lump-sum payment to 13 instalments paid over 6 months. From 1 January 2013, when the Paid Parental Leave (PPL) Scheme was introduced, Baby Bonus has only been payable if PPL was not received (Wilkins 2014). Baby Bonus was abolished on 1 March 2014 and was replaced with the Newborn supplement and the Stillborn baby payment to provide assistance to those families not eligible for or not accessing PPL (Service Australia 2022-2023).

There are two important clarifications about the estimation of family payments. First, the HILDA survey deliberately does not collect family payments. These payments are estimated by the HILDA survey data managers based on eligibility criteria². Second, the family payments described above have been modified over our observation period (2001-2021). These changes are not described in this work, but are considered in the analysis using the "HILDA Survey Income Model" derived in Wilkins (2014).

Data

To examine the impact of children on household income in Australia, our analysis is based on the Household, Income and Labour Dynamics (HILDA) Survey. The HILDA Survey is an annual longitudinal survey of Australian households that began in 2001. Response proportions are high; the annual re-interview rate was 87% in 2002 and has remained above 94% in each wave since 2005 (Summerfield et al. 2022). Until 2010, the number of households responding to the survey was about 7,000 each year, this number increased to about 9,500 in 2011 and has remained so since (*Idem*). Our analysis is based on the 2021 version (the latest release), covering the years between 2001 and 2021.

We construct our sample in a step-by-step process. First, since our event study analysis is based on the arrival of a child, we begin by identifying the newborns in each household in each wave and the parents of these newborns³. Parents are those who identify the newborn as their own, adopted, step or foster child. Second, we restrict the dataset to one of the parents with a child born between 2001 and 2021, such that each household is represented by one parent. Parents are the unit of analysis. Third, we drop all parents younger than 15 or older than 50 when they had their first child. We focus on this age group because we are interested in the impact of children on the working-age population⁴. Fourth, we construct a balanced panel. We restrict the sample to parents observed three years before having a child and five years after. Thus, our analysis focuses on first births between 2004-2016. Fifth, parents reporting having had a child born earlier are not included. This leaves us with a core estimation sample of 969 parents observed over a 9-year window (8,721 individual-year observations), see Table A1 (Sample 1) in the Appendix.

² For the formulas determining family payment entitlements in the HILDA Survey data, see Wilkins (2014) and Summerfield et al. (2022).

³ Our sample includes natural births, adoptions, and multiple births. Number of cases with multiple births: 33 (in Sample 1) and 30 (in Sample 2).

⁴ First-time parents between 15 and 50 years of age account for 99.4% of the observations.

The main household income measure examined in this study is household annual disposable income. Household annual disposable income is the sum across all household members of gross income after taxes. To extend the analysis, we use two additional definitions of income, household annual gross income and household annual disposable income after housing costs. See Table 2 for a decomposition of household disposable income. Household annual gross income is the sum across all household members of regular income from all private (market and private transfers) and public (pension and benefit) sources. Household annual disposable income after housing costs is defined as disposable income after deducting mortgage or rent payments on the home. All monetary variables are adjusted for inflation and are reported in 2021 dollars. Negative values of income are transformed to zero. Table A2 in the Appendix shows descriptive statistics of these monetary variables. Irrespective of the type of income, this table shows a decline in household income, especially in the first year postpartum.

To understand how parenthood affects household income, we examine the impact of the first childbirth on income for all households, irrespective of partnership status. Then, to examine how the transition to parenthood affects income differently across households, we divide the sample in one-parent and two-parent households. There is substantial volatility of partnership in the early years after birth, some individuals report having a partner in a given year and in the following year not, and vice versa, see Table A3 in the Appendix. When analysing across households, we restrict the sample to those individuals having information on their partnership status in the years after birth. This leaves us with a sample of 918 individuals (8,262 individual-year observations), see Table A1 (Sample 2) in the Appendix. We define two-parent households as individuals having a partner for more than three years after birth and we define one-parent households as individuals having a partner for three years or less after birth. In the Appendix C, we provide alternative definitions to one-parent and two-parent households as a robustness check.

Finally, to consider effects on poverty risk we define the poverty threshold at 60% of median equivalised household disposable income⁵. We examine three poverty states: (i) poverty (equivalised household disposable income below the poverty threshold), (ii) near poverty (equivalised household disposable income between 100% and 125% of the poverty threshold) and (iii) not poverty (equivalised household disposable income above 125% of the poverty threshold),

⁵ Equivalising means adjusting household income for the 'needs' of the household. The most used equivalence scale is the 'modified OECD scale', which sets the scale equal to one for the first household member, plus 0.3 for each child plus 0.5 for each other household member.

see Table A3 in the Appendix. We include the definition of "near poverty" to identify the group of households living near the poverty line, as in Sączewska-Piotrowska (2016). These households have incomes slightly above the poverty line, but any income shock – such as having a child – can push them into poverty. It should be noted that the poverty line can be defined at a different level; for instance, the Australian Census use the 50% threshold. For the purpose of this study, the poverty threshold we use is set at 60% of median equivalised household income. In the Appendix E, we provide a less generous poverty line as robustness check. Consistent with the drop in household income presented in Table A2 in the Appendix, Table A3 shows that the largest increase in the proportions of individuals being in poverty or near poverty are around childbirth and the first year postpartum. It follows that the largest decreases in proportions of individuals not in poverty occur at these same time points. Table A3 also shows that the proportions in each category remain similar over the first five postpartum years.

Empirical Methodology

To analyse the effect of parenthood on household income, we implement a similar event study approach as Kleven et al. (2019b), exploiting sharp changes in household income around the arrival of the first child for parents. While our approach is based on the event of having the first child, we also present results of the effect of births subsequent to the first in Appendix B. Our identification assumption for causality relies on two assumptions. First, childbirth (the event) is not determined by the outcome variable. The graphical evidence supports this assumption, there is no indication that the outcome responds *prior* to childbirth. The sharp drop in income always occurs *just after* having children. Second, the average non-child earnings path is smooth. In this approach, we compare the earnings of the same individual *just* before and after time zero, assuming that in the absence of childbirth, the earnings of this individual before and after time zero would have been the same. The short-window period we consider in the analysis allows us to rely on the smoothness assumption common to all event studies for identification and do not require stronger assumptions or the use of a control group or an instrument.

For each parent in the data, we denote the year in which the individual has their first child by $t = 0$, and index all years relative to that year. As stated in Section 4, our baseline specification considers a balanced panel of parents who we observe every year between three years before having their first child and five years after, and so event time t runs from -3 to $+5$. We study the evolution of household income as a function of event time, and we run the following regression:

$$Y_{ist} = \sum_{j \neq -1} \alpha_j \cdot I[j = t] + \sum_k \beta_k \cdot I[k = age_{is}] + \sum_y \gamma_y \cdot I[y = s] + v_{ist} \quad (1)$$

Where, the dependent variable Y_{ist} is the annual household income for individual i in year s and at event time t . The first term on the right-hand side of Eq. (1) is a full set of event time dummies, omitting the year before the arrival of the first child ($t = -1$). By doing so, the event time coefficients of Eq. (1) capture the impact of children relative to the year just before the childbirth (Kleven et al. 2019b). The second term is a full set of age dummies that control for underlying life-cycle trends and the third term is a full set of year dummies that control for time trends. When analysing across households, we run Eq. (1) separately for one-parent and two-parent households.

We estimate Eq. (1) in levels – rather than in logs – to include individuals with zero income, and convert the level effects into percentages by calculating:

$$P_t = \frac{\hat{\alpha}_t}{E[\tilde{Y}_{ist}|t]} \quad (2)$$

Where, \tilde{Y}_{ist} is the predicted outcome when omitting the contribution of the event dummies, i.e., $\tilde{Y}_{ist} = \sum_k \hat{\beta}_k \cdot I[k = age_{is}] + \sum_y \hat{\gamma}_y \cdot I[y = s]$. Thus, P_t captures the year- t effect of children as a percentage of the counterfactual outcome absent children. Estimating Eq. (2) in a level-specification (rather than a log-specification) may raise the concern that the estimates are mainly driven by the effects at the top and the bottom of the distribution. In Appendix C, we present quantile regression of Eq. (1) that rule out this concern.

Results

Estimating the Effect of First Childbirth on Household Income

In this section, we provide evidence that the first childbirth in Australia is associated with a reduction of household income. Figure 1 plots the impact of the first childbirth across event time. As defined in Section 5, these are outcomes at event time t relative to the year before the first childbirth ($t = -1$), having controlled nonparametrically for age and time trends. The figure includes 95% confidence bands around the event coefficients. Estimates of the event regression are provided in Table D1 in the Appendix.

Panel A starts by showing household gross income (i.e., regular income before taxes). There is a significant drop in income experienced the years after the first childbirth: 17.3% ($t = 1$), 17.0% ($t = 2$), 19.3% ($t = 3$), 19.2% ($t = 4$) and 18.6% ($t = 5$). Five years after the birth of a first child, household income never converge back to their original level and stabilizes at around 18.3% below its level just before childbirth. Panel B considers household disposable income (i.e., gross income after taxes), rather than gross income, to see whether the Australian tax and welfare system smooths this income penalty. As shown in the figure, when the first child arrives, household disposable income significantly decreases by 15.2% ($t = 1$), 15.0% ($t = 2$), 17.1% ($t = 3$), 16.9% ($t = 4$) and 16.4% ($t = 5$). The drop in household earnings is around 16.1% in the five years after birth. Comparing panels A and B, we observe that the drop in household income is reduced by around 2%. As housing is the largest fixed costs for most households, in Panel C we consider disposable income after housing costs (i.e., rent and mortgages). Once housing costs are accounted for, the drop in household income after the first childbirth is 18.2% ($t = 1$), 16.7% ($t = 2$), 19.3% ($t = 3$), 18.7% ($t = 4$) and 17.1% ($t = 5$). The impact of children is significantly sharper when housing costs are included, in the five years after birth the drop in income increases from 16.1% (without housing costs) to 18.0% (with housing costs).

The drop in household income in Figure 1 could be partially explained by the reductions in women's hours of work, employment, and hourly wages, following the arrival of children. The impact of children on gender inequality in the labour market (i.e., the motherhood penalty) has been extensively studied in the last decades in many countries, see Kleven et al. (2019a) for a review. Australia's motherhood penalty is among the highest, about 55% in the five years following parenthood (Bahar et al. 2023). This high motherhood penalty in Australia can be explained by gender norms and the institutional settings that support these norms. According to Hickson and Marshan (2023), Australia exhibits relatively conservative norms about the roles of men and women compared to other countries. Other factors, such as job loss, separation, and subsequent births, may contribute to the lack of recovery even five years after the birth of the first child.

Our baseline results show the impact of the birth of the first child, irrespective of the total number of children the parents end up having⁶. This implies that the estimated impacts should be interpreted as capturing the *total* impact of all children. In Appendix B, we replicate the event study in earnings to explore the impact of second and third births. No further drop in income is detected for families with a second or a third childbirth. This suggests that the determinants of the

⁶ In the five-year period after the first birth, 17.7% of parents did not report another birth, 44.7% had a second birth, 27% had a third birth, 8.8% had a fourth birth and 1.8% had a fifth birth.

motherhood penalty (e.g., employment, hours worked, hourly rate) are most affected by the first birth and that there is limited opportunity for recovery between subsequent births on these determinants.

We provide a number of extensions and robustness checks in Appendix C. We examine the sensitivity of our main result (i.e., Figure 1) to a longer time-window (Figure C1), to the inclusion of negative values of household disposable income (Figure C2), to the weight put to the top and bottom of the distribution (Figure C3), to the COVID-19 pandemic (Figure C4), and to other definitions of one-parent and two-parent households (Figure C5). These figures show that the drop in household income detected in Figure 1 is robust to these other empirical specifications.

Finally, Figure 2 plots the impact of children on income over time by family type. Irrespective of the type of income, this figure shows that at the precise moment the first child arrives, the earnings paths of one- and two-parent households drop significantly. In the year after parenthood ($t = 1$), one- and two-parent households experience the same immediate drop in disposable income of almost 17%. In the second year following the initial drop ($t = 2$), the earnings paths of both households start to diverge. While the drop in income stabilizes for two-parent households from year 2 at around 16.5%, it continues falling for one-parent households. Five years after the birth of the first child, one-parent household earnings is 29.2% below its level just before childbirth. The difference in the fall in income between one- and two-parent households can be explained by gender inequities driven by the motherhood penalty, given that single mothers account for a high proportion of one-parent households (77.4%) in our dataset.

Estimating the Effect of Childbirth on Poverty Risk

This section provides evidence of a relationship between childbirth and poverty. It shows that a substantial proportion of families are in or near poverty around the first childbirth, that there is little movement out of these categories during the first five postpartum years, and that the first childbirth increases the probability of staying in, or moving into or near poverty.

Shares. Table 1 (columns 1-3) shows that 57-59% of households remained out of poverty in each of the five years following the birth of the first newborn. Between 3-5% moved out of poverty or near poverty. In total, between 37-40% of households stayed in or moved into poverty or near poverty. Table 1 (columns 4-9) shows that the movement between poverty categories was

substantially greater for one-parent households compared with two-parent households. For one-parent households, 23-32% remained out of poverty, 4-6% moved out of poverty or near poverty, and 63-70% stayed in or moved into poverty or near poverty. In contrast, for two-parent households, 61-64% remained out of poverty, 2-4% moved out of poverty or near poverty, and 34-36% stayed in or moved into poverty or near poverty.⁷

Event study. Figures 3 and 4 show the impact of the first childbirth on the probability of being in poverty (Panel A), on the probability of being near poverty (Panel B) and on the probability of not being in poverty (Panel C). Each probability is an indicator which takes a value of one when the household is in each poverty category. The results are based on the same specification as above. Estimates of the event regression are provided in Table D2 in the Appendix.

Figure 3 (Panels A and B) shows a significant and persistent increase in the probability of being in or near poverty after first childbirth for all households by around 0.12 and 0.15 percentage points, respectively. Parents are more likely to be in these categories in the years after birth than in the years before birth. We estimate that, five years after childbirth, the probability for parents of being in poverty and near poverty is 0.14 and 0.17, respectively. Figure 4 disaggregate this result by family type. In Panel A, we estimate that one-parent households are, on average, 0.17 percentage points more likely to be in poverty as a result of parenthood than two-parent households, whose probability of being in poverty is, on average, 0.10 percentage points. Interestingly, in Panel B the result for being near poverty is the opposite; two-parent households are more likely to be near poverty than one-parent households in the years post birth, i.e., 0.16 vs 0.12 (on average) respectively.⁸

Poverty risk being higher for one-parent households than for two-parent households may be explained by the absence of partner's earnings. Marital status at the time of the first birth may invoke private responses that may moderate poverty risk, as previous studies have examined (Harkness 2022; Brady et al. 2017; Page and Stevens 2004; Tach and Eads 2015). While the presence of a partner can moderate the losses in household income, two-parent households show

⁷ In all the associations shown in Table 1, the Pearson chi-squared statistic (χ^2) is between 1,561-2,628 (for all households), 84-280 (for one-parent households) and 1,247-1,960 (for two-parent households), with a p-value of less than 0.001. In all combinations, we reject the null hypothesis that there is no relation between the two variables under analysis. The Cramer's V statistic is between 0.30-0.39 (for all households), 0.22-0.40 (for one-parent households), and 0.29-0.36 (for two-parent households), which indicates that the relation between variables is medium in size.

⁸ To validate these results, we use a Probit regression analysis to test whether childbirth is associated with "poverty persistence" and "transition into poverty" in Appendix F. The results indicate that childbirth and not having a partner have higher positive correlations with "poverty persistence" and "transition into poverty" than their counterparts.

a high probability of being near poverty after parenthood. This may be explained by the fact that married mothers may be more likely to reduce their participation in the labour market or their hours of work than single mothers at the time of first birth (Harkness 2022; Loughran and Zissimopoulos 2009).

The Role of Government Family Payments Around the Time of Birth

This section examines the role of the government's family payments in moderating poverty during the time around the first childbirth. To identify the family payments around the time of birth, in Table 2 we decompose household disposable income into its main components based on the HILDA Survey Income Model derived in Wilkins (2014). The first stage sums the financial year regular income from wage and salary income, business income, investment income, private income, and government income support. Government income support include government pensions, parenting payments, allowances (which primarily comprise Newstart Allowance and Youth Allowance), family payments (FTB Part A, FTB Part B, and other parental payments), government bonus payments (such as SIFS, bonus payment for pensioners bonus back to school bonus, training and learning bonus), other non-income support payments, and other unclassified payments from the government. The second stage subtracts non-taxable income components and estimated tax deductions from gross income. Finally, disposable income results from subtracting the tax due to gross income, where the tax due is the tax on taxable income considering income tax rates, the Medicare levy, and applicable tax offsets and tax credits.

As in the previous section, we determine households' poverty status by comparing the equivalised real household disposable income to 60% of the median equivalised real household disposable income (i.e., poverty threshold) each year. To identify households' poverty status without family payments, we exclude the major government welfare payments related to childbirth and parenthood from households' disposable income, i.e., family payments⁹. It is important to note that these payments have been changing throughout the period analysed, but the purpose of this section is to describe how these payments are currently applied. Figure 5 displays the family payments received by families with a newborn in each of the three and five years before and after childbirth. The figure shows the importance of family payments around birth. As expected, family payments increase in the years after childbirth, especially that from FTB.

⁹ We exclude the value of family payments received from Parenting Payments, Family Tax Benefit (FTB Part A and B), Maternity Allowance, and the Single Income Family Bonus (SIFS).

Figure 6 shows that poverty rates with family payments are consistently lower than rates without family payments. Without family payments, the average poverty rate increases from 26% for one-parent households and 10% for two-parent households before childbirth, to 63% and 20%, respectively, in the years following birth. With family payments, the average poverty rates after childbirth are 37% for one-parent households and 11% for two-parent households¹⁰. Estimates of the mean poverty rates with their standard errors and confidence intervals are provided in Table D3 in the Appendix. While family payments help reduce poverty among households around childbirth, these payments do not protect them from falling into poverty after childbirth. Even with family payments, a substantial proportion of families are entering parenthood and raising their children in poverty. This result is consistent with previous studies for Australia (Phillips et al. 2020) and for the US (Hamilton et al. 2023).

Policy Implications

How to prevent families from falling into poverty after childbirth? How to eradicate or reduce child poverty? From a purely economic perspective, we can think about increasing family benefits¹¹, providing cash transfers to families or modifying the childcare system and parental leave. But these policies entail important trade-offs. For example, if increasing family benefits had the unintended effects of reducing labour supply or training among women, given the strong gender norms in Australia (Hickson and Marshan 2023; Bahar et al. 2023), this could exacerbate the motherhood penalty. Effects to labour supply and training could also have long-run effects on lifetime wages and superannuation balances. Furthermore, any increase to family benefits would need to be funded, most likely through the tax system, which would entail new tensions that warrant discussion.

¹⁰ We tested the difference between the mean poverty rate in the year before birth ($t = -1$) and the mean poverty rate in each year after birth ($t = 1, 2, 3, 4, 5$), with and without family benefits, to see if this difference is statistically significant. Without family benefits, the mean poverty rate in the year before birth is significantly lower than that in the years after birth ($p < 0.001$). When family benefits are included, the mean poverty rate in the year before birth remains significantly lower than in the years after birth for all households ($p < 0.001$), for two-parent households ($p < 0.001$), and for one-parent households ($p < 0.1$).

¹¹ In Appendix F, we use Australia's COVID-19 income supplements as a conceptual starting point to consider how the income penalty and early childhood poverty could be changed if household income was substantially increased over the first five postpartum years. This hypothetical change consists of a yearly increase in disposable household income (income supplement) that begins the first year after the birth of the first child and continues for the next five years. This modelling is purely illustrative and mechanical.

Although poverty is defined by household income, actions to halve or even eradicate child poverty will be more complex than increasing household income alone. Previous studies (Goldfeld et al. 2018a, 2018b, 2019; Koh et al. 2010) have conceptualized child poverty in a multidimensional framework based on the bio-ecological perspective that "child development occurs within a complex system of interacting environments and is shaped by the circumstances in which children live, learn and grow" (Goldfeld et al. 2018b: 1486). This perspective of understanding child poverty results in a "four-factor model" structured around the interrelated social determinant lenses of sociodemographic factors (such as community unemployment rate, parent education and ethnicity), geographic environments (such as child/parent perceptions of neighbourhood and access to parks or leisure facilities), health conditions (such as substance abuse within the community, parent mental illness and oral health disorders), and risk factors (such as access to health care, parenting style, preschool attendance and birth weight). Children can have different combinations of exposure to disadvantage across these four lenses and over time (Goldfeld et al. 2018b).

Therefore, addressing child poverty requires a more comprehensive approach, a rigorous understanding of the extent of the problem and identification of the modifiable leverage points for change (Goldfeld et al. 2018a). Policy interventions should consider "the interaction between the child, their biology and the multiple and diverse factors influencing their experiences across ecological settings and over time" (Goldfeld et al. 2018b: 1494). Our analysis is a first step in this direction. This study aims to contribute on this perspective by providing evidence base of the effect of childbirth on household income and poverty and showing the role of the Australian government's family payment system to further ameliorate child poverty during the early years.

Conclusion

Using the HILDA Survey for the period 2001-2021, we conducted a quasi-experimental approach based on event studies around the birth of the first child. For a five-year window, we find sharp effects: the arrival of the first child reduces household income between 16% and 18% (depending on the type of income). This drop in income is higher for one-parent households than for two-parent households. Furthermore, we connect this drop in income with the risk of poverty around the time of childbirth. We show that 37-40% of households stayed or moved into or near poverty after childbirth. Movement between poverty categories was substantially greater for one-parent than two-parent households. We also use the event study approach to shed light on staying

in or moving into poverty. We show that the probability of being in poverty as a result of parenthood is, on average, 0.12 percentage points for all households, 0.17 percentage points for one-parent households and 0.10 percentage points for two-parent households. Finally, we find that Australia's family payments reduce but do not eliminate child poverty. This shows the potential that the government's family benefits offer for reducing or eradicating poverty; noting, however, the complexity of the challenge is likely to require more than increases to household income alone. As the current study focuses on household income alone, future research should examine whether households engage in precautionary savings pre-pregnancy, and how childbirth change consumption patterns and families' overall wealth. It could also be important for future studies to consider outcomes in addition to income and poverty, such as material deprivation, financial stress, physical and mental health and wellbeing, and life satisfaction.

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Tables

Table 1: Transitions into and out of poverty

	All households			One-parent households			Two-parent households		
	Poverty (1)	Near poverty (2)	Not poverty (3)	Poverty (4)	Near poverty (5)	Not poverty (6)	Poverty (7)	Near poverty (8)	Not poverty (9)
Panel A: t=1									
Poverty	8%	2%	1%	22%	2%	3%	6%	2%	1%
Near poverty	3%	3%	2%	7%	6%	1%	2%	3%	1%
Not poverty	9%	13%	59%	16%	10%	32%	8%	14%	64%
Panel B: t=2									
Poverty	7%	3%	2%	18%	6%	3%	5%	2%	1%
Near poverty	3%	2%	2%	7%	4%	3%	2%	2%	1%
Not poverty	11%	15%	56%	21%	13%	23%	10%	15%	61%
Panel C: t=3									
Poverty	7%	2%	2%	19%	3%	5%	5%	2%	2%
Near poverty	3%	3%	2%	8%	5%	1%	2%	2%	2%
Not poverty	10%	15%	57%	16%	12%	30%	9%	16%	61%
Panel D: t=4									
Poverty	7%	2%	2%	20%	2%	5%	5%	2%	2%
Near poverty	3%	3%	2%	7%	6%	1%	2%	2%	2%
Not poverty	10%	13%	58%	16%	11%	31%	9%	14%	63%
Panel E: t=5									
Poverty	7%	2%	2%	17%	6%	4%	5%	1%	2%
Near poverty	3%	2%	2%	10%	3%	1%	2%	2%	2%
Not poverty	9%	14%	58%	11%	17%	30%	9%	14%	62%

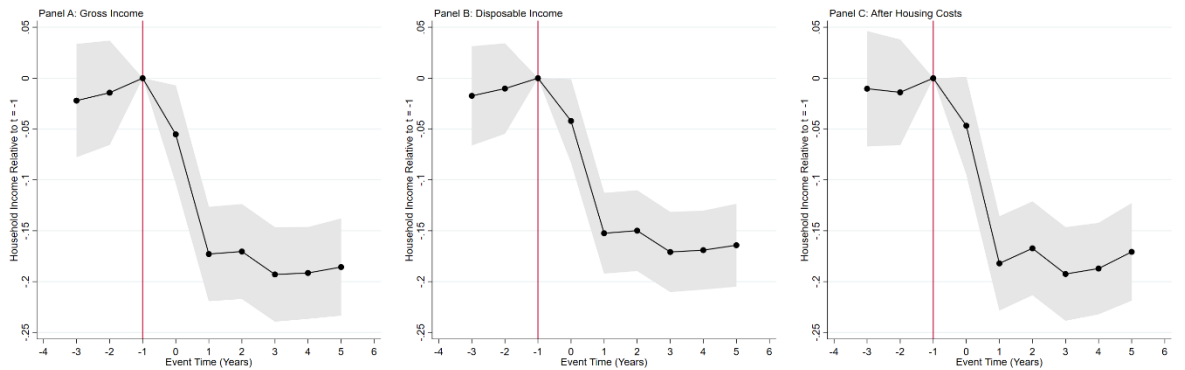
Notes: Panels A-E refer to the number of years after the first child arrives. Estimations for all households are calculated using Sample 1 and estimations for one-parent and two-parent households are calculated using Sample 2.

Table 2: Components of household disposable income

<i>Gross income</i>
(+) Wages and salary
(+) Business income
(+) Investment income
(+) Government income support
(+) Pensions
(+) Parenting payments
(+) Allowances
(+) Family payments
(+) Periodic bonus payments
(+) Other non-income support payments
(+) Private income
<i>Taxable income</i>
(+) Gross income
(-) Superannuation income
(-) Tax-exempt government payments
(-) Transfers from non-household members
(-) Salary sacrificed wages and salary
(-) Deductions
<i>Disposable income = Gross income - tax due</i>

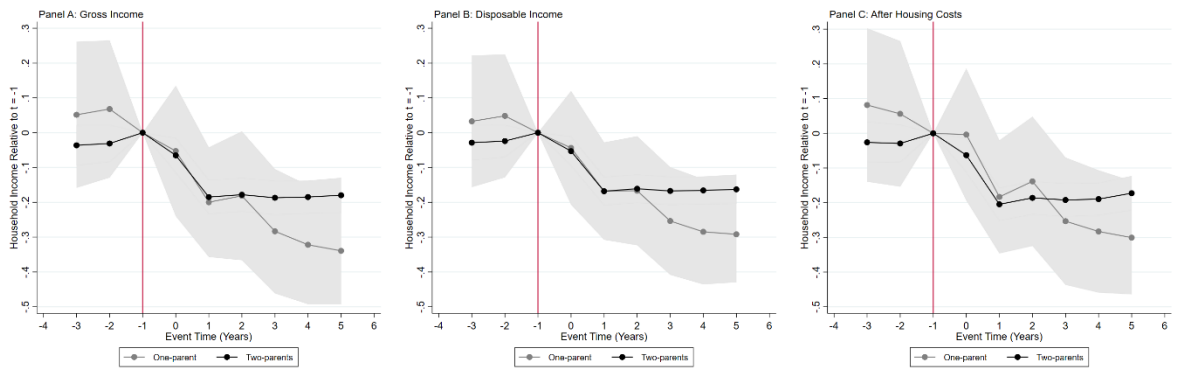
Figures

Figure 1: Impact of First Childbirth, All households



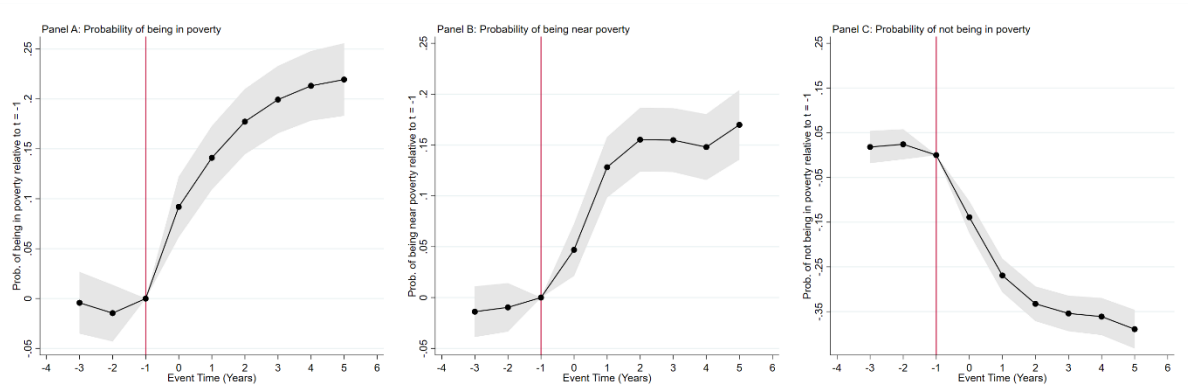
Notes: The figure shows event time coefficients estimated from Eq. (1) as a percentage of the counterfactual outcome, for all households and for different income outcomes. The vertical line refers to the year before the arrival of the first child. Coefficients on age and year dummies are omitted. The shaded 95% confidence intervals are based on robust standard errors. Estimations are calculated using Sample 1.

Figure 2: Impact of First Childbirth, One-parent vs Two-parent households



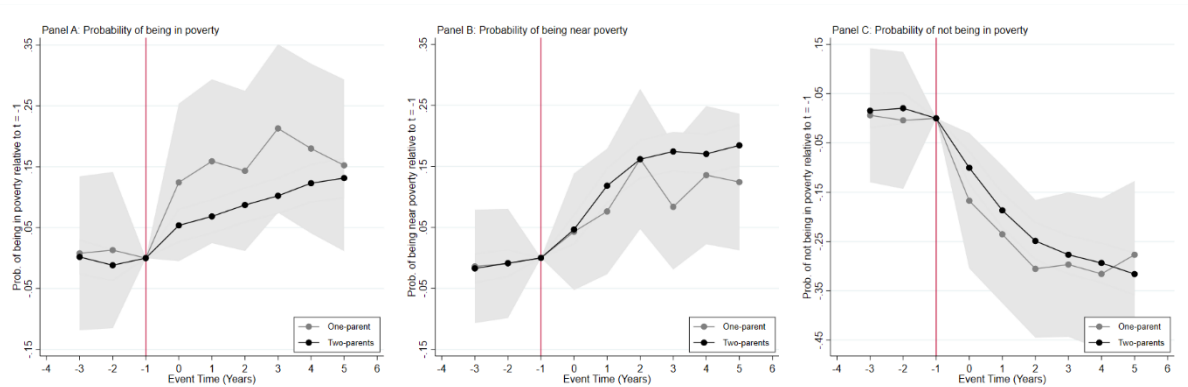
Notes: The figure shows event time coefficients estimated from Eq. (1) as a percentage of the counterfactual outcome, for one-parent and two-parent households, and for different income outcomes. The vertical line refers to the year before the arrival of the first child. Coefficients on age and year dummies are omitted. The shaded 95% confidence intervals are based on robust standard errors. Estimations are calculated using Sample 2.

Figure 3: Probability of being poor after parenthood, All households.



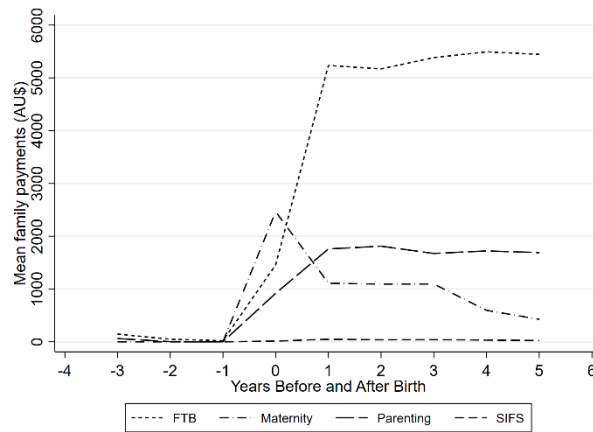
Notes: The figure shows event time coefficients estimated from Eq. (1), for all households and for different poverty outcomes. The vertical line refers to the year before the arrival of the first child. Coefficients on age and year dummies are omitted. The shaded 95% confidence intervals are based on robust standard errors. Estimations are calculated using Sample 1.

Figure 4: Probability of being poor after parenthood, One-parent vs Two-parent households



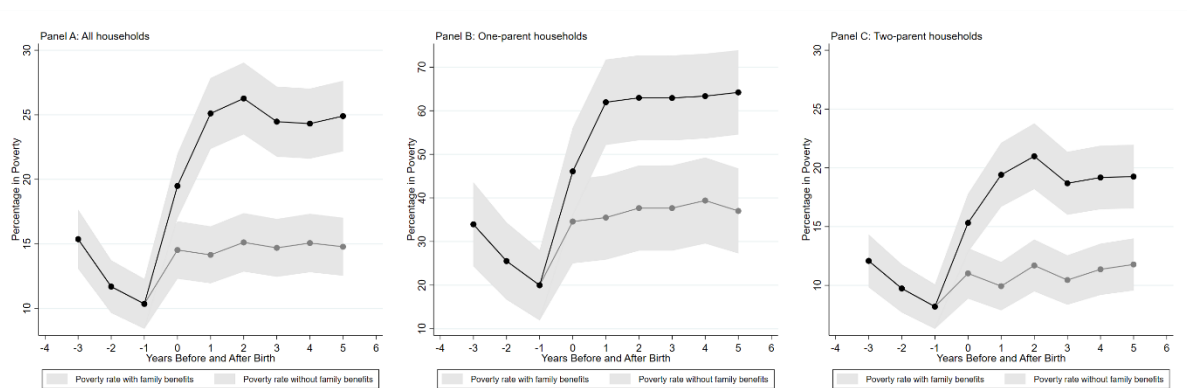
Notes: The figure shows event time coefficients estimated from Eq. (1), for one-parent and two-parent households and for different poverty outcomes. The vertical line refers to the year before the arrival of the first child. Coefficients on age and year dummies are omitted. The shaded 95% confidence intervals are based on robust standard errors. Estimations are calculated using Sample 2.

Figure 5: Australian government family payments during childbirth



Notes: Family benefits include Parenting Payments, Family Tax Benefits (Part A and B), Maternity Allowance, and the Single Income Family Bonus (SIFS). Note that the mean value of the SIFS is positive but little for the years after birth (around \$37). Estimations are calculated using Sample 1. Population weights are included.

Figure 6: Poverty rates during childbirth



Notes: Poverty rates without family payments exclude the value of payments received from Parenting Payments, Family Tax Benefits (Part A and B), Maternity Allowance, and the Single Income Family Bonus (SIFS). Estimations for all households are calculated using Sample 1 and estimations for one-parent and two-parent households are calculated using Sample 2. Population weights are included.

Appendix A: Descriptive statistics

Table A1: Sample selection

	Indiv.	Obs.
Broad sample	45,570	433,115
Selection 1: Restrict to one parent with first-born children	4,119	58,166
Selection 2: Restrict to parents aged 15-50	4,080	53,708
Selection 3: Balanced panel 9-year window	1,186	10,674
Selection 4: Drop parents with a previous child	969	8,721
Sample 1	969	8,721
Sample 2	918	8,262

Notes: Indiv.=Individuals; Obs.=Observations

Table A2: The financial situation of households around the time of first childbirth (in \$2021)

Birth (year)	Indiv.	Obs.	Gross income		Disposable income		After housing costs	
			Mean	Median	Mean	Median	Mean	Median
-3	969	8,721	142,648	130,631	113,148	105,807	92,781	83,818
-2	969	8,721	147,518	136,815	116,525	109,794	93,369	84,638
-1	969	8,721	157,758	141,473	122,883	115,454	97,824	88,829
0	969	8,721	153,963	139,839	121,341	113,596	95,878	87,535
1	969	8,721	140,808	121,423	111,442	99,580	86,374	74,910
2	969	8,721	145,511	127,058	114,834	103,764	90,078	78,798
3	969	8,721	149,687	133,526	117,870	107,737	92,322	82,524
4	969	8,721	152,636	137,488	119,788	111,238	93,759	86,754
5	969	8,721	158,708	140,641	124,036	114,659	99,202	88,407

Notes: Population weights are included. Indiv.=Individuals; Obs.=Observations. Estimations are calculated using Sample 1.

Table A3: The demographic situation of households around the time of first childbirth

Birth (year)	Indiv.	Obs.	Age of parent (mean)	Have a partner (%)	Number children	Poverty (%)	Near poverty (%)	Not poverty (%)
-3	969	8,721	28.2	72.9%	0.0	16.4%	8.8%	74.5%
-2	969	8,721	29.3	78.2%	0.0	12.8%	7.0%	79.6%
-1	969	8,721	30.3	86.9%	0.0	10.9%	7.0%	81.6%
0	969	8,721	31.3	92.0%	1.0	16.9%	10.4%	72.4%
1	969	8,721	32.2	90.3%	1.1	18.6%	17.8%	63.4%
2	969	8,721	33.2	89.3%	1.4	18.6%	20.4%	60.9%
3	969	8,721	34.1	88.0%	1.6	19.4%	18.2%	62.3%
4	969	8,721	35.1	87.3%	1.8	18.7%	17.8%	63.5%
5	969	8,721	36.1	86.5%	1.9	17.9%	18.2%	63.9%

Notes: Population weights are included. Indiv.=Individuals; Obs.=Observations. Estimations are calculated using Sample 1.

Appendix B: Subsequent childbirths

Figure B1: Impact of Second Childbirth, All households

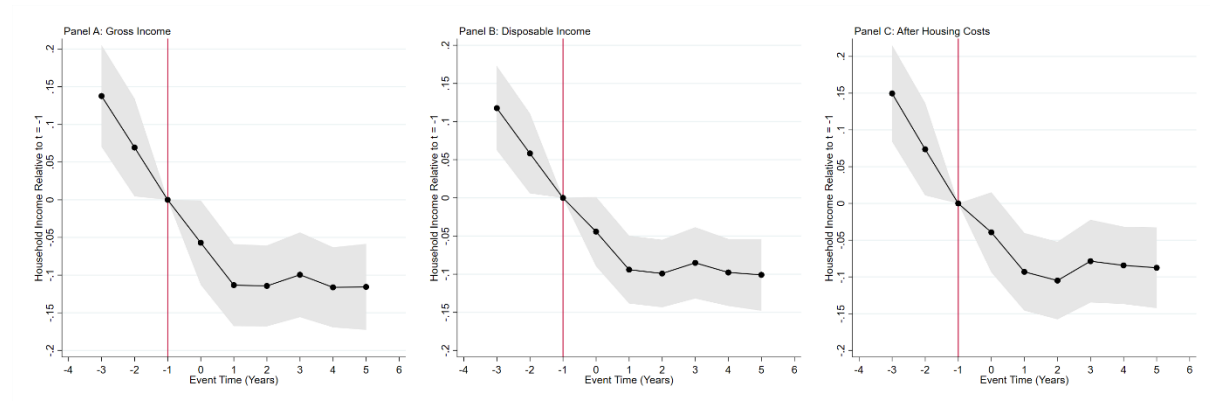
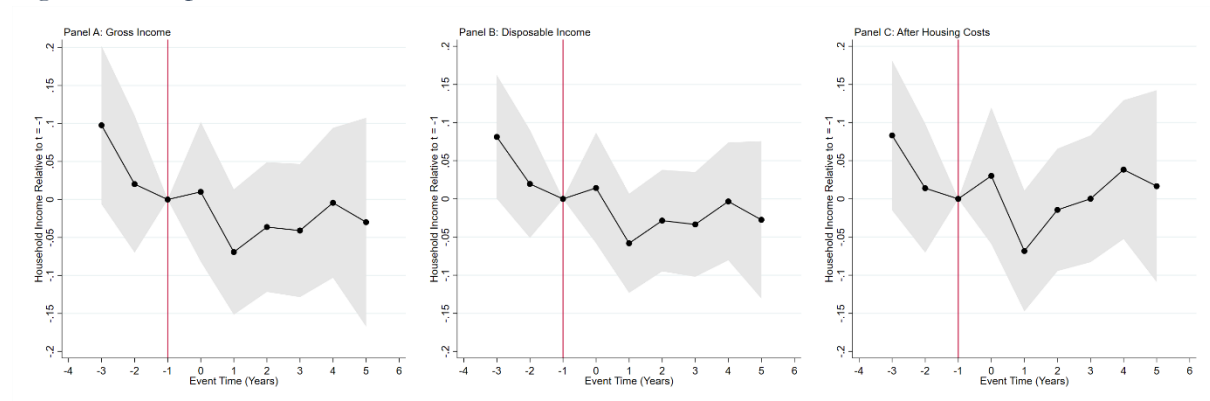


Figure B2: Impact of Third Childbirth, All households



Appendix C: Robustness checks

Figure C1: Extension of time window

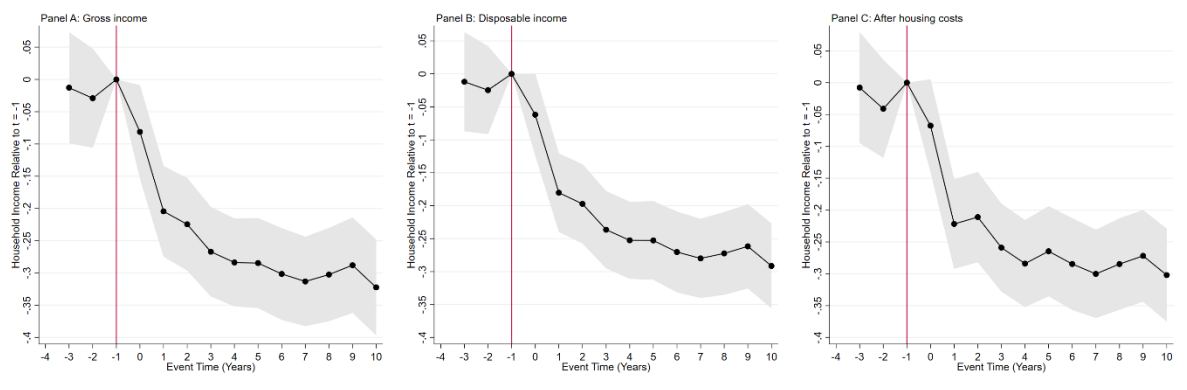


Figure C2: Real household disposable income with negative values

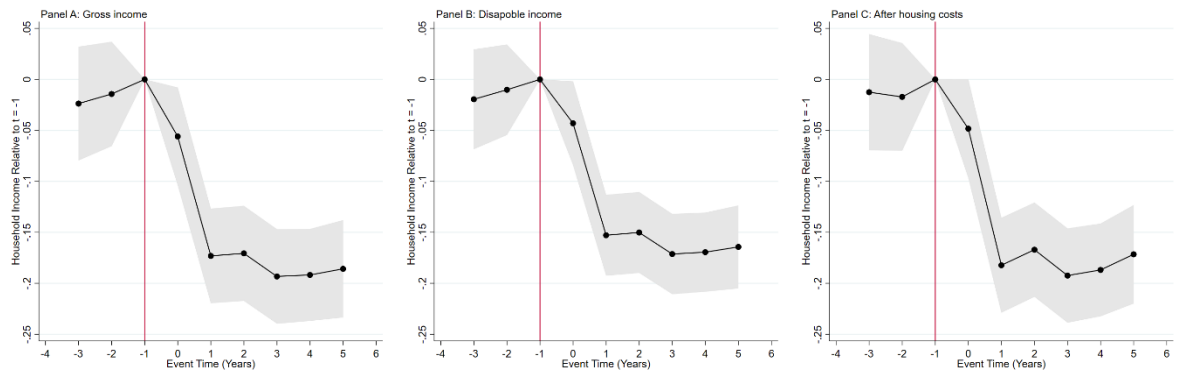


Figure C3: Median impacts of children

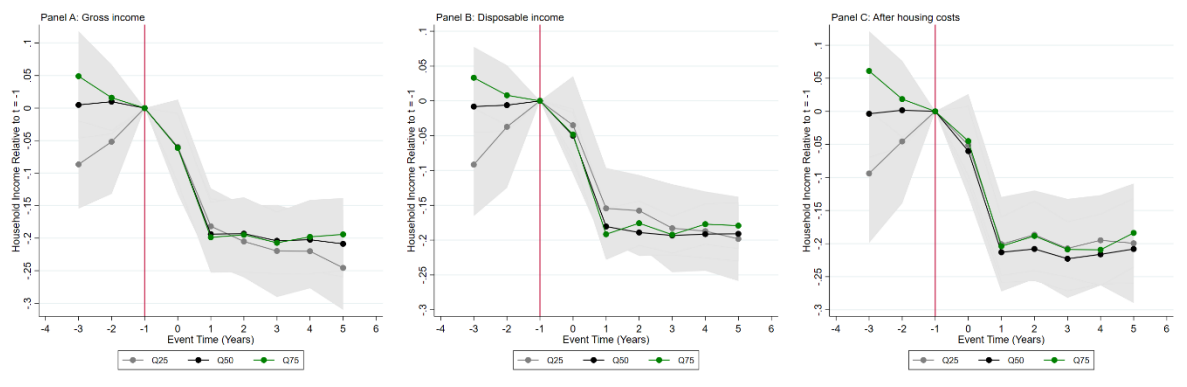


Figure C4: Drop the years of the COVID-19 pandemic

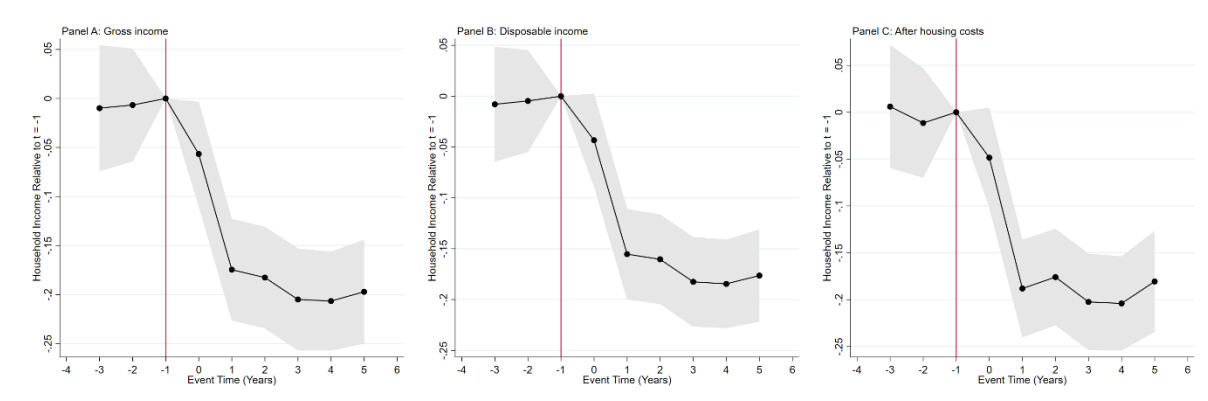
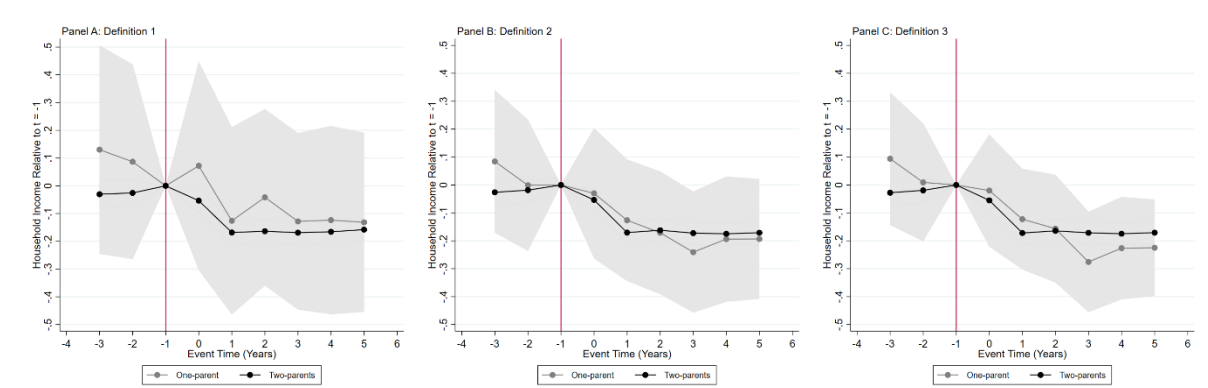


Figure C5: Other definitions of One-parent and Two-parent households



Notes: Definition 1 defines one-parent households as individuals who have no partner after birth and two-parent households as individuals who have a partner for five years after birth. Definition 2 defines one-parent households as individuals who have a partner for one year or less after birth and two-parent households as individuals who have a partner for more than one year after birth. Definition 3 defines one-parent households as individuals who have a partner for two years or less after birth and two-parent households as individuals who have a partner for more than two years after birth.

Appendix D: Results

Table D1: Event study regression results (Figures 1 and 2)

	All households			One-parent households			Two-parent households		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
t = - 3	-2,999 (3,858)	-1,873 (2,678)	-895 (2,489)	4,748 (9,857)	-5,171 (4,237)	2,536 (7,487)	-3,210 (2,901)	4,885 (6,750)	-2,348 (2,706)
t = - 2	-2,064 (3,760)	-1,163 (2,571)	-1,262 (2,397)	6,457 (9,527)	-4,688 (4,142)	3,839 (7,153)	-2,841 (2,790)	3,418 (6,528)	-2,777 (2,617)
t = 0	-8,786** (3,894)	-5,224** (2,598)	-4,627* (2,413)	-5,386 (9,808)	-10,880** (4,275)	-3,706 (7,100)	-6,879** (2,803)	-239 (6,301)	-6,545** (2,617)
t = 1	-28,770*** (3,932)	-19,686*** (2,608)	-18,775*** (2,431)	-20,615** (8,293)	-32,379*** (4,339)	-14,418** (6,137)	-22,707*** (2,813)	-11,952** (5,422)	-22,148*** (2,626)
t = 2	-29,590*** (4,125)	-20,089*** (2,707)	-17,910*** (2,510)	-19,762* (10,297)	-32,518*** (4,505)	-15,021** (7,198)	-22,533*** (2,900)	-9,498 (6,522)	-20,873*** (2,697)
t = 3	-34,830*** (4,263)	-23,698*** (2,781)	-21,369*** (2,599)	-32,368*** (10,411)	-35,386*** (4,676)	-23,820*** (7,412)	-24,209*** (2,990)	-18,047*** (6,669)	-22,330*** (2,811)
t = 4	-35,508*** (4,259)	-23,978*** (2,799)	-21,227*** (2,595)	-36,511*** (9,888)	-35,977*** (4,682)	-26,625*** (7,212)	-24,548*** (3,014)	-20,099*** (6,390)	-22,542*** (2,812)
t = 5	-35,514*** (4,654)	-23,946*** (3,023)	-20,050*** (2,866)	-38,888*** (8,989)	-36,237*** (5,156)	-27,540*** (6,638)	-24,871*** (3,280)	-21,556*** (5,977)	-21,361*** (3,138)
Constant	58,891** (24,230)	52,251*** (18,576)	35,998*** (11,709)	115,462*** (27,856)	50,473* (26,707)	98,578*** (19,809)	45,536** (21,210)	76,476*** (16,429)	30,665*** (11,352)
Observations	8,721	8,721	8,721	882	882	882	7,380	7,380	7,380
R-squared	0.10	0.11	0.08	0.16	0.15	0.13	0.10	0.11	0.08
Adjusted R-squared	0.0965	0.0994	0.0720	0.0954	0.0796	0.0609	0.0918	0.100	0.0748

Notes: The table reports the event study regression estimates of Eq. (1). Columns (1), (4) and (7) refer to household gross income, (2), (5), (8) refer to household disposable income, and (3), (6), (9) refer to household disposable income after housing costs. Estimations for all households are calculated using Sample 1 and estimations for one-parent and two-parent households are calculated using Sample 2. Coefficients on age and year dummies are omitted. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table D2: Event study regression results (Figures 3 and 4)

	All households			One-parent households			Two-parent households		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
t = - 3	-0.00 (0.02)	-0.01 (0.01)	0.02 (0.02)	0.07 (0.07)	-0.10* (0.05)	0.02 (0.07)	-0.01 (0.02)	-0.01 (0.01)	0.02 (0.02)
t = - 2	-0.01 (0.01)	-0.01 (0.01)	0.02 (0.02)	0.04 (0.07)	-0.08 (0.05)	0.03 (0.07)	-0.01 (0.01)	-0.01 (0.01)	0.02 (0.02)
t = 0	0.09*** (0.02)	0.05*** (0.01)	-0.14*** (0.02)	0.16** (0.07)	0.04 (0.05)	-0.20*** (0.07)	0.08*** (0.02)	0.05*** (0.01)	-0.13*** (0.02)
t = 1	0.14*** (0.02)	0.13*** (0.02)	-0.27*** (0.02)	0.24*** (0.07)	0.05 (0.06)	-0.28*** (0.07)	0.12*** (0.02)	0.14*** (0.02)	-0.27*** (0.02)
t = 2	0.18*** (0.02)	0.16*** (0.02)	-0.33*** (0.02)	0.28*** (0.07)	0.09 (0.06)	-0.38*** (0.07)	0.16*** (0.02)	0.17*** (0.02)	-0.33*** (0.02)
t = 3	0.20*** (0.02)	0.15*** (0.02)	-0.35*** (0.02)	0.29*** (0.07)	0.07 (0.06)	-0.36*** (0.07)	0.17*** (0.02)	0.18*** (0.02)	-0.35*** (0.02)
t = 4	0.21*** (0.02)	0.15*** (0.02)	-0.36*** (0.02)	0.30*** (0.08)	0.05 (0.06)	-0.36*** (0.08)	0.19*** (0.02)	0.17*** (0.02)	-0.36*** (0.02)
t = 5	0.22*** (0.02)	0.17*** (0.02)	-0.39*** (0.02)	0.25*** (0.07)	0.15** (0.07)	-0.39*** (0.07)	0.21*** (0.02)	0.18*** (0.02)	-0.39*** (0.02)
Constant	0.56* (0.29)	0.33 (0.22)	0.11 (0.25)	-0.43** (0.21)	1.40*** (0.21)	0.02 (0.23)	0.75** (0.30)	0.03 (0.05)	0.21 (0.31)
Observations	8,721	8,721	8,721	882	882	882	7,380	7,380	7,380
R-squared	0.10	0.04	0.14	0.15	0.07	0.18	0.09	0.05	0.14
Adjusted R-squared	0.0887	0.0357	0.135	0.0833	0.000114	0.112	0.0820	0.0449	0.129

Notes: The table reports the event study regression estimates of Eq. (1). Columns (1), (4) and (7) refer to household gross income, (2), (5), (8) refer to household disposable income, and (3), (6), (9) refer to household disposable income after housing costs. Estimations for all households are calculated using Sample 1 and estimations for one-parent and two-parent households are calculated using Sample 2. Coefficients on age and year dummies are omitted. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table D 3: Poverty rates during childbirth (Figure 6)

	All households					One-parent households					Two-parent households				
	Obs	Mean	Std.Err.	95% conf. interval		Obs	Mean	Std.Err.	95% conf. interval		Obs	Mean	Std.Err.	95% conf. interval	
Panel A: With family benefits															
t = -3	966	0.15	0.01	0.13	0.18	97	0.34	0.05	0.24	0.44	818	0.12	0.01	0.10	0.14
t = -2	963	0.12	0.01	0.10	0.14	97	0.26	0.04	0.17	0.34	816	0.10	0.01	0.08	0.12
t = -1	965	0.10	0.01	0.08	0.12	98	0.20	0.04	0.12	0.28	817	0.08	0.01	0.06	0.10
t = 0	967	0.15	0.01	0.12	0.17	98	0.35	0.05	0.25	0.44	819	0.11	0.01	0.09	0.13
t = 1	966	0.14	0.01	0.12	0.16	98	0.35	0.05	0.26	0.45	818	0.10	0.01	0.08	0.12
t = 2	968	0.15	0.01	0.13	0.17	98	0.38	0.05	0.28	0.47	820	0.12	0.01	0.09	0.14
t = 3	968	0.15	0.01	0.12	0.17	98	0.38	0.05	0.28	0.47	820	0.10	0.01	0.08	0.13
t = 4	968	0.15	0.01	0.13	0.17	98	0.39	0.05	0.30	0.49	820	0.11	0.01	0.09	0.14
t = 5	968	0.15	0.01	0.13	0.17	98	0.37	0.05	0.27	0.47	820	0.12	0.01	0.10	0.14
Panel B: Without family benefits															
t = -3	966	0.15	0.01	0.13	0.18	97	0.34	0.05	0.24	0.44	818	0.12	0.01	0.10	0.14
t = -2	963	0.12	0.01	0.10	0.14	97	0.26	0.04	0.17	0.34	816	0.10	0.01	0.08	0.12
t = -1	965	0.10	0.01	0.08	0.12	98	0.20	0.04	0.12	0.28	817	0.08	0.01	0.06	0.10
t = 0	967	0.19	0.01	0.17	0.22	98	0.46	0.05	0.36	0.56	819	0.15	0.01	0.13	0.18
t = 1	966	0.25	0.01	0.22	0.28	98	0.62	0.05	0.52	0.72	818	0.19	0.01	0.17	0.22
t = 2	968	0.26	0.01	0.23	0.29	98	0.63	0.05	0.53	0.73	820	0.21	0.01	0.18	0.24
t = 3	968	0.24	0.01	0.22	0.27	98	0.63	0.05	0.53	0.73	820	0.19	0.01	0.16	0.21
t = 4	968	0.24	0.01	0.22	0.27	98	0.63	0.05	0.54	0.73	820	0.19	0.01	0.16	0.22
t = 5	968	0.25	0.01	0.22	0.28	98	0.64	0.05	0.55	0.74	820	0.19	0.01	0.17	0.22

Notes: Estimations for all households are calculated using Sample 1 and estimations for one-parent and two-parent households are calculated using Sample 2. Population weights are included.

Appendix E: Robustness check – poverty threshold

Table E 1: Transitions into and out of poverty

	All households			One-parent households			Two-parents households		
	Poverty	Near poverty	Not poverty	Poverty	Near poverty	Not poverty	Poverty	Near poverty	Not poverty
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: t=1									
Poverty	4%	2%	2%	15%	3%	4%	2%	1%	1%
Near poverty	1%	2%	2%	2%	3%	2%	1%	2%	2%
Not poverty	4%	9%	74%	9%	16%	45%	3%	8%	78%
Panel B: t=2									
Poverty	3%	2%	2%	10%	5%	7%	2%	1%	1%
Near poverty	1%	2%	2%	3%	2%	2%	1%	2%	2%
Not poverty	5%	10%	72%	13%	15%	42%	4%	10%	76%
Panel C: t=3									
Poverty	3%	2%	3%	12%	2%	8%	2%	1%	2%
Near poverty	2%	1%	2%	6%	1%	0%	1%	1%	2%
Not poverty	5%	9%	73%	13%	11%	46%	4%	9%	77%
Panel D: t=4									
Poverty	3%	2%	3%	8%	8%	6%	2%	1%	2%
Near poverty	1%	2%	2%	4%	2%	1%	1%	2%	3%
Not poverty	5%	9%	73%	11%	12%	47%	4%	10%	76%
Panel E: t=5									
Poverty	3%	2%	3%	9%	5%	8%	2%	1%	2%
Near poverty	2%	2%	2%	4%	2%	1%	1%	2%	2%
Not poverty	5%	8%	74%	9%	13%	48%	4%	8%	78%

Notes: Poverty threshold at 50% of median equivalised household disposable income.

Figure E1: Probability of being poor after parenthood, All households.

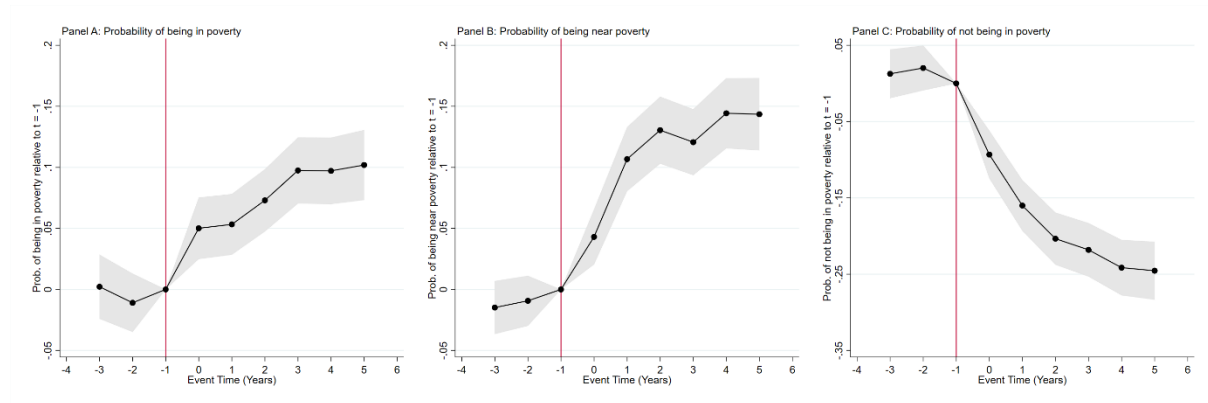


Figure E2: Probability of being poor after parenthood, One-parent vs Two-parent households

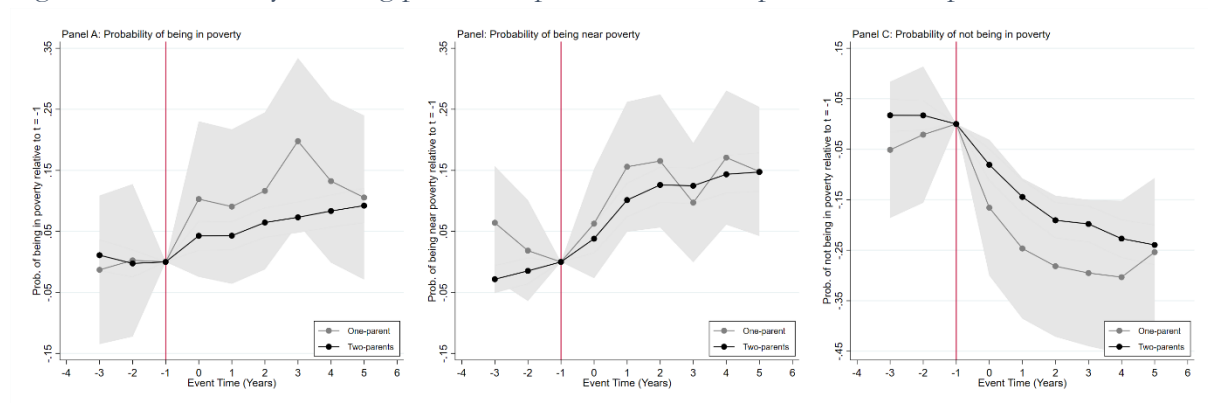
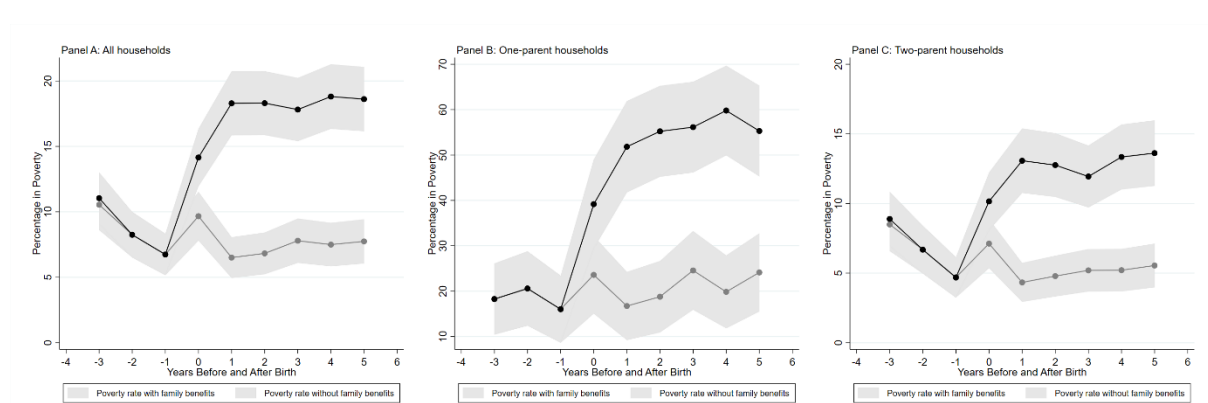


Figure E3: Poverty rates during childbirth



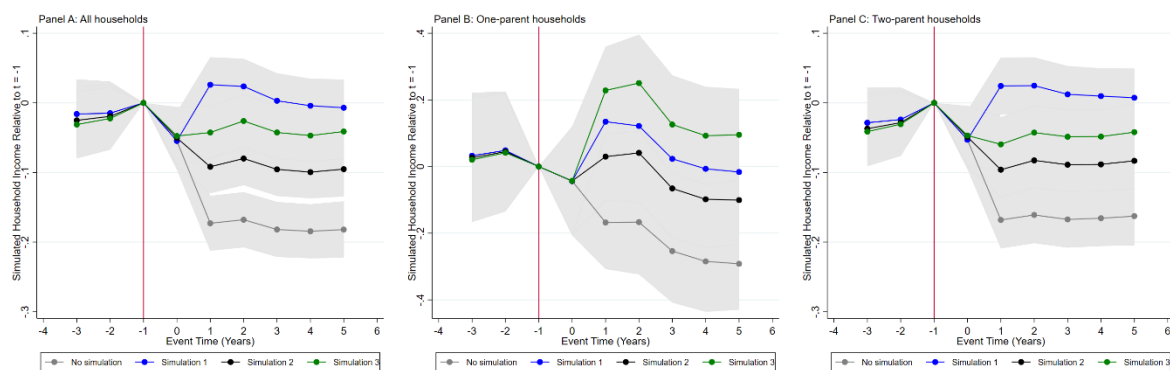
Appendix F: Other analysis

Table F1: Probit regression analysis

Dependent variable:	Poverty persistence (1)	Transition into poverty (2)	Poverty persistence (strict) (3)	Transition into poverty (strict) (4)
No childbirth	0.066*** (0.004)	0.184*** (0.008)	0.049*** (0.004)	0.080*** (0.006)
Childbirth	0.137*** (0.005)	0.246*** (0.006)	0.102*** (0.005)	0.095*** (0.004)
No partner	0.211*** (0.013)	0.243*** (0.015)	0.170*** (0.012)	0.159*** (0.013)
Partner	0.090*** (0.003)	0.221*** (0.005)	0.064*** (0.003)	0.081*** (0.003)
No childbirth x No partner	0.131*** (0.017)	0.212*** (0.024)	0.103*** (0.015)	0.151*** (0.022)
No childbirth x Partner	0.055*** (0.004)	0.181*** (0.008)	0.040*** (0.003)	0.072*** (0.005)
Childbirth x No partner	0.265*** (0.017)	0.261*** (0.018)	0.217*** (0.017)	0.163*** (0.016)
Childbirth x Partner	0.119*** (0.005)	0.245*** (0.007)	0.085*** (0.005)	0.086*** (0.004)
Observations	8,262	8,258	8,099	8,254

Notes: The table reports Probit regression estimates where the dependent variable is an indicator for poverty persistence and transition into poverty. Column 1 is an indicator for whether the household is in poverty (or near poverty) in years $t-1$ and $t+1$. Column 2 is an indicator for whether the household moved from not poverty in year $t-1$ to poverty (or near poverty) in year $t+1$. Column 3 is an indicator for whether the household is in poverty in years $t-1$ and $t+1$. Column 4 is an indicator for whether the household moved from not poverty in year $t-1$ to poverty in year $t+1$. The coefficients are marginal predicted probabilities. Coefficients on age and year dummies are omitted. Estimations are calculated using Sample 2. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Figure F1: Hypothetical income transfer



Notes: Simulation 1 = \$26,000 to all households, Simulation 2 = \$26,000 to low-income households, and Simulation 3 = \$52,000 to low-income one-parent households and \$39,000 to low-income two-parent households. The hypothetical income transfer is a supplement to household disposable income during $t=1-5$. Poverty is defined as households in poverty or near poverty in $t=1-5$. Estimations are calculated using Sample 2.



60
YEARS
IMPACT