Minding Your Business or Your Child? Motherhood and the Entrepreneurship Gap

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Abstract

I study the effect of childbirth on women's entrepreneurial activity. Drawing on Canadian administrative data and using an event study and instrumental variable design, I show that childbirth has substantial and persistent negative effects on women's founding rates and firm performance. The effects extend to employees of mother-owned firms, who experience a decline in earnings. In contrast, firms owned by men show no decline in performance after childbirth. The results cannot be fully explained by household specialization based on labor market advantage. Childcare availability and progressive gender norms mitigate the adverse effect of childbirth on the entrepreneurship gap.

Keywords: Entrepreneurship, gender gap, childbirth, household specialization, gender norms, childcare
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1 Introduction

Entrepreneurship plays a crucial role for economic growth. Young firms play a disproportionate role in creating new jobs and driving aggregate productivity dynamics (Haltiwanger, Jarmin, and Miranda, 2013; Andrews et al., 2022). However, women are still underrepresented in entrepreneurship. Despite some convergence over the past decades, a substantial gender gap remains in both the likelihood of women starting new firms and the performance of female-founded firms. The causes of these disparities are not entirely understood,[1] but their implications are potentially far-reaching. If women's underrepresentation in entrepreneurship reflects a misallocation of talent, it could have significant consequences for aggregate growth and innovation. This paper provides a novel explanation for the persistence of the entrepreneurship gender gap: children have a substantial effect on mothers' entrepreneurial activities, but not on fathers'.

Understanding the impact of childbirth on women's entrepreneurship is important for two reasons. First, it can help explain gender disparities in both firm entry and performance. If children are a significant factor behind these gender gaps in entrepreneurship, then policies designed to support mothers could yield higher-than-anticipated returns as they can foster new business creation or prevent the closure of women-owned

[1] Supply-side explanations emphasize the role of preferences and beliefs. Women's higher risk aversion may make entrepreneurship less attractive than wage employment, which offers a more stable income stream (Fossen, 2012; Caliendo, Fossen, and Kritikos, 2014). Gender stereotypes can also deter women from pursuing entrepreneurship, as it is often perceived as a male-dominated field (Yang and Aldrich, 2014; Yang and del Carmen Triana, 2019). Even when women do enter entrepreneurship, they may prioritize non-pecuniary goals, such as work-family balance, over firm growth (Burke, Fitzroy, and Nolan, 2002; Looze and Desai, 2020). Demand-side factors focus on frictions and discrimination. Female entrepreneurs face greater challenges in raising capital, partly due to investor biases (Guzman and Kacperczyk, 2019; Hebert, Forthcoming; Hebert, Tookes, and Yimfor, 2024). The problem is exacerbated in contexts in which investors are predominantly males, such as VC: male financiers show less interest in female-founded ventures and are less skilled in assessing their potential (Ewens and Townsend, 2020; Raina, 2021). The lack of female entrepreneurial role models further restricts women's opportunities to enter and succeed in business (Markussen and Røed, 2017; Mertz, Ronchi, and Salvestrini, 2024).

firms. Second, examining firm performance before and after childbirth helps determine whether its impact extends beyond women's careers. If childbirth negatively affects firm performance—a result that would be consistent with evidence on the importance of founders for firm success (Smith et al., 2019; Becker and Hvide, 2022)—this suggests that childbirth effectively imposes a negative externality on the firm. This further raises the importance of policies aimed at closing gender gaps in entrepreneurship.

This paper studies the effect of children on women's entrepreneurial activity using rich administrative data from Canada. Using an event study design around the birth of the first child, I find that childbirth accounts for half of the gender gap in firm outcomes for entrepreneurial firms. Childbirth among women entrepreneurs generates large negative spillovers: firm sales drop by over 20% following childbirth, and workers' earnings drop by around 4%. Conversely, firms owned by men show no significant performance decline after childbirth. In addition, I show that childcare availability (supplied by either retired grandparents or daycare centers) as well as more progressive gender norms significantly reduce the negative effect of childbirth on firm performance. These results suggest that frictions, such as limited childcare support, are an important explanation for the existence of gender gaps in entrepreneurship. Addressing these frictions can thus lead to significant efficiency gains by fostering the creation of more women-led firms and improving the performance of existing ones.

Studying the impact of childbirth on entrepreneurship requires longitudinal data that tracks individuals through childbirth events, along with firm-level information, including ownership, financials, and personnel data. I use the Canadian Employer-Employee Dynamics Database (CEEDD), a set of linkable administrative files compiled by Statistics Canada. The CEEDD is a matched employer-employee dataset derived from tax records, containing both demographic information on workers and detailed financial data on firms.

A unique advantage of the CEEDD is that it links matched worker-firm data with

ownership records for the entire universe of Canadian private firms. This linkage allows for precise identification of entrepreneurs and accurate measurement of the earnings extracted by each founder. Another key strength of the CEEDD is that it allows childbirth events to be identified using the Canada Child Benefit and birth records. Finally, by using historical tax filing data, I link entrepreneurs to their families of origin, allowing me to study the effect of informal childcare provided by grandparents.

The first part of the analysis examines how a childbirth event experienced by the founder affects firm performance. I focus on entrepreneurs who started an incorporated business at least two years before having their first child. Using a matched event-study design that compares firms owned by women who become mothers to similar firms owned by women without children, I find that childbirth leads to a substantial deterioration in firm outcomes. In the 5 years following childbirth, sales decline on average by 22%, assets by 17%, and profit by 21%, relative to the control group. These effects extend beyond mere downsizing: firms become less profitable, with profit margins decreasing by 6%. Survival rates also decline, though the effect is modest. After 5 years, the likelihood of mother-owned firms remaining operational falls by approximately 4% relative to the control group.

Crucially, firm performance is virtually unaffected when a male founder, rather than a female founder, has a child. Men-owned and women-owned firms follow parallel trends up to the year of childbirth, but they sharply diverge afterward. While childbirth has no effect on men-owned firms, it leads to large, persistent declines for women-owned firms. The magnitude of the effect I find using fathers as the control group is very similar to that found using women without children as controls. An Oaxaca decomposition shows that children are a substantial contributor to gender inequality in entrepreneurial outcomes, accounting for 47% of the gender gap in sales and 54% of the gap in profits.

I use the event study design around first childbirth as my main empirical strategy

because it has the advantage of capturing the overall treatment effect of all children in the population. To mitigate concerns related to selection into parenthood, I supplement the evidence with an instrumental variable approach, using the sex of the first two children as an instrument for the birth of a third child (Angrist and Evans, 1998). Analyzing the impact of a third child through this IV approach, I find that childbirth affects firms owned by mothers, but the effects are smaller and recovery is quicker compared to the first child. Importantly, the IV estimates closely align with the event-study estimates around the third child, lending support to the validity of the event-study design.

The empirical patterns on firm performance suggest that entrepreneurial firms are vulnerable to disruptions in the supply of the founder's human capital. I examine how the impact of children varies across firms at different stages of their life cycle and I find that the effect is stronger for early-stage entrepreneurial firms (under 5 years old), confirming that young firms are especially dependent on the founder. In addition, it is specifically founders (rather than other firm investors) that drive the results. To assess the economic significance of the main findings, I test whether the effects are concentrated among small firms or firms in low-value-added sectors. I show that this is not the case: the negative effects persist even for firms in the top quintile of the size distribution and are not solely driven by low-value-added service industries.

The second part of the analysis examines how childbirth affects entrepreneurial careers. I first focus on mothers and fathers who were already entrepreneurs before childbirth and follow their income trajectories after parenthood. Prior to childbirth, mothers and fathers' incomes follow common trends, but their paths sharply diverge in the year of first childbirth. Fathers' total income remains stable, while mothers' declines by around 11%. This decline is largely driven by reductions in the wages and dividends that mothers extract from their firms.

The results presented so far apply to individuals who were already entrepreneurs

before having their first child. But how does childbirth affect the probability that women will become entrepreneurs in the first place? Ex ante, this effect is ambiguous.[2] Entrepreneurship could be an attractive career path for mothers, offering greater flexibility (Yang, Kacperczyk, and Naldi, 2024; Gottlieb, Townsend, and Xu, 2022). However, entrepreneurs work longer hours than employees (Levine and Rubinstein, 2017), often with unpredictable schedules, driven by the need to capitalize on time-sensitive opportunities before they disappear. This could make entrepreneurship a greedy job (Goldin, 2014), incompatible with the commitments of motherhood. Tracing out dynamic effects around the first childbirth event, I find a marked negative effect of childbirth on women's probability of becoming entrepreneurs. Firm creation rates drop by more than 35% in the year of childbirth. While the effects gradually lessen in subsequent years, founding rates do not fully recover to pre-birth levels, potentially resulting in a "missing cohort" of female-founded firms.

The third set of main outcomes, after firm performance and entrepreneurial careers, concerns workers. I show that after the entrepreneur has a child, the firm's employees experience career disruptions. Workers in mother-owned firms see their earnings drop by 2% in the first year after childbirth, relatively to workers employed in firms owned by women without children. The decline in earnings persists for at least 5 years, with earnings remaining 4% lower that the control group. Furthermore, workers affected by entrepreneur's childbirth event are 1% more likely to experience unemployment. Overall, these findings indicate that the impact of childbirth extends beyond the mother-entrepreneur, generating spillovers onto employees, particularly younger ones.

I test several potential mechanisms to explain why childbirth systematically impacts

[2]To show this, in Appendix B I develop a simple model of occupational choice with children extending the canonical model in Lucas (1978).

entrepreneurial outcomes for mothers—but not for fathers. The first is that mothers become more risk averse and switch to safer, lower-return investment strategies, without a deterioration in firm quality. The second potential explanation is that, after childbirth, couples need to specialize and choose to allocate tasks based on their comparative advantage. Since women are more likely to be the secondary earner, they take on a larger share of childcare responsibilities, while their partners continue working outside the home. Third, couples might adhere to traditional gender norms, regardless of their comparative advantage in the labor market. Fourth, I examine the role of childcare availability, both informal (through family) and formal (through daycare centers).

I find no evidence that mother-owned firms become less risky. The decline in firm outcomes appears to reflect a genuine drop in performance rather than a strategic shift toward lower-risk investments.

If household specialization were based purely on comparative advantage, the negative effects of childbirth should be smaller for female breadwinners, as their spouses would likely take on the majority of childcare responsibilities. While I find modest evidence that female breadwinners experience relatively better firm outcomes after childbirth, this group still faces significant penalties. Moreover, relative to couples with a male breadwinner, household income declines for couples with a female breadwinner, as the father's earnings do not increase enough to fully offset the mother's earnings losses. This pattern suggests that specialization based on labor market advantage alone cannot fully explain the division of labor after childbirth. Instead, gender norms may play a significant role.

To study the role of gender norms, I analyze a sample of second-generation immigrants to Canada and find that women from cultures with more traditional gender norms experience a steeper decline in firm outcomes following childbirth, while there is no similar effect for fathers. This suggests that cultural expectations influence women's roles in childcare, reinforcing gendered divisions in household responsibilities.

To understand how family support networks influence entrepreneurial success, I link mothers to their own parents using tax identifiers. Grandparents, particularly grandmothers, are often relied upon for childcare, and proximity to them may boost mothers' business performance. I find that women who live near their parents see relatively better business outcomes after childbirth. An event study around grandmother retirement shows a significant improvement in business performance for mothers living near newly retired grandmothers, with no similar effect from grandfather retirement, suggesting that the mechanism is tied specifically to caregiving.

The effects of grandmother's retirement are especially strong in municipalities with limited formal childcare availability. This suggests that family-provided childcare can substitute for formal services. To further explore the role of childcare expansion, I examine how expansions in formal childcare affect mothers' entrepreneurial outcomes. By analyzing increases in the density of childcare workers in municipalities and comparing the effects on mothers with young versus older children, I find that such expansions positively impact firm performance.

This paper contributes to two main strands of literature. The first is the literature on the gender gap in entrepreneurship. To the best of my knowledge, this is the first study to examine the role of childbirth in explaining the entrepreneurship gender gap, quantifying its impact on both women's entry into entrepreneurship and firm performance, while also documenting spillovers onto workers and extensively exploring the underlying mechanisms.

Several studies have begun exploring the link between motherhood and entrepreneurship. In recent work, Bonney, Pistaferri, and Voena (2025) provide evidence on the effect of business owners' childbirth on firm performance in Norway, finding similar results. Yang, Kacperczyk, and Naldi (2024) find that, in Sweden, mothers are more likely to enter entrepreneurship when labor market child penalties are high, suggesting that en-

trepreneurship can serve as a means of avoiding career disruptions. Other studies examine how access to reproductive healthcare, such as abortion and emergency contraception, affects female entrepreneurship (Zandberg, 2021; Core, 2024). However, these studies focus on reproductive choice rather than the aggregate impact of children on the entrepreneurship gender gap. My analysis differs by leveraging administrative data to provide a comprehensive assessment of the effects of motherhood on both firm performance and entrepreneurial participation. Relatedly, another strand of literature studies the effect of family policies, such as parental leave and maternity benefits, on female entrepreneurship (Gottlieb, Townsend, and Xu, 2022; Core and Karpati, 2024; Fontenay, 2024).

The second literature I contribute to is the one on the effect of childbirth on labor market outcomes.[3] While much of this literature focuses on how children affect individual career outcomes, this paper shifts the focus to the broader spillover effects of childbirth when the individual is an entrepreneur. Evidence on such spillovers remains limited. An exception is Brenøe et al. (2024), who study the effects of female employees giving birth and taking parental leave on small firms and coworkers in Denmark, finding modest effects. By contrast, for entrepreneurial firms, which rely heavily on the founder, these spillover effects can be far more pronounced. Given the central role of entrepreneurs in driving job creation and economic growth, childbirth affects not only the entrepreneur's career trajectory but also firm growth and employees' earnings. Moreover, entrepreneurs are not subject to external workplace policies; they set their own schedules and rules, providing a unique setting to study child penalties in the absence of organizational con-

[3]Child penalties account for most of the remaining gender gap in earnings, while differences in human capital between men and women have largely disappeared (Kleven, Landais, and Søgaard, 2019). Biological explanations have little support (Kleven, Landais, and Søgaard, 2021; Andresen and Nix, 2022b), while cultural norms strongly correlate with child penalties (Boelmann, Raute, and Schönberg, 2024; Kleven, 2022). The effectiveness of parental leave and childcare subsidies in reducing gender inequality remains debated: some studies find positive effects on female labor supply (Baker, Gruber, and Milligan, 2008; Andresen and Nix, 2022a), while others find minimal or no impact, often limited to single mothers (Nollenberger and Rodríguez-Planas, 2015; Kleven et al., 2024).

straints.

2 Data

For my analysis, I use the Canadian Employer-Employee Dynamics Database (CEEDD), a comprehensive administrative dataset compiled by Statistics Canada. The CEEDD integrates data from multiple government agencies, including the Canada Revenue Agency (CRA), Employment and Social Development Canada, and Immigration, Refugees, and Citizenship Canada (IRCC).

Each agency contributes specific data. The Canada Revenue Agency provides personal and corporate tax records. The T1 personal tax file contains individual demographic and financial characteristics, such as birth year, gender, marital status, and municipality of residence. The T2 corporate tax file includes firm financial statements, location, and industry classification for all corporations in Canada. The T4 Statement of Remuneration file contains job-level information, including annual employment income received by each worker from each employer.

Employment and Social Development Canada provides data on federal government programs and services, including Employment Insurance. Finally, Immigration, Refugees, and Citizenship Canada provides detailed immigration records. By linking these administrative sources through unique identifiers (anonymized Social Insurance Numbers for individuals and Business Numbers for firms), the CEEDD creates a rich longitudinal dataset, allowing detailed analysis of individuals, families, and firms over time.

Identifying entrepreneurs To construct the dataset, I start by identifying business owners. The T2 corporate tax file can be linked through firm-level identifiers to Schedule 50 (T2S50), a tax form that contains information on the firm's ownership structure. Private Canadian-controlled corporations are required to file a Schedule 50 to disclose the

identity of all owners who hold at least 10% of common or preferred shares. Combining the T2 Schedule 50 and T4 files allows me to accurately identify entrepreneurs and measure returns to entrepreneurship. This represents a significant improvement over existing studies that typically rely on top earners within a firm to identify entrepreneurs. Since business owners can decide to pay themselves via salary, dividends, or a mix of both, ignoring dividend income could introduce substantial measurement error. The availability of detailed ownership data allows for precise identification of entrepreneurs and an accurate measurement of the payoff extracted from the firm by each founder.

Defining who is considered an entrepreneur is a debated issue among entrepreneurship scholars. There is no consensus on whether the definition should include all or a subset of the self-employed. I focus on individuals who start incorporated firms, as incorporation may serve as a better proxy for entrepreneurship than overall self-employment (Rubinstein and Levine, 2018). Most unincorporated self-employed individuals have little ambition to grow their businesses, whereas incorporation is more common for ventures with high-growth potential due to limited liability and separate legal identity. Levine and Rubinstein (2017) show that individuals choose the legal form of their firm based on the nature of their planned business activities rather than switching legal forms ex post based on business success.

The sample covers the period 2001–2017 (the first year in which Schedule 50 ownership data became available). I restrict the sample to firms created during this period that had positive sales within the first five years of founding. Entrepreneurs are defined as firm owners holding at least 20% of firm shares in the first year in which ownership is reported,[4] as long as the ownership structure is reported within three years of founding.[5]

[4]Results are robust to using alternative ownership thresholds.

[5]I adopt this rule because co-founders may delay equity allocation, allowing time to assess contributions and avoid costly renegotiations ex post (Wasserman, 2008).

In my firm-level analysis, I exclude firms created by spouses (married or cohabiting couples) to separately identify the effects of childbirth on firms owned by fathers versus mothers.

Family-level data Family-level data is drawn from the T1 Family File (T1FF), which aggregates information on family units by linking tax filers to their spouses and dependent children. Statistics Canada constructs family relationships by cross-referencing tax return filings and benefit claims.

To identify birth events, I use a family-level identifier to link individual tax files to a supplemental file containing children's year of birth and sex. Data on children is collected by Statistics Canada from the Canada Child Tax Benefit, a federal program supporting families, as well as from a supplemental birth record file, ensuring comprehensive coverage of children born in Canada. I restrict the parent sample to individuals who had their first child between 2001 and 2017.

Additionally, I use family identifiers to construct intergenerational links over time. By observing individuals who previously filed taxes together as part of a family unit, I can track familial relationships over time, even if co-filing ceases. This allows me to link entrepreneurs to their parents and study the effect of informal childcare provided by grandparents.

Immigration records To identify immigrants, I link individuals to immigration records from the Longitudinal Immigration Database compiled by Immigration, Refugees and Citizenship Canada (IRCC). This file contains information on all individuals granted permanent residency in Canada since 1980, including their country of origin and year of arrival. Through individual-level identifiers, immigration records can be linked to tax records.

To construct my sample of second-generation immigrant entrepreneurs, I first build family linkages by linking entrepreneurs to their own parents, as described above. If an entrepreneur was born in Canada but has at least one parent recorded in the immigration database, I classify her as a second-generation immigrant. I use an immigrant's country of origin to determine her cultural background accurately (Wang, Bena, and Lu, 2022). This method differs from previous studies that relied on name-based inferences of CEOs' cultural heritage, eliminating the risk of measurement error.

3 Empirical Methodology

Childbirth events are not random occurrences. Ideally, an econometrician would want to randomly assign children to individuals and compare entrepreneurial outcomes between parents and non-parents. Because this is an impossible experiment,[6] I use a quasi-experimental approach based on event studies around the birth of the first child. The identifying assumption is that the sharp divergence in entrepreneurial outcomes between mothers and their control group around first childbirth is orthogonal to unobserved determinants of fertility decisions, which should evolve smoothly over time. I address threats to identification due to selection into motherhood by using different control groups and an instrumental variable design, as detailed below.

The first approach I use is to match firms owned by mothers to firms owned by women with zero observed lifetime fertility. Section 3.1 describes the matching algo-

[6]The closest approximation to this ideal experiment is Gallen et al. (2023), who exploit the failure of long-term contraception as an exogenous shock to pregnancy timing. They find that unplanned pregnancies lead to large earnings penalties. Their estimates are similar to those obtained from event studies using observational data on all births. Conversely, they find smaller penalties using in vitro fertilization (IVF) success as an instrument for planned pregnancies. However, they show that women who undergo IVF unsuccessfully (the control group) also experience earning losses, suggesting that infertility itself could negatively impact earnings and that the instrument might underestimate the effect of planned pregnancies.

rithm. The identifying assumption behind this approach is that the decision to have a child is not correlated with firm performance. One might argue that fertility can be timed strategically. For example, entrepreneurs might decide to have children after their firms have reached certain milestones, implying that their firms would exhibit accelerated growth before pregnancy; alternatively, they might have a child when the business has been performing poorly. I show that firms owned by mothers do not grow faster (or more slowly) than control firms in the years before pregnancy; instead, they follow identical trends to control firms up until childbirth and sharply diverge afterward.

The second approach is to compare outcomes for mothers and fathers, as described in Section 3.2. This comparison is informative about the effect of childbirth on the entrepreneurship gender gap. In addition, restricting the sample to parents helps mitigate concerns related to selection: people who choose to have children might be different from non-parents along some unobservable dimension that also determines entrepreneurial entry and success. The identifying assumption behind using fathers as a control group is that the decision to have a child is not correlated with business performance differently for mothers and fathers. I show that firms owned by mothers and fathers are on parallel trends until the year of birth of the first child, when firm performance sharply drops for mothers.

Even though I find no evidence of different trends before childbirth, one might argue that entrepreneurs have information about *future* performance that cannot be observed by the econometrician. Mothers could plan to have a child because they know that their firms will start performing poorly, even though there have been no observable signs up to that point. It should be noted that the inclusion of industry-by-year effects implies that the alleged anticipated drop in performance would be purely idiosyncratic. Naturally, even though childbirth can be planned, there is a degree of unpredictability regarding the exact timing of pregnancy and childbirth; at the same time, future business opportunities

and entrepreneurial outcomes are uncertain at the time of fertility decisions.

To mitigate this concern, I verify that results are robust to restricting the sample to women who are close to the end of their childbearing years, for whom pregnancy is costlier to postpone and pregnancy timing is harder to predict. I find that the results are similar for this sample, supporting the identifying assumption that the sudden drop in women's entrepreneurial activity observed upon childbirth is caused by the childbirth event rather than by mothers planning the timing of childbirth with perfect foresight of future entrepreneurial outcomes.

Finally, to further reduce concerns related to selection bias, I use the sex of the first two children as an instrumental variable for the birth of a third child, as detailed in Section 3.3. I show that estimates from an event study around the birth of the third child and from the instrumental variable approach are very similar.

3.1 Mothers vs. women without children

In this section, I restrict the analysis to women and I start by analyzing the effect of childbirth on firm outcomes. I restrict the sample to a panel of founders who had their first child during the sample period in year t^*, with the condition that the childbirth occurred during an entrepreneurship spell lasting at least 2 years between $t^* - 2$ and t^*. I exclude firms jointly owned by spouses. I match mothers to observationally similar women who never had children. I use a caliper matching algorithm without replacement to construct the comparison sample. I use exact matching on industry at the 4-digit level, year, founder status, and marital status, and caliper-matching on firm age, entrepreneur's age, individual income percentile, and household income percentile, using calipers of 1 year, 5 years, 25%, and 25%, respectively. The matching is performed two years before childbirth (the last year in which individuals do not know that they will have a child in year t^*). To estimate the effect of childbirth on firm outcomes, I use the following

event-study specification:

$$y_{jt} = \alpha_j + \lambda_{s(j),p(j),t} + \sum_{k=a}^{b} \beta_k R_{jt}^k + \sum_{k=a}^{b} \theta_k (R_{jt}^k \times Mother_j) + X_{jt}'\gamma + \epsilon_{jt}, \tag{1}$$

where y_{jt} is an outcome (e.g., sales) for firm j in year t. $Mother_j$ is an indicator for whether firm j is owned by a mother, and $R_{jt}^k = \mathbf{1}\{t = t_i^* + k\}$ are event-study indicators with t_i^* denoting the year of the first childbirth. The coefficients of interest, θ_k, measure the effect of children relative to θ_{-2}. The set of control variables X_{jt} includes firm age indicators, number of owners (a proxy for how dependent the firm is on the founder who has a child), a polynomial for the entrepreneur's age, and marital status. I include firm fixed effects, α_j, to control for time-invariant firm characteristics: thus, the estimates only rely on within-firm variation over time. Finally, $\lambda_{s(j),p(j),t}$ denote industry-province-year fixed effects and ϵ_{jt} is the error term. Standard errors are clustered at the firm level.

Next, I study the evolution of firm creation rates following childbirth. I expand the sample to all women who had their first child within the sample period, rather than just those who were already entrepreneurs. I use exact matching on year, marital status, and Census Metropolitan Area, together with caliper matching on age, individual income percentile, and family income percentile (with calipers of 1 year, 3%, and 3%, respectively). The following event-study specification estimates the impact of childbirth on firm entry:

$$y_{it} = \alpha_i + \lambda_t + \sum_{k=a}^{b} \beta_k R_{it}^k + \sum_{k=a}^{b} \theta_k (R_{it}^k \times Mother_i) + X_{it}'\gamma + \epsilon_{it}, \tag{2}$$

where y_{it} is equal to 1 if individual i starts a firm in year t. α_i and λ_t represent individual and year fixed effects, respectively. The set of covariates X_{it} includes age dummies to control for life-cycle trends and marital status. Finally, the error term ϵ_{it} is clustered at the individual level.

Finally, I study the effect of childbirth on workers employed by mothers, relatively to workers employed in control firms. I focus on employees who had worked at the firm for at least one year before the entrepreneur's childbirth and follow their employment and earnings trajectories over time. Workers may stay with the firm or move to another employer in the post-childbirth period. The following equation estimates the impact of childbirth on workers:

$$y_{ht} = \alpha_h + \lambda_t + \sum_{k=a}^{b} \beta_k R^k_{j(h)t} + \sum_{k=a}^{b} \theta_k (R^k_{j(h)t} \times Mother_{j(h)}) + X'_{ht}\gamma + \epsilon_{ht}, \tag{3}$$

where y_{ht} represents an outcome (e.g., earnings) for worker h in year t. α_h and λ_t denote worker and year fixed effects, respectively. $Mother_{j(h)}$ is an indicator for whether the entrepreneur is a mother and $R^k_{j(h)t} = \mathbf{1}\{t = t^*_{j(h)} + k\}$ are event-study indicators with $t^*_{j(h)}$ denoting the year of the entrepreneur's first childbirth. In the rare cases in which a worker is employed by multiple entrepreneurs who become mothers at different times, I let $t^*_{j(h)}$ be the earliest event. The set of control variables X_{ht} includes indicators for worker's age. The error term ϵ_{ht} is clustered at the worker level.

3.2 Mothers vs. fathers

The method described so far allows us to understand the impact of childbirth on women. However, looking at mothers alone does not address how parenthood affects the gender gap. Fathers might experience similar effects (resulting in no gap) or face little to no impact. In this section, I extend the analysis to compare the impact of childbirth on mothers and fathers relative to their respective counterparts without children. I use the same methodology described in the previous section but also include fathers and match them to men without children. I estimate Equations 1 and 2 separately by gender $g \in \{m, w\}$.

As an additional robustness check, I implement the methodology used by Kleven,

Landais, and Søgaard (2019), which directly compares mothers to fathers. In this approach, I restrict the sample to parents and estimate the effects of childbirth separately for mothers and fathers. Identification comes from comparing the trajectories of mothers and fathers after childbirth. However, since fathers lack a suitable control group, this approach does not provide insights into how childbirth affects them in absolute terms.

To ease interpretation, I express the level effects as percentage effects. I calculate $P_k^g \equiv \frac{\hat{\theta_k}^g}{\mathbb{E}[\tilde{y}_{jt}^g | t = t_j^* + k]}$, where $\tilde{y}_{jt}^g$ is the predicted counterfactual outcome for firm j in the absence children. Thus, P_k^g equals the impact of childbirth at event time k, as a fraction of the average counterfactual outcome without children. The differential effect of children between men and women, $P_k = P_k^m - P_k^w$, is the penalty that mothers experience relative to fathers.

Gap due to childbirth To quantify the extent to which childbirth contributes to the gender gap in entrepreneurial outcomes, I use a modified Oaxaca-Blinder decomposition (Kleven, Landais, and Søgaard, 2019). The standard Oaxaca-Blinder decomposition divides the gap in outcomes between two groups into an explained component, which reflects differences in observable characteristics, and an unexplained component, which captures differences in returns to these characteristics and other unobserved factors (Oaxaca, 1973; Blinder, 1973; Altonji and Blank, 1999; Fortin, Lemieux, and Firpo, 2011).

The mean gender gap Δ is given by $\Delta = (E[y_{jt}^m] - E[y_{jt}^w])/E[y_{jt}^m]$, where y_{jt}^g is a firm outcome (e.g., profits) for firm j owned by an individual of gender g in year t. Δ can be decomposed into inequality due to children and residual inequality:

$$\hat{\Delta} = \frac{E[P_k \cdot \tilde{y}_{jt}^w]}{E[\hat{y}_{jt}^m]} + \sum_q (\beta_q^m - \beta_q^w) \frac{E[X_{qjt}^m]}{E[\hat{y}_{jt}^m]} + \sum_q \beta_q^w \frac{E[X_{qjt}^m] - E[X_{qjt}^w]}{E[\hat{y}_{jt}^m]}. \tag{4}$$

P_k is the child penalty at event time k, $\tilde{y}_{jt}^w$ is the predicted counterfactual outcome for

women (what women's outcomes would be absent childbirth), and $\hat{y}_{jt}^{m}$ is the predicted actual outcome for men. The first term measures the direct effect of childbirth on gender inequality in firm outcomes. It captures the share of the gender gap attributable to the differential impact of children on women relative to men, scaled by counterfactual firm outcomes for women. The second term represents differences in the returns to observable characteristics between men and women (the unexplained component of the gender gap). Finally, the third term measures differences in the distribution of observable characteristics, such as industry sorting, prior experience, or firm characteristics, representing the explained component of the gap.

3.3 Instrument: sibling sex mix

To address potential sample selection issues stemming from the endogeneity of childbirth, I use the sex of the first two children as an instrument for the birth of a third child, following Angrist and Evans (1998). This approach exploits parents' preference for variety in the sex mix of their children: a couple with two boys or two girls is more likely to have a third child than a couple with one child of each sex. The instrument estimates the local average treatment effect (LATE), capturing the effect of having a third child for compliers, i.e., individuals who had a third child only because their first two children were of the same sex.

For this instrument to be valid, it must satisfy two key assumptions. First, the sex of the first two children must be as good as randomly assigned. Second, it has to satisfy the exclusion restriction, requiring that the sex of the first two children must not directly affect entrepreneurial outcomes, except through its impact on the likelihood of having a third child.[7] These assumptions cannot be tested directly. However, I show

[7] An additional assumption concerns the presence of defiers—individuals who are *negatively* affected by the treatment. In this setting, defiers are individuals who prefer a particular sex, so that having two

that women who had two same-sex children are observationally similar to women who had two opposite-sex children, supporting the random assignment assumption.

I restrict the sample to women who had their first child during the sample years and had at least two children by the end of the sample period (therefore, in a given year, they might have no children or one child and still be part of the estimation sample). I estimate the dynamic effect of having a third child following Kleven, Landais, and Søgaard (2019). I use the following specification:

$$y_{jt'} = \alpha_j + \lambda_{s(j),p(j),t'} + \sum_{k=a}^{b} \beta_k R^k_{jt'} + X'_{jt'}\gamma + \epsilon_{jt'}, \tag{5}$$

where $y_{jt'}$ is an outcome for firm j. Indicator variables $R^k_{jt'}$ denote event times relative to the birth of the third child. Each indicator is instrumented by the interaction $R^k_{jt'} \times SameSex_j$, where $SameSex_j$ is equal to 1 if the first two children are of the same sex. In addition to controls included in previous specifications, control variables include binned event time indicators around the birth of the second child and an indicator for whether the entrepreneur already had their first child.

Finally, I compare estimates from the instrumental variable event study to those from the OLS event study design around the birth of the *third* child. This exercise allows me to assess external validity. The IV captures the effect of having a third child for compliers, whereas the OLS event study estimates the effect for the entire treated population. If the two estimates are similar, it suggests that the effects observed among compliers are generalizable to a broader population. In addition, the similarity of these

boys or two girls decreases the probability of having a third child. Unlike Dahl and Moretti (2008) in the United States, I do not find that parents in Canada have a systematic preference for boys during the sample period I examine. De Chaisemartin (2017) shows that it is possible to identify causal estimates under weaker assumptions than the absence of defiers and that the sufficient conditions are likely to hold in the context of the sibling sex mix instrument.

estimates strengthens the credibility of using event studies centered around childbirth for causal inference.

4 Results

4.1 Firm outcomes

I begin by examining the effect of childbirth on firm outcomes in Figure 1. Panel (a) shows the evolution of firm sales. Firms owned by mothers and by women without children are on similar trends until the year just before childbirth, after which a sharp divergence occurs. In the year of childbirth, firms owned by mothers see a substantial decline in sales, exceeding 20%. This effect persists, with sales still 16% lower after five years, relative to women without children. Panel (b) shows a similar pattern for firm assets, which, on average, decline by about 17% in the five years following childbirth. Moving to firm profits (i.e., net income) in panel (c), we observe an abrupt initial decline of about 27% in the year of childbirth. While there is a slow recovery in the following years, profits remain down by 17% after five years. To ensure these findings are not merely a result of downsizing, in panel (d) I also examine the effect on profit margins, which decline by 6%.[8]

These results are conditional on firms surviving.[9] I turn to the effect of childbirth on

[8] A potential concern is whether the results depend on the specific matching algorithm used to create the control group. I employ an alternative design in which I randomly assign placebo births to women who never actually have children, drawing from the distribution of age at first childbirth among those who eventually become mothers. Figure A.1 shows that the results are similar to those obtained from the matched sample.

[9] In Figure A.2, I show results without conditioning on survival by imputing zeros for firms that exit and applying the inverse hyperbolic sine (IHS) transformation to outcome variables, defined as $\text{IHS}(x) = \ln\left(x + \sqrt{x^2 + 1}\right)$. This transformation approximates the log transformation for small positive values but is also defined for $x \leq 0$. Using this approach, I continue to find significant negative effects across all outcome variables.

firm survival in Figure 2. Unlike the substantial declines observed in other firm outcomes, the effect on survival is modest, reducing the probability of remaining in business by only 3-4%. This result highlights how firm survival, while commonly used in prior literature to assess entrepreneurial performance, is an inadequate measure: these firms may stay in business but exhibit signs of stagnation in terms of sales, profitability, and other performance measures. One possible explanation is that mothers face weak incentives to exit, as labor market child penalties reduce the opportunity cost of keeping a low-performing business afloat. Alternatively, some women may place a high value on the non-pecuniary benefits of entrepreneurship, making it preferable to traditional employment despite the financial setbacks.

A natural question is whether first-time fathers experience similar effects. To answer this, I compare the effects of childbirth on mothers and fathers relative to women and men without children. Figure 3 shows that fathers experience little to no impact across firm outcomes. Sales in firms owned by fathers dip slightly in the year of childbirth but see a modest increase relative to men without children in later years. Profit margins also see a small positive effect, while other outcomes remain unchanged.[10] To quantify how much childbirth contributes to the gender gap in firm outcomes, I apply a modified Oaxaca-Blinder decomposition, where the direct effect of children enters as a separate component alongside differences in observable characteristics and returns to these characteristics. The results show that childbirth accounts for 47% of the sales gap and 54% of the profit gap between male- and female-owned firms, pointing to its key role in driving performance differences.

[10] As an alternative to this design, I use fathers as a direct control group for mothers, restricting the sample to parents only. This approach is common in child penalty studies. However, since fathers lack a corresponding control group, this method does not measure the direct effect of childbirth on men. Figure A.3 shows that estimates remain nearly identical.

The event study design around the first childbirth allows me to capture the overall effect of having children on entrepreneurial outcomes. To mitigate concerns about selection into parenthood, in Figure 4 I present results from an instrumental variable approach that uses the sex composition of the first two children as an instrument for the birth of a third child. The impact of a third child is smaller in magnitude compared to that of a first child, reflecting that the disruption caused by a third child for women who already have two children may be less severe than becoming a mother for the first time. For instance, sales decline by 15% and profits by 11% in the year of birth, with both metrics fully recovering after three years. Additionally, IV estimates closely align with those from the OLS event study centered around the birth of a third child, reinforcing the validity of using event studies to estimate the effects of childbirth on firm outcomes.

A clear pattern emerges in the main results presented so far – firms downsize and their performance deteriorates. I now turn to analyzing heterogeneity to better understand which firms are driving the results. In Figure 5, I analyze firms' life cycle, comparing young firms that experience the motherhood shock when they are at most 5 years old with older firms. While the overall pattern of performance decline holds for firms of all ages, the effect is larger in magnitude among young firms. For instance, looking at firm sales, we observe an immediate drop of 25 log points in the year of childbirth for the young group, more than double the decline experienced by older firms.

The fact that the effects are concentrated in young firms confirms the importance of founders' human capital for nascent firms, which rely on the founder's active involvement to build a competitive edge. To further support this interpretation, Figure A.4 presents a placebo test using angel investors—individuals who never receive wage compensation from the firm nor hold founder status. The results show no significant impact of childbirth on firm outcomes for angel investors, suggesting that the observed declines are driven by the founder's human capital contributions rather than financial investment.

An important question is whether the effects of childbirth are confined to very small firms or to low-value-added service sectors, in which women tend to be overrepresented. The evidence suggests that this is not the case. Figure 6 shows that the negative impact of childbirth on firm performance is actually more pronounced in sectors like scientific research, manufacturing, and computer systems design than in personal services or hospitality. Similarly, Table 2 shows that the effects persist even among larger and more productive firms, including those in the top quintile by assets or value-added two years before childbirth. For firms in the top quintile by assets and value-added, sales decline by 12% and 18%, respectively. While the effects are smaller than the average effect, it remains substantial. These results suggest that the impact of childbirth extends beyond small businesses or firms in low-productivity sectors.

Figure A.5 examines how business cycles influence post-childbirth firm performance. The direction of the effect is ex ante ambiguous. On one hand, having a child during a boom may lead to higher opportunity costs, as entrepreneurs risk missing out on rapid market expansion. On the other hand, in a downturn, the demands on founders to keep their ventures afloat might intensify, conflicting with the time and effort needed to care for a newborn. To define business cycles, I classify industry-year sales growth into terciles, using only firms owned by male entrepreneurs to avoid mechanical correlations with childbirth. I find that the short-term effects are most pronounced for women who give birth during industry booms. In the first two years post-childbirth, sales decline by 30 log points for mothers whose firms were in expanding industries, compared to 20 log points for those in contracting industries. Firm assets follow a similar pattern, dropping by 20 versus 9 log points, respectively. This pattern suggests that women do not systematically time childbirth to align with periods of lower opportunity costs, as they are slightly more likely to give birth during industry booms—precisely when penalties are highest.

Additional evidence to mitigate concerns that women time childbirth based on expected firm performance declines comes from Figure A.6 focuses on women who gave birth at age 35 or older and were unmarried and not cohabiting when they founded their firm. For this group, pregnancy timing is arguably less flexible. First, fertility declines with age, reducing the ability to time childbirth around business conditions. Second, conception takes longer for older women.[11] It is unlikely that women precisely anticipate business downturns and plan pregnancies accordingly, particularly given the unpredictability of conception at later ages. For this subgroup, the short-term effects of childbirth are even larger than for the full sample: sales decline by 30 log points and profits by 32%, potentially reflecting the increased physical toll of later-life childbirth.

4.2 Entrepreneurs' outcomes

In this section, I examine to which extent childbirth contributes to gender differences in entrepreneurial career trajectories. A substantial body of literature has documented the long-term effects of motherhood on women's earnings, but the existing research focuses on salaried employees. The effect of career disruptions due to childbirth may differ for entrepreneurs compared to the broader labor force.[12]

In Figure 7, I compare mothers and fathers to a matched sample of women and men without children, respectively. In panels (a) and (b), the sample is composed of individuals who had been entrepreneurs for at least two years before becoming parents. Panel (a) compares the income trajectories of mothers and fathers around childbirth,

[11] Women aged 35–39 have a 50% lower likelihood of spontaneous conception compared to women aged 19–26. Miscarriage rates also rise sharply, reaching 27% at age 40 (Taylor, 2003; Delbaere, Verbiest, and Tydén, 2020).

[12] Research on career disruptions has generally concentrated on job loss events due to plant closures and mass layoffs, which tend to affect lower-wage and less-skilled workers. These studies tell us little about how high-skilled women, particularly entrepreneurs, experience career disruptions. An exception is Fedyk and Hodson (2024), who focus on high-skill white-collar workers.

relative to their matches, irrespective of whether they are still entrepreneurs at any point. While mothers experience an average 11% decline in total income over the five years following childbirth compared to women without children, fathers show no such decline; instead, their total income trends slightly upward, increasing by 2.5%. This disparity is partly driven by a reduction in compensation (measured as the sum of wages and dividends paid to the entrepreneur) that mothers take from their firms after childbirth. Mothers experience a nearly 20% decline in compensation, while fathers see a 5% increase (panel (b)), mirroring the trends in firm performance.

Up until this point, I have examined outcomes for individuals who were already entrepreneurs before having their first child. Next, I expand the analysis to study how motherhood impacts the likelihood of all women, regardless of prior entrepreneurial experience, to start a new firm. Panel (c) presents an event study that tracks firm entry surrounding childbirth. While the adverse effects on firm outcomes primarily appear after childbirth, the decline in mothers' firm creation rates begins in the pregnancy year. This effect peaks in the birth year, reaching a 37% decline relative to fathers, and subsequently tapers off, albeit without reverting to pre-birth levels. These results suggest that motherhood deters women from entrepreneurship, potentially resulting in a missing cohort of female-founded firms.

4.3 Worker outcomes

The existing literature on the effect of children focuses on how childbirth affects individual mothers' careers, but it generally overlooks potential spillovers to other employees within firms. This section examines the effect of the entrepreneur's childbirth on the earnings and employment prospects of workers employed in these firms. The sample for this analysis includes workers who were employed in treated or in the matched sample of control firms for at least one year before the childbirth event.

I find that workers' careers are disrupted by the childbirth event. In panel (a) of Figure 8 I use earnings in levels to include in the sample workers who leave the labor force. The reported effects are expressed as percentages of the counterfactual outcome in the absence of childbirth. On average, workers in treated firms experience an earnings decline of approximately 2% in the first year following childbirth, compared to the control group. This decline persists for at least five years, with earnings remaining 4% lower than the pre-childbirth trajectory. These numbers reflect both employed and non-employed workers.

Panel (b) examines the impact of childbirth on log earnings, which restricts the sample to workers with positive earnings. Workers in treated firms experience an average earnings decline of approximately 3.5% in the first 5 years following the entrepreneur's childbirth. Panel (c) examines the probability of experiencing a period of involuntary exit from the labor force, defined as receiving positive income from unemployment insurance. I find that the average increase in unemployment risk across the first five years after childbirth is approximately 1%. In panel (d), I consider an alternative measure of reduced career opportunities by defining underemployment as earning less than the equivalent of 12 weeks of full-time minimum wage employment. I find an average increase in underemployment risk of approximately 1.5%.

Figure A.7 shows results for log earnings separately by worker age and sex. Panel (a) shows that the effects are concentrated among young workers (those below the median age of 33 at the time of childbirth), consistent with younger workers being especially vulnerable to economic shocks (Kahn, 2010; Oreopoulos, Wachter, and Heisz, 2012). Panel (b) shows that both male and female workers experience a decline in earnings, with larger point estimates for men.

5 Mechanisms

In the previous section, I presented evidence that childbirth affects entrepreneurial outcomes. I now examine the underlying mechanisms to determine whether these effects stem from maternal preferences, such as increased risk aversion, or from constraints, such as limited access to childcare. Gender norms fall somewhere in between, shaping behavior through social expectations and blurring the line between choice and constraint. I first examine whether childbirth leads to a shift in risk preferences. Second, I turn to the role of household specialization and cultural norms to understand how couples choose to allocate tasks. Finally, I study childcare availability to understand if relaxing constraints has an effect on how mothers allocate time. If improving access to childcare mitigates the negative effects of childbirth, this would suggest that external constraints, rather than solely women's preferences, play a role in determining women's time allocation.

5.1 The risk-return trade-off

Parenthood has been linked to increased risk aversion (Görlitz and Tamm, 2020). The first potential explanation for the decline in firm outcomes post-childbirth could be related to changes in the risk-return profile of mother-owned firms. If female entrepreneurs become more risk-averse after having children, they may adopt safer, lower-risk investment strategies that yield lower but more stable returns.[13]

[13] A large literature has studied gender differences in risk preferences, mostly finding that women are more risk averse than men (see Bertrand (2011) for a review). Faccio, Marchica, and Mura (2016) find that firms led by female CEOs have lower leverage and less volatile earnings, suggesting lower levels of risk-taking compared to firms led by men. The relationship between gender and risk-taking may depend on context; for example, in their experimental setting, Kirchler, Lindner, and Weitzel (2018) find no gender differences in risk-taking among finance professionals. The effect of parenthood on risk preferences may be particularly pronounced for mothers due to evolutionary pressures: women's substantial investment in childbearing and caregiving may heighten their tendency to adopt safer strategies to protect both themselves and their children.

To assess whether reduced risk-taking explains the decline in firm performance post-childbirth, I use three proxies for firm risk-taking behavior. The first is the volatility of returns on assets, σ(ROA), measured as the standard deviation of ROA before and after childbirth. A decrease in σ(ROA) would indicate lower fluctuations in returns, suggesting a shift toward more conservative investment decisions. Similarly, I measure profit volatility as the standard deviation of profits over the same period. Finally, I use leverage as a proxy for the riskiness of corporate financing choices, defined as the ratio of total long-term liabilities to total assets. A higher leverage ratio indicates greater reliance on debt financing, increasing the firm's exposure to financial shocks.

Table 3 shows no significant change in the volatility of ROA or profits after childbirth. The leverage ratio, however, increases (Figure A.9 presents an event study showing that leverage starts increasing during the childbirth year). While the risk-return trade-off suggests that a shift toward lower-risk investment should reduce both risk and returns, the data show no evidence of reduced risk. These findings suggest that the observed decline in firm performance post-childbirth cannot be explained by a move toward safer investment strategies.

5.2 Individual or household decisions?

Up to this point, I have treated outcomes after childbirth as a result of women's individual choices. However, most entrepreneurs with children are married, so it is reasonable to assume that career and childcare decisions are made at the household level rather than by individuals alone. One possibility is that couples allocate work and childcare responsibilities based on their respective comparative advantage to maximize household income: the partner with higher earnings prioritizes their career, while the other assumes a greater share of childcare duties (Andresen and Nix, 2022b). Since women entrepreneurs are more likely than men entrepreneurs to be the secondary earner, this could explain why

they take on a greater share of childcare responsibilities compared to male entrepreneurs.

If couples specialize based on labor market advantage, firms owned by female breadwinners should be less affected by childbirth than those owned by female secondary earner. This is because households with a female breadwinner would prioritize the mother's entrepreneurial career, while the father would take on a greater share of childcare. In addition, household income should be affected similarly regardless of whether the husband or wife was the primary earner, as they would adjust labor supply efficiently irrespective of gender. Moreover, female breadwinners should experience a less negative (or even positive) impact on their own income, as they might increase their labor supply to meet the additional financial demands of parenthood.

To test these predictions, I classify women based on whether they were the primary earner in the household during the three years before their first childbirth. Panel A of Table 4 provides some evidence in support of the household specialization hypothesis. However, since primary earners tend to own larger firms, which generally experience smaller post-childbirth declines, I use inverse probability weighting to reweight the sample so that firms owned by primary and secondary earners have similar characteristics. The results are mixed: primary earners experience a smaller decline in sales (40% smaller than for secondary earners) but the effects on profits and profit margins are similar between the two groups. Even among breadwinners, the performance penalty remains substantial, suggesting that while household specialization may mitigate the effects of childbirth, it does not fully offset them.

Panel B of Table 4 shows that couples with a female breadwinner experience a decline in total family income, relative to couples where the husband was the breadwinner. This is driven by the fact female breadwinners suffer greater income losses than secondary earners (13% lower income than secondary earners) and their spouses do not fully compensate for this decline.

These findings could be explained by mothers having an inherent comparative advantage in childcare tasks, independent of their labor market advantage. The existing literature has largely ruled out childbirth itself as the primary driver of large career penalties for mothers (Kleven, Landais, and Søgaard, 2021; Andresen and Nix, 2022b), but other forms of comparative advantage, such as nurturing abilities beyond childbirth and nursing, could still matter. In addition, gender norms and preferences may shape household decision-making, leading women to prioritize childcare even when they have a stronger position in the labor market. I explore this hypothesis in the next section.

5.3 Culture

Immigrants provide a useful setting for studying cultural influences because norms and beliefs are embedded within individuals, whereas institutions and policies are location-specific. As people migrate, they bring their cultural heritage with them, while leaving behind the institutional environment of their home country (Alesina, Giuliano, and Nunn, 2013).[14]

In this section, I examine whether the effect of childbirth on women's entrepreneurial outcomes can be attributed to cultural preferences related to gender norms. I focus on second-generation immigrants, i.e., individuals born in Canada to foreign-born parents[15] (who, as Canadian citizens since birth, are more precisely referred to as second-generation

[14] A large literature in economics and finance has studied culture, defined as a set of shared values, beliefs, and preferences that influence individual behavior within a particular society or group and persist across generations (Guiso, Sapienza, and Zingales, 2006; Alesina and Giuliano, 2015; Boelmann, Raute, and Schönberg, 2024; Grinblatt and Keloharju, 2001). Gender norms are a subset of cultural norms that specifically pertain to expectations associated with individuals based on their gender. These norms shape the division of labor within households, influence career choices by prescribing which professions are deemed suitable for men and women, and affect investment in human capital. In cultures where men are perceived as primary earners, families may prioritize investing in sons' education over daughters' (Johnston, Schurer, and Shields, 2014; Humlum, Nandrup, and Smith, 2019).

[15] Canada, with its large immigrant population and long-standing support for cultural diversity, represents an ideal setting. During my sample years, about 20% of the Canadian population was made up of immigrants.

Canadians). This approach offers several advantages over studying first-generation immigrants. Second-generation individuals typically have a stronger command of the host country's language, greater exposure to its education system and labor market, and no direct choice in the immigration decision, which was made by their parents (Fernández, 2007).

To measure gender norms by country of ancestry, I rely on data from the World Values Survey, a large-scale international research project that examines people's values and beliefs across countries. The survey was conducted in multiple waves since the early 1980s and covers a wide range of topics, including attitudes toward democracy, social capital, religion, family, and gender roles. I use responses to specific survey questions to construct a gender progressivity index, capturing country-level attitudes toward gender norms (see Appendix B for details on its construction). Figure A.8 shows the distribution of gender norms across countries.

Table 5 compares firm outcomes after childbirth for entrepreneurs whose parents immigrated from countries with more egalitarian versus more conservative gender norms, separately by gender. Columns (1)-(3) show that women whose parents originated from traditional cultures experience larger declines in sales, profits, and profit margins than their egalitarian counterparts. These results are not explained by systematic differences in pre-birth firm characteristics. Because the sample of second-generation female founders is relatively small, in columns (4)-(6) I extend the analysis to all business owners and find similar results.

In columns (7)-(9), I repeat the exercise for fathers. If anything, the pattern is reversed: male entrepreneurs from traditional cultural backgrounds exhibit equal or better business outcomes following the birth of a child. This divergence is consistent with women from traditional backgrounds prioritizing family responsibilities over their entrepreneurial pursuits post-childbirth, while traditional gender norms reinforce men's role as primary

providers. These findings suggest that while couples do specialize after having children, the process appears to be driven more by gender norms than by labor market advantage.

5.4 Informal childcare

The role of grandparents in providing childcare to their grandchildren is an important aspect of family support networks.[16] In this section, I study the role of proximity to grandparents in mitigating the impact of childbirth on women's entrepreneurial outcomes.

To examine the role of grandparents, I first establish a connection between entrepreneurs and their own parents. This linkage is possible because individuals residing at the same address file taxes together (non-filers, such as dependent children, are input by Statistics Canada). Thus, individuals who lived with their own parents at any point from 2001 onward are included in the sample. I then define a mother as living near her parents if they reside in the same Census Metropolitan Area or Census Agglomeration[17]. This measure of proximity serves as an indicator of potential childcare availability within family networks.

Table 6 shows that mothers who live in the same city as their parents experience less severe declines in business performance after childbirth. Geographical proximity to grandparents mitigates the negative effects of motherhood on sales, profits, and profitability. Figure A.10 presents event studies on sales and profits, showing that this mitigating effect is strongest when the child is very young. This pattern is likely driven by the in-

[16] In the United States, 20% of working mothers with children under five rely on grandparents as their primary childcare providers (Posadas and Vidal-Fernandez, 2013); in Mexico, grandmothers take care of 40% of children aged under six (Marcos, 2023). Several studies have found that access to grandparental childcare increases mothers' labor supply but a negative effect on grandmothers' employment (Kaufmann, Özdemir, and Ye, 2022; Zamarro, 2020).

[17] A Census Metropolitan Area is akin to a commuting zone. Statistics Canada defines CMAs as regions with at least 100,000 people, including a core urban area of at least 50,000 and surrounding municipalities with high economic and social integration. In rural areas, a Census Agglomeration must have a core population of at least 10,000.

tensive caregiving demands of infants and toddlers, which may lead mothers to rely more heavily on grandparental support during the early years. As children grow older, formal childcare options such as preschool and daycare may become more available, reducing the reliance on grandparents. Panel B of Table 6 provides a corresponding test for fathers, showing that proximity to grandparents has no significant effect on their entrepreneurial outcomes post-childbirth.

To provide further evidence on the role of grandmothers, I study the impact of grandmother retirement on their daughters' firms in Figure 9. I restrict the analysis to mothers who did not experience childbirth during their entrepreneurial spell, ensuring that the decision to become a mother is not influenced by the grandmother's retirement. In addition, I restrict the sample to grandmothers who were employed at some point to capture a shift in their time availability for childcare. The empirical strategy compares mothers whose own mothers retire while living in the same municipality (allowing for potential childcare support) to mothers whose mothers also retire but live farther away. I find that mothers living in close proximity to grandmothers see significant improvements in firm performance following the retirement event. Examining pre-trends, there is no evidence that the retirement event is driven by an increase or a decline in business performance prior to retirement, supporting the interpretation that the improvements in firm outcomes result from the grandmother's retirement.[18]

Table A.2 shows that the effect of grandmother retirement on business performance is concentrated among women living in municipalities where center-based childcare provision is lacking. This suggests some degree of substitution between informal (e.g. family-

[18]A potential concern is that these results may reflect general family assistance (for example, involvement with the business) rather than caregiving support. To address this, I conduct a falsification test by examining the effect of grandfather retirement and find no such improvement in entrepreneurial outcomes (Figure A.11). This suggests that the results are not driven by broader family involvement but are specific to the caregiving support traditionally provided by grandmothers.

provided) and formal childcare support, consistent with evidence that expanding formal childcare services partially reduces reliance on family-provided care (Baker, Gruber, and Milligan, 2008). Details on how I measure childcare provision at the municipality level are discussed below.

5.5 Formal childcare

The availability of childcare affects labor market outcomes even for highly skilled professional women.[19] In this section, I analyze the impact of formal childcare on mothers' entrepreneurial outcomes, using childcare expansion events at the municipality level as an exogenous shock to childcare availability. To measure the availability of formal childcare, I construct a municipality-level index based on the ratio of workers employed in childcare centers to the number of children under the age of two. Since the data does not report hours worked, childcare workers are classified as full-time if their annual earnings exceed the equivalent of full-time minimum wage. If a childcare worker's annual earnings are below this threshold, I consider them as a fraction of a full-time worker, proportional to their earnings relative to the full-time minimum wage.

I define a childcare shock as a one-standard-deviation increase in the density of childcare workers within a municipality over a given year. If a municipality undergoes multiple instances of childcare expansion based on the above definition, I consider the municipality treated starting from the first expansion event. Since childcare expansions may be correlated with broader labor market trends, such as rising female employment, I include municipality-by-year fixed effects in all specifications. This ensures that identification relies on within-municipality-year variation, comparing mothers in the same location and

[19] In the finance industry, the availability of childcare benefits is linked to lower gender pay gaps (Lagaras et al., 2022). (Barber et al., 2021) find that, during the COVID-19 pandemic, time spent on childcare reduced productivity for female finance academics.

year who were differentially exposed to increased childcare availability based on their child's age at the time of expansion.

Specifically, I compare mothers with children under 6 who experienced a childcare expansion when their child was at most 2 years old with mothers whose children were older (3 to 6 years old) at the time of the expansion. This triple-differences design allows me to assess how the timing of childcare expansions affects mothers who are more likely to benefit due to their child's younger age. This approach is similar to Simintzi, Xu, and Xu (2024), who study the impact of the 1997 universal childcare reform in Quebec on women's labor market outcomes and firms by exploiting variation in treatment intensity based on the child's age at the time of expansion. While I cannot exploit the 1997 reform because it pre-dates the start of my sample, I validate my measure by confirming that childcare density in Quebec municipalities is consistently higher than in the rest of Canada, reflecting the province's long-standing investment in childcare services.

The results in Table 7 show that the expansion of formal childcare significantly improves firm performance for mothers with young children. Specifically, the triple interaction term shows an 11% increase in sales and a 7% rise in profit margin relative to mothers whose children were older at the time of the expansion. For robustness, I include fathers in the analysis, as shown in Panel B, to ensure that the observed effects are specific to mothers.

6 Conclusion

Entrepreneurship is a key driver of economic growth and innovation, yet women remain significantly underrepresented among entrepreneurs, particularly in high-growth ventures. Female entrepreneurs are less likely to succeed in scaling their businesses or achieving high-value outcomes, such as acquisitions or IPOs. Despite a growing literature on female entrepreneurs, our understanding of the underlying factors driving the entrepreneurship

gender gap remains incomplete.

This paper contributes to filling this gap by examining the effects of childbirth on women's entrepreneurial activity. Drawing on comprehensive administrative data from Canada, I show that childbirth leads to a sharp decline in women's likelihood of starting a business and a persistent deterioration in the performance of their existing firms, explaining a large fraction of the entrepreneurship gender gap. While these effects attenuate over time, they do not fully recover to pre-birth levels. The negative spillovers extend beyond the entrepreneur herself, reducing earnings and increasing job displacement risk for employees of affected firms.

These findings contribute to the broader discussion on demographic change and economic dynamism. Children impose significant career costs on women; this paper provides new evidence that these costs extend beyond individuals, creating spillovers for entrepreneurial firms and their employees. At the same time, many advanced economies face declining fertility rates, raising concerns about the long-term implications for labor supply and innovation. A growing literature documents a decline in business dynamism, with falling rates of firm entry and young firm activity across industries and regions (Decker et al., 2016). Demographic shifts may be one contributing factor, as new firm creation is closely linked to the supply of young workers, who are disproportionately employed in high-growth, innovative firms (Ouimet and Zarutskie, 2014; Karahan, Pugsley, and Şahin, 2024). Understanding the trade-offs between the immediate economic costs of children and the long-term effects of demographic change on entrepreneurship and productivity remains an important avenue for future research.

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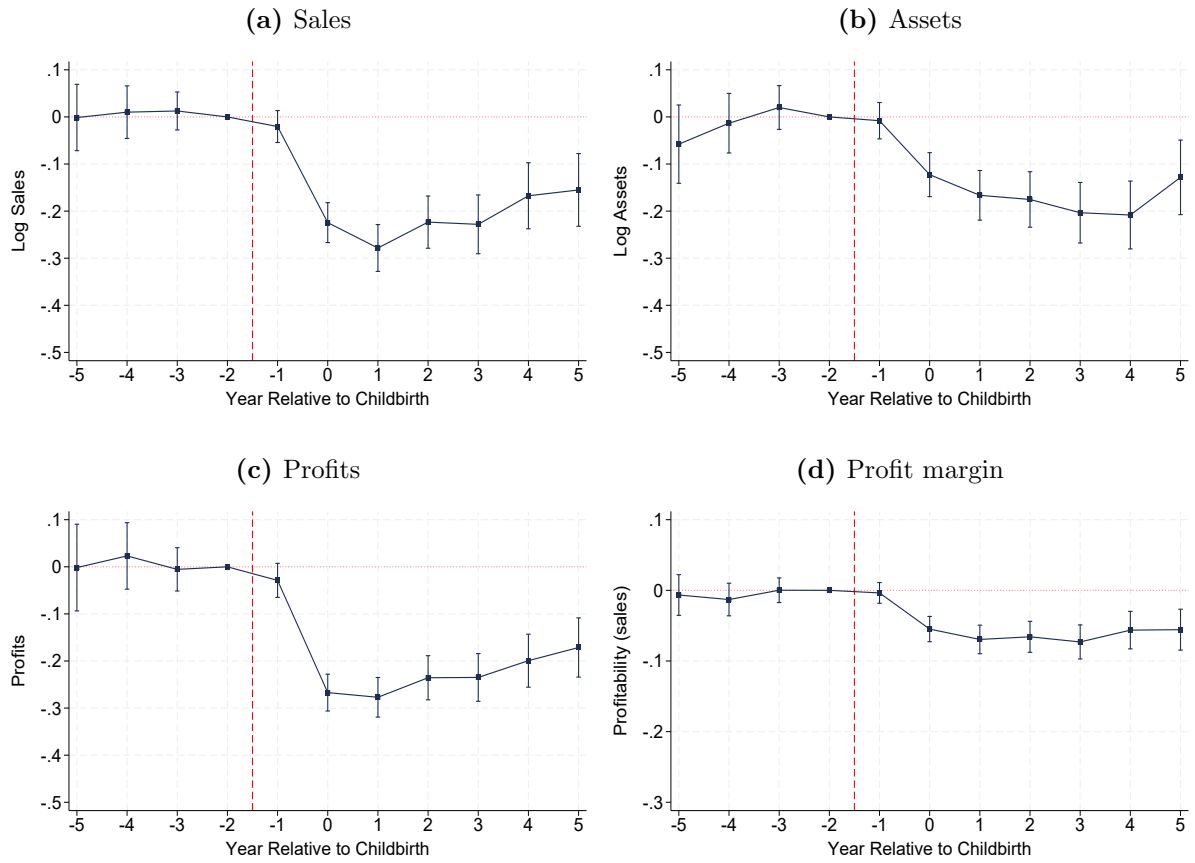
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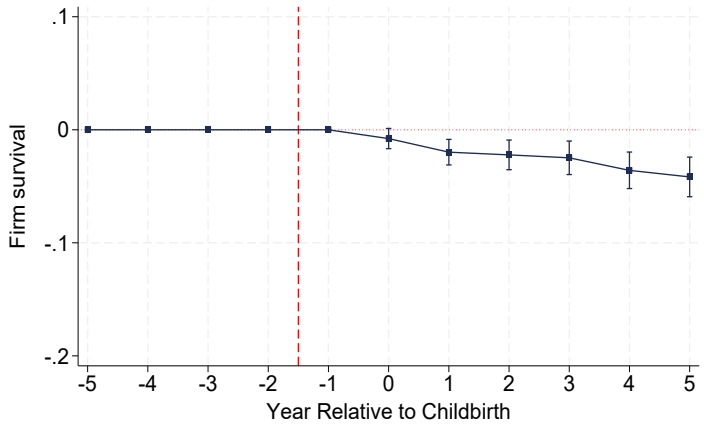
Figures

Figure 1: Effect of childbirth on firm outcomes



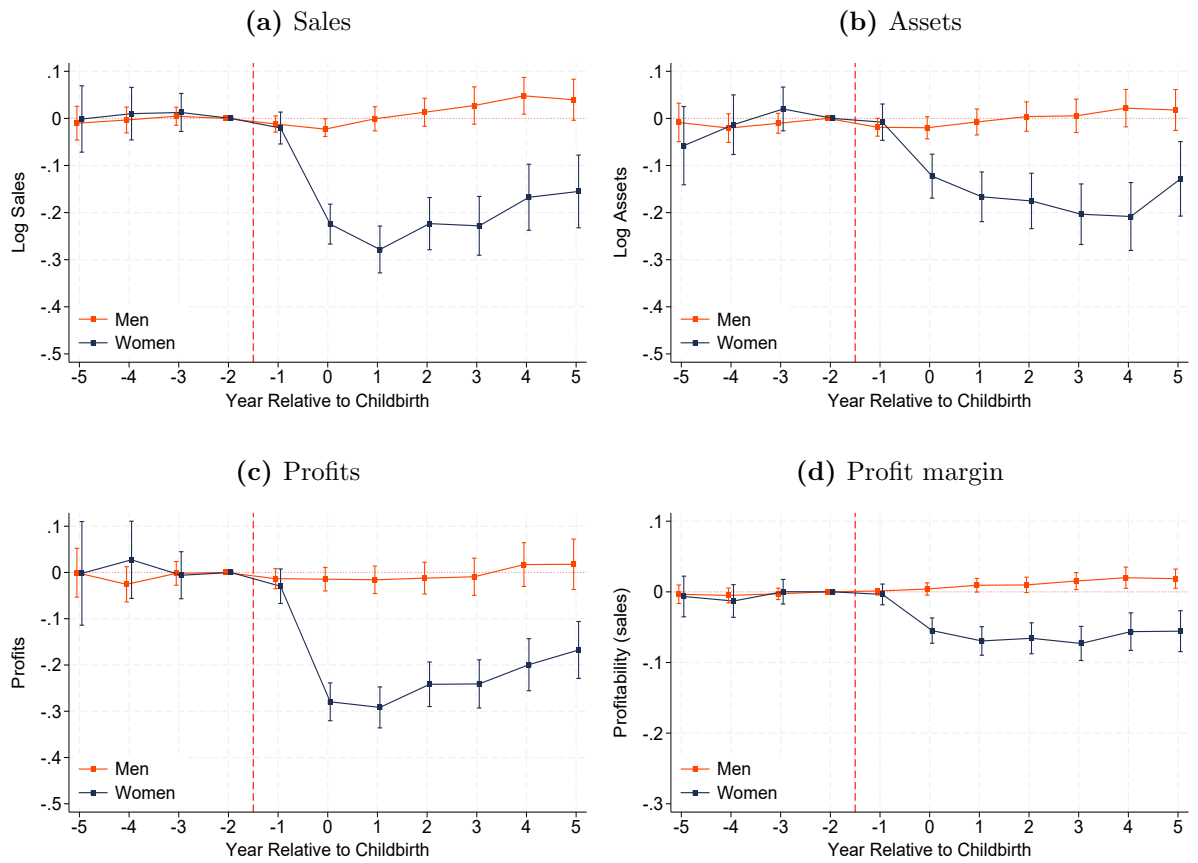
Notes: The graphs show event-study estimates obtained by fitting equation 1 on log sales (panel (a)), log assets (panel (b)), profits (panel (c)), and profit margin (panel (d)). Year 0 is when the first childbirth event takes place. The treated group is a sample of firms owned by a female entrepreneur for at least two years before she had her first child. The control group is a matched sample of firms owned by female entrepreneurs with zero observed fertility. Coefficients for profits are reported as a percentage of the counterfactual outcome absent children. Profit margin is the ratio of profits to sales. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

Figure 2: Firm survival



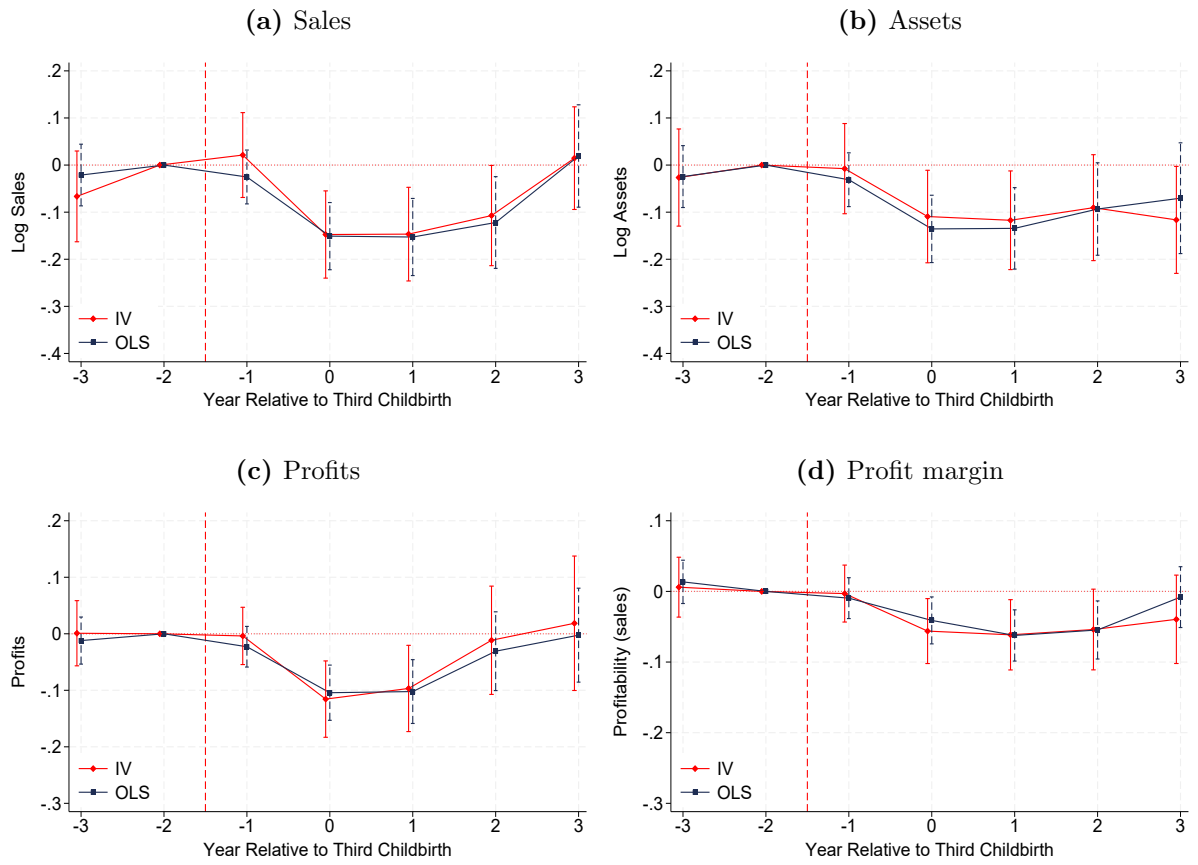
Notes: The graphs show event-study estimates obtained by fitting equation 1 on an indicator variable for firm survival. Year 0 is when the first childbirth event takes place. The treated group is a sample of firms owned by a female entrepreneur for at least two years before she had her first child. The control group is a matched sample of firms owned by female entrepreneurs with zero observed fertility. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

Figure 3: Effect of childbirth on firm outcomes: mothers vs. fathers



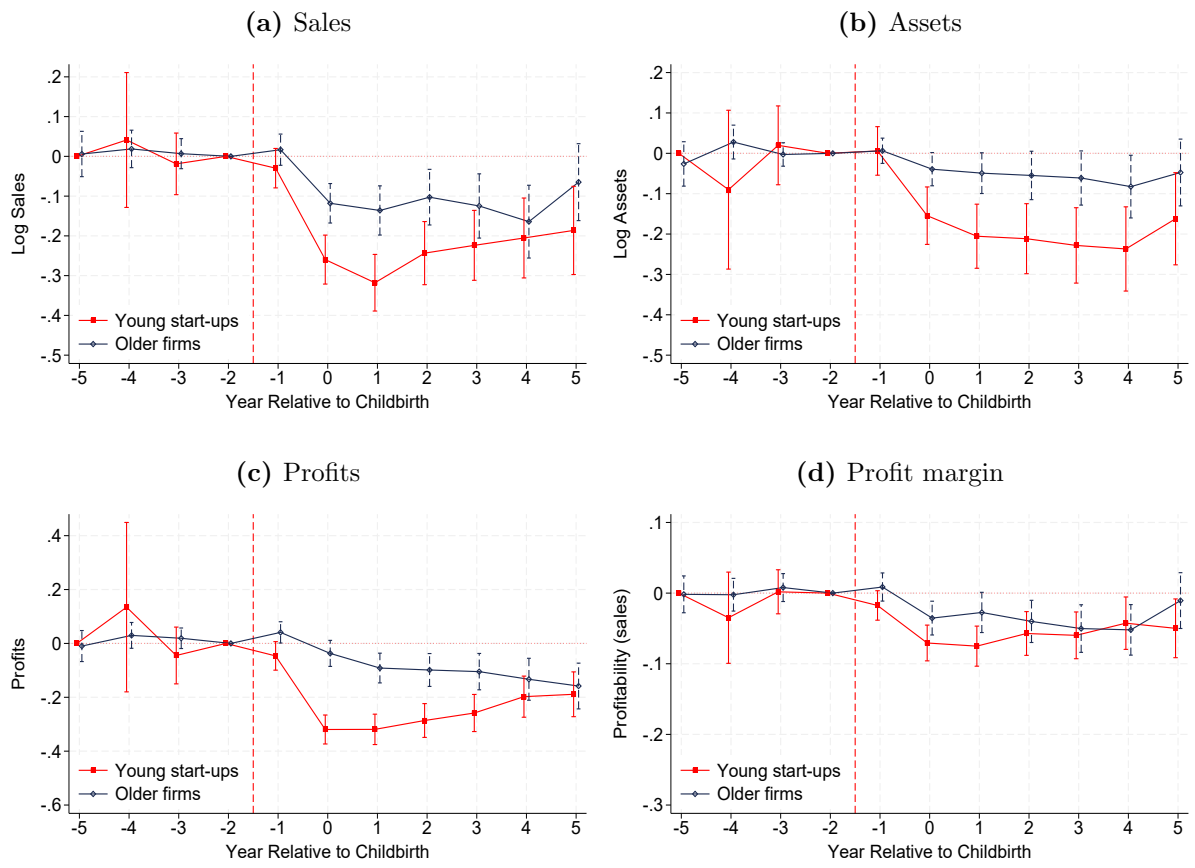
Notes: The graphs show event-study estimates obtained by fitting equation 1 on log sales (panel (a)), log assets (panel (b)), profits (panel (c)), and profit margin (panel (d)), separately for men and women. Year 0 is when the first childbirth event takes place. Coefficients for profits are reported as a percentage of the counterfactual outcome absent children. Profit margin is the ratio of profits to sales. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

Figure 4: Effect of childbirth on firm outcomes: sibling sex mix IV vs. OLS



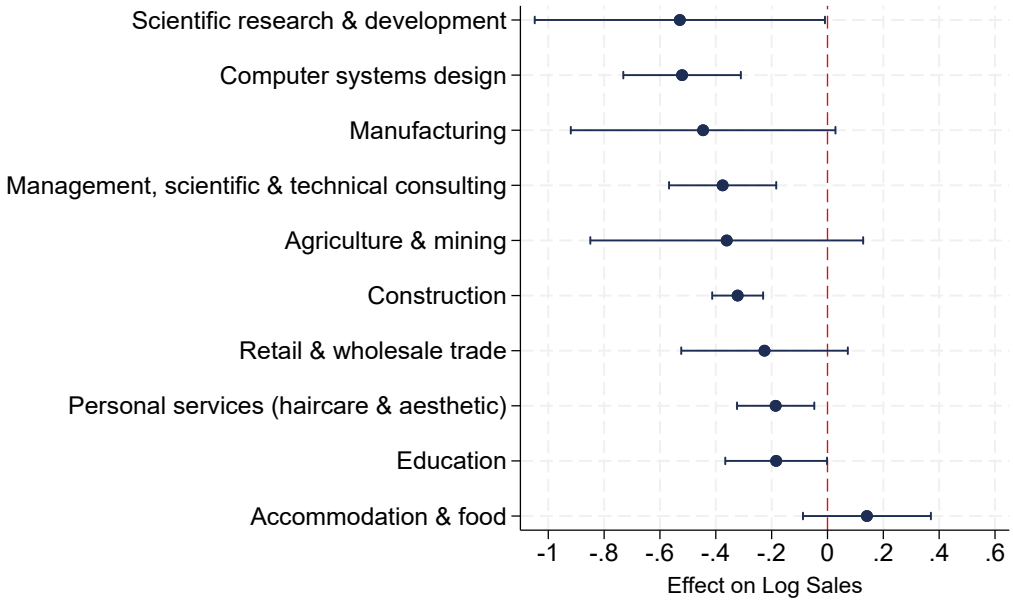
Notes: The graphs compare event-study estimates around third childbirth using an instrumental variable and OLS. The dependent variables are log sales (panel (a)), log assets (panel (b)), profits (panel (c)), and profit margin (panel (d)). Year 0 is when the first childbirth event takes place. For the IV design, I report event time coefficients β_κ estimated from equation 5. The instrumental variable specification is based on the sex mix of the first two children as instrument for the birth of a third child. Coefficients for profits are reported as a percentage of the counterfactual outcome absent children. Profit margin is the ratio of profits to sales. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, marital status, a dummy to indicate whether the individual already had their first child, and binned event time dummies with respect to the second child. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

Figure 5: Effect of childbirth on firm outcomes by firm age



Notes: The graphs show event-study estimates obtained by fitting equation 1 on log sales (panel (a)), log assets (panel (b)), profits (panel (c)), and profit margin (panel (d)), separately by firm age. Young start-ups are firms that experienced the entrepreneur's first childbirth when they were at most 5 years old. Older firms are defined as firms that were older than 5 when the entrepreneur had her first child. Year 0 is when the first childbirth event takes place. The treated group is a sample of firms owned by a female entrepreneur for at least two years before she had her first child. The control group is a matched sample of firms owned by female entrepreneurs with zero observed fertility. Coefficients for profits are reported as a percentage of the counterfactual outcome absent children. Profit margin is the ratio of profits to sales. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

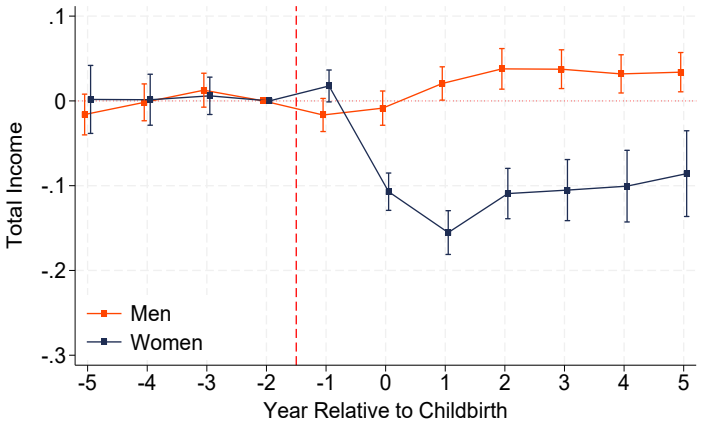
Figure 6: Effect of childbirth on log sales by industry



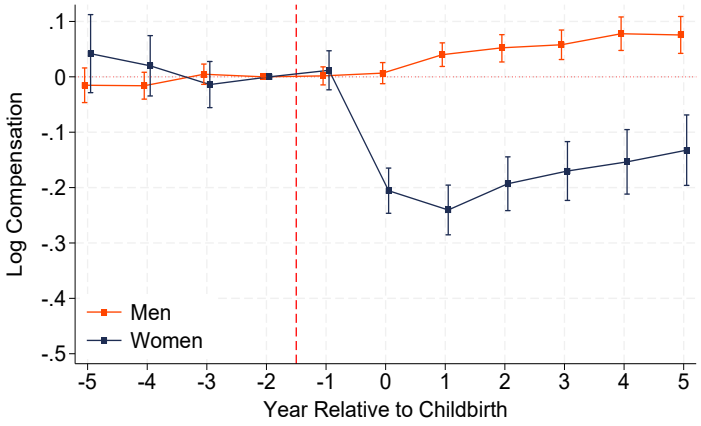
Notes: The graphs show event-study estimates obtained by fitting a two-period version of equation 1 on log sales, separately by industry. I report coefficients on the interaction $Post \times Mother_j$. Post is an indicator equal to 1 in the year of birth of the first child or after. The treated group is a sample of firms owned by a female entrepreneur for at least two years before she had her first child. The control group is a matched sample of firms owned by female entrepreneurs with zero observed fertility. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included, where industry codes are at the 4-digit level. I report 95% confidence intervals based on standard errors clustered at the firm level.

Figure 7: Effect of childbirth on entrepreneur's career outcomes

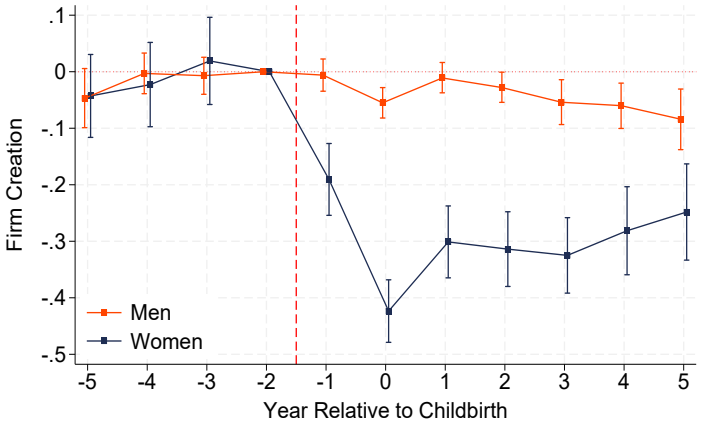
(a) Total income



(b) Entrepreneur's compensation

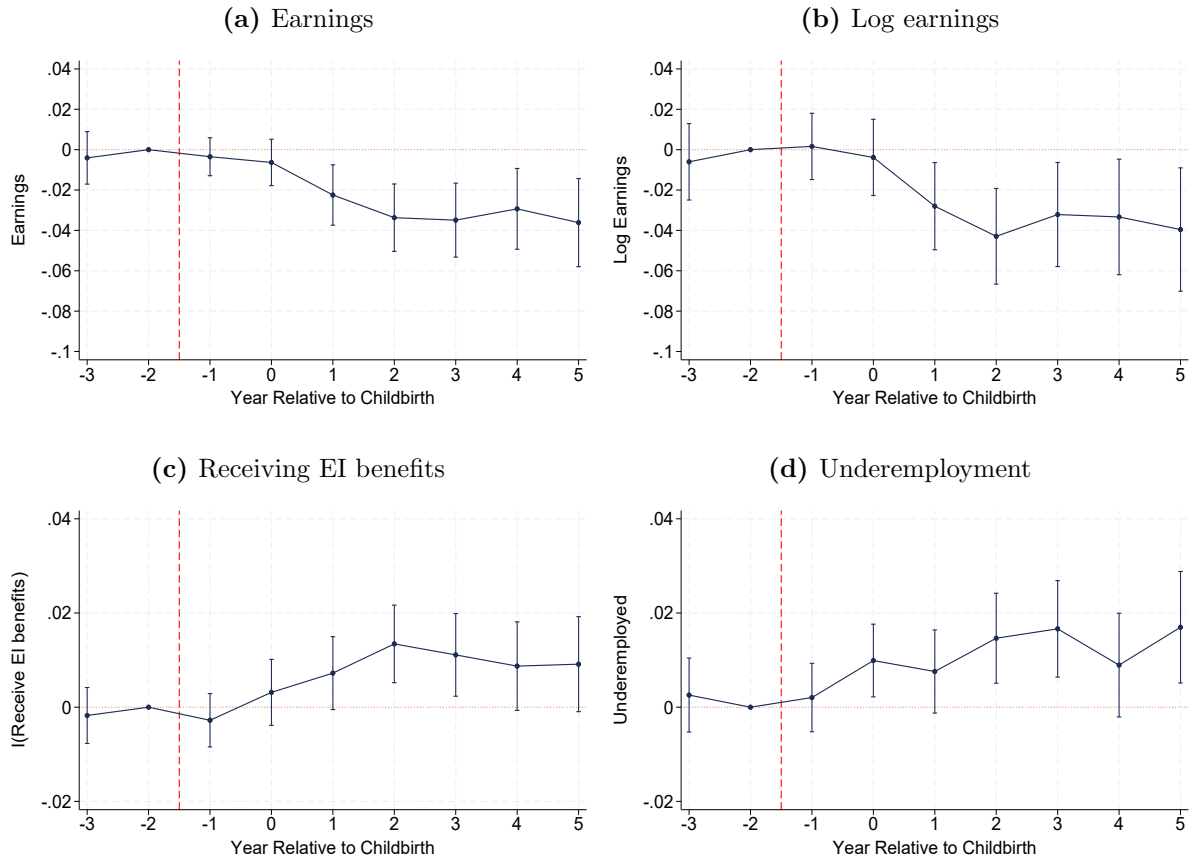


(c) Firm creation rates



Notes: The graphs show the effect of childbirth on entrepreneurial career outcomes, separately by gender. Year 0 is when the first childbirth event takes place. Panel (a) and (b) report coefficients obtained by fitting variations of equation 1, for the sample of individuals who were entrepreneurs for at least two years before the first childbirth event. In panel (a), total income is income from all sources, irrespective of whether the individual is still an entrepreneur at any point. Coefficients are reported as a percentage of the counterfactual outcome absent children. Control variables include a polynomial for individual age and marital status. Individual and year fixed effects are included. In panel (b), entrepreneurs' compensation is the sum of wages and dividends entrepreneurs take from their firms (conditional on the firm being active). Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. Panel (c) reports event-study estimates obtained fitting equation 2, separately by gender, irrespective of any entrepreneurial experience prior to childbirth. Coefficients are reported as a percentage of the counterfactual outcome absent children. Control variables include indicators for individual age and marital status. Individual and year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the individual level (panel (a) and (c)) and at the firm level (panel (b)).

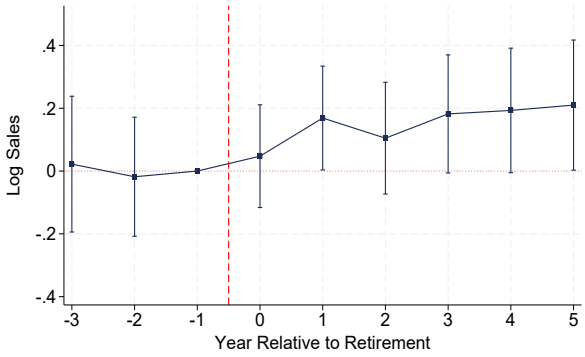
Figure 8: Effect of childbirth on worker outcomes



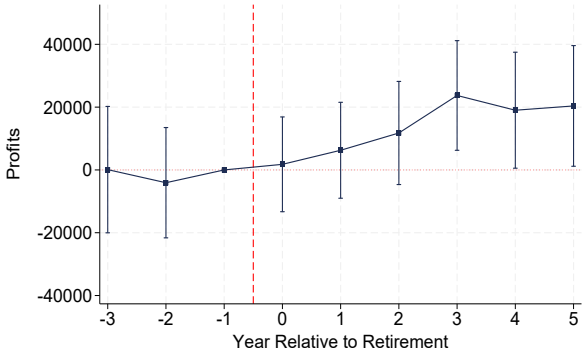
Notes: The graphs show event-study estimates obtained by fitting equation 3 on total earnings (panel (a)), log earnings (panel (b)), the probability of receiving EI benefits (panel (c)), and underemployment (panel (d)). Year 0 is when the entrepreneur's first childbirth event takes place. The treated group include workers employed in firms in which the entrepreneur had a child, compared to a control group of workers employed in a matched sample of firms owned by women with zero observed fertility. In panel (a), earnings refer to total employment income in year t and coefficients are expressed as a percentage deviation from the counterfactual earnings trajectory in the absence of childbirth. In panel (c), receiving EI benefits is an indicator equal to 1 if the individual reports positive income from unemployment insurance. In panel (d), underemployment is an indicator equal to 1 if the individual earns in one year less than an amount equivalent to 12 weeks of full-time employment at minimum wage. Control variables include indicators for worker age. Worker and year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the worker level.

Figure 9: Effect of grandmother's retirement on mothers' firm outcomes

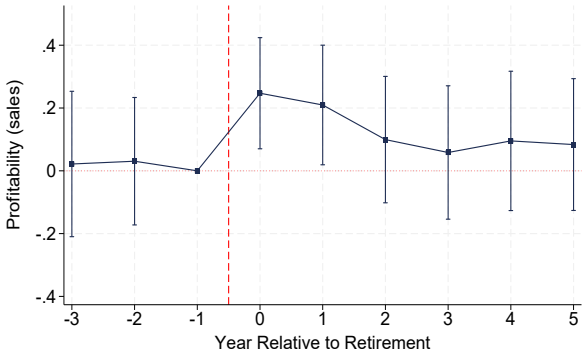
(a) Sales



(b) Profits



(c) Profit margin



Notes: The graphs show event-study estimates around grandmother's retirement for log sales (panel (a)), profits (panel (b)), and profit margin (panel (c)). Year 0 is when the grandmother retires. The sample includes mother entrepreneurs who can be matched to their own family of origin through tax files. The treated group includes women who live in the same municipality as their mother, compared to a control group of women whose mother lives in a different municipality. Coefficients for profits are reported in real terms (2012 CPI). Profit margin is the ratio of profits to sales. Control variables include indicators for firm age, a polynomial for entrepreneur's age, and indicators for whether or not a grandfather is also retired and lives in the same municipality. Firm and industry × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

Tables

Table 1: Descriptive statistics

Panel A: firms

	(1) **All mothers**	(2) **Matched mothers**	(3) **Matched controls**	(4) **Standardized difference**	(5) **Variance ratio**
Firm age	2.6	2.7	2.6	0.05	1.10
	(2.1)	(2.1)	(2.0)		
No. owners	1.53	1.48	1.40	0.10	0.95
	(0.89)	(0.76)	(0.78)		
Equity share	78.2	80.4	83.2	-0.11	1.10
	(29.1)	(28.1)	(26.8)		
Log Sales	11.7	11.8	11.8	0.04	1.00
	(2.3)	(2.0)	(2.0)		
Log Assets	10.8	11.0	10.9	0.03	1.01
	(2.7)	(2.5)	(2.5)		
Net income (000)	30.5	40.7	40.0	0.01	1.01
	(82.4)	(90.8)	(90.4)		
Service sectors	94.5%	89.9%	89.9%	–	–
Number of observations	20,235	11,290	11,290		

Panel B: entrepreneurs

	(1) **All mothers**	(2) **Matched mothers**	(3) **Matched controls**	(4) **Standardized difference**	(5) **Variance ratio**
Age	31.1	31.7	32.4	-0.16	0.71
	(4.3)	(4.3)	(5.1)		
Total income (000)	64.5	71.1	70.6	0.01	1.28
	(116.0)	(111.6)	(98.5)		
Family income (000)	127.7	133.6	132.5	0.01	0.66
	(205.5)	(190.2)	(234.7)		
Married	65%	59%	59%	–	–
Number of observations	20,865	11,485	11,485		

Notes: This table presents summary statistics for firms (Panel A) and entrepreneurs (Panel B). Summary statistics are reported at the earliest between $t-2$ and $t-1$. Column (4) reports the standardized mean difference between the treated (T) and the control (C) samples, calculated as $(\bar{x}_T - \bar{x}_C)/\sqrt{s^2}$, where s^2 is the pooled variance. Column (5) reports the variance ratio, s_T^2/s_C^2. Standard deviations are reported in parenthesis. The numbers of observations are rounded to the nearest five to comply with the confidentiality requirements of Statistics Canada.

Table 2: Top-performing firms

	Top 20% by assets			Top 20% by value added		
	(1)	(2)	(3)	(4)	(5)	(6)
	Log Sales	**Profits**	**Profit margin**	**Log Sales**	**Profits**	**Profit margin**
Post × Mother	-0.121***	-29,147***	-0.059***	-0.180***	-42,764***	-0.055***
	(0.041)	(4,337)	(0.015)	(0.028)	(3,666)	(0.009)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry × province × year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	24,435	24,435	24,435	32,425	32,425	32,425

Notes: This table examines outcomes for the top quintile of the firm distribution. The top quintile is calculated two years before childbirth, using the full sample of male- and female-owned firms within each cohort. The difference in sample size between columns (1)-(3) and columns (4)-(6) is due to the fact that more women-owned firms rank in the top quintile by value added than in the top quintile by assets. The treated group is a sample of firms owned by a female entrepreneur for at least two years before she had her first child. The control group is a matched sample of firms owned by female entrepreneurs with zero observed fertility. "Post" is an indicator equal to 1 in the year of birth of the first child or after. Profits are expressed in constant 2012 dollars. Controls include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Standard errors are reported in parenthesis and are clustered at the firm level. * indicates statistical significance at the 10% level, ** at the 5% level, and *** at the 1% level. The numbers of observations are rounded to the nearest five to comply with the confidentiality requirements of Statistics Canada.

Table 3: Firm risk taking

	(1) σ**(ROA)**	(2) σ**(Profits)**	(3) **Leverage**
Post × Mother	0.019	661	0.025**
	(1.017)	(837)	(0.011)
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Industry × province × year FE	Yes	Yes	Yes
Number of observations	157,470	157,470	157,470

Notes: This table examines the impact of childbirth on firm risk-taking. The treated group is a sample of firms owned by a female entrepreneur for at least two years before she had her first child. The control group is a matched sample of firms owned by female entrepreneurs with zero observed fertility. "Post" is an indicator equal to 1 in the year of birth of the first child or after. The dependent variable in column (1), σ(ROA), is the standard deviation of the return on assets, computed separately before and after childbirth. The dependent variable in column (2), σ(Profit), is the standard deviation of net income, calculated separately before and after childbirth, in constant 2012 dollars. The dependent varaible in column (3), Leverage, is the ratio of total long term liabilities to total assets, reflecting the firm's reliance on debt financing. Control variables iinclude firm age, the number of owners, and marital status. Standard errors are clustered at the firm level. * indicates statistical significance at the 10% level, ** at the 5% level, and *** at the 1% level. The numbers of observations are rounded to the nearest five to comply with the confidentiality requirements of Statistics Canada.

Table 4: Specialization within the household

Panel A: firm outcomes

	Raw			Inverse Probability Weighting		
	(1) **Log Sales**	(2) **Profits**	(3) **Profit Margin**	(4) **Log Sales**	(5) **Profits**	(6) **Profit Margin**
Post × Mother	-0.345***	-16,486***	-0.078***	-0.348***	-22,310***	-0.077***
	(0.034)	(1,523)	(0.012)	(0.035)	(2,016)	(0.011)
Post × Mother × Main earner	0.153***	-5,987**	0.021	0.143***	1,111	0.014
	(0.045)	(2,516)	(0.016)	(0.048)	(2,704)	(0.017)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry × province × year effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.800	0.770	0.658	0.800	0.768	0.657
Number of observations	86,110	93,745	86,110	80,125	83,945	80,125

Panel B: income

	(1) **Household Income**	(2) **Individual Income**	(3) **Spousal Income**
Post × Mother	0.073***	-0.069*	0.122***
	(0.016)	(0.039)	(0.017)
Post × Mother × Main earner	-0.067***	-0.130***	0.022
	(0.024)	(0.047)	(0.028)
Controls	Yes	Yes	Yes
Individual effects	Yes	Yes	Yes
Province × year effects	Yes	Yes	Yes
R^2	0.522	0.454	0.626
Number of observations	227,195	225,440	133,570

Notes: This table examines variation in firm and individual-level outcomes depending on main earner status. The sample is restricted to entrepreneurs who were married or cohabiting the year before giving birth to their first child. "Main earner" is an indicator equal to 1 if the mother earned more than 50% of the household income in the 3 years before childbirth. Panel A examines firm outcomes for main vs. secondary earners. In columns (4)-(6), observations are reweighted to achieve a balanced distribution of firm characteristics between main and secondary earners. Panel B examines the effect on log income, irrespective of whether the individual is still an entrepreneur at any point. The control group includes the entrepreneurs who own the matched firms and their spouses (spouses stay in the sample if they are still married to the entrepreneur). Controls in Panel B include a polynomial for individual age, marital status, and interaction between main earner status and marital status. Standard errors are reported in parenthesis and are clustered at the firm level (Panel A) and at the individual level (Panel B). * indicates statistical significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Table 5: Cultural norms and firm outcomes

	Mothers (founders)			Mothers (all firm owners)			Fathers (founders)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Log Sales	**Profits**	**Profit Margin**	**Log Sales**	**Profits**	**Profit Margin**	**Log Sales**	**Profits**	**Profit Margin**
Post × Traditional	-0.256**	-34,205***	-0.141**	-0.253***	-18,000***	-0.081***	0.176**	-1,953	0.027
	(0.123)	(4,705)	(0.061)	(0.088)	(3,582)	(0.028)	(0.070)	(5,718)	(0.033)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province × year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.800	0.762	0.680	0.822	0.812	0.652	0.793	0.703	0.600
Number of observations	8,525	9,475	8,525	15,670	18,020	15,670	31,430	34,845	31,430

Notes: This table presents regression estimates examining variation in mothers' and fathers' firm outcomes depending on cultural norms. The sample includes parents who are second-generation immigrant entrepreneurs, i.e., individuals born in Canada from foreign-born parents. "Post" is an indicator equal to 1 in the year of birth of the first child or after. "Traditional" is an indicator equal to 1 if the entrepreneur's parents immigrated from a country with traditional gender norms. The construction of the gender norms index is detailed in Appendix C. Columns (1)-(3) show results for mothers who are founders; columns (4)-(6) for all mothers who are business owners. Columns (7)-(9) shows results for fathers who are founders. Profits are expressed in constant 2012 dollars. Controls include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Standard errors are reported in parentheses and are clustered at the firm and landing year *times* country of origin level. * indicates statistical significance at the 10% level, ** at the 5% level, and *** at the 1% level. The numbers of observations are rounded to the nearest five to comply with the confidentiality requirements of Statistics Canada.

Table 6: Proximity to grandparents and firm outcomes

Panel A: mothers

	(1) **Log Sales**	(2) **Profits**	(3) **Profit Margin**
Post × Close to grandparents	0.133***	5,728**	0.071***
	(0.035)	(2,287)	(0.024)
Controls	Yes	Yes	Yes
Industry × province × year effects	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes
R^2	0.803	0.756	0.598
Number of observations	49,770	54,820	49,770

Panel B: fathers

	(1) **Log Sales**	(2) **Profits**	(3) **Profit Margin**
Post × Close to grandparents	0.019	-3,748***	0.007
	(0.019)	(1,338)	(0.012)
Controls	Yes	Yes	Yes
Industry × province × year effects	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes
R^2	0.766	0.670	0.496
Number of observations	236,635	259,890	236,635

Notes: This table presents regression estimates examining variation in mothers' and fathers' firm outcomes depending on proximity to grandparents. "Post" is an indicator equal to 1 in the year of birth of the first child or after. "Close to grandparents" is an indicator equal to 1 if the grandparents live in the same municipality as the parent, as a proxy for the availability of informal childcare through family networks. Panel A shows results for firms owned by mothers; Panel B for firms owned by fathers. The sample includes mother and father entrepreneurs who can be matched to their own family of origin through tax files. Profits are expressed in constant 2012 dollars. Controls include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Standard errors are reported in parenthesis and clustered at the firm level. * indicates statistical significance at the 10% level, ** at the 5% level, and *** at the 1% level. The numbers of observations are rounded to the nearest five to comply with the confidentiality requirements of Statistics Canada.

Table 7: Formal childcare expansion and firm outcomes

Panel A: mothers

	(1) **Log Sales**	(2) **Profits**	(3) **Profit Margin**
Post expansion × Mother	-0.048	711	-0.054*
	(0.041)	(2,992)	(0.029)
Post expansion × Mother × Child under two	0.113**	4,625	0.072***
	(0.050)	(3,913)	(0.027)
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Industry × year FE	Yes	Yes	Yes
Municipality × year FE	Yes	Yes	Yes
Number of observations	58,335	58,335	58,335

Panel B: mothers and fathers

	(1) **Log Sales**	(2) **Profits**	(3) **Profit Margin**
Post expansion × Father × Child under two	-0.028	-1,813	0.004
	(0.031)	(2,239)	(0.008)
Post expansion × Mother × Child under two	0.172***	11,494**	0.095***
	(0.050)	(4,819)	(0.031)
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Industry × year FE	Yes	Yes	Yes
Municipality × year FE	Yes	Yes	Yes
Number of observations	344,540	344,540	344,540

Notes: This table examines the effect of formal childcare expansion on firm outcomes. The sample include parents of children who are at most six years old. "Post expansion" is equal to 1 in or after the year the municipality experiences an increase in childcare provision of at least one standard deviation. "Child under two" is equal to 1 if the parent has a child who is two years old or younger at the time of expansion. In Panel A, mothers and their matches are part of the sample. In Panel B, men and their matches are also included. Profits are expressed in constant 2012 dollars. Controls include indicators for firm age, the number of firm owners, a polynomial for individual age, marital status, and indicators for the number of children under 3 years old in the household. Standard errors are double clustered at the firm and municipality level. * indicates statistical significance at the 10% level, ** at the 5% level, and *** at the 1% level. The numbers of observations are rounded to the nearest five to comply with the confidentiality requirements of Statistics Canada.

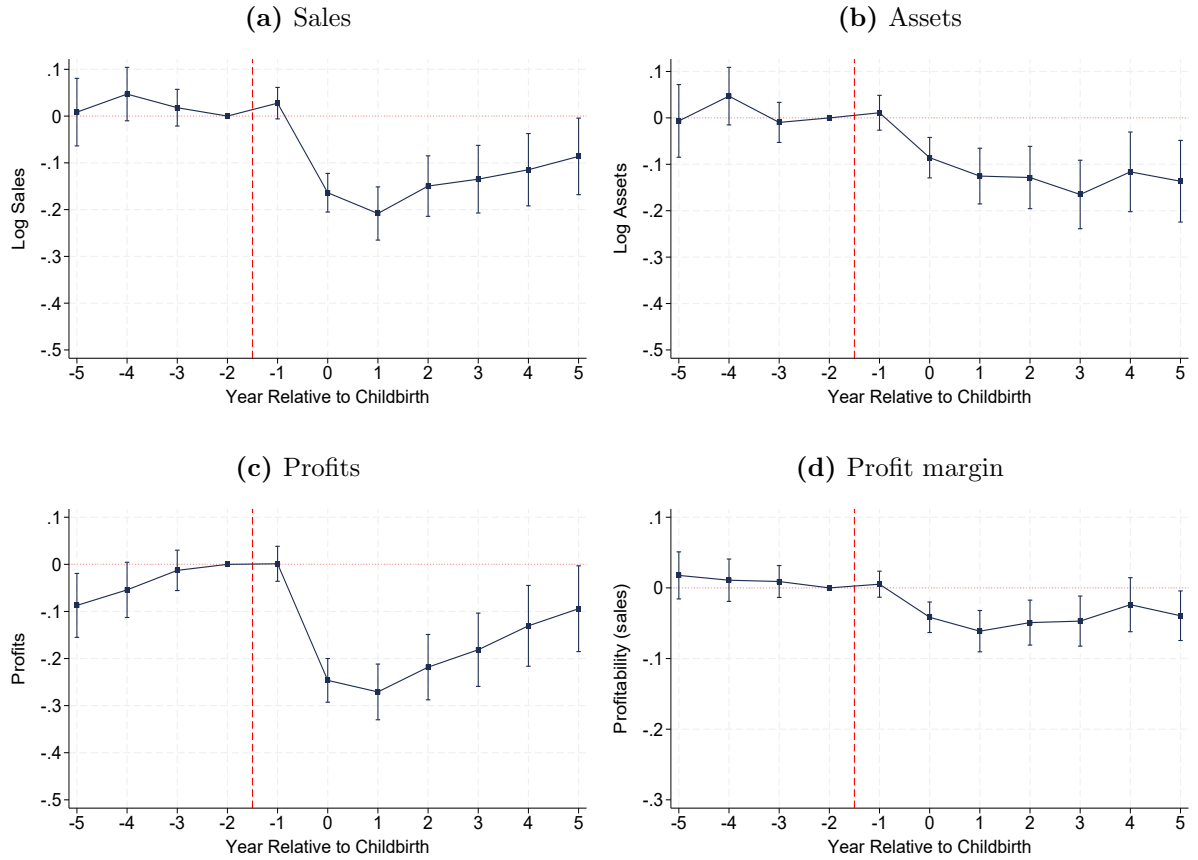
Internet Appendix to

"Minding Your Business or Your Child? Motherhood and the Entrepreneurship Gap"

Valentina Rutigliano
University of British Columbia

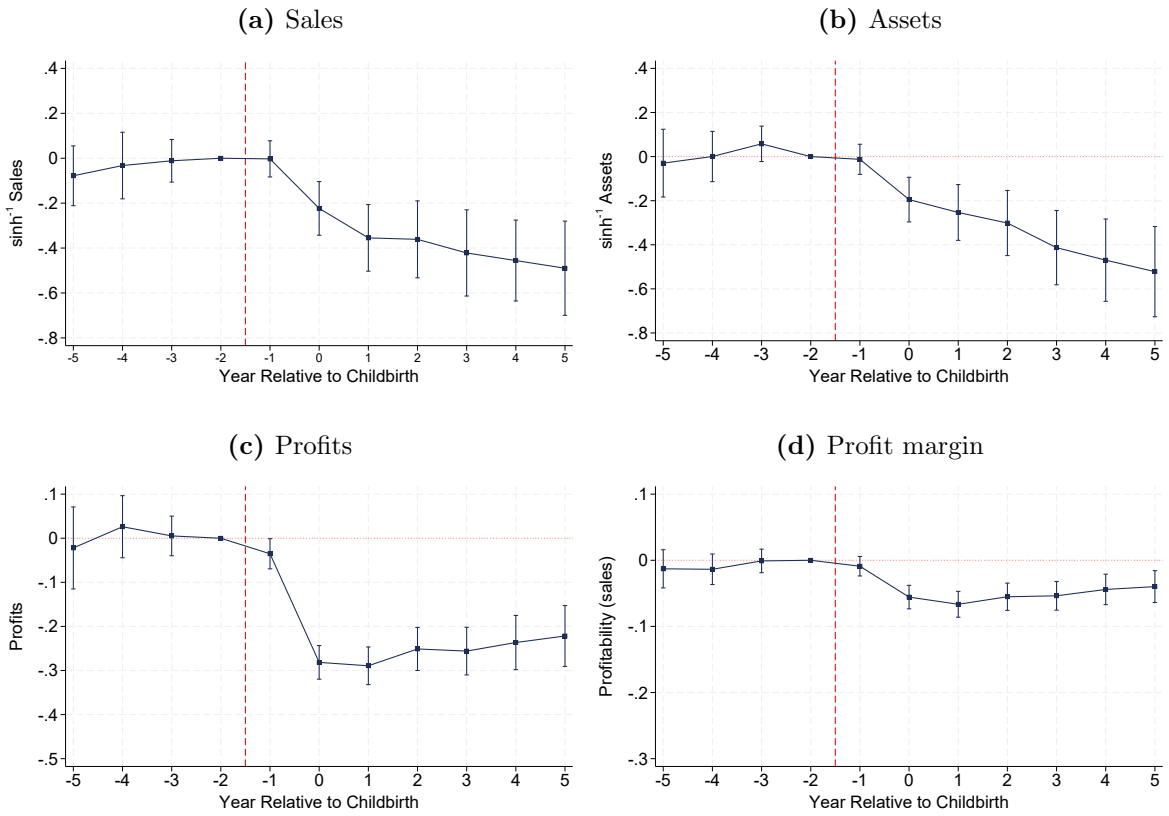
A Additional Figures and Tables

Figure A.1: Effect of childbirth on firm outcomes: control group with randomly assigned births



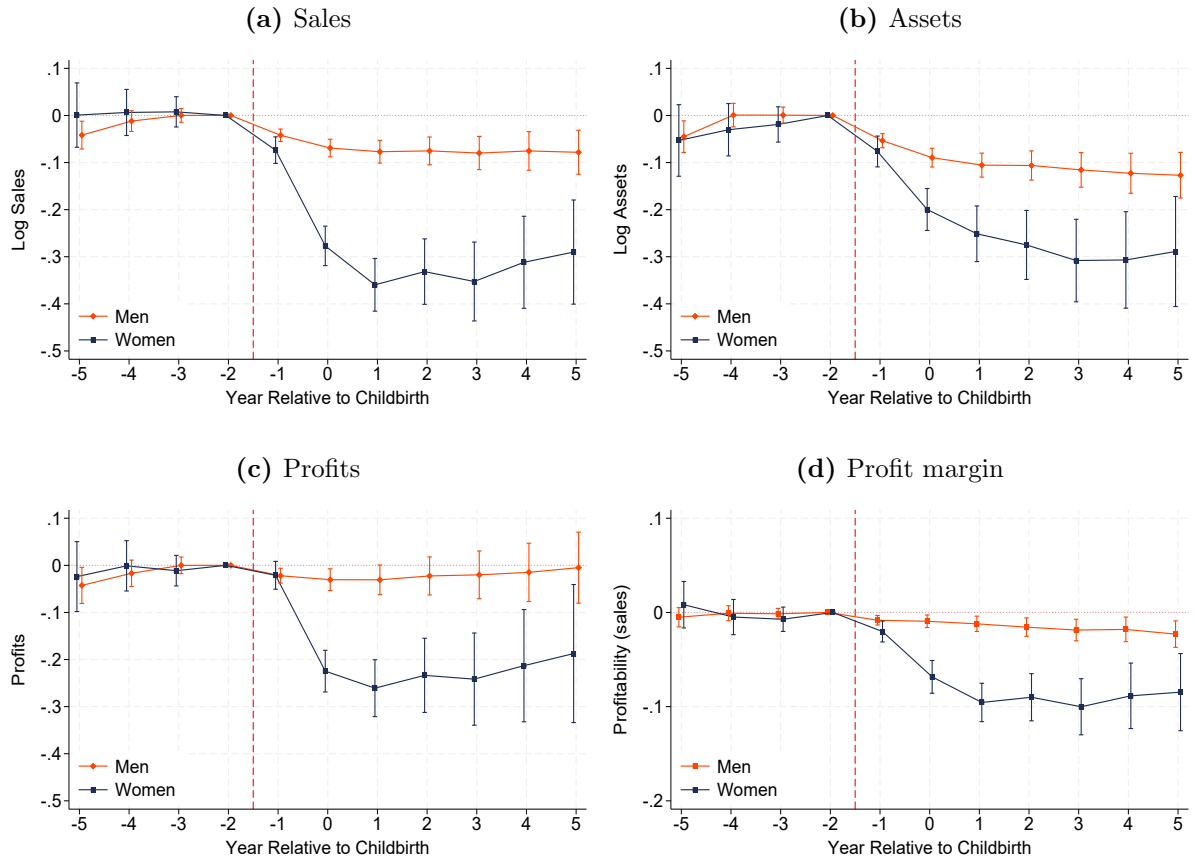
Notes: The graphs show event-study estimates obtained by fitting equation 1 on log sales (panel (a)), log assets (panel (b)), profits (panel (c)), and profit margin (panel (d)). Year 0 is when the first childbirth event takes place. The treated group is a sample of firms owned by a female entrepreneur for at least two years before she had her first child. The control group is a sample of firms owned by women with zero observed fertility. The control group was randomly assigned births based on the observed distribution of age at first child among mothers. Coefficients for profits are reported as a percentage of the counterfactual outcome absent children. Profit margin is the ratio of profits to sales. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

Figure A.2: Effect of childbirth on firm outcomes without conditioning on survival



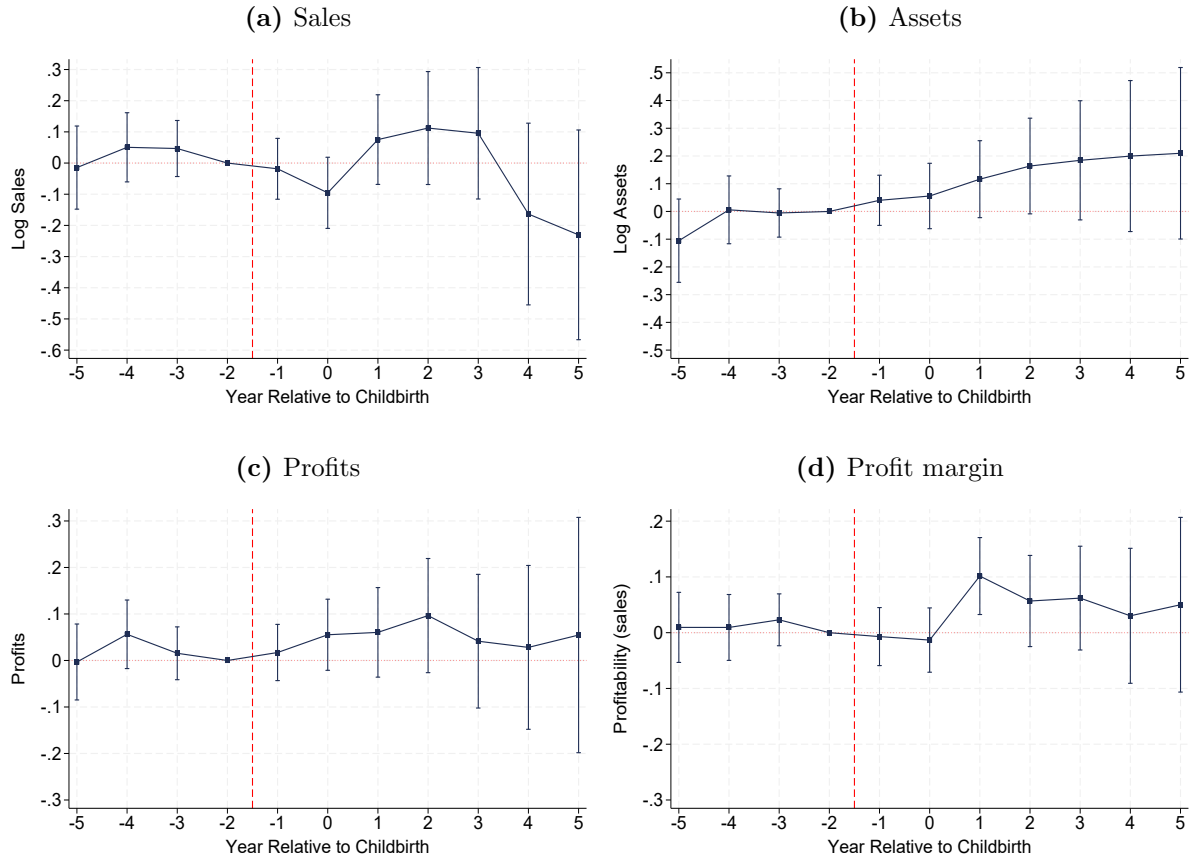
Notes: The graphs show event-study estimates obtained by fitting equation 1, without conditioning on firm survival. Firms that go out of business remain in the sample and their outcomes are set to 0. Logs are replaced by inverse hyperbolic sine. The control group is a matched sample of firms owned by women with zero observed fertility. Coefficients for profits are reported as a percentage of the counterfactual outcome absent children. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors which are clustered at the firm level.

Figure A.3: Effect of childbirth on firm outcomes: mothers vs. fathers



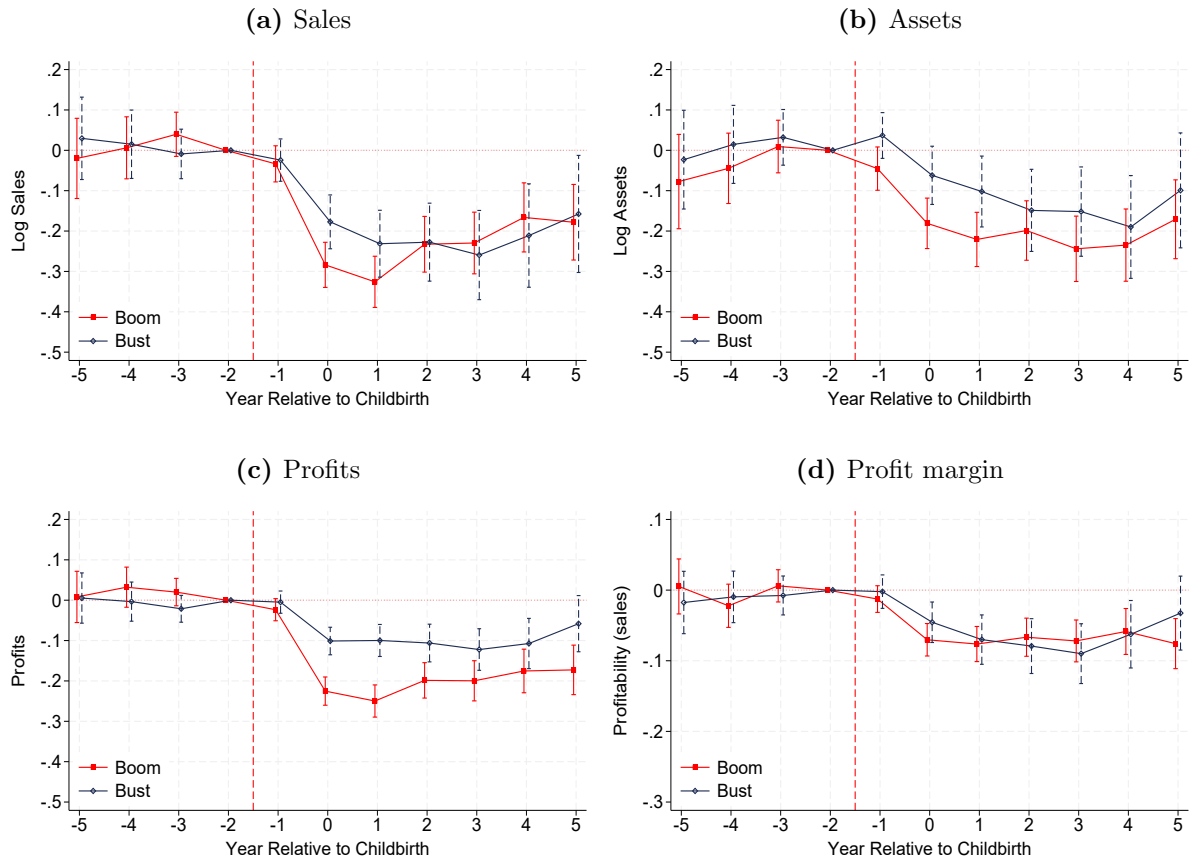
Notes: The graphs show event-study estimates obtained by estimating equation 1 on the sample restricted to parents, separately for mothers and fathers, following Kleven, Landais, and Søgaard (2019). Outcomes include log sales (panel (a)), log assets (panel (b)), profits (panel (c)), and profit margin (panel (d)). Year 0 is when the first childbirth event takes place. Coefficients for profits are reported as a percentage of the counterfactual outcome absent children. Profit margin is the ratio of profits to sales. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

Figure A.4: Effect of angel investors' childbirth on firm outcomes



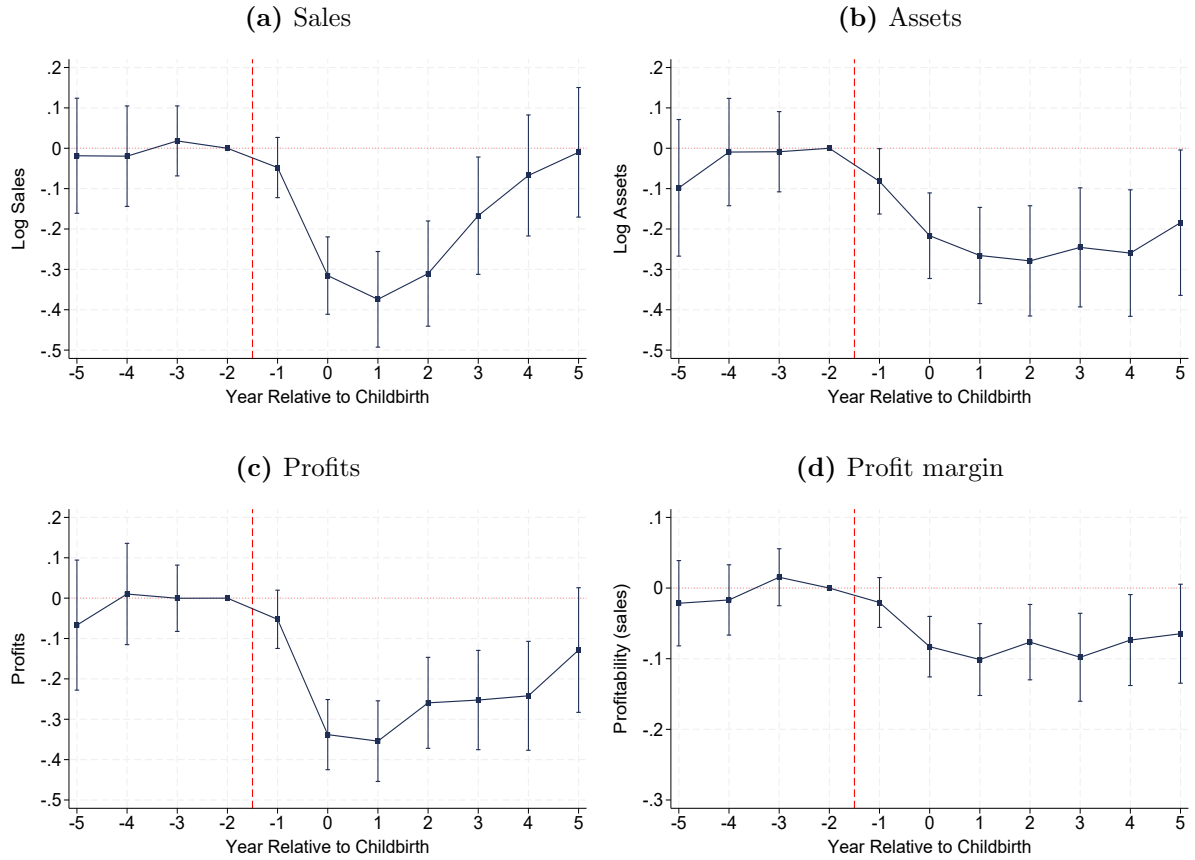
Notes: The graphs show event-study estimates obtained by fitting equation 1 on log sales (panel (a)), log assets (panel (b)), profits (panel (c)), and profit margin (panel (d)). The sample includes angel investors, defined as firm owners who are not founders and are never actively involved in the firm. Year 0 is when the first childbirth event takes place. The treated group is a sample of firms with an angel investor who owned shares in the firm for at least two years before she had her first child. The control group is a matched sample of firms with an angel investor with zero observed fertility. Coefficients for profits are reported as a percentage of the counterfactual outcome absent children. Profit margin is the ratio of profits to sales. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

Figure A.5: Firm outcomes by business cycle



Notes: The graphs show event-study estimates obtained by fitting equation 1 on log sales (panel (a)), log assets (panel (b)), profits (panel (c)), and profit margin (panel (d)), separately by industry performance in the year of the first childbirth. Booms are periods in which industry sales growth ranks in the upper tercile of all industry-years, while busts are periods of growth in the lower tercile. Only firms owned by male entrepreneurs are used to construct the terciles. Year 0 is when the first childbirth event takes place. The treated group is a sample of firms owned by a female entrepreneur for at least two years before she had her first child. The control group is a matched sample of firms owned by female entrepreneurs with zero observed fertility. Coefficients for profits are reported as a percentage of the counterfactual outcome absent children. Profit margin is the ratio of profits to sales. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

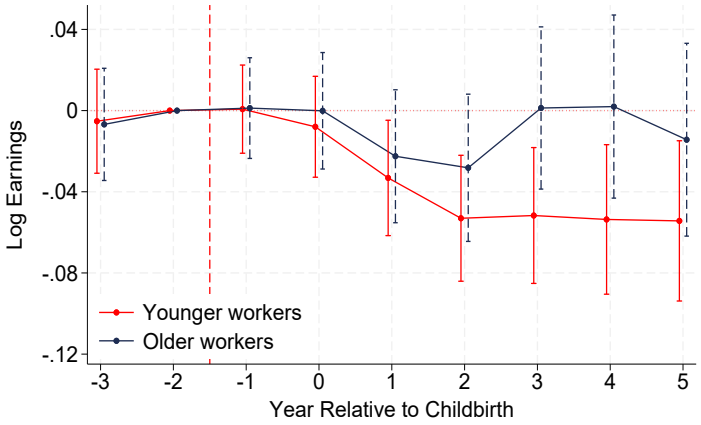
Figure A.6: Effect of childbirth on firm outcomes for women over 35



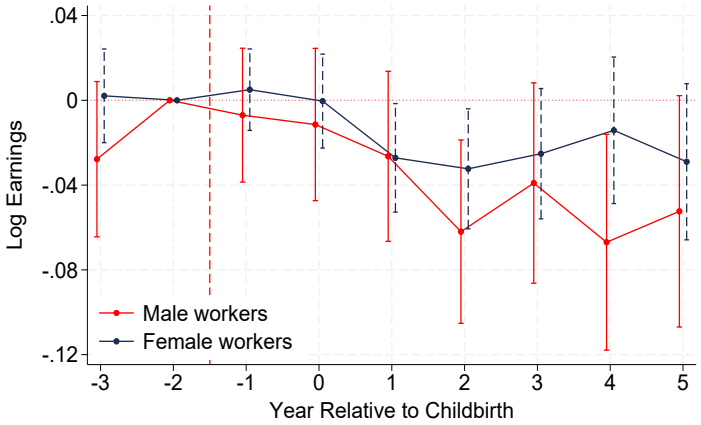
Notes: The graphs show event-study estimates obtained by fitting equation 1 on log sales (panel (a)), log assets (panel (b)), profits (panel (c)), and profit margin (panel (d)). The sample is restricted to women who were over 35 when they had their first child and were single (not married or cohabiting) when they started their firm. Year 0 is when the first childbirth event takes place. The treated group is a sample of firms owned by a female entrepreneur for at least two years before she had her first child. The control group is a matched sample of firms owned by female entrepreneurs with zero observed fertility. Coefficients for profits are reported as a percentage of the counterfactual outcome absent children. Profit margin is the ratio of profits to sales. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

Figure A.7: Effect of childbirth on workers' earnings by age and sex

(a) Worker age

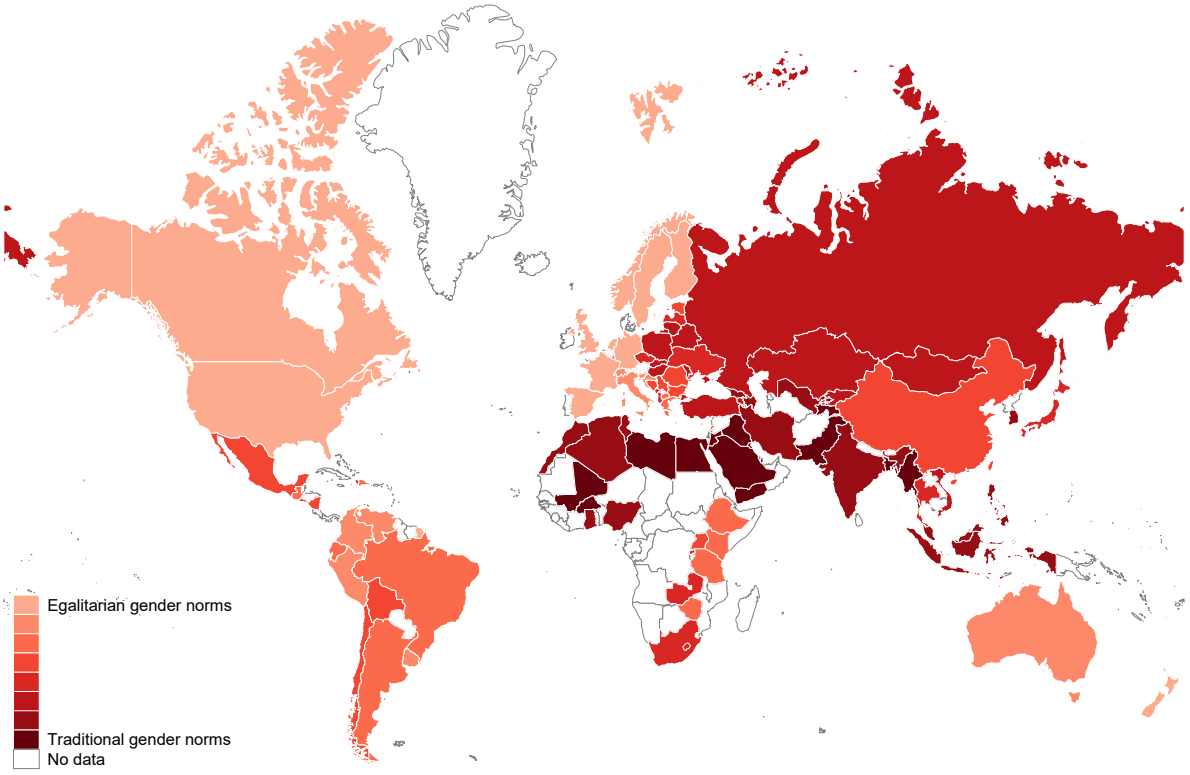


(b) Worker sex



Notes: The graphs show event-study estimates obtained by fitting equation 3 on log earnings by worker age and sex. Year 0 is when the entrepreneur's first childbirth event takes place. The treated group include workers employed in firms in which the entrepreneur had a child, compared to a control group of workers employed in a matched sample of firms owned by women with zero observed fertility. Panel (a) shows results for workers who were above or below the median age of 33 when the entrepreneur had a child. Panel (b) shows the earnings effects for male vs. female workers. Control variables include indicators for worker age. Worker and year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the worker level.

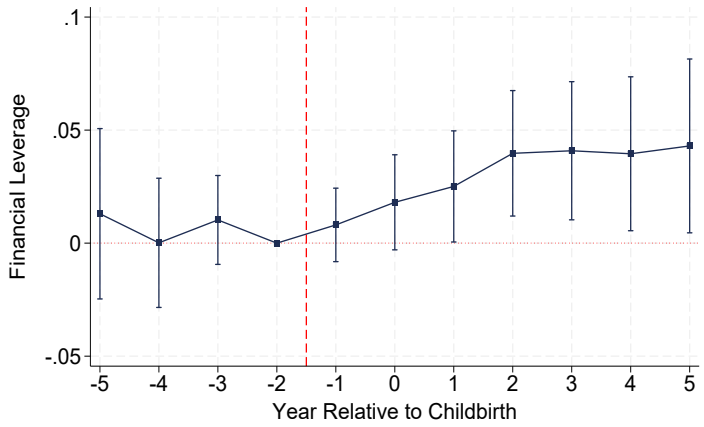
Figure A.8: Distribution of the gender progressivity index



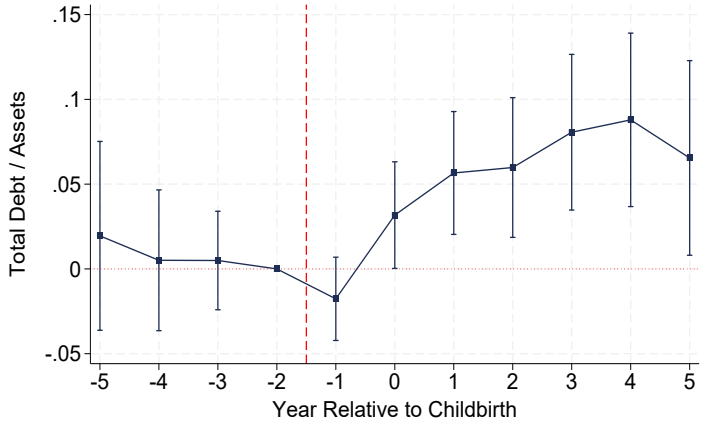
Notes: This figure depicts values of a gender progressivity index calculated using values from the World Values Survey. See Appendix C for details on index construction.

Figure A.9: Effect of childbirth on firm leverage

(a) Financial leverage



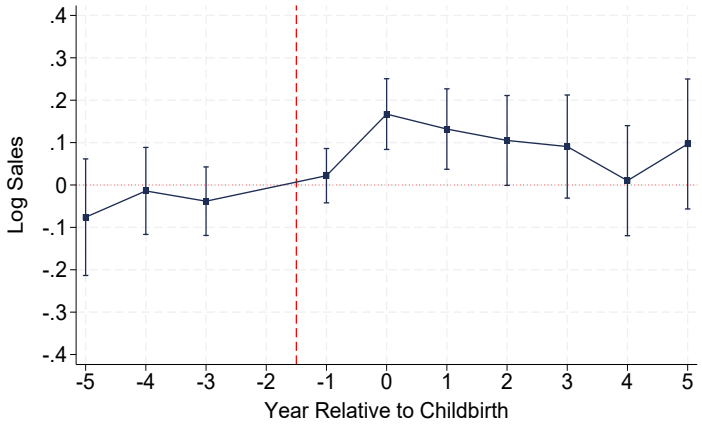
(b) Total debts / Assets



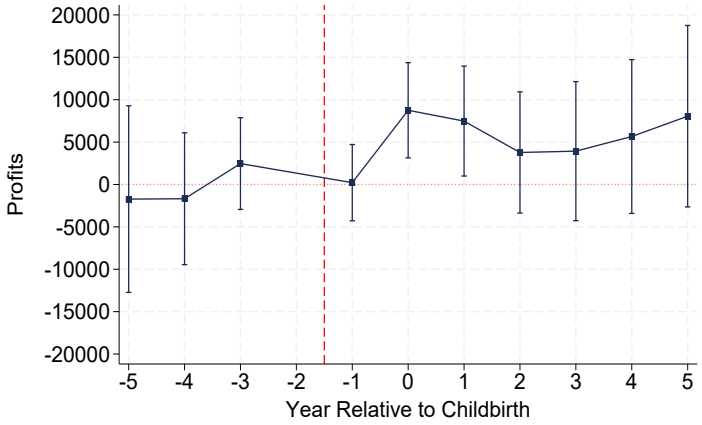
Notes: The graphs show event-study estimates obtained by fitting equation 1 on financial leverage (panel (a)) and the ratio of total debt to total assets (panel (b)). Financial leverage is the ratio of long term liabilities to total assets. Total debt is the difference between total assets and total equity. Year 0 is when the first childbirth event takes place. The treated group is a sample of firms owned by a female entrepreneur for at least two years before she had her first child. The control group is a matched sample of firms owned by female entrepreneurs with zero observed fertility. Control variables include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

Figure A.10: Proximity to grandparents and mothers' firm outcomes: event study

(a) Sales



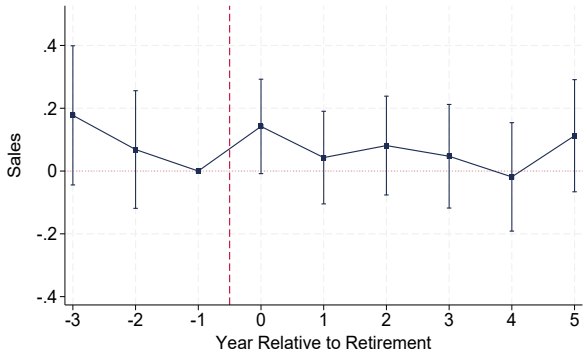
(b) Profits



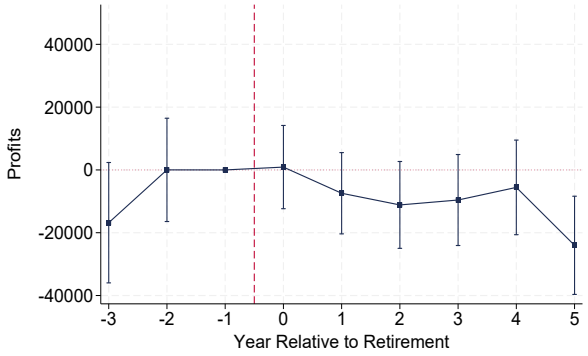
Notes: This figure depicts coefficients for the interaction of event time indicators relative to first childbirth and an indicator for proximity to grandparents, showing dynamic effects for the specification in Table 6. Firm effects and industry × province × year fixed effects are included. I report 95% confidence intervals based on standard errors which are clustered at the firm level.

Figure A.11: Effect of grandfather's retirement on mothers' firm outcomes

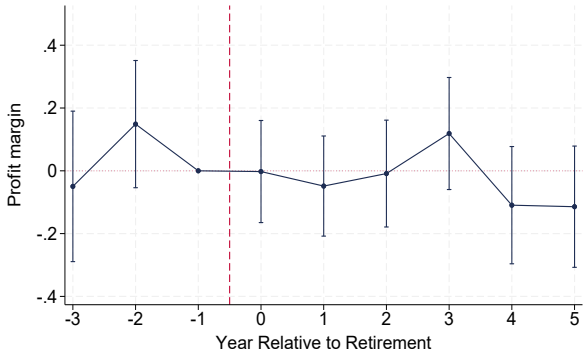
(a) Sales



(b) Profits



(c) Profit margin



Notes: The graphs show event-study estimates around grandfather's retirement for log sales (panel (a)), profits (panel (b)), and profit margin (panel (c)). Year 0 is when the grandfather retires. The sample includes mother entrepreneurs who can be matched to their own family of origin through tax files. The treated group includes women who live in the same municipality as their father, compared to a control group of women whose father lives in a different municipality. Coefficients for profits are reported in real terms (2012 CPI). Profit margin is the ratio of profits to sales. Control variables include indicators for firm age, a polynomial for entrepreneur's age, and indicators for whether or not a grandfather is also retired and lives in the same municipality. Firm and industry × year fixed effects are included. I report 95% confidence intervals based on standard errors clustered at the firm level.

Table A.1: Children's sex mix and family size

Panel A: family size

	(1) **Third child**	(2) **Third child**	(3) **Third child**	(4) **Second child**
Same sex	0.047***			
	(0.006)			
Two sons		0.045***		
		(0.008)		
Two daughters		0.049***		
		(0.008)		
First-born daughter			0.001	0.002
			(0.002)	(0.004)
Controls	Yes	Yes	Yes	Yes
Province × year effects	Yes	Yes	Yes	Yes
R^2	0.020	0.020	0.042	0.207
Number of observations	77,260	77,260	253,500	253,500

Panel B: descriptive statistics

		(1) **Same sex**	(2) **Different sex**
Married	%	84.0	83.9
Age	mean	33.8	33.7
	SD	5.0	5.0
Age at first childbirth	mean	30.0	30.0
	SD	3.1	3.1
Age at second childbirth	mean	32.8	32.8
	SD	3.3	3.2
Individual income	mean	68,911	69,624
	SD	99,975	126,787
Family income	mean	155,693	160,529
	SD	211,794	324,260
Number of observations		62,760	63,370

Notes: This table provides evidence on the same-sex instrumental variable. Panel A presents regression estimates examining the effect of children's sex mix on family size. Column (1) shows the effect of having two children of the same sex on the probability of having a third child, for a sample of female entrepreneurs with at least two children. Column (2) decomposes the the effect in column (1) into the effect of having two sons vs. two daughters. Column (3) and (4) show the effect of having a first-born daughter on the probability of having a third and second child, respectively, for the whole sample of female entrepreneurs who are mothers. Controls include marital status and a polynomial for age. Standard errors are reported in parenthesis and are clustered at the individual level. * indicates statistical significance at the 10% level, ** at the 5% level, and *** at the 1% level. Panel B shows descriptive statistics for the sample of women with two children, separately by the sex mix of the first two children. Individual and family income are reported in real terms (2012 CPI). The numbers of observations are rounded to the nearest five to comply with the confidentiality requirements of Statistics Canada.

Table A.2: Grandmother retirement and center-based childcare

	Log Sales	**Profits**	**Profit Margin**
Post × Close to grandma	0.217***	16,016**	0.144**
	(0.065)	(6,354)	(0.071)
Post × Close to grandma × High childcare	-0.176**	-16,515**	-0.212***
	(0.073)	(7,149)	(0.080)
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Industry × year FE	Yes	Yes	Yes
Municipality × year FE	Yes	Yes	Yes
Number of observations	37,190	37,190	37,190

Notes: This table examines the effect of grandmother retirement on firm outcomes, using a triple difference design. "Post retirement" is an indicator equal to 1 in the year of retirement or after. "Close to grandparents" is equal to 1 if the grandparents live in the same municipality as the parent. High childcare refers to municipalities with above median center-based childcare provision. Profits are expressed in constant 2012 dollars. Controls include indicators for firm age, the number of firm owners, a polynomial for individual age, and marital status. * indicates statistical significance at the 10% level, ** at the 5% level, and *** at the 1% level. The numbers of observations are rounded to the nearest five to comply with the confidentiality requirements of Statistics Canada.

B Theoretical Framework

The effect of childbirth on women's entrepreneurship rates is not obvious ex ante. While my empirical findings show a decline in firm creation rates post-childbirth, prior research has found opposite results. Yang, Kacperczyk, and Naldi (2024) find that, in Sweden, mothers are more likely to become entrepreneurs, suggesting that flexibility may be a primary driver of entrepreneurial entry for mothers. These contrasting findings can be rationalized through a model in which individuals sort into entrepreneurship and make fertility decisions endogenously. If women choose entrepreneurship because they value flexibility, then childbirth may increase entry rates and the marginal entrant may have relatively low productivity. In contrast, if entrepreneurship requires high productivity and long working hours that are difficult to reconcile with parenthood, then childbirth may instead lead to missing firms, even among relatively productive women. This distinction has implications for the firm size distribution. I develop a simple model of occupational choice, building on the canonical model of Lucas (1978). I introduce fertility choices in Subsection B.2.

B.1 Model of occupational choice

Individuals derive utility from both monetary payoffs and leisure, choosing between wage employment and entrepreneurship to maximize their utility. Productivity $z \in [0, \bar{z}]$ varies across individuals according to a known distribution $F(z)$. Workers receive a fixed wage w and must work h_w hours, earning total labor income $W = w \cdot h_w$. Conversely, entrepreneurs' income depends on their productivity and the time they allocate to their business. Unlike workers, entrepreneurs have the flexibility to optimally choose their working hours. Each individual has a total time endowment of H, so an individual who works h hours enjoys $H - h$ hours of leisure.

Each individual maximizes the following value function by choosing between wage employment ($x = 0$), where they earn the equilibrium wage, or entrepreneurship ($x = 1$), where they earn firm profits given the optimal labor demand and hours worked:

$$V(z, W) = \max_{x \in \{0,1\}} \left\{ (1 - x) \left[w \cdot h_w + \frac{(H - h_w)^{1-\gamma}}{1 - \gamma} \right] + x \max_{n,h} \left[f(z, h, n) - wn + \frac{(H - h)^{1-\gamma}}{1 - \gamma} \right] \right\}.$$

I assume that firms use workers' labor n and entrepreneur's labor h as inputs, where n represents the effective labor supply (the number of hired workers multiplied by h_w. Firm profits are increasing at a decreasing rate in both inputs ($f_n > 0$, $f_h > 0$, $f_{nn} < 0$,

$f_{hh} < 0$). In addition, I assume complementarity among inputs and between inputs and productivity, that is, all cross-partial derivatives of f are positive. Finally, the production function exhibits concavity in n and h, jointly, which requires that the determinant of the Hessian matrix of the function should be positive.

Entrepreneurs face a trade-off between profits and leisure. Higher productivity increases entrepreneurial labor supply h^*: the substitution effect prevails over the income effect. To see that entrepreneurs' hours worked are increasing in productivity, first note that $n_z > 0$:

$$\frac{\partial n(h;z,w)}{\partial z} = -\frac{\frac{\partial(f_n(z,h,n)-w)}{\partial z}}{\frac{\partial(f_n(z,h,n)-w)}{\partial n}} = \frac{-f_{nz}(n,z,h)}{f_{nn}(n,z,h)} > 0$$

Substituting the function for $n(\cdot)$ into the FOC for h, we obtain:

$$G(h,z,w) \equiv f_h(h,n(h;z,w),z) - (H-h)^{-\gamma} = 0.$$

Next, we apply the implicit function theorem to G to get:

$$\frac{\partial h^*}{\partial z} = -\frac{\frac{\partial G}{\partial z}}{\frac{\partial G}{\partial h^*}} = \frac{-f_{hz}(n(h;z,w),z,h) - f_{hn}(n(h;z,w),z,h)\frac{\partial n(h;z,w)}{\partial z}}{f_{hh}(n(w;z,h),z,h) - \gamma(H-h)^{-\gamma-1} + f_{hn}(n(h;z,w),z,h)\frac{\partial n(h;z,w)}{\partial h}} > 0.$$

As in Lucas (1978), the model's solution implies the existence of a single productivity threshold $\hat{z}$ above which individuals choose to become entrepreneurs.

B.2 Model of occupational choice with children

I now extend the model to encompass selection into parenthood. The model now features two periods to capture entry into and exit from entrepreneurship. In the first period, individuals make their first occupational choice under a veil of ignorance regarding their desire for children.[20] At the beginning of the second period, they draw a valuation of children $b \in [\underline{b}, \bar{b}]$, which represents the subjective benefit that individuals associate with becoming parents and is unique to each individual.

Women with children incur an additional disutility of hours worked $\phi(h)$, capturing the costs associated with being away from their children, such as the potential need to

[20] This assumption is inconsequential because there are no costs associated with exit from entrepreneurship, such as irrecoverable investment. Thus, the problem faced by individuals in this two-period model is again static.

rely on others for childcare, the loss of bonding opportunities, and cultural expectations. I assume that the disutility of work for mothers is increasing at a weakly increasing rate in hours worked: $\phi_h > 0$ and $\phi_{hh} \geq 0$. Alternatively, women with children have to devote a fixed number of hours κ to child-rearing responsibilities, so that the total number of available working hours is now $H' = H - \kappa$.[21]

Workers with children switch to a part-time contract; denoting as h_1 the hours worked by non-parents, parents work $h_2 < h_1$ hours.[22] Each part-time worker is equivalent to h_2/h_1 full-time workers.[23] After learning their value of children b, individuals weigh the costs and benefits of having children ($y = 1$) or not ($y = 0$) and make their second occupational choice between entrepreneurship ($x = 1$) and wage work ($x = 0$).

Denoting by y the decision of having children, the value function facing individuals in the second period is as follows:

$$\begin{aligned} V(z,b,w) = \max_{\substack{x\in\{0,1\}\\ y\in\{0,1\}}} \Bigg\{ & (1-x)(1-y)\left[w\, h_1 + \frac{(H-h_1)^{1-\gamma}}{1-\gamma}\right] \\ & + (1-x)\, y \left[w\, h_2 + b + \frac{(H-h_2)^{1-\gamma}}{1-\gamma} - \phi(h_2)\right] \\ & + x\,(1-y) \max_{n,h}\left[f(z,h,n) - wn + \frac{(H-h)^{1-\gamma}}{1-\gamma}\right] \\ & + x\, y \max_{n,h}\left[f(z,h,n) - wn + b + \frac{(H-h)^{1-\gamma}}{1-\gamma} - \phi(h)\right]\Bigg\}. \end{aligned}$$

If entrepreneurs decide to have children, they manage the firm optimally given the presence of children. So, they decide their labor supply to the firm h' using their new first order condition:

$$f_h(h,n,z) - (H-h)^{-\gamma} - \phi_h(h) = 0.$$

[21] Time allocated to childcare may depend on productivity z. Less productive women are more likely to be secondary earners and take on a larger share of childcare, while primary earners increase their labor supply. Empirical evidence supports some degree of household specialization, but traditional gender roles play a major role in shaping the division of labor. For example, Parker and Wang (2013) find that stay-at-home mothers spend 19.7 hours per week on childcare, three times more than their husbands (6.5 hours). In contrast, stay-at-home fathers spend 11.3 hours, while their wives spend 8.9 hours (a ratio of 1.3).

[22] I assume that a part-time regime is welfare-improving for working mothers.

[23] Since workers are unable to modulate their work hours, it is possible that h_2 achieves a sufficiently better trade-off between labour and leisure that all workers have children. In order to prevent this, I assume that $\underline{b} < \phi(h_1)$, so that a worker with the minimum possible benefit $\underline{b}$ would not want children.

Entrepreneurial labour supply decreases, given z and w, if the entrepreneur chooses to have children, so that $h' < h^*$. The same result obtains if instead of an additional cost of hours worked $\phi(h)$ we assume that total hours available are reduced to $H' < H$ due to childcare responsibilities.[24] Without loss of generality, I restrict attention to the case with the additive disutility term $-\phi(h)$. Since $\phi(h)$ is assumed to be weakly convex and strictly increasing, $-\phi(h)$ maintains the concavity of the overall objective and the first order conditions remain sufficient. Since $\phi_h(\cdot) > 0$, h^* exceeds the optimum h' in the presence of children because of the additional marginal dis-utility of entrepreneurial work. To show that h' is increasing in z as in the model without fertility decisions, we can again use the implicit function theorem on G'.

When women have the option of having children, two distinct productivity thresholds determine the decision to become an entrepreneur: one for non-mothers and one for mothers. A woman without children becomes an entrepreneur when her productivity exceeds a threshold $\hat{z}_1(w)$, which is determined by the equilibrium condition that makes the marginal woman without children indifferent between wage employment and entrepreneurship:

$$wh_1 + \frac{(H - h_1)^{1-\gamma}}{1-\gamma} = \pi(h, n, \hat{z}_1) + \frac{(H - h)^{1-\gamma}}{1-\gamma},$$

where $\pi(\cdot)$ denotes firm profits. A mother becomes an entrepreneur when $z \geq \hat{z}_2(w)$, where $\hat{z}_2(w)$ satisfies:

$$wh_2 + \frac{(H - h_2)^{1-\gamma}}{1-\gamma} - \phi(h_2) = \pi(h', n', \hat{z}_2) + \frac{(H - h')^{1-\gamma}}{1-\gamma} - \phi(h').$$

Given $\hat{z}_1(w)$ and $\hat{z}_2(w)$, we determine the optimal value and policy functions of an entrepreneur with value z as follows. First, regardless of the value of b and the presence ($y = 1$) or absence of children ($y = 0$), she will become an entrepreneur if $z \geq \hat{z}_1(w)$

[24] In fact, reduced total available hours can be seen as a special case of adding the additional disutility term $-\phi(h)$, where

$$-\phi(h) = -\frac{(H - h)^{1-\gamma}}{1-\gamma} + \frac{(H' - h)^{1-\gamma}}{1-\gamma}$$

with

$$\phi_h(h) = (H - h)^{-\gamma} - (H' - h)^{-\gamma} > 0.$$

and $z \geq \hat{z}_2(w)$. If z is below $\hat{z}_1(w)$ and $\hat{z}_2(w)$, she will work for any b or y. The strategy for individuals with productivity between $\hat{z}_1(w)$ and $\hat{z}_2(w)$ depends on whether $\hat{z}_2(w) > \hat{z}_1(w)$ or $\hat{z}_2(w) < \hat{z}_1(w)$. I start with the former case. When $z \in [\hat{z}_1(w), \hat{z}_2(w))]$ and $\hat{z}_2(w) > \hat{z}_1(w)$, a woman will become an entrepreneur if she does not have children.

Given the optimal policy for x conditional on y, I similarly develop the optimal policy for y on a case by case basis. First, if $z < \hat{z}_1(w)$, so that, a woman will choose to have children iff:

$$b\big(z < z_1(w)\big) \geq w(h_1 - h_2) + \frac{(H - h_1)^{1-\gamma} - (H - h_2)^{1-\gamma}}{1 - \gamma} + \phi(h_2)$$

If $z \geq \hat{z}_2(w)$ so that she always chooses entrepreneurship, a woman will choose to have children iff: Denoting the value function of the entrepreneur without children as $f_1(z)$ and the entrepreneur with children as $f_2(z)$, the relevant threshold is:

$$b\big(z \geq \hat{z}_2(w)\big) \geq f_1(z) - f_2(z),$$

where $f_1(z)$ denotes the value function for an entrepreneur without children and $f_2(z)$ the value function for an entrepreneur with children. This threshold is increasing in z. Finally, between $\hat{z}_1(w)$ and $\hat{z}_2(w)$, the threshold value of b for having children depends upon the value function for being an entrepreneur without children, and the utility from being a worker with children. Following the same notation as before:

$$b\big(\hat{z}_1(w) \leq z < \hat{z}_2(w)\big) \equiv f_1(z) - wh_2 - \frac{(H - h_2)^{1-\gamma}}{1 - \gamma} + \phi(h_2).$$

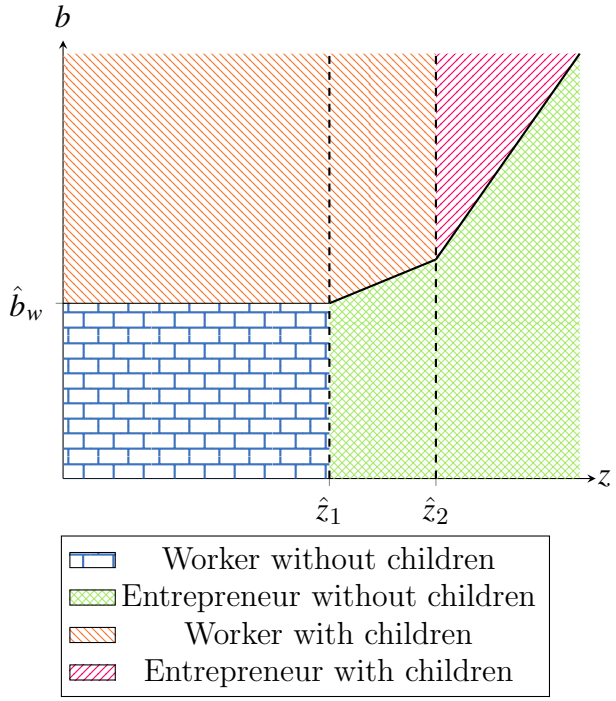
Note that $f_1(z)$ is increasing in z, so the threshold value of b must be as well. Figure B.1 depicts an example of equilibrium for this first case.

Having characterized the optimal strategies, I close the model using the market clearing condition:

$$\int_{\underline{z}}^{\hat{z}_1} \int_{\underline{b}}^{\hat{b}(z)} h_1 dF(z) d\Theta(b) + \int_{\underline{z}}^{\hat{z}_2} \int_{\underline{b}}^{\hat{b}(z)} h_2 dF(z) d\Theta(b) = \int_{\hat{z}_1}^{\bar{z}} \int_{\underline{b}}^{\hat{b}(z)} n^*(z, w) dF(z) d\Theta(b) + \int_{\hat{z}_2(w)}^{\bar{z}} \int_{\hat{b}(z)}^{\bar{b}} n^*(z, w) dF(z) d\Theta(b).$$

The optimal strategy is different in the second case, when $\hat{z}_2(w) < \hat{z}_1(w)$. If pro-

Figure B.1: Example of equilibrium with $\hat{z}_2(w) > \hat{z}_1(w)$

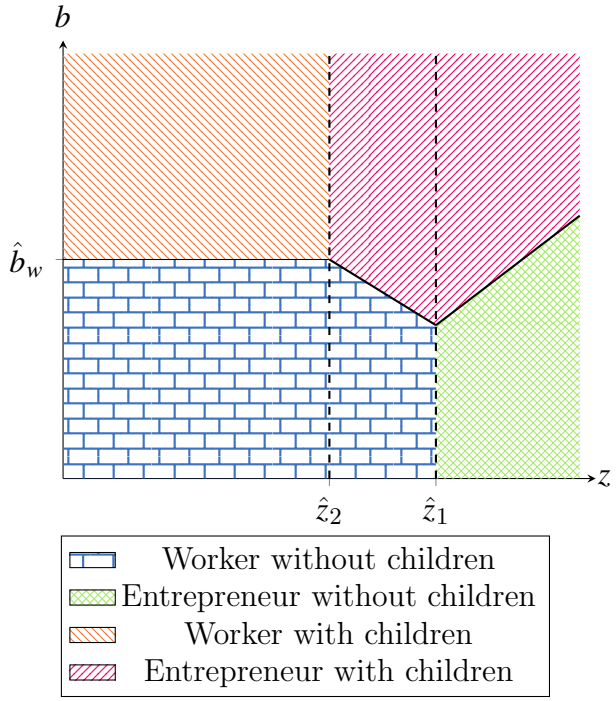


ductivity is above the higher threshold, $z \geq \hat{z}_1(w)$, an individual always becomes an entrepreneur, regardless of whether she has children. Conversely, if productivity is below the lower threshold, $z < \hat{z}_2(w)$, she always chooses wage employment. When $z \in [\hat{z}_2(w), \hat{z}_1(w))$ and $\hat{z}_2(w) < \hat{z}_1(w)$, the individual becomes an entrepreneur if she has children. Between $\hat{z}_2(w)$ and $\hat{z}_1(w)$ the threshold value of b for having children depends on the comparison between being an entrepreneur with children and a worker without children. In this instance:

$$b\big(\hat{z}_2(w) \leq z < \hat{z}_1(w)\big) \equiv wh_1 - \frac{(H - h_1)^{1-\gamma}}{1-\gamma} - f_2(z)$$

This threshold is *decreasing* in z. $\hat{z}_1$ and $\hat{z}_2$ highlight distinct mechanisms through which motherhood affects entrepreneurship. When $\hat{z}_2 > \hat{z}_1$, fewer women enter entrepreneurship after having children, as only those with very high productivity can justify the career costs. This leads to lower entrepreneurship rates among mothers. In contrast, if $\hat{z}_2 < \hat{z}_1$, some women now enter entrepreneurship as mothers because of its more favorable labor-leisure trade-off. This increases entrepreneurship rates among mothers. Figure B.2 shows an example of equilibrium for the second case.

Figure B.2: Example of equilibrium with $\hat{z}_2 < \hat{z}_1$



B.3 Discussion

The model predicts that entrepreneurs with children decrease their labor supply to the firm. Given the equilibrium wage, firm performance declines for firms owned by mothers relative to equally productive entrepreneurs who don't have children.

The model also points to the theoretical ambiguity surrounding the effect of childbirth on entrepreneurial participation. On one hand, the flexibility of entrepreneurship makes it appealing for mothers. If the marginal entrepreneur does not need to work excessive hours, childbirth could increase entrepreneurial entry. On the other hand, if firm productivity depends heavily on the founder's labor, reducing hours may be prohibitively costly. In such cases, entrepreneurship becomes less viable for mothers, as balancing childcare with the firm's demands may not be feasible.

The impact of motherhood on entrepreneurship is also affected by the structure and institutions prevailing in the labor market. In a labor market with substantial child penalties for women, entrepreneurship becomes relatively more attractive as it lowers the required rate of return that entrepreneurs are willing to accept. Even in labor markets without financial penalties, entrepreneurship may still be preferable if wage employment

offers little flexibility, such as the absence of part-time work, making the consumption-leisure trade-off less favorable.

The model also speaks to the relationship between career choices and fertility. In careers where earnings are closely tied to productivity and long hours are rewarded, such as entrepreneurship, only women with a sufficiently strong desire for children are willing to bear the career costs of motherhood. The relative fertility rates of entrepreneurs and workers depend on the correlation between productivity and fertility preferences. However, estimating this correlation is challenging, as standard productivity proxies, such as wages or education, are shaped by fertility expectations even before childbearing occurs Adda, Dustmann, and Stevens (2017).

A well-documented empirical pattern over the past two centuries has been the negative relationship between income and fertility, as well as between women's education and fertility, in post-industrial societies. However, this trend has weakened or even reversed in recent decades: women's labor force participation is now positively associated with fertility Doepke et al. (2023). These shifts have led to new models emphasizing career-family reconciliation as a key determinant of fertility. If fertility preferences are independent of productivity, the model implies that more productive women, who are more likely to become entrepreneurs, will have lower fertility rates. But if career structures influence fertility choices, then observed fertility patterns reflect not just preferences but also how different career paths accommodate motherhood. Understanding this sorting mechanism is crucial for interpreting the evolving relationship between productivity and fertility.

C Gender Progressivity Index

The World Values Survey (WVS) includes several questions designed to gauge individuals' attitudes toward gender roles. These questions may ask respondents to agree or disagree with statements related to gender equality, traditional gender roles, and women's roles in society. I consider the following questions or statements:

1. A working mother can establish just as warm and secure a relationship with her children as a mother who does not work.
2. Both the husband and wife should contribute to household income.
3. When jobs are scarce, men should have more right to a job than women.
4. On the whole, men make better political leaders than women do.
5. A university education is more important for a boy than for a girl.
6. On the whole, men make better business executives than women do.
7. If a woman earns more money than her husband, it's almost certain to cause problems.
8. When a mother works for pay, the children suffer.
9. Do you think that a woman has to have children in order to be fulfilled or is this not necessary?

Not all questions are asked in each survey wave, but all the questions I include were present in at least three waves. To create a single index, I aggregate the answers in several steps. First, I code the answers to all questions so that a higher score represents more egalitarian attitudes. Second, for each wave, I calculate a country's score as the standardized deviation from the average score of that wave. Using the deviation from the average helps account for changes in gender norms over time and ensure fair comparisons between countries surveyed in different years. Finally, for countries surveyed in multiple waves, I average the score across waves.

Cultural values are remarkably stable over time: the correlation of the index across different time periods within countries is 86%. I alternatively compute the index only using questions 3, 4, and 5, which were included in each wave except the first. The correlation between the two indexes is 96%.

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