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# Interactions amongst gender norms: Evidence from US couples

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## Resumen

Las normas de género tienen consecuencias relevantes para los resultados del mercado laboral de las mujeres. En particular, una literatura reciente encuentra que las normas de crianza de los hijos y la prescripción de que el varón debe ser el principal sostén de la familia conducen a cambios de comportamiento que afectan la oferta laboral de las mujeres. La maternidad reduce la participación y las horas de trabajo en el mercado, mientras que se ha demostrado que las mujeres que ganan más que sus maridos reaccionan de manera de revertir dicha brecha. En este documento utilizamos datos de panel de Estados Unidos para examinar en qué medida estas dos normas interactúan entre sí. Comenzamos por preguntarnos si las normas de crianza de los hijos afectan a las mujeres que son el principal sostén de la familia y a las que no lo son de la misma manera, y luego pasamos a ver cómo reaccionan las madres y las mujeres sin hijos cuando rompen la norma del hombre proveedor. Nuestros resultados muestran que la norma de varón proveedor tiene efecto solo en las madres, lo que sugiere que la prominencia de las normas de género puede depender del contexto del hogar. En cuanto a la crianza de los hijos, encontramos que, aunque la oferta laboral de las mujeres que ganan más que sus maridos responde inicialmente a la maternidad menos que la aquellas que ganan menos, los dos grupos convergen después de 10 años. Además, las mujeres de la primera categoría muestran un aumento desproporcionadamente grande en la proporción de tareas domésticas que realizan después de convertirse en madres. Estos resultados indican que las normas de género aún prevalecen sobre consideraciones de ventaja comparativa, y que la presencia de hijos empuja a las mujeres a buscar compensar el rompimiento de una norma adhiriéndose a otra.

Palabras clave: normas de identidad de género, oferta laboral femenina, maternidad, ingresos relativos

Código JEL: D10, J16, J22

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## Abstract

Gendered norms have major implications for women's labor market outcomes. Notably, a recent literature finds that child-rearing norms and the prescription that the husband should be the main breadwinner lead to behavioral changes affecting women's labor supply. Motherhood reduces participation and hours of market work, while women who earn more than their husbands have been shown to react in ways that reverse that gap. In this paper we use panel data for the US to examine to what extent these two different norms interact. We start by asking whether child-rearing norms affect women who are the main breadwinner and those who are not in the same way, and then turn to how mothers and childless women react when breaking the male-as-the-breadwinner norm. Our results show that the breadwinner norm has an effect only on mothers, suggesting that the salience of gender norms may depend on the household's context. Concerning child-rearing, we find that although the labor supply of women who earn more than their husbands initially responds to motherhood less than that of secondary earners, the two groups converge after 10 years. Moreover, women in the former category exhibit a disproportionately large increases in the share of housework they perform after becoming mothers. These results indicate that norms still prevail over considerations of comparative advantage, and that the presence of children pushes women to seek to compensate breaking a norm by adhering to another one.

Keywords: gender identity norms, female labor supply, motherhood, relative income

JEL Classification: D10, J16, J22

# 1 Introduction

While the early literature on gender earnings gaps focused on differences in human capital accumulation, massive convergence in education and labor market participation has called forth additional explanations.<sup>1</sup> Recent work has consequently focused on gender identity roles and norms as important factors for the persistence of gender gaps, emphasizing the idea that individuals adhere to gender-specific behavioral prescriptions because not following the norm is inherently costly for them. Social norms on child-rearing require mothers to be the main care provider, and a large literature has shown that women’s market work is vastly reduced after the birth of their first child, in line with social expectations. More recent work has focused on the norm that the husband should be the household’s main breadwinner and found that women’s labor supply is reduced when the couple does not conform to this prescription.<sup>2</sup> Yet norms do not exist in isolation. The aim of this paper is to examine how norms interact by focusing on how labor supply responses to the birth of the first child are conditioned by economic considerations of relative earnings within the couple.

The arrival of the first child demands a large amount of time from parents. Starting with the seminal work of Becker (1965), standard theories of the household state that an “efficient” allocation of household resources requires the member of the couple with the highest labor income to remain in the labor market while the other member becomes the main child-carer. Women who are the main bread-winner should consequently *not* become the main carer. However, such specialization conflicts with social prescriptions which assign this role to mothers, putting pressure on women to conform and leading to decisions that defy standard economic rationality. This paper address how gender norms interact by focusing on two social norms: the prescription that the mother should be the main childcare provider and that requiring the husband to earn more than his wife.<sup>3</sup> In particular, we try to understand to what extent female labor supply decisions are affected by the interaction between the two norms.

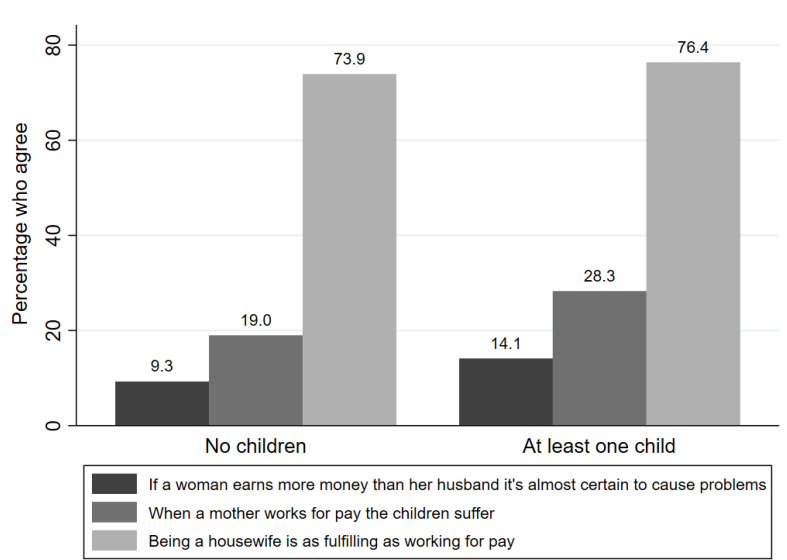
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<sup>1</sup>See, for example, Blau and Kahn (2017) and Goldin (2014) for overviews and discussions of recent trends.

<sup>2</sup>See, for example Angrist and Evans (1998), Adda et al. (2017) and Kleven et al. (2019) on the so-called child penalty and Bertrand et al. (2015) for the seminal work on the breadwinner norm.

<sup>3</sup>Historically, motherhood has been the key aspect defining female identity, while, at least in industrial Western societies, the view that the husband should be a household’s main provider is strongly anchored in our perception of how couples should interact.

Figure 1: Gender norms in the US: differences by parental status



*Notes:* Author’s calculations based on the *World Value Survey* data for the US, 2011. Each column shows the percentage of respondents who agree or strongly agree with the corresponding statement. For the first statement the possible answers were: Agree, Disagree or Neither, and only respondents who answer “Agree” were included. For the two other questions the possible answers were Strongly agree, Agree, Disagree, Strongly disagree, and both respondents who answer “Agree” or “Strongly agree” were included.

As argued by Akerlof and Kranton (2000) social norms affect agents’ utility by generating a cost that appears when the individual (or household) does not conform to the norm, and consequently observed behavior will depend on the costs and benefits stemming from breaking it. In such a framework, adherence to a norm will depend on the context. Motherhood seems to be particularly important, as shown by recent work that indicates that as they become mothers women’s values change; see Kuziemko et al. (2018) and Grinza et al. (2017).<sup>4</sup> Indeed, data from the World Value Survey reported in Figure 1 shows that gender attitudes differ depending on whether or not women have children. For example, women are more likely to agree with the idea that breaking the breadwinner norm causes problems if they have children than if they do not. Such evidence indicates that context and personal experience can be major factors in how social prescriptions are perceived. Yet, the way in which different norms interact has received little attention in the literature. Norms could reinforce each other, so that when an individual adheres to one she or he tends to also follow another, related norm, or could offset each other making

<sup>4</sup>Kuziemko et al. (2018) show that upon becoming mothers women adopt more traditional attitudes, suggesting that motherhood serves as an information shock to their beliefs. Grinza et al. (2017), using longitudinal panel data for the UK, find that becoming a parent significantly shifts women’s attitudes towards more conservative views, while leaving men unaffected.

individuals who break one social prescription adhere particularly strongly to some other.<sup>5</sup> We hence focus on two major gendered social prescriptions and analyse the interactions between becoming a mother and relative earnings.

Using panel data for US couples, our analysis proceeds in two steps. We first examine labour supply responses to motherhood. Motherhood reduces participation and hours of market work, and we start by asking whether child-rearing norms affect women who are the main breadwinner and those who are not in the same way. Notably, if a woman chooses not to conform in terms of the breadwinner norm, will she also be less likely to follow traditional child-care roles after she becomes a mother? We then consider the effect of the male breadwinner norm. This aspect has recently gained attention as a factor playing an important role in holding back women's performance in the labor market. Bertrand et al. (2015) use as the key explanatory variable for labor supply decisions whether a woman earns more than her husband in year  $t-1$ , and find that breaking the norm leads women to subsequently reduce participation and hours of market work. We examine whether this norm affects all women in the same way, notably by distinguishing between those with at least one child and those without children. It is possible that couples pay little attention to whether they conform to traditional gender roles as long as they do not have children, yet the arrival of offspring and the desire to transmit certain preferences could be a trigger that makes gender norms salient and hence pushes women who are earning more than their husbands to modify their behavior.

We address the first question through an event study approach, estimating the impact of the birth of the first child on the labor market trajectories of women. Having information on both members of the couple, we can assess whether there are differences in the responses depending on who was the main breadwinner in the couple before having their first child. We find that motherhood has a strong impact on women's labor supply, in line with existing work. Both women who were earning less and those who were earning more than their husband reduce their hours and employment probability as a result of their first child's birth. Yet participation responses differ markedly across the two groups. Women who are secondary earners display a sharp reduction in participation immediately after the birth that partly recovers from the 6th year onwards. In contrast, women who are the main breadwinner are initially significantly less likely to stop working but their participation falls steadily over time, so that 10 years after the birth of their first child both groups converge, being 28 percent less likely to be employed than

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<sup>5</sup>An example of the latter is provided by Bertrand et al. (2015) who, in one of the rare studies addressing norm interaction, find that when women break the breadwinner norm they tend to offset it by increasing the share of housework they perform so as to strongly conform to the idea that the wife should be the home-maker.

before motherhood. We also find that both groups of women experience a large increase their hours of housework, roughly doubling them one year after the birth. Moreover, while for all women the hours of housework keep increasing over time, the medium-term effect is substantially larger for those who were initially the main breadwinners in their households.

These results highlight the difficulty that women have not behaving according to gender norms and imply that the latter prevail, to a large extent, over economic considerations. The results for the two groups point towards two novel conclusions. First, we find that even if women earn more, they still adhere to the “motherhood” norm of reducing labor supply and shouldering the childcare responsibilities more than men. This result goes against what we would expect to observe if comparative advantage in market work were driving the household’s decisions. Second, our results indicate that while women who were the main breadwinners are initially less likely to conform to the child-rearing norm than secondary earners, over time they reduce their participation and converge to that exhibited by secondary earners, raising questions about why they do not manage to sustain decisions that are in disaccordance with the norm.

The second step in our analysis consists of considering the effect of the male breadwinner norm. Our results indicate that while mothers behave as previously found, being less likely to be in the labor force and, conditional on working, working fewer hours at  $t$  than those who do not earn more than their husbands at  $t - 1$ , women without children do not. In fact, for the latter we find no evidence that breaking the norm affects their labor supply, a result that seems to indicate that the cost of not conforming only appears once there are children in the household. The reaction to the male breadwinner norm also seems to be strongly affected by the wife’s education level. In particular, women (with children) who have a college degree reduce their hours but not their probability of participating in response to having broken the male breadwinner norm. A possible reason for this is that for these women their identity stems both from their role in their household as well as their professional life, and hence dropping out of the labour force to conform with child-rearing norms entails a loss of professional identity. We do not observe this pattern when we look at women with fewer years of education for whom career concerns are likely, on average, to be less important.

This paper contributes to three different strands of literature. First, it adds to recent work on the so-called “child penalty”, defined as the extent to which women fall behind men (in employment rates, hours or earnings) due to having children.<sup>6</sup> Recently, event studies around

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<sup>6</sup>Recent work has also highlighted how the expectation of motherhood can affect outcomes, for example through their impact on women’s career choices as in Adda et al. (2017) or because firms are less likely to employ women who are likely to become mothers, as shown by Becker et al. (2019)



the birth date of the first child have gained popularity as they have the potential to capture the global treatment effect of children, as opposed to only the local treatment effect of a second or third child, obtained from the twin or sibling-sex-mix instruments proposed by previous literature on the child penalty; see Angrist and Evans (1998). This approach has been used to estimate how various outcomes change after the birth of the first child, such as hours worked, the dynamics of within-couple gaps in earnings, or changes in within-firm remuneration and bonuses; see Paull (2008), Angelov et al. (2016), and Lundborg et al. (2017).<sup>7</sup> We follow the event-study approach proposed by Kleven et al. (2019), who find a long-run penalty on earnings in Denmark, and apply it to labor supply choices. We contribute to this literature by focusing on how the pre-birth circumstances, notably the relative earnings of the two members of a couple, affect the intensity of the effects of parenthood on labor market trajectories. In particular, we show that although women who were the main breadwinners in the household initially conform less to the norm than secondary earners, this difference is short-lived as they eventually reduce their labor supply as much as the latter and even overcompensate their adherence to social norms by exhibiting a particularly large increase in the household responsibilities that they shoulder.

The paper is also related to recent work on how social norms can help us understand gender gaps in the labor market (a comprehensive review of this literature is presented in Bertrand (2011)). Some of this literature has focused on the intergenerational transmission of norms within the family or in society as a whole, providing micro-foundations for differential sorting of men and women across occupations and women’s decisions to participate in the workforce.<sup>8</sup> One of the remaining challenges is to understand why women “choose” to work fewer hours or to be in less-well-paid firms, sectors and occupations, and behavioral responses to gender norms within couples appears as a potential explanation. Bertrand et al. (2015) identify such effects, and their results indicate that in couples in which the wife’s potential earnings are likely to exceed her husband’s, women reduce their labor supply or remain in lower-paid jobs so as to avoid a gender role reversal in earnings, and they conclude that conforming to this gender identity norm partly explains gender gaps. A number of articles have found similar results for other countries, such as Sweden, Brazil and Uruguay.<sup>9</sup>

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<sup>7</sup>See also Kleven et al. (2019) for an international comparison, Lucifora et al. (2017) on French data and Berniell et al. (2021) for an analysis on a middle-income country, Chile.

<sup>8</sup>This literature has examined, for example, women’s under-representation in mathematics and in other scientific disciplines (Nollenberger et al., 2016), the persistence of occupational gender segregation (Breen and García-Peñalosa, 2002), and labor force participation and hours of work (Fortin, 2005; Bertrand et al., 2015; Fernández et al., 2004; Farré and Vella, 2013; Olivetti et al., 2020; Humlum et al., 2019). According to Blau and Kahn (2017), it has the potential to help explain not only the unexplained gender gap (i.e. the fraction not accounted for gender differences in measured qualifications), but also gender differences in some of the measured factors themselves

<sup>9</sup>See Ichino et al. (2019) for Sweden, Codazzi et al. (2018) for Brazil and Galván (2020) for Uruguay. The

These insights have been confirmed for German data by Wieber and Holst (2015), who argue that context can affect the strength of responses to the norm. Comparing West and East Germany, they find that the male breadwinner norm significantly affects labor supply decisions in West Germany but not in the East where the socialist regime had implemented strong policies to erode gender stereotypes. Context is also crucial for Hwang et al. (2019) who use Korean data to look at how the social environment, defined by sex-ratios at birth in the place of birth of the husband, affect the wife’s housework time. Closer to our approach is Lippmann et al. (2020). They use German data to show how norms can offset each other. Women who earn more than their husbands compensate breaking the norm by increasing the number of housework hours, but only in West Germany and not in the East, indicating that the socio-political context in which individuals grow is a key determinant of the cost individuals face when not adhering to social norms. Our results contribute to this literature by examining an additional way in which norms are affected by context, providing evidence that it is the arrival of children to the household that triggers women’s response to the male breadwinner norm. That is, the cost of not adhering is not only affected by society-wide conditions but also by the individual household’s context.

More generally, we also contribute to the growing literature on social norms in economics. Social norms have long been the realm of sociologists, yet over the past decades economists’ interest in them has been rising, both because they allow us to explain a variety of phenomena but also because the rational-agent model can help understand how such norms evolve and are transmitted.<sup>10</sup> We add to a literature in economics that sees norms as essential in explaining women’s welfare, whether it in terms of labour supply decisions, as in the papers cited above, their fertility or the acceptance of intimate partner violence.<sup>11</sup> Our results indicate that is important to considering various norms together, as different social prescriptions can reinforce or offset each other.

The paper is organized as follows. Section 2 describes the data and sample while Section 3 presents the methodological approach. Section 4 discusses the results on the impact of the birth of the first child on labor market outcomes and how these effects are related to the breadwinner

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importance of social norms has also been addressed concerning relative hours of work, with women exhibiting lower satisfaction if they break the norm that the husband should work more hours than the wife, as shown by Flèche et al. (2020). Some authors have criticized parts of the analysis in Bertrand et al. (2015), notably, Hederos Eriksson and Stenberg (2015), Zinovyeva and Tverdostup (2018) and Binder and Lam (2018).

<sup>10</sup>See Hiller and Baudin (2016) for a model on the transmission of gender norms and Fernández et al. (2004) and Giménez-Nadal et al. (2019), amongst others, on evidence on transmission across generations.

<sup>11</sup>See, for example, Fernández and Fogli (2006) on fertility and González and Rodríguez-Planas (2020) on domestic violence, as well as Bertrand (2011) for a review of work on gender identity norms and Postlewaite (2011) for a discussion of social norms in economics. The latter also highlights the difficulty in distinguishing between individual preferences and social norms, as the former are the result of social interactions and thus shaped by the latter.

norm. Section 5 focuses on the analysis of heterogeneous responses to the male breadwinner norm, before moving to the analysis of employment patterns. The last section concludes.

## 2 Data and Sample description

Our primary data source is the Panel Study of Income Dynamics (PSID) for the period 1968-2015. The PSID is a longitudinal study of US households that began in 1968 with a nationally representative sample, and contains information collected on sampled families and their descendants for nearly 50 years. All individuals living in PSID families in 1968 were interviewed yearly through 1997 and every other year since then. The PSID also follows those born into or adopted by a PSID family even after they moved out of the original household. Those who married into PSID families were followed for as long as they lived with a member of the PSID sample.<sup>12</sup>

More specifically, the data that we use comes from the *Family files* and the *Cross-year Individual files*. The *Cross-year Individual files* contain one record for each person ever in a PSID family from the beginning of the study through 2015. The *Family files* contain family-level information and detailed information for the head and wife, including married and cohabitant couples. The main advantages of using these data are that they allow us to follow couples for a long time and that they contain detailed information on labor market outcomes for household heads and spouses, including labor supply, income and industry and occupation variables, as well as information on hours of housework. This makes it particularly suitable for analyzing outcomes for the two members of a couple.

Our estimation sample is composed of 129,265 couple-year observations for women who live in couples, where both, husband and wife are between 18 and 65 years old, and where at least one of the spouses has positive earnings (in the previous year).<sup>13</sup> The sample is also restricted to family heads and spouses or not married partners. Information on birth dates is taken from the *Birth and Adoption History File*. The event study analysis consequently includes only those couples who have a register in this data.

Table 1 presents summary statistics for the main variables in our sample. All the income related variables correspond to the previous year, and the values of wife’s and husband’s income in the table are expressed in 2015 dollars. On average, the men in our couple-sample are two

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<sup>12</sup>The Panel Study of Income Dynamics, public use dataset is produced and distributed by the Institute for Social Research, University of Michigan, Ann Arbor, MI (2017). PSID data are publicly available at <https://psidonline.isr.umich.edu/>

<sup>13</sup>Our sample includes only individuals belonging to the “core sample”. The Latino sample, the immigrant refresher sample, and the low-income over-sample are excluded in order to prevent changes in these samples from affecting the results. The disadvantage of this is that the composition of the core sample is representative of US population in 1968, not of the US population today.

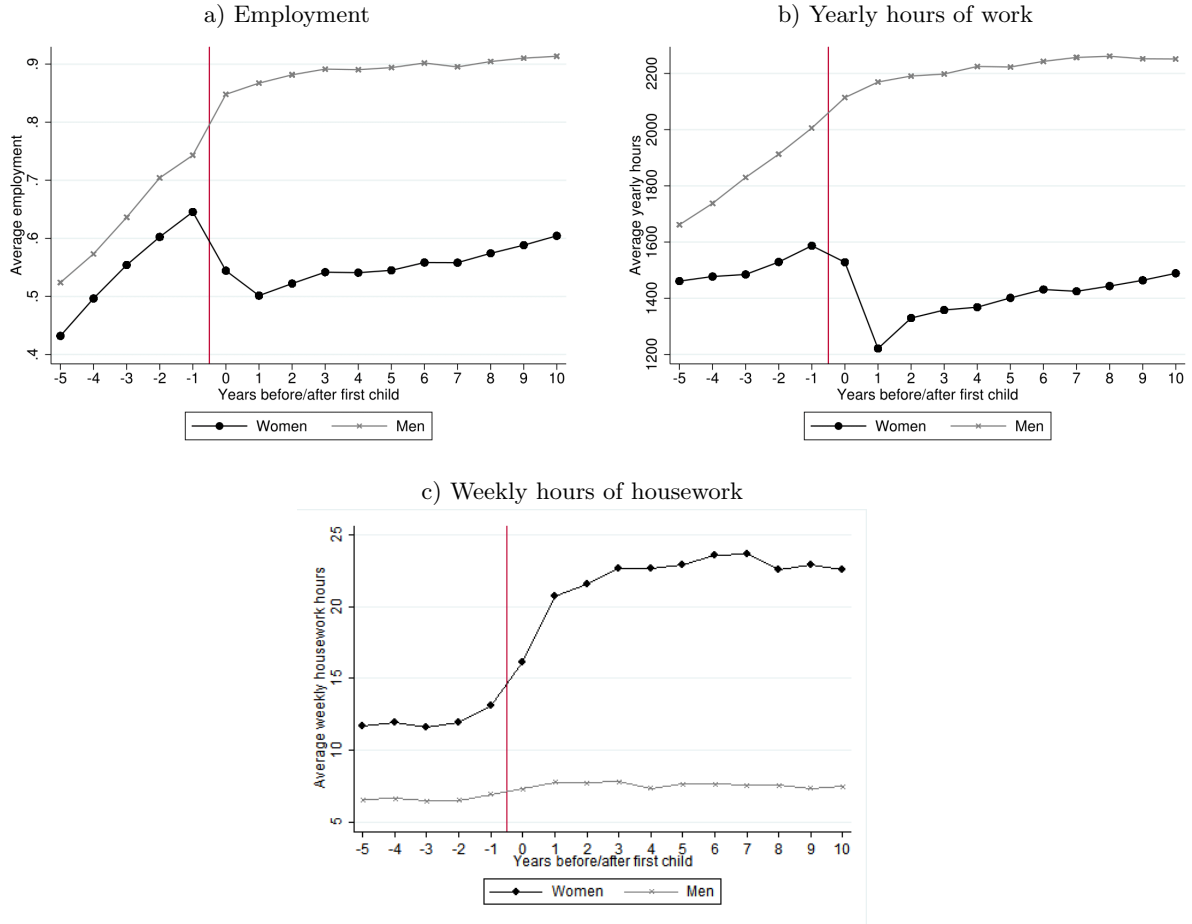
years older than the women. The mean of the relative income is 0.29, which means that women earn on average around 29% of the income of the couple. The wife earns more than the husband in 18 percent of the cases. Also, 85 percent of women have at least one child, and the average number of children is 2.53. Education is defined as the maximum education level reached by the individual, and comprises three categories: high-school or less, 1-3 years of college and at least 4 years of college (college graduates).

Table 1: Sample summary statistics

	Mean	SD	Min	Max	N
<i>In t-1:</i>					
Wife earns more	0.18	0.38	0	1	129.265
Wife's Income	20.785	25.766	0	1,027,758	129.265
Husband's Income	53.779	68.271	0	6,410,906	129.265
Relative Income	0.29	0.28	0	1	129.265
<i>In t:</i>					
Wife's age	37.15	11.12	18	65	129.265
Husband's age	39.55	11.49	18	65	129.265
Number of children at home	1.38	1.39	0	13	129.265
No children at home	0.34	0.47	0	1	129.265
Wife's labor force participation	0.63	0.48	0	1	129.265
Wife's yearly hours of work	1.152	918.9	0	7,980	129.265
Highschool or less	0.49	0.50	0	1	129.265
1-3 years of college	0.26	0.44	0	1	129.265
At least 4 years of college	0.24	0.43	0	1	129.265
Ever had a child	0.85	0.35	0	1	120.789
Number of children	2.53	1.72	0	15	120.789

*Notes:* The data is from the 1968-2015 PSID. The sample correspond to couple-year observations of women who live in couple (wives or non-married cohabitant couples), where both husband and wife are between 18 and 65 years old, and where at least one of the spouses has positive earnings (corresponding to the previous year). Yearly labor income is expressed in 2015 prices (deflated using Consumer Price Index (CPI) - Bureau of Labor Statistics). The number of observations in the variables corresponding to the *Childbirth History File* is smaller because information was not collected for some individuals.

Figure 2: Average employment, yearly hours of work and housework before and after having their first child



*Notes:* The graphs show average levels of employment, yearly hours of work (conditional on being employed) and weekly hours of housework for men and women in each event-time before and after the first child is born (vertical line).

Our data exhibit features that have been identified in previous work. Figure 2 depicts the (raw) averages for employment, hours of work and housework around the birth of the first child for both women and men. In panel (a) it is possible to observe that before the birth of the first child the employment trajectories of men and women evolve in parallel, suggesting no gender-specific trend but higher employment levels for men. Immediately after the birth of the first child, there is a sharp drop in employment levels for women and a slight increase for men. A similar pattern is observed with respect to hours of work and housework. Conditional on remaining employed, there is a sharp drop in yearly hours of work for women after having their first child (panel (b)), while there is an important increase in the hours of housework they

perform (panel (c)). This indicates that the gaps between men and women that exist prior to the birth become much larger after the first child arrives. As we show in the Appendix, these sharp drops in labor market trajectories take place for women in all educational groups. The most noticeable difference among the various groups is that the trends in employment levels for highly-educated women before having a child are almost identical to those for men.<sup>14</sup>

### 3 Empirical approach

#### 3.1 Key questions

To investigate how the interaction between child-rearing roles and norms concerning relative earnings within the couple affect women’s labour supply decisions we tackle the question from two complementary perspectives. We start by looking at the impact of the birth of the first child on labor supply decisions and housework. In particular, we analyse whether in couples in which the woman was the main breadwinner before the birth of the first child, she remains in the labor market while her partner takes the main role at childcare, which would be the efficient response from the point of view of a standard household model. In contrast, if social norms related to maternity prevail over efficiency considerations, both groups of women would reduce their labour supply. Our first step will hence consist in examining whether women who are the main breadwinner and those who are not respond differently in terms of employment, hours of market work and hours of household work to becoming mothers.

We then turn around the question and consider how women react to breaking the male breadwinner norm. Women who start earning more than their husbands tend to reduce their labor supply, and we ask whether this is the case for all women. We distinguish first between those with and those without children. Motherhood has been shown to make women more conservative and lead them to adopt more traditional attitudes,<sup>15</sup> and this could be reflected in their attitudes towards other social norms, implying that behavioral patterns that were acceptable in the absence of children are not in their presence. We consider a second dimension along which norms and identity conflicts may lead women to react in different ways to the breadwinner norm: the level of formal education. As stated by Akerlof and Kranton (2000), social categories need not be mutually exclusive, and an individual may be mapped into several categories; that is, individual  $j$  can be both a “mother” and a “professional”. Individuals can get a sense of identity from the job they perform and, at least in the US, this effect seems to be stronger for more educated individuals (Gallup News, 2014). Indeed, Goldin (2006) describes the period that began

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<sup>14</sup>See Figures A.1 and A.2 in the Appendix.

<sup>15</sup>See Kuziemko et al. (2018) and Grinza et al. (2017).

in the late-1970s as a “quiet revolution” characterized by a change in female identity that for the first time allowed a woman’s occupation to define her fundamental identity and societal worth. As a result, if highly-educated women find themselves in conflict between the identity derived from their career and that associated to conforming to gender norms, we can expect them to be less willing than other women to drop out of the labor force when becoming mothers. To test this hypothesis we consider whether women with different levels of formal education react differently to breaking the male breadwinner norm.

These two questions require different methods to examine heterogeneity in behavior, and the next two subsections explain our empirical approach to tackle each of them.

### 3.2 Event study of the impact of motherhood

For our first step we follow the event study approach used by Kleven et al. (2019). We define as our event the arrival of the first child and examine how the outcomes of interest - employment, hours of work and hours of housework- are affected by the birth. Since we are interested in understanding how labor supply responses to the birth of the first child are conditioned by economic considerations of relative earnings within the couple, we need to identify couples in which the wife was earning more than the husband in the pre-motherhood context and those in which she was secondary earner. To do so, we follow the approach proposed by Bertrand et al. (2015) in their analysis of the male breadwinner norm, by defining a dummy variable,  $Wem_{i,t-1}$ , that takes value one if the wife earned more than the husband in  $t - 1$ , i.e.  $Wem_{i,t-1} = 1$  if  $RelativeIncome_{t-1} > 0.5$ , where  $RelativeIncome_{t-1} \equiv WifeIncome_{t-1} / (WifeIncome_{t-1} + HusbandIncome_{t-1})$ . Our sample of couples will hence be divided into those where the wife earned less and those where she earned more than her husband before their first child was born.

For each individual in the sample we denote by  $z = 0$  the year in which the individual has his/her first child and index all years relative to that year. We estimate the following regression:

$$y_{itz}^g = \sum_{j \neq -1} \alpha_j^g \cdot I[j = z] + \sum_k \beta_k^g \cdot I[k = age_{it}] + \sum_l \gamma_l^g \cdot I[l = t] + v_{itz}^g, \quad (1)$$

where  $y_{itz}^g$  is the outcome of interest for individual  $i$  of gender  $g = f, m$  in year  $t$  and at event time  $z$ .

Since the objective is to investigate how the arrival of the first child affects the labor supply and division of work within the household, we will focus on three outcomes: labor force participation, the number of hours worked in the year, and hours of housework per week. The

regressions include a full set of event time dummies (first term on the right-hand side), age dummies (second term) and year dummies (third term). The event dummy goes from -5 to 10 omitting the event time dummy at  $z = -1$ , implying that the event time coefficients measure the impact of children relative to the year just before the first child is born. By including a full set of age dummies, we control non-parametrically for underlying life-cycle trends, and including a full set of year dummy controls non-parametrically for time trends such as wage inflation and business cycles. The inclusion of age dummies improves the comparison between men and women as women are, on average, a couple of years younger than men when having their first child, and between women of different educational levels, as the less educated tend to have children at a younger age.

The estimated level effects are converted into percentages by calculating

$$P_z^g = \hat{\alpha}_z^g / E[y_{itz}^{\tilde{g}} | z],$$

where  $y_{itz}^{\tilde{g}}$  is the predicted outcome when omitting the contribution of the event dummies, i.e.  $y_{itz}^{\tilde{g}} = \sum_k \beta_k^g \cdot I[k = age_{it}] + \sum_l \gamma_l^g \cdot I[l = t]$ . Hence,  $P_z^g$  captures the year- $z$  effect of children as a percentage of the counterfactual outcome, i.e. that in the absence of children.

By exploiting individual-level variation in the timing of the first birth, the event study approach presents a way of dealing with the endogeneity problem associated with fertility decisions. Typically, fertility choices could be determined by unobserved factors which are also correlated with labor market outcomes. However, the event of having a child generates sharp changes in labor market outcomes just after the birth, which can be assumed orthogonal to unobserved determinants of those outcomes which evolve smoothly over time.<sup>16</sup> Therefore, by comparing the results just before and after birth it is possible to estimate the effects of having a child.<sup>17</sup> As in quasi-experimental settings, the main identification assumption is that is that the “treatment”, that is, the decision on when to have a child, should not be induced by unobservable information of a changed direction of the outcome for one of the spouses. This means that the timing of parenthood should not be influenced by expected future shocks to the participation and hours of work that they would have experienced in the absence of entering parenthood. However, if these shocks take place before the birth of the child, they are observed in our data and hence

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<sup>16</sup>See Kleven et al. (2019) for a discussion.

<sup>17</sup>Children may have two conceptually different effects on labor market outcomes. The event study approach is designed to identify only post-child effects of realized fertility. It cannot capture pre-child effects of anticipated fertility, such as women choosing certain occupations in anticipation of expected fertility. This effect is incorporated in the pre-event levels in our formulation, implying that the event study estimates provide a lower bound for the lifetime impact of children. Adda et al. (2017) estimate that occupational choices at the age of 15–16 due to anticipated fertility are small, accounting for less than 5% of the total earnings loss from children.



controlled for. Our graphical evidence supports this assumption. The descriptive figures for the levels of employment and hours of work before and after the first child is born display a sharp breaks in labor market outcomes trajectories which occurs just after the birth of the first child (see Figure 2). That is, there is no evidence that the outcomes change prior to the childbirth.

The regression in equation (1) is estimated separately women (men) who were the main breadwinner at  $z = -1$  and those who were secondary earners in order to explore if there are heterogeneous responses. We hence estimate two separate regressions for women, one for  $y_{itz}^{f,Wem=1}$  and another for  $y_{itz}^{f,Wem=0}$ , and consequently obtain two values of the impact of motherhood,  $P_z^{f,Wem=1}$  and  $P_z^{f,Wem=0}$ . If comparative advantage guides decisions about household labor supply and childcare, we expect to find differences between the two groups of women, with those that are the main breadwinner exhibiting weaker responses to the arrival of the child. If gender norms are the key element in the household's decision, then both groups of women should respond in similar ways. It is even conceivable that women who earn more than their husbands respond more strongly if they compensate breaking the breadwinner norm with adhering strongly to another one.

### 3.3 Impact of the breadwinner norm

In our second step we turn around the question and analyze responses to the prescription that a man should earn more than his wife, to see whether the male breadwinner norm is affected by motherhood. For this we follow the approach proposed by Bertrand et al. (2015), where the actual realization of the wife earning more than her husband in the previous period is used as a predictive for observed outcomes.

The panel nature of the data allows us to include couple fixed effects and hence investigate whether realizations of earnings that imply that the male breadwinner norm is violated in year  $t-1$  result in a change in the labor supply of women at  $t$ . Specifically, we estimate the following linear probability model:

$$y_{it} = \alpha Wem_{i,t-1} + \beta X_{it} + \mu_i + \gamma_t + \delta_s + \varepsilon_{it}, \quad (2)$$

where  $y_{it}$  is the outcome for the wife in couple  $i$  at time  $t$ , which is either the wife's labor force participation or the logarithm of the number of hours she worked in year  $t$ .  $Wem_{i,t-1}$  is a dummy that takes the value one if the wife earned more than the husband at  $t-1$ , i.e.  $Wem_{i,t-1} = 1$  if  $RelativeIncome_{t-1} > 0.5$ , where  $RelativeIncome_{t-1} \equiv WifeIncome_{t-1} / (WifeIncome_{t-1} + HusbandIncome_{t-1})$ . The parameter of interest,  $\alpha$ , captures the predicted

changes in the likelihood that the wife participates in the labor force and the hours of work when  $Wem_{i,t-1}$  changes by one unit, holding the other variables constant.

The vector  $X_{it}$  is a set of controls that include the logarithms of the labor income of the husband ( $\ln HusbandIncome_{t-1}$ ) and the wife ( $\ln WifeIncome_{t-1}$ ) and the couple's income ( $\ln CoupleIncome_{t-1}$ ), and a quadratic in both the wife's and the husband's age. Depending on the specifications, we also include higher terms for incomes, the wife's relative income, and children controls. As well as a couple fixed effect ( $\mu_i$ ), the regressions include year ( $\gamma_t$ ) and state ( $\delta_s$ ) fixed effects. In the regression including all the women in our sample the logarithm of one plus yearly income is used in order to include zeros in addition to an indicator for whether only the wife is working and an indicator for whether only the husband is working. Following Bertrand et al. (2015) we estimate the regression through a linear probability model, pooling together observations for all years.

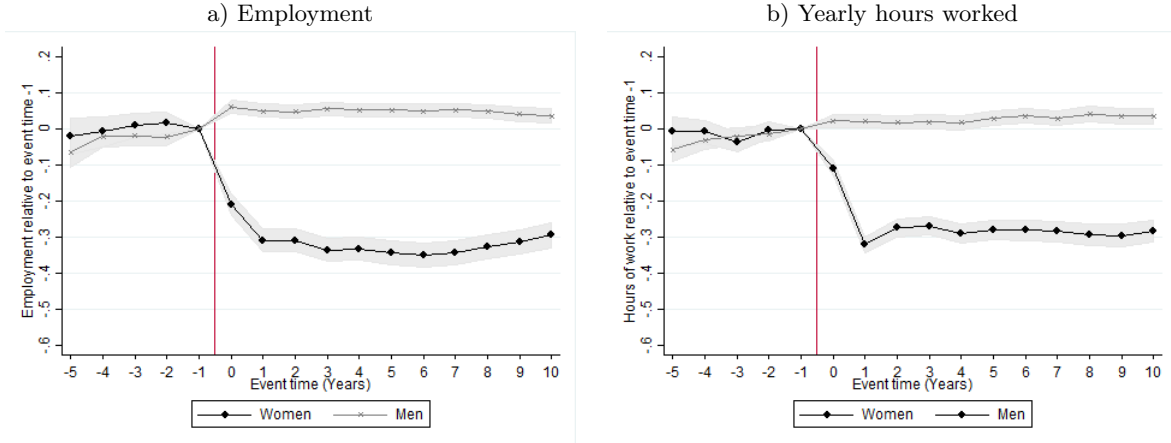
The main question we want to address is how the parameter  $\alpha$  varies across subgroups of the population for which social norms may be more or less stringent. We will consider two dimensions: women with and women without children, and women with different levels of formal education.

## 4 Responses to the birth of the first child

### 4.1 Women's labor supply responses

We start by considering the event-study regressions for the entire samples of women and of men. The resulting effects are reported in Figure 3. As previously defined, these are year- $z$  effects (as a percentage of the counterfactual outcome absent children) relative to the year just before the first child birth. The figure includes 95% confidence bands around the event coefficient. Once life-cycle and time trends are controlled for, men and women have stable paths before parenthood, but the dynamics differ following the arrival of the first child. Women experience an immediate drop in both employment and hours of around 30%. Hours increase after the first year and stabilize on year  $z + 2$ , while employment remains low for 6 years and increases moderately after that. Ten years after having their first child, women are 30% less likely to be employed and work 28% fewer hours compared to the year just before motherhood. In contrast, men experience a small increase in both their employment probability and in hours (of 5% and 2%, respectively) following the birth of their first child.

Figure 3: Impact of children on employment and hours worked



These results are in line with existing work, notably the analysis of Danish data in Kleven et al. (2019) who also find that the arrival of a child has a negative effect on women’s trajectories, reducing both labor force participation and their hours of work. These responses can, however, differ across women depending on individual or family circumstances. We turn to this question in the next subsection.

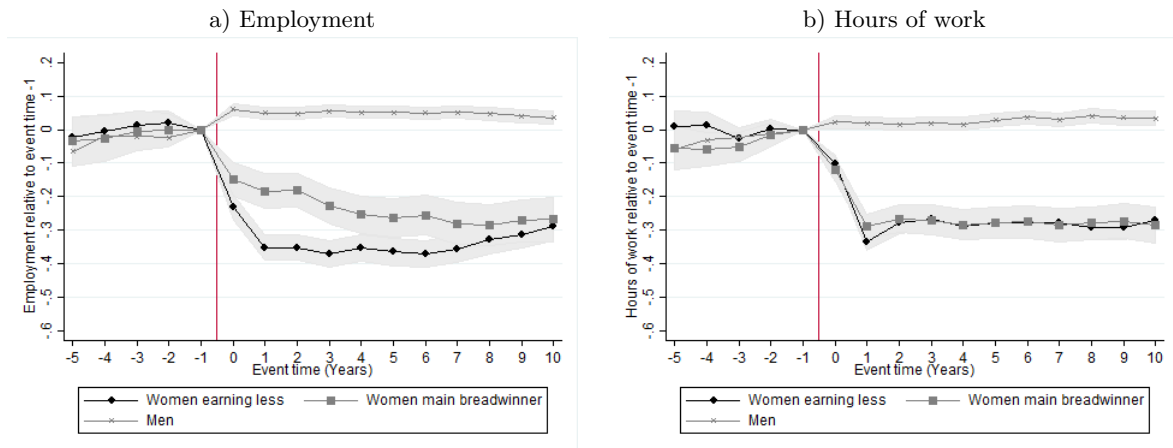
#### 4.2 Child-rearing and relative earnings within the couple

As we have argued, women who earn more than their husbands may react differently to the birth of their first child from those who do not. Figure 4 presents the estimated impacts when we divide the sample of women into women who were earning more than 50% of the household’s labor income, i.e. those for whom the dummy variable  $Wem_{i,t-1}$  is equal to one, and those that were earning a smaller share prior to the birth ( $Wem_{i,t-1}=0$ ).

Our results do not support an efficient division of labor. Both, women who were earning less and those who were earning more than their husband reduce their hours and employment probability dramatically, while men exhibit stable hours and a slight increase in their employment probability as an effect of the first child birth. Conditional on being employed, the reduction in hours of work is roughly the same for women who were and were not the main breadwinner (right panel). The magnitude of the effect in employment is, however, different across the two groups of women (left panel). The immediate effect of the birth of the first child is a drop in employment of around 20% for women who were main breadwinners, and about 35% for those who were secondary earners. Interestingly, the dynamics differ across the two groups. Secondary earners exhibit a sharp initial reduction, but the employment probability recovers after year 6. The estimated effect after ten years is 28%. In contrast, for those who were the main bread-

winners, the initial drop is much smaller but the employment probability keeps decreasing over time, and 10 years after the birth the estimated effect is virtually identical for the two groups of women.<sup>18</sup>

Figure 4: Impact of children and main breadwinner norm

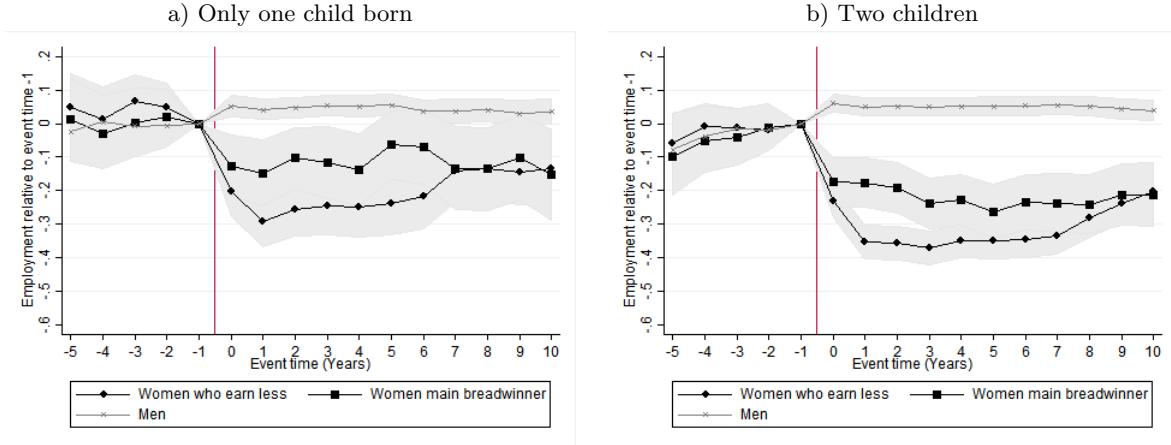


To further understand the differences between the two groups, Figure 5 presents the estimates for those women who have only one child (23.5% of our sample) and for those with two children.<sup>19</sup> Consider the former group. Again, there is a considerable difference in the magnitude of the initial employment reduction between those who earn less and those who earn more than their husbands. The latter have an initial negative effect on employment of around 12% and then fluctuate around 10% for the next nine years. Women who are secondary earners experience a much larger effect of the first child birth (of 30%) but then this estimate slowly increase. Ten years after the birth they are around 12% less likely to work than before the birth, an estimated effect equivalent to that of the breadwinners. These results confirm those in Figure 4 indicating that employment behavior initially differs across the two groups, but not in the long run even for women with only one child.

<sup>18</sup>The short-run impact is estimated considering event times just before and after time zero. However, when we consider an event time long after zero, for example ten years after the birth of the first child, it is necessary to consider, first, that it can be capturing the effect of total lifetime fertility as opposed to the effect of the first child. Second, the smoothness assumption is no longer sufficient for identification and the long-run child penalty might be a biased estimate of the true post-child impact. However, by comparing standard event study estimates to more sophisticated event study approaches that use control groups or instrument for child births, Kleven et al. (2019) show that the event study approach, once we control non-parametrically for age and time trends, does a good job of identifying child penalties even in the long run.

<sup>19</sup>Given that the number of observations is considerably reduced, the confidence intervals become larger, especially for women with only one child who earn more than their husbands.

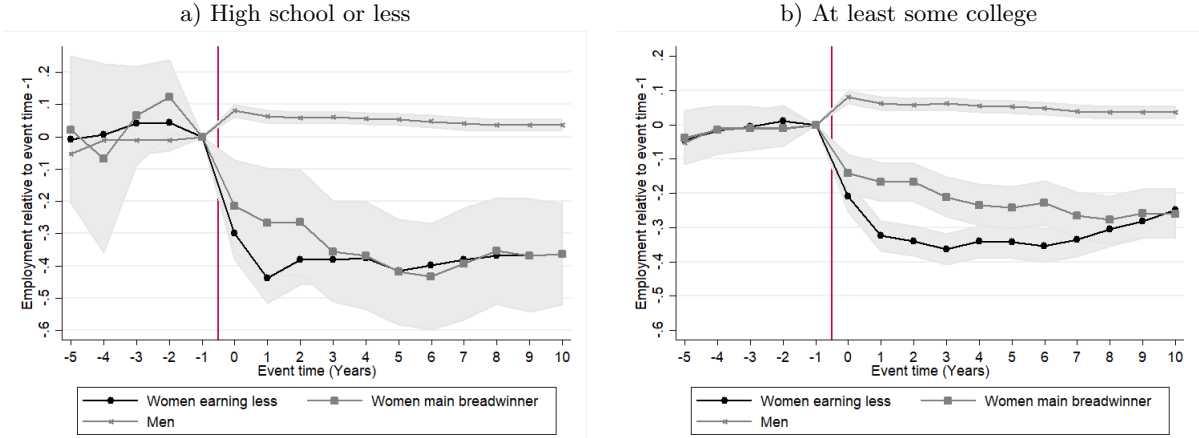
Figure 5: Impact of children and main breadwinner norm: employment



*Notes:* The graphs show event time coefficients estimated from equation (1) as a percentage of the counterfactual outcome absent children:  $P_t^g = \hat{\alpha}_t^g / E[Y_{ist}^g | t]$  for men and women who were main breadwinners or secondary earners in  $z = -1$ . The effects on yearly hours worked are estimated conditional on employment. The shaded 95 % confidence intervals are based on robust standard errors.

Fertility patterns are strongly correlated with educational attainment, and our next step consists in examining differences across education groups. In order to maintain reasonable sample sizes, we class women into two groups: women with a high-school degree or less, and those with “some college” and at least 4 years of college, which are grouped together. The labor supply changes for the less-educated group are depicted in the left-hand panel of Figure 6. Although women who are the main breadwinner initially have a smaller reduction in employment than those who are not, these differences are not statistically significant and have disappear by year 4. The results for high-skilled women are reported on the right-hand panel. The first thing to note is that the decline in participation is more gradual and, after 10 years, smaller than for the less-skilled group, amounting to 26% rather than 36%. Second, high-skilled women exhibit different patterns depending on whether or not they are the main breadwinner, in line with our earlier findings. Interestingly, there seems to be no difference in the behavior of the husbands of the two types of women.

Figure 6: Impact of children and main breadwinner norm by education groups



*Notes:* The graphs show event time coefficients estimated from equation (1) as a percentage of the counterfactual outcome absent children:  $P_t^g = \hat{\alpha}_t^g / E[\tilde{Y}_{ist}^g | t]$  for men and for women who were main breadwinners or secondary earners in  $z = -1$ . The education groups are defined on the basis of the wife's education. The effects on yearly hours worked are estimated conditional on employment. The shaded 95 % confidence intervals are based on robust standard errors.

These three figures indicate a strong response of women to child-rearing norms, which occurs both for women with one child and for those who have two, implying that the dynamics are not (mainly) driven by the arrival of subsequent children. These dynamics show that although women who are the main breadwinner initially behave differently from those who are not, exhibiting smaller reductions in their labor supply, these differences are only temporary. After ten years, the two groups have reduced their labor supply by exactly the same amount, with an employment probability well below that in the year before they had their first child. A possible explanation is that while women who earn more than their husbands are initially more reluctant to conform to child-rearing norms, they eventually behave in accordance to them just as much as secondary earners. Interestingly, this difference in behavior is more marked for high-education women, while those with a lower educational attainment show employment dynamics that are less affected by whether or not they are the main earner. The latter group of women seems to be more willing to conform to the norm from the start, while the former only do so as time passes.

### 4.3 Men's employment and the division of housework

We turn next to the impact of children on men's employment. Again, we split the sample between men earning more and those earning less than their wives and report the change relative to the year before the birth of the first child. For those who were already main breadwinners, having a

child has virtually no effect on the probability of employment and hours worked. However, men that were earning less than their wives before the birth, increase their probability of employment by around 12%, while the estimated effect on their hours of work rises steadily in the 10 years following the birth, and hours are around 20% higher by the end of the decade (Figure 7).

Figure 7: Impact of children and main breadwinner norm



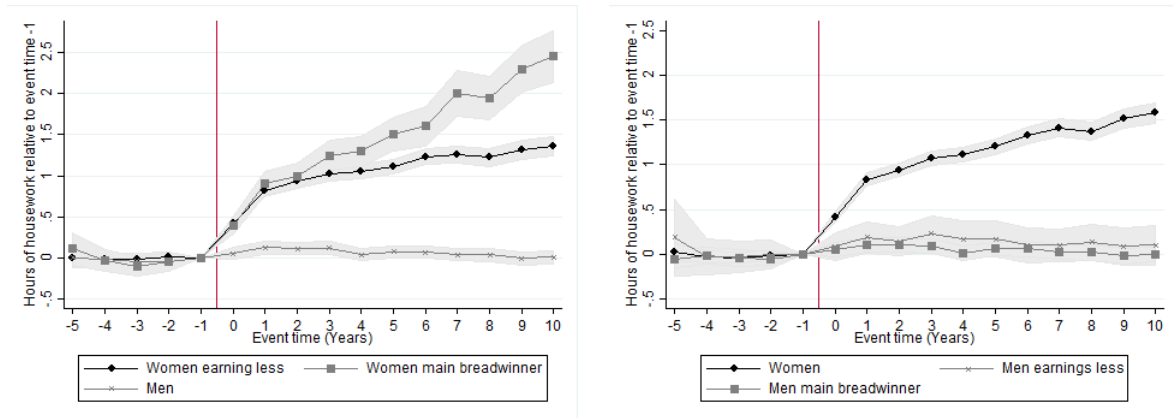
*Notes:* The graphs show event time coefficients estimated from equation (1) as a percentage of the counterfactual outcome absent children:  $P_t^g = \hat{\alpha}_t^g / E[Y_{ist}^g | t]$  for men and women who were main breadwinners or secondary earners in  $z = -1$ . The effects on yearly hours worked are estimated conditional on employment. The shaded 95 % confidence intervals are based on robust standard errors.

There are two possible reasons for these changes. One is simply that the increased labor market activity of these men seeks to compensate the reduction in household income occurring when their wives, who were bringing home a high share of earnings, reduce their employment. Alternatively, men may react to the presence of children by reverting to a traditional division of labor and hence increase their market activity and reduce the amount of time spent in housework.

We consider this possibility by examining the response of hours of housework following the birth of the first child. Average weekly hours of housework before having children are 12 hours for women and 7 for men. Following the birth of their first child, the dynamics of housework for men and women diverge, with men still performing about 7 hours per week and women almost doubling them to 23 hours (Figure 2). When we perform our estimations of the effect of the first child on housework we find that the birth does not affect the hours spent in housework for men, and that this is the case for both men that were and were not the main breadwinner (Figure 8, right panel). For women there is a large increase just after the child's birth, with hours roughly doubling one year after the birth. The left panel of Figure 8, reports the estimates for

both secondary earners and women who were the main breadwinner prior to the child’s arrival. Initially, the estimated effect of the child is an increase by about the same amount in the number of weekly hours of household, and for both groups hours keep increasing. However the increase in the estimated effects is much faster for those who were the main breadwinners, who after 10 years have an increase of 250% compared to the year before motherhood.

Figure 8: Impact of children on hours of housework



*Notes:* The graphs show event time coefficients estimated from equation (1) as a percentage of the counterfactual outcome absent children:  $P_t^g = \hat{\alpha}_t^g / E[\tilde{Y}_{ist}^g | t]$  for men and women who were main breadwinners or secondary earners in  $z = -1$ . The shaded 95% confidence intervals are based on robust standard errors.

Our results contrast to those obtained by Angelov et al. (2016) on Swedish data. They find that wives whose husbands are relatively better paid take greater responsibilities at home after the birth of a child, compared to those whose husbands had a lower income (relative to the wife’s), in line with the theory of comparative advantage within the couple. Our results for the US indicate the opposite. Both women who were secondary earners and main breadwinners take the greatest responsibilities at home when the child arrives increasing their hours of housework, while it remains almost unchanged for men. Moreover, those women who were the main breadwinners prior to the child’s birth experience a greater change in their housework time compared to the group of secondary earners. The contrasting evidence could be explained by different strength of the social norm in the two countries.

Our results indicate that the effect of the arrival of children on labor market trajectories is large, even for those women who were the main breadwinners in their households prior to the child’s birth. Women seem to take on the role of main carer, reducing employment and (for those who remain employed) their working hours. There are, nevertheless, important differences



between women that were the main providers in their households before being mothers and those that were secondary earners. Although, conditional on employment, the groups have similar reactions in terms of hours of work, they differ in the probability of employment and the amount of housework performed. Initially the effect on employment is greater for secondary earners, yet the two groups of women exhibit the same reduction in their employment probability after ten years. In contrast, the pattern for hours of housework indicates that it is those women that were initially the main breadwinner that experience the greatest effect in terms of housework (compared with their previous levels) when children arrive.

## 5 Do all women react to the breadwinner norm?

### 5.1 Mothers and non-mothers

The previous section indicates that women’s labor supply choices following the birth of their first child are strongly shaped by social conventions on caring for children and that such reactions often contradict the specialisation pattern that would be implied if the main carer were the spouse with lower income. We now turn to how women react to breaking the breadwinner norm and analyze heterogeneity in the responses to the prescription that a man should earn more than his wife. In particular, we seek to understand the relationship that the male breadwinner norm has with motherhood. The presence of children may affect the way in which couples react to gender norms. Historically, motherhood has been the key aspect defining female identity, hence it is possible that couples pay little attention to whether they conform to traditional gender roles as long as they do not have children. The arrival of offspring could be a trigger that makes gender norms salient and hence pushes women who are earning more than their husbands to modify their behavior. We will thus explore whether the effect of the male breadwinner norm is stronger for women with than for women without children.

As described above, we follow the approach proposed by Bertrand et al. (2015), and examine whether realizations of earnings that imply that the male breadwinner norm is violated in year  $t$  result in a change in the labor supply of women at  $t + 1$ . Crucially, the panel nature of the data allows us to include couple fixed effects. Table 2 considers married women’s labor force participation as a function of the dummy variable  $Wem_{i,t-1}$ , which takes value one if the wife earned more than the husband in  $t - 1$ . The three columns in each panel present different specifications as additional controls are added. Columns (1) and (4) have couple fixed effects (as well as standard controls), columns (2) and (5) add polynomials for the wife’s and the husband’s income, and columns (3) and (6) add the relative income of the wife as well as child controls,

taking the form of dummy variables for whether the youngest child is 3 or younger, between 4 and 6, or older than 6. We split the data into two groups, depending on whether women are mothers, with the results for childless women being on the left panel and those for women with at least one child on the right panel.

Table 2: Labor supply and relative income by ever had a child

	(1)	(2)	(3)	(4)	(5)	(6)
<i>(a) Dependent variable: female labor force participation</i>						
	No child born			At least one child born		
$Wem_{t-1}$	-0.013* [0.007]	-0.004 [0.008]	-0.010 [0.008]	-0.021*** [0.004]	-0.012*** [0.004]	-0.018*** [0.005]
Observations	17,761	17,761	17,761	103,028	103,028	103,028
R-squared	0.369	0.375	0.377	0.408	0.415	0.416
<i>(b) Dependent variable: ln yearly hours of work</i>						
	No child born			At least one child born		
$Wem_{t-1}$	-0.075*** [0.013]	-0.006 [0.012]	0.001 [0.014]	-0.101*** [0.007]	-0.031*** [0.006]	-0.012* [0.007]
Observations	14,928	14,928	14,928	69,830	69,830	69,830
R-squared	0.598	0.627	0.628	0.633	0.665	0.667
<i>Couple fixed effects</i>	yes	yes	yes	yes	yes	yes
<i>Cubic in lnWifeIncome and lnHusbIncome</i>	no	yes	yes	no	yes	yes
<i>Relative Income</i>	no	no	yes	no	yes	yes
<i>Children controls</i>	no	no	yes	no	no	yes

*Notes:* The data is from the 1968-2015 PSID. In Panel (a) the dependent variable is an indicator variable which takes the value of one if the woman is in the labor force, zero otherwise. In panel (b) the dependent variable is the logarithm of yearly hours of work, and the regressions are conditional on being employed (positive labor income and hours). *No child born* is a subsample of women who in year  $t$  do not have any child born, while *At least one child born* includes those women who in year  $t$  have at least one child born.  $Wem_{t-1}$  is an indicator variable that equals one if the relative income is greater than 0.5 at time  $t - 1$ . All regressions include the log of the wife's income, the log of the husband's income, the log of the couple's income, an indicator for whether only the wife is working or only the husband is working, a quadratic in wife's and husband's age, year fixed effects and state fixed effects. *Children controls* include indicator variables for whether the youngest child is 3 or younger, between 4 and 6, or older than 6. The regression is estimated using a linear probability model. Standard errors are clustered at the couple level and are reported in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

We start by examining the effect on participation (top panel). The coefficients for mothers are negative and statistically and economically significant. A wife who earns more than her husband, is 1.8 percentage points less likely to be in the labor force the following year than one who does not, results which are close to those reported in Bertrand et al. (2015) when considering all women. In contrast, the coefficient for childless women is negative, much smaller, and, once we include the additional controls, not statistically significant. The sample of childless women is considerably smaller than that for women with children, raising the question of whether sample size is the main reason behind the lack of statistical power. But even if the absence of significance is driven by sample size, the estimated coefficients for the sample of childless women are much smaller than those obtained for women with children. In our preferred specifications (columns (3) and (6), which include the most controls), the effect of the norm on participation is about half of what we find for mothers. The bottom panel of Table 2 runs the same regressions for yearly hours of work (conditional on working). For women who never had a child, we initially find a negative effect of having earned more, but it disappears once we start including controls and eventually becomes positive, of small magnitude and not significant. For mothers, it is negative and significant.<sup>20</sup>

Overall, the table indicates that the effect of the breadwinner norm is much more important for mothers than for women without children. The former have a strong reaction to the norm in terms of labor force participation and hours of work; women with no children have no statistically significant response to earning more than their husbands. This evidence suggests that the male breadwinner norm has an effect on women’s labor supply decisions only when there are children in the household.

## 5.2 The breadwinner norm and educational attainment

One possible explanation for this findings is that women with and without children differ in some characteristic. In particular, highly-educated women are more likely to be childless than those with less schooling. To consider this possibility, we split our sample by education group. Since the number of women without children is small, we have too few observations in each education

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<sup>20</sup>We also performed an alternative estimation, pooling all women and interacting  $Wem_{i,t-1}$  with a dummy for having at least one child instead of estimating separate regressions for mothers and non mothers. The results are reported in Table A.5 in the appendix and confirm that it is mothers who react to the male breadwinner norm reducing their participation in the labor market. For these women the coefficients tend to be of larger magnitude and more significant than in our specification in Table 2. For non-mothers we find equivalent results to those in Table 2 when looking at participation (a negative and significant coefficient on  $Wem_{i,t-1}$  that becomes insignificant once all controls are included), while in the regression for hours they display a positive and significant effect. The differences are probably due to the fact that we are imposing the same return to all other characteristics for the two groups. Notably, the return to experience is likely to be considerably lower for mothers than for non-mothers.

category, hence we focus on women with at least one child.

The results are reported in Table 3, where the left-hand side displays the coefficients for participation and the right-hand side for annual hours of work. The three panels consider the impact of  $Wem_{i,t-1}$  on these two variables separately for the three educational groups in our dataset: women with a high-school degree or less, women with some college education, and those with at least four years of college. As before, the various columns sequentially add controls. When we consider participation, the coefficient is negative, large and significant for women with a high-school degree or less as well as for those with “some college”, but it is non-significant and of a much smaller magnitude for those with at least 4 years of college, indicating a differential response across educational groups. Women with some college have a reduction of similar magnitude to that of the entire population, 1.9 percentage points, while the effect is substantially stronger for less educated women, amounting to a negative effect of 3.3 percentage points.

The right-hand side of Table 3 performs the same analysis looking at hours of work (conditional on being employed). Both women at the bottom and those at the top of the skill distribution exhibit a negative and significant coefficient, indicating that earning more than her husband leads women to subsequently reduce their hours of work. The effect is considerably stronger for more educated women: if a wife earned more than her husband in  $t - 1$ , conditionally of remaining employed, she worked 2.2% and 3.5% fewer hours in the next period if she is in the bottom and top education groups, respectively. To gauge these magnitudes, note that average annual hours worked for mothers are 980 for the less and 1265 for the most educated. Our coefficients imply that, if a wife earned more than her husband, in the next period she works 22 hours less on average if she is low educated and 44 hours less for those with college. In contrast, for the middle skill group (*some college*), once we include controls, notably, once the relative income of the wife is included, the effect becomes statistically insignificant and small in magnitude, although it remains negative.

Table 3: Labor supply and relative income for mothers

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Female labor force participation</i>			<i>ln yearly hours of work</i>		
	(a) Highschool or less					
$Wem_{t-1}$	-0.019*** [0.007]	-0.019*** [0.007]	-0.033*** [0.007]	-0.097*** [0.009]	-0.035*** [0.010]	-0.022** [0.011]
Observations	51,766	51,766	51,766	31,575	31,575	31,575
R-squared	0.429	0.436	0.436	0.632	0.673	0.673
	(b) Some college					
$Wem_{t-1}$	-0.025*** [0.008]	-0.020** [0.008]	-0.019** [0.009]	-0.109*** [0.013]	-0.031** [0.013]	-0.007 [0.012]
Observations	27,748	27,748	27,748	20,170	20,170	20,170
R-squared	0.382	0.387	0.389	0.630	0.663	0.665
	(c) At least 4 years of college					
$Wem_{t-1}$	-0.019*** [0.007]	0.000 [0.007]	0.005 [0.008]	-0.095*** [0.012]	-0.024** [0.012]	-0.035** [0.014]
Observations	23,294	23,294	23,294	17,958	17,958	17,958
R-squared	0.407	0.414	0.418	0.649	0.672	0.675
Additional controls						
<i>Couple fixed effects</i>	yes	yes	yes	yes	yes	yes
<i>Cubic in lnWifeIncome and lnHusbIncome</i>	no	yes	yes	no	yes	yes
<i>Relative Income</i>	no	no	yes	no	no	yes
<i>Children controls</i>	no	no	yes	no	no	yes

*Notes:* The data is from the 1968-2015 PSID. In columns (1) to (3) the dependent variable is an indicator variable which takes the value of one if the woman is in the labor force, zero otherwise. In columns (4) to (6) the dependent variable is the logarithm of yearly hours of work, and the regressions are conditional on being employed (positive labor income and hours).  $Wem_{t-1}$  is an indicator variable that equals one if the relative income is greater than 0.5 at time  $t - 1$ . All regressions include the log of the wife's income, the log of the husband's income, the log of the couple's income, an indicator for whether only the wife is working or only the husband is working, a quadratic in wife's and husband's age, year fixed effects and state fixed effects. *Children controls* include indicator variables for whether the youngest child is 3 or younger, between 4 and 6, or older than 6. The regression is estimated using a linear probability model. Standard errors are clustered at the couple level and are reported in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Our results indicate that while all mothers seem to react to the male breadwinner norm, education is an important determinant of *how* they respond. Less educated women adjust both the intensive and the extensive margin of labor supply, but other educational categories seem to react by changing only one of these margins. Those with some college adjust participation, while

those with at least 4 years of college respond by reducing their hours of work but do not leave the labor market. Three non-mutually-exclusive explanations could be behind these patterns. First, the opportunity cost of not working will be higher the higher the income of the woman is, and since those with most skills command the highest wages, they tend to reduce their hours but not to quit market employment. Second, the various groups may face different labor market constraints, with some women being able to adjust hours and others not. Their labour supply reaction would then be imposed rather than a choice.<sup>21</sup> An additional explanation relies on the importance of different identity traits. Women at the top of the education distribution are more likely to form their identity around their professional life, as argued by Goldin (2006). As a result, dropping out of the labor force would consequently have a larger cost in terms of identity loss than for other women and hence they choose to try to conform to the male breadwinner norm by adjusting hours while maintaining a professional life. Women without a college degree are less likely to derive a strong sense of identity from their job, and hence choose to adjust their participation.

## 6 Career changes

The last aspect we consider are career changes. It is well established that men and women work in different industries and hold different occupations.<sup>22</sup> However, while the literature on the drivers of female employment and hours of work is vast, the determinants of career choices have received much less attention. Yet, they are closely linked to social norms as changing industry and occupation can help women adhere to expected behavior. On the one hand, because such jobs tend to pay less, even women who keep working full time can reduce their earnings relative to their husband's and hence adhere to the breadwinner norm.<sup>23</sup> On the other, the prevalence of part-time in feminized jobs facilitates reducing the number of hours of market work thus freeing time for child-rearing. This raises the question of whether women's career choices are made ex

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<sup>21</sup>While high-skill women are likely to have the capacity to negotiate working hours, those with fewer years of education may not. Women with no college occupy a variety of positions, and adjusting hours may be possible for some, such as "Maids and housekeepers, cleaners", but not for others. They hence adjust both their participation and hours. For women in the middle of the skill distribution, the nature of the jobs they perform may give them little freedom to choose their hours as they are often support staff for professionals and are hence constraint by the requirements of the latter's schedules. They hence tend to adjust participation rather than hours.

<sup>22</sup>Blau and Kahn (2017) show that while the share of the gender wage gap due to human capital (education and experience) has declined noticeably, the share accounted for by locational factors like occupation and industry actually increased from 27% of the 1980 gap to 49% of the (much smaller) 2010 gap. See also Goldin (2014), Goldin and Katz (2016), and, closer to our approach, Bertrand et al. (2010) who study the careers dynamics in the financial and corporate sectors.

<sup>23</sup>A sizable literature provides evidence that feminized occupations pay less than male occupations for workers with similar measured characteristics; see Levanon et al. (2009), Blau and Kahn (2017), and Bayard et al. (2003), amongst others.

ante, in anticipation of motherhood and family constraints, or whether they react ex post as a change in the household circumstance (the birth of the first child or relative incomes) makes social prescriptions more salient.

To analyze if women adjust to the norm of being the main caregivers through their choices of industry and sector, we estimate the effect of the first child’s birth on the probability of being employed in a feminized industry or occupation relative to the probability of being in such an industry/occupation the year before the birth of the first child. Ideally, we would also have liked to examine how the choice is affected by whether or not the wife is the main breadwinner; unfortunately a relatively small share of women are in such category, and when we cross that with motherhood and industry/sector we do not have enough observations to obtain reasonable estimates.

We create our industry and occupation variables by recovering information on three different variables defined for the head of household and wife in the PSID Family files. From 1968-1980 we consider the industry and occupation variables that were coded retroactively using original PSID reports and the three-digit 1970 Census industry and occupation codes.<sup>24</sup> For the period 1981-2001 the industry and occupation information was obtained using the 3-digit 1970 Census Industry code and, finally, for 2003-2015 the 3-digit 2000 Census code was used. In all the cases the information corresponds to the main job.<sup>25</sup> Based on this, we construct 19 industry categories and 25 occupational categories.

We define feminized industries and occupations as those in which women account for at least 50% of the labor force and in which women work on average, less than 1650 hours.<sup>26</sup> Taking these criteria (see Tables A.3 and A.4 in the Appendix), we classify as feminized industries: *Retail trade, Accommodation and food services, Other services excluding public administration, Arts, entertainment and welfare services, and Education and related services*. The feminized occupations are: *Education (excluding university teachers) and library, Personal care and services, Maids and housekeepers, Food preparation and serving related, Arts, design entertainment*

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<sup>24</sup>This retroactive coding was done for a selected sample of PSID heads and wives: (a) Original sample Heads and Wives/”Wives still living by 1992 who reported main jobs in at least three waves during the period 1968-1992, with at least one of those reports prior to 1980. (b) Additionally, original sample Heads and Wives/”Wives” who had reported at least one main job between 1968 and 1980 but were known to have died by 1992. The selection criteria did not include all Heads and Wives/”Wives” who had worked between 1968 and 1980, therefore this variable contains missing information. For detailed information about the Retrospective Coding Project please see the document, “A Panel Study of Income Dynamics: 1968-1980 Retrospective Occupation-Industry Files Documentation”, available on PSID website.

<sup>25</sup>Since there is no clear correspondence between 1970 and 2000 census industries and occupation codes, a reclassification was needed in some cases based on the description of the 3-digit categories.

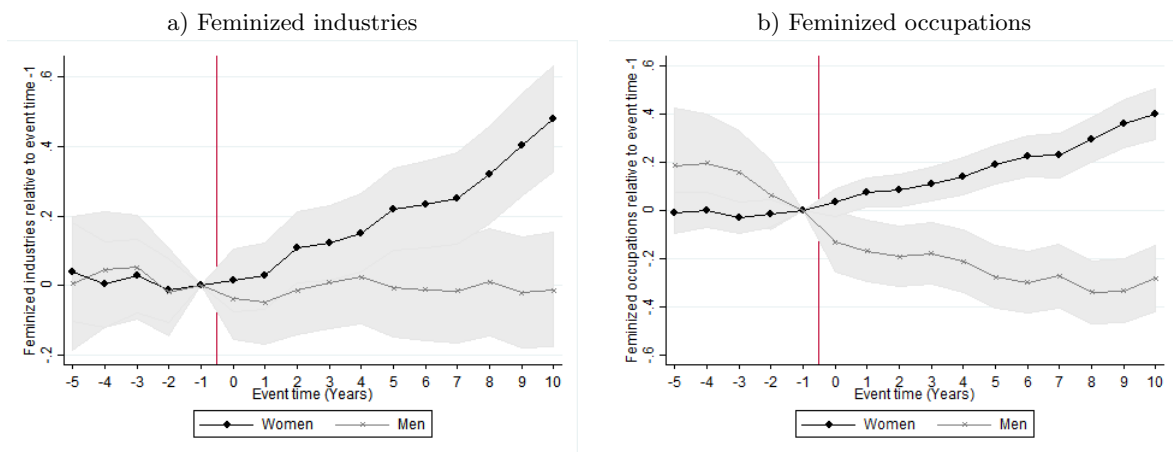
<sup>26</sup>For reference, note that a worker who works 40 hours per week with 2 weeks of vacation works a total of 2,000 hours worked per year. The average number of hours worked (including all employed, full and part time) in the US in 2015 was 1786 hours (OECD Stat: <https://stats.oecd.org>).

and media, Sales and related, Healthcare support, and Office and Administrative support.

As a robustness exercise, we use a broader criteria to classify industries and occupations as feminized. We relax the working hours restriction to include some categories in which women are highly represented but also have high average hours. In the case of industries, we add *Health care and Social assistance*, in which women represent 81.4% of the labor force and have a mean of 1724 hours. Regarding the occupational categories, we include also *Health technologist and technicians* and *Community and social services*, where women account for 78.4% and 59.3%, respectively. It is worth noting that for all occupations the average number of hours worked by men is higher than for women. For example, for *Healthcare practitioners*, the mean for women is 1792 yearly hours, while for men it is 2368.

We use the same event-study approach as in section 4, defining indicator variables that take the value of one if the individual is employed in a feminized industry/occupation and zero otherwise. We can then estimate the effect of the first child’s birth on the probability of being employed in a feminized industry/occupation. The estimates are conditional on remaining employed after the birth. Figure 9 presents the estimated effect of having a first child on whether or not the individual works in a feminized industry (left panel) or occupation (right panel) for both men and women.

Figure 9: Impact of children on feminized industries and occupations



*Notes:* The graphs show event time coefficients estimated from equation (1) as a percentage of the counterfactual outcome absent children:  $P_t^g = \hat{\alpha}_t^g / E[Y_{ist}^g | t]$  for men and women. Sample is restricted to men and women for whom an occupation and industry code is declared in  $z = -1$ . Feminized industries and occupations are described in Sub-section 6 The shaded 95 % confidence intervals are based on robust standard errors.

As far as industry is concerned, we can see that men and women are on very similar pre-child



trends in terms of their probability of working in a feminized industry, but start to diverge soon after having a child. While men do not change after the birth, the probability that a woman is in such an industry increases steadily after the birth and is 43 percent higher 10 years after having had her first child than it was before the birth. The pattern for occupations is quite different. Throughout their working life men reduce their probability of being in a feminized occupations, an effect that seems to be independent of the timing of fatherhood. For women, the probability of being in such occupations is stable before having children and starts increasing with the birth, being 40 percent higher than in the reference period ten years on. The estimated effects using the broader criteria to define feminized industries and occupations (Figure A.8 in the Online Appendix), are slightly smaller in size but show the same trends. Ten years after child birth, women are almost 40 percent more likely to be employed in a feminized industry/occupation relative to the year before child birth.

The observed patterns indicate that motherhood acts as a trigger for women but not for men. The latter's choices (staying in feminized industries, leaving feminized occupations) seem to be unaffected by the birth of their first child. In contrast, for women this event produces large changes in industry and occupation choices. In line with our earlier findings, motherhood seems to make gender norms related to child-rearing salient. The change in career can then be a response to the working conditions in those industries/sectors, but also be part of a more general desire to conform, which takes the form, amongst other, of a move towards jobs seen as appropriate for women.

## 7 Conclusions

A growing literature in economics has tried to identify how social norms shape women's labor market outcomes and this paper contributes to it by considering the interaction between different gender norms. Norms may reinforce each other, so that when a woman tends to conform in one aspect she also accepts other social conventions, or could have offsetting effects, such that an individual that behaves contrary to one norm would tend to compensate by strongly adhering to another one.

We focus on two norms, the social prescription requiring mothers to be the main care-giver for children and the view that men should be the household's main breadwinner, and use panel data for US couples to examine their interactions. We start by investigating how labor supply responses to the birth of the first child are conditioned by whether the couple was adhering or not to the breadwinner norm before the birth. Our event-study analysis shows that the arrival

of the first child has little impact on the father’s employment, market hours, and housework but reduces dramatically market labor supply for women. Contrary to what an efficient allocation of household time would imply, we find sharp changes both for women who were secondary earners and those who were the main breadwinners. Interestingly, the reduction in the probability of employment is initially lower for the latter group, yet it keeps falling over time so that 10 years after the birth of the first child both groups of women have an equal reduction in the probability of being employed relative to the pre-birth level. Moreover, although all women increase the amount (and share) of housework they do immediately after becoming mothers, in the years that follow housework increases considerably faster for those who were the main breadwinner, as if this were a compensation for having departed from the traditional patterns of relative earnings.

Our second contribution consists in considering heterogeneous reactions to the male breadwinner norm. This norm has been found to be important for labor supply, as women who earn more than their husband tend to subsequently reduce their working hours and participation. When we split the sample between women who have had at least one child and those who have not, we find that having children is key to determine whether couples adhere to the norm, with the effect being statistically insignificant for childless couples. Existing work has identified that women tend to agree more with gender stereotypes after becoming mothers, and our results indicate that this change in attitudes is translated into labor market differences. The second dimension we consider is the woman’s level of formal education. Education can be important as it affects career objectives, potentially creating a conflict between identity as a mother and identity as a professional. When we split the data by education level, we find that the most skilled women reduce their hours of work but, contrary to less skilled women, do not leave the labor market, a behavior that can be seen as an attempt to reconcile the two identities.

Overall, our results indicate a close interaction between different norms. The effect of the male breadwinner norm is highly contextualized, as women’s willingness to depart from the norm is strongly affected by education and the presence of children. This is important because the long-term consequences of reducing labor supply (not explored in this paper) can be different depending on whether a woman reduces her hours or drops out of the labor force. In contrast, motherhood generates very strong responses along traditional lines and, contrary to what an efficient allocation of household time would imply, even those women who were the main breadwinners in the household before having their first child, largely conform to the traditional division of roles. These women seem to attempt to conform less, as manifested by a smaller initial reduction in employment, but over time end up being the ones with the strongest

response to motherhood, catching up with other women as far as participation is concerned and increasing dramatically the amount of housework they undertake.

A possible interpretation of our results is that there is a hierarchy of norms. While the effect of the male breadwinner norm is highly contextualized, norms related to children are not, indicating that the potential social cost when not conforming is higher. This has important implications for gender equalization policy, and raises the question of whether efforts to be more inclusive in the professional sphere will have limited success if they are not accompanied by strategies that focus on child-care in a way that allows women not to bear the brunt of parenthood. Understanding such policy complementarities is an important question that we leave for future work.

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## Online Appendix

Table A.1: Female Labor force participation and relative income. All women, 1968-2015

	(1)	(2)	(3)	(4)
<i>Dependent variable: female labor force participation</i>				
(a) All women in the sample				
$Wem_{t-1}$	-0.020*** [0.004]	-0.021*** [0.004]	-0.021*** [0.004]	-0.023*** [0.004]
Observations	129,265	129,265	129,265	129,265
R-squared	0.668	0.673	0.674	0.609
(b) Highschool or less				
$Wem_{t-1}$	-0.021*** [0.006]	-0.033*** [0.007]	-0.032*** [0.007]	-0.034*** [0.006]
Observations	63,080	63,080	63,080	63,080
R-squared	0.687	0.691	0.692	0.630
(c) Some college				
$Wem_{t-1}$	-0.022*** [0.007]	-0.019** [0.008]	-0.018** [0.008]	-0.019*** [0.007]
Observations	33,953	33,953	33,953	33,953
R-squared	0.622	0.626	0.628	0.553
(d) At least 4 years of college				
$Wem_{t-1}$	-0.013** [0.006]	-0.006 [0.006]	-0.007 [0.006]	-0.008 [0.006]
Observations	31,502	31,502	31,502	31,502
R-squared	0.625	0.629	0.634	0.571
Additional controls				
<i>Couple fixed effects</i>	yes	yes	yes	no
<i>Cubic in lnWifeIncome and lnHusbIncome</i>	no	yes	yes	yes
<i>Relative Income</i>	no	yes	yes	yes
<i>Children controls</i>	no	no	yes	yes

*Notes:* The data is from the 1968-2015 PSID. The dependent variable is an indicator variable which takes the value of one if the woman is in the labor force, zero otherwise.  $Wem_{t-1}$  is an indicator variable that equals one if the relative income is greater than 0.5 at time  $t - 1$ . All regressions include the log of the wife's income, the log of the husband's income, the log of the couple's income, an indicator for whether only the wife is working or only the husband is working, a quadratic in wife's and husband's age, year fixed effects and state fixed effects. *Children controls* include indicator variables for whether the respondent has no children, whether the youngest child is 3 or younger, between 4 and 6, or older than 6. The regression is estimated using a linear probability model. Standard errors are clustered at the couple level and are reported in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .



Table A.2: Female hours of work and relative income. All women, 1968-2015

	(1)	(2)	(3)	(4)
<i>Dependent variable: ln yearly hours of work</i>				
(a) All women in the sample				
$Wem_{t-1}$	-0.097*** [0.006]	-0.014** [0.006]	-0.013** [0.006]	-0.019*** [0.006]
Observations	89,606	89,606	89,606	89,606
R-squared	0.787	0.805	0.807	0.718
(b) Highschool or less				
$Wem_{t-1}$	-0.101*** [0.008]	-0.027*** [0.010]	-0.026*** [0.010]	-0.029*** [0.009]
Observations	38,809	38,809	38,809	38,809
R-squared	0.801	0.822	0.822	0.743
(c) Some college				
$Wem_{t-1}$	-0.101*** [0.012]	-0.007 [0.011]	-0.006 [0.011]	-0.014 [0.010]
Observations	25,241	25,241	25,241	25,241
R-squared	0.770	0.794	0.796	0.712
(d) At least 4 years of college				
$Wem_{t-1}$	-0.085*** [0.010]	-0.030*** [0.012]	-0.029** [0.011]	-0.023** [0.011]
Observations	25,113	25,113	25,113	25,113
R-squared	0.777	0.791	0.794	0.713
Additional controls				
<i>Couple fixed effects</i>	yes	yes	yes	no
<i>Cubic in lnWifeIncome and lnHusbIncome</i>	no	yes	yes	yes
<i>Relative Income</i>	no	yes	yes	yes
<i>Children controls</i>	no	no	yes	yes

*Notes:* The data is from the 1968-2015 PSID. The dependent variable is the logarithm of yearly hours of work. The regressions are conditional on being employed (positive labor income and hours).  $Wem_{t-1}$  is an indicator variable that equals one if the relative income is greater than 0.5 at time  $t - 1$ . All regressions include the log of the wife's income, the log of the husband's income, the log of the couple's income, an indicator for whether only the wife is working or only the husband is working, a quadratic in wife's and husband's age, year fixed effects and state fixed effects. *Children controls* include indicator variables for whether the respondent has no children, whether the youngest child is 3 or younger, between 4 and 6, or older than 6. The regression is estimated using a linear probability model. Standard errors are clustered at the couple level and are reported in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table A.3: Feminized industries classification. Descriptive statistics

Industry	Percentage of women	Distribution of women across industries	Yearly hours of work			
			Women		Men	
			Mean	Std. Dev.	Mean	Std. Dev.
<i>(a) Feminized industries</i>						
Other services, exc public adm	65.6	9.1	1298	7.6	2100	11.1
Retail Trade	55.6	13.9	1480	5.7	2169	6.5
Education and related services	72.2	13.3	1507	5.1	2005	8.3
Accommodations and Food services	65.9	3.1	1516	11.6	1958	17.5
Arts, Entertainment and recreation and welfare services	67.6	3.9	1559	11.4	1918	15.9
<i>(b) Included as feminized industries in the broader classification</i>						
Health care and social assistance	81.4	16.3	1724	4.5	2102	10.3
<i>(c) Non feminized industries</i>						
Agriculture, Forestry, Fishing and Hunting	17.3	1.0	1231	25.3	2319	12.9
Management, Administrative and support and waste management services	44.1	1.9	1584	16.1	1922	14.9
Professional, Scientific and technical services	47.5	4.3	1617	9.7	2086	9.2
Transportation and warehousing	23.3	1.9	1620	14.8	2199	8.4
Real State	46.2	1.4	1663	17.8	2056	17.1
Construction	7.6	1.0	1666	20.0	1960	5.5
Wholesale trade	28.2	2.0	1724	13.1	2217	7.9
Mining	14.4	0.2	1751	39.1	2326	19.0
Manufacturing	34.5	13.4	1764	4.5	2135	3.1
Information, Newspapers, Radio, etc.	49.2	1.7	1781	11.7	2171	12.1
Public Administration and active duty military	40.0	5.6	1785	7.2	2200	6.1
Finance and Insurance	65.2	5.6	1793	6.3	2183	9.7
Utilities	15.9	0.5	1837	21.5	2106	8.9

*Notes:* The data is from the 1968-2015 PSID. The Industry and occupation variables correspond to main job, and are defined for Head of household (man, or woman if single) and wife (including cohabitators) at the family level. Since there is no perfect correspondence between 1970 and 2000 census industries and occupation codes, a reclassification was needed in some cases based on the description of the 3-digit categories.

Table A.4: Feminized occupations: Alternative classification. Descriptive statistics

Occupations	Percentage of women	Distribution of women across occupations	Yearly hours of work			
			Women		Men	
			Mean	Std. Dev.	Mean	Std. Dev.
<i>(a) Feminized occupations</i>						
Maids and housekeepers, cleaners	97.5	3.2	1116	11.6	1698	92.3
Personal care and services	87.2	5.7	1392	10.0	1881	25.9
Food preparation and serving related	73.1	6.1	1404	8.1	1846	14.5
Sales and related	50.9	5.9	1428	8.8	2175	8.2
Arts, design, entertainment, sports and media	52.6	1.6	1497	18.0	1923	19.1
Education, teachers (except university) and library	78.7	6.6	1525	7.0	1954	14.0
Office and administrative support	81.8	26.5	1641	3.3	1995	7.2
Healthcare support (nurses, etc)	91.0	8.1	1644	6.6	1949	21.0
<i>(b) Included as feminized occupations in the broader classification</i>						
Community and social services	59.3	1.7	1734	13.5	2150	21.0
Health technologist and technicians	78.4	1.8	1780	12.9	2199	27.5
<i>(c) Non feminized occupations</i>						
Farm, forestry and fishing laborers	13.6	0.6	1006	30.5	1922	11.3
Building and grounds cleaning and maintenance	42.3	3.3	1414	10.9	1750	9.9
Transportation and material moving	13.3	1.8	1514	16.0	2098	6.0
Education, university teachers	48.3	0.7	1569	26.4	2083	27.4
Production	41.1	10.4	1658	5.5	2088	4.4
Protective service workers	22.7	0.8	1725	21.4	2210	11.9
Installation, repair and maintenance	3.7	0.4	1748	27.9	2096	5.2
Healthcare practitioners	53.1	1.2	1792	18.3	2368	21.8
Architect and engineering	13.0	0.7	1828	19.8	2157	6.6
Construction and extraction	5.4	0.5	1846	26.3	2015	6.1
Life, physical and social scientist	46.2	1.2	1872	15.3	2195	14.2
Computer and mathematical	29.3	0.8	1926	15.7	2114	10.5
Legal, lawyers and judges	35.1	0.5	1936	27.1	2236	19.1
Managers and administrators, accountants, business and financial operations	34.4	9.7	1960	6.0	2403	4.6
Military	17.0	0.1	2028	83.5	2518	33.6

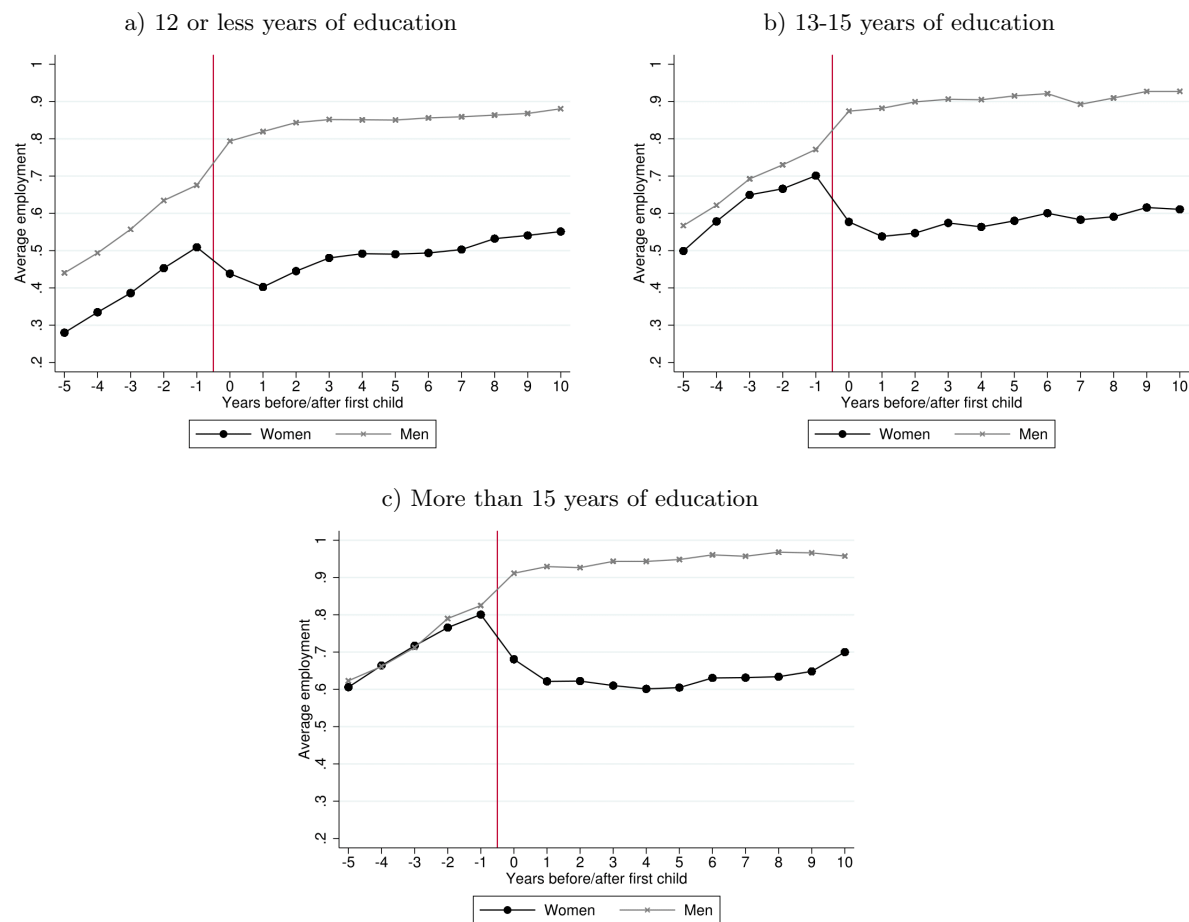
*Notes:* The data is from the 1968-2015 PSID. Industry and occupation variables correspond to main job, and are defined for Head of household (man, or woman if single) and wife (including cohabitators) at the family level. Since there is no perfect correspondence between 1970 and 2000 census industries and occupation codes, a reclassification was needed in some cases based on the description of the 3-digit categories.

Table A.5: Labor supply and relative income by ever had a child. Alternative estimation

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Labor force participation</i>			<i>ln yearly hours of work</i>		
No child born	0.012** [0.006]	0.014** [0.006]	0.007 [0.006]	-0.053*** [0.011]	-0.000 [0.010]	0.029*** [0.010]
At least one child born	-0.028*** [0.004]	-0.019*** [0.004]	-0.027*** [0.004]	-0.135*** [0.007]	-0.055*** [0.007]	-0.025*** [0.007]
Observations	120,789	120,789	120,789	91,520	91,520	91,520
R-squared	0.410	0.418	0.418	0.612	0.645	0.645
<i>Couple fixed effects</i>	yes	yes	yes	yes	yes	yes
<i>Cubic in lnWifeIncome and lnHusbandIncome</i>	no	yes	yes	no	yes	yes
<i>Relative Income</i>	no	no	yes	no	no	yes

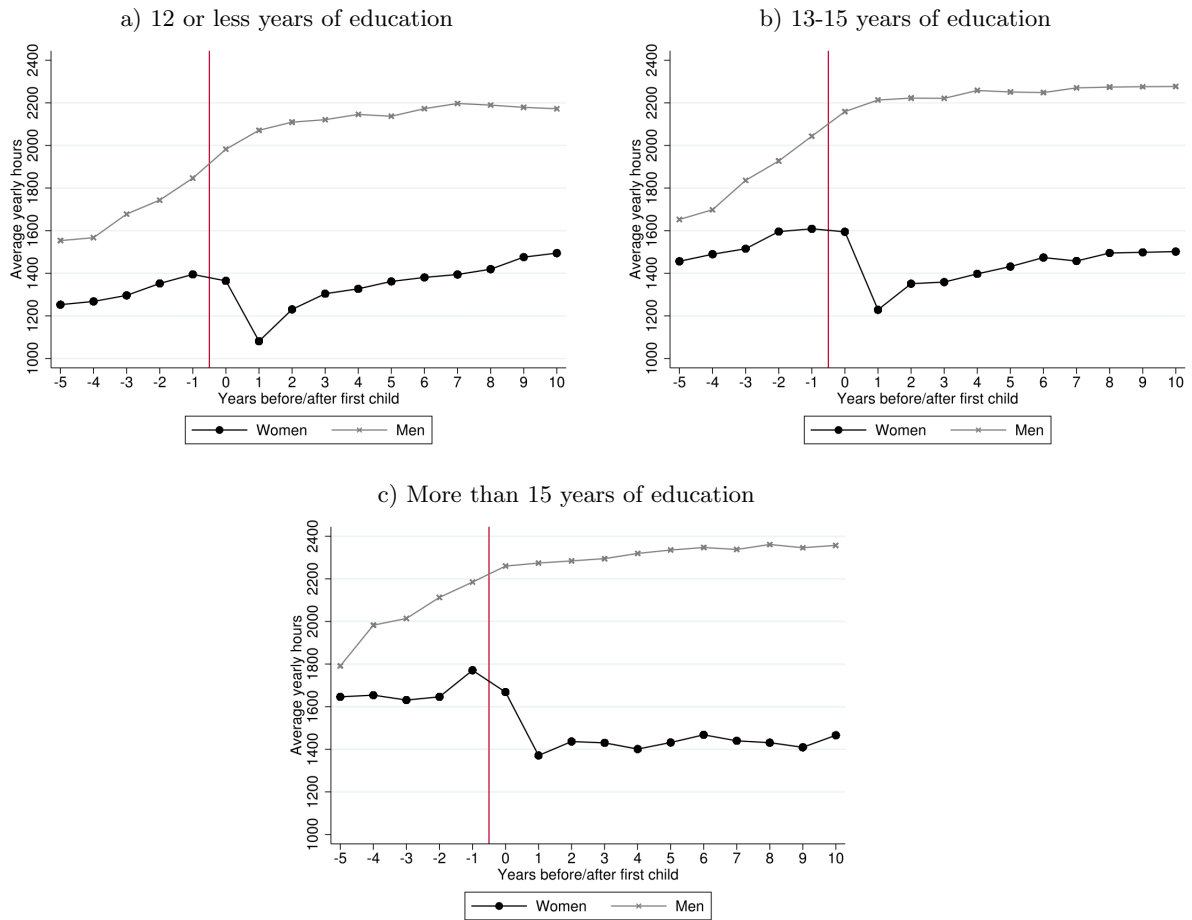
*Notes:* The data is from the 1968-2015 PSID. The table reports the estimated coefficients for  $Wem_{t-1}$  (an indicator variable that equals one if the relative income is greater than 0.5 at time  $t - 1$ ), and the sum of this coefficient and that obtained from the interaction of  $Wem_{t-1}$  with a dummy variable for having at least one child born. All regressions include the log of the wife's income, the log of the husband's income, the log of the couple's income, an indicator for whether only the wife is working or only the husband is working, a quadratic in wife's and husband's age, year fixed effects and state fixed effects. The regression is estimated using a linear probability model. Standard errors are clustered at the couple level and are reported in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Figure A.1: Average employment level for women and men before and after having their first child



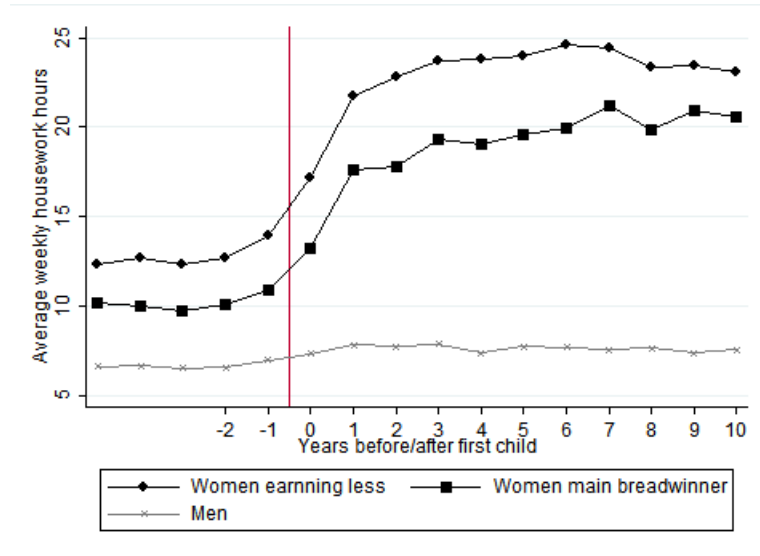
Notes: The graphs show average levels of employment in each event-time before and after the first child is born (vertical line).

Figure A.2: Average yearly hours for women and men before and after having their first child



Notes: The graphs show average levels of yearly hours of work (conditional on being employed) in each event-time before and after the first child is born (vertical line).

Figure A.3: Average weekly hours of housework before and after having their first child



Notes: The graphs show average levels of weekly hours of housework in each event-time before and after the first child is born.

Figure A.4: Impact of children and main breadwinner norm: Hours of work

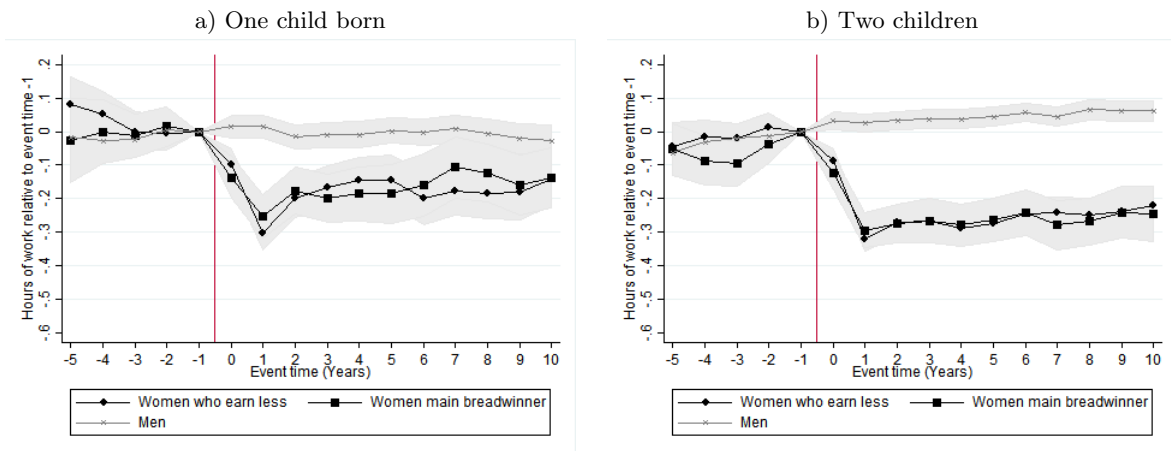
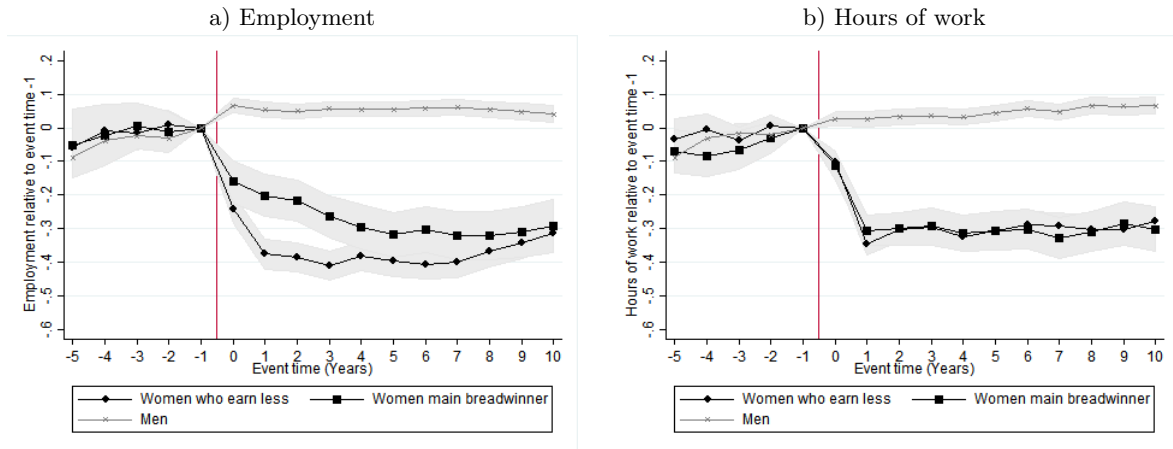


Figure A.5: Impact of children and main breadwinner norm: Sample of women and men with two or more children born



Notes: The graphs show event time coefficients estimated from equation (2) as a percentage of the counterfactual outcome absent children:  $P_t^g = \hat{\alpha}_t^g / E[Y_{ist}^g | t]$  for men and women who were main breadwinners or secondary earners in  $z = -1$ . The effects on yearly hours worked are estimated conditional on employment. The shaded 95 % confidence intervals are based on robust standard errors.

Figure A.6: Female relative income before and after having their first child

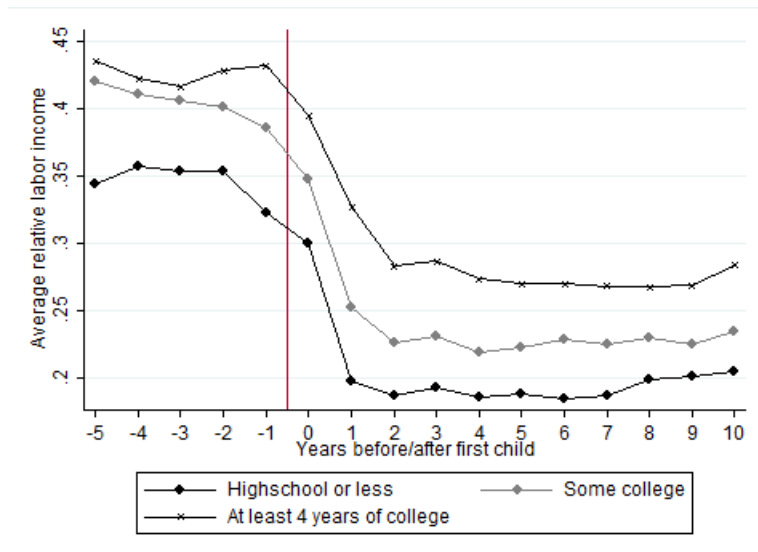




Figure A.7: Impact of children and main breadwinner norm: Sample of husbands with positive earnings

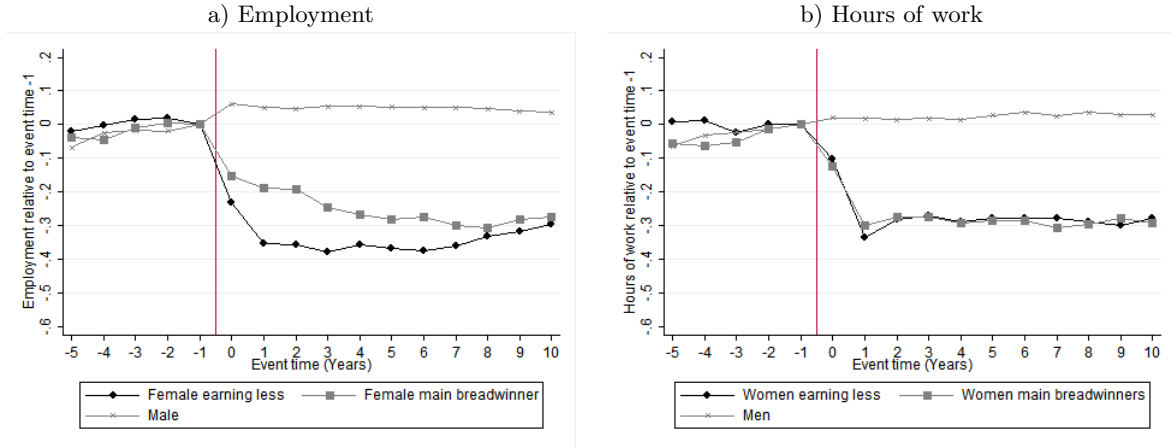
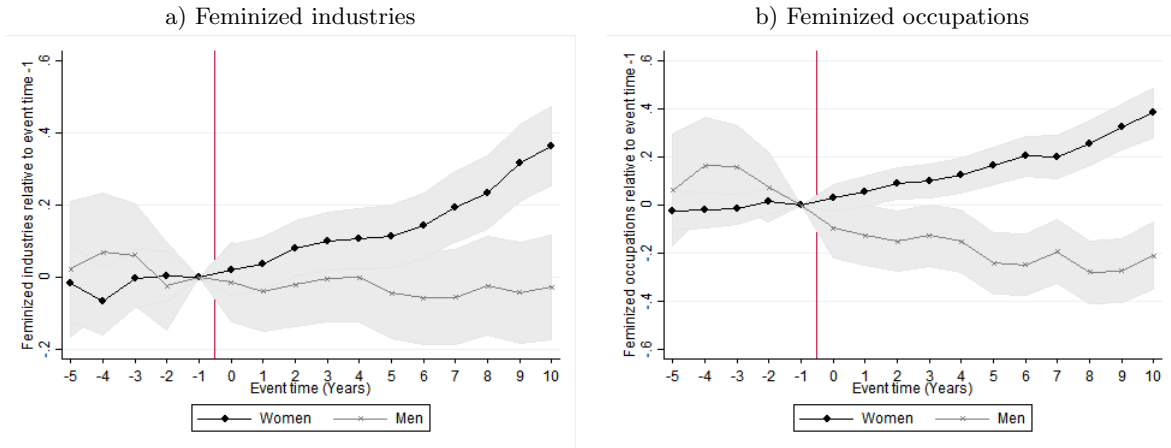


Figure A.8: Impact of children on feminized industries and occupations, broader criteria.



Notes: The graphs show event time coefficients estimated from equation (1) as a percentage of the counterfactual outcome absent children:  $P_t^g = \hat{\alpha}_t^g / E[Y_{ist}^g | t]$  for men and women. Sample is restricted to men and women for whom an occupation and industry code is declared in  $z = -1$ . Feminized industries and occupations are described in Sub-section 6. The shaded 95% confidence intervals are based on robust standard errors.