

# What Works for Working Couples? Work arrangements, Maternal Labor Supply and the Division of Home Production\*

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## Abstract

Do work arrangements matter for the child penalty? Does an increase in maternal labor supply lead to a more equal division of home production between mothers and fathers? The Australian 2009 Fair Work Act explicitly entitled parents of young children to request a (reasonable) change in work arrangements. Leveraging variation in the timing of the law, timing of childbirth, and the bite of the law across different occupations and industries, we establish three main results. First, the Fair Work Act was used by new mothers to reduce their weekly working hours without renouncing their permanent contract, hence maintaining a regular schedule. Second, with this work arrangement, working mothers' child penalty declined from a 47 percent drop in hours worked to a 38 percent drop. For the most exposed mothers, the Fair Work Act led to both a 51% increase in the probability of staying in permanent contracts after childbirth, and a 38% decrease in the child penalty in hours of work. Third, while this implies a significant shift towards equality in the female- and male-shares of household income, we don't observe any changes in the female (disproportionate) share of home production.

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# 1 Introduction

In most countries, women on average experience a drop in labor earnings when becoming parents, while men do not (Kleven et al., 2023). This is mirrored by the fact that children bring with them a very large demand for time, which falls disproportionately on women (Figure 1). Therefore, we could say that this “child penalty” in earnings is a matter of time, and more precisely, how time-intensive tasks, such as paid work and home production, are allocated within person and between partners in a couple.

Work arrangements are what determine when, where, and how work is to be performed. As such, we do expect them to impact the ability of parents to balance paid work and home production. While Goldin’s seminal publications make a strong case for the structure of work and work arrangements to be responsible for a large share of the gender pay gap (Goldin, 2014; Goldin and Katz, 2016), we yet lack causal evidence directly linking specific work arrangements to women’s labor supply and to how tasks are split within the household.

This paper fills this gap by showing that a specific type of work arrangement – the possibility of reducing work hours while keeping a regular schedule – reduces the child penalty in labor supply for mothers but does not have a feedback effect on how tasks are split within the household.

We leverage the Australian 2009 Fair Work Act as a natural experiment to make a causal statement on the impact of work arrangements on the time use of mothers and their partners. This law changed a very specific work arrangement: it enabled mothers to reduce hours of work within their permanent contracts, which are generally associated with a regular schedule, without switching to casual contracts, which are characterized by irregular schedules, and which used to be the main route to reducing work hours below full-time. By expanding access to regular-schedule less-than-full-time jobs (“permanent reduced hours”), the passage of the Fair Work Act allows us to study the (positive) impact of this work arrangement on maternal labor supply and on the (null) reallocation of tasks within the household.

First, we show that the 2009 Fair Work Act enabled mothers to reduce work hours while maintaining a permanent contract and thus a regular schedule. Before the Fair Work Act, it used to be uncommon to work less than full-time in permanent contracts (collective agreements –“awards”– mostly did not consider this option), and individuals who wanted to reduce hours, primarily mothers, had to turn to casual contracts, characterized by very irregular schedules. The Fair Work Act *de facto* introduced the notion of “permanent part-time”, thus introducing the possibility of reducing hours below full-time without giving up a permanent contract and the regular schedule that comes with it. Qualitatively, we find that indeed the wording of the awards (collective agreements) changed to include permanent less-than-full-time work. Quantitatively, we find that the distribution of hours worked under permanent contract shifted to include a previously missing mass of “reduced hours” (25-34 hours per week) and that the probability of new mothers having a permanent job with reduced hours more than doubled after the Fair Work Act.

We lay the ground for the rest of the analysis by describing the child penalty in Australia before the introduction of the Fair Work Act. Consistent with the institutional setting, we find that, after becoming mothers, women experienced a drop in the probability of

being on a permanent contract by 25 percentage points (conditional on working), with the magnitude increasing over time. This was accompanied (and is accompanied, by a large extent) by a dramatic reallocation of time use: new mothers reduced the total number of hours in paid work and commute by 28 hours per week (coming both from the extensive and from the intensive margin) in order to increase home production (housework and caring for the child) by a staggering 53 hours per week. Instead, when becoming fathers, men did not (and do not) experience any change in contract type, very little change in time spent at work or time spent on housework, and spent on average 15 hours per week caring for the child (less than one-third relative to mothers).

Leveraging the quasi-experiment brought about by the Fair Work Act, we show that having access to a job with a permanent contract and reduced hours dramatically lowers the child penalty in labor supply for treated mothers, who work more and do fewer hours of housework, but their partners' time use is unaffected. We show this using two complementary empirical strategies: the first exploits variation in the timing of childbirth, while the second adds to it variation in exposure to the law coming from the types of jobs mothers held before childbirth.

In the first empirical strategy, we compare the child penalty of women who become mothers in the four years preceding the Fair Work Act with that of those who become mothers in the four years after the Fair Work Act. Under the assumption that the late cohorts of mothers would have behaved like the early ones absent the law, this comparison recovers the causal estimate of the Fair Work Act – and of the change in work arrangements it brought about – on the child penalty. We support this assumption by showing that mothers in the early and late cohorts were similar on observables before childbirth, by showing robustness to potential contemporaneous confounders, and by showing that the change in the child penalty we document happened sharply around the 2009 cohort, implying that this early vs late comparison is not capturing a smooth time trend.

Using this strategy, we document a large decrease in the post-childbirth probability of transitioning from permanent to casual contracts and in the child penalty in labor supply and housework for mothers, but no change in time spent directly with the child. Women who gave birth to their first child after the passage of the Fair Work Act are 70% less likely to transition from permanent to casual contract relative to early (pre-Fair Work Act) cohorts. They are also eight percentage points more likely to be in the labor force post-childbirth and work four more hours per week conditional on working (a 22% decrease in the child penalty in hours of work). Late cohorts of mothers do relatively less housework (minus two hours per week), but do not spend any less time directly with the child – thus mitigating the concern that an increase in maternal labor supply has to come at the expense of time spent investing in the child's development.

In the second empirical strategy, we add a further level of variation to the previous one: exposure to the law, determined by the characteristics of the job women held before childbirth. The intuition is the following. The Fair Work Act decreased the probability of transitioning from a permanent to a casual contract. This did not have bite for jobs that only offered permanent contracts even before the law (e.g. public administration). At the other end of the spectrum, jobs that only offered casual contracts (e.g. hospitality) presumably did so for “technological” reasons and thus were not affected by the law either (employers could refuse requests “on reasonable business grounds”). The group of jobs

most exposed to the law is the middle group, where there was both scope for change and no technological constraints against it.

Thus, our second empirical strategy is based on the idea that different jobs were differentially exposed to the Fair Work Act, that the pre-2009 share of casual contracts in a job (“casual prevalence”) can efficiently summarize such exposure, and that mothers were differentially exposed to the Fair Work Act depending on the exposure of the job they held before childbirth. We operationalize it as follows. We define a job as an occupation-by-industry cell, and we use pre-2009 (pre-Fair Work Act) data to measure the share of casual contracts, which we label “casual prevalence”. We then split jobs in terciles of this distribution of casual prevalence, and we assign mothers to the tercile of the modal job they held in the five years prior to childbirth. We study the changes in the child penalty around the Fair Work Act for these three groups under the assumption (which we provide supporting evidence for) that the middle tercile was more exposed to the law than the other two.

In this case, the identifying assumption is a triple difference version of the parallel trend assumption: that the child penalties of mothers in the treated tercile would have evolved, over time, similarly to the ones of the other two groups. We lend support to this assumption in several ways, including showing parallel pre-trends in child penalties across terciles. In particular, we show that our results are not driven by systematic changes of occupation or selection into fertility (both of which would have been interesting mechanisms, but not what happened).

Using this second empirical strategy, we confirm that the aggregate results found using the first strategy are entirely driven by mothers in the group most exposed to the law, those with a pre-birth job in the middle tercile of casual prevalence. While for women in the bottom tercile of casual prevalence – namely those in pre-birth jobs with a very high fraction of permanent contracts – we don’t observe significant changes in the child penalty in contract type and time use between pre- and post-Fair Work Act cohorts of mothers, for women in the middle tercile the probability of transitioning from a permanent to a casual contract upon childbirth goes from 37 percentage points among women who had their first child before 2009 to zero among post-Fair Work Act cohorts of mothers. For these most exposed mothers, this is associated with an increase in labor supply (paid work and commute) by 11 hours per week and a decrease in housework by 6 hours per week, with no change in time spent directly with the child.

The intra-household allocation of home production does not change even among treated couples where the woman’s labor supply – and contribution to household income – has increased dramatically. Men who became fathers after the Fair Work Act do not have systematically different “child penalties” in time use relative to earlier cohorts of fathers, and this is also true when focusing on male partners of treated women. In treated couples, those in which the woman’s pre-birth job is in the middle tercile of casual prevalence, we find no significant change in female share of home production, despite a 13 percentage point increase in female share of household income. Given that even a sizeable increase in the female share of income leads to no decrease in the disproportionate share of home production women shoulder, this suggests that relative income is not the (unique) determinant of how tasks are split within the couple, and the answer needs to be found somewhere else, possibly in gender norms.

**Related Literature** This work is at the intersection of a large and growing literature on the determinants of the child penalty and a recent but well-established literature on the role of work arrangements on the gender earnings gaps.

Contrary to common wisdom, the size of the child penalty does not seem to be affected by parental leave policies (Schönberg and Ludsteck, 2014; Dahl et al., 2016; Kleven et al.), while the evidence on childcare is mixed (positive in Gelbach, 2002 and Lefebvre and Merrigan, 2008, null in Havnes and Mogstad, 2011 and Kleven et al.).<sup>1</sup> Similarly, neither biology nor comparative advantage are able to explain the drop in labor earnings women – and not men – face when becoming parents (Andresen and Nix, 2022; Kleven et al., 2021). Instead, gender norms seem to be a strong predictor of the size of the child penalty (see, for example, Boelmann et al., 2021 and Kleven, 2022, among others). For a recent review of the literature on the child penalty, see Cortés and Pan (2023).

We contribute to this literature by focusing on the role played by the characteristics of the workplace and work arrangements that women face upon returning to work, and more specifically, the ability to work less than full-time while maintaining a regular schedule. Our result is relatively unique in the literature in that we show that public policies, if aimed at changing the structure of work in a way that makes balancing a family and a career easier, can have an impact on maternal labor supply.

Work arrangements have been shown to be a key determinant in gender earnings gap (Bertrand et al., 2010; Goldin, 2014; Goldin and Katz, 2016). Two papers we are aware of address a similar question, investigating the relationship between the child penalty and workplace flexibility: Bütikofer et al. (2018) compute child penalties for different professions in Norway for mothers who have their first birth between 1989 and 2000, and show that the child penalty is smaller in more flexible professions; Bang (2021) shows that child penalties in the US between 1979-2016 are decreasing in own and spouse's flexibility. Our casual estimates are consistent with their descriptive analysis.

Our story hinges on two components of the interaction between work arrangements and parenthood: on the one hand, working mothers value predictability and regularity in the schedule; on the other hand, they often need to reduce working hours. In support of the first fact there is experimental evidence by Mas and Pallais (2017), who find that women, especially with young children, place a higher than average value on avoiding irregular work schedules. Further evidence is provided by Bolotnyy and Emanuel (2022) who, using administrative time-card data on bus and train operators, find that female operators, especially those with dependents, pursue schedule conventionality, predictability, and controllability more than male operators.

In support of the claim that mothers often need to reduce working hours, there is extensive descriptive evidence (virtually all papers about the child penalty document a reduction in hours of work upon motherhood, e.g. Kleven et al., 2019, in Denmark, de Quinto et al., 2021, in Spain, Cortés and Pan, 2023, in the US; Booth and Van Ours, 2013, show that partnered women in part-time work have a low desire to change their working hours), as well as causal evidence by Wasserman (2023), who finds that when a medical specialty reduces its weekly hours, more women enter the specialty, whereas there is little change

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<sup>1</sup>The effects of family policies on female labor market outcomes are reviewed in Olivetti and Petrongolo (2017).

in men's entry. We add to this literature by showing the importance of the coexistence of these two work arrangements (shorter working hours and regular schedules).<sup>2</sup> This point is also present in Del Boca et al. (2009), who find that the diffusion of part-time work is positively associated with women employment only in countries in which part-time jobs offer the same stability as full-time work.

We build on and complement the descriptive patterns presented above by leveraging an exogenous change in work arrangements to establish two novel facts: first, the possibility to make protected requests for changes work arrangements was used by Australian mothers to reduce their working hours while maintaining their permanent contracts, therefore sticking to a regular schedule (which can be considered a form of flexibility, in Goldin, 2014's definition of the term); second, that there is indeed a causal link between this work arrangement and the size of the child penalty.

Our final set of results, which shows the lack of changes in the intra-household organization of home production following the reduction in child penalty we document, speaks to a large literature on the question of whether men and women split housework and parenting tasks on the basis of who makes more money. A recent contribution, using our same data, is Siminski and Yetsenga (2022): they find that that comparative advantage plays little or no role in the gendered division of labor within couple households, and they document that Australian women do much more housework than males at every percentile of the relative wage distribution. While the relative wage distribution is likely to be endogenous to choices made before marriage and childbirth (like education and job sorting), we rely instead on an arguably exogenous change in the relative wage distribution within the family, provided by the reduction in the child penalty in labor supply brought about by the Fair Work Act. Ours is, to the best of our knowledge, the first paper to document that a seemingly exogenous change in the female-share of household income does not lead to a corresponding adjustment of home production task allocation.

The remainder of the paper is organized as follows. Section 2 describes the data and the sample selection. Section 3 first describes the institutional setting and then discusses the impact of the Fair Work Act on work arrangements, in particular on the prevalence of less-than-full-time permanent contracts. Section 4 describes the status quo, namely the child penalty in contract type and time use before the Fair Work Act. Section 5 documents the impact of the Fair Work Act on the child penalty and on the intra-household allocation of time, first through the early versus late comparison (Section 5.1) and second through the exposure design (Section 5.2). Section 6 concludes.

## 2 Data: HILDA

The Household, Income, and Labor Dynamics in Australia survey (HILDA) contains a rich set of information on a representative sample of Australian households since 2001. For each of the approximately 8,000 sampled households, everyone above 15 years old is

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<sup>2</sup>Note that in our setting there is a very strong correlation between having a permanent contract and being on a regular schedule, which we document in detail in Section 3; thus, we refer to them almost interchangeably here.

interviewed, but basic demographics are also collected for younger members of the household. Individuals within families are followed over time, and family linkages are codified, which allows us to match each individual with their spouse or *de facto* partner and to identify when children are born. At the time of the analysis, data up to 2019 are available to researchers – hence our sample covers the years 2001-2019. The design of HILDA is detailed in Watson and Wooden (2012).

The uniqueness of the HILDA lies in the fact that it provides information on work characteristics and time use for all adult household members. This allows us to test whether the Fair Work Act impacted work arrangements and study, in the same sample, how this affected the time use of both the treated mothers and their partners.

**Variables Definition** Our analysis relies on measures of work arrangements and of time use. By work arrangements we indicate what determines when, where, and how a job is expected to be performed. This includes the number of working hours, but also how the hours are arranged in a schedule. Key variables in our analysis will be the type of contract (whether casual or permanent), whether a schedule is regular (working from Monday to Friday on a regular daytime schedule) or irregular (being on call), whether the job is full-time (35 hours per week or more), less-than-full-time (1-34 hours per week), or “reduced hours” (between 25 and 34 hours per week).

We measure three dimensions of time use: paid work, housework, and parenting. “Paid work” measures the number of hours per week spent in paid employment or commuting; “Housework” is a combination of housework, outdoor tasks, and errands; “Parenting” is time spent playing with or caring for own children. We define “Home production” as the sum of housework and parenting, and we call “Total active time” the sum of home production and paid work, that is, weekly hours spent not in leisure or sleep.<sup>3</sup>

We are also interested in how time is allocated within the couple. To this end, we define “Female share of home production” as the number of weekly hours a woman spends in home production divided by the sum of weekly hours she and her partner spend in home production. “Female share of paid work” is defined analogously. “Female share of total income” is the fraction of total annual household labor income earned by the woman. All these variables are only defined for heterosexual couples, and only when we observe the same variable for both partners in the couple. Details on variables definition can be found in Appendix A.

**Sample Restrictions** We make two sets of sample restrictions: one is individual-based, and one is couple-based.

At the individual level, we focus on people aged 15 to 65. When we study parents (from Section 4 onwards) we only keep parents whose first child was born between 2003 and 2017, in order to observe at least two years before and two years after the first childbirth. For parents, we only keep observations from 4 years before childbirth to 7 years after, in order to have a balanced panel when we restrict to the cohorts close to the Fair Work Act.

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<sup>3</sup>The questionnaire specifies not to count any activity twice, and caps the total number of indicated hours at 168.

In the pre-post Fair Work Act comparisons, we exclude the cohort of parents who had their first child exactly in 2009, since this cohort is partially treated.

The couple-based restrictions are germane to our study of intra-household task allocation and apply to Section 5.2.<sup>4</sup> We focus on heterosexual couples. This excludes 10% of first births from single mothers and 1% of first births from lesbian couples (not enough to adequately study them separately, which would be desirable if sample size allowed). In our primary sample, for each year we match each woman to the partner she indicates that year, regardless of whether he is the partner in the year of her first childbirth. In our secondary sample, we match each woman to the partner she indicates the year of her first childbirth, regardless of whether they are no longer or not yet a couple. Results are practically identical. We only report results on the primary sample, but results on the secondary sample are available upon request.

Given our focus on couples, and how time is split in the couple, we restrict the analysis to couples for which we observe variables of interest for both men and women. If a given variable in a given year is missing for the man, we set the corresponding variable to missing for his partner as well, and vice-versa. This allows us to make sure that results on men and women are comparable, that is, they come from the same couples. In practice this restriction doesn't significantly impact our results, but it allows for a cleaner interpretation.

Since the exposure design relies on a woman's job before childbirth, for the analysis of Section 5.2 we restrict the sample to couples in which we can observe it. Namely, we keep women (and their partners) if they work and report an occupation and an industry at least once in the five years prior to the birth of their first child. This is not very restrictive: 89% of mothers in our sample satisfy this criterion.

We keep non-parents and parents with older children as controls, meaning we drop individuals who enter the survey with children aged five or younger. Our results are robust to dropping all individuals who are already parents when they enter the survey, and keeping only the non-parents as controls. In the sample of non-mothers, we assign random fake childbirth years, and we perform symmetrical matching with partner and cleaning procedures as for the mothers.

**Descriptive Statistics** The summary statistics in Table 1 show clear gender differences in work characteristics and time use in the Australian population. 72% of women are in the labor force, as opposed to 84% of men, and, conditional on working, women work 31 hours per week on average, while men 42. Conditional on working, 26% of women are in casual contracts and 63% have a permanent contract, while these figures for men are 19% and 72% respectively. Women do the home shift: on average, they spend 31 hours per week in home production, while among men this figure is 18 hours. These aggregates mask extensive heterogeneity by parental status and cohorts, which will be the focus of the rest of the analysis.

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<sup>4</sup>All the results in the sections preceding this one replicate in this smaller sample and are available upon request.

### **3 Institutional Setting: Causal Jobs and the Fair Work Act**

In order to make a causal statement on the impact of work arrangements on the time use of mothers and their partners, we rely on a natural experiment. The 2009 Fair Work Act changed a very specific work arrangement: it enabled mothers to reduce hours of work within their permanent contracts, which are generally associated with a regular schedule, without switching to casual contracts, which are characterized by irregular schedules and used to be the main route to reduce work hours below full-time. By expanding access to regular-schedule less-than-full-time jobs (“permanent reduced hours”), the passage of the Fair Work Act allows us to study the (positive) impact of this work arrangement on maternal labor supply and on the (null) reallocation of tasks within the household.

#### **3.1 Before 2009: Working Less Than Full-Time Was Only Possible in Casual Contracts**

Before the Fair Work Act, it used to be uncommon to work less than full-time in permanent contracts (collective agreements mostly did not consider this option), and individuals who wanted to reduce hours – primarily mothers – had to turn to casual contracts, characterized by very irregular schedules.

There are three types of contracts in the Australian labor market. The most common type are permanent jobs, which don’t have a termination date and include a prescribed number of weekly hours. Very similar to those, although much less prevalent, are fixed-term contracts, the only difference being that they have an end date. Finally, a peculiarity of the Australian setting is the existence of casual contracts.

Casual contracts are zero-hours contracts with no commitments on either part and without entitlements like sick leave; they are generally associated with low hours and irregular schedules. Casual contracts are relatively common in Australia (more than 20% in 2019) and they are disciplined by the awards (Australian collective bargaining contracts): even when the award includes protections for the workers who are hired under permanent contracts, special clauses allow for workers to be employed under certain forms of casual employment that are exempted from the standard provisions (Pocock et al., 2004). These forms of causal employment are most common among people working less-than-full-time jobs, are generally associated with irregular schedules, and this has a gender component to them: Pocock and Masterman-Smith (2005) comment on the institutional setting before the Fair Work Act and highlight that Australian women are more likely than the OECD average to work part-time, and much more likely than Australian men to work under causal contracts. The authors argue that such arrangement “reduces flexibility as well as many conditions of employment like security”.

We document the same pattern in our data: casual jobs are associated with low hours and irregular schedules. First, people who work less than full-time are concentrated in casual contracts (Appendix Figure B.3). Second, people who work under permanent contracts are 28% more likely to have a regular schedule, and this also holds when controlling by occupation-by-industry fixed effects (17% more likely) or by individual fixed effects (18% more likely) (Appendix Table B.1), highlighting the fact that the more irregular

nature of work arrangements for people under causal contracts is a characteristic of the contract itself and not a simple by-product of different occupations and industries. In fact, while some industries and occupations are dominated by one type of contract or the other, many see workers in either regime. For example, 44% of people working as service and sales workers have a causal contract, as do 48% of people working as personal and protective services workers.

All this evidence is coherent in indicating that the Australian labor market is pretty segmented: on the one hand, there are regular jobs, whose schedules are predictable and mostly full-time, and which are under permanent contracts; on the other hand, there are irregular jobs, which often come with very short hours and are normally performed under causal contracts.

The existence of this trade-off between reducing working hours and giving up predictability is summarized also in Pocock et al. (2009), commenting on the pre-Fair Work Act landscape. They argue that “workers may seek out casual work [...] as a strategy to reduce their time commitment to paid work. However, our findings suggest that they are likely to get the same work-life benefits just by working shorter hours as a permanent or fixed-term employee. Unfortunately, finding part-time work in the current Australian labour market often requires a shift to casual work – with effects on the quality of work, income, careers, retirement savings and so on.” More specifically addressing how this trade-off has gender-related consequences, the authors highlight how “in pursuing part-time work, many women find that they have to accept casual employment.”

An important cost of this choice seems to be reducing working hours more than one had wanted: Kler et al. (2018) find that causal employees are more likely to be underemployed, and, to confirm this point, Appendix Figure B.2 shows that the share of workers in this type of contract who express a desire to work more hours than they actually do is higher than the corresponding figure among people in permanent contracts.

## 3.2 The Shift: The Fair Work Act Facilitates Shorter Hours in Permanent Contracts

The Fair Work Act *de facto* introduced the notion of “permanent part-time”, thus introducing the possibility of reducing hours below full-time without giving up a permanent contract (and the regular schedule that comes with it). Qualitatively, we find that indeed the wording of the awards (collective agreements) changed to include permanent less-than-full-time work. Quantitatively, we find that the distribution of hours worked under permanent contract shifted to include a previously missing mass of “reduced hours” (25-34 hours per week) and that the probability of new mothers having a permanent job with reduced hours tripled after the Fair Work Act.

### 3.2.1 The Wording of the Law and its Interpretation

While the Fair Work Act allows a generic “change in work arrangements”, it was understood in the media as well as by legal scholars as introducing a right to request “permanent

part-time”, namely the option to remain in a permanent contract – with the regular schedule associated with it – while reducing hours below full-time.

The Fair Work Act establishes that parents of children below school age are entitled to request a change in working arrangements, which their employer can refuse only on reasonable business grounds. Requests that are protected under this provision include changes in the location of work, changes in the patterns on work and, importantly, changes in the hours of work. The list of work arrangements that can be made under the protection of this provision includes<sup>5</sup> “changing from full-time to part-time”. This is of course not the only protected request, but we can argue that the notion of “permanent part-time”, a work arrangement that combines the security and regularity of a permanent contract with reduced hours, is an important component of the reform we are considering: Pocock et al. (2009), for example, while commenting on the Fair Work Act “right to request”, cite the option of permanent part-time as an important tool in facilitating work-life balance of workers.

### 3.2.2 Qualitative Evidence of the “Success” of the Law

We find evidence of the Fair Work Act enabling less-than-full-time permanent contracts both in the text of the awards (collective agreement), which explicitly allow for this possibility after the Fair Work Act, and in the distribution of hours worked under permanent contracts, which shifts after the Fair Work Act to include a previously missing mass of “reduced hours” (25-34 hours a week).

In their “Labour Law” textbook, Creighton and Stewart (2010) argue that “until recently many awards did not provide for part-time workers to be engaged on anything but a casual basis. But with changing attitudes in the union movement, and legislative reforms, the concept of permanent part-time employment has become well accepted.”

For example, the 2010 Modern Award for Private Hospital Employees mentions that “A part-time employee has reasonably predictable hours of work. Before commencing employment, the employer and employee will agree in writing on a regular pattern of work including the number of hours to be worked each week, days of the week the employee will work and starting and finishing times each day.” This is in contrast to the corresponding pre-Fair Work Act collective bargaining agreement, which did not consider regular part-time positions at all. This and other examples of change in the wording of the Awards for different occupations and industries are included in Table 2.

The importance of the Fair Work Act in allowing women to maintain permanent positions while reducing working hour emerges also in the case study by Cooper and Baird (2015), who interviewed managers and employees from two major Australian firms. The authors find that the typical request made under the protective umbrella of the Fair Work Act involved a reduction of working hours below full-time. In particular, the majority of the employees interviewed “were in reduced hours permanent roles and each of these interviewees were mothers returning from a period of maternity leave, having previously worked in standard full-time role.”

Coherently with this narrative around the Fair Work Act and with the institutional

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<sup>5</sup><https://www.fairwork.gov.au/tools-and-resources/best-practice-guides/flexible-working-arrangements>

evidence presented in this section, we find suggestive evidence, in our data, that the Fair Work Act did introduce permanent contracts with reduced hours. We see an increase of permanent contracts among mothers working less than 35 hours/week (see Appendix Figure B.3) and a shift towards the left in the distribution of hours worked by mothers under permanent contracts (see Appendix Figure B.4), that “fills” the missing mass that we could observe, before 2009, on the immediate left of full-time jobs.

The wording of the law and the interpretation given by the Australian government, together with the qualitative evidence described in this paragraph, allow us to conclude that reduced hours and type of contract are important work arrangements to study when evaluating the effects of the Fair Work Act, together with more standard examples like working from home or flexible hours.

### 3.3 First Stage: Quantitative Evidence of the Effect of the Law on Work Arrangements

We employ a difference-in-difference methodology (allowing for a large set of treatment effect heterogeneities) to show that the Fair Work Act did have bite: after the passage of the law, new mothers were three times as likely to be in jobs with a permanent contract and reduced hours, and twice as likely to report having a regular schedule. This is a large shift in work arrangements we will leverage in subsequent sections.

#### 3.3.1 Empirical Strategy

Our strategy is a variation of the standard difference-in-differences: instead of simply comparing treated individuals (parents of children under school age) to the others, before and after the law, we augment the specification by allowing the changes in the outcome variable to depend flexibly on the age of the child and the time of birth.

The Fair Work Act entitles parents of children under school age to request a change in work arrangements, and thus the most natural specification would be one that includes all parents of children who are younger than five in the treated group (after 2009) and everybody else, both non-parents and parents of older children, in the control group. However, we have the prior that the law would impact different demographics differently: for example, if women are those who disproportionately care for the children, a law which is explicitly aimed at improving work-family balance<sup>6</sup> might disproportionately affect them. Similarly, we might hold the prior of path-dependence in maternal labor supply: for example, we could think that labor supply choices are made within the first year from the birth of the first child, and then re-optimized only in case of large changes to the environment. In our main specification we allow for enough flexibility to account and test for those priors.

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<sup>6</sup>Section 3 of the Law describes its objective as “to provide a balanced framework for cooperative and productive workplace relations that promotes national economic prosperity and social inclusion for all Australians by [...] assisting employees to balance their work and family responsibilities by providing for flexible working arrangements”.

We run the following specification, separately by gender:

$$Y_{it} = \sum_{a \in A} \left( \sum_{j \neq 2009} \beta_{a,j} \times \mathbb{1}\{C(i,t) \in a\} \times \mathbb{1}\{t = j\} + \beta_a \times \mathbb{1}\{C(i,t) \in a\} \right) + \alpha_i + \delta_t + \gamma_{h(i)} + \epsilon_{it} \quad (1)$$

where  $Y_{it}$  is the outcome of interest for individual  $i$  at time  $t$ ,  $\mathbb{1}\{C(i,t) \in a\}$  is an indicator function that takes the value of one if  $i$ 's oldest child in year  $t$  is in age range  $a$ . The age ranges  $a \in A$  used in the estimation are 0-2, 3-5, 6-8, 9-10, 10+. The indicator  $\mathbb{1}\{t = j\}$  is equal to 1 if the year is  $j$ , and  $\alpha_i, \delta_t, \gamma_{h(i)}$  are individual, time and age fixed effects respectively. The coefficients of interest are the  $\beta_{a,j}$ 's, which tell us at any point in time how differently parents of first children in the age range  $a$  behave from analogous parents in 2009, relative to non-parents (controlling for individual, time and age of the parent fixed effects).

**Threats to Identification** The difference-in-difference strategy just described relies on a parallel trends assumption between mothers and non-mothers; namely, that mothers of young children before and after 2009 would have shown similar work arrangements in the absence of the law, relative to non-mothers. We provide supporting evidence for this assumption in several ways. In addition to showing the absence of pre-trends in the figures below, in Appendix C we show that there was no systematic change in fertility or selection into fertility around 2009, that the financial crisis (which was mild in Australia, not even a formal recession) does not play a role in these results, and that there was no employer response on the hiring margin (no backlash through decreased hiring).

### 3.3.2 Results

Our main finding is that new mothers are more likely to be in permanent contracts with reduced hours after the Fair Work Act than mothers with similarly aged young children before 2009. Correspondingly, they are more likely to have a regular schedule, but they do not experience any change in flexibility. For fathers, we don't observe any change in work arrangements.

**Reduced-hours Permanent Contracts Increase for Mothers** The fraction of mothers with a reduced-hours permanent contract more than doubled after 2009, but with considerable heterogeneity according to age of the child. From the left panel in Figure 2 we learn that, in 2009, only 3% of mothers who had given birth to their oldest child in the previous two years worked under a reduced-hours permanent contract, where reduced hours indicate 25 to 34 hours per week (approximately 80% of full-time); and this figure is similar for new mothers of 0-2 year old children in the preceding years. Starting in 2010, this fraction starts increasing, more than tripling in the first three years and constantly remaining at a higher level afterward. In the right panel, where we display coefficients on the dummy for the oldest child being between 3 and 5 years old, we notice a very similar pattern, but with the increase starting after 2013, the year in which the first children born after the passage of the Fair Work Act turned three.

Informed by the patterns just described, and in order to gain precision and facilitate comparisons, we estimate a restricted version of Equation (1), where we replace the year-by-year interactions with mobile “post” dummies. In particular, we interact the dummy for the first child being between 0 and 2 years old with an indicator for the year being equal or after 2010 and the dummy for the first child being between 3 and 5 years old with an indicator for the year being equal or after 2013. These mobile “post” dummies are meant to capture the point at which mothers whose first child was born after the passage Fair Work Act start entering the indicated group, in line with the evidence presented above.

**Other Work Arrangements: Schedule Regularity Increases for Mothers, Flexibility Does Not** Table 3 confirms that the increase in reduced-hours permanent contracts was accompanied by an increase in the probability of being on a regular schedule for mothers, while other work arrangements, such as flexibility and work from home, either did not change or give inconclusive results. Column (1) summarizes the findings in Figure 2 relative to reduced-hours permanent contract (unconditional variable, equal to 0 for unemployed people), and column (2) confirms that they hold also conditionally on working (which clarifies that the extensive margin of labor force participation is not driving the observed pattern): the probability for a young mother to be on a reduced-hours permanent contract conditional on working doubles after the Fair Work Act. While columns (1) and (2) emphasize that the large increase is of mothers who work right below full-time, column (3) confirms that more in general the probability of working less-than-full-time (1 to 34 hours per week) on a permanent contract increases by 47%. This is accompanied by a 38% increase in the probability of being on a regular schedule (column 4) and a 28% decrease in the probability of being on call (column 5).

Other work arrangements, while in principle covered by the Fair Work Act, did not change systematically, highlighting the importance of understanding the public discussion around this law rather than simply its words. Flexibility, measured as agreeing with the statement “My working times can be flexible”, does not display significant changes for new mothers after the Fair Work Act: if anything, the coefficient estimates in column (6) are negative (counterintuitively), though mostly insignificant. The analysis regarding work from home is inconclusive: the coefficient estimates in column (7) range from negative to positive, are mostly insignificant, and the corresponding figure (not shown) displays a lot of ups and downs.

**No Changes in Work Arrangements for Fathers** We replicate the same analysis on men, and show that nothing happens for fathers of young children around 2009. Appendix Table D.1 replicates Table 3 on the sample of men. Reduced-hours permanent contracts are very rare among men (only 2% of working fathers have this arrangement), who tend to work full-time, and this doesn’t change with the Fair Work Act. For fathers, the probability of being on a regular schedule was double that of mothers before the Fair Work Act (55% probability for fathers versus 27% probability for mothers of 0 to 2-year-olds) and was not affected by the law, along with the other work arrangements.

**Interpretation** We interpret the evidence as supporting a few key facts, which inform the subsequent analysis. First, the Fair Work Act has had a statistically significant impact only on the work arrangements of mothers, and none on those of fathers. This is consistent with government reports, which indicate that the greatest majority of requests made under the Fair Work Act comes from women (76% of them, according to survey evidence in O’Neill, 2012). This insight, together with evidence we will present in Section 4 of the child penalty being an issue only for mothers, motivates the primary focus on women. Secondly, we show that the entirety of the effect is concentrated among women whose first child was born after the passage of the law, and was persistent. This suggests the following pattern: women rearrange their working life and re-optimize soon after they become mothers, based on the constraints they face at that moment, and these arrangements are sticky; so that mothers of three-year-old children, although technically treated by the law, did not change their arrangements when the Fair Work Act was introduced. This supports our choice in the subsequent analysis of defining treatment and exposure to the law based on the year of birth of the first child.

## 4 The Status Quo: What Happen(ed) around Childbirth

We now set the ground for the analysis that will follow in the next section by describing the child penalty before the Fair Work Act. Women who became mothers before the Fair Work Act experienced a large decrease in labor supply upon childbirth, a massive increase in home production, and, consistently with the institutional setting, a sizeable transition from permanent to casual employment. This changes sharply after the reform, as does women’s time allocation, as we will show in the next section.

### 4.1 Measuring the Child Penalty

We define the “child penalty” as the change in an outcome of interest in the seven years following the birth of an individual’s first child, relative to the four years before the childbirth, relative to a counterfactual trend based on similarly aged childless individuals and individuals with (much) older children. We present it here as an event study. Consistently with most of the literature (e.g. Kleven et al., 2019; Cortés and Pan, 2023), we denote by child penalty the gap between a woman who becomes a mother and her counterfactual self had she not had children, rather than the gap between mothers and fathers (the latter approach is taken for example by Andresen and Nix, 2022).

Our main object of interest is how work arrangements and time use change around the birth of a first child for women and men. Formally, we are interested in the coefficients  $\gamma_k$  from the following event study regression:

$$Y_{it} = \sum_{\substack{k=-4, \\ k \neq -2}}^{10} \left\{ \gamma_k \times \mathbb{1}\{t - E_i = k\} \right\} + \alpha_i + \delta_t + \beta_{h(i)} + \epsilon_{it}, \quad (2)$$

where  $E_i$  represents the year of birth of  $i$ ’s first child, and  $\alpha_i, \delta_t$ , and  $\beta_{h(i)}$  are individual, time, and age fixed effects respectively. We run this regression separately for men and

women, and for couples as a single entity where appropriate. The coefficients of interest,  $\gamma_k$ 's, represent the change in outcome  $Y$   $k$  periods after childbirth, relative to two years before – this is the child penalty in outcome  $Y$ ,  $k$  years from childbirth. Never-parents and individuals who don't have a child aged five or younger when they enter the survey are kept in the sample and act as controls. In order to account for heterogeneous treatment effects across cohorts, we estimate the equation above using the Sun and Abraham (2020) estimator.<sup>7</sup> We cluster standard errors at the individual level.

## 4.2 Evidence on the Child Penalty Before the Fair Work Act

Women who became mothers before the Fair Work Act experienced a stark transition from permanent to casual employment at the time of childbirth (-25 percentage point probability of being in a permanent contract conditional on working). This was accompanied by a substantial reallocation of time from paid work (-28 hours per week) to home production (+53 hours per week). Men did not change their employment contract upon fatherhood; they only mildly changed labor supply and time spent on housework (about two hours a week of less paid work and more housework) and spent about a third of the time with the newborn relative to women.

**The Transition from Permanent to Casual Contracts for Mothers** Before the Fair Work Act, women moved to casual jobs after becoming parents, while men did not. As explained in Section 3, before the Fair Work Act it used to be very hard to reduce hours below full-time while keeping a permanent job. Instead, in order to reduce hours, people had to move to casual contracts, which don't require any commitment and are associated with low and irregular hours. Unsurprisingly, motherhood, with its large increase in time demands, was associated with a sharp transition from permanent to casual jobs. This is evident in panel (a) of Figure 3, which plots the estimate of the child penalty in the probability of being on a permanent contract conditional on working, separately for women (in pink) and men (in blue). From the figure, we see a large drop (almost 20 percentage points) in the probability of being on a permanent contract upon motherhood, which increases over time to nearly 30 percentage points in the seven subsequent years (the average over this time horizon is 25 p.p.). Recall that this is only among women who are employed, so the drop is not explained by women dropping out of the labor force. Instead, we see no changes in contract type for men who become fathers.

**Partners Specialize and This has Long Term Consequences** We document a post-childbirth increase in total active time of both partners, that hides very heterogeneous changes in time use. Panels (b) and (c) of Figure 3 show the change in active time around the birth of their first child, for women and men respectively, both in total active time and differentiated by its sub-components: paid work, housework, and parenting. In panel (c) we see that, for men, time in paid work decreases by a small amount (on average, 2.6 hours per week), while time spent in household work increases marginally (1.4 hours

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<sup>7</sup>Accounting for treatment effect heterogeneity is a novelty relative to the current practice in the literature on the child penalty, as emphasized by Melentyeva and Riedel (2023).

per week), and basically the entire increase in active time (14 hours per week) comes from time spent parenting. For women, in panel (b), the story is very different: in order to make space for the 42 hours a week spent parenting and the 11 hours a week of increased housework, they decrease time in paid work and commute by 28 hours per week (a 77% decrease relative to their pre-child work hours). The residual of the three observed components, which clearly includes leisure and sleep, is reduced by 24 hours a week.

Choices of time use made when the first child is born have long-lasting consequences. From panel (b) of Figure 3, we see that, while parenting time needs decrease over time, women do not increase time in paid work symmetrically, suggesting that work choices made at a time of high pressure – the arrival of a baby – might be hard to reverse even after the direct pressure decreases. This translates into a permanently lower income for mothers. If there isn't perfect income pooling, or if bargaining power in a couple depends on income, this might have adverse consequences for women's welfare in the long run.

## 5 The Impact of Work Arrangements on the Child Penalty and on the Intra-household Allocation of Time

Exploiting the quasi-experiment brought about by the Fair Work Act, we show that having access to a job with a permanent contract and reduced hours dramatically lowers the child penalty in labor supply and housework for treated mothers, while their partners' time use is unaffected. We show this using two complementary empirical strategies. The first exploits variation in the timing of childbirth, while the second adds to it variation in exposure to the law at the occupation-by-industry level, defining individual exposure from the job mothers held before childbirth. We find that women who had their first child after the Fair Work Act are 70% less likely to move out of a permanent contract after childbirth and work on average five more hours per week relative to their earlier counterparts. The entirety of the effect is concentrated among women in jobs most exposed to the law. While treated mothers do reduce time spent on housework (but not on parenting), their partners do not pick up the slack. Since parenting is the biggest component of home production, women's reduction of housework is not enough to tilt the household task sharing towards equity, and the female share in home production does not change significantly.

### 5.1 Strategy 1: Early versus Late Cohorts

We compare women who became mothers in the four years preceding the Fair Work Act (early cohorts) and those who became mothers in the four years after the Fair Work Act (late cohorts): we find that later cohorts of mothers are only 30% as likely as the early cohorts to move from permanent to casual contracts after childbirth, and this is accompanied by a 22% lower child penalty in labor supply. Under the assumption that the late cohorts of mothers would have behaved like the early ones absent the law, this comparison recovers the causal estimate of the change in work arrangement brought by the Fair Work Act on the child penalty. We support this assumption by showing that mothers in the early and late cohorts were similar on observables before childbirth and that the change in the

child penalty happened sharply around the 2009 cohort (so the early vs late comparison is not capturing a smooth time trend), as well as by addressing possible contemporaneous confounders.

### 5.1.1 Empirical Strategy

We compare the child penalties in contractual form, labor supply, and home production for early and late cohorts of mothers, where early cohorts are defined as women who had their first child between 2005 and 2008 (before the 2009 Fair Work Act) and late cohorts are women who became mothers between 2010 and 2013.

We start by estimating the child penalty for each year relative to childbirth, separately for early and late cohorts of mothers. In particular, we estimate Equation (2) separately for the two groups, keeping the non-mothers and mothers of older children as controls in both, and we plot the resulting estimates in the same graph, to gauge the difference visually.

We also estimate the child penalty for the two groups of cohorts jointly, in a more succinct specification, in order to formally test for their difference. In particular, we estimate the following model:

$$Y_{it} = \gamma \times \mathbb{D}_{it} + \gamma_{post} \times \mathbb{D}_{it} \times Post(i) + \alpha_i + \delta_t + \beta_{h(i)} + \epsilon_{it} \quad (3)$$

where  $\mathbb{D}_{it} \equiv \mathbb{1}\{(t - E_i) \in [0, 7]\}$  is an indicator function for  $i$ 's first child being between 0 and 7 years old (which are all the post-childbirth observations we keep for parents), and  $Post(i) \equiv \mathbb{1}\{E_i > 2009\}$  is an indicator function taking value of one if  $i$ 's first child was born after 2009 – meaning, an indicator for  $i$  being part of the late cohorts. The 2009 cohort is partially treated, and we exclude it from this analysis. Similarly, the year right before childbirth is also partially treated (some women stop working during pregnancy, for example), therefore we also drop it in this analysis. In this specification, the estimate of  $\gamma$  summarizes the child penalty in  $Y$  for the early cohorts, while  $\gamma_{post}$  estimates the difference in child penalty for late cohorts relative to early cohorts, which is the object of interest discussed in this section.

### 5.1.2 Results

Late (post-Fair Work Act) cohorts of mothers are 70% less likely to transition from permanent to casual contracts after childbirth, relatively to early (pre-Fair Work Act) cohorts. They are also eight percentage points more likely to be in the labor force post-childbirth and they work four more hours per week conditional on working. While they decrease the number of hours in housework, time spent directly with the child is unaffected.

Figure 4 shows the change in the child penalty for women brought by the Fair Work Act, for all the outcomes of interest. In this figure, green circles display the estimates of  $\gamma_k$ 's from Equation (2) estimated only on mothers whose first child was born between 2005 and 2008, and red squares display the same estimates but on the sample of mothers whose first child was born between 2010 and 2013. Table 4 reports the estimates of Equation (3), where we test formally for the difference in child penalty between late and early cohorts of mothers.

**Lower Probability of Transitioning to Causal Employment After Childbirth** Post-Fair Work Act cohorts of mothers experienced a substantially lower probability of transitioning to casual employment, consistently with the interpretation of the law and the evidence presented in Section 3. Panel (a) of Figure 4 shows the change in the probability of being on a permanent contract conditional on working around motherhood. The green circles replicate the pink line in Figure 3a and show that for pre-Fair Work Act cohorts of mothers this probability dropped by 20 to 30 percentage points, increasing over time. The red squares show that instead for post-Fair Work Act cohorts of mothers this probability dropped far less (about 70% less): women who became mothers after the Fair Work Act did use their new right to remain in permanent and regular employment, instead of switching into causal employment, when moving to below full-time after childbirth.

**Treated Mothers Work Longer Hours** This change in type of contract was accompanied by a significant increase on the extensive and, in particular, on the intensive margin. Panel (c) shows that, on average, late cohorts of mothers returned to work at a higher rate relative to the earlier cohorts, and in particular, they are eight percentage points more likely to return. Even more starkly, panel (b) shows that, among working mothers, late cohorts worked on average four more hours per week, which corresponds to a decrease in the child penalty by 22%. This is a very large change, especially in light of the current near-consensus in the literature finding public policies aiming at improving maternal labor supply mostly ineffective (Olivetti and Petrongolo, 2017; Cortés and Pan, 2023).<sup>8</sup>

**With Tighter Time Constraints, Mothers Favor Parenting Over Housework** This large decrease of the child penalty in labor supply was accompanied by a decrease of the child penalty in housework, but no change in the time spent directly with the child. Panel (d) shows that later cohorts of mothers experienced a smaller increase in time spent on housework relative to their earlier counterparts (+9 hours a week instead of +11 hours a week), but they spend exactly the same time playing with and caring for the child (+42 hours a week). This suggests that in their optimization, mothers who work more cut first on less valuable forms of home production (housework), thus mitigating concerns that working mothers invest less in their children.

This is consistent with analogous results found for the US by Bastian and Lochner (2022): better labor market opportunities translate into a greater fraction of time spent in paid work and a smaller fraction in home production. However, the first kind of home production that is substituted away is housework, which is presumably considered less

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<sup>8</sup>Differently from other countries studied in the literature (e.g. Denmark in Kleven et al., 2019, Austria in Kleven et al., US in Cortés and Pan, 2023), in Australia there is no child penalty in hourly wages, neither before nor after the Fair Work Act. This is consistent with a labor market characterized by collective bargaining, where awards cover most employees and include tables with minimum wage rates by detailed type of job (Creighton and Stewart, 2010, p. 352). This is also not in contradiction with the changing composition of contracts: while permanent contracts could, in principle, be associated with higher “status” and higher wages within a job, casual workers are mandated by law to be paid with a 25% premium.<sup>9</sup> Thus, there is no reason to expect that the post-motherhood transition to causal contracts we observe at baseline, or the changes in this transition brought about by the Fair Work Act, would induce a mechanical change in hourly wage, in either direction.

important than parenting, time for which is not affected at all by the large increase in labor supply.

### 5.1.3 Threats to Validity and Robustness Checks

The interpretation of our results of this early vs late cohorts comparison as causal relies on the assumption that absent the Fair Work Act late cohorts of mothers would have behaved, after childbirth, in the same way as the early cohorts. We support this assumption in several ways, by discussing and addressing three sets of concerns. First, in this subsection we show that women in early and late cohorts were similar on observables before becoming mothers, ruling out selection into childbearing as a concern. Second, in the next subsection we show that the change in the child penalty happened sharply around the 2009 cohort rather than being a slow-moving time trend. Finally, we rule out potential confounders such as Paid Parental Leave (women affected by this other reform are not driving our results) and other provisions in the Fair Work Act (which either turned out to be quantitatively irrelevant or did not affect parents differently relative to non-parents and are thus captured by our controls). This last set of robustness checks are detailed in Appendices E and F.

First, we address selection into childbearing. This selection could drive our results if the women who have children after the Fair Work Act are systematically different from their earlier counterparts. As highlighted before, and as we discuss further in Appendix C, we find no systematic change in the fertility trend around 2009, nor do we find systematic differences in pre-birth observables between women who became mothers before and after the Fair Work Act. For example, both early and late cohorts of women have their first child at 29 years of age on average, 93% of both groups are in the labor force two years before childbirth, and in both groups, two years before childbirth, they work roughly 39 hours per week conditional on working. This supports the assumption that women becoming mothers before and after the Fair Work Act can be meaningfully compared.

Second, a simple secular trend in maternal labor supply may explain our results. If the child penalty did not change discontinuously around 2009 but rather slowly evolved, we cannot attribute the observed changes to the Fair Work Act. Section 5.1.4 discusses – and dismisses – this eventuality.

Third, something else may have happened around the same time to explain the discontinuous change in the child penalty we document. First, we address the hypothesis that the financial crisis might have increased labor supply of mothers through the added-worker effect. In Section E.1, we show that our results are unchanged, and if anything stronger, when we control for a woman's partner's earnings and labor supply. This is unsurprising, given that the financial crisis was mild in Australia (not even a formal recession, Borland, 2011) and controlling for it does not affect our results on work arrangements.<sup>10</sup> Second, in Appendix E.2 we discuss other provisions of the Fair Work Act and argue that none of them differentially impacted mothers relative to other women, and thus do not violate our identification assumption, given that we always keep non-mothers as controls. Finally, we consider the introduction of federal Paid Parental Leave in Australia in 2010, which may in

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<sup>10</sup>Appendix C.3 shows robustness of the work arrangement results to accounting for the financial crisis.

principle explain why mothers in the late cohorts have better labor market outcomes. We exploit the fact that approximately half of the women in our sample already had access to Paid Leave through their employer even before the 2010 provision, and we show that our results also hold in this group of women not affected (or affected less) by the introduction of employer-provided Paid Parental Leave. Appendix F describes this in detail.

#### 5.1.4 It is Not a Time Trend

So far, we have shown that women who became mothers after the Fair Work Act experience a systematically smaller child penalty in labor supply and housework relative to earlier counterparts. Here we confirm that this is driven by a sharp change in 2009 and not by a slow-moving time trend. We do so by estimating the child penalty separately by cohorts, where cohort is now defined by the year of birth of the first child: for all the outcomes of interest, this time series of child penalties is relatively flat before 2009, then shows a discrete jump in 2009, and continues being flat at the new level afterward. A formal test for a break in the time series confirms the significance of this result.

**Empirical Strategy** More formally, we expand on Equation (3) by estimating a separate coefficient by cohort:

$$Y_{it} = \sum_c \left\{ \gamma_c \times \mathbb{D}_{it} \times \mathbb{1}\{c = cohort(i)\} \right\} + \alpha_i + \delta_t + \beta_{h(i)} + \epsilon_{it} \quad (4)$$

where  $\mathbb{D}_{it}$  is a dummy function for  $i$ 's first child being between 0 and 7 years old (as above) and  $cohort(i)$  is the cohort  $i$  belongs to. We define cohorts based on pairs of years of childbirth to preserve statistical power. Here,  $\gamma_c$  is the average child penalty in the first seven years after the birth of the first child, for mothers belonging to cohort  $c$ . The sequence of these coefficients shows us the time evolution of the child penalty.

**Results** Figure 5 shows that the time series of the child penalties are relatively flat up to 2009, then display a discrete jump around the 2009 cohort, and finally remain flat at a higher level. In these graphs, the year of first childbirth is on the x-axis, and the corresponding  $\gamma_c$ , from estimating Equation (4), is on the y-axis.

This pattern of child penalties being stable before the 2009 cohort, displaying a jump exactly at 2009, and then remaining stable afterwards is common among both the type of contract and labor supply. Panel (a) shows that a woman who gave birth to her first child in 2003 or 2004 was 21 percentage points less likely to be on a permanent contract conditional on working after childbirth; this number for a woman who had her first child in 2007 or 2008 was -25 percentage points. Instead, for a woman who became a mother in 2010 or 2011, the decrease in the probability of being in a permanent contract after childbirth was only 9 percentage points, and remained similarly small for women who became mothers in the following years.

This pattern looks similarly striking when the outcome is labor supply. On the intensive margin (panel b), the magnitude of the child penalty in working hours slightly increases, over time, for the birthing cohorts 2003 to 2008, before discontinuously decreasing after

2009. The figure shows that a woman experienced a drop in hours of work in the seven years after childbirth by 16 hours per week if her first child was born in 2003 or 2004 and by 17 if born between 2005 and 2008, but the child penalty in weekly hours of work was 14 hours per week or less for women who became mothers in 2010 or later. The extensive margin (panel c) shows a similar sharp change exactly around the 2009 cohort, in the direction of greater labor supply (smaller child penalty).

Home production is more nuanced, consistent with the pre-post analysis above. Panel (d) shows that the child penalty in housework displays a shift downward for post-2009 cohorts, but the shift is less pronounced than for labor supply. In panel (e), we can see that time spent parenting is pretty much constant throughout the sample period.

## 5.2 Strategy 2: Exposure by Occupation and Industry

Despite the fact that the early versus late cohorts comparison presented in Section 5.1 is robust to a series of checks, our results might, in principle, still be driven by something systematically changing for mothers in 2009 we have not accounted for. Here we address this concern by adding a further level of variation: exposure to the law, determined by the characteristics of the job women held before childbirth. We find that indeed the entirety of the effect on contract type (lower likelihood to transition from permanent to casual contract after childbirth for post-Fair Work Act cohorts of mothers), labor supply (lower drop in labor supply), and housework (lower spike in housework) is concentrated among mothers in the most exposed jobs. Adding this level of variation also allows us to zoom into the household division of labor of the most exposed couples, and test for changes we might not detect at the aggregate level. We find that male partners of treated mothers do not pick up the slack in housework and thus, while female share in paid work and household income increases substantially, female share in household home production does not change.

### 5.2.1 A Measure of Occupational Exposure

Our empirical strategy is based on the idea that different jobs are differentially exposed to the Fair Work Act and that the pre-2009 share of casual contracts in a job (“casual prevalence”) can efficiently summarize such exposure.

**Intuition** We rely on the fact that employers could refuse requests made under the Fair Work Act on “reasonable business grounds”. This implies that the reform did not affect some jobs, in which irregular and casual employment was likely inherent to the nature of the job (e.g. hospitality). Conversely, other jobs only offered permanent contracts even before the law (e.g. public administration), thus the Fair Work Act likely did not affect them either. This creates three categories of jobs: jobs with a high share of casual contracts were unaffected by the law for technological reasons, jobs with a very low share of casual contracts were unaffected because there was no scope for change in the direction of more permanent contracts (and more regular schedules), while an intermediate share of casual contracts indicates that there was scope for improvement, without technological

reasons preventing it. Therefore, we conjecture that women in this intermediate group of jobs would be most exposed to the reform.

**The Intuition in Practice** We define a “job” as an occupation-by-industry cell, and we measure casual prevalence as the share of casual contracts within a job using pre-2009 observations. Occupations and industries are identified at the 2-digit level: in our view, this strikes a good balance between cells that are sufficiently granular that people within the same cell do sufficiently similar jobs, while retaining a sufficient sample size for accurately estimating the level of casual prevalence.<sup>11</sup> Our measure of casual prevalence is the fraction of all worker-years in a given occupation-by-industry cell that report having a casual contract, restricting to observations prior to 2009. The resulting distribution of casual prevalence is displayed in Appendix Figure G.1. Our results are robust to measuring casual prevalence using observations only for men for the whole sample period (under the assumption that men are not treated by the law, both these measures should proxy for underlying job “technology”).

**Terciles of Casual Prevalence** We split the jobs (occupation-by-industry cells) in terciles of casual prevalence; Figure 6 depicts where occupations and industries fall in this classification. Each occupation is present in multiple industries, and each industry contains multiple occupations, which is why each bar contains multiple colors. From the figure, we see that the occupations with the lowest casual prevalence, meaning the occupations characterized by the highest fraction of permanent jobs, are corporate managers and various types of professionals, and public administration is the industry in which the smallest fraction of employees are on a casual contract. At the other end of the spectrum, security guards, salespersons, and workers at hotels and restaurants are those most likely to be on a casual contract. In the middle tercile of casual prevalence, we find teaching professionals, office clerks, and life science professionals, working in education and health and social work. It is reasonable to imagine that full-time permanent teachers coexist with casual teachers called in if a colleague is sick, and similarly for nurses. These occupations and industries have both a large fraction of permanent workers and a sizeable fraction of casuals, meaning that there is both scope for the law to bring a change in the direction of more permanent contracts, and no technological constraints against it: these are the occupations and industries in which we expect the Fair Work Act to have the most bite.

The bottom and middle terciles of casual prevalence include jobs that are quite similar, while the top tercile is fairly different: this is why we will mostly focus on the bottom-vs-middle comparison. In Appendix G we discuss the similarity and differences between the terciles. The main takeaway is that jobs in the bottom and middle terciles are similar in terms of weekly hours of work and pay, while for the bottom tercile these figures are much lower. Women in these jobs tend to make similar choices in terms of fertility too: women in jobs in the bottom and middle tercile of casual prevalence have their first child at 31, on average, which is three years later relative to women with jobs in the top tercile of the casual prevalence distribution. This is why, in our empirical analysis, we will emphasize

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<sup>11</sup>This is also a practical choice, since 2-digit is the highest level of granularity afforded by the general release of the dataset.

the comparison between the bottom and middle tercile, as the bottom tercile provides a more credible counterfactual for the middle tercile than the top.

### 5.2.2 Empirical Strategy

We group mothers by exposure to the Fair Work Act depending on the causal prevalence of the job they held before childbirth, and we test whether the child penalty evolved differently after 2009 for more and less exposed groups of women.

We split women in terciles of casual prevalence and we carry out three related exercises. Each woman is assigned the tercile of casual prevalence of the modal job she held in the five years prior to childbirth.<sup>12</sup> First, we replicate the early versus late cohort comparison of Section 5.1 separately by tercile, to show that the observed changes are concentrated in the middle (most exposed) tercile. Second, we estimate the time series of the child penalty separately by tercile, to show parallel pre-trends in the child penalty between more and less exposed terciles. This is carried out in Appendix H. Third, we estimate the relative difference-in-differences for the child penalties, as explained below.

Estimating the difference-in-differences for the child penalties is a little more involved than a standard diff-in-diff because we are not interested in estimating the treatment effect on  $Y$  (e.g. labor force participation), but on the pre-post birth *change* in  $Y$  (e.g. the child penalty in labor force participation). In practice, we augment Equation (3) by including the interaction with indicators for terciles:

$$\begin{aligned}
 Y_{it} = & \gamma_a \times \mathbb{D}_{it} + \\
 & + \gamma_{a,2} \times \mathbb{D}_{it} \times \mathbb{1}\{\text{tercile}(i) = 2\} + \\
 & + \gamma_{a,3} \times \mathbb{D}_{it} \times \mathbb{1}\{\text{tercile}(i) = 3\} + \\
 & + \gamma_b \times \mathbb{D}_{it} \times \text{Post}(i) + \\
 & + \gamma_{b,2} \times \mathbb{D}_{it} \times \text{Post}(i) \times \mathbb{1}\{\text{tercile}(i) = 2\} + \\
 & + \gamma_{b,3} \times \mathbb{D}_{it} \times \text{Post}(i) \times \mathbb{1}\{\text{tercile}(i) = 3\} + \\
 & + \alpha_i + \sum_{d \in \{1,2,3\}} \{\delta_{t,d} + \beta_{h(i),d}\} \times \mathbb{1}\{\text{tercile}(i) = d\} + \epsilon_{it}
 \end{aligned} \tag{5}$$

where  $\mathbb{D}_{it} = \mathbb{1}\{(t - E_i) \in [0, 7]\}$  is an indicator function that takes value of one if  $i$ 's first child is aged 0 to 7; the dummy  $\text{Post}(i)$  indicates that  $i$ 's first child was born on or after 2010 (and hence  $i$  belongs to the late cohorts, using the terminology from previous sections); and the bottom line specifies that time and age fixed effects are estimated separately by tercile. Here  $\gamma_a$  is the baseline child penalty for the bottom tercile of casual prevalence, meaning that it is the difference in  $Y$  in the seven years following the birth of their first child relative to the four years before, for individuals in the bottom tercile of casual prevalence, which we take as reference group.  $\gamma_{a,2}$  is the baseline difference in the child penalty for the treated group (middle tercile) relative to the reference group (bottom tercile), and  $\gamma_{a,3}$  is analogous for the placebo group (top tercile); these baselines are estimated off the early cohorts, meaning couples who had their first child between 2003 and

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<sup>12</sup>We do the same for the controls (non-mothers and mothers who enter the sample with old children) based on a randomly assigned fake childbirth year.

2008. The coefficient  $\gamma_b$  is the difference in child penalty for the late cohorts relative to the early cohorts for the reference group, and  $\gamma_{b,2}$  is the difference-in-differences coefficient of interest, which captures the difference in child penalty for late versus early cohorts of couples in the treated group, relative to the same difference for the reference group.  $\gamma_{b,3}$  is the difference-in-differences coefficient for the placebo group.

### 5.2.3 Results for Mothers

We confirm that the aggregate results presented earlier are concentrated among mothers in the jobs most exposed to the Fair Work Act, supporting the hypothesis that the greater likelihood of being on a permanent contract and on a regular schedule brought by the Fair Work Act was responsible for the observed increase in maternal labor supply (decrease in the child penalty).

Figure 7 replicates Figure 4 (early versus late cohort comparison) but split by terciles of exposure. Here the estimates for the early cohorts of mothers (that is, women who became mothers between 2005 and 2008, before the Fair Work Act) are represented by circles connected by dashed lines, while the ones for the late cohorts of mothers (women whose first childbirth was between 2010 and 2013) are represented by squares connected by solid lines. The panels on the left, in blue, are estimated on women with pre-birth jobs in the bottom tercile of casual prevalence: these women were in jobs where it was already the norm for everyone to be on a permanent contract, and thus were likely not affected by the Fair Work Act. The panels in the middle, in orange, are estimated on women with pre-birth jobs in the middle tercile of casual prevalence: in these jobs, not everyone was already on permanent contracts – and thus there was scope for improvement, but also not everyone was on casual contracts, thus suggesting the absence of “technological” constraints against permanent contracts. Finally, the panels on the right, in grey, are estimated on mothers with pre-birth jobs in the top tercile of casual prevalence: here, casual contracts are presumably part of the “technology” of the job, and it’s likely that employers can refuse requests made under the Fair Work Act on “reasonable business grounds”: we don’t expect this group to be impacted by the Fair Work Act as much as the middle group (if at all).

**Probability of Transitioning Out of a Permanent Contract Upon Childbirth: from 37 Percentage Points to Zero for Most Exposed Mothers** Women with pre-birth jobs in the middle tercile of “casual prevalence” experienced a stark decrease in the probability of transitioning to a casual contract after childbirth after the Fair Work Act, while women with jobs in the other two terciles did not. Panel (a) of Figure 7 shows the child penalty in the probability of being on a permanent contract, conditional on working. For women with jobs in the bottom tercile of casual prevalence (blue, on the left), relatively few women transitioned from permanent to casual contract after childbirth at baseline, before the Fair Work Act (9 percentage points); this number is virtually zero for post-Fair Work Act cohorts of mothers, and the difference between cohorts is not statistically significant (11 p.p., with a standard error of 7 p.p.). Mothers in the top tercile (grey, on the right) experienced a similar decrease in the probability of being in a permanent contract both before and after

the Fair Work Act. Women with pre-birth jobs in the middle tercile of casual prevalence – the most exposed – (orange, in the middle) are the ones for which we observe the sharpest change: while the early cohorts experienced a massive drop in the probability of remaining in a permanent contract after childbirth (-37 p.p.), the late cohorts in this group experienced no change in the probability of remaining in a permanent contract after childbirth. The difference is large and highly significant (40 p.p., S.E.: 8 p.p.).

**Exposure to Fair Work Act Increased Labor Supply and Decreases Housework, But Not Parenting** The large change in maternal labor supply (decrease in child penalty) between pre- and post-Fair Work Act cohorts of mothers is fully concentrated in the middle tercile, as is the change in housework; parenting does not change for any group. By looking at Figure 7, it is evident that the middle tercile (in orange), which experienced the largest relative increase in the probability of being on a permanent contract (panel a), is also the same group that experienced the largest relative increase in labor supply (panel b, +11 hours per week, with a standard error of 2.6 hours/week) and decrease in housework (panel d, -6 hours per week, S.E.: 2 hours/week). Parenting (panel c) is unchanged even in this group (+2.3 hours per week, S.E.: 3 hours per week), despite the massive increase in labor supply.

The triple difference coefficient estimates are consistent with the patterns visualized in the graphs. The coefficients of interest ( $\gamma_{b,2}$ ) from running Specification (5) are highlighted in blue in Table 5. They convey the same message as Figure 7; numbers can be slightly different because this specification uses all available cohorts (birthing cohorts from 2003 to 2017, excluding 2009) as opposed to focusing only on the cohorts closest to the Fair Work Act.<sup>13</sup> Indeed, the fact that the triple difference numbers are very close in the two exercises speaks to the stability of the estimated treatment effect and to the underlying parallel trends assumption, which we discuss in detail in Appendix H.

#### 5.2.4 Results for Couples and Intra-household Time Allocation

We do not find any evidence that increased labor supply and earnings of mothers impact how the time burden of children is shared among partners, or that men's time use is impacted at all.

In what follows, treatment status for men is defined as their female partner's treatment status, and treatment status for a couple is defined as the woman's treatment status. That is, men (and couples) in "bottom tercile" are partners of women with pre-birth jobs in the bottom tercile of casual prevalence, and analogously for the other two groups, regardless of their own job.

**(Lack of) Changes in Men's Time Use** Partners of treated mothers don't change their labor supply, nor their time spent in home production, despite the large changes in their female partner's time use. As we can see from panel (a) of Figure 8, men do not change

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<sup>13</sup>In the event study graphs we restrict to cohorts 2005-2008 and 2010-2013 in order to have a balanced panel for both early and late cohorts of parents.

their labor supply around childbirth, and this is true for all groups and cohorts. Panel (c) shows that the same is true for housework, except for a small and not significant increase in housework for the late cohorts of fathers in the middle tercile. In panel (b) we see a small increase in parenting for partners of most exposed mothers (middle panel, in orange), but the increase is not statistically significant and does not significantly alter how home production is shared between the partners, to which we turn next. Consistently, the triple difference coefficient estimates reported in blue in Table 6 (columns 2, 4, and 6) show no significant change in time use for the partners of most exposed mothers.

### **Women Contribute More to Household Income But No Less to Home Production**

Most exposed mothers, who increase their labor supply (thanks to greater access to regular schedules and permanent contracts granted by the Fair Work Act) increase their contribution to total household income, but this does not lead to a change in the relative distribution of home production. Panel (a) of Figure 9 displays the child penalty in “Female Share of Household Income”, computed as the fraction of total household annual labor income earned by the woman. For all groups and for all cohorts we observe a decrease in the female contribution to total household income after childbirth, consistent with the post-childbirth decrease in labor supply for women but not for men documented previously, in Figure 7. However, for the middle tercile (most exposed to the Fair Work Act), the late cohorts experience a drop in this measure half the size that of their earlier counterparts (while we don’t observe similarly sharp differences between the two cohorts for women in bottom and top terciles). This is a direct consequence of the fact that most exposed mothers increased their contribution to the total labor supply of the household, as shown in panel (b).<sup>14</sup> Despite the substantial increase in the female share of household income and of the female share in paid work for most exposed mothers, we do not observe a significant decrease in the female share of home production (the point estimate is -0.4 p.p., with a standard error of 2.5 p.p.). Since housework represents a small share of home production when there is a young child to take care of, the decrease in women’s time spent in housework is compatible with the lack of change in the relative distribution of total time in home production.

This lack of reallocation of home production among partners, despite a substantial increase in the female share of household income, suggests that women’s labor market opportunities are not the main reason we observe such an unbalanced allocation of the time burden of children. In other words, task allocation within the household is not simply a function of relative labor market earnings. The reason for the observed unequal division of home production is to be looked for elsewhere, possibly in gender norms.

#### **5.2.5 Threats to Validity and Robustness Checks**

Our job exposure strategy relies on a triple difference version of the parallel trend assumption: that the *child penalties* of mothers in the treated tercile would have evolved, over

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<sup>14</sup>Here the outcome variable is the fraction of female time spent in paid work over total household time spent in paid work:  $\frac{\text{Woman's weekly hours in paid work}}{\text{Woman's weekly hours in paid work} + \text{Man's weekly hours in paid work}}$ .

time, similarly to the ones of the other two groups. We support this assumption in several ways. First, we show parallel pre-trends in child penalties across terciles. Second, we show no selection into childbirth: early and late cohorts of mothers in the three groups are similar in terms of observables in the pre-birth years, and fertility trends are similar across terciles. Third, we rule out selection into occupation by showing that our results are robust to assigning women the exposure of the job they had before the Fair Work Act. We discuss these three sets of checks in detail in Appendix H.

In the first check, carried out in Appendix H.1, we show that the child penalties in the outcomes of interest (probability of being on a permanent contract, labor supply, house-work) for the bottom and middle terciles were evolving in parallel before the 2009 cohort. We do this by displaying the evolution over cohorts of the child penalty in our main outcomes of interest, separately for the three terciles of casual prevalence to whom mothers belong. Namely, we replicate Figure 5 separately for the three terciles of casual prevalence. The figures clearly show that the child penalties for the bottom and middle terciles were evolving in parallel, though on different levels, before 2009, with the middle tercile displaying bigger penalties. They also show that there was a sharp change in 2009 for the middle tercile and that after 2009, the child penalties for the bottom and middle tercile continued to evolve in parallel, but much closer to each other, or, in certain cases, on the same level.

The second set of checks shows that will-be mothers are similar on pre-birth observables in each tercile. In Appendix H.2 we replicate the balance table in pre-birth characteristics between early and later cohorts of mothers (Appendix Table C.1) separately by terciles. In all three terciles, will-be mothers whose first child was born between 2003 and 2008 are similar in pre-birth characteristics such as hours worked, hourly pay, and female share of household labor income to will-be mothers whose first child was born between 2010 and 2017. This lends support to the assumption that earlier cohorts of mothers in similar pre-birth jobs are a good counterfactual for later cohorts of mothers.

Finally, we show that selection into occupation is not a concern in this setting. If more career-oriented women endogenously switched to jobs in the middle tercile, for example, this would be an interesting story but would change the interpretation of our results. We rule this out with two observations. First, most of our analysis focuses on a short time span (four-year childbirth cohorts around 2009), and it's unlikely that workers in their late twenties would make a dramatic occupation switch in this small window. Second, in Appendix H.3, we show formally that our results are unchanged when defining exposure on jobs that were chosen before the Fair Work Act: we limit the sample to two-year cohorts around the Fair Work Act and assign women the exposure of the job they had three years before childbirth (thus the job they had before the Fair Work Act); our results are the same as with the primary strategy.

## 6 Conclusion

This paper studies the role of work arrangements in explaining the child penalty in labor supply, defined as the large drop in working hours that women face when becoming mothers. Leveraging the variation introduced by the Fair Work Act, which entitled parents of

young children to request a change in their work arrangements, we establish three sets of facts. First, the Fair Work Act was used by new mothers to reduce their weekly working hours without renouncing their permanent contract, hence maintaining a regular schedule. In the institutional context in place in Australia at the time of the reform, permanent contracts provided the most predictable hours, but such contracts were almost exclusively available for full-time jobs. The shift introduced by the Fair Work Act allowed mothers to work under permanent contracts while reducing their working hours, and therefore enjoying the predictability of a regular schedule while being able to work less-than-full-time hours.

The second part of our analysis documents that this shift led to a decrease in the child penalty in working hours. Our interpretation is that, when given the option to work the regular schedule afforded by a permanent contract, mothers were able to work longer hours than what they would have done with the irregular schedule associated with a casual contract. Using our measure of occupational exposure to the Fair Work Act as a further source of identification, we find that the most exposed women, for whom the probability of staying in a permanent contract after childbirth increased by 50%, are also the group for whom the child penalty in the hours of work dropped by almost 40%.

The final set of results we present discusses the effect on intra-household repartition of tasks of the above-mentioned improvement: while the changes in mothers' working hours imply a shift towards equality in the male- and female-shares of household income, we do not observe any changes in the female (disproportionate) share of home production.

We conclude the paper opening the way for further research in this area. First, our paper shows the existence of a "child penalty" in work arrangements: most notably, women switch out of their permanent contract at the time of childbirth, in order to be able to reduce their labor supply on the intensive margin. When these work arrangements are allowed to change, labor supply changes as well. Further research is warranted to explore further both which work arrangements are predictive of the size of the child penalty, and what we can learn from the way work arrangements change around childbirth. Second, one would expect that changing labor supply around childbirth would be part of an overall rearrangement of tasks within the household. We have argued that this is not the case, and that improving women's share of household income does not map into a more equitable distribution of home production. Exploring why the reallocation did not happen and understanding what in certain cases prevents labor market conditions from impacting the intra-household allocation of tasks (is it gender norms?) seems like a fruitful avenue for future research.

## **Disclaimers**

This paper uses unit record data from Household, Income and Labour Dynamics in Australia Survey [HILDA] conducted by the Australian Government Department of Social Services (DSS). The findings and views reported in this paper, however, are those of the author[s] and should not be attributed to the Australian Government, DSS, or any of DSS' contractors or partners. DOI: 10.26193/3QRFMZ.

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## References

- Martin Eckhoff Andresen and Emily Nix. What Causes the Child Penalty? Evidence from Adopting and Same-Sex Couples. *Journal of Labor Economics*, 40(4):971–1004, October 2022. Publisher: The University of Chicago Press. 5, 15
- Minji Bang. Job Flexibility and Household Labor Supply: Understanding Gender Gaps and the Child Wage Penalty. page 53, 2021. 5
- Garry Barrett. The labor market in Australia, 2000-2016. *IZA World of Labor*, 2018. ISSN 20549571. doi: 10.15185/izawol.443. 59
- Micaela Bassford and Hayley Fisher. The Impact of Paid Parental Leave on Fertility Intentions. *Economic Record*, 96(315):402–430, 2020. ISSN 1475-4932. doi: 10.1111/1475-4932.12561. 73
- Jacob Bastian and Lance Lochner. The Earned Income Tax Credit and Maternal Time Use: More Time Working and Less Time with Kids? *Journal of Labor Economics*, 40(3):573–611, July 2022. ISSN 0734-306X. Publisher: The University of Chicago Press. 19
- Marianne Bertrand, Claudia Goldin, and Lawrence F. Katz. Dynamics of the gender gap for young professionals in the financial and corporate sectors. *American Economic Journal: Applied Economics*, 2(3), 2010. 5
- Barbara Boelmann, Anna Raute, and Uta Schonberg. Wind of change? cultural determinants of maternal labor supply. 2021. 5
- Valentin Bolotnyy and Natalia Emanuel. Why do women earn less than men? evidence from bus and train operators. *Journal of Labor Economics*, 40(2):283–323, 2022. 5
- Alison L Booth and Jan C Van Ours. Part-time jobs: What women want? *Journal of Population Economics*, 26:263–283, 2013. 5
- Jeff Borland. The australian labour market in the 2000s: The quiet decade. In *The Australian Economy in the 2000s, Proceedings of a Conference, Reserve Bank of Australia, Sydney*, pages 165–218, 2011. 20, 59
- Aline Bütikofer, Sissel Jensen, and Kjell G. Salvanes. The role of parenthood on the gender gap among top earners. *European Economic Review*, 109:103–123, 2018. 5
- Rae Cooper and Marian Baird. Bringing the “right to request” flexible working arrangements to life: From policies to practices. *Employee Relations*, 37(5):568–581, 2015. 11
- Patricia Cortés and Jessica Pan. Children and the Remaining Gender Gaps in the Labor Market. *Journal of Economic Literature*, 61(4):1359–1409, December 2023. ISSN 0022-0515. 5, 15, 19
- Breen Creighton and Andrew Stewart. *Labour Law*. The Federation Press, 2010. 11, 19

Gordon B. Dahl, Katrine V. Løken, Magne Mogstad, and Kari Vea Salvanes. What Is the Case for Paid Maternity Leave? *Review of Economics and Statistics*, 98(4):655–670, 2016.  
5

Alexandra de Gendre, John Lynch, Aurélie Meunier, Rhiannon Pilkington, and Stefanie Schurer. Child Health and Parental Responses to an Unconditional Cash Transfer at Birth. Working Paper 14693, IZA Discussion Papers, 2021. 73

Alicia de Quinto, Laura Hospido, and Carlos Sanz. The child penalty: evidence from Spain. *SERIES*, 12(4):585–606, 2021. ISSN 1869-4195. 5

Daniela Del Boca, Silvia Pasqua, and Chiara Pronzato. Motherhood and market work decisions in institutional context: a european perspective. *Oxford Economic Papers*, 61(suppl\_1):i147–i171, 2009. 6

Daniel Fernández-Kranz and Núria Rodríguez-Planas. Too family friendly? the consequences of parent part-time working rights. *Journal of Public Economics*, 197:104407, 2021. 63

Jonah B Gelbach. Public Schooling for Young Children and Maternal Labor Supply. *American Economic Review*, 92(1):307–322, 2002. 5

Claudia Goldin. A grand gender convergence: Its last chapter. *American Economic Review*, 104(4):1091–1119, 2014. 2, 5, 6, 75, 76

Claudia Goldin and Lawrence F Katz. A most egalitarian profession: pharmacy and the evolution of a family-friendly occupation. *Journal of Labor Economics*, 34(3):705–746, 2016. 2, 5

Tarjei Havnes and Magne Mogstad. Money for nothing? Universal child care and maternal employment. *Journal of Public Economics*, 95(11), 2011. 5

Guyonne Kalb. Paid parental leave and female labour supply: A review. *Economic Record*, 94(304):80–100, 2018. 73

Parvinder Kler, Azhar Hussain Potia, and Sriram Shankar. Underemployment in australia: a panel investigation. *Applied Economics Letters*, 25(1):24–28, 2018. 10

Henrik Kleven. The Geography of Child Penalties and Gender Norms: Evidence from the United States, June 2022. 5

Henrik Kleven, Camille Landais, Johanna Posch, Andreas Steinhauer, and Josef Zweimüller. Do Family Policies Reduce Gender Inequality? Evidence from 60 Years of Policy Experimentation. *American Economic Journal: Economic Policy*. ISSN 1945-7731. doi: 10.1257/pol.20210346. 5, 19

Henrik Kleven, Camille Landais, and Jakob Egholt Søgaard. Children and Gender Inequality: Evidence from Denmark. *American Economic Journal: Applied Economics*, 11(4): 181–209, 2019. 5, 15, 19

Henrik Kleven, Camille Landais, and Jakob Egholt Søgaard. Does Biology Drive Child Penalties? Evidence from Biological and Adoptive Families. *American Economic Review: Insights*, 3(2):183–198, 2021. 5

Henrik Kleven, Camille Landais, and Gabriel Leite-Mariante. The Child Penalty Atlas, August 2023. 2

Pierre Lefebvre and Philip Merrigan. Child-Care Policy and the Labor Supply of Mothers with Young Children: A Natural Experiment from Canada. *Journal of Labor Economics*, 26(3), 2008. doi: 10.1086/587760. 5

Alexandre Mas and Amanda Pallais. Valuing alternative work arrangements. *American Economic Review*, 107(12):3722–59, 2017. 5

Julie McMillan, Adrian Beavis, and Frank L Jones. The ausei06: A new socioeconomic index for australia. *Journal of Sociology*, 45(2):123–149, 2009. 50

Valentina Melentyeva and Lukas Riedel. Child Penalty Estimation and Mothers' Age at First Birth. 2023. 16

Claudia Olivetti and Barbara Petrongolo. The economic consequences of family policies: lessons from a century of legislation in high-income countries. *Journal of Economic Perspectives*, 31(1):205–30, 2017. 5, 19, 72, 73

Bernadette O'Neill. General Manager's Report into the operation of the provisions of the National Employment Standards relating to requests for flexible working arrangements and extensions of unpaid parental leave 2009-2012. Technical report, Fair Work Australia, 2012. 15, 71

Barbara Pocock and Helen Masterman-Smith. Workchoices and women workers:[paper in: Whose choices? analysis of the current industrial relations' reforms']. *Journal of Australian Political Economy*, The, (56):126–144, 2005. 9

Barbara Pocock, John Buchanan, and Iain Campbell. Meeting the challenge of casual work in australia: evidence, past treatment and future policy. *Australian Bulletin of Labour*, 30(1):16–32, 2004. 9

Barbara Pocock, Natalie Skinner, and Reina Ichii. Work, life and workplace flexibility: The australian work and life index 2009. *Centre for Work+ Life, University of South Australia*, page 11, 2009. 10, 11

Reserve Bank of Australia. The Global Financial Crisis. URL <https://www.rba.gov.au/education/resources/explainers/the-global-financial-crisis.html>. 59

Uta Schönberg and Johannes Ludsteck. Expansions in Maternity Leave Coverage and Mothers' Labor Market Outcomes after Childbirth. *Journal of Labor Economics*, 32(3): 469–505, 2014. 5

Peter Siminski and Rhiannon Yetsenga. Specialization, comparative advantage, and the sexual division of labor. *Journal of Labor Economics*, 40(4):851–887, 2022. 6

Michelle Summerfield, Brooke Garrard, Markus Hahn, Yihua Jin, Roopa Kamath, Ninette Macalalad, Nicole Watson, Roger Wilkins, and Mark Wooden. Hilda user manual-release 19. *Melbourne Institute of Applied Economic and Social Research, University of Melbourne*, 2019. 50

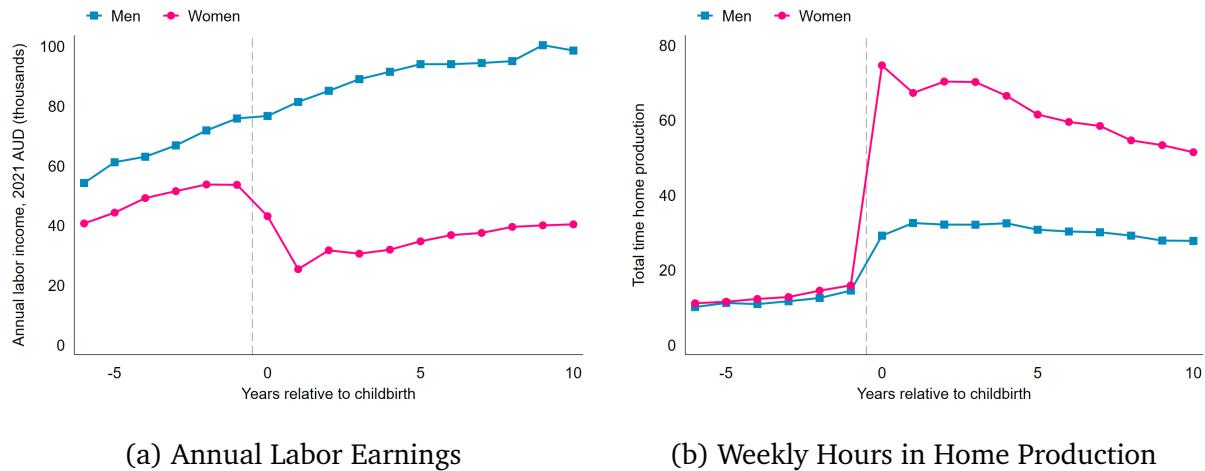
Liyang Sun and Sarah Abraham. Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, 2020. 16, 37, 42

Melanie Wasserman. Hours Constraints, Occupational Choice, and Gender: Evidence from Medical Residents. *The Review of Economic Studies*, 90(3):1535–1568, May 2023. ISSN 0034-6527. doi: 10.1093/restud/rdac042. 5

Nicole Watson and Mark Peter Wooden. The hilda survey: a case study in the design and development of a successful household panel survey. *Longitudinal and life course studies*, 3(3):369–381, 2012. 7

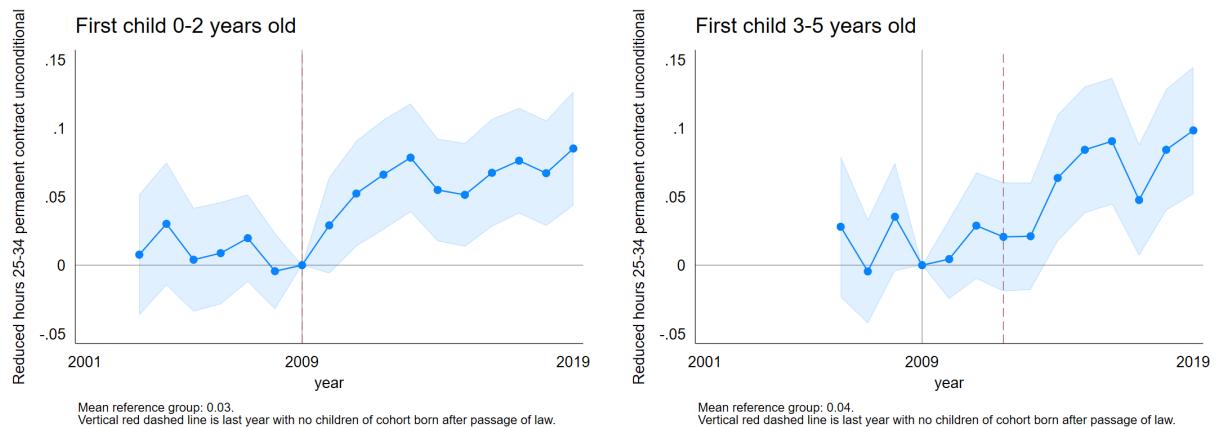
## 7 Figures

Figure 1: Child Penalties in Raw Data: Labor Earnings and Time Use around Birth of First Child



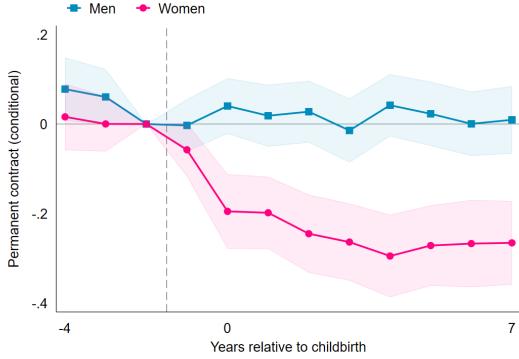
Note: This figure shows average annual labor earnings (in thousands of Australian Dollars, normalized to 2021) and average weekly hours spent in home production (housework and playing with and caring for own children) in years relative to the birth of the first child. The blue squares are averages for men, and the pink circles are averages for women.

Figure 2: Reduced-hours Permanent Contract for Mothers Relative to Non-Mothers, by Year and Age of Child

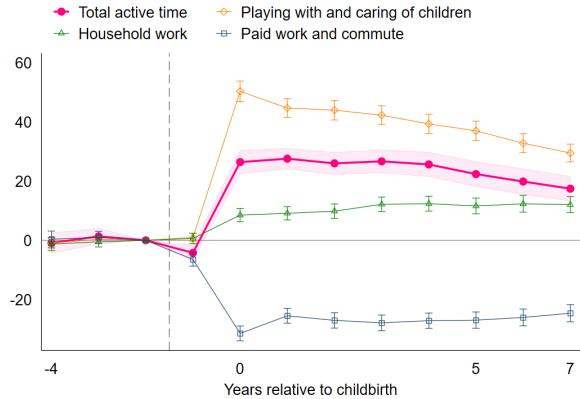


*Note:* This figure shows the change in the unconditional probability of having a reduced-hours permanent contract for mothers relative to non-mothers over time. More formally, we are plotting the estimates of  $\beta_{a,j}$  from Equation (1), where the outcome variable is reduced-hours permanent contract, a dummy for working between 25 and 34 hours per week under a permanent contract (unconditional). The left panel displays the estimates for the dummy of the first child being aged 0-2, the right panel 3-5. The vertical dashed lines indicate the first cohort that includes at least some children born after the passage of the law (2010 for 0-2 year old, 2013 for 3-5 year old).

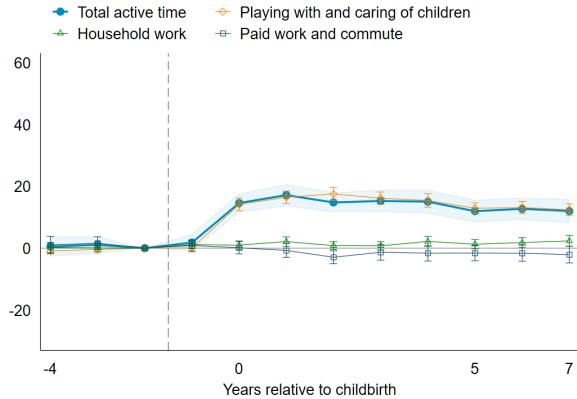
Figure 3: Child Penalties Before the Fair Work Act



(a) Permanent contract (conditional)



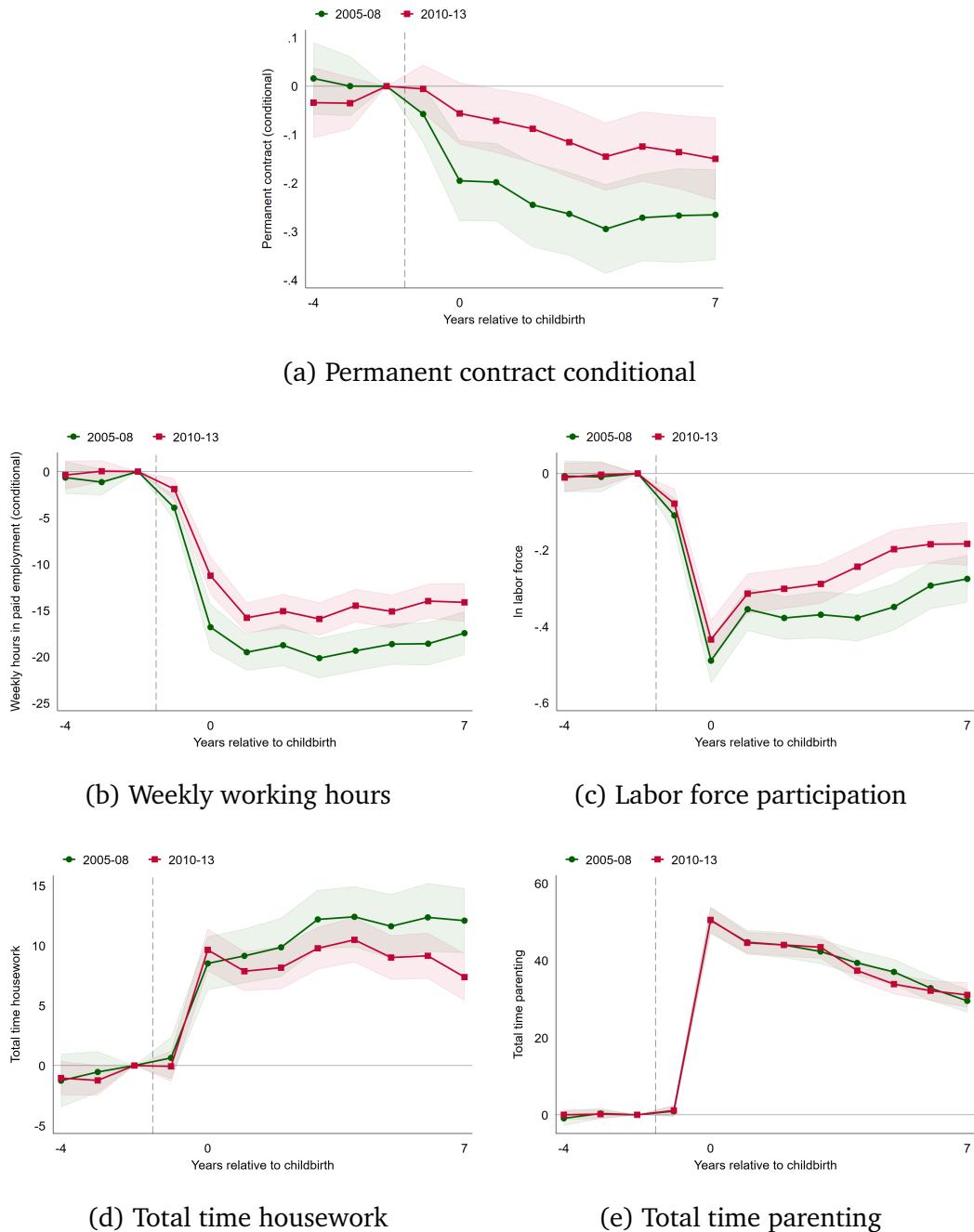
(b) Time use - Women



(c) Time use - Men

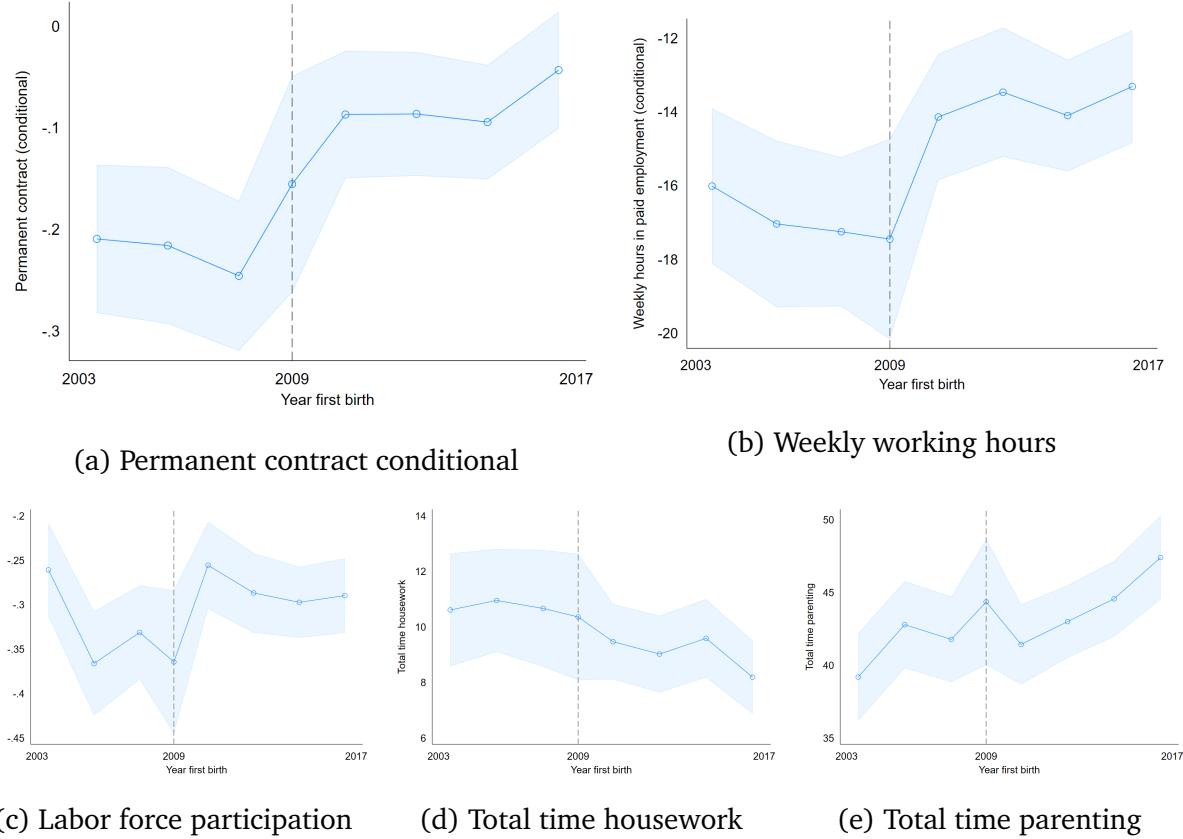
*Note:* This figure shows the child penalty in the probability of having a permanent contract conditional on working (panel a) and in different dimensions of time use (panels b and c), as described in Section 4.1. Namely, the figure plots the coefficients  $\gamma_k$ 's from estimating Equation (2), which includes individual, time, and age fixed effects. In panel (a), the outcome is a dummy for being on a permanent contract conditional on working: the blue squares are the estimates for men, the pink circles are the estimates for women, and the shades around them are 95% confidence intervals. Panels b and c plot the estimates for different dimensions of time use, separately for women (panel b) and men (panel c). The blue squares are estimates for the outcome variable “weekly hours spent in paid work and commuting”, the green triangles for weekly hours spent in housework, and the yellow diamonds for weekly hours spent playing with or caring for the child. “Total active time” is the sum of these three variables, and can be interpreted as total hours in a week minus leisure and sleep. The coefficient estimates for total active time as outcome variable are shown in pink for women in panel b and in blue for men in panel c. We only include parents who had their first child between 2005 and 2008, and we include non-parents and parents of older children as controls - see Section 4.1 for details. All regressions are estimated using the Sun and Abraham (2020) estimator, and clustering standard errors at the individual level.

Figure 4: Change in the Child Penalty for Women: Early Versus Late Cohorts (Pre vs Post Fair Work Act)



*Note:* This figure shows how the child penalty in permanent contract and time use for women has changed after the passage of the Fair Work Act. In panel (a) the outcome is a dummy for having a permanent contract conditional on working; in panel (b) the outcome is weekly hours in paid employment conditional on working; in panel (c) the outcome is a dummy for whether the individual is in the labor force; in panel (d) the outcome is weekly hours spent doing housework, and in panel (e) weekly hours spent playing with and taking care of the child . All panels plot the child penalty by year relative to childbirth (the coefficients  $\gamma_k$ 's in Equation (2)) for women, estimated separately for early cohorts (first childbirth between 2005 and 2008, green circles) and late cohorts (first childbirth between 2010 and 2013, red squares). Women without children and with older children are included in both regressions as controls, and women having children in other sample years are excluded from both regression. See note to Figure 3 for further details.

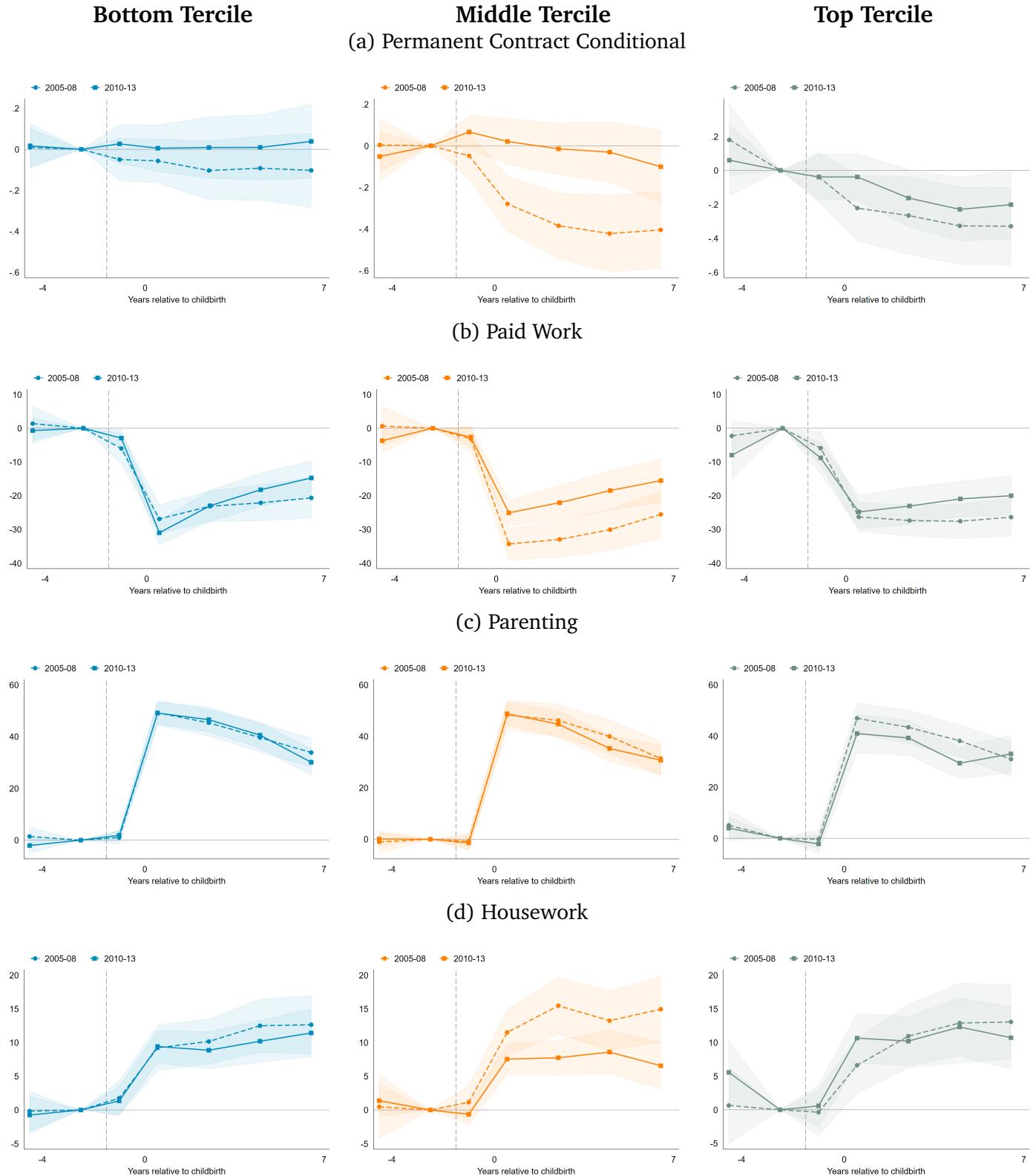
Figure 5: Time Evolution of the Child Penalty for Women



*Note:* This figure shows how the child penalty in permanent contract and labor supply for women has changed over the sample period. All panels display average of the child penalty from zero to seven years after the birth of the first child for women by year of birth of the first child. That is, they plot the estimates of  $\gamma_c$  from Equation (4). The blue circles are the estimates yearly cohort-by-yearly cohort, and the shades around them are 95% confidence intervals. The solid lines are the linear trends estimated for childbirth cohorts 2003-2008 and 2010-2017, and the dashed lines are the corresponding 95% confidence intervals, as described in Section 5.1.4. We cluster standard errors at the individual level.

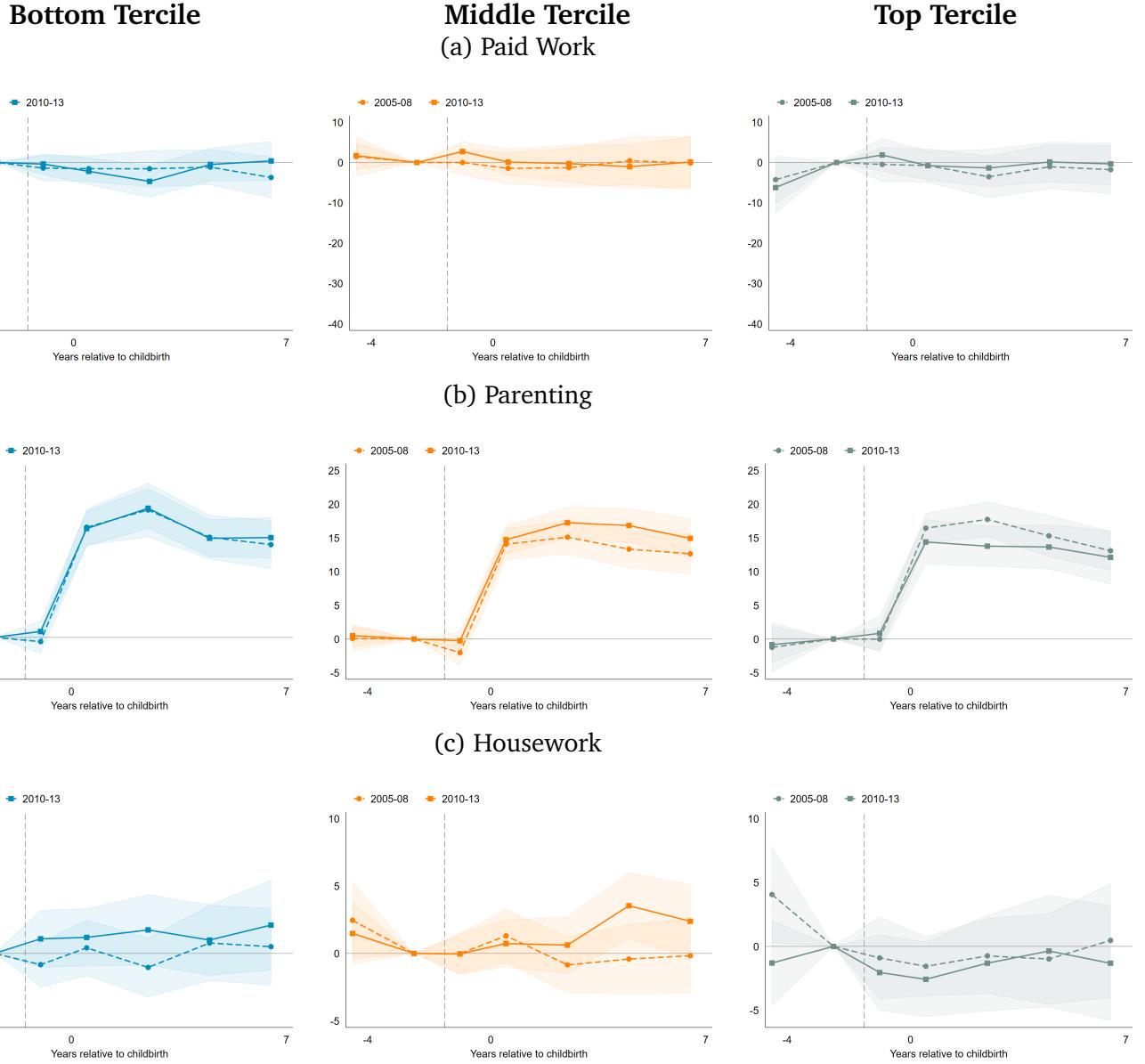


Figure 7: Contract Type and Time Use of Women around Childbirth, Before and After Reform by Exposure to the Fair Work Act



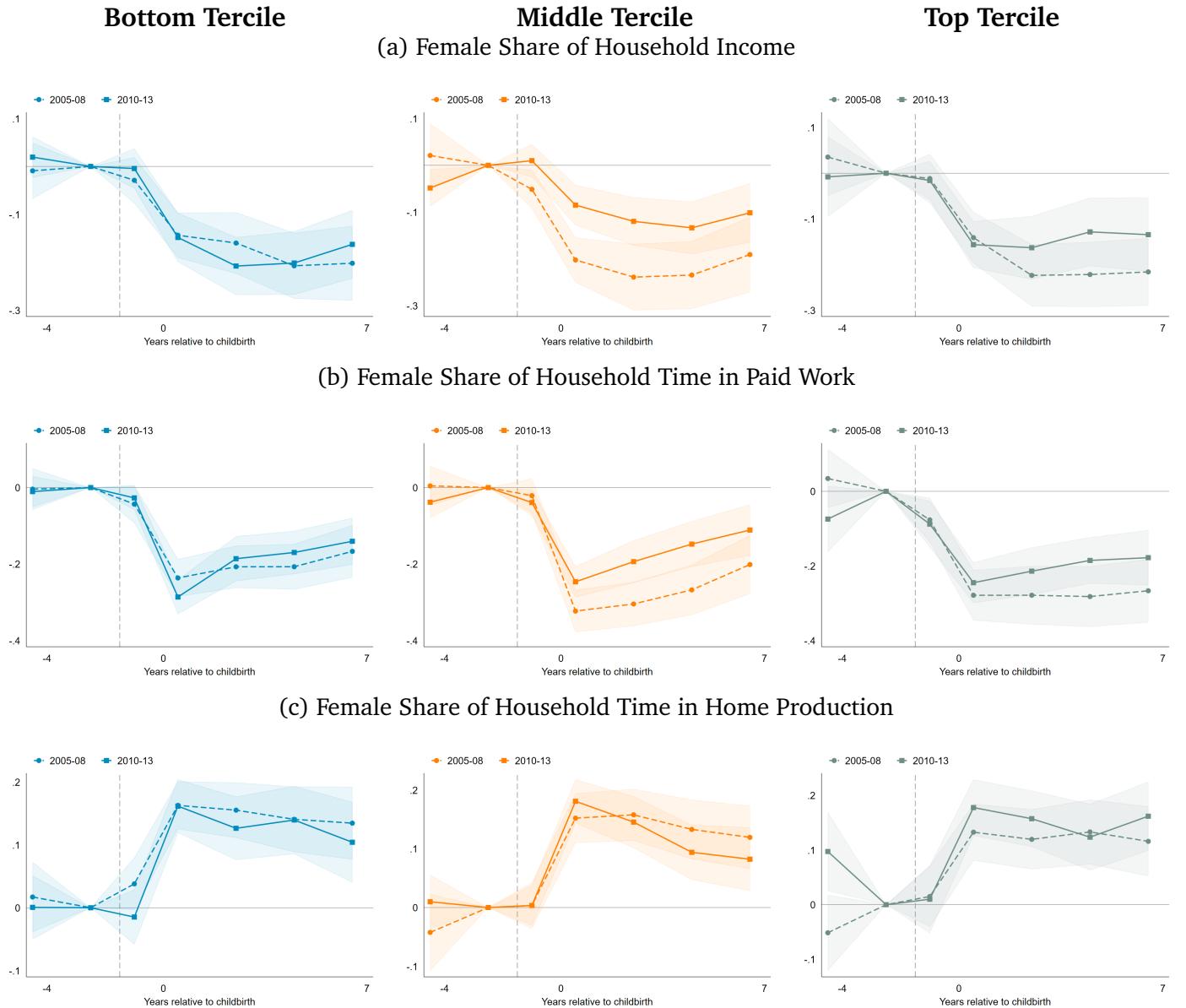
Note: This figure shows the child penalty in permanent contract and time use for women by early and late cohorts and by terciles of casual prevalence. The leftmost panels restrict the sample to women whose modal job in the five years before their first childbirth was in the bottom tercile of casual prevalence (jobs with the highest share of permanent contracts); the middle panels to women whose modal job in the five years before their first childbirth was in the middle tercile of casual prevalence (the most exposed to the Fair Work Act); the rightmost panels to women whose modal job in the five years before their first childbirth was in the top tercile of casual prevalence (jobs with the highest share of casual contracts) - see text for details. Further details on estimation in note to Figure 8.

Figure 8: Time Use of Men around Childbirth, Before and After Reform by their Partner's Exposure to the Fair Work Act



*Note:* This figure shows the child penalty in time use for men by early and late cohorts and by their female partner's terciles of casual prevalence. It replicates the time use part of Figure 7 for men, but based on their female partner's treatment status. In each panel, we report estimates of  $\gamma_k$ 's from estimating a version of Equation (2) that pools adjacent years in pairs for clarity (i.e. the relative-year dummies are bi-annual as opposed to annual). Each set of coefficient estimates comes from separate regressions, all of which include individual, time, and age fixed effects. In the top row, the outcome is weekly hours spent in paid work and commute; in the second row, the outcome is weekly hours spent in household work (housework and errands); in the bottom row, the outcome is weekly hours spent parenting (playing with and caring for the child). Within each panel, the circles connected via dashed lines are estimates restricting the sample to male partners of women who had their first child between 2005 and 2008, while the squares connected via solid lines are coefficient estimates restricting the sample to male partners of women whose first child was born between 2010 and 2013. The shades around the point estimates are 95% confidence intervals. All regressions are estimated using the Sun and Abraham (2020) estimator, and clustering standard errors at the individual level.

Figure 9: Female Share of Household Income, Working Time, and Home Production around Childbirth, Before and After Reform by Exposure to the Fair Work Act



*Note:* This figure shows the child penalty in female share of household income, female share in total household time spent working, and female share in total household time spent in home production (sum of housework and parenting) by early and late cohorts and by terciles of casual prevalence. The treatment status of the household is based on the woman's treatment status. See notes to Figure 7 and 8 for details.



Table 2: Comparing pre-2009 Awards to Modern Awards

Before Fair Work Act			After Fair Work Act		
Name	Year	Provision	Name	Year	Provision
Private Hospital Employees (State) Award (AN120434)	2006	(i) A permanent part-time employee is one who is permanently appointed to work a specified number of hours which are less than those prescribed for a full-time employee. Permanent part-time employees shall be paid an hourly rate calculated on the basis of [...] (Section 8)	Health Professionals and Support Services Award (MA000027)	2010	A part - time employee is an employee who is engaged to work less than the full - time hours of an average of 38 hours per week and who has reasonably predictable hours of work. Before commencing employment, the employer and employee will agree in writing on a regular pattern of work including the number of hours to be worked each week, the days of the week the employee will work and the starting and finishing times each day. (Section 10.3)
Community Colleges Tutors (State) Award (AN120151)	2006	"Part-Time Tutor" means a tutor other than a casual tutor who is engaged to work regularly, but has a lesser tutoring load than a full-time tutor. [...] A part-time tutor shall be entitled to the same conditions as a full-time tutor and shall be entitled to all conditions on a pro-rata basis. (Section 2.6 and 3.2.2)	Educational Services (Post-Secondary Education) Award (MA000075)	2010	A part-time employee is an employee employed for less than the normal ordinary hours specified for a full-time employee, or in the case of a teaching staff member for less than the face-to-face teaching load of a full-time teaching staff member at that workplace, for which all award entitlements are paid or calculated on a pro rata basis by reference to the time worked. Before engagement the employer and the part-time employee will agree in writing on a regular pattern of work, including the number of hours to be worked each week, the days of the week the employee will work, the starting and finishing times each day where hours are not averaged and any periods during a year when work by the employee will not be required. Changes in hours may only be made by agreement in writing between the employer and the employee. (Section 10.3)
Restaurant Keepers Award (AN170086)	2006	A part-time employee shall be entitled to all provisions of a full-time employee on a pro rata basis. (Section 27)	Fast Food Industry Award (MA000003)	2010	A part-time employee is an employee who works less than 38 hours per week and has reasonably predictable hours of work. (Section 12.1)

Note: The table shows quotes from different Awards, before and after the Fair Work Act, to illustrate how provisions concerning part-time employment changed. The correspondence between pre-2009 Awards and the post-Fair Work Act relevant contract was downloaded here: <https://www.fwc.gov.au/agreements-awards/awards/awards-research> (date of download: February 5 2024). All the texts from the Awards can be downloaded from <https://www.fwc.gov.au/document-search> (date of download: March 26, 2024).

Table 3: Changes in Work Arrangements for Mothers

	(1) Reduced- hours Permanent (Uncond.)	(2) Reduced- hours Permanent (Cond.)	(3) Less-than- Full-Time Permanent (Uncond.)	(4) Regular Schedule	(5) On call	(6) My working times can be flexible (yes /no)	(7) Any hour worked from home
First child 0-2 × First birth after 2009	0.0501*** (0.00889)	0.0845*** (0.0169)	0.0725*** (0.0147)	0.102*** (0.0234)	-0.0285+ (0.0158)	-0.0613* (0.0303)	-0.0380+ (0.0221)
First child 3-5 × First birth after 2012	0.0499*** (0.0111)	0.0778*** (0.0199)	0.0767*** (0.0177)	0.0577* (0.0265)	-0.0447** (0.0170)	-0.0101 (0.0281)	0.0323 (0.0230)
Pre-period mean:							
First child aged 0-2	0.0367	0.0837	0.154	0.267	0.103	0.588	0.314
First child aged 3-5	0.0529	0.107	0.191	0.282	0.123	0.579	0.310
Observations:							
N	123930	74013	123930	83553	83580	61120	88698
N Individuals	12506	9118	12506	9782	9783	8259	10532

Standard errors in parentheses

+  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

Note: This table shows the estimates for the coefficients of a restricted version of Equation (1), where we replace the year-by-year interactions with mobile “post” dummies. In particular, we interact the dummy for the first child being between 0 and 2 with an indicator for the year being equal or after 2010 and the dummy for the first child being between 3 and 5 with an indicator for the year being equal or after 2013. These coefficients are reported in the first two lines. The regressions also include the dummies based on the age of the first child for age groups 0-2, 3-5, 6-8, 9-10, more than 10; as well as the interaction between 6-8 and post-2016 and individual, time and age fixed effects; these coefficients are not reported. The bottom panel includes the pre-period means of the outcome variables, namely averages for the relevant group of the years for which the mobile “post” dummy is zero. Standard errors are clustered at the individual level. Here the sample is restricted to women only. The outcomes considered are: in column (1) a dummy for working reduced hours (25-34 hours per week) on a permanent contract, unconditional; in column (2) same as column (1) but conditional on working a positive number of hours; in column (3) a dummy for working less than full time (1-34 hours per week) on a permanent contract, unconditional; in column (4) a dummy for being on a regular schedule; in column (5) a dummy for being on call or working an irregular schedule; in column (6) a dummy for agreeing with the statement “My working times can be flexible”; in column (7) a dummy for working from home at least one hour a week on a regular basis. All variables are defined in Appendix A.

Table 4: Child Penalty for Early and Late Cohorts of Mothers

	(1) Permanent contract (conditional)	(2) Weekly hours in paid employment (conditional)	(3) In labor force	(4) Total time housework	(5) Total time parenting
Child Penalty 0-7	-0.252*** (0.0310)	-18.37*** (0.868)	-0.375*** (0.0223)	11.27*** (0.829)	41.72*** (1.186)
Child Penalty 0-7 * Post-2009 First Birth	0.177*** (0.0394)	3.992*** (1.083)	0.0795** (0.0288)	-1.784 <sup>+</sup> (1.007)	0.952 (1.528)
Pre-birth mean:					
Early cohorts	0.727	38.89	0.920	14.52	0.340
Late cohorts	0.736	37.63	0.928	13.09	0.267
Observations:					
N	49993	56116	84594	71447	66524
N Individuals	6858	7368	9625	8717	8554
N New Parents	636	662	776	752	746

Standard errors in parentheses

<sup>+</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

Note: This table reports the estimates for the child penalty in several outcomes of interest, both as baseline, for the cohorts of women who became mothers for the first time before the Fair Work Act (early cohorts), and as change (difference between late cohorts and early cohorts). More formally, the displayed coefficients are estimated as in Equation (3): the top panel reports estimates for the baseline child penalty ( $\gamma$ ), while the bottom panel reports estimates for the change in child penalty ( $\gamma_{post}$ ). For consistency with Figure 4, we restrict to four-year cohorts around the Fair Work Act (2005-08 and 2010-13) and we drop the year right before childbirth (partially treated due to pregnancy). All outcome variables are defined in Appendix A.





## A Variables' Construction

**Demographics and labor market outcomes** "Age" is the age of the respondent. "In labor force" is a dummy equal to one if the individual is either employed or unemployed but looking for work, and equal to zero if the individual is not in the labor force; it can be missing if the individual is not administered this part of questionnaire - see Summerfield et al. (2019) for further details. "Weekly hours in paid employment" is conditional on hours being strictly positive. "Annual labor income" and "Hourly wage" are yearly earnings and hourly wages, both in 2021 Australian dollars, and both winsorized at 0.5% level, by year and gender. "Has bachelor degree" is a dummy variable equal to one if the respondent holds a bachelor degree, a graduate diploma or a postgraduate one. "Occupational status scale" is the Australian Socioeconomic Index 2006 from McMillan et al. (2009), ranging from 1 to 100.

**Contract Type** "Permanent employment (conditional)" is a dummy equal to one if the respondent has a permanent contract, and equal to 0 if they have casual or fixed-term contracts (it is missing for unemployed individuals). "Causal contract (conditional)" is similarly defined. The variable "Reduced hours" is a dummy equal to 1 if the weekly working hours of the respondent are between 25 and 34 hours a week. "Full-time" refers to working 35 hours per week or more, and "Less-than-full-time" is defined as working between 1 and 34 hours per week.

**Regular Schedule** There are mainly two questions that refer to work schedules. The first one, which we label "Regular weekly schedule" asks "On which days of the week do you usually work in your main job?", and possible answers are "Monday to Friday", "Nine day fortnight", that their days vary from week to week, and that they vary from month to month. The second question is "Regular daily schedule", and respondents are asked "Which of these best describes your current work schedule in your main job?". Possible answers are listed below.

1. A regular daytime schedule
2. A regular evening shift
3. A regular night shift
4. A rotating shift (changes from days to evenings to nights)
5. Split shift (two distinct periods each day)
6. On call
7. Irregular schedule
8. Other

Our measure, which is called "Regular schedule" is a dummy variable equal to 1 if the answer to the first question is "Monday to Friday" and the answer to the second question is "A regular daytime schedule", and equal to 0 for any other combination of the two answers.

**Workplace flexibility** The main measure of workplace flexibility we adopt is a dummy indicating agreement with the statement "My working times can be flexible". This is built based on a categorical variable denoting how strongly respondents agree, on a scale from 1 to 7, with the statement "My working times can be flexible". We discretize it by indicating as agreement any answer above 4 and disagreement otherwise. Results are unchanged if we use the categories separately, or alternative variables, such as the answer to the question "Would you be entitled to flexible start/finish times if you were to need it?".

**Work from home** The variable "Hours worked from home" is based on the question "Approximately how many hours each week do you usually work at home?". This is missing for unemployed respondents.

**Time use** For most of our time use variables we rely on direct questions of the form "How much time would you spend on each of the following activities in a typical week?" This is true for the following measures:

- Playing with and caring for your children
  - "Playing with your children, helping them with personal care, teaching, coaching or actively supervising them, or getting them to child care, school and other activities "
- Housework
  - "Housework, such as preparing meals, washing dishes, cleaning house, washing clothes, ironing and sewing"
  - "Household errands, such as shopping, banking, paying bills, and keeping financial records (but do not include driving children to school and to other activities)"
  - "Outdoor tasks, including home maintenance (repairs, improvements, painting, etc.), car maintenance or repairs and gardening"
- Paid employment and commute
  - "Paid employment"
  - "Travelling to and from a place of paid employment"

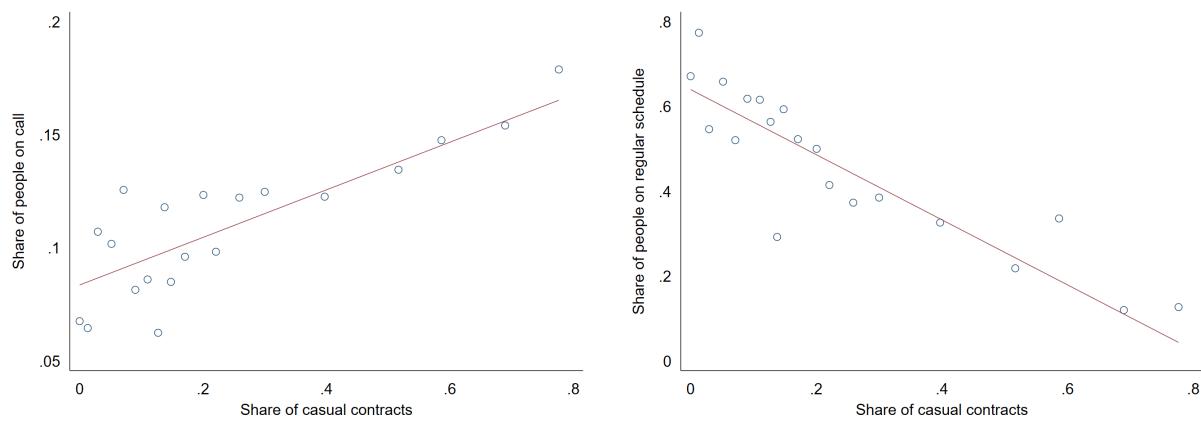
Home Production is the sum of Housework and Playing with your children; Total Active Time is the sum of the three components above. The form explicitly asks not to count any activity twice; at the end, it asks to sum the hours indicated for all activites and specifies the following: "This cannot exceed 168 hours and typically will not be greater than 120. If it is, please re-think your answers." This mitigates potential worries that our measures of home production and total active time might include double-counting of hours.

## B Characteristics of Casual Contracts and Qualitative Evidence on the Effect of the Fair Work Act

### B.1 Characteristics of Casual Contracts

Casual contracts are characterized by irregular schedules. This is true both across jobs, as can be seen by the scatterplots in Figure B.1, and within jobs, as can be inferred from the coefficient on “permanent” in Table B.1 remaining high and highly significant after controlling for occupation-by-industry fixed effects. Casual contracts also tend to come with a less-than-desired number of working hours, as shown in Figure B.2.

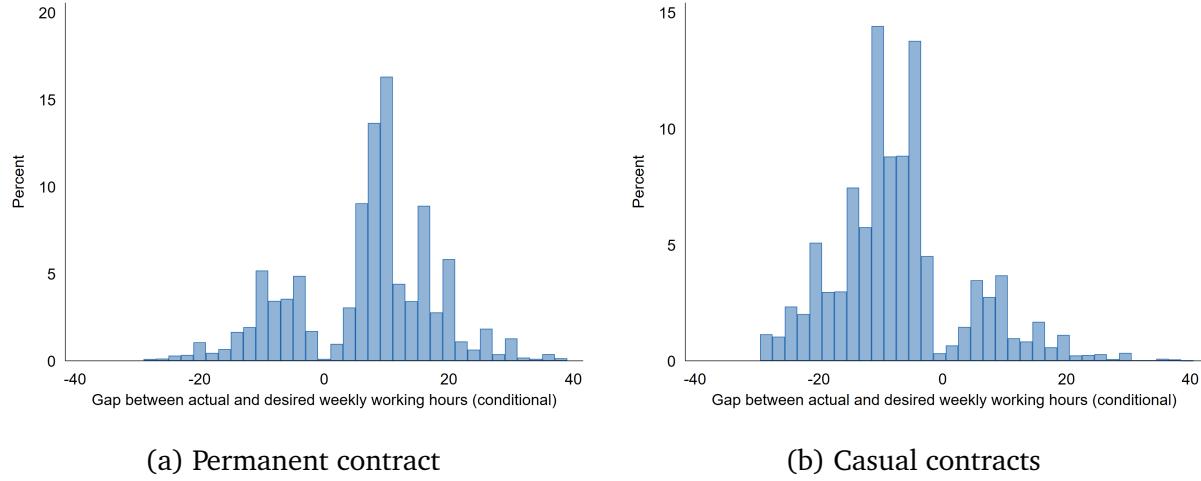
Figure B.1: Correlation between Casual Contract and (Ir)regular Schedule



(a) Share of Casual Contracts and Fraction of Workers on Call  
(b) Share of Casual Contracts and Fraction of Workers on a Regular Schedule

*Note:* This figure shows a binscatter between share of casual contracts and two measures of (ir)regular schedule. The unit of observation is a job (occupation-by-industry, 2-digit), weighted by the fraction of workers, all measured before 2009.

Figure B.2: Gap between actual and desired working hours



*Note:* This figure shows the distribution, among all workers, of the gap between actual and desired working hours, separately for permanent and casual contracts. The underlying question is only asked people who report working a different number of hours than their desired level (hence missing when the gap is zero).

Table B.1: Probability of Having a Regular Schedule by Type of Contract

	(1) Regular schedule (M-F and regular daytime schedule)	(2) Regular schedule (M-F and regular daytime schedule)	(3) Regular schedule (M-F and regular daytime schedule)
Permanent contract (conditional)	0.281*** (78.08)	0.168*** (47.23)	0.178*** (46.66)
Constant	0.267*** (93.19)	0.336*** (122.83)	0.334*** (119.56)
Observations	76352	74595	73984
Included fixed effects	None	Occ-by-ind (2d)	Individual

*t* statistics in parentheses

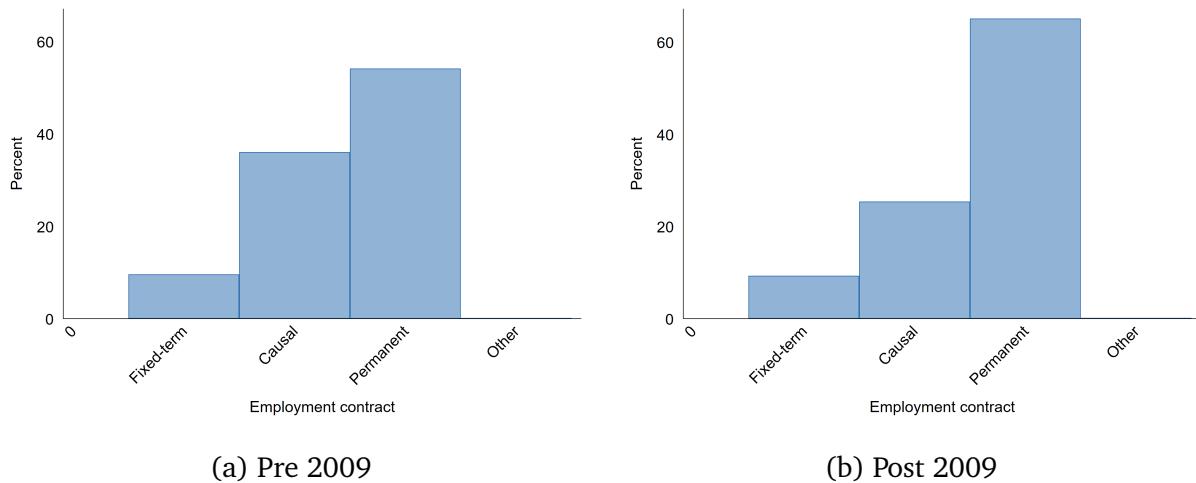
\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

*Note:* The table shows the estimated coefficients from a regression of a dummy variable for being on a regular schedule on a dummy variable for having a permanent contract (as opposed to casual or fixed term, conditional on working). Column 1 includes no additional controls, column 2 includes occupation-by-industry (2-digit) fixed effects, and column 3 includes individual fixed effects.

## B.2 Qualitative Evidence on the Effect of the Fair Work Act

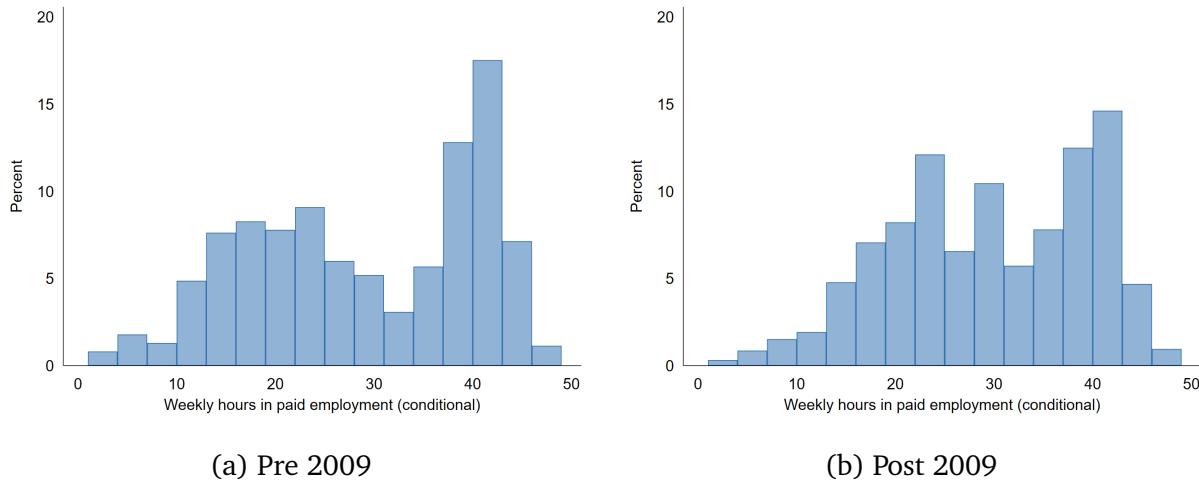
The advent of “permanent reduced hours”, meaning the arrangement to work right below full-time but on a permanent contract, is evident even in the raw data. Figure B.3 shows the type of contract for mothers who work less than 35 hours per week: the giant post-2009 increase in the fraction of permanent contracts among less than full-time workers is clear. Figure B.4 shows the distribution of hours worked by mothers under permanent contracts: the clear missing mass of hours right below full-time in the pre-2009 data disappears post-2009.

Figure B.3: Type of Contracts among Mothers Working Less Than Full-Time, Before and After the Fair Work Act



*Note:* This figure shows the distribution of types of contracts for mothers working less than full time, before and after the 2009 Fair Work Act.

Figure B.4: Number of Hours Worked by Mothers in Permanent Jobs, Before and After the Fair Work Act



Note: This figure shows the distribution of hours worked under permanent contracts by mothers, before and after the 2009 Fair Work Act.

## C Threats to the Identification of the Direct Effect of the Fair Work Act on Work Arrangements

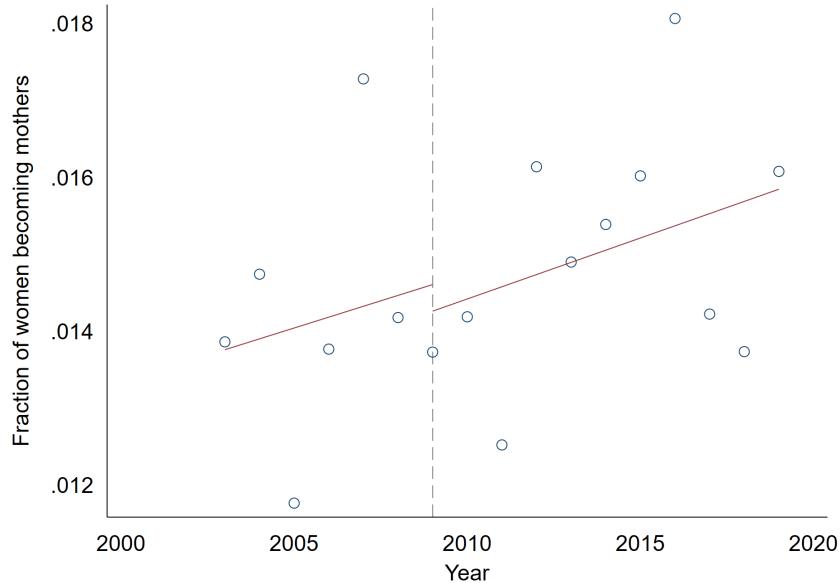
Section 3.3 quantifies the effect of the Fair Work Act on work arrangements. These findings rely on the assumption that new mothers of young children before and after 2009 would have shown similar work arrangements in the absence of the law, relative to non-mothers. In this Appendix, we address potential threats to identification. First, we show that fertility does not change systematically around 2009 (Section C.1), and that women who become mothers before and after 2009 are similar on pre-birth observables (Section C.2). Second, we address the concern that a potential “added-worker effect” induced by the global financial crisis could be driving our results, showing that results are robust to controlling for partner’s labor market status (Section C.3). Finally, we demonstrate that there was no employer backlash in hiring in response to the reform, by showing that there are no gender differences in the trend of employment, even for the childbearing age bracket (Section C.4).

### C.1 No Systematic Changes in Fertility

Australian women did not become mothers at different rates around 2009. Figure C.1 plots the fraction of Australian women in our sample (aged between 15 and 65) who give birth to their first child by year, and superimposes best-fit lines separately before and after 2009. Although there is a slight upward trend in first births, it does not seem to change systematically around 2009, supporting the claim that the law did not directly impact rates of first births. The graph looks very similar if we restrict the sample to women aged 20 to

45 (although the range of the y-axis understandably changes).

Figure C.1: Fertility Did Not Change Discontinuously Around 2009



*Note:* This figure plots the fertility rate (for first births) in our sample over the sample period. Each dot represents the total number of women giving birth to their first child in the corresponding year divided by the total number of women in our sample in that year. The vertical dotted line indicates the year 2009, in which the Fair Work Act was introduced.

## C.2 Early and Late Cohorts of Mothers are Similar on Pre-Birth Observables

Women who became mothers before and after 2009 were not observationally different when compared before childbirth. This lends support to the hypothesis that they would have behaved similarly also after childbirth, had institutional conditions not changed thanks to the Fair Work Act. Table C.1 presents means and standard deviations of key labor market variables for mothers who had their first child between 2003 and 2008 (early cohorts) and for mothers who had their first child between 2010 and 2017 (late cohorts), measured two years before their first childbirth. The last two columns present the between-groups difference, and standard indications for whether the difference is significantly different from zero. Table C.2 shows that “early” and “late” mothers also worked in similar industries and occupations before childbirth.





### C.3 Accounting for the Financial Crisis

The global financial crisis was particularly mild in Australia, which never went into formal recession (Reserve Bank of Australia; Borland, 2011; Barrett, 2018). Thus, it is unlikely to be driving our results.

Here we show formally that the financial crisis is unlikely to be the driver of our results in Section 3.3. In the tables below, we show that, controlling for their male partner's employment and earnings, our results on the effect of the Fair Work Act on mothers' work arrangements remain virtually identical. Tables C.3, C.4, and C.5 replicate columns (1)-(3) of Table 3 respectively, and progressively add controls for whether a woman's male partner is employed or how many hours per week he works and his labor earnings. The coefficients of interest in the first two rows are practically unchanged from adding these controls. This indicates that the results on the effect of the Fair Work Act on mothers' work arrangements presented in Section 3.3 are not driven by women rearranging their labor supply due to their partner's reduced labor earnings from the financial crisis.

Table C.3: Robustness of Effect of Fair Work Act on Work Arrangements to Accounting For The Financial Crisis: Permanent Reduced Hours (unconditional)

	(1) Reduced hours (25-34) permanent contract un- conditional (woman)	(2) Reduced hours (25-34) permanent contract un- conditional (woman)	(3) Reduced hours (25-34) permanent contract un- conditional (woman)	(4) Reduced hours (25-34) permanent contract un- conditional (woman)	(5) Reduced hours (25-34) permanent contract un- conditional (woman)	(6) Reduced hours (25-34) permanent contract un- conditional (woman)	(7) Reduced hours (25-34) permanent contract un- conditional (woman)
First child 0-2 × First birth after 2009	0.0633*** (0.0121)	0.0629*** (0.0122)	0.0627*** (0.0122)	0.0629*** (0.0122)	0.0637*** (0.0128)	0.0636*** (0.0128)	0.0636*** (0.0128)
First child 3-5 × First birth after 2012	0.0586*** (0.0152)	0.0593*** (0.0155)	0.0589*** (0.0155)	0.0593*** (0.0154)	0.0623*** (0.0162)	0.0620*** (0.0163)	0.0624*** (0.0162)
Employed (man)		0.0109 <sup>+</sup> (0.00581)	0.00663 (0.00586)	-0.000256 (0.00679)			
Hours per week usually worked in all jobs (man)					0.000108 (0.000154)	0.0000398 (0.000158)	0.0000680 (0.000155)
Weekly labor earnings (000) (man)			0.00445* (0.00225)			0.00461 <sup>+</sup> (0.00239)	
Log(1+weekly labor earnings) (man)				0.00202* (0.000795)			0.00191* (0.000855)
Pre-period mean:							
First child aged 0-2	0.0312	0.0313	0.0313	0.0313	0.0333	0.0333	0.0333
First child aged 3-5	0.0470	0.0474	0.0474	0.0474	0.0490	0.0490	0.0490
Observations:							
N	48702	45135	45135	45135	37882	37882	37882
N Individuals	6225	5858	5858	5858	5141	5141	5141

Standard errors in parentheses

<sup>+</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Note: The table replicates column (1) of Table 3 but includes controls for mothers' male partner's employment status, hours of work, and earnings. The outcome variable is a dummy for working between 25 and 34 hours a week under a permanent contract (unconditional). Note that the coefficients without controls (column 1) are marginally different from the table in the main text because, in order to carry out a meaningful exercise, here we restrict the sample to women with male partners.

Table C.4: Robustness of Effect of Fair Work Act on Work Arrangements to Accounting For The Financial Crisis: Permanent Reduced Hours (conditional on working)

	(1) Reduced hours (25-34) permanent contract (woman)	(2) Reduced hours (25-34) permanent contract (woman)	(3) Reduced hours (25-34) permanent contract (woman)	(4) Reduced hours (25-34) permanent contract (woman)	(5) Reduced hours (25-34) permanent contract (woman)	(6) Reduced hours (25-34) permanent contract (woman)	(7) Reduced hours (25-34) permanent contract (woman)
First child 0-2 × First birth after 2009	0.114*** (0.0205)	0.114*** (0.0206)	0.113*** (0.0206)	0.114*** (0.0206)	0.113*** (0.0212)	0.113*** (0.0212)	0.113*** (0.0212)
First child 3-5 × First birth after 2012	0.0862** (0.0264)	0.0897*** (0.0268)	0.0891*** (0.0268)	0.0897*** (0.0268)	0.0928*** (0.0276)	0.0921*** (0.0276)	0.0929*** (0.0276)
Employed (man)		-0.00426 (0.0109)	-0.0123 (0.0113)	-0.0172 (0.0132)			
Hours per week usually worked in all jobs (man)					0.000343 (0.000240)	0.000192 (0.000247)	0.000290 (0.000242)
Weekly labor earnings (000) (man)			0.00774* (0.00376)			0.00965* (0.00395)	
Log(1+weekly labor earnings) (man)				0.00224+ (0.00136)			0.00228 (0.00141)
Pre-period mean:							
First child aged 0-2	0.0650	0.0652	0.0652	0.0652	0.0672	0.0672	0.0672
First child aged 3-5	0.0945	0.0949	0.0949	0.0949	0.0979	0.0979	0.0979
Observations:							
N	29630	27488	27488	27488	25010	25010	25010
N Individuals	4524	4237	4237	4237	3969	3969	3969

Standard errors in parentheses

+  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Note:** The table replicates column (2) of Table 3 but includes controls for mothers' male partner's employment status, hours of work, and earnings. The outcome variable is a dummy for working between 25 and 34 hours a week under a permanent contract, conditional on working. Note that the coefficients without controls (column 1) are marginally different from the table in the main text because, in order to carry out a meaningful exercise, here we restrict the sample to women with male partners.



## C.4 (No) Backlash in Hiring

When giving rights to a specific group of workers, employers might react by not hiring them: we show here that this was not the case for the 2009 Australian Fair Work Act, which is consistent with the law giving a “right to request” rather than a “hard” right. This is different, for example, from Spain, which witnessed an employer reaction to a right to part-time given to parents of young children (Fernández-Kranz and Rodríguez-Planas, 2021). The Australian 2009 Fair Work Act grants parents a right to request, which employers can refuse on reasonable business grounds, so we don’t expect it to have this negative impact. Following Fernández-Kranz and Rodríguez-Planas (2021), we formally test whether women of childbearing age were less likely to be in employment, worked systematically fewer hours, or were paid systematically less after the Fair Work Act relative to men and relative to older women. We don’t find support for this backlash in any dimension.

The specification we use to test for backlash in hiring is a triple difference, which compares men and women, of childbearing age vs not, before and after the passage of the 2009 Fair Work Act. In Table C.6, we report coefficient estimates from regressing a dummy for being employed (columns 1-2), number of hours conditional on working (columns 3-4), and the logarithm of hourly wages (columns 5-6) on an indicator for being a woman, an indicator for being of childbearing age (20-40), an indicator for the year being after 2009 (the year of the Fair Work Act), all the pairwise interactions and the triple interaction. We also control for age and year fixed effects. The coefficient of interest is the coefficient on the triple interaction, reported in the first row. For all outcomes, we run the regression both for individuals aged 20-65 (odd-numbered columns) and also restricting to individuals aged 25-50 (even-numbered columns). Since the second age range is smaller, we expect it to group individuals who are more comparable to each other.

After the Fair Work Act, women of childbearing age were not less likely to be employed, did not work for fewer hours, and were not paid less relative to men and older women. If the Fair Work Act had caused a backlash from employers, making them less likely to hire women of childbearing age, this would show up as a negative coefficient on the triple interaction. In all the specifications, the coefficients are not statistically different from zero and the point estimates are positive for employment, hours of work, and hourly wages, indicating that such employer backlash did not materialize.

Table C.6: No Backlash in Hiring

	(1) Employed	(2) Employed	(3) Weekly hours in paid employment (condi- tional)	(4) Weekly hours in paid employment (condi- tional)	(5) Log hourly wage	(6) Log hourly wage
Childbearing age (20-40) × Woman × Post-2009	0.00689 (0.0168)	0.00310 (0.0223)	0.730 (0.623)	1.009 (0.830)	0.0219 (0.0236)	0.0450 (0.0324)
Childbearing age (20-40) × Woman	0.0469*** (0.0127)	-0.00513 (0.0164)	-0.353 (0.467)	-2.318*** (0.610)	0.00904 (0.0177)	-0.0847*** (0.0238)
Woman × Post-2009	0.0335*** (0.00366)	0.0315*** (0.00440)	1.793*** (0.137)	2.088*** (0.163)	-0.00964+ (0.00529)	-0.0151* (0.00634)
Childbearing age (20-40) × Post-2009	-0.0549*** (0.0122)	-0.00508 (0.0163)	-0.669 (0.437)	-0.451 (0.578)	-0.00798 (0.0166)	0.0129 (0.0228)
Woman	-0.156*** (0.00282)	-0.169*** (0.00334)	-11.58*** (0.106)	-12.64*** (0.124)	-0.0923*** (0.00409)	-0.0908*** (0.00483)
Constant	0.828*** (0.00131)	0.890*** (0.00158)	43.09*** (0.0469)	44.55*** (0.0560)	3.294*** (0.00183)	3.324*** (0.00219)
Observations	217344	130098	164073	105292	148302	95953
Age Range	20-65	25-50	20-65	25-50	20-65	25-50

Standard errors in parentheses

+  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

Note: The table reports coefficient estimates from regressing a dummy for being employed (columns 1-2), number of hours conditional on working (columns 3-4), and the logarithm of hourly wages (columns 5-6) on an indicator for being a woman, an indicator for being of childbearing age (20-40), an indicator for the year being after 2009 (the year of the Fair Work Act), all the pairwise interactions and the triple interaction. We also control for age and year fixed effects. In odd-numbered columns the sample is comprised of individuals aged 20 to 65; in even-numbered columns of individuals aged 25 to 50.

## D No Effects of the Fair Work Act on Fathers' Work Arrangements

In this Appendix we report the result of running the same empirical analysis of Section 3.3 on men. Although the Fair Work Act is gender-neutral and its provisions apply to both parents, we don't find any changes in men's work arrangements: all the coefficients in Table D.1 are small in magnitude and not significantly different from zero.

Table D.1: Changes in Work Arrangements for Fathers

	(1) Reduced- hours Permanent (Uncond.)	(2) Reduced- hours Permanent (Cond.)	(3) Less-than- Full-Time Permanent (Uncond.)	(4) Regular Schedule	(5) On call	(6) My working times can be flexible (yes /no)	(7) Any hour worked from home
First child 0-2 × First birth after 2009	-0.00202 (0.00440)	-0.00478 (0.00577)	-0.00656 (0.00590)	0.0166 (0.0184)	0.00288 (0.0110)	0.0273 (0.0217)	-0.0136 (0.0161)
First child 3-5 × First birth after 2012	0.000870 (0.00641)	-0.00197 (0.00859)	-0.00484 (0.00759)	0.0147 (0.0215)	-0.00914 (0.0124)	0.0189 (0.0229)	0.000570 (0.0189)
Pre-period mean:							
First child aged 0-2	0.0149	0.0197	0.0231	0.554	0.0791	0.510	0.251
First child aged 3-5	0.0188	0.0251	0.0246	0.589	0.0853	0.519	0.274
Observations:							
N	113454	72264	113454	89605	89621	62311	98520
N Individuals	11995	8852	11995	10063	10065	8200	11182

Standard errors in parentheses

<sup>+</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Note: This tables replicates Table 3 for men. See note to Table 3 for details.

## **E Threats to Identification in The Early Versus Late Cohort Design**

### **E.1 Accounting for the Financial Crisis (Continued)**

In this Appendix we show that controlling for men's employment and earnings, our estimates for the early-versus-late cohorts comparison remain almost identical (if anything, they become stronger), supporting the fact that the results shown in Section 5.1 are not driven by women's increasing supply in response to their male partner's losing their job (added-worker effect).

Tables E.1 and E.2 show that the estimated effect of the Fair Work Act on the child penalty in the probability of having a permanent contract and in hours of work is practically unchanged or becomes stronger when including controls for male partner's labor supply. The estimated effect for child penalty in labor force participation becomes slightly smaller, but remains large and significant, as shown in Table E.3.





Table E.3: Robustness of Early vs Late Cohort Comparison to Partner's Labor Supply and Income (Added-Worker Effect): Labor Force Participation

	(1) In labor force (woman)	(2) In labor force (woman)	(3) In labor force (woman)	(4) In labor force (woman)	(5) In labor force (woman)	(6) In labor force (woman)	(7) In labor force (woman)
Child Penalty 0-7	-0.380*** (0.0226)	-0.328*** (0.0264)	-0.327*** (0.0264)	-0.328*** (0.0265)	-0.333*** (0.0262)	-0.332*** (0.0261)	-0.333*** (0.0262)
Child Penalty 0-7 * Post-2009 First Birth	0.0801** (0.0292)	0.0689* (0.0324)	0.0694* (0.0323)	0.0691* (0.0324)	0.0665* (0.0322)	0.0675* (0.0321)	0.0667* (0.0322)
Employed (man)		0.133*** (0.0114)	0.144*** (0.0119)	0.144*** (0.0133)			
Hours per week usually worked in all jobs (man)					0.000790** (0.000274)	0.00104*** (0.000279)	0.000823** (0.000275)
Weekly labor earnings (000) (man)			-0.0107* (0.00421)			-0.0167*** (0.00438)	
Log(1+weekly labor earnings) (man)				-0.00190 (0.00128)			-0.00160 (0.00130)
Pre-birth mean:							
Early cohorts	0.920	0.955	0.955	0.955	0.959	0.959	0.959
Late cohorts	0.927	0.954	0.954	0.954	0.960	0.960	0.960
Observations:							
N	83613	39542	39542	39542	32661	32661	32661
N Individuals	9543	5175	5175	5175	4483	4483	4483
N New Parents	767	680	680	680	648	648	648

Standard errors in parentheses

+  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Note: The table replicates column (3) of Table 4 (and is similarly run on women only) but includes controls for their male partner's employment status, hours of work and earnings.

## E.2 Other National Employment Standards Provisions

The Fair Work Act established a list of provisions that all collective bargaining agreements must include, i.e. minimum employment standards that must be provided to all employees, called National Employment Standards (NES). This Appendix lists them and discusses why all of them (except for the provision we study) are either not expected to impact mothers differentially relative to other women, and therefore their potential impact is controlled for by the inclusion of non-mothers as controls, or they are quantitatively irrelevant.

The list of National Employment Standards provisions is the following<sup>15</sup>:

1. maximum weekly hours
2. requests for flexible working arrangements
3. parental leave and related entitlements
4. annual leave
5. personal/carer's leave and compassionate leave
6. community service leave
7. long service leave
8. public holidays
9. notice of termination and redundancy pay
10. Fair Work Information Statement.

The provision we are studying is the second one. The third one (parental leave and related entitlements) is the only one that could, in principle, impact our analysis since it potentially impacts mothers differently than anyone else, but it turns out to be quantitatively irrelevant, as we argue below. The cap on maximum weekly hours was already present in Australian legislation<sup>16</sup>, and the Fair Work Act only strengthened the related protections to employees. This provision, together with the ones regulating community service leave and public holidays, applies broadly to all workers, and we don't expect them to impact mothers and non-mothers differentially. The Fair Work Information Statement is a publication that contains, among others, information about the National Employment Standards, the modern Awards, the role of Fair Work Act, and that needs to be distributed to workers when hired.

Annual (vacation) leave, personal/carer's leave and compassionate leave, and notice of termination and redundancy pay apply to all workers except casual employees, but they apply to both men and women, and to both parents and non-parents, in the same way. Therefore, these are "controlled for" in all our specifications by the inclusion of non-parents as controls in our analysis.

<sup>15</sup>The full text of the Fair Work Act, as approved in 2009, can be found at this link: <https://www.legislation.gov.au/C2009A00028/2009-07-01/text>.

<sup>16</sup>The 38 hours workweek was introduced in 1983, as described on this government website: <https://www.fairwork.gov.au/about-us/workplace-laws/fair-work-system/australias-industrial-relations-timeline>

### E.2.1 Parental Leave and Related Entitlements

This provision gives workers the right to request up to 12 months of extension to the 12 months of unpaid parental leave they are entitled to, for a total of 24 months.<sup>17</sup>

While the first twelve months are an entitlement, the extension is not: the employee needs to send a request to his or her employer, who has to agree to the extension. The extension cannot be longer than 12 months and needs to immediately follow the end of the available parental leave period.

On ending unpaid parental leave, an employee is entitled to return to the pre-parental leave position, or, if that job no longer exists, “an available position for which the employee is qualified and suited nearest in status and pay to the pre-parental leave position.”

Hence, in order to understand whether this provision can confound our results, we verify whether it led to an increase in average leave length, beyond the 12 months parents were already entitled to. First, we note that the government report that evaluates this aspect of the Fair Work Act (O’Neill, 2012) finds that less than one quarter of a percent of all employees surveyed were considered to have made a request for an extension of unpaid parental leave under the National Employment Standards beyond the 12 months entitlement.

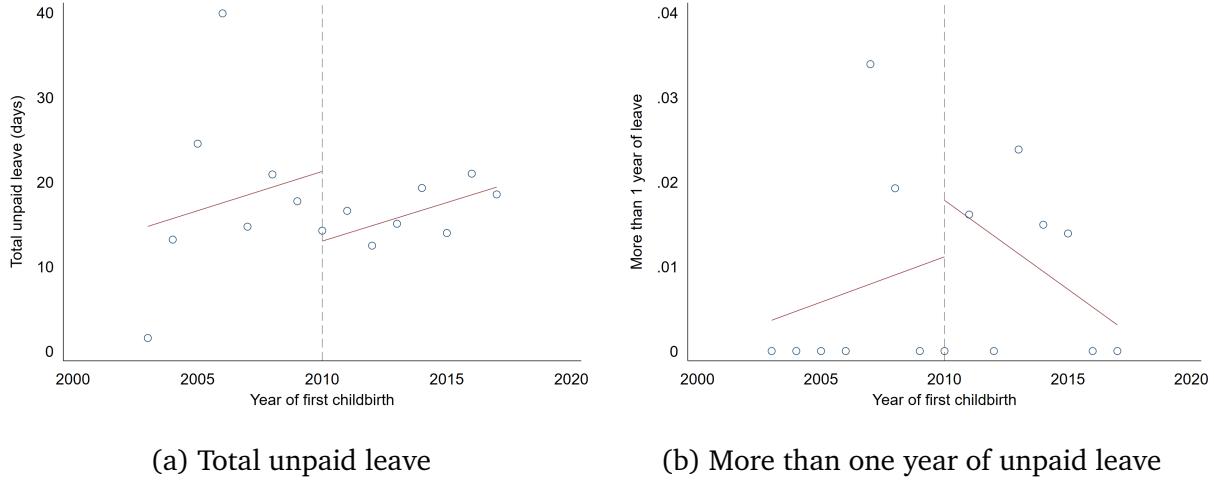
In order to confirm the irrelevance of this legislative change for working mothers in our data, we compute the total number of unpaid leave days taken in the year of first childbirth, and the two subsequent years. Figure E.1 shows the time evolution of the total days of unpaid leave in this three-year window for the subsample of women who did not have a second child in the two years after the first one<sup>18</sup>. The left panel shows the total number of days of unpaid leave, and we can see that the average is around 20 days, far below the maximum leave length that can be taken without the employer’s agreement. The right panel shows the share of women taking more than one year of leave: the numbers are very small (and actually zero for most of the years), further validating the irrelevance, for our results, of the above-described provision.

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<sup>17</sup>The entitlement to the first 12 months of job-protected unpaid leave has been available to Australian workers since 1979, as highlighted in the timeline of Australian industrial relations here:<https://www.fairwork.gov.au/about-us/workplace-laws/fair-work-system/australias-industrial-relations-timeline>

<sup>18</sup>The share of women who have a second child within two years from the year in which they gave birth for the first time is unchanged around 2009.

Figure E.1: No variation in unpaid leave take-up



*Note:* This figure plots the average number of days of unpaid leave (panel a) and the probability that leave taken is longer than one year (panel b) in the year of first birth and in the following two years, by year of the birth of the first child.

## F Paid Parental Leave

In this Appendix, we rule out the possibility that the introduction of a federal Paid Parental Leave in Australia in 2010 may have been the cause of the effects we observe. In order to do this we rely on the fact that approximately half of the Australian workforce (and of our sample) had already access to paid parental leave through their employer before the federal reform. Running our analysis on this sample we find unchanged results. The absence of a major effect of Paid Parental Leave on the child penalty in labor supply is consistent with findings in the literature (Olivetti and Petrongolo, 2017), and reasonable in a setting in which Paid Parental Leave replaced a previously existing job-protected unpaid leave and a cash transfer for newborns (thus not dramatically changing incentives for new mothers).

### F.1 Institutional Setting

Paid Parental Leave was introduced a year after the Fair Work Act, and could thus act as a confounder. However, the pre-existing presence of unpaid leave with job guarantee for up to one year, and a cash transfer for newborns, implies that this new piece of legislation did not substantially change incentives for new mothers.

Paid parental leave was signed into law in 2010 (and it applies since January 1, 2011), allowing one of the parents to take up to 18 weeks off from work, paid at the national minimum wage, after the birth of a child. The Paid Parental Leave could not be combined with the Baby Bonus, an unconditional and tax-exempt cash transfer that was available to all families who had a child. While the Paid Parental Leave is nominally more generous, the interaction with the tax and transfer system (including Family Tax Benefits, a set of

transfers specifically for lower income families) meant that for a fraction of families it was less advantageous than the already existing Baby Bonus, and for another set the two were close substitutes. The remaining group, relatively wealthier mothers, were facing a relatively lower replacement rate (since Paid Parental Leave is paid at the minimum wage regardless of pre-birth earnings) and were more likely to be already eligible for employer-provided paid maternity leave, thus it is unclear whether this policy changed their choice set either.

In addition, paid leave guarantees job protection – and this is the aspect that really matters for labor force attachment of new mothers, according to the review article by Olivetti and Petrongolo (2017). However, up to one year of unpaid job-protected leave upon the birth of a child was already granted to all Australian workers since 1979 (as mentioned also in Appendix E.2), so the 2010 reform didn't change this aspect either. In conclusion, it seems that this provision did not significantly change the incentives faced by new parents, and therefore we do not expect it to lead to significant changes in their labor supply choices. For a more detailed explanation of family benefits in Australia, and how they have changed over the past twenty years, see Bassford and Fisher (2020); Kalb (2018); de Gendre et al. (2021).

## F.2 Empirical Strategy and Results

In order to study whether Paid Parental Leave affected the change in child penalty we document, we leverage the fact that before its introduction, 55% of working women were already eligible for employer-provided paid maternity leave. Under the assumption that the introduction of national, state-funded, Paid Parental Leave does not affect women who already can access this benefit through their employer, any change we observe for this group of women can be attributed to the Fair Work Act (and not Paid Parental Leave).

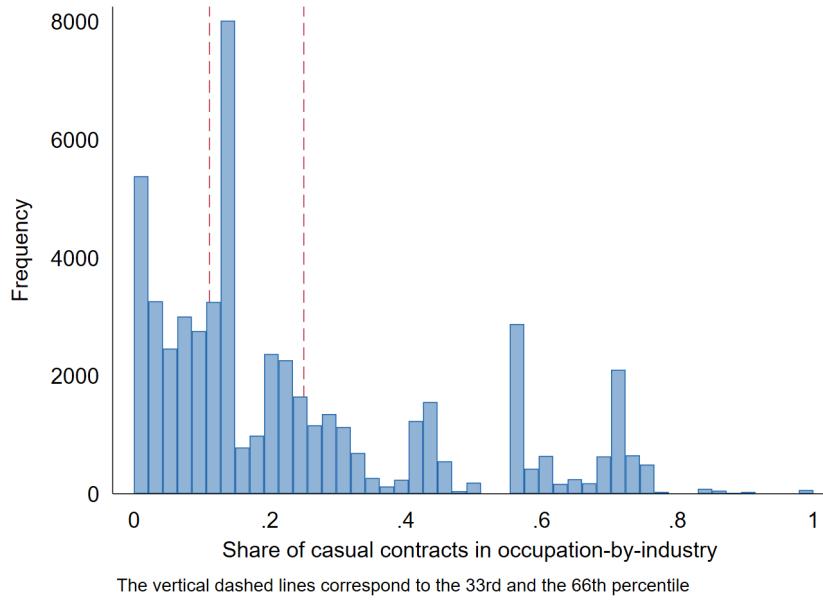
We repeat the analysis of Table 5 on the subsample of women who, two years before childbirth, were entitled to employer-provided paid parental leave. Results are presented in Table F.1: while we do lose statistical power since we are working on a smaller sample, all coefficients have the same sign and similar magnitudes.



## G Further Details on the Exposure Design

### G.1 Distribution of Casual Prevalence

Figure G.1: Distribution of Casual Prevalence



### G.2 Characteristics of Jobs in the Three Terciles

In this section, we discuss similarities and differences of the jobs in the three terciles of casual prevalence. Including only data until 2008, we notice two main characteristics. First, jobs with lower casual prevalence are associated with higher pay, longer hours, and greater occupational status. Second, while there are differences between jobs in the bottom and in the middle tercile, they are substantially smaller than the differences with jobs in the top tercile. This lends justification to our choice of using women with pre-birth job in the bottom tercile of casual prevalence as our preferred comparison group for treated women in the middle tercile.

Table G.1 shows that wages, occupational prestige, and weekly work hours are highest in the bottom tercile of casual prevalence, and monotonically decrease in casual prevalence. We also observe a similar pattern for the probability of being on a regular schedule—which is unsurprising, given the strong correlation between a permanent contract and the probability of having a regular schedule.

We also construct four measures to summarize the “greediness” of jobs, mirroring Goldin (2014); they indicate that lower casual prevalence is correlated with higher greediness. The four<sup>19</sup> characteristics are Time pressure, Establishing and maintaining interpersonal relationships, Structured vs unstructured work, and Freedom to make decisions. For

<sup>19</sup>Goldin (2014) also includes Contact with others, for which no equivalent question was found in HILDA.

each of these job characteristics, we identify in the HILDA survey questions that match the O\*NET question used by Goldin (2014)<sup>20</sup>. The variable “Flex Score” averages them all. Following Goldin (2014), each of these has been coded so that a higher value of the variables denotes a job that has less flexibility, more interpersonal contact, less independence in decision-making, and so on. Each of these characteristics should produce the convex relationship between hours and earnings that Goldin (2014) identifies as an explanation for the residual gender earnings gap. In all of these measures, except for time pressure, jobs at the bottom of the distribution of causal prevalence score higher, and jobs at the top have the lowest score.

These characteristics depict a picture of jobs in the bottom tercile of casual prevalence as being career-oriented jobs, with extended hours and possibly convex returns to hours, comparable to Goldin’s “greedy” jobs. Jobs in the middle tercile appear as good white-collar jobs, similar to those in bottom tercile except for the greediness. Finally, jobs in the top tercile of casual prevalence are irregular, low-hours and low-pay jobs.

The reform we study does not fundamentally change the nature of greedy jobs; instead, it introduces a change in one specific aspect of work arrangements that relates to the ability to combine family and career. The Fair Work Act did not make greedy jobs less greedy, it did not linearize convex returns to hours, to maintain Goldin’s terminology. It instead acted where there was room for improvements, in jobs that could in principle be more mother-friendly but were not due to institutional practices. Thus, it should not be surprising to notice that the most affected jobs were not the greediest, i.e. the ones of the bottom tercile, where the contractual arrangements probably did not matter, but the intermediate ones of the middle tercile.

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<sup>20</sup>When comparing our measures with the O\*NET ones, applied to our data by merging the occupation codes, we find very high correlation for Freedom in decision-making and Structured vs unstructured, somehow lower for the other two.

Table G.1: Job characteristics by tercile

	Bottom tercile		Middle tercile		Diff Middle-Bottom		Top tercile		Diff Top-Bottom	
	Mean	SD	Mean	SD	Diff.	SE	Mean	SD	Diff.	SE
Avg hourly wage (2021 dollars)	37.20	(0.58)	31.68	(0.66)	-5.53***	(0.31)	22.55	(0.45)	-14.65***	(0.26)
Avg occupational status	60.32	(0.66)	54.02	(0.32)	-6.30***	(0.26)	30.56	(0.45)	-29.76***	(0.28)
Avg weekly working hours	42.76	(0.47)	37.72	(0.24)	-5.04***	(0.19)	30.93	(0.64)	-11.82***	(0.28)
Share of causal contracts	0.05	(0.01)	0.17	(0.01)	0.12***	(0.00)	0.51	(0.01)	0.46***	(0.01)
Avg tenure with current employer	7.36	(0.14)	7.22	(0.11)	-0.14*	(0.06)	4.91	(0.24)	-2.45***	(0.10)
Share of regular schedule	0.62	(0.02)	0.48	(0.03)	-0.14***	(0.01)	0.25	(0.02)	-0.37***	(0.01)
Share of on call	0.10	(0.01)	0.10	(0.02)	0.00	(0.01)	0.16	(0.03)	0.06***	(0.01)
Share on flexible start/finish times	0.69	(0.02)	0.48	(0.01)	-0.20***	(0.01)	0.55	(0.01)	-0.14***	(0.01)
Avg age at firstbirth	32.51	(0.56)	31.59	(0.80)	-0.92*	(0.34)	29.48	(0.64)	-3.03***	(0.30)
Share of women	0.36	(0.01)	0.53	(0.00)	0.18***	(0.00)	0.54	(0.01)	0.18***	(0.01)
Avg Freedom Decision	0.22	(0.01)	0.04	(0.00)	-0.19***	(0.00)	-0.27	(0.01)	-0.50***	(0.00)
Avg Unstructured work	0.22	(0.01)	-0.00	(0.00)	-0.22***	(0.00)	-0.20	(0.01)	-0.41***	(0.01)
Avg Importance of Relationships	0.22	(0.01)	-0.00	(0.00)	-0.23***	(0.00)	-0.23	(0.01)	-0.46***	(0.00)
Avg Time Pressure	-0.01	(0.00)	0.05	(0.00)	0.07***	(0.00)	-0.06	(0.00)	-0.05***	(0.00)
Avg Flex Score	0.17	(0.01)	0.01	(0.00)	-0.16***	(0.00)	-0.21	(0.00)	-0.38***	(0.00)

Note: This table shows means and differences in means for various characteristics of jobs, divided into the three terciles of casual prevalence as defined in Section 5.2. Here we include all employees (with no distinction of gender) and all observations between 2001 and 2008.

## H Threats to Identification in The Occupational Exposure Strategy

Our job exposure strategy from Section 5.2 relies on a triple difference version of the parallel trend assumption: that the child penalties of mothers in the treated tercile would have evolved, over time, similarly to the ones of the other two groups. We lend support to this assumption in several ways. First, In Section H.1, we show parallel pre-trends in child penalties across terciles. Second, in Section H.2, we show that there isn't any selection into childbirth: early and late cohorts of mothers in the three groups are similar in terms of observables in the pre-birth years. Third, in Section H.3, we rule out selection into occupations by showing that our results are robust to narrowing the sample to two-year cohorts around the Fair Work Act and assigning women the exposure of the job they had three years before childbirth (thus the job they had before the Fair Work Act).

### H.1 Parallel Pre-trends

Here we show the evolution over time of the child penalty, separately for the three terciles of casual prevalence to whom mothers belong. The figures clearly show that the child penalties for bottom and middle terciles were evolving in parallel, though on different levels, before 2009; that there was a sharp change in 2009 for the middle tercile; and that after 2009, the child penalties for the bottom and middle tercile continue to evolve in parallel, at a closer level (in some cases identical) relative to before.

Empirically, we do the following: we fully interact Equation (4) with tercile-of-casual-prevalence dummies:

$$Y_{it} = \alpha_i + \sum_{d \in \{1,2,3\}} \left\{ \sum_c \left\{ \gamma_{c,d} \times \mathbb{D}_{it} \times \mathbb{1}\{c = cohort(i)\} + \right\} + \delta_{t,d} + \beta_{h(i),d} \right\} \times \mathbb{1}\{d = tercile(i)\} + \epsilon_{it} \quad (6)$$

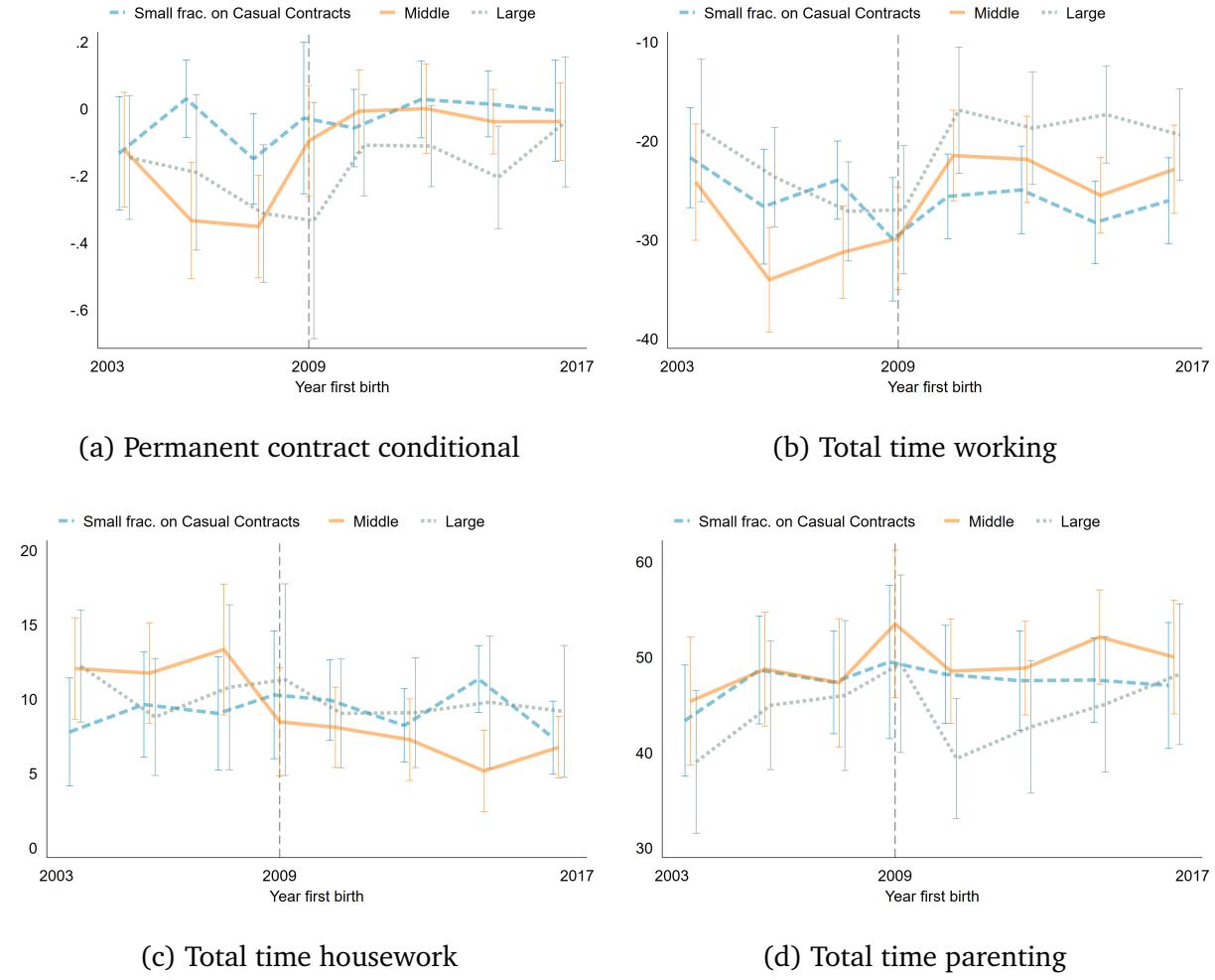
where  $\mathbb{D}_{it} = \mathbb{1}\{(t - E_i) \in [0, 7]\}$  is an indicator function that takes value of one if  $i$ 's first child is aged 0 to 7. Here the coefficients of interest are  $\gamma_{c,d}$ , which indicate the child penalty in outcome  $Y$  for mothers who have had their first child in year  $c$  and who belong to tercile  $d$ . For power reasons, in this specification cohorts of mothers are biannual as in Section 5.1.4 (we group together mothers having their first child in 2003-04, 2005-06, etc.).

Figure H.1 replicates Figure 5 but separately by terciles of casual prevalence. In each panel, the blue dashed line shows the evolution of the child penalty for women with a pre-birth job belonging to the bottom tercile of casual prevalence (main control group), the orange solid line for women with pre-birth jobs in the middle tercile of casual prevalence (treated group), and the dashed grey line for the top tercile. Recall that the bottom and middle tercile are jobs that are closest in characteristics, and thus the orange-versus-blue (bottom versus middle tercile) is the most meaningful comparison.

The figure shows that the child penalties in permanent contract, labor supply, and housework for the bottom and middle tercile of casual prevalence were evolving in parallel until 2009; that for the middle tercile there was a sharp change in 2009; and that

the child penalties for these two groups continued to evolve in parallel, at a closer level, afterward. Panel (a) shows the evolution of the child penalty in the probability of having a permanent contract. The blue dashed line shows us that this penalty was close to zero throughout the sample period for women in jobs with a very low share of casuals to start with: mothers who gave birth in 2005 and had a pre-birth job in the bottom tercile of casual prevalence were as likely to be in permanent contract after childbirth as before (conditional on working), and the same is true for women who became mothers in 2013 and had a pre-birth job in the bottom tercile of casual prevalence. The orange line shows that instead, for women who gave birth in 2005 or 2007 and had a job in the middle tercile of casual prevalence, there was a sizeable child penalty in this measure (around 30 percentage points), which was relatively stable; there was a sharp decrease in this child penalty around the 2009 cohort, and women with pre-birth jobs in this middle tercile who gave birth from 2010 onwards basically no longer experienced a child penalty in this dimension, exactly like women in the bottom tercile. The child penalties in labor supply (panel b) and time spent in housework (panel c) display analogous patterns; total time spent parenting (panel d) is very similar for the bottom and middle terciles and does not change around 2009, consistently with the results presented in the main text.

Figure H.1: Time Evolution of Child Penalty by Exposure to Fair Work Act



*Note:* This figure shows the evolution of the child penalty in contract type and in time use for women over the sample period, separately by levels of exposure to the Fair Work Act, as described in Section 5.2. Specifically, exposure of a job is defined as the share of casual contracts using pre-2009 observations; the exposure of a woman is that of the modal job (occupation-by-industry) she had in the five years before childbirth. The blue dashed lines are estimates for the bottom tercile (lowest casual prevalence), the orange solid lines are estimates for the middle tercile (the most exposed group), the grey dotted lines for the top tercile. More precisely, dots represent the estimates for  $\gamma_{c,d}$  from Equation (6). Cohorts are biannual (i.e. we pull together women whose birth was in 2003 and in 2004, in 2005 and in 2006, etc; except for 2009, which is kept separate). The vertical segments represent 95% confidence intervals. Women without children and with older children are included as controls, and exposure is assigned based on the modal job they had in the five years before a randomly-drawn fake childbirth year. We cluster standard errors at the individual level.

## H.2 Early and Late Cohorts are Similar on Pre-Birth Observables in All Terciles

Here we show that the Fair Work Act did not induce selection into fertility, and thus the estimated effects of the Fair Work Act on the child penalties are not driven by a different selection of women who become mothers. While fertility could in principle be impacted by the Fair Work Act (and if that was the case, this would change the interpretation of our results), here we show that it was not, for none of the terciles; thus earlier cohorts of mothers in similar pre-birth jobs are a good counterfactual for later cohorts of mothers.

Table H.1 shows that early and late cohorts of will-be mothers are similar on pre-birth observables in all terciles. It also shows that women in the bottom and middle terciles are similar before childbirth. Women whose modal job in the five years before childbirth was in the bottom tercile of casual prevalence on average became mothers at 31 years old both in the early and late cohorts. Furthermore, two years before childbirth, they worked more than 40 hours a week, both in the early and late cohorts, and earned almost 50% of household income, again both in the early and late cohorts. Women whose modal pre-birth job was in the middle tercile of casual prevalence are very similar pre-birth, both between early and late cohorts and compared to women in the bottom tercile. Women in the bottom tercile are again very similar between early and late cohorts, but they are systematically different from will-be mothers of the other two terciles (for example, they become mothers at 28 and have significantly lower hourly wages).

Fertility trends are similar across terciles, and in particular between bottom and middle tercile. When regressing the fraction of women who become mothers on time fixed effects and tercile dummies, the trend in the middle and bottom tercile is identical both before and after the Fair Work Act (not shown, available upon request).



### H.3 Robustness to Pre-Fair Work Act Job Choice

Our results are not driven by endogenous job switching in response to the Fair Work Act. The empirical strategy presented in Section 5.2 relies on grouping women in terciles of exposure to the Fair Work Act, based on their pre-birth job. Our main specification assigns each woman the modal job she had in the five years prior to the birth of her first child, and women's exposure is measured as the casual prevalence associated with such job. However, if will-be-mothers endogenously switch jobs in response to the Fair Work Act, this might bias our results. Here, we show that this is not the case and that our results are robust to assigning mothers jobs they had chosen before the Fair Work Act.

Restricting to jobs chosen before the Fair Work Acts yields results that are almost identical to our main specification. In Table H.2, we restrict the sample to women who became mothers in 2007-08 and 2010-12. In columns (1)-(4), we replicate the main columns of Table 5 on this sample. Here, we use the same treatment assignment as in the main text: each woman is assigned the modal job she holds in the five years prior to the birth of her first child, and she is assigned the tercile of casual prevalence relative to this job. In columns 5-8, instead, we base the tercile assignment on the job she held precisely three years before childbirth. This guarantees that all jobs used in the assignment are chosen before 2009, and thus could not be impacted by the Fair Work Act. Comparing column (2) with column (6) and column (4) with column (8) we see that the two specifications yield basically identical results. In addition, the coefficients of interest (highlighted in blue), are, if anything, larger in magnitude than the corresponding coefficients in the main table, indicating that endogenous job switching is not driving our main results.

