Foreign Manufacturing Jobs and Women: Impacts on Work, Marriage, and Childbirth*

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Abstract

We investigate the effects of a rapid expansion in the number of jobs in export-oriented foreign-owned manufacturing on marriage and childbirth decisions of young women in Vietnam. Using variation in the location and timing of foreign manufacturing job expansion, we find a reduction in the share of women in their early to mid-20s who are married and are mothers, and a large increase in internal migration. The reductions in marriage and childbirth are particularly pronounced among recent internal migrants. Ten years later, we find little evidence of persistent effects among the initially effected cohorts.

Keywords: foreign direct investment, marriage, fertility, migration, Vietnam

JEL Classification: O14, F16, J12, J13, O15

1 Introduction

Low-income countries have dramatically increased their participation in global supply chains of multinational firms, receiving the majority of inflows of foreign direct investment (FDI) in recent

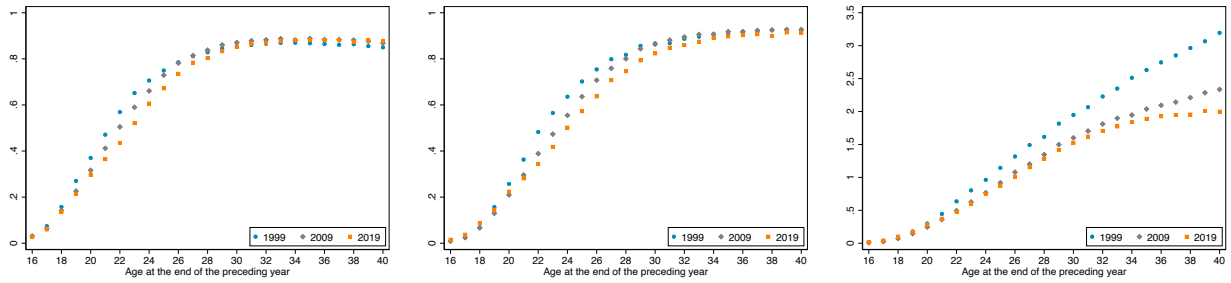
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decades (UNCTAD 2014). The majority of workers in low-income countries primarily work in agriculture on a family farm or informal manufacturing and services. Thus, the arrival of a large number of jobs associated with FDI has the potential to change both the location and composition of labor market opportunities, and consequently influence early life decisions of workers in a low-income host country. This may be particularly true for women because many jobs in multinational affiliates in lower-income countries are in labor-intensive manufacturing industries that disproportionately employ women, such as footwear and clothing.[1] Thus the arrival of manufacturing affiliates of multinational firms might change the labor market opportunities for women outside of the household, with implications for a broader set of outcomes, such as marriage and fertility, for women. Indeed, this expansion of FDI into low-income countries has coincided with a period of falling fertility rates for most countries (Goldin 2024).

We investigate the effects of a rapid expansion in the number of jobs in foreign-owned manufacturing on marriage and childbirth decisions of young women in Vietnam. Vietnam provides an excellent context in which to study these effects for three reasons. First, Vietnam received a large inflow of jobs in foreign affiliates of multinational firms, concentrated in export-oriented manufacturing. Between 2000 and 2009, almost a *million* additional women became employed in foreign-invested manufacturing. *One in 11* women age 21 worked in foreign manufacturing in 2009, as compared to only 1 in 77 in 1999. Over half of this expansion was in clothing and footwear. Second, Vietnam experienced a significant decline in the number of children born between 1999 and 2009, accompanied with delays in age of marriage and first birth (Figure 1). Third, the availability of population census data in 2009 and 2019 allows us to explore how the arrival of jobs in affiliates of foreign multinationals affected marriage and childbirth in the short and long run by tracking cohorts of women over time. We can then distinguish between temporary and permanent effects of the arrival of foreign jobs on marriage and childbirth.

We examine the short-term effects of jobs in foreign-owned manufacturing firms on marriage and childbirth by matching marriage and childbirth information from the 2009 population census with foreign manufacturing job growth that varies over time and space. Specifically, we calculate the change in the number of foreign manufacturing jobs per working-age individual in each district-year combination. We then match these measures by district-cohort to when a cohort turns 18, which is a key year in which many women transition from school to working (see Figure 2a and Section 3 for further discussion on the importance of age 18). For example, jobs arriving in 2005

[1]For example, in Vietnam in 2010, 85 and 80% of workers in foreign-owned clothing and footwear are women.



(a) Share married (b) Share given birth (c) Average number of children

Figure 1: Share married, given birth and average number of children by cohort

Each point represents the share or average for the respective cohort of women based on authors' calculations from the 1999, 2009, and 2019 population censuses. All estimates are weighted using sampling weights.

are matched to women born in 1987. This is similar to Atkin (2016), which examines the arrival of export-oriented manufacturing jobs on education in Mexico. We subsequently track the same cohorts of women ten years later, using the 2019 population census, to examine long-run effects.

We find that women exposed to larger foreign employment growth in the year they turn 18 are less likely to be married compared to women in the same cohort who were less exposed. In particular, the share of women that are married decreases for those ages 18 to 22 in districts experiencing the greatest foreign manufacturing employment growth.[2] We find a similar decrease in the share of women who are a mother and a decrease in the number of children per woman. Our estimates suggest that the share of women that are married fell by almost 5 percentage points among women age 21 in the most exposed districts relative to women in districts that received little or no foreign manufacturing employment growth in the same year. This is a significant drop compared to the national marriage rate of 41% among women age 21. Ten years later, the decrease in the marriage and motherhood rates has largely disappeared for all cohorts. The decrease in the number of children is still evident in the most exposed districts, but the estimates are imprecise. Being able to track these cohorts of women over time is a key contribution of our long run setting.

We explore two related reasons for why exposure to foreign manufacturing jobs might delay marriage and childbirth: migration and labor market changes. First, we find that there is a positive effect of foreign manufacturing employment on in-migration within districts. This is particularly true for women in their early to mid-20s. The inflow of young women led to a higher share of women in the local population in the short run because migration among men was significantly

[2]Throughout the paper, we refer to the age of individuals as of the end of the calendar year prior to the respective census, not at the time of the census. This way the ages refer to women born in the same year, consistent with our cohort-based exposure measures.

less. As migrants are less likely to be married and to be mothers, the increase in the share of migrants contributed to a decrease in marriage and motherhood. Additionally, we find that the rate of marriage among female migrants drops considerably in the most exposed districts. This is much less the case for non-migrants. We similarly find a large reduction in the share of migrants that are mothers in the short run, but no such effect for non-migrants. Hence, migration is a key intervening factor. Second, we explore changes in labor market outcomes for migrants and non-migrants. Both groups experienced a reduction in the likelihood of working in agriculture and an increase in the likelihood of working in manufacturing, particularly foreign manufacturing. Although both groups experience labor market shifts in the same direction, we do not observe noticeable changes in motherhood or the number of children among non-migrants, suggesting that changes in labor market outcomes, which are interesting outcomes on their own, are not the driving force behind observed changes in family formation decisions.

We perform a number of robustness checks and additional analyses. First, we explore whether the results are driven by pre-existing trends using changes in marriage between 1989 and 1999 among similarly aged cohorts, as in our main analysis. We find little evidence of such pre-existing trends. Additionally, when we directly control for the change in marriage between 1989 and 1999, it does not change our main results. Second, we employ an instrumental variable strategy based on large changes in foreign manufacturing employment within firms, following Atkin (2016), and find very similar results. Third, we explore whether the results are specific to foreign manufacturing or generalize to formal manufacturing. We find smaller effects when examining the impacts of jobs in formal manufacturing excluding foreign firms, consistent with less in-migration in response to these jobs. Lastly, we find little change in our main results when we remove provinces that have no foreign manufacturing jobs.

We provide a simple conceptual model that features migration and heterogeneous preferences for marriage to help explain our results. The model highlights that a simple selection story, whereby women who are the least likely to marry are more likely to migrate, cannot explain all of our results. Our results are driven by changes among migrants, and our model posits declines in the probability of marriage among female migrants as the local share of women increases.

Our work contributes to the growing literature on how globalization effects family formation decisions in low- and middle-income countries.[3] In Bangladesh, Heath and Mobarak (2015) find

[3]In high-income countries, Autor *et al.* (2019) find declines in marriage and fertility rates in the U.S. due to rising Chinese import penetration that reduced employment and earnings for young males, while Keller and Utar (2022) find that Danish women more exposed to rising Chinese imports are more likely to have children and form new

that young women exposed to the booming garment sector delay marriage and childbirth. Kis-Katos *et al.* (2018) report Indonesian regions that were more exposed to input tariff reductions expanded female-intensive sectors, and there was a delay in marriage. Erten *et al.* (2023) find decreases in marriage and women with children in China in response to FDI liberalization and little migration response. Mansour *et al.* (2023) find rising Chinese imports decreased marriage rates but had no effect on fertility in Peru. We contribute by studying the short- and long-run effects of foreign manufacturing jobs on marriage, motherhood, and labor markets in a low-income country setting. Importantly, we document that the effects of foreign manufacturing jobs vary by age cohort and are influenced by migration.[4] Additionally, by tracking cohorts of women over time we are able to distinguish between short- and long-run effects. In our context, most of the decrease in the likelihood of being married and a mother in the short run is diminished in the long run. In contrast, the reduction in the number of children appears to be a long run shift. This demonstrates the importance of having a long period of data for studying these changes.

Second, we contribute to the broad literature on structural change. A first strand that we relate to addresses the economic roles of women. Ngai *et al.* (2024) show how hours worked by women in the U.S. change across sectors, and between within the household and outside the household, while Dinkelman and Ngai (2022) study the allocation of women's time between home and market work during structural transformation in Africa. A second strand relates to internal migration. This strand has conventionally focused on the differences in earnings between rural and urban workers and the role of worker selection into location, such as in Lagakos and Waugh (2013) and Hamory *et al.* (2021), while Imbert *et al.* (2022) show how internal migration can induce changes in the structure of production in urban areas and Facchini *et al.* (2019) demonstrates that internal migration in China responds to positive export demand shocks. We contribute to these strands by documenting how internal migration driven by "pull" factors, expanding employment opportunities in export-oriented foreign manufacturing, is associated with changes in family formation decisions among recent internal migrants. Our results highlight the importance of the location of new jobs that employ women relative to the location of the existing supply of workers in the context of structural transformation.[5]

marriages.

[4]Most papers in this literature pool over a range of cohorts and identify average effects within their pooled age group. Keller and Utar (2022) is an exception as it tracks specific Danish women over time. Kis-Katos *et al.* (2018) find changes in local population size, i.e., migration, but are unable to examine results separately for migrants vs. non-migrants. Erten *et al.* (2023) finds no effects on migration in China.

[5]A large literature more broadly discusses the drivers of structural change, without a focus on internal migration or women specifically. See, for example, Bustos *et al.* (2016) on the role of technical change in Brazilian agriculture

Additionally, our work contributes to the literature on marriage markets in developing countries (Banerjee *et al.* 2013, Brandt *et al.* 2016). We most closely relate to Bau *et al.* (2025) which shows that marriage norms interact with migration decisions in India. They use a reduction in migration costs to show that male migration responds more strongly from regions with that historically had stronger dowry traditions. We complement their analysis by demonstrating how changes in the relative returns to migrating that differ by gender, a positive labor demand shock that is larger for women, leads to delays in marriage and motherhood in the short run, with no observable differences in the long run.[6]

We discuss our context and data in Section 2 and the empirical framework in Section 3. In Section 4, we provide our main results for marriage, motherhood, and number of children, followed by a discussion of mechanisms in Section 5. Section 6 provides robustness results, and in Section 7 we include a simple model for explaining our results. Section 8 concludes.

2 Context and Data

In this section we provide a brief overview of foreign-invested manufacturing in Vietnam, norms concerning marriage and childcare, and then discuss in detail our data.

2.1 Foreign Manufacturing in Vietnam

Vietnam has been relatively open to foreign investment in manufacturing since the 1990s (Malesky *et al.* 2015). Employment in foreign-invested manufacturing grew rapidly in the first decade of the 2000s, from 307 thousand workers at the start of 2000 to 1.76 million workers at the end of 2009. Employment of women increased from 200 thousand to 1.23 million.[7] Most foreign investment in manufacturing stems from East Asian economies, making up more than 80% of employment in foreign-invested manufacturing. The most important source countries of investment were, in order, Taiwan, South Korea, and Japan (McCaig *et al.* 2023). Employment of women in foreign manufacturing is concentrated in a few industries. As of 2009, clothing and footwear accounted for 30% and 26% of women working in foreign-invested manufacturing. The next most important industries, furniture, electronic components, and luggage, handbags, etc. each accounted for less than 5%. Foreign-invested manufacturing in Vietnam is very export oriented. Depending on the

and Erten and Leight (2021) on reductions in trade policy uncertainty and sectoral shifts in China.

[6]See Section B.1 for a discussion of literature on how trade and foreign direct investment are affecting workers, firms, and structural change in Vietnam.

[7]Author's calculations using data from the Vietnam Enterprise Survey.

year, between 65 and 75% of foreign-invested manufacturers report exporting and the exporters account for around 90% of total employment in foreign-invested manufacturing (McCaig *et al.* 2023).

2.2 Women, Marriage and Children in Vietnam

Marriage and children are very important expectations for women in Vietnam (Institute for Social Development Studies 2015), consistent with the high share of women who are married and have children reported in Figure 1. Marriage is legal for women starting at age 18 and for men starting at age 20, though some do marry before then (Hoang 2017). Traditionally, young married couples move in with the husband's family before establishing their own household and the son plays an important role in caring for parents as they age. Sons are also seen as important for maintaining the family line. Consequently, Vietnam has a high son-daughter ratio at birth (Huynh and Nguyen 2025). Women are expected to do the majority of household work and childcare.

2.3 Population Census Data

We use the 2009 population census to construct our main outcome variables, focusing on cohorts born in the years 1983 to 1992 (i.e., cohorts turning 16 through 25 by the end of 2008). Although data on older cohorts is available in the census, as described below, the data on foreign manufacturing employment by district only becomes available in 2000, and thus the first calendar year for which we can observe changes in foreign manufacturing employment is 2001, the year in which the 1983 cohort turns 18. We don't examine cohorts born after 1992 since almost none of these women are married or mothers as of the 2009 census. We use a 15% sample of the population census obtained from the General Statistics Office of Vietnam. The census was collected as of April 1st and contains information on demographics, education, and employment during the past 7 days. We construct indicator variables for outcomes at the time of the census: marriage, being a mother, working, working in agriculture, working in manufacturing, and being an inter-district migrant.[8] An inter-district migrant is defined as someone living in a different district at the time of the census compared to five years earlier. Additionally, we calculate the number of children ever born by the woman. Table A1 reports summary statistics for these cohorts. The share of women who are married increases from 0.03 for the youngest cohort, those that turned 16 in 2008, to 0.73

[8] A district is the second sub-national administrative unit in Vietnam, below a province. At the time of the 2009 census there were 685 districts with an average land area of 484 km^2.

for the oldest cohort, those that turned 25 in 2008. There is a corresponding increase in the share of mothers from 0.01 to 0.64 and an increase in the average number of children born from 0.01 to 0.92. The table also shows the extent of employment in foreign manufacturing. Among the 1986 and 1987 cohorts, almost 1 in 11 women were working in foreign manufacturing in 2009.

We utilize a 9% sample of the 2019 population census to examine the outcomes of the same cohorts, those born in 1983 through 1992, ten years later. We construct the same series of variables.[9] By tracking the cohorts over time we are able to study both the short run effects of exposure to FDI employment shocks using the 2009 census and the long run effects of those same shocks using the 2019 census. This is an important contribution of our work relative to existing literature. Table A2 shows how the share of women who are married and the share that have children within these cohorts has changed relative to 2009. For example, the share in the 1988 cohort who are married increased from 0.32 to 0.85 between 2009 and 2019. Similarly, the share of women within that cohort who were mothers increased from 0.21 to 0.82 and the average number of children for women in the 1988 cohort increased from 0.24 to 1.52.

We use data from a 33% sample of the 1999 population census to construct similar measures for cohorts born earlier. We use two different sets of cohorts depending on whether the analysis is focused on short run outcomes in 2009 or long run outcomes in 2019. For outcomes in 2009, we use women born in 1973 through 1982, such that they turned 16 to 25 in 1998, the same age range as our main cohorts at the time of the 2009 census. For outcomes in 2019, we use women born in 1963 through 1972, such that they turned 26 to 35 in 1998, the same age range as our main cohorts at the time of the 2019 census. We use these cohorts to measure differences in outcomes prior to our data measuring changes in foreign manufacturing jobs.[10] Table A3 displays the means for each cohort and variable in 1999. A few important differences stand out relative to cohorts born ten years later. For example, focusing on women who turned 20 in 1998 and 2008, they were more likely to be married, to be a mother, to be working, and specifically in agriculture, in 1999. They were less likely to be an internal migrant, to be in school, and to be working in manufacturing or foreign manufacturing. Indeed, very few young women were working in foreign manufacturing in 1999.

Finally, we use a complete version of the 1989 population census for examining trends in the period 1989 to 1999. See Table A4 for summary statistics.

[9] This sample was also obtained directly from the General Statistics Office of Vietnam.

[10] Note that the reference period for work questions in the 1999 population census was the previous 12 months, not the past 7 days as in the 2009 and 2019 censuses.

2.4 Vietnam Enterprise Survey Data

We employ data from the annual Vietnam Enterprise Survey to calculate employment in foreign-invested manufacturing by district and year. The survey covers all businesses registered in Vietnam as an *enterprise*, and all foreign-invested firms must register as an enterprise.[11] We use data from 2000, the first year of the data, to 2010 and focus on 100% wholly foreign-owned enterprises, based on the enterprise's reported ownership in the first year observed in the data, in manufacturing.

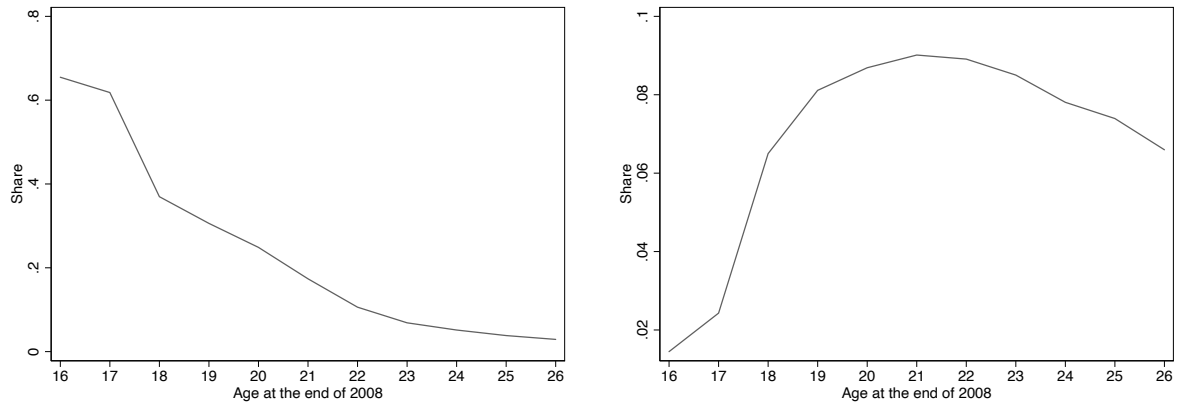
2.5 Consistent Districts Over Time

We match the population censuses and foreign manufacturing employment by district. As the number of districts has grown over time and boundaries have changed, we follow McCaig *et al.* (2024) and construct consistently defined districts over the period 1999 to 2019 from consistently defined urban wards and rural communes. This procedure gives us 611 consistently defined districts.

3 Empirical Specification

Before we introduce our empirical framework, we explore why exposure to foreign manufacturing jobs, relative to other jobs, might matter for young women. To do so, we use data from the 2010 Vietnam Household Living Standards Survey. The survey collected information on demographics, education, and labor market outcomes such as earnings, hours, the ownership of the business, the industry of employment, and whether the job included a contract, paid leave, and social insurance. We use the sample of women born in 1983 through 1992, which are our focus cohorts in the main analysis. We regress various job characteristics on an indicator for working in foreign manufacturing, as well as a complete set of indicators for birth cohort and a complete set of indicators for highest completed level of education (primary, lower secondary, upper secondary or higher, with less than primary as the omitted category). We present the results in Table B1. The top panel uses all workers, the middle panel uses workers in manufacturing (both those working in informal and formal firms), while the bottom panel restricts the sample to workers in formal manufacturing. We find that working in foreign manufacturing is associated with higher hourly wages, higher daily

[11] The unit of observation is a firm based on having an independent taxcode. Although multiple plants could be established under the same taxcode, this is relatively rare among foreign manufacturers. In the 2007 Establishment Census, only 2.7% of 100% foreign-owned manufacturing firms have more than one establishment under the same taxcode, accounting for 8.0% of wholly owned foreign manufacturing employment. As we will be using data on employment by district, this introduces the possibility of attributing employment from different establishments to the wrong location if the establishments are in different districts. However, this does not appear to be a large concern as many of these multi-establishment firms have all of their establishments in the same district.



(a) Attending school

(b) Working in foreign manufacturing

Figure 2: School attendance and working in foreign manufacturing for women by cohort in 2009

Notes: Each point represents the unweighted share of individuals within the cohort that reported attending school in the figure on the left and that reported working in foreign manufacturing on the right at the time of the 2009 population census.

and monthly hours worked, and a greater likelihood of having a signed contract, being entitled to paid leave, and being entitled to social insurance contributions. This is true for all jobs, as well as when the comparison is restricted to just within manufacturing. This suggests that foreign manufacturing jobs are relatively desirable jobs for young women in Vietnam.[12]

We adopt a framework similar to Atkin (2016) by focusing on foreign employment shocks at a key age, the year in which an individual turns 18. This is the year in which individuals would normally complete upper secondary school. During our period, this is the most important year for leaving school as the share of individuals within a cohort attending school as of the 2009 census drops the most between the cohort that turns 17 in 2008 and the cohort that turns 18 in 2008. Figure 2a shows the large decline in the attendance rate for women across these two cohorts, from 62 to 37% between cohorts turning 17 and 18 in 2008. This demonstrates the potential importance of exposure to foreign manufacturing jobs in the year an individual turns 18. The decrease in school attendance corresponds to an increase in the share of women working in foreign manufacturing (Figure 2b). It increases from 2.4 to 6.5% between the cohorts that turned 17 and 18 in 2008. The low levels of employment below age 18 are consistent with pressure from international buyers to not employ younger individuals (UNICEF 2018).

We measure exposure to foreign manufacturing employment in each district in the year the

[12]These results are consistent with changes in earnings documented by Asghar and McCaig (2024), which follows individuals as they move into formal manufacturing, mostly foreign manufacturing, in response to U.S. tariff reductions on imports from Vietnam. That analysis suggests that individuals moving from self-employment in agriculture or the informal sector experienced the largest increase in earnings on average. Due to a lack of wage data, the self-employed are excluded from the regressions reported in Table B1 except for the hours worked regressions.

cohort turns 18 as:

$$l_{dc} = \frac{\textit{foreign employment}_{d,c+18} - \textit{foreign employment}_{d,c+17}}{\textit{working-age population}_{d,c+18}} \tag{1}$$

where d denotes a district, c denotes a cohort (i.e., year of birth), $\textit{foreign employment}_{d,t}$ denotes the total number of manufacturing jobs in wholly owned foreign enterprises in district d in year t, and $\textit{working-age population}_{d,c+18}$ is the working-age population (15 to 54) in district d in year $c+18$. We calculate the working-age population for each year based on the working-age population in 1999 and the average annual growth rate in the working-age population between 1999 and 2019. Our exposure measure varies between -0.051 and 0.216. That is, the most exposed district-cohort experienced an increase of 216 foreign manufacturing jobs per 1,000 working-age individuals. See Table A5.

Motivated by the high share of districts that do not receive any foreign manufacturing employment during our period and by the districts that receive very large increases in foreign manufacturing jobs, we construct two indicators of the extent of exposure. They are both based on the distribution of exposure conditional on positive exposure. The Mid exposure bin includes district-cohorts for which exposure is greater than the 25$^{\text{th}}$ percentile and less than the 75$^{\text{th}}$ percentile as calculated across all district-cohort observations. The $High$ exposure bin includes district-cohorts for which exposure is greater than the 75$^{\text{th}}$ percentile.[13] We measure exposure relative to district-cohorts that had either negative, 0, or very low exposure.

The location of new foreign manufacturing jobs is not random. In Tables B2 and B3 we report the partial correlation between the Mid and $High$ indicators, respectively, and initial district characteristics. The dependent variable in these regressions is either the Mid or $High$ indicator. We estimate these regressions separately for each cohort and for each explanatory variable shown in the rows. The explanatory variables are the 1999 outcomes for the cohort that was born 10 years earlier such that they are the same age in 1999 as our cohorts of interest are in 2009. Exposure is positively correlated with the share of individuals within these cohorts that are working in foreign manufacturing and that are migrants in 1999. It is negatively correlated with the share of individual workings in agriculture and typically positively related to the share of individuals in school. We control for these initial conditions in 1999 by district-cohort in our subsequent regression analysis.

[13]The cutoffs are 0.0006 and 0.012 for the 25$^{\text{th}}$ and 75$^{\text{th}}$ percentiles respectively. Within the *medium* and *high* bins, the mean value of exposure is 0.004 and 0.042 respectively or 4 and 42 additional jobs per 1,000 working-age individuals.

Our econometric model closely follows the approach of Autor *et al.* (2019) except that we look at the decadal changes in outcomes by individual cohorts instead of pooling over cohorts. We estimate the following model:

$$\Delta Y_{cd} = \alpha_c + \beta_c^M Mid_{cd} + \beta_c^H High_{cd} + \mathbf{X}_{cd}^{'}\theta_c + u_{cd} \tag{2}$$

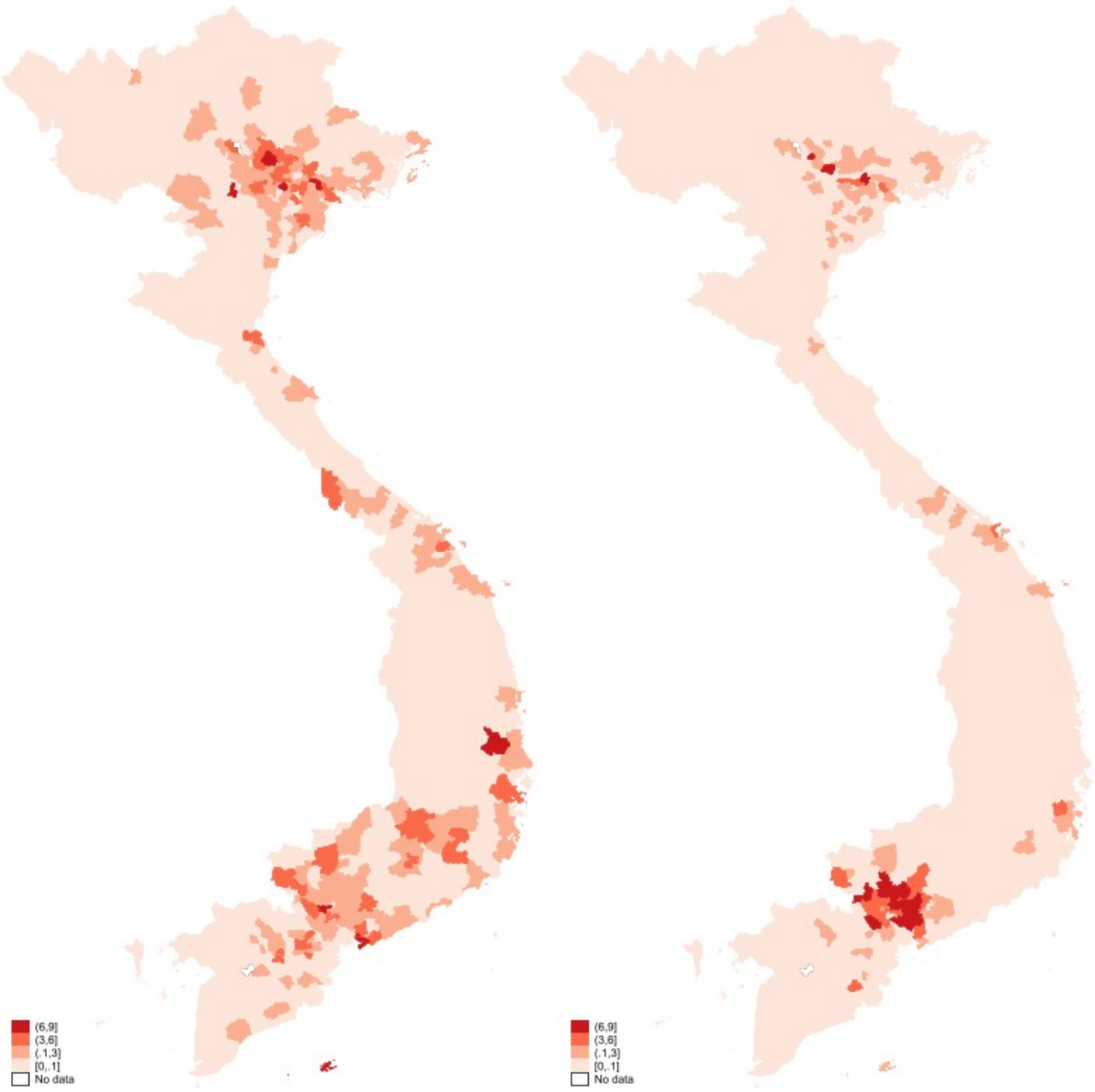
where ΔY_{cd} is the change in the outcome between cohort c in 2009 and cohort $c-10$ in 1999, such that they are measured at the same age in the respective censuses, in district d when examining short run changes (i.e., up to 2009). When examining long run changes (i.e., up to 2019), ΔY_{cd} is the change in the outcome between cohort c in 2019 and cohort $c-20$ in 1999 in district d. Mid_{cd} and $High_{cd}$ are the previously defined indicator variables based on the extent of changes in foreign manufacturing jobs in district d when cohort c was 18. The vector of controls, $\mathbf{X}_{cd}^{'}$, contains the 1999 outcome value for cohort $c-10$ for short run regressions and $c-20$ for long run regressions in district d, thereby controlling for possible convergence or divergence in outcomes across districts; the share of individuals in cohort $c-10$ for short run regressions and $c-20$ for long run regressions in district d that in 1999 work in foreign manufacturing, work in agriculture, are in school, and are in-migrants; and the share of the district-cohort that is an ethnic minority as ethnic minorities tend to marry and become mothers earlier as well as have more children than ethnic Vietnamese. α_c is a cohort fixed effect.

It is important to note that, in equation (2), we allow the effects of exposure to foreign manufacturing jobs to vary by cohort, unlike Autor *et al.* (2019), Mansour *et al.* (2023), and Erten *et al.* (2023), which pool over multiple age groups. Additionally, we allow the effects of the controls to vary by cohort. Hence, our specification is more flexible both in terms of controls and its ability to identify variation in effects across cohorts. Since we are regressing changes in the outcome as the dependent variable, any unobserved factors that vary across districts and effect the level of the outcome are effectively differenced away. Hence, identification comes from changes in the outcomes across districts by exposure within a cohort, conditional on differential trends associated with variation in initial conditions.

Nonetheless, one might be concerned that these controls do not sufficiently control for concerns about the endogenous location of foreign manufacturing jobs. For example, one might be worried that foreign manufacturing firms are choosing their locations based on changing household formation decisions or related factors. We provide three pieces of evidence against this concern. First, a

large share of workers in foreign manufacturing firms are internal migrants. Second, the increase in foreign manufacturing jobs is not correlated with pre-existing trends in family formation decisions. Third, we find very similar results when we use the IV strategy of Atkin (2016), which is based on large changes in employment that are less likely to endogenously respond to local labor markets changes due to sunk costs. Together, these suggest that the changes in foreign manufacturing jobs, conditional on controls, are plausibly exogenous to family formation decisions. We discuss this in greater detail throughout the paper.

Figure 3 displays a map featuring the share of cohorts within districts for which the variables Mid and $High$ take the value 1. Districts in the south, around the province of Ho Chi Minh City, and in the north, around the province of Ha Noi, feature higher exposure to foreign manufacturing employment. Additional districts throughout central Vietnam also experienced Mid and $High$ exposure. The figure additionally demonstrates that most districts are not exposed to foreign manufacturing employment shocks during our period.



(a) Mid-exposure (b) High-exposure

Figure 3: Number of mid- and high-exposure cohorts by district

Notes: For each district we count the number of mid- and high-exposure cohorts per district. We use 2009 district boundaries for the map. Where our consistent district boundaries differ from the 2009 district boundaries, we take a simple average over all consistent districts that overlap with the 2009 district.

4 Marriage, Child Birth and Foreign Manufacturing Jobs

In Figure 4a we report coefficient estimates and 95% confidence intervals for the *Mid* and *High* exposure indicators for each cohort. We see that women who faced a medium or large increase in the number of foreign manufacturing jobs in the year they turned 18 are less likely to be married

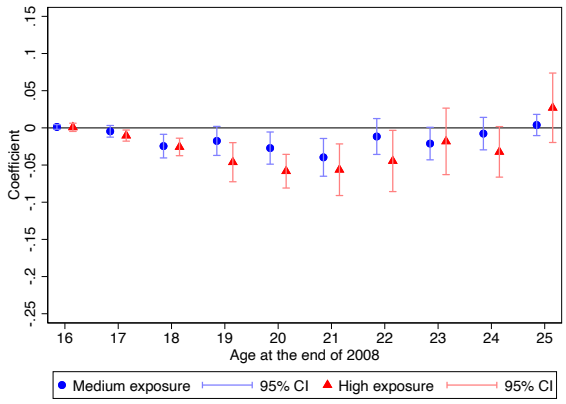
as of the 2009 census. These effects are most obvious for the cohorts that turned 18 through 22 in 2008, and within cohorts they tend to be larger for women in high-exposure districts than for those in medium-exposure districts. The reduction in the marriage rate for women in their early 20s would be more difficult to detect using an approach that pools over multiple cohorts. Focusing on the 20-year-old cohort, there is a 2.7 and 5.8 percentage point decrease in the share of women that are married in medium- and high-exposure districts. Relative to the national average of 31.6 percentage points in 2009 for this cohort, these decreases are important.

One of the important advantages of our context and data is our ability to track cohorts of young women over time.[14] In particular, we can observe the same cohorts of women ten years later in the 2019 census. This allows us to examine whether the reduction in the probability of marriage persists in the long run. Figure 4b reports coefficients from estimating equation (2) where the dependent variable is the change in the share of women within the district-cohort that are married, where the change is calculated between 2019 and 1999. We compare the rate of marriage for women in cohort c in 2019 with that for women in cohort $c-20$ in 1999 in the same district such that we're comparing women at similar ages when they are observed in the 2019 and 1999 censuses respectively. We find that the reduction in marriage in 2009 among cohorts that turned ages 18 through 22 in 2008 has disappeared by the time these cohorts are ten years older in 2019. In 2019, the coefficients are typically smaller in magnitude and not statistically different from 0, for both medium and high exposure. The pattern of results generally suggests a delay in marriage, but not a permanent reduction.

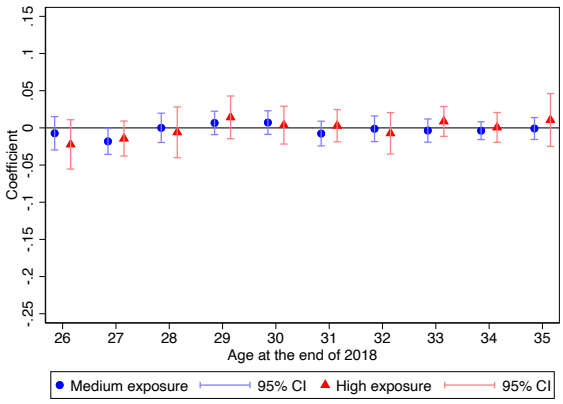
One possible concern with this analysis of the long versus short run effects is that the composition of women within district-cohorts may have changed between the 2009 and 2019 censuses. If so, it is possible that this compositional change might be responsible for the elimination of the short run marriage decrease in the long run. In Appendix Section B.4 we show similar results when we (1) use consistently defined districts based on district boundaries in 2019 and (2) use a woman's district in 2014, as reported in the 2019 census, for the long run analysis. This partially undoes the effects of migration between 2009 and 2014. The results for marriage, motherhood, and number of children are very similar.

Our ability to observe the same cohorts over a ten-year period allows us to capture both the short- and long-term effects of employment shocks to local labor markets due to foreign manufac-

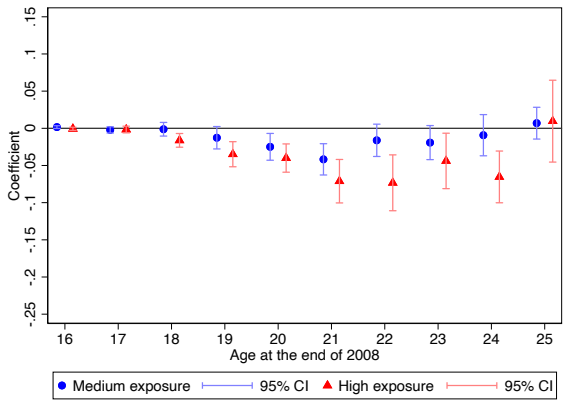
[14] Mansour *et al.* (2023) find that the marriage rate of low-educated men and women in Peru fell in response to rising import competition from China, but the analysis pools over ages 25 to 55 and does not track these cohorts over time preventing analysis of whether these shocks to marriage are temporary or permanent.



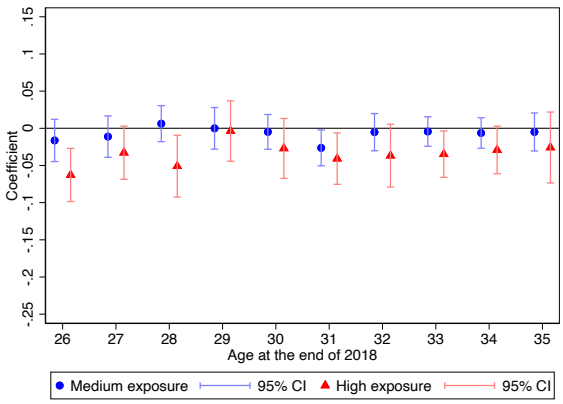
(a) Married, 2009



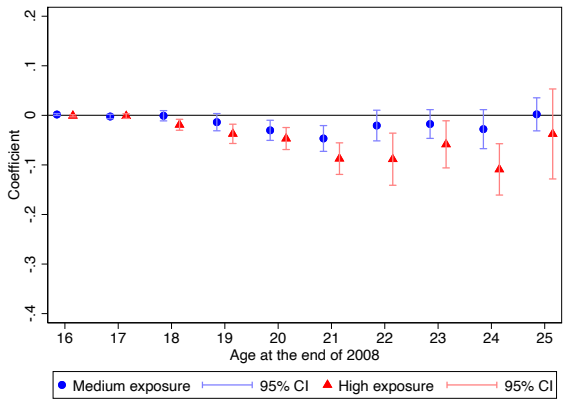
(b) Married, 2019



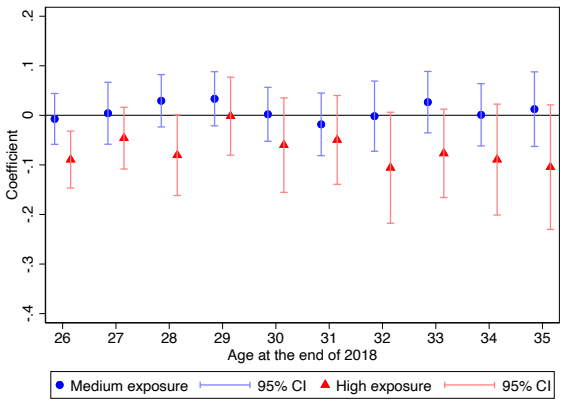
(c) Mother, 2009



(d) Mother, 2019



(e) Number of Children, 2009



(f) Number of Children, 2019

Figure 4: Foreign manufacturing jobs and family characteristics

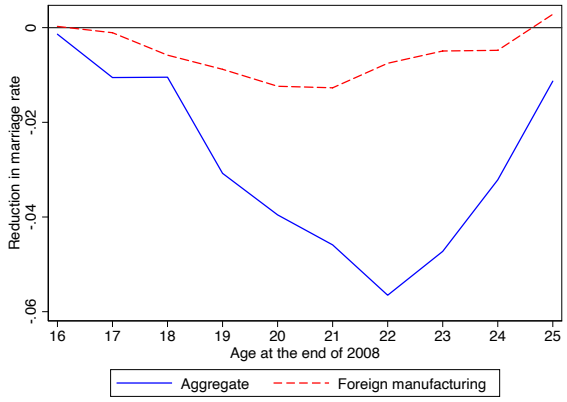
Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variables are the difference in the share married, the share mothers, and average number of children in district d and cohort c in 2009 or 2019 (by column) relative to women in the same district in cohort $c-10$ or $c-20$ (by column) in 1999. Controls include the share of women within the district in 1999 in cohort $c-10$ (for 2009) or $c-20$ (for 2019) that work in foreign manufacturing, that work in agriculture, that are in school, and that are in-migrants, interacted with the cohort, as well as cohort fixed effects. Additionally, the regressions control for the 1999 outcome interacted by cohort. Controls also include the share of women in the district-cohort who are an ethnic minority interacted with cohort. Standard errors are clustered by district.

turing jobs. Additionally, our large samples allow us to examine heterogeneous effects across ages. Together, we observe a short run decrease in the probability of being married among individuals ages 18 through 22, but this effect disappears in the long run.

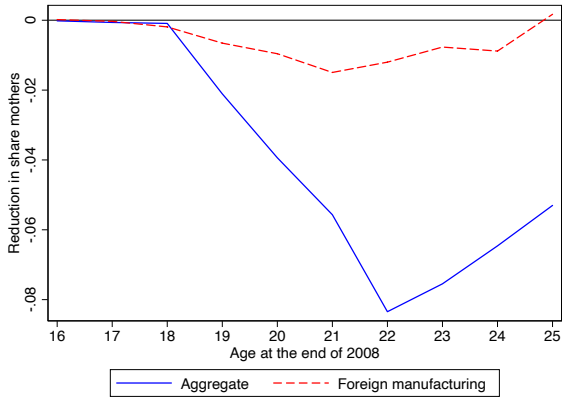
We next examine the effect of foreign manufacturing jobs on being a mother. The decision to become a mother is closely related to being married, as suggested by Figure 1. Figures 4c and 4d show coefficient estimates from equation (2) where the dependent variable is the change in the share of women within a district-cohort that report being a mother as of the 2009 and 2019 censuses respectively. We find evidence of a reduction in the share of women who are mothers in 2009 in the medium- and high-exposure districts for some cohorts. In high-exposure districts, the decrease is evident for ages 18 through 24. In medium-exposure districts the decrease is only evident for ages 20 and 21. In terms of magnitude, for the age 21 cohort, the estimates suggest a reduction in the share of women who are mothers of 4.2 and 7.1 percentage points due to medium- and high-exposure as compared to the national rate of being a mother within that cohort of 29.6 percent. In the long run, in general, the reduction in the share of women who are mothers disappears (Figure 4d). However, for some of the youngest cohorts, there appears to be an increase in the negative effect on motherhood in the high-exposure districts. This may be due to these cohorts being so young in 2009 as to have not significantly entered into motherhood. As such, it was too soon to see the potential effects on motherhood.

We subsequently examine the effects for the number of children in Figures 4e and 4f. Consistent with the reduction in the share of women who are mothers as of the 2009 census, we see a decrease in the average number of children in the short run in both medium- and high-exposure districts for some cohorts. In particular, in medium-exposure districts there is evidence of a reduction in the number of children for the age 20 and 21 cohorts, but no such evidence for other cohorts. In high-exposure districts we find evidence of a reduction in the number of children for women in cohorts 18 through 24 as of 2009. The estimate is -0.087 for the age 21 cohort, as compared to the national average of 0.360 children on average in 2009 in this cohort. In the long run, there is no evidence of a sustained decrease in the average number of children among women in medium-exposure districts. For high-exposure districts, the estimates suggest a long run decline in the average number of children, but the estimates are imprecise.

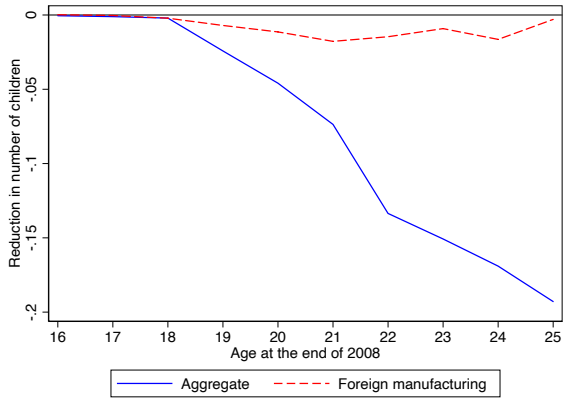
Contribution to aggregate changes in the short run Figure 1 shows the national rates of marriage, motherhood, and the number of children in 1999 and 2009. Using the coefficients



(a) Married, 2009



(b) Mother, 2009



(c) Number of children, 2009

Figure 5: Contribution to aggregate short-run changes

Note: The lines plot the aggregate change in the share of women who were married, who were mothers, and the average number of children between 1999 and 2009, as well as the predicted reduction in these outcomes from our regression results.

reported in Figure 4 we estimate the contribution of exposure to foreign manufacturing jobs to these aggregate reductions between 1999 and 2009. To do so, we estimate the reduction in each outcome by cohort by summing over the product of the coefficients on *mid* and *high* exposure and the population of women in that cohort in the *mid* and *high* exposure districts. We then divide by the total population within the cohort and compare this reduction to the aggregate reduction. Figure 5 reports the contribution to short run changes in marriage, motherhood, and number of children by cohort. The figures show that reductions in marriage, motherhood, and the number of children due to foreign manufacturing jobs made relatively modest contributions to overall changes for most cohorts. For example, focusing on the cohort that turned 21 in 2008, our regression results suggest that exposure to foreign manufacturing jobs contributed to 28%, 27%, and 24% of the aggregate reduction in marriage, motherhood, and the number of children. But for other cohorts with larger aggregate changes, exposure to foreign manufacturing jobs accounts for a lower proportion of the aggregate change.

Taken together, these results provide a rich description of the short and long run effects for young women being exposed to foreign manufacturing employment shocks during a key year - the year in which they turn 18 and would typically complete upper secondary school. Young women who are more exposed to these new job opportunities are less likely to be married, less likely to be a mother, and have fewer children in the short run. This is most strongly true for cohorts that turned 20 through 23 in 2008. In the long run, the marriage and motherhood gap disappears, but there is some evidence of a reduction in the average number of children among women in the high-exposure districts, although the effects are imprecisely estimated.

5 Mechanisms

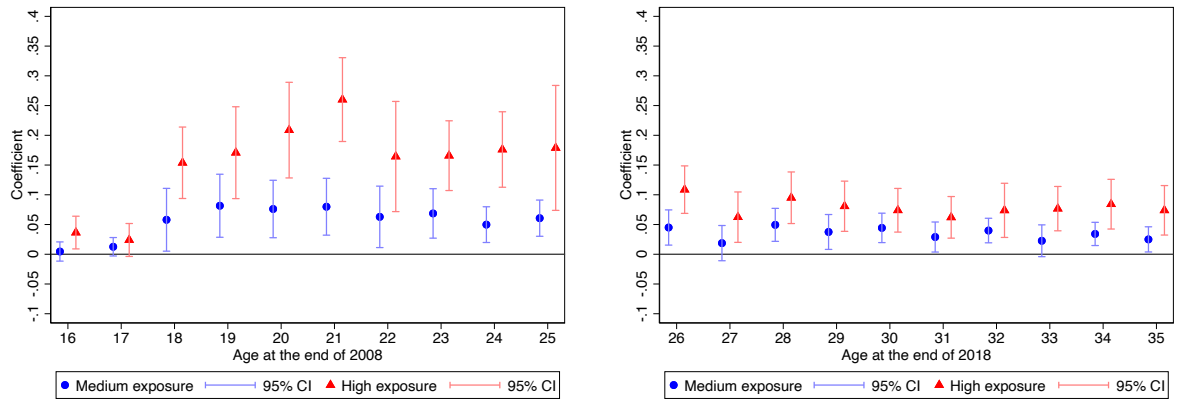
The changes in family formation decisions may be operating through a number of different mechanisms. We focus on the role of internal migration for two reasons. First, a large share of women working in foreign manufacturing have recently migrated across provinces. Second, recent migrants are less likely to be married compared to non-migrants in the same birth cohort. In this section, we show that the expansion of foreign manufacturing jobs increased migration into the most exposed districts and that the effects on marriage, motherhood, and childbirth differ considerably between migrants and non-migrants.

5.1 Migration

Among our cohorts of interest, 18.3% have migrated across districts within the five years leading up to the 2009 census. The share of migrants reaches a maximum of 25.7% in the 1989 cohort, those turning 20 in 2009 (see Table A1). This is a significant increase from comparably aged cohorts at the time of the 1999 census (see Table A3).[15] Within cohorts, migration is substantially higher for those in districts that were exposed to the foreign manufacturing employment shock. For example, in the 1989 cohort in districts with high exposure to foreign manufacturing jobs, 43.7% of individuals are inter-district migrants in 2009. High levels of migration may contribute to the delay in marriage as female migrants are less likely to be married within most cohorts (Figure A1). The gap is largest for the cohort turning 20 in 2008, 0.34 for non-migrants versus 0.25 for migrants. Hence, all else equal, if migration is increasing due to foreign manufacturing jobs, this influx of unmarried women could decrease the rate of marriage in exposed districts.

We begin exploring the role of migration by estimating equation (2) using as the dependent variable the change in the share of women within the district-cohort that are inter-district migrants. We use the district at the time of the census such that it is the destination district after migrating for those who migrated. Hence, we are looking at changes in the share of in-migrants. Migration is defined as having moved across districts within the five years prior to the census. Note that the census does not ask the location of birth, and thus the only information available on migration is based on migrating within the past 5 years. Figure 6 displays the estimated coefficients. Among district-cohorts that experienced both medium and high exposure, we observe an increase in the probability of a woman being an inter-district migrant. This is particularly true for those that turned 18 or older in 2008. Importantly, the coefficients are quite large in magnitude. For example, the cohort that turned 21 in 2008 experienced a 8.0 and 26.0 percentage point increase in the share of in-migrants in medium- and high-exposure districts respectively. For comparison purposes, the inter-district migration rate was 17.5 and 19.0% on average in these medium- and high-exposure districts in 1999 for the same age cohort. The effect on migration is consistent with migration responses to other shocks in Vietnam. Gröger and Zylberberg (2016) finds that a typhoon-induced drop in rural income led to migration to urban areas and McLaren and Yoo (2017) report migration towards provinces receiving FDI.

[15] See Huynh (2025) for a discussion of a relaxation of internal migration restrictions in 2005. These restrictions were relaxed at the national level and thus unlikely to vary spatially in a way that is correlated with our foreign manufacturing exposure variables.



(a) 2009 (b) 2019

Figure 6: Foreign manufacturing jobs and in-migration

Note: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variable in panel (a) is the difference in the share of women within the district-cohort that are in-migrants in 2009 relative to women in the same district in cohort $c-10$ in 1999. The dependent variable in panel (b) is the difference in the share of women within the district-cohort that are in-migrants in 2019 relative to women in the same district in cohort $c-20$ in 1999. An in-migrant is defined as someone who moved into the district within 5 years prior to the respective census. Controls include the share of women within the district in 1999 in cohort $c-10$ (for 2009) or $c-20$ (for 2019) that work in foreign manufacturing, that work in agriculture, that are in school, and that are in-migrants, interacted with the cohort, as well as cohort fixed effects. Controls also include the share of women in the district-cohort who are an ethnic minority interacted with cohort. Standard errors are clustered by district.

In Figure 6b we explore the effects on migration in the long run. Using the 2019 census, we again look at changes in the rate of in-migration based on migrating within the past 5 years, and we make comparisons to similarly aged cohorts at the time of the 1999 census. We find evidence of continuing migration in the long run, although the estimates are noticeably lower than in the short run. Since migrants are less likely to be married than non-migrants, the increase in migration likely contributed to the decrease in marriage in the short run.

5.2 Effects on marriage, motherhood, and number of children among migrants and non-migrants

Having shown that the rate of in-migration increased substantially among women in the district-cohorts most exposed to the increase in foreign manufacturing jobs, we now turn to whether marriage, motherhood, and the number of children responded differently among migrants and non-migrants. We focus in this subsection on the short run effects for two reasons. First, as documented in Section 4, the effects on marriage and motherhood were largely short run effects. Second,

the census questions only allow us to identify if an individual has moved in the 5 years leading up to the census. Hence, a young woman who, for example, migrated in 2007 would be classified as a migrant in 2009, but not in 2019. Hence, we cannot separately track migrants and non-migrants from the short to the long run.

In Figure 7 we repeat the marriage analysis reported in Figure 4 but split the sample by migration status prior to calculating district-cohort marriage rates.[16] We find evidence of a large reduction in the share of female migrants that are married. For the cohort that turned 21 in 2008, the estimates suggest an 11.6 and 16.7 percentage point reduction in the likelihood of being married. In contrast, the changes for non-migrants are much smaller in magnitude and are only statistically different from 0 for the age 18 through 20 cohorts. These results suggest that not only is the share of internal migrants increasing in the most exposed districts, but also that the outcomes for the growing population of migrants is also changing.

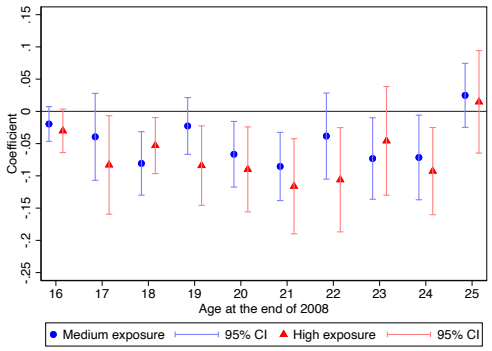
In Figures 7c through 7f we report estimates of the effects on motherhood and the number of children for migrants and non-migrants. Here too we find important differences across migrants and non-migrants. The probability of being a mother drops substantially among migrants, but shows little change among non-migrants, and the average number of children drops considerably for migrants, but changes little for non-migrants. Together, these results suggest that the overall reduction in the likelihood of being married, being a mother, and the number of children in the short run are driven by two components: an increase in migration to exposed districts and a change in the outcomes of migrants in the exposed districts.

5.3 Why are family formation decisions changing among migrants?

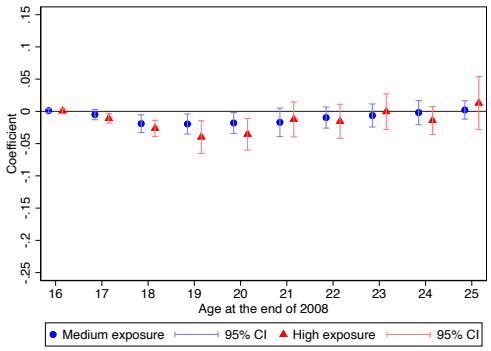
We explore several possible reasons for why the family formation decisions of migrants in exposed districts might be changing relative to non-migrants. These include (1) changes in the composition of the local marriage market, (2) changes in labor market outcomes, and (3) balancing work and childcare.

Shift in Gender Composition If more women than men are migrating in response to new employment opportunities in foreign manufacturing, a gender imbalance could play a role in the postponement of marriage and subsequent decisions. All else equal, more women relative to men in a district would imply fewer possible partners for many women. This may be particularly

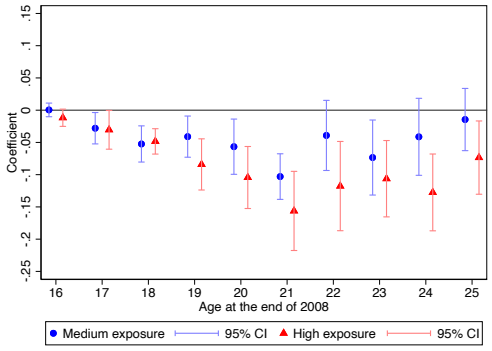
[16] Our controls are now based separately on migrants and non-migrants respectively.



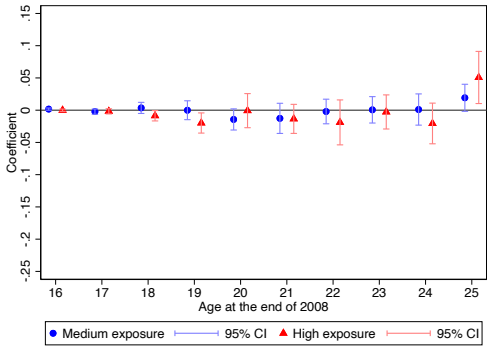
(a) Married, Migrants



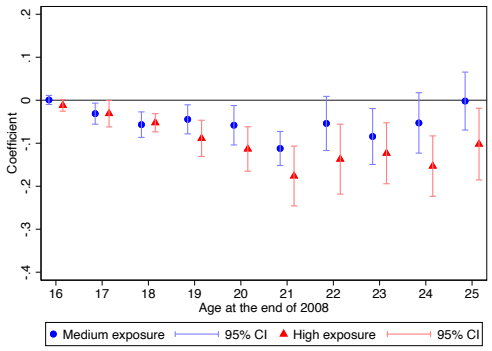
(b) Married, Non-migrants



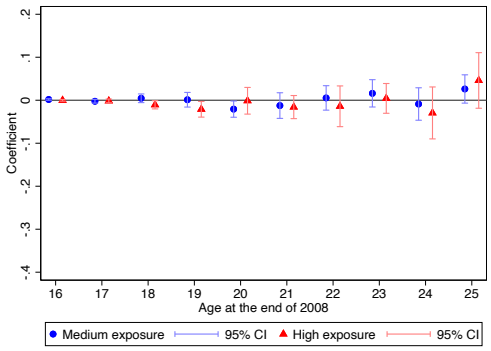
(c) Mother, Migrants



(d) Mother, Non-migrants



(e) Number of Children, Migrants



(f) Number of Children, Non-migrants

Figure 7: Foreign manufacturing jobs and marriage, motherhood, and number of children for migrants and non-migrants

Note: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variables are the difference in the share married, the share mothers, and the average number of children for women within the district-cohort in 2009 relative to women in the same district in cohort $c-10$ in 1999. Panels (a), (c), and (d) are calculated only over migrants, and panels (b), (d), and (f) are calculated only over non-migrants. Controls, based on migrant and non-migrant samples respectively, include the share of women within the district in 1999 in cohort $c-10$ that work in foreign manufacturing, that work in agriculture, and that are in school in 1999, as well as cohort fixed effects. Additionally, the regressions control for the 1999 outcome interacted by cohort. Controls also include the share of women in the district-cohort who are an ethnic minority interacted with cohort. Both are within migrants or non-migrants alone. Standard errors are clustered by district.

acute for migrants, as migrants tend to marry other migrants and similarly among non-migrants. Among married migrant women in our sample that are living with their spouse, 63% are married to migrants. In contrast, among married non-migrant women, only 3% are married to migrants.[17] To examine this possibility, we estimate equation (2) where the dependent variable is the change in the share of the district-cohort population that is female. We find evidence of a large increase in the share of women within high-exposure districts in 2009 corresponding with the migration increase, starting with the cohort that turned 18 in 2008 (see Appendix Figure B11). It remains positive for several additional cohorts, until the cohorts that were 22 and 23 at the end of 2008. The estimates suggest an increase in medium-exposure districts as well, but the effect is far less pronounced. These results are somewhat consistent with the large increase in migration among women in the short run, though not among the older cohorts (Figure 6), a noticeably smaller migration response among younger men (Figure B7), and an increase in the marriage rate among men in the most exposed districts as they became relatively more scarce (Figure B6).

Labor Markets We turn now to labor markets as an potential mechanism, with a focus on differences in outcomes between migrants and non-migrants. If social norms treat family formation and some types of employment as incompatible, this can mean that a shift in women's labor market outcomes will impact family formation. There is reason to suspect that such social norms could matter in this context, as 47% of 2020 World Values Survey respondents think it's a "problem if women have more income than husband," and 78% agree that "when a mother works for pay, children suffer."

We begin with the share of women, separately for migrants and non-migrants, who report working in 2009 in Figure B13. Among migrants, we estimate a large increase in the share of women who are working in high-exposure districts for all cohorts. The estimates range between about a 10 to 20 percentage point increase in the likelihood of working. The estimates for medium-exposure districts are smaller in magnitude and generally not statistically different from 0. In contrast, the estimates for non-migrants suggest little change in the likelihood of working for most cohorts, with some evidence of a moderate increase in the likelihood of working among the oldest cohorts in high-exposure districts. This suggests that the decrease in marriage, motherhood, and number of

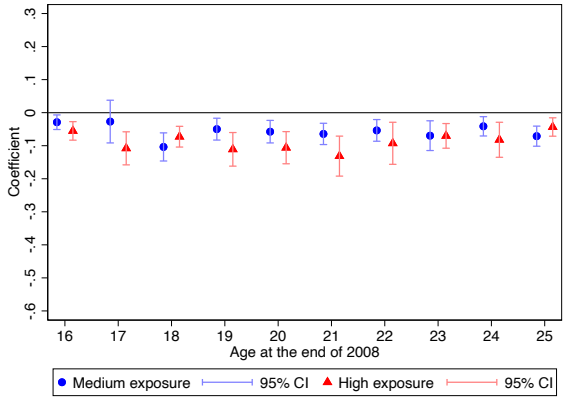
[17]This analysis is based on women in the 2009 census who are in our birth cohorts of interest, are married, and are either the head or spouse within the household. Restricting the sample to those who are the head or spouse is necessary so that we can track outcomes for their husband. 94% of migrant women in this sample are living with their husband. Among husbands, 83% of migrants are married to other migrants, and 8% of non-migrants are married to migrants.

children among migrant women in response to foreign manufacturing employment opportunities is at least partially due to a simultaneous increase in the likelihood of working.

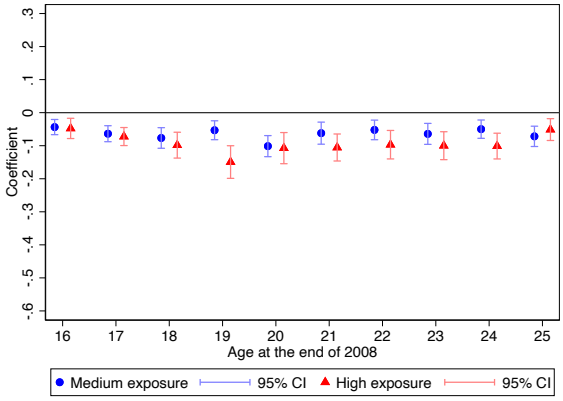
We additionally find evidence of changes in the sectoral composition of employment, for both migrants and non-migrants. Figure 8 shows the short run estimates of the share of women working in agriculture and the share of women working in foreign manufacturing for migrants and non-migrants. We find that migrants and non-migrants similarly were less likely to work in agriculture in both medium- and high-exposure districts for almost all cohorts. The shift out of agriculture is consistent with aggregate trends documented in McCaig and Pavcnik (2013) and Asghar and McCaig (2024). We also find evidence that both migrants and non-migrants shifted into foreign manufacturing. The shift occurred in both medium- and high-exposure districts and for most cohorts. The shift into foreign manufacturing was generally larger for migrants than for non-migrants, and in many cases by a substantial amount. For example, among migrant women in the cohort that turned 21 in 2008, they were 43.6 percentage points more likely to work in foreign manufacturing due to high exposure as compared to 16.0 percentage points among non-migrants. The shift toward employment in foreign manufacturing is consistent with results from McCaig *et al.* (2023), which shows substantial expansion of foreign manufacturing in Vietnam due to new export opportunities. We find similar results for working in overall manufacturing (Figure B10), which will include not only working in foreign manufacturing, but also other formal firms as well as informal firms.[18] The similar magnitude for foreign manufacturing and overall manufacturing in the short run suggests that most of the sectoral shift toward manufacturing was due to foreign manufacturing.

Together, we view the labor market changes as potentially important mechanisms for helping to understand the marriage and motherhood outcomes for migrants and non-migrants. Both migrants and non-migrants shifted out of agriculture to a similar extent, yet migrants had a much larger drop in the share married and the share that were mothers as of 2009. This suggests that moving out of agriculture is not directly related to these changes. We do find evidence that migrants experienced an increase in the share working, whereas non-migrants did not. We additionally find that both migrants and non-migrants shifted into foreign manufacturing jobs. Although the shift into foreign manufacturing was larger for migrants, it was nonetheless about half the magnitude for non-migrants and yet we see relatively minor changes in marriage and no evidence of changes in

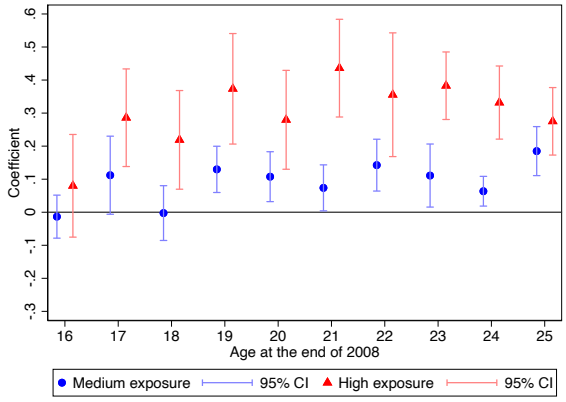
[18]See McCaig and Pavcnik (2015) and McCaig and Pavcnik (2018) for further information on the distinction between formal and informal firms in Vietnam's manufacturing sector.



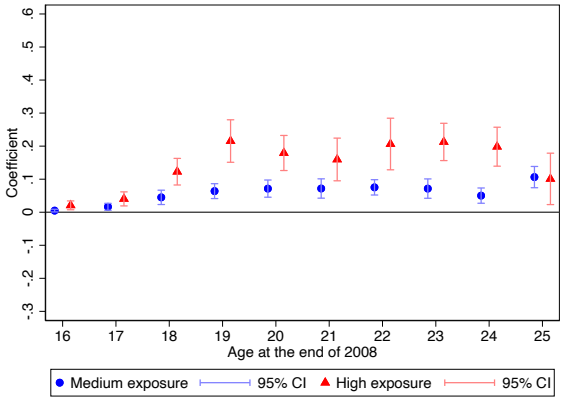
(a) Agriculture, migrants



(b) Agriculture, non-migrants



(c) Foreign manufacturing, migrants



(d) Foreign manufacturing, non-migrants

Figure 8: Foreign manufacturing jobs and working in agriculture and foreign manufacturing for migrants and non-migrants

Note: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variable in both panels is the difference in the share of women working in agriculture within the district-cohort in 2009 relative to women in the same district in cohort $c-10$ in 1999. In panel (a) the share of women working in agriculture is calculated only over migrants and in panel (b) they are calculated only over non-migrants. Controls, based on the migrant and non-migrant sample respectively, include the share of women within the district-cohort that are an ethnic minority, the share working in cohort $c-10$, that work in foreign manufacturing, that work in agriculture, and that are in school in 1999; and cohort fixed effects. Standard errors are clustered by district.

motherhood or the number of children. Hence, it does not appear as though the shift into foreign manufacturing is directly responsible for the observed changes in family formation decisions.

Balancing Work and Childcare The prevalence of working among women is relatively high in Vietnam (see Tables A1 and A2). This continues to be true of mothers, even those with young children (see Tables A6 and A7), which suggests that the availability of childcare is very important for balancing work and motherhood. However, Dang *et al.* (2022) report that enrollment in formal childcare in 2010 is very rare among the youngest children, with less than 1% of children younger than 1, 3% of children age 1, and 15% of children age 2 attending childcare.[19] Consistent with low enrollment in formal childcare, we see lower rates of work among women with young children as compared to mothers overall (Table A6). This is particularly the case for migrant women. For example, among women born in 1987, 65.3% of migrant mothers worked and 74.3% of non-migrant mothers worked.

A substantial fraction of the foreign manufacturing jobs are located in industrial zones (McCaig *et al.* 2024), and these zones are known to generally lack childcare (UNICEF 2018).[20] This may pose a particular problem for migrant women, who will also more commonly lack locally available family-based childcare. Indeed, many migrant women appear to send their children back to their home areas to live with their grandparents (UNICEF 2018). Hence, migrant women face a more challenging set of circumstances in which to make decisions regarding work, marriage, and motherhood. Migrating for better work opportunities will often come at the cost of greater difficulties in accessing childcare. This will likely influence not only decisions about motherhood, but also decisions related to marriage, since marriage and motherhood are so tightly linked in Vietnamese culture, and consequently work and migration as well.

6 Robustness Checks

In this section we perform four checks on our main results. First, we examine whether district-cohort pairs were subject to pre-existing trends using information on changing marriage rates between 1989 and 1999. Second, we use an instrumental variable strategy based on large changes

[19]The analysis by Dang *et al.* (2022) is based on the 2010 and 2016 Vietnam Household Living Standards Surveys, which do not do a good job of surveying recent migrants. Hence, these results should cautiously be interpreted as based on the young children of non-migrants. Access to formal childcare is likely even more limited for migrants (UNICEF 2018).

[20]Dang *et al.* (2022) report, more generally, on the lack of publicly funded early childcare centers throughout the country.

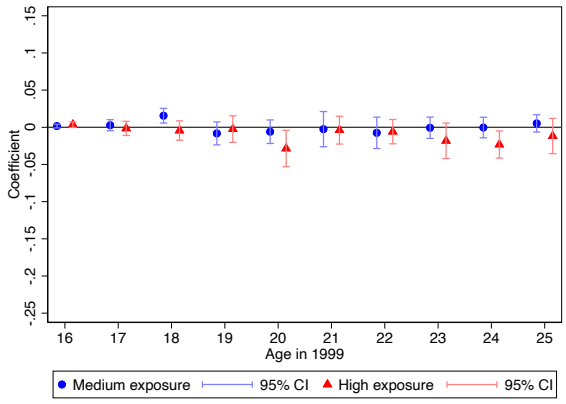
in employment within firms, following Atkin (2016). Third, we examine if the results are unique to foreign manufacturing or are more generally associated with increasing employment in formal manufacturing. Fourth, we explore the sensitivity of our results to changing the set of districts that are included in the sample.

6.1 Are results due to pre-existing trends?

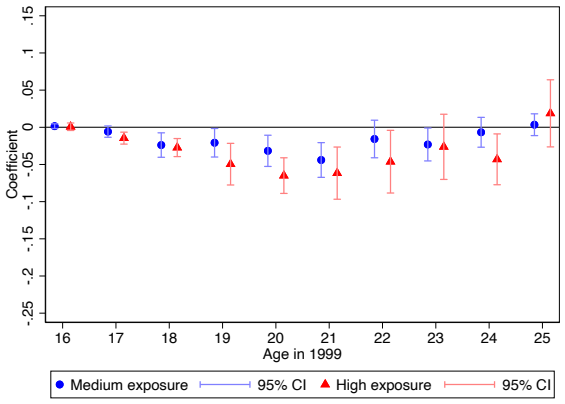
A key assumption of our identification strategy is that districts that were exposed to large increases in foreign manufacturing employment were not subject to pre-existing trends that are correlated with subsequent exposure to foreign manufacturing jobs. For example, if foreign manufacturing jobs are disproportionately located in districts in which marriage and motherhood rates were already falling faster on average, then this could bias our estimates. To explore whether our main results are possibly due to correlated pre-existing trends, we estimate equation (2), assigning the foreign manufacturing employment shocks to ten years prior to their actual arrival. For example, foreign manufacturing employment shocks in 2003, which are associated with the 1985 cohort in our main results, are assigned to the 1975 cohort in this falsification check. Our dependent variable is then the change in the share of women within a cohort that are married between the 1999 and 1989 censuses, where we match women in the 1989 census such that they are the same age in 1989 as the respective cohort in 1999. The estimates in Figure 9a suggest that there is little evidence of correlated pre-existing trends for marriage. The coefficients for both medium and high exposure are consistently close to 0 and not statistically different from 0. In Figure 9b we repeat our main marriage results additionally controlling for the change in marriage between 1989 and 1999. Consistent with the evidence of limited pre-existing trends, we find little difference between these results and our main results.

We similarly find little evidence of correlated pre-existing trends in changes of motherhood (Figure 9c), as the coefficients are consistently statistically insignificant and small in magnitude. The only exception is the high-exposure coefficient for the age 24 cohort, which is borderline statistically significant at the 5% level. Our main motherhood results are not sensitive to controlling for the 1989-99 change (Figure 9d).

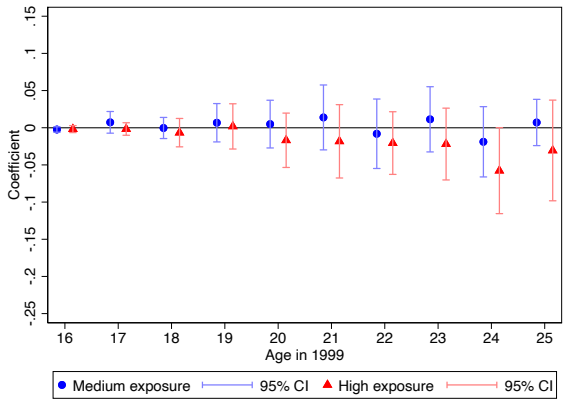
As an additional check about pre-existing trends, in Appendix Section B.11 we remove districts that had already been exposed to foreign manufacturing as of the 1999 census. We report the results in Figure B19a. We find strong evidence of no pre-existing trends in changes in marriage between 1989 and 1999. When we repeat our main analysis of marriage in 2009 on this restricted



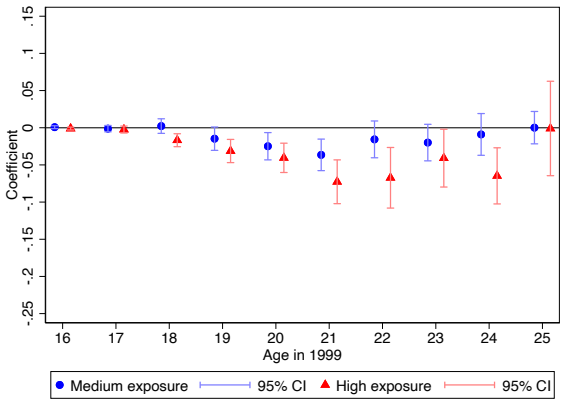
(a) Married in 1999 falsification results



(b) Married in 2009 controlling for 1989-99 trend



(c) Motherhood in 1999 falsification results



(d) Motherhood in 2009 controlling for 1989-99 trend

Figure 9: Pre-trend analysis of foreign manufacturing jobs and marriage and motherhood for women

Note: Each point (line) is a coefficient (95% confidence interval) from the main regression presented in equation 2. Both mid and high FDI-shocks are included in a single regression. The dependent variable in panel (a) is the difference in the share of women married within the district-cohort in 1999 relative to women in the same district in cohort $c-10$ *in 1989. In panel (b) the dependent variable is the difference in the share of women married within the district-cohort in 2009 relative to women in the same district in cohort* $c-10$ *in 1999. In panel (a) controls include the share of women within the district in cohort* $c-10$ *that are an ethnic minority in 1989, that were married in 1989, that worked in manufacturing in 1989, that worked in agriculture in 1989, and that were inter-district migrants in 1989 all interacted with cohort fixed effects. In panel (b) the controls are the same as in our main specification (Figure 4a) with the addition of the change in the marriage share between 1989 and 1999. Standard errors are clustered at the district level.*

set of districts, i.e., excluding those districts that were already somewhat exposed to foreign manufacturing as of 1999, the effects are stronger than in our baseline estimates. See Figure B20 for these results with a restricted set of districts.

Figure B20 also shows results for being a mother using the same sample restriction. As for marriage, focusing on districts that had not been exposed to foreign manufacturing jobs as of 1999 leads to larger short run reductions and generally no long run effects. Similarly, Figure B21 shows larger short run and smaller long run effects on being a migrant when using the same sample restriction. Together, these figures suggest that the effects are consistently larger in the short run and smaller in the long run when focusing on districts that had not been exposed to foreign manufacturing jobs as of 1999.

6.2 An instrumental variable strategy based on large changes in firm employment

The previous subsection demonstrated that our main results are not driven by correlated pre-existing trends. In this subsection we employ an instrumental variable approach as used in Atkin (2016). The concern is that foreign manufacturing firms may be choosing to locate in districts for unobserved reasons that are correlated with changes in family formation decisions. Atkin (2016) argues that large changes in firm-level employment, due to openings, expansions, contractions, and closures, are less likely to be influenced by changes in local labor markets for one or even multiple cohorts due to large fixed costs.

We instrument for mid- and high-exposure measures - which were based on the total change in foreign manufacturing jobs scaled by estimated population - with mid- and high-exposure measures based on changes in foreign manufacturing jobs including only those that accounted for at least 50 jobs and use the same thresholds to be considered medium or high exposure. This instrumental variable maps to the instrument used by Atkin (2016) who instrumented for "new net export jobs per worker" with "new net export jobs per worker generated by large single-firm expansions/openings and contractions/closings positive or negative changes of 50 or more employees in a single year at a single firm." We unstack the IV relative to the main analysis, running the regression for each cohort separately to avoid including a large number of instruments in a single regression. The IV estimation results for marriage in 2009 and 2019 are shown in Figure B15. The results are broadly similar. We estimate a delay in marriage consistent with our baseline results, albeit with a slight decrease in magnitude for some coefficients and somewhat larger confidence intervals. The

regressions have Kleibergen-Paap F statistics that are all above 25 and most of which are above 50 or 100, suggesting that the instruments are strong.

6.3 Is it foreign manufacturing jobs or formal manufacturing jobs more generally?

We also explore whether what we observe is caused specifically by foreign manufacturing jobs or whether any jobs in the formal manufacturing sector induce similar effects.[21] During our period of focus, 2000 to 2009, the number of manufacturing jobs in private domestic firms also increased dramatically (McCaig *et al.* 2023).

We replace our indicators for medium and high exposure to foreign manufacturing jobs with similar measures based on formal manufacturing jobs in non-foreign firms. The estimates shown in Figure B18 demonstrate little evidence of an impact on marriage, motherhood, number of children, and migration in medium-exposure districts. In high-exposure districts we estimate negative effects on marriage, motherhood, and the number of children, and an increase in migration. However, the estimates are substantially smaller in magnitude than our main results. This is possibly due to the more geographically dispersed expansion of jobs in private domestic firms as only 26.6% of women in our cohorts working in these firms were inter-provincial migrants in 2009 as compared to 43.8% among those working in foreign manufacturing firms.

6.4 Alternative samples of districts

As a last robustness check, we examine the sensitivity of our results to excluding districts in provinces in which no district-cohort is ever in our medium or high exposure bins. There are 10 such provinces which receive essentially no foreign manufacturing jobs during this period.[22] We remove all district-cohorts in these provinces and report the results in Figure B22 for marriage. The results are very similar to our main results. Similarly, if we include only districts in provinces in which at least one district-cohort was high exposure, they are fairly consistent (Figure B24).

[21] A formal firm in Vietnam is one that is registered with the Vietnamese government as an enterprise. All foreign and state firms must register as an enterprise, regardless of size. Private domestic firms must register if they have 10 or more workers or have more than one location. See McCaig and Pavcnik (2015, 2018) for further discussion of informal and formal firms.

[22] These provinces are Ha Giang, Cao Bang, Tuyen Quang, Lai Chau, Quang Binh, Kon Tum, Gia Lai, An Giang, Kien Giang, and Ca Mau.

7 A Simple Conceptual Framework

In this section, we sketch out a simple model of migration selection based on heterogeneity in preferences for marriage. We show that selection cannot explain our results as this model makes predictions counter to some of the patterns we observe. Second, we briefly discuss the potential role of norms around marriage and childcare for explaining our results.

7.1 A model of migration based on heterogeneous marriage preferences

Our results have shown that the change in marriage and motherhood in response to foreign manufacturing jobs was stronger among migrants than non-migrants. In this section we discuss a simple model to help explain why this happened. We focus on migrants and, for simplicity, ignore potential spillovers from migrants to non-migrants. We imagine this from the perspective of a single woman since very few women in Vietnam are married at the age of 18, the year we measure them as exposed to the arrival of foreign manufacturing jobs.

Consider a forward-looking young woman who lives in an area not directly affected by the increase in foreign manufacturing jobs. This woman cares both about total income and being married. We focus on the marriage decision since marriage and motherhood are so closely related in Vietnam. When new jobs appear in other locations, she optimally decides whether to migrate. Assume that there is a fixed cost to migrating. In addition, if she migrates this causes the probability of getting married to decrease. For simplicity, assume that she gets married if she does not migrate and the probability of marriage conditional on migrating is strictly less than 1. We view the decrease in the probability of being married following migration as due to a number of possible reasons, such as disruptions to social networks, challenges of finding affordable childcare, etc. This is consistent with migrants being less likely than non-migrants to be married at most ages (Figure A1). Hence, the woman faces a choice between receiving higher income, a decline in the probability of being married, and paying the migration cost if she migrates versus lower income and being married if she does not migrate.

Assume that utility for non-migrants can written as $V_i^o = w^o + M_i$, where w^o is income in the origin region and doesn't vary across individuals, and M_i is the utility from being married, which does vary across individuals. For migrants, we similarly have $V_i^d = w^d + pM_i - c$, where w^d is income in the destination region, $p < 1$ is the probability of being married as a migrant, and c is the cost of migration. A woman will migrate if their marriage preference is below a cutoff value:

$M_i < \frac{w^d - w^o - c}{1-p}$. In other words, for a given difference in income across regions and migration costs, women with the lowest utility from marriage will migrate.

Consider now what happens in response to new foreign manufacturing jobs, which increase the demand for women in the destination region (i.e., an increase in the value of w^d). This will increase the marriage preference cutoff for migration. That is, compared to before, women with a greater preference to be married will now be induced to migrate. Hence, relative to previous migrants, these additional migrants care more strongly about being married.

This simple model gives us a straightforward way to think about selection into migration and the effects on marriage. If one believes that migration disrupts marriage, consistent with the aggregate difference in marriage rates for migrants compared to non-migrants, and that young women care positively about being married, consistent with the high long run marriage rates in Vietnam, this model predicts women who care the least about marriage are more likely to migrate. However, as the economic motivation for migrating increases, the additional, marginal migrants should care more about marriage than the first women to migrate. Together, this suggests that the marriage rate among migrants should *increase* as additional women migrate. This is not what we see though. The marriage rate among migrants *fell* in the more exposed districts as the rate of in-migration increased. This suggests that what we're finding is not simply driven by a selection effect. Indeed, our results for changes in marriage rates among migrants are opposite of what is predicted by this simple model.

We now allow the probability of being married in the destination location to be a function of the local gender ratio. As the ratio of women to men increases, the probability of marriage for women decreases. Hence, utility in the destination location can be written as $V_i^d = w^d + p(r)M_i - c$ where $p(r)$ is the probability of being married which is inversely related to the female-male ratio r. A woman will optimally choose to migrate if

$$M_i < \frac{w^d - w^o - c}{1 - p(r)}. \tag{3}$$

The model still predicts selection as before: the women who care least about marriage will be the ones more likely to migrate and as more women migrate, the additional migrants will be ones that care more about marriage than the first migrants. However, the aggregate rate of migration now also matters for the gender ratio in the destination location. As more and more women migrate, the female-male ratio continues to increase, leading to a decrease in the probability of being married

in the destination location. If the fall in the probability of marriage is sufficiently large to offset the selection on marriage preference, then an overall decline in the marriage rate among migrants is possible. This prediction is consistent with the empirical evidence we presented where migration among young women responded very strongly to the shock (Figure 7), the female share of the population rose in the short run (Figure B11), and increased marriage among migrant men (Figure B8), who became relatively more scarce and thus the opposite prediction would hold.

It is noteworthy that our results based on exposure to other jobs in formal manufacturing, i.e., domestic firms, produce smaller effects on marriage, motherhood, number of children, and migration (Figure B18). This pattern of results is consistent with the important role of migration in disrupting family formation. Where new formal manufacturing jobs did not induce as much migration, marriage, motherhood, and number of children fell by less. This is consistent with domestic firms being less export oriented (McCaig *et al.* 2023) and thus more likely to be geographically dispersed relative to foreign manufacturing firms.

7.2 The role of marriage and childcare norms

Cultural norms around the role of women are becoming more liberal in Vietnam, particularly among the young (Institute for Social Development Studies 2015). As such, it is natural to ask to what extent our results may be driven by changing cultural norms. To do so, we revisit some of our previous robustness results and interpret them in the context of changing social norms.

First, consider the results of exposure to other jobs in formal manufacturing. To the extent that industrialization and economic development drive changes in social norms, we would expect exposure to new employment opportunities in domestically-owned manufacturing to lead to changing marriage norms. The results in Figure B18 suggest a modest effect of this possibility. The short run decrease in marriage, motherhood, and the number of children in response to domestic manufacturing employment opportunities is much smaller than in response to foreign manufacturing. This suggests that changing norms due to industrialization may play a role in accounting for our main results, but they do not explain them entirely.

Second, consider the results shown in Figure B24 where the sample is restricted to provinces in which at least one district-cohort experienced *high* exposure. These regressions include provinces from the Red River Delta in the north, provinces around Ho Chi Minh City in the southeast, and a few provinces in the center near Da Nang. As such, district-cohorts in this sample that feature no- or low-exposure to foreign manufacturing are all in areas that are generally experiencing rapid

growth and economic development. Thus, changing social norms could be expected to be more similar between the no-/low-exposure and mid-/high-exposure district-cohorts in this sample. If changing norms due to economic development were driving our results, we should expect much weaker results in this sample, yet we don't in general find this to be the case.

Lastly, consider the possibility that foreign-invested manufacturing firms are transferring social norms to their workers (Tang and Zhang 2021). As we described in section 2, around 80% of foreign manufacturing employment is in Taiwanese, South Korean, and Japanese firms. As these countries have similar views on gender norms, particularly on women's role in household (Iida 2023) and these firms are commonly managed by men, either Vietnamese or from the source country, it is unlikely that more liberal views are being transferred from the firms to their female workers.

8 Conclusion

Vietnam's large inflow of foreign direct investment into manufacturing in the early 2000s provides an excellent setting for studying how the expansion of relatively good labor market opportunities for women affects marriage and motherhood decisions. We find strong evidence that there was a reduction in the likelihood of being married and being a mother among young women living in districts more heavily exposed to the expansion of foreign manufacturing jobs. Additionally, we find that migration is an important mechanism as the reduction in marriage is largely driven by two factors. First, migrants are less likely to be married than non-migrants in the same district-cohort, and there is a large increase in migration into the exposed districts. Second, among migrants there is a large reduction in the share that are married in the heavily exposed districts.

Our results suggest that migration is a key factor in understanding the delay in marriage and motherhood. The key question is why. Both migrants and non-migrants are less likely to work in agriculture and more likely to work in foreign manufacturing in the most heavily exposed districts, although the shift toward employment in foreign manufacturing is larger for migrants than for non-migrants. Despite similar changes in the nature of work, there is little short-run effect on marriage and no effects on motherhood and number of children for non-migrants. This suggests that migration itself, as opposed to the nature of work, may be the driving factor. This has potentially important consequences for thinking about how the location of economic activity interacts with fertility decisions, at least in the short run. Numerous governments around the world are actively trying to attract foreign direct investment in manufacturing, often inside special economic zones

(UNCTAD 2019). The location of these zones and their jobs relative to the location of the workers most likely to affected may influence family formation decisions.

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A Summary Statistics

Table A1: Summary statistics for women in 2009

Cohort	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983
Age at the end of 2008	16	17	18	19	20	21	22	23	24	25
Married	0.031	0.064	0.142	0.226	0.316	0.412	0.505	0.590	0.661	0.729
Mother	0.010	0.024	0.067	0.130	0.210	0.296	0.389	0.473	0.555	0.636
Number of children	0.010	0.026	0.073	0.147	0.245	0.360	0.495	0.625	0.768	0.918
Migrant	0.049	0.064	0.217	0.257	0.256	0.236	0.215	0.200	0.185	0.169
School	0.655	0.618	0.370	0.306	0.249	0.174	0.106	0.069	0.052	0.038
Worked	0.352	0.374	0.536	0.587	0.626	0.691	0.753	0.788	0.810	0.825
In agriculture	0.238	0.233	0.298	0.310	0.316	0.330	0.350	0.345	0.348	0.352
In manufacturing	0.070	0.089	0.160	0.183	0.190	0.202	0.205	0.205	0.199	0.195
In foreign manufacturing	0.014	0.024	0.065	0.081	0.087	0.090	0.089	0.085	0.078	0.074
Number of districts	611	611	611	611	611	611	611	611	611	611

Note: Reported values are means across districts. They are weighted by district size.

Table A2: Summary statistics for women in 2019

Cohort	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983
Age at the end of 2018	26	27	28	29	30	31	32	33	34	35
Married	0.735	0.784	0.803	0.833	0.852	0.866	0.870	0.876	0.882	0.882
Mother	0.637	0.707	0.746	0.793	0.823	0.848	0.860	0.875	0.892	0.898
Number of children	1.011	1.155	1.281	1.414	1.525	1.620	1.706	1.774	1.841	1.890
Migrant	0.121	0.109	0.100	0.092	0.082	0.073	0.065	0.060	0.056	0.050
School	0.013	0.010	0.008	0.006	0.007	0.006	0.005	0.005	0.004	0.004
Worked	0.827	0.832	0.832	0.842	0.847	0.849	0.855	0.854	0.860	0.861
In agriculture	0.181	0.171	0.182	0.187	0.197	0.201	0.216	0.212	0.219	0.223
In manufacturing	0.287	0.281	0.283	0.275	0.268	0.262	0.262	0.259	0.246	0.242
In foreign manufacturing										
Number of districts	611	611	611	611	611	611	611	611	611	611

Note: Reported values are means across districts. They are weighted by district size. Information on working in foreign manufacturing was not collected in the 2019 census.

Table A3: Summary statistics for women in 1999

Cohort	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973
Age at the end of 1998	16	17	18	19	20	21	22	23	24	25
Married	0.030	0.074	0.158	0.271	0.370	0.471	0.569	0.651	0.706	0.749
Mother	0.009	0.025	0.069	0.157	0.260	0.363	0.482	0.566	0.638	0.703
Number of children	0.009	0.027	0.075	0.177	0.302	0.445	0.638	0.803	0.968	1.148
Migrant	0.032	0.042	0.083	0.108	0.113	0.100	0.087	0.078	0.068	0.064
School	0.444	0.365	0.244	0.173	0.131	0.086	0.046	0.024	0.017	0.014
Worked	0.441	0.515	0.603	0.669	0.706	0.749	0.789	0.807	0.814	0.813
In agriculture	0.362	0.403	0.454	0.492	0.493	0.510	0.530	0.536	0.538	0.541
In manufacturing	0.045	0.067	0.091	0.106	0.120	0.122	0.117	0.116	0.111	0.105
In foreign manufacturing	0.002	0.004	0.009	0.012	0.014	0.013	0.012	0.011	0.010	0.009
Number of districts	611	611	611	611	611	611	611	611	611	611
Cohort	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963
Age at the end of 1998	26	27	28	29	30	31	32	33	34	35
Married	0.785	0.812	0.828	0.845	0.855	0.860	0.865	0.869	0.870	0.867
Mother	0.750	0.798	0.816	0.858	0.866	0.874	0.887	0.897	0.908	0.909
Number of children	1.312	1.482	1.616	1.819	1.951	2.084	2.235	2.362	2.516	2.627
Migrant	0.056	0.051	0.046	0.042	0.038	0.036	0.033	0.031	0.030	0.029
School	0.011	0.009	0.007	0.006	0.005	0.005	0.004	0.004	0.004	0.004
Worked	0.804	0.812	0.797	0.802	0.803	0.802	0.810	0.816	0.820	0.822
In agriculture	0.534	0.547	0.540	0.547	0.554	0.548	0.561	0.564	0.571	0.571
In manufacturing	0.099	0.093	0.085	0.077	0.070	0.067	0.062	0.060	0.056	0.054
In foreign manufacturing	0.008	0.007	0.006	0.005	0.004	0.004	0.003	0.002	0.002	0.002
Number of districts	611	611	611	611	611	611	611	611	611	611

Note: Reported values are means across districts. They are weighted by district size.

Table A4: Summary statistics for women in 1989

Cohort	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963
Age at the end of 1988	16	17	18	19	20	21	22	23	24	25
Married	0.038	0.093	0.187	0.315	0.421	0.515	0.603	0.669	0.724	0.757
Migrant	0.027	0.034	0.047	0.057	0.064	0.066	0.068	0.066	0.067	0.064
Worked	0.572	0.669	0.719	0.780	0.805	0.825	0.843	0.855	0.863	0.866
In agriculture	0.505	0.578	0.592	0.625	0.625	0.623	0.630	0.631	0.639	0.633
In manufacturing	0.040	0.056	0.076	0.088	0.094	0.097	0.094	0.095	0.091	0.091
Number of districts	607	607	607	607	607	607	607	607	607	607
Mother	0.016	0.047	0.120	0.225	0.323	0.413	0.525	0.602	0.684	0.746
Number of districts	424	431	442	443	445	447	447	448	450	449

Note: Reported values are means across districts. They are weighted by district size. The number of observations available for the the share of women that are mothers is lower since this information is only available in a 5% sample and not all districts were included in this sample.

Table A5: Summary statistics for exposure to foreign manufacturing jobs

Cohort	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983
Age at the end of 2008	16	17	18	19	20	21	22	23	24	25
Exposure	0.004	0.001	0.003	0.007	0.008	0.006	0.008	0.008	0.009	0.006
Max Exposure	0.148	0.171	0.095	0.163	0.130	0.097	0.198	0.189	0.217	0.211
Mid Exposure	0.155	0.107	0.124	0.161	0.172	0.133	0.132	0.133	0.137	0.127
High Exposure	0.093	0.056	0.108	0.129	0.132	0.132	0.135	0.116	0.116	0.086
Number of districts	611	611	611	611	611	611	611	611	611	611

Note: Reported values are means across districts with the exception of Max exposure, which is the maximum value of l_{dc}, as calculated in equation (1), across districts within the cohort. They are weighted by district size.

Table A6: Share of women employed in 2009 by motherhood

Cohort	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983
Age at the end of 2008	16	17	18	19	20	21	22	23	24	25
	All									
Mothers and non-mothers	0.352	0.374	0.536	0.587	0.626	0.691	0.753	0.788	0.810	0.825
Non-Mothers	0.350	0.369	0.532	0.583	0.622	0.688	0.756	0.795	0.822	0.840
Mothers	0.638	0.630	0.621	0.662	0.679	0.720	0.744	0.764	0.784	0.801
Mothers w/ Children Under 1	0.583	0.595	0.550	0.575	0.582	0.601	0.632	0.644	0.669	0.693
Mothers w/ Children Under 2	0.597	0.610	0.580	0.625	0.632	0.658	0.684	0.695	0.719	0.736
	Non-migrants									
Mothers and non-mothers	0.336	0.350	0.572	0.643	0.676	0.725	0.771	0.799	0.815	0.831
Non-Mothers	0.334	0.345	0.566	0.637	0.671	0.721	0.770	0.800	0.820	0.838
Mothers	0.650	0.646	0.669	0.704	0.708	0.743	0.767	0.784	0.798	0.814
Mothers w/ Children Under 1	0.608	0.603	0.598	0.608	0.619	0.631	0.662	0.677	0.687	0.710
Mothers w/ Children Under 2	0.617	0.619	0.630	0.665	0.668	0.688	0.711	0.726	0.737	0.752
	Migrants									
Mothers and non-mothers	0.662	0.712	0.405	0.425	0.479	0.582	0.689	0.743	0.787	0.797
Non-Mothers	0.662	0.719	0.409	0.428	0.482	0.588	0.708	0.776	0.834	0.846
Mothers	0.708	0.518	0.412	0.506	0.602	0.653	0.662	0.676	0.722	0.735
Mothers w/ Children Under 1	0.547	0.489	0.399	0.448	0.476	0.507	0.537	0.530	0.617	0.618
Mothers w/ Children Under 2	0.702	0.552	0.387	0.463	0.529	0.566	0.596	0.579	0.656	0.659

Note: Reported values are means across districts. They are weighted by district size. Mothers with children under one are the subset of women whose children were born sometime during the year preceding the census (after April of 2008) based on the year and month of last live birth. Those with children under two are the subset with children born within the preceding two years (after April of 2007).

Table A7: Share of women employed in 2019 by motherhood

Cohort	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983
Age at the end of 2018	26	27	28	29	30	31	32	33	34	35
					All					
Mothers and non-mothers	0.827	0.832	0.832	0.842	0.847	0.849	0.855	0.854	0.860	0.861
Non-Mothers	0.834	0.830	0.819	0.811	0.817	0.810	0.797	0.794	0.779	0.777
Mothers	0.807	0.820	0.822	0.837	0.846	0.849	0.856	0.855	0.863	0.864
Mothers w/ Children Under 1	0.707	0.713	0.720	0.728	0.746	0.751	0.749	0.743	0.759	0.756
Mothers w/ Children Under 2	0.747	0.759	0.763	0.773	0.782	0.781	0.785	0.787	0.788	0.792
					Non-migrants					
Mothers and non-mothers	0.826	0.832	0.831	0.842	0.848	0.851	0.857	0.854	0.862	0.862
Non-Mothers	0.830	0.825	0.812	0.804	0.815	0.807	0.792	0.787	0.773	0.771
Mothers	0.808	0.822	0.824	0.839	0.848	0.851	0.859	0.857	0.865	0.866
Mothers w/ Children Under 1	0.709	0.720	0.725	0.733	0.748	0.759	0.753	0.752	0.768	0.763
Mothers w/ Children Under 2	0.750	0.763	0.768	0.778	0.786	0.788	0.790	0.791	0.795	0.798
					Migrants					
Mothers and non-mothers	0.845	0.847	0.844	0.847	0.847	0.841	0.844	0.856	0.835	0.844
Non-Mothers	0.883	0.890	0.890	0.894	0.866	0.880	0.879	0.904	0.836	0.829
Mothers	0.808	0.811	0.808	0.820	0.832	0.828	0.832	0.840	0.828	0.841
Mothers w/ Children Under 1	0.703	0.672	0.662	0.677	0.749	0.699	0.701	0.630	0.605	0.673
Mothers w/ Children Under 2	0.742	0.742	0.731	0.731	0.734	0.729	0.734	0.719	0.690	0.733

Note: Reported values are means across districts. They are weighted by district size. Mothers with children under one are the subset of women whose children were born sometime during the year preceding the census (after April of 2018) based on the year and month of last live birth. Those with children under two are the subset with children born within the preceding two years (after April of 2017).

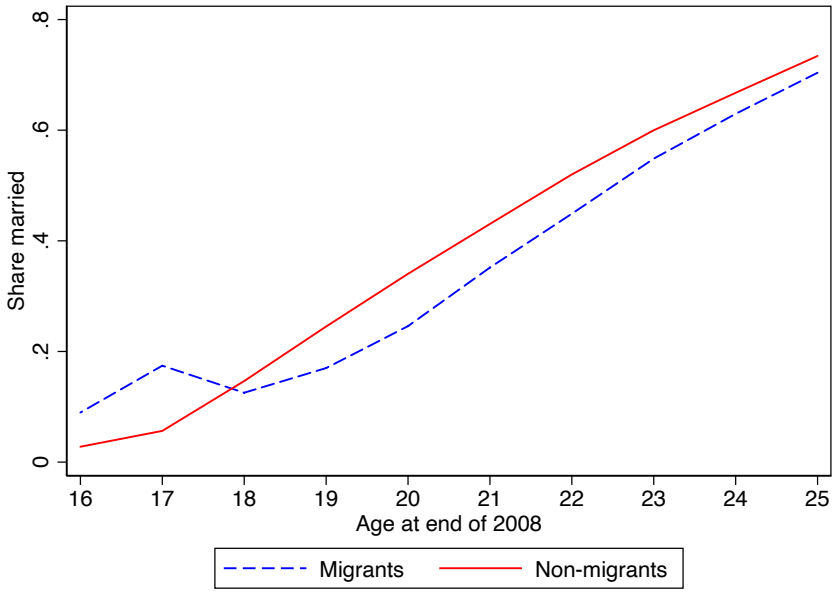


Figure A1: Share of migrant and non-migrant women married in 2009

Notes: The sample is women in the 2009 census born in 1983 through 1992. A woman is defined as a migrant if they moved across districts within the five years preceding the 2009 census. All estimates are weighted.

B Additional results and discussion

B.1 Literature on trade and foreign direct investment in Vietnam

Our work relates to how trade and foreign direct investment are affecting workers, firms, and structural change in Vietnam.[23] The most closely related papers are McCaig *et al.* (2023), which shows that reductions in U.S. tariffs on manufacturing imports from Vietnam led to an increase in employment in foreign-invested firms operating in Vietnam, particularly among entrants; Asghar and McCaig (2024), which demonstrates that individuals transitioning into the jobs generated by the U.S. tariff reductions are largely coming from outside of manufacturing; Sakakibara (2024), which documents that women were pulled into the garments sector in response to new export opportunities; and Hoang (2025), which finds that young women delay marriage and childbirth in provinces more exposed to the U.S. tariff reductions due to the 2001 U.S.-Vietnam Bilateral Trade Agreement. Our work looks at the demographic - marriage and motherhood - changes induced by foreign manufacturing jobs using detailed location and timing of job arrival, with a focus on the important role of migration and distinguishing between short and long run effects.

B.2 Foreign Manufacturing Job Characteristics

The following table lays out the relationship between working in foreign manufacturing and various job characteristics - ages, hours, and having a contract, paid leave, or social insurance. Each panel focuses on a different subset of workers: all workers, workers in manufacturing (both in informal and formal firms), and workers in formal manufacturing. We report the coefficient and standard error on an indicator variable for working in foreign manufacturing from a series of regressions where the dependent variable varies across numerous job outcomes.

[23] See McCaig (2011), Fukase (2013), McCaig and Pavcnik (2013, 2018), Malesky and Mosley (2018), Baccini *et al.* (2019), McCaig *et al.* (2023), Mitra *et al.* (2022), Hoang *et al.* (2024), Malesky and Mosley (2021), Rotunno *et al.* (2024), and Huynh and Ku (2025).

Table B1: Foreign manufacturing job characteristics

	Hourly Wages	Daily Hours	Monthly Hours	Contract	Paid Leave	Social Insurance
			Panel A: All Jobs			
Foreign Manufacturing Jobs	0.072***	0.507***	0.507***	0.338***	0.337***	0.439***
	(0.019)	(0.011)	(0.011)	(0.013)	(0.018)	(0.015)
Observations	4650	10821	10821	4666	4666	4666
			Panel B: Manufacturing Jobs			
Foreign Manufacturing Jobs	0.170***	0.137***	0.243***	0.254***	0.367***	0.442***
	(0.023)	(0.008)	(0.015)	(0.015)	(0.020)	(0.019)
Observations	2089	2699	2699	2094	2094	2094
			Panel C: Formal Manufacturing Jobs			
Foreign Manufacturing Jobs	0.099***	0.014**	0.018	0.074***	0.239***	0.302***
	(0.023)	(0.007)	(0.011)	(0.013)	(0.022)	(0.021)
Observations	1704	1706	1706	1709	1709	1709

Note: *** p<0.01, ** p<0.05, * p<0.1. We use data from the 2010 Vietnam Household Living Standard Survey, focusing on the individual's most time consuming job during the past 12 months. The sample includes women in cohorts 1983 to 1992. The dependent variables are ln hourly wages calculated as earnings during the past 30 days divided by hours worked during the past 30 days, the ln of daily and monthly hours, and indicator variables for having a signed payroll book, being entitled to paid leave and holidays, and being entitled to social insurance. Each coefficient is from a separate regression where the dependent variable is the variable indicated in the column header and the explanatory variable is an indicator for working in foreign manufacturing. The regressions control for cohort fixed effects and indicators for highest completed level of education (primary, lower secondary, and upper secondary or higher). Standard errors are robust.

B.3 Exposure to foreign manufacturing jobs and initial district-cohort conditions

Table B2: Partial correlation between mid exposure to foreign manufacturing jobs and 1999 district characteristics

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Married	-0.417***	-0.484***	-0.295***	-0.397***	-0.330***	-0.304***	-0.338***	-0.107	-0.408***	-1.177***
	(0.140)	(0.140)	(0.111)	(0.114)	(0.096)	(0.092)	(0.087)	(0.090)	(0.086)	(0.158)
R-squared	0.020	0.035	0.015	0.035	0.031	0.021	0.023	0.001	0.013	0.032
Mothers	-0.161**	-0.250***	-0.113*	-0.236***	-0.158***	-0.222***	-0.267***	-0.236	-0.074	-1.190***
	(0.066)	(0.081)	(0.066)	(0.066)	(0.057)	(0.070)	(0.071)	(0.150)	(0.162)	(0.215)
R-squared	0.008	0.022	0.005	0.024	0.012	0.015	0.015	0.005	0.000	0.012
Number of Children	-0.079***	-0.102***	-0.057	-0.138***	-0.108***	-0.148***	-0.215***	-0.202*	-0.089	-0.968***
	(0.020)	(0.027)	(0.035)	(0.030)	(0.031)	(0.042)	(0.050)	(0.111)	(0.102)	(0.172)
R-squared	0.018	0.025	0.006	0.028	0.014	0.014	0.016	0.005	0.001	0.011
In foreign manufacturing	4.916***	4.480**	2.998***	5.095**	2.807**	2.692*	3.131***	2.243**	1.189	20.542***
	(1.448)	(2.161)	(0.836)	(2.588)	(1.242)	(1.547)	(0.580)	(0.940)	(1.040)	(5.965)
R-squared	0.077	0.057	0.046	0.044	0.024	0.028	0.040	0.022	0.003	0.046
In agriculture	-0.195***	-0.243***	-0.182***	-0.234***	-0.231***	-0.229***	-0.248***	-0.113**	-0.141***	-0.304***
	(0.050)	(0.053)	(0.050)	(0.055)	(0.053)	(0.056)	(0.055)	(0.052)	(0.049)	(0.069)
R-squared	0.039	0.062	0.030	0.052	0.052	0.042	0.046	0.008	0.012	0.036
School	2.574***	3.446***	1.840***	1.544***	0.703***	0.419***	0.299**	0.011	0.164**	0.276***
	(0.959)	(0.933)	(0.597)	(0.318)	(0.203)	(0.132)	(0.119)	(0.077)	(0.069)	(0.079)
R-squared	0.019	0.061	0.034	0.082	0.060	0.027	0.015	0.000	0.008	0.020
Migrant	0.358**	0.836***	0.635***	0.615***	0.600***	0.545***	0.427***	0.085	-0.304***	0.154
	(0.172)	(0.239)	(0.209)	(0.212)	(0.179)	(0.160)	(0.153)	(0.141)	(0.113)	(0.272)
R-squared	0.007	0.040	0.027	0.034	0.043	0.034	0.022	0.001	0.004	0.001

Notes: *** p<0.01, ** p<0.05, * p<0.1. Each coefficient is from a separate regression where the dependent variable is an indicator for whether cohort c in district d faced mid exposure to foreign manufacturing jobs in the year they turned 18. The explanatory variable changes across rows and is based on the 1999 outcome for cohort $c-10$ in district d. Standard errors are reported in parentheses below the coefficient and the R-squared is reported below the standard error. Within each cohort, the sample is all districts except those for which $High$ takes the value 1.

Table B3: Partial correlation between high exposure to foreign manufacturing jobs and 1999 district characteristics

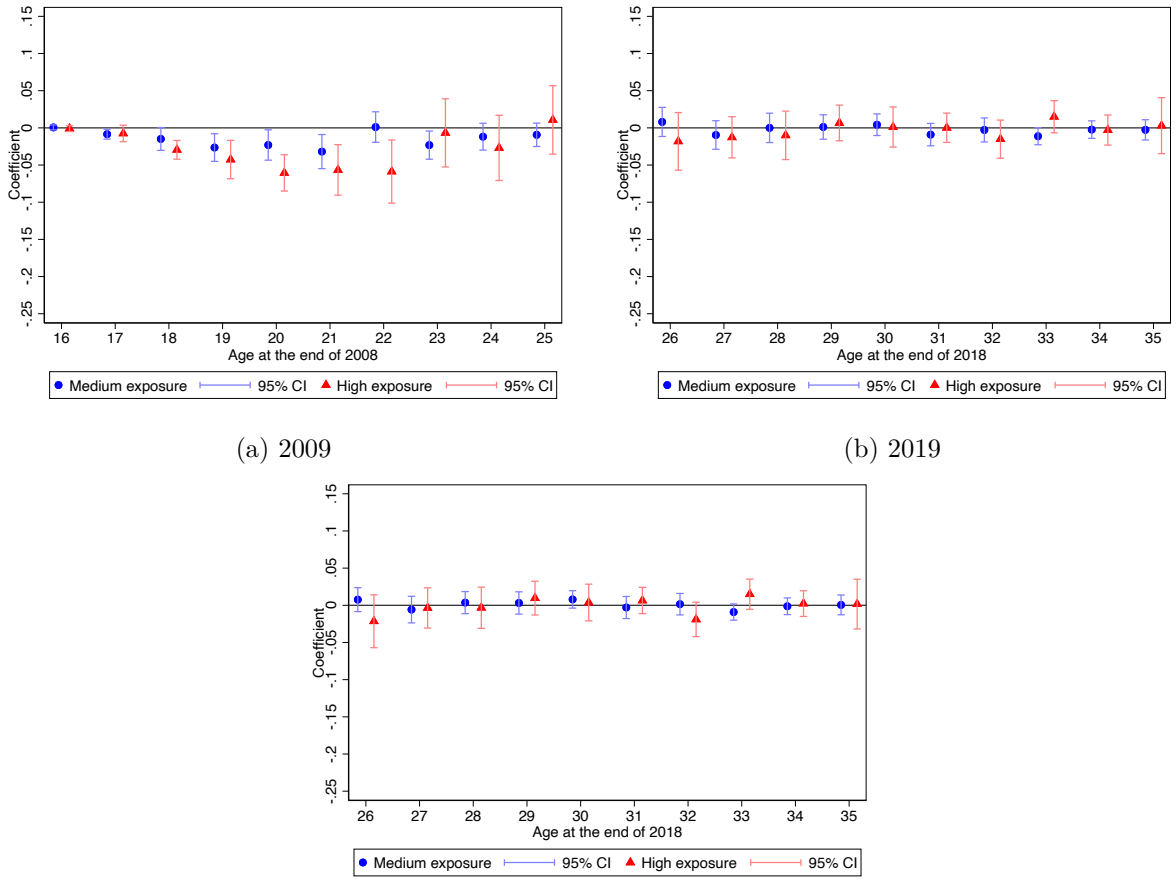
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Married	-0.399***	-0.450***	-0.321***	-0.433***	-0.313***	-0.296***	-0.217***	-0.254***	-0.223***	-0.667***
	(0.118)	(0.116)	(0.098)	(0.094)	(0.071)	(0.074)	(0.074)	(0.069)	(0.056)	(0.122)
R-squared	0.067	0.057	0.034	0.061	0.041	0.033	0.015	0.015	0.007	0.016
Mothers	-0.197***	-0.203***	-0.182***	-0.222***	-0.179***	-0.197***	-0.138**	-0.262***	-0.229***	-0.489**
	(0.059)	(0.062)	(0.056)	(0.053)	(0.045)	(0.054)	(0.058)	(0.068)	(0.069)	(0.231)
R-squared	0.048	0.028	0.026	0.032	0.023	0.020	0.006	0.011	0.004	0.003
Number of Children	-0.056***	-0.081***	-0.087***	-0.107***	-0.115***	-0.129***	-0.134***	-0.174***	-0.174***	-0.381**
	(0.017)	(0.019)	(0.023)	(0.024)	(0.025)	(0.034)	(0.039)	(0.066)	(0.055)	(0.177)
R-squared	0.034	0.030	0.028	0.027	0.025	0.018	0.010	0.007	0.004	0.003
In foreign manufacturing	4.842***	4.451***	4.261***	4.516***	3.678***	3.492***	4.357***	3.599***	0.949	21.847***
	(0.898)	(0.697)	(0.689)	(0.593)	(0.402)	(0.610)	(0.541)	(0.923)	(0.858)	(2.644)
R-squared	0.540	0.401	0.345	0.401	0.306	0.260	0.247	0.139	0.004	0.185
In agriculture	-0.147***	-0.185***	-0.172***	-0.249***	-0.244***	-0.230***	-0.196***	-0.186***	-0.078**	-0.160***
	(0.041)	(0.043)	(0.044)	(0.049)	(0.048)	(0.049)	(0.050)	(0.047)	(0.035)	(0.059)
R-squared	0.080	0.066	0.053	0.090	0.089	0.068	0.044	0.041	0.007	0.014
School	0.829*	0.905**	0.652**	0.687**	0.223**	0.219**	0.162*	0.146**	0.083*	0.075
	(0.443)	(0.424)	(0.327)	(0.294)	(0.104)	(0.099)	(0.088)	(0.069)	(0.048)	(0.059)
R-squared	0.007	0.007	0.008	0.017	0.008	0.011	0.006	0.007	0.004	0.002
Migrant	0.650***	0.760***	0.634***	0.756***	0.473***	0.534***	0.472***	0.347**	-0.062	0.242
	(0.210)	(0.231)	(0.200)	(0.214)	(0.158)	(0.159)	(0.151)	(0.143)	(0.127)	(0.250)
R-squared	0.104	0.070	0.059	0.087	0.040	0.052	0.041	0.021	0.000	0.002

Notes: *** p<0.01, ** p<0.05, * p<0.1. Each coefficient is from a separate regression where the dependent variable is an indicator for whether cohort c in district d faced mid exposure to foreign manufacturing jobs in the year they turned 18. The explanatory variable changes across rows and is based on the 1999 outcome for cohort $c-10$ in district d. Standard errors are reported in parentheses below the coefficient and the R-squared is reported below the standard error. Within each cohort, the sample is all districts except those for which Mid takes the value 1.

B.4 Alternative Mapping of Consistent District Boundaries

In this subsection we explore how sensitive our main results are to defining consistent district boundaries as of 1999. In particular, we use consistent district boundaries as close as possible to district boundaries as of 2019. This is motivated by the 2019 population census which asked for the individual's district of residence five years prior to the census, i.e., 2014. Using 2019-based consistent district boundaries then allows us to easily examine 2019 outcomes based on the individual's location in 2014. This allows us to partially strip out compositional changes between 2009 and 2019 due to migration across districts.

We begin with marriage results in 2009 and 2019 using 2019-based consistent district boundaries. The results are shown in Figure B1. Results for 2009 and 2019 are very similar to those shown in Figures 4a and 4b, our main specification using 1999-based consistently defined districts. This suggests that the difference in the definition of consistent districts does not create differences in results. In Figure B1c we use the 2019 census to study the long run effects, but use the woman's location as of 2014 such that there are no compositional changes between 2014 and 2019 due to migration. Note that we cannot use the 2019 census to know the individual's location as of 2009 as it only asked about the individual's location 5 years prior. We find little difference in long run effects if we use the individual's location in 2014 vs 2019. This is consistent with a lack of compositional changes driving the long run effects on marriage.



(a) 2009

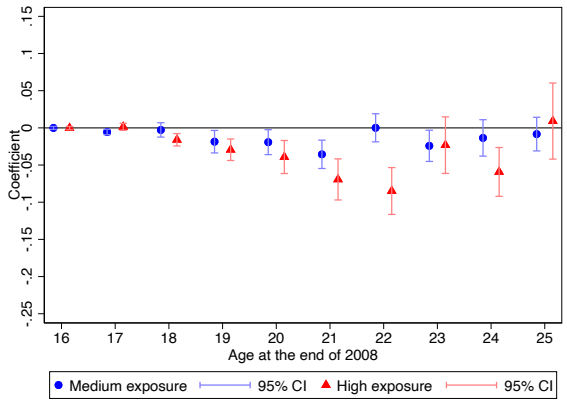
(b) 2019

(c) 2019 - District as of 2014

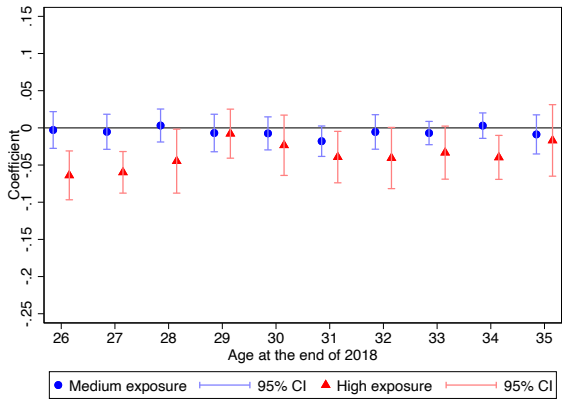
Figure B1: Foreign manufacturing jobs and marriage, unwinding part of migration

Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variable is the change in the share of women within the district-cohort that are married. Controls include the share of women within the district-cohort that are an ethnic minority, the share married in 1999, and cohort fixed effects. The consistent districts for 2019 are based on those women lived in as of 2014, unwinding part of the migration. Standard errors are clustered by district.

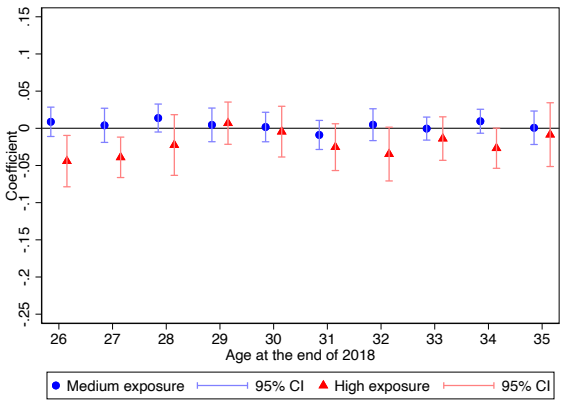
In Figure B2 we repeat the same exercise using motherhood as the outcome. Here too we find that using districts based on 2019 boundaries does not alter our main results for motherhood in either the short run, 2009, or the long run, 2019. We furthermore find no evidence of important differences in results when we use the woman's location as of 2014. This is again consistent with the idea that compositional changes due to migration are not driving the differences between short and long run results.



(a) 2009



(b) 2019

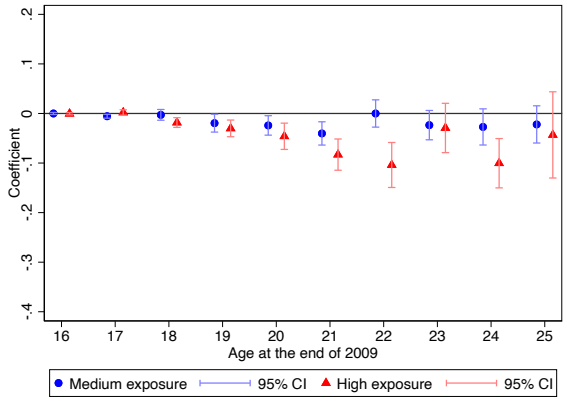


(c) 2019 - District as of 2014

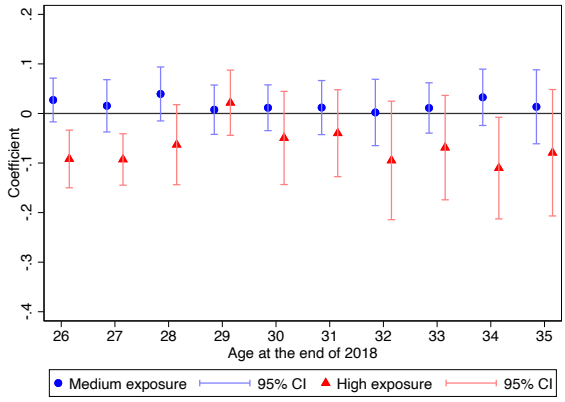
Figure B2: Foreign manufacturing jobs and motherhood, unwinding part of migration

Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variable is the change in the share of women within the district-cohort that are married. Controls include the share of women within the district-cohort that are an ethnic minority, the share married in 1999, and cohort fixed effects. The consistent districts for 2019 are based on those women lived in as of 2014, unwinding part of the migration. Standard errors are clustered by district.

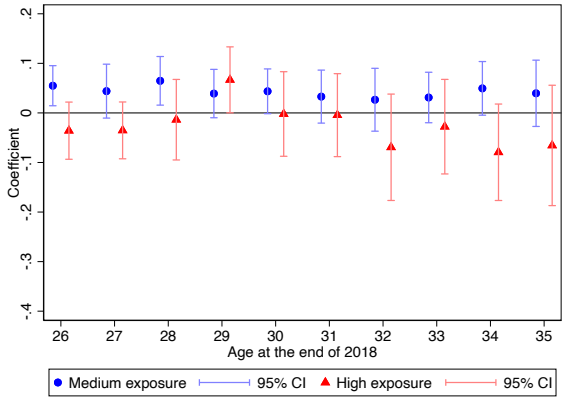
Lastly, in Figure B3 we perform the same exercise using the average number of children as the outcome. Results for 2009 and 2019 remain very similar with the new district mapping and there remains relatively little evidence of important compositional changes between 2014 and 2019.



(a) 2009



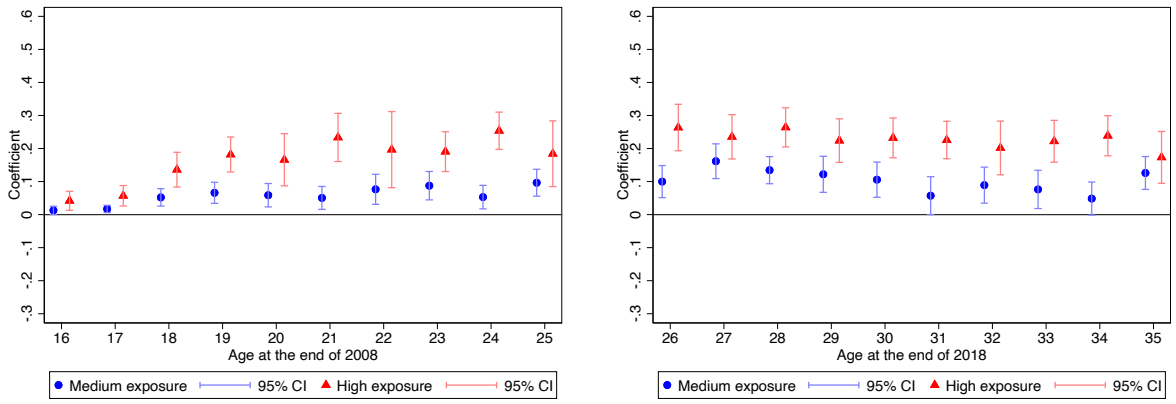
(b) 2019



(c) 2019 - District as of 2014

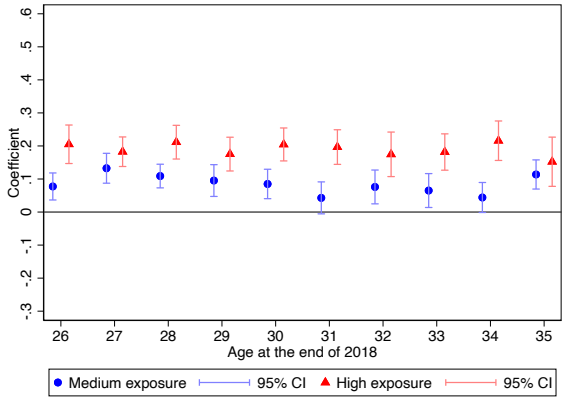
Figure B3: Foreign manufacturing jobs and number of children, unwinding part of migration

Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variable is the change in the share of women within the district-cohort that are married. Controls include the share of women within the district-cohort that are an ethnic minority, the share married in 1999, and cohort fixed effects. The consistent districts for 2019 are based on those women lived in as of 2014, unwinding part of the migration. Standard errors are clustered by district.



(a) 2009

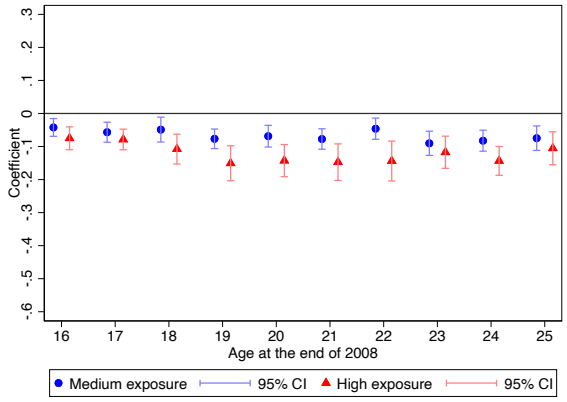
(b) 2019



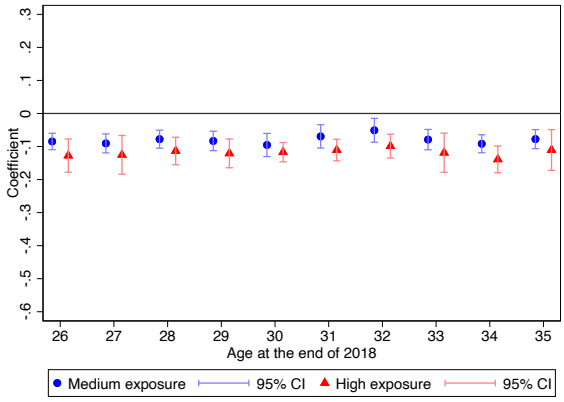
(c) 2019 - District as of 2014

Figure B4: Foreign manufacturing jobs and working in manufacturing, unwinding part of migration

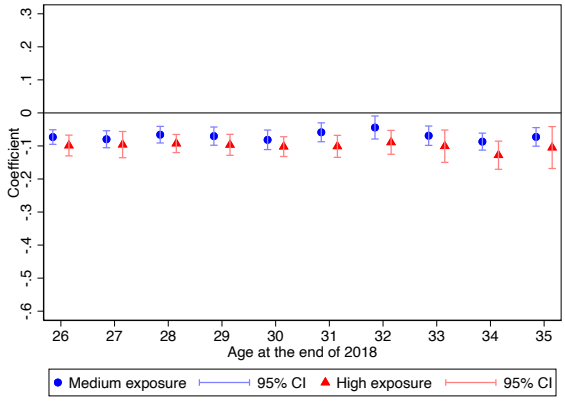
Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variable is the change in the share of women within the district-cohort that are married. Controls include the share of women within the district-cohort that are an ethnic minority, the share married in 1999, and cohort fixed effects. The consistent districts for 2019 are based on those women lived in as of 2014, unwinding part of the migration. Standard errors are clustered by district.



(a) 2009



(b) 2019



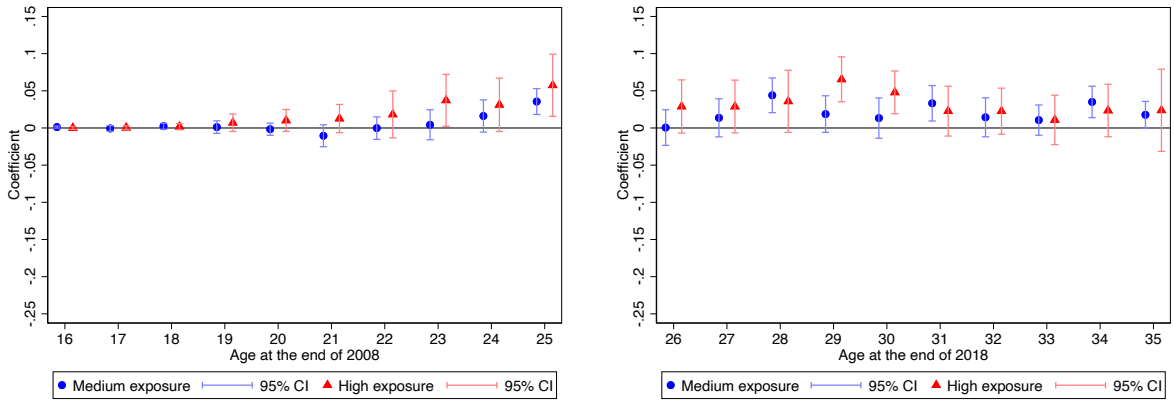
(c) 2019 - District as of 2014

Figure B5: Foreign manufacturing jobs and working in agriculture, unwinding part of migration

Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variable is the change in the share of women within the district-cohort that are married. Controls include the share of women within the district-cohort that are an ethnic minority, the share married in 1999, and cohort fixed effects. The consistent districts for 2019 are based on those women lived in as of 2014, unwinding part of the migration. Standard errors are clustered by district.

B.5 Foreign manufacturing jobs and outcomes for men

Our focus in this paper has been on women. However, we can look at changes in outcomes for men as well. Figure B6 displays the effects of exposure to foreign manufacturing jobs at age 18 for changes in the share of men that are married in 2009 and 2019. In contrast to women (see Figures 4a and 4b), we see no evidence of a decrease in the share of men that are married. Instead, the estimates suggest an increase in the share of men that are married in both medium- and high-exposure districts among older cohorts. For the age 25 cohort, the estimates suggest an 8 percentage point increase in the share of married men in high-exposure districts. This pattern is consistent with the large shift in the gender composition documented in Figure B11. The influx of young women might have relatively improved the odds of being married for men who are slightly older. In the long run, 2019, many of the cohorts continue to exhibit increases in the share married, but the estimates are sometimes not statistically different from 0, and it is worth further noting that the magnitudes decrease in high-exposure districts in the older cohorts relative to in 2009. Hence, as for women, some of the short run effects seem to dissipate for men as well.



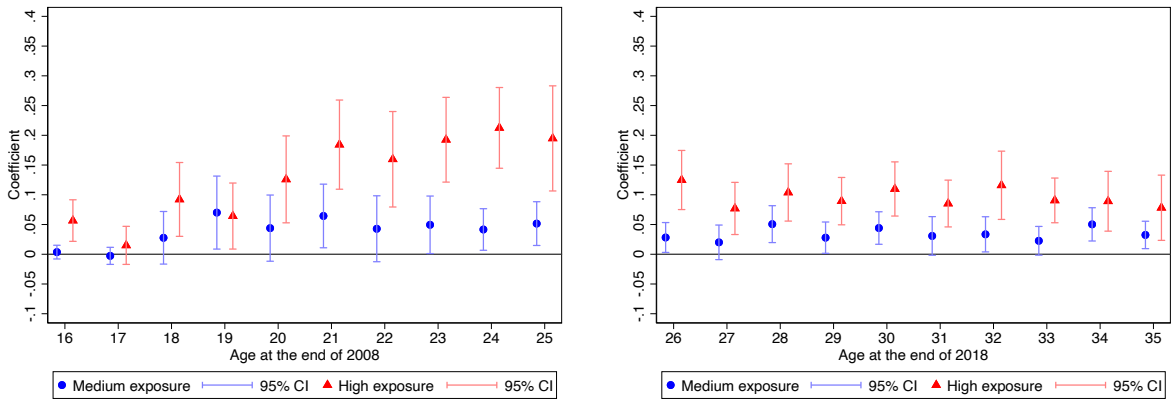
(a) 2009 (b) 2019

Figure B6: Foreign manufacturing jobs and marriage for men

Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variable is the change in the share of men within the district-cohort that are married. Controls include the share of men within the district-cohort that are an ethnic minority, the share married in 1999, and cohort fixed effects. Standard errors are clustered by district.

Figure B7 shows the migration results for men. In general, the results for men are smaller in magnitude than for women (Figure 6), consistent with the increase in the share of the district-cohort population that are women (Figure B11).

In terms of labor market outcomes for men, we also observe a shift out of agriculture and into

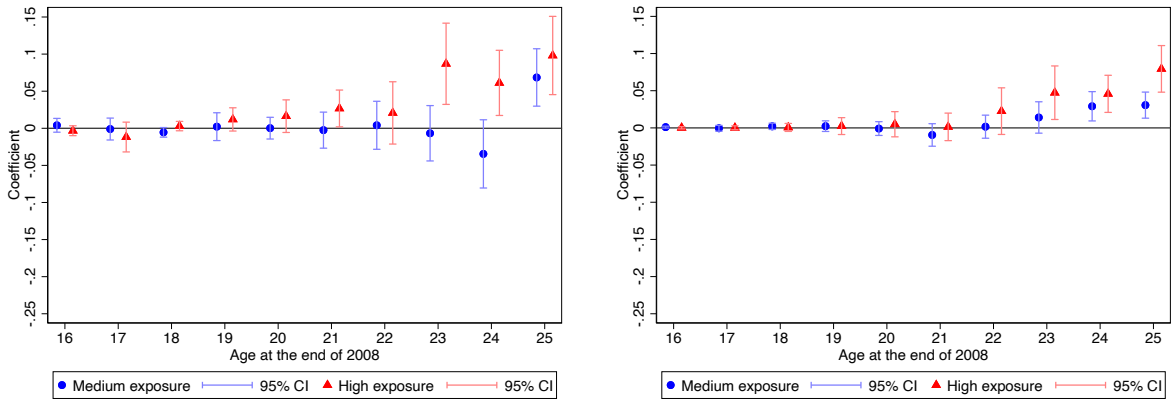


(a) 2009 (b) 2019

Figure B7: Foreign manufacturing jobs and migration for men

Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variable is the change in the share of men within the district-cohort that are migrants. Controls include the share of women within the district-cohort that are an ethnic minority, the share married in 1999, and cohort fixed effects. Standard errors are clustered by district.

manufacturing in districts more exposed to foreign manufacturing jobs (Figure B9). However, the shift out of agriculture is slightly smaller for men than for women in 2009, but by 2019 the effects look very similar across genders. We correspondingly see a smaller shift into manufacturing for male cohorts in exposed districts in 2009, but here too the long run effects look very similar across genders. Overall, the labor market changes look broadly similar for women and men with women experiencing slightly larger changes in the short run. Despite the relatively similar labor market changes, the effects on marriage differ substantially for women and men. This suggests that either the labor market changes are not directly responsible for the changes in marriage patterns or that these labor market changes induced differential effects on marriage patterns across women and men.

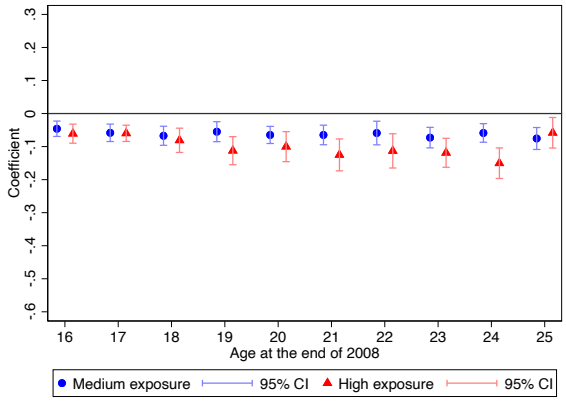


(a) Married, migrants

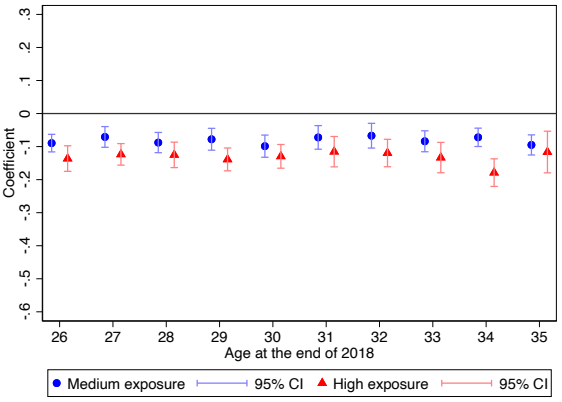
(b) Married, non-migrants

Figure B8: Foreign manufacturing jobs and marriage among migrant and non-migrant men

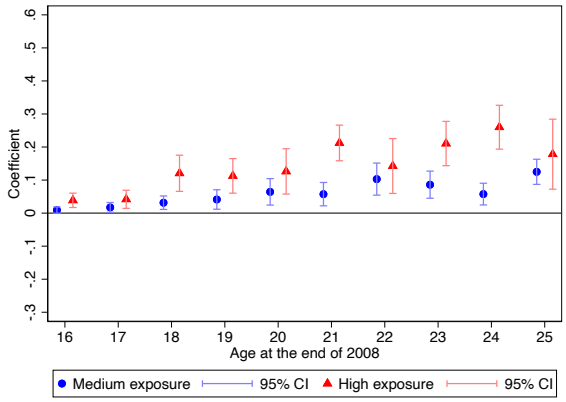
Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variables are the difference in the share married for men within the district-cohort in 2009 relative to men in the same district in cohort $c-10$ in 1999. Panel (a) is calculated only over migrants and panel (b) is calculated only over non-migrants. Controls, based on migrant and non-migrant samples respectively, include the share of men within the district in 1999 in cohort $c-10$ that work in foreign manufacturing, that work in agriculture, and that are in school in 1999, as well as cohort fixed effects. Additionally, the regressions control for the 1999 outcome interacted by cohort. Controls also include the share of men in the district-cohort who are an ethnic minority interacted with cohort. Both are within migrants or non-migrants alone. Standard errors are clustered by district.



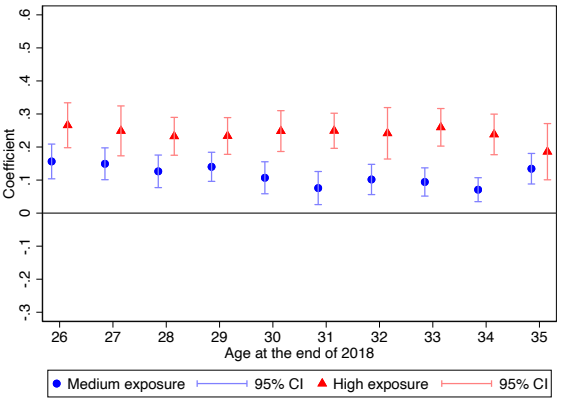
(a) 2009 in agriculture



(b) 2019 in agriculture



(c) 2009 in manufacturing

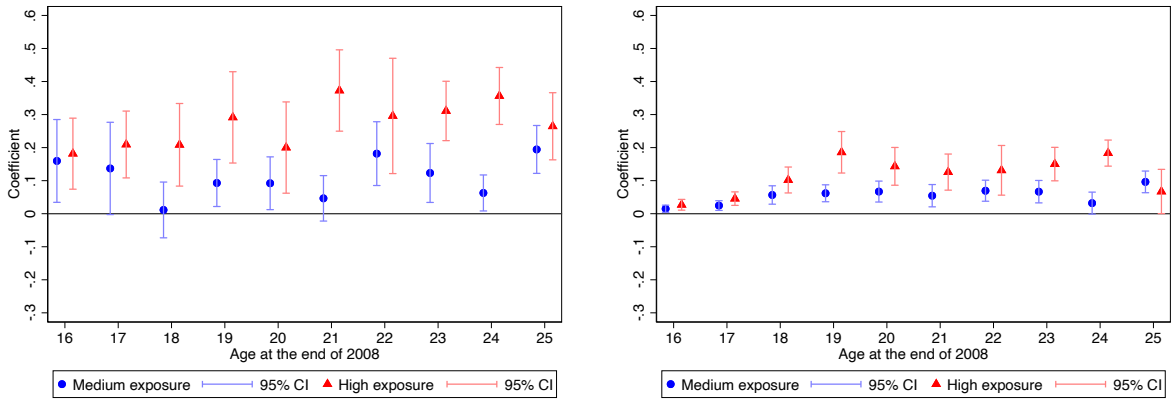


(d) 2019 in manufacturing

Figure B9: Foreign manufacturing jobs and working in agriculture and manufacturing for men

Notes: Each point (line) is a coefficient (95% confidence interval) from the main regression presented in equation 2. Both mid and high FDI-shocks are included in a single regression. The dependent variables are the change in the share of men working in agriculture (manufacturing) in 2009 and 2019 respectively. Controls include the share of men within the district-cohort that are an ethnic minority, the outcome share in 1999, and cohort fixed effects. Standard errors are clustered at the district level.

B.6 Additional results for migrants and non-migrants



(a) Migrants

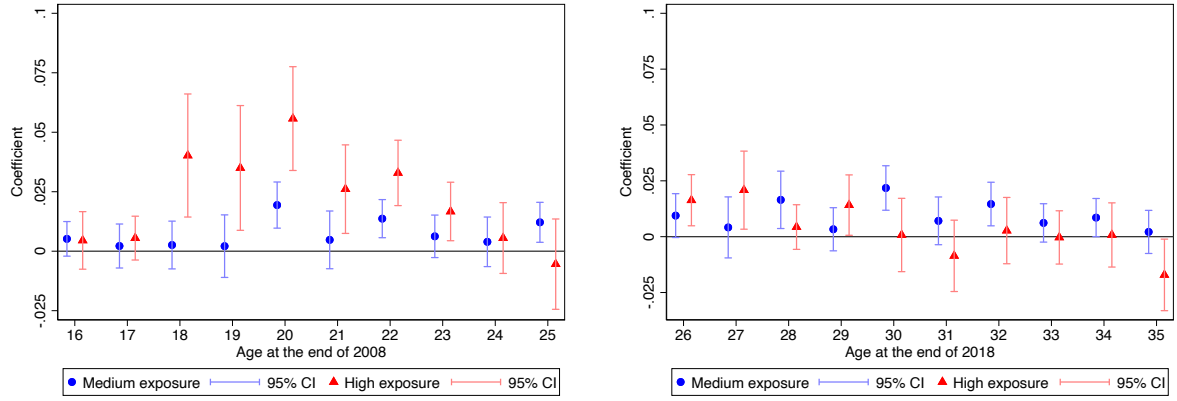
(b) Non-migrants

Figure B10: Foreign manufacturing jobs and working in manufacturing for migrants and non-migrants

Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variable in both panels is the difference in the share of women working in manufacturing within the district-cohort in 2009 relative to women in the same district in cohort $c-10$ in 1999. In panel (a) the share of women working in manufacturing is calculated only over migrants and in panel (b) they are calculated only over non-migrants. Controls, based on the migrant and non-migrant sample respectively, include the share of women within the district-cohort that are an ethnic minority, the share working in cohort $c-10$, that work in foreign manufacturing, that work in agriculture, and that are in school in 1999; and cohort fixed effects. Standard errors are clustered by district.

B.7 Female Share of the Population

To explore the role that gender composition in districts plays in the effects we observe, we consider our main regression from equation 2 with the share of the population that is women as the outcome.



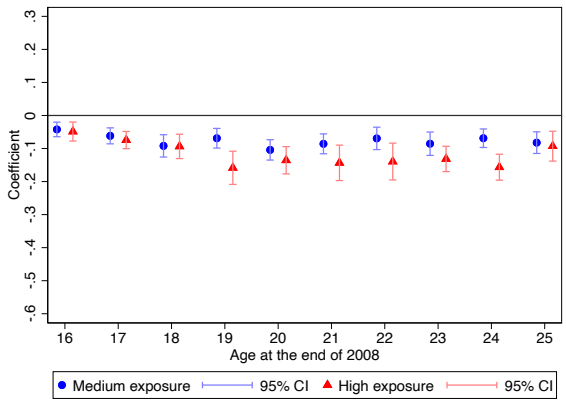
(a) 2009 (b) 2019

Figure B11: Foreign manufacturing jobs and the female share of the population

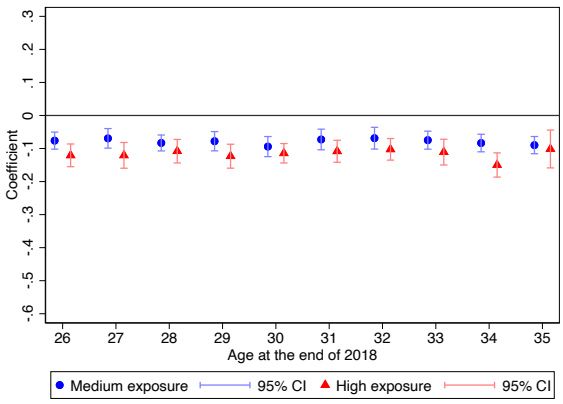
Notes: Each point (line) is a coefficient (95% confidence interval) from the main regression presented in equation 2. Both mid and high FDI-shocks are included in a single regression. The dependent variables are the changes in the share of women within the district in 2009 and 2019 respectively. Controls include the share of women in the district in 1999, the share of women working in foreign manufacturing in 1999, the share of women working in agriculture in 1999, the share of women in school in 1999, and the share of women that were inter-district migrants in 1999, all interacted with cohort fixed effects. Cohort fixed effects are also included. Standard errors are clustered at the district level.

B.8 Additional labor market results for women

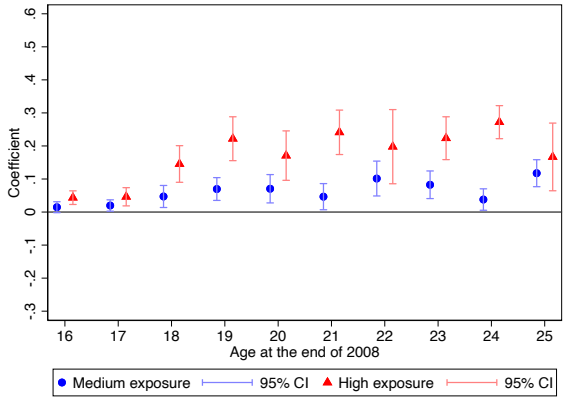
The following figures expand on the discussion of labor markets as a mechanism using labor market outcomes for women as the dependent variable in equation 2. Figure B12 show the results for women working in agriculture and manufacturing in general in 2009 and 2019, while Figure 8 focuses on agriculture and formal manufacturing in 2009 for migrants and non-migrants. Figure B14 considers being in formal and non-formal manufacturing as the outcome.



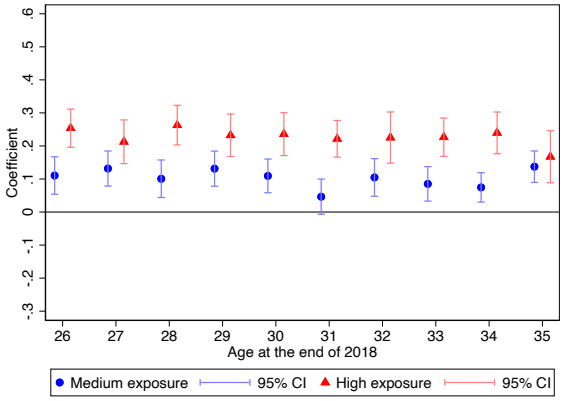
(a) 2009 in agriculture



(b) 2019 in agriculture



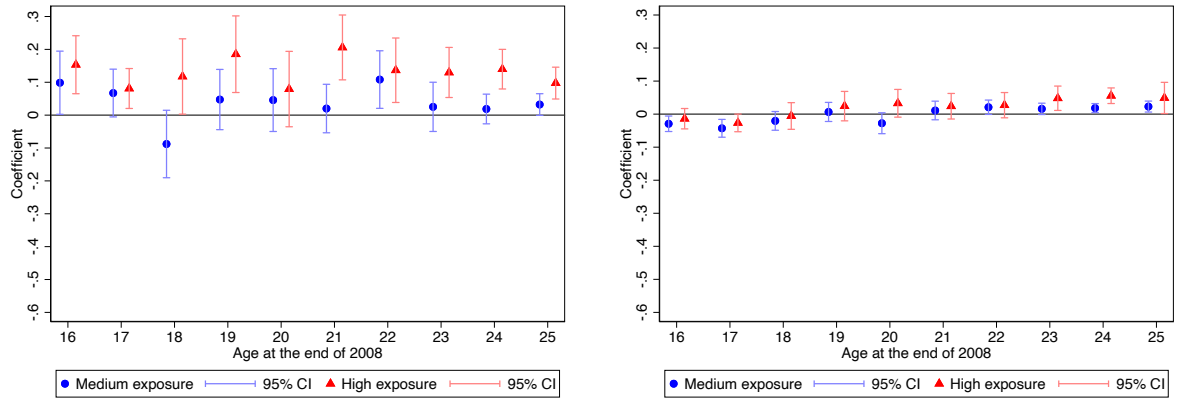
(c) 2009 in manufacturing



(d) 2019 in manufacturing

Figure B12: Foreign manufacturing jobs and working in agriculture and manufacturing

Notes: Each point (line) is a coefficient (95% confidence interval) from the main regression presented in equation 2. Both mid and high FDI-shocks are included in a single regression. The dependent variables are the change in the share of women working in agriculture (manufacturing) in 2009 and 2019 respectively. Controls include the share of women within the district-cohort that are an ethnic minority, the outcome share in 1999, and cohort fixed effects. Standard errors are clustered at the district level.

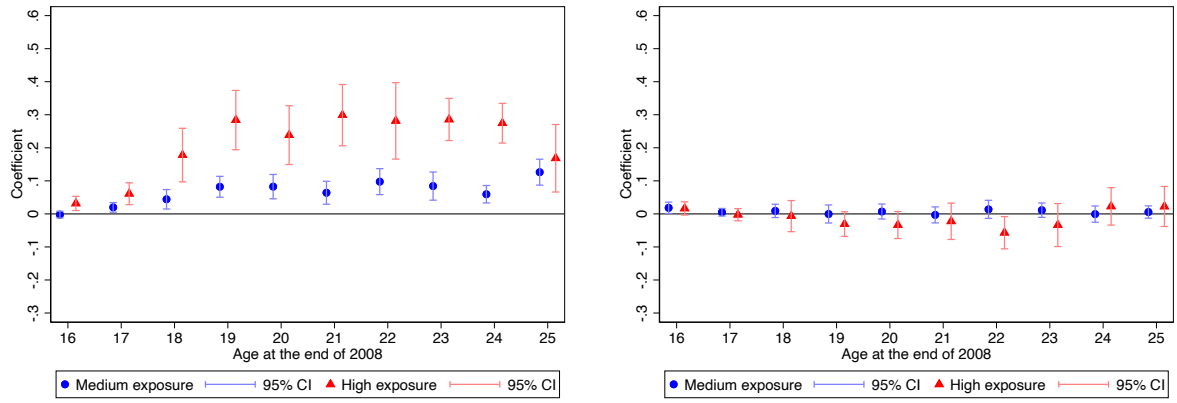


(a) Migrants

(b) Non-migrants

Figure B13: Foreign manufacturing jobs and working for migrants and non-migrants in 2009

Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variable in both panels is the difference in the share of women working within the district-cohort in 2009 relative to women in the same district in cohort $c-10$ in 1999. In panel (a) the number of children rates are calculated only over migrants and in panel (b) they are calculated only over non-migrants. Controls, based on the migrant and non-migrant sample respectively, include the share of women within the district-cohort that are an ethnic minority, the share working in cohort $c-10$, that work in foreign manufacturing, that work in agriculture, and that are in school in 1999; and cohort fixed effects. Standard errors are clustered by district.



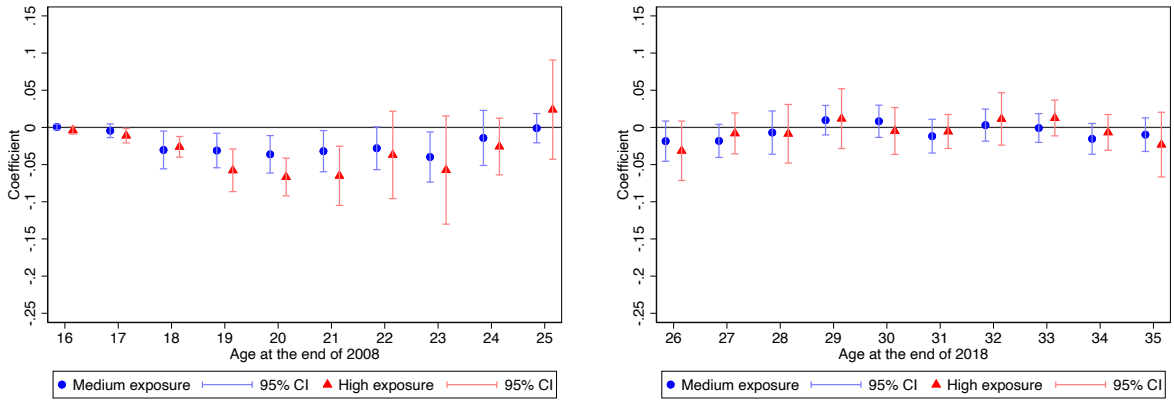
(a) 2009 in foreign manufacturing

(b) 2009 in manufacturing other than foreign

Figure B14: Foreign manufacturing jobs and working in foreign and non-foreign manufacturing

Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variables are the difference in the share of women working in foreign manufacturing in panel (a) and the difference in the share of women working in other manufacturing in panel (b). Controls include the share of women within the district in 1999 in cohort $c-10$ that work in foreign manufacturing, that work in agriculture, that are in school, and that are in-migrants, interacted with the cohort, as well as cohort fixed effects. Additionally, the regressions control for the 1999 outcome interacted by cohort. Controls also include the share of women in the district-cohort who are an ethnic minority interacted with cohort. Standard errors are clustered by district.

B.9 Robustness: Instrumental Variables

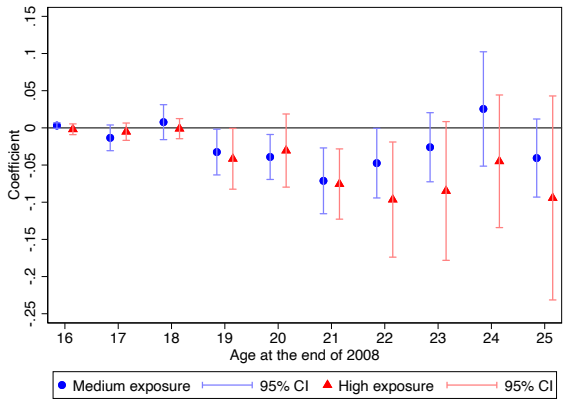


(a) IV - 2009

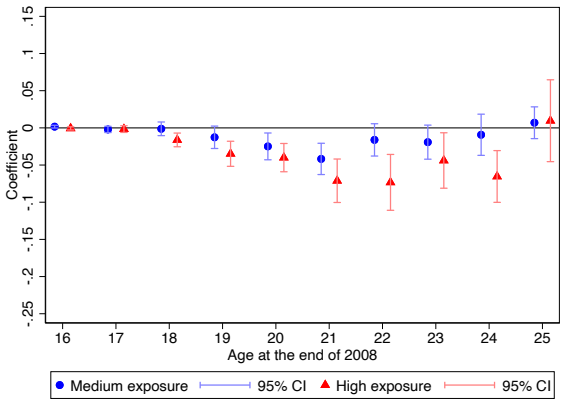
(b) IV - 2019

Figure B15: Foreign manufacturing jobs and marriage - Instrumental Variables

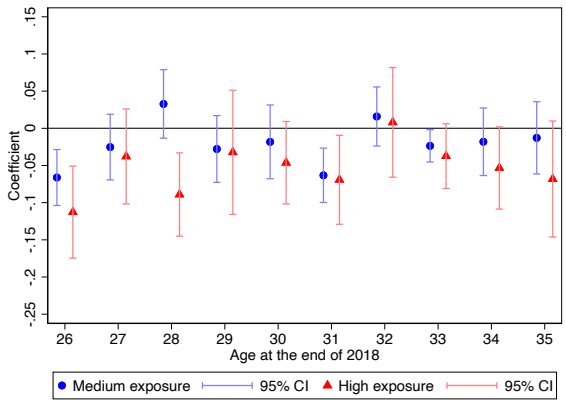
Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The figure on the left is the instrumental variables version of the regressions, unstacked to limit the number of instruments in each regression. The figure on the right is the core approach, included for ease of comparison



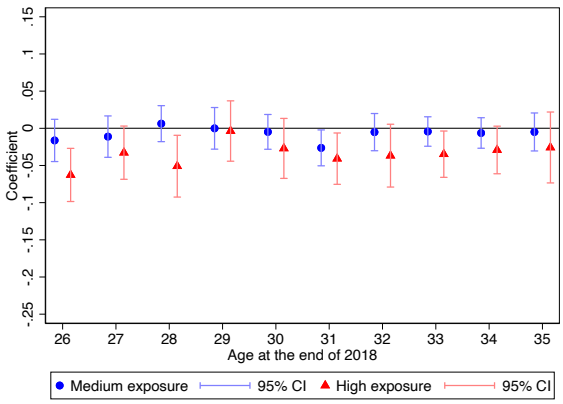
(a) IV - 2009



(b) Core Approach - 2009



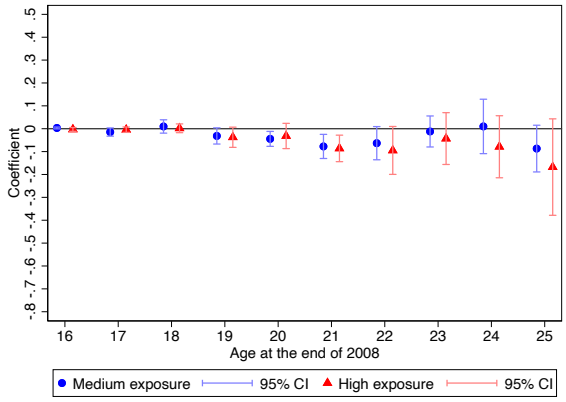
(c) IV - 2019



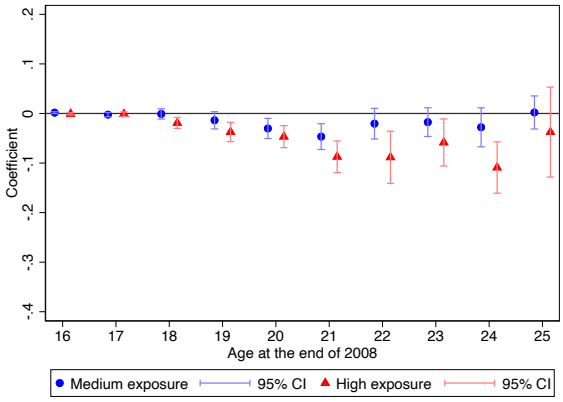
(d) Core Approach - 2019

Figure B16: Foreign manufacturing jobs and motherhood - Instrumental Variables

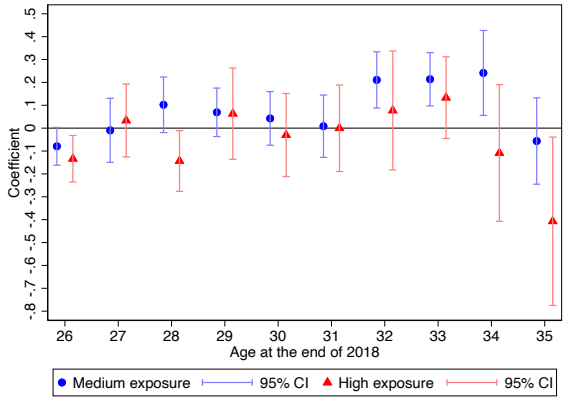
Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The figure on the left is the instrumental variables version of the regressions, unstacked to limit the number of instruments in each regression. The figure on the right is the core approach, included for ease of comparison



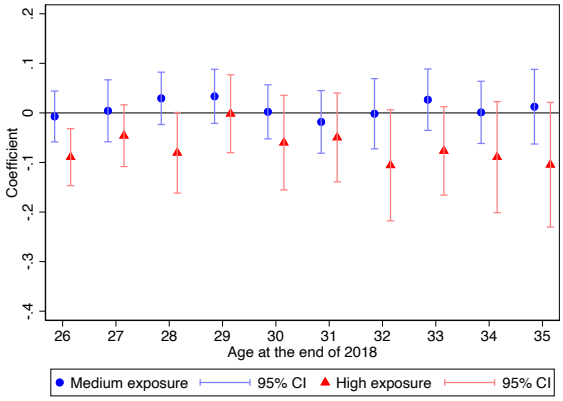
(a) IV - 2009



(b) Core Approach - 2009



(c) IV - 2019



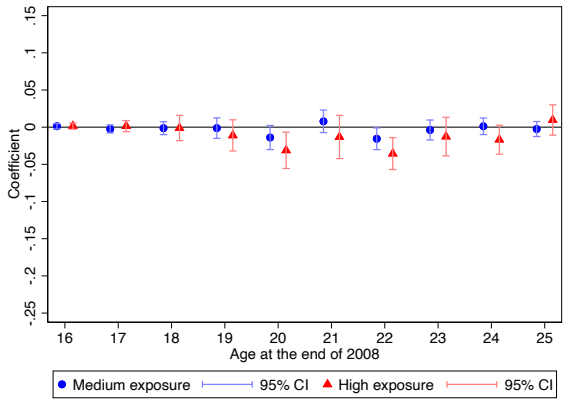
(d) Core Approach - 2019

Figure B17: Foreign manufacturing jobs and number of children - Instrumental Variables

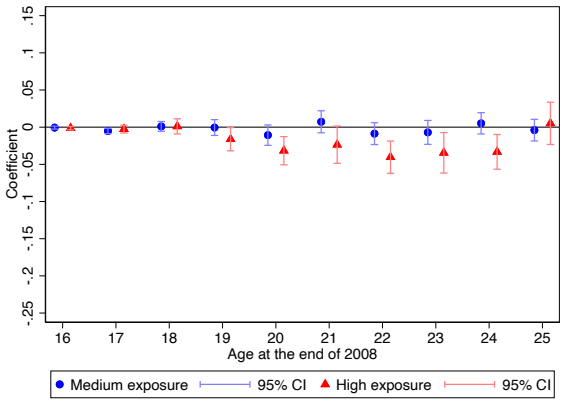
Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The figure on the left is the instrumental variables version of the regressions, unstacked to limit the number of instruments in each regression. The figure on the right is the core approach, included for ease of comparison

B.10 Domestic Manufacturing Jobs

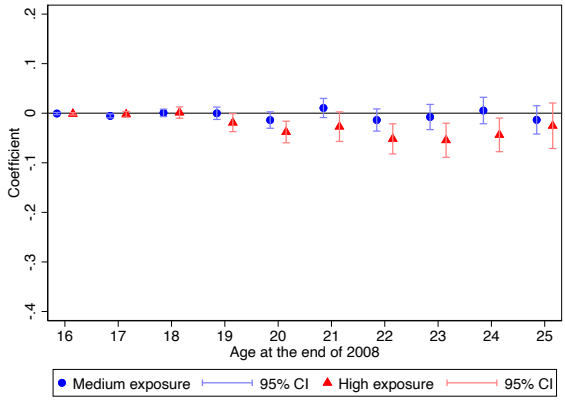
Figure B18 displays short-run results using exposure to formal manufacturing jobs other than in foreign manufacturing. We calculate the change in jobs in domestic formal manufacturing firms in the year the cohort turns 18 relative to the working-age population and then construct *Mid* and *High* indicators based on the same cutoffs we used for foreign manufacturing job. We find smaller decreases in marriage, motherhood, and the number of children, along with a smaller increase in migration.



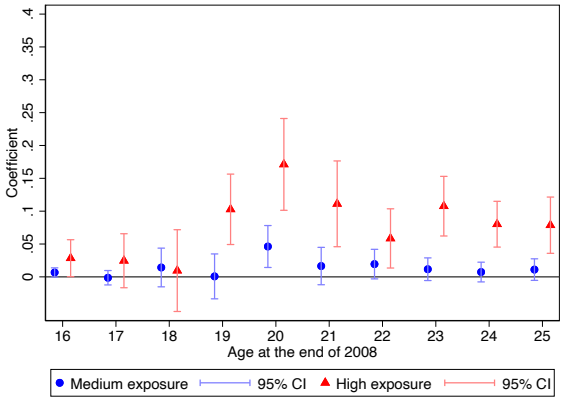
(a) Marriage



(b) Motherhood



(c) Number of children



(d) Migration

Figure B18: Non-foreign manufacturing jobs and short-run family formation

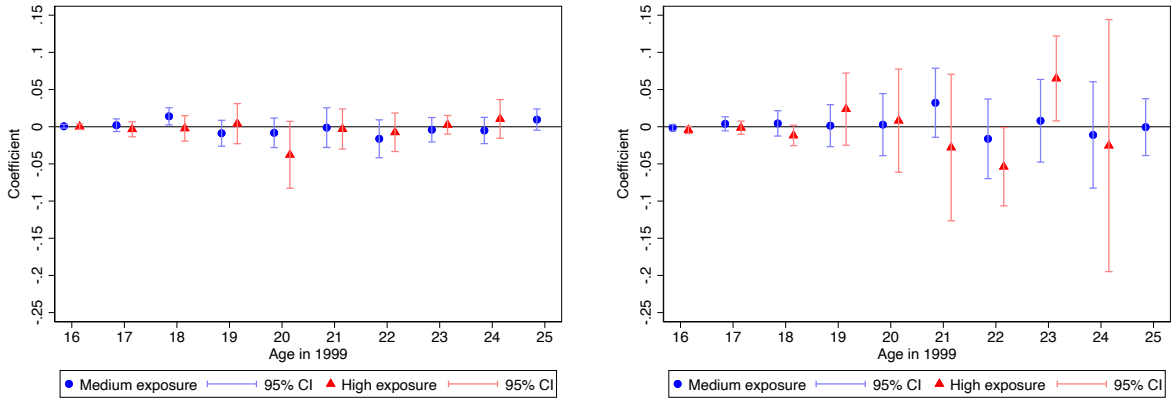
Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variables are the difference in the share married, the share mothers, and average number of children in district d and cohort c in 2009 or 2019 (by column) relative to women in the same district in cohort $c-10$ or $c-20$ (by column) in 1999. Controls include the share of women within the district in 1999 in cohort $c-10$ (for 2009) or $c-20$ (for 2019) that work in foreign manufacturing, that work in agriculture, that are in school, and that are in-migrants, interacted with the cohort, as well as cohort fixed effects. Additionally, the regressions control for the 1999 outcome interacted by cohort. Controls also include the share of women in the district-cohort who are an ethnic minority interacted with cohort. Standard errors are clustered by district.

B.11 Excluding districts that were already exposed to foreign manufacturing jobs in 1999

In this subsection, we explore the sensitivity of the pre-existing trends regression results and our main results to the set of districts included in the regressions. Recall that regressions investigating whether there are pre-existing trends that are correlated with *future* exposure to foreign manufacturing jobs assumes that the jobs arrived ten years earlier than they actually did and then checks if changes in marriage and motherhood between 1989 and 1999, when the jobs had yet to arrive, are correlated with future job arrivals.[24] Overall, those regressions found little evidence of correlated pre-existing trends that are statistically significant. However, as some districts did in fact receive foreign manufacturing jobs prior to 1999, we redo some of our regressions by dropping the district-cohort pairs that were most exposed to foreign manufacturing as of 1999. In particular, we drop the district-cohort combinations for which the max the share of women within the corresponding district in 1999 that worked in foreign manufacturing was above 0.02. We first report the results for our regression exploring pre-existing trends for marriage and motherhood in Figure B19. Consistent with the pre-trend analysis in the main text, we find little evidence of correlated pre-trends with this restricted set of districts.

We subsequently explore how sensitive our main results are to districts that were already exposed to foreign manufacturing jobs as of the 1999 census. Specifically, we estimate our main regression, equation (2), but restrict the sample of districts that are included. We remove the most exposed districts in terms of the share of young women within the district that worked in foreign manufacturing as of 1999. In the remaining districts, less than 2% of young women were working in foreign manufacturing as of 1999 in any given cohort. Hence, these are districts that were essentially not exposed to foreign manufacturing jobs prior to the period of our main analysis. We report results for marriage, motherhood and number of children in Figure B20, and for migration in Figure B21. The general pattern of results in the short and long run holds. For some cohorts, there is suggestive evidence of larger effects when districts that were already exposed to foreign manufacturing in 1999 are removed. Note that after the sample restriction, there are no districts that feature *high* exposure for the 1983 cohort, i.e., turned 25 in 2008 or 35 in 2018, so there is no coefficient for *high* exposure for this cohort.

[24] The controls in this regression are a slight modification of the main regression controls given data differences in 1989.

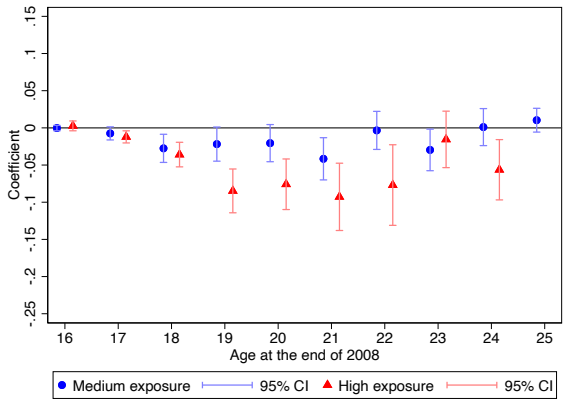


(a) Married

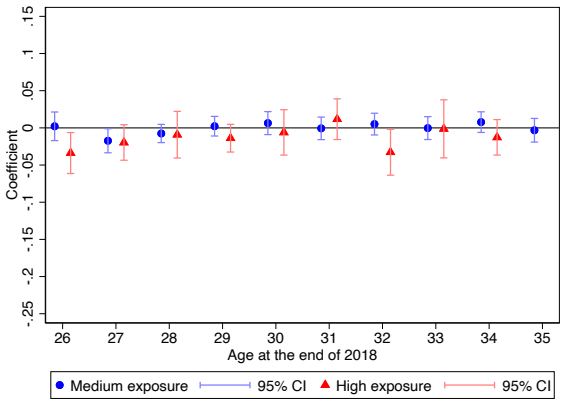
(b) Mother

Figure B19: Marriage and motherhood in 1999 falsification results, excluding districts that were already exposed to foreign manufacturing jobs in 1999

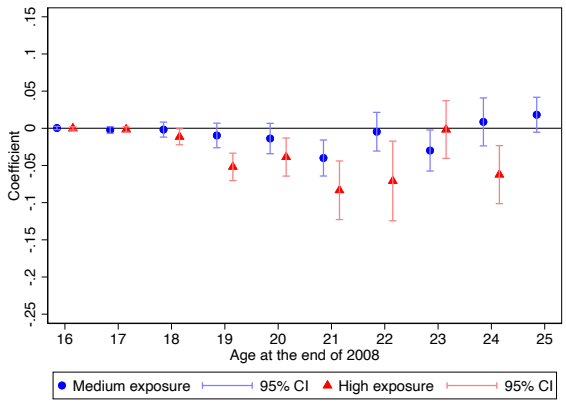
Notes: Each point (line) is a coefficient (95% confidence interval) from the main regression presented in equation 2. Both mid and high FDI-shocks are included in a single regression. The dependent variable is the change in the share of women in 1999 within the district that are married. Foreign manufacturing employment shocks are assumed to have arrived 10 years prior to actual arrival. Controls include the share of women within the district-cohort that are an ethnic minority, employed in manufacturing, employed in agriculture and inter-district migrants, as well as the share married (or mothers) in 1989 and cohort fixed effects. Standard errors are clustered at the district level.



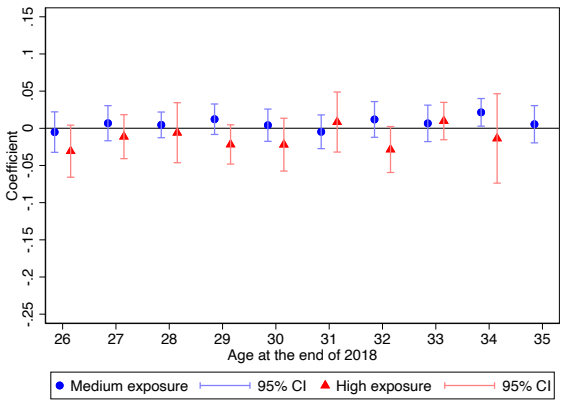
(a) 2009 marriage



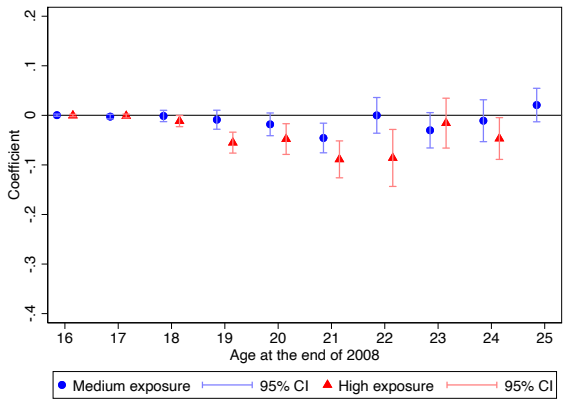
(b) 2019 marriage



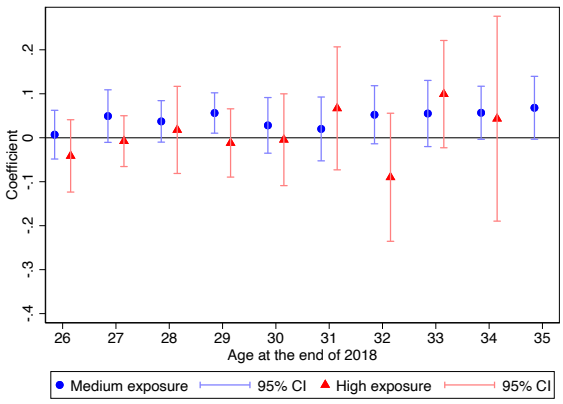
(c) 2009 motherhood



(d) 2019 motherhood



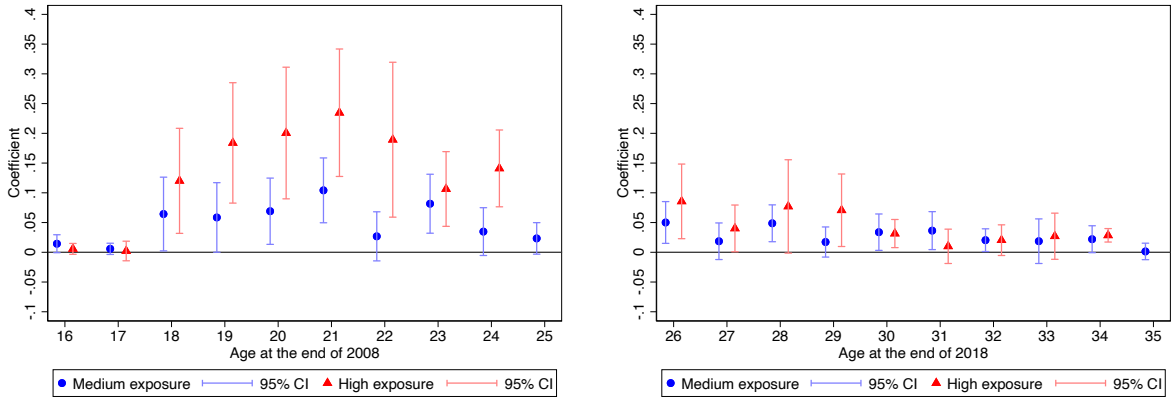
(e) 2009 number of children



(f) 2019 number of children

Figure B20: Foreign manufacturing jobs and marriage, motherhood, and number of children, excluding districts that were already exposed to foreign manufacturing jobs in 1999

Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variables are the difference in the share of women that are married in district d and cohort c in 2009 or 2019 (by column) relative to women in the same district in cohort $c-10$ or $c-20$ (by column) in 1999. Controls include the share of women within the district in 1999 in cohort $c-10$ (for 2009) or $c-20$ (for 2019) that work in foreign manufacturing, that work in agriculture, that are in school, and that are in-migrants, as well as an aggregation of the outcome the share (or average) of marriage, motherhood or number of children, interacted with the cohort, as well as cohort fixed effects. Controls also include the share of women in the district-cohort who are an ethnic minority interacted with cohort. The sample of districts is restricted such that the most exposed districts in terms of the max across cohorts of the share of women working in foreign manufacturing in 1999 were excluded. Standard errors are clustered by district.



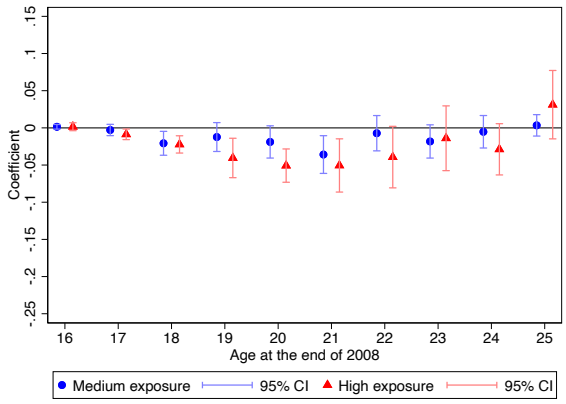
(a) 2009 (b) 2019

Figure B21: Foreign manufacturing jobs and being a migrant, least exposed districts as of 1999

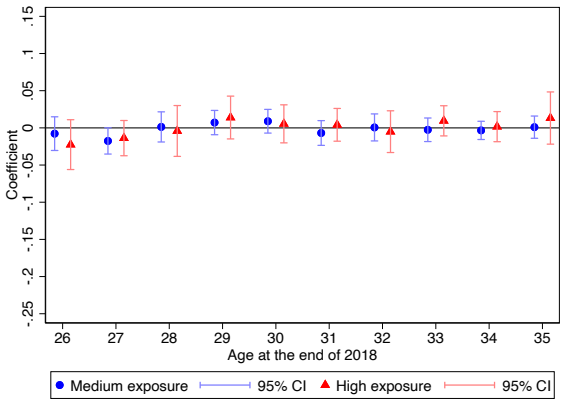
Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variables are the difference in the share of women that are migrants in district d and cohort c in 2009 or 2019 (by column) relative to women in the same district in cohort $c-10$ or $c-20$ (by column) in 1999. Controls include the share of women within the district in 1999 in cohort $c-10$ (for 2009) or $c-20$ (for 2019) that work in foreign manufacturing, that work in agriculture, that are in school, and that are in-migrants, interacted with the cohort, as well as cohort fixed effects. Controls also include the share of women in the district-cohort who are an ethnic minority interacted with cohort. The sample of districts is restricted such that the most exposed districts in terms of the max across cohorts of the share of women working in foreign manufacturing in 1999 were excluded. Standard errors are clustered by district.

B.12 Excluding provinces that had no cohorts with *mid* or *high* exposure

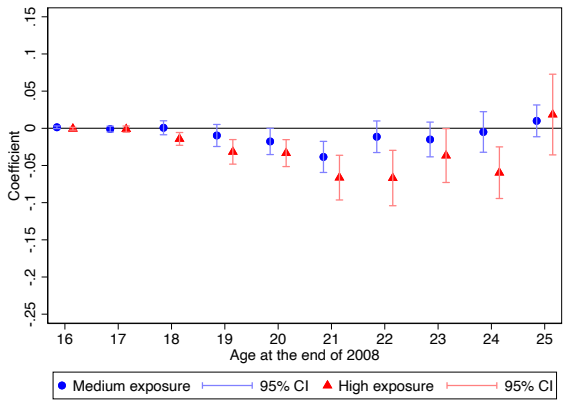
In this subsection we explore how sensitive our main results are to provinces in which none of the district-cohort pairs are classified as *mid* or *high* exposure. Specifically, we estimate our main regression, equation 2, but restrict the sample of provinces that are included to those that had at least one district-cohort with *mid* or *high* exposure. We exclude 10 provinces. We report results for marriage, motherhood and number of children in Figure B22. In Figure B23, we report results for the share of the district that is women and the share of women that migrated across districts. The general pattern of results in the short and long run holds.



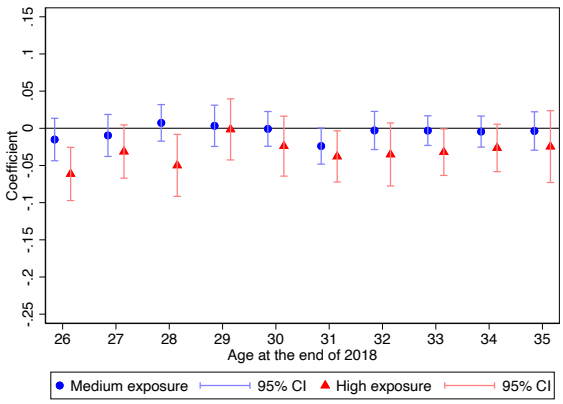
(a) 2009 - Married



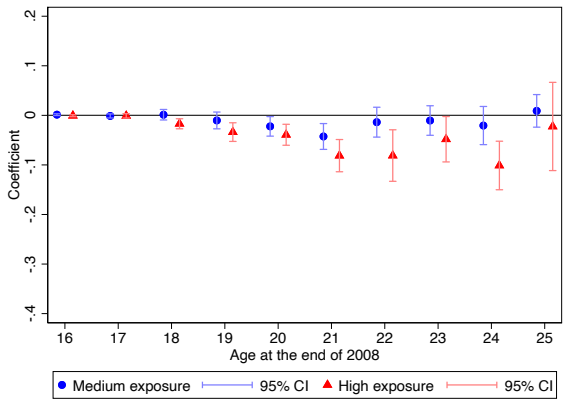
(b) 2019 - Married



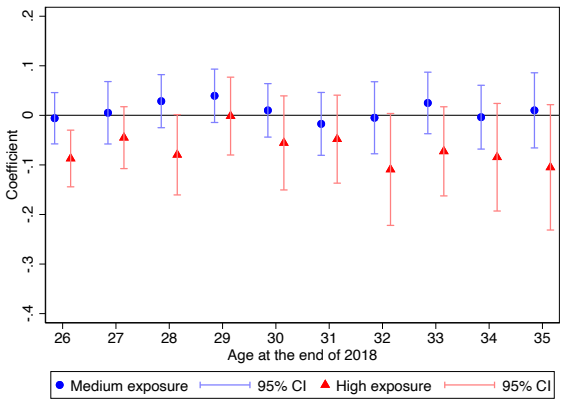
(c) 2009 - Motherhood



(d) 2019 - Motherhood



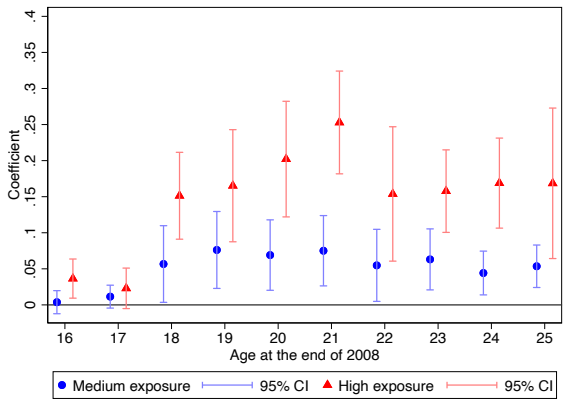
(e) 2009 - Number of Children



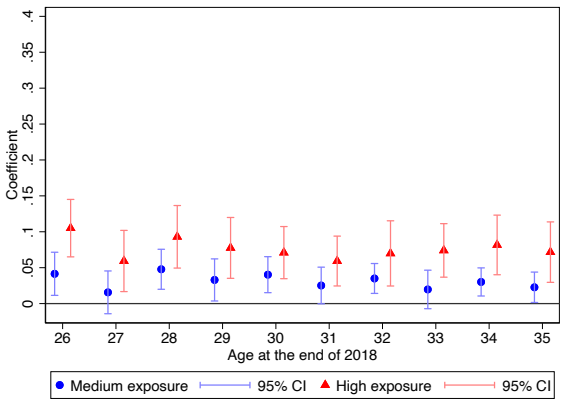
(f) 2019 - Number of Children

Figure B22: Foreign manufacturing jobs and marriage and motherhood, excluding least exposed provinces

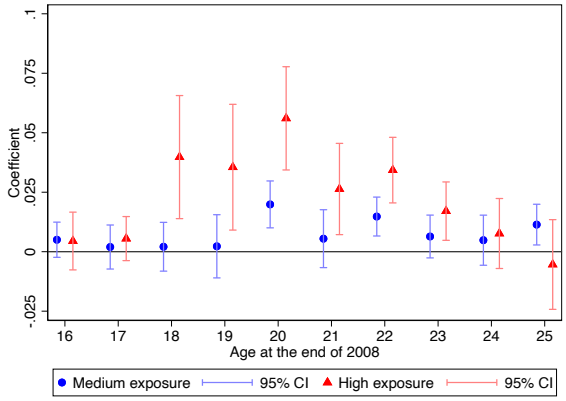
Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variables are the difference in the share of women that are married or mothers or the average number of children per woman in district d and cohort c in 2009 or 2019 (by column) relative to women in the same district in cohort $c-10$ or $c-20$ (by column) in 1999. Controls include the share of women within the district in 1999 in cohort $c-10$ (for 2009) or $c-20$ (for 2019) that work in foreign manufacturing, that work in agriculture, that are in school, and that are in-migrants, as well as an aggregation of the outcome the share (or average) of marriage, motherhood or number of children, interacted with the cohort, as well as cohort fixed effects. Controls also include the share of women in the district-cohort who are an ethnic minority interacted with cohort. The sample of provinces is restricted such that provinces with no district-cohort pairs with mid or high exposure were excluded. Standard errors are clustered by district.



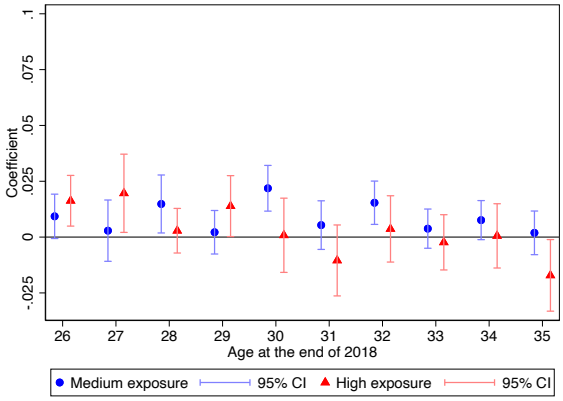
(a) 2009 - Migrate across districts



(b) 2019 - Migrate across districts



(c) 2009 - Share Female



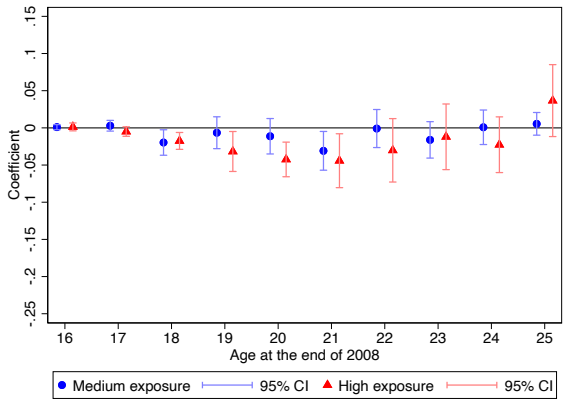
(d) 2019 - Share Female

Figure B23: Foreign manufacturing jobs and migration and share female, excluding least exposed provinces

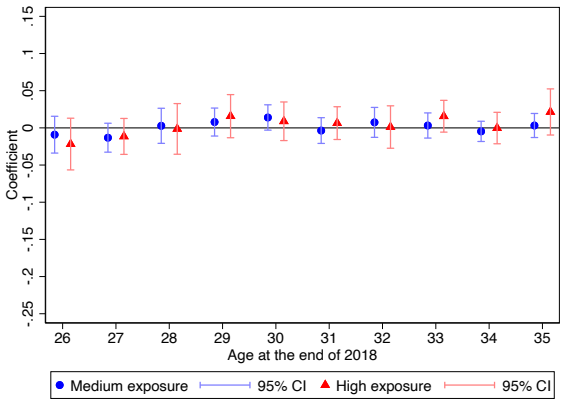
Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variables are the difference in the share of women that migrated across districts in district d and cohort c or the share of people in district d and cohort c that were women in 2009 or 2019 (by column) relative to the same district in cohort $c-10$ or $c-20$ (by column) in 1999. Controls include the share of women within the district in 1999 in cohort $c-10$ (for 2009) or $c-20$ (for 2019) that work in foreign manufacturing, that work in agriculture, that are in school, and that are in-migrants, as well as the share of women who were migrants or the share of the district who were women, interacted with the cohort, as well as cohort fixed effects. Controls also include the share of women in the district-cohort who are an ethnic minority interacted with cohort. The sample of provinces is restricted such that provinces with no district-cohort pairs with mid or high exposure were excluded. Standard errors are clustered by district.

B.13 Including only provinces that had at least one cohorts with *high* exposure

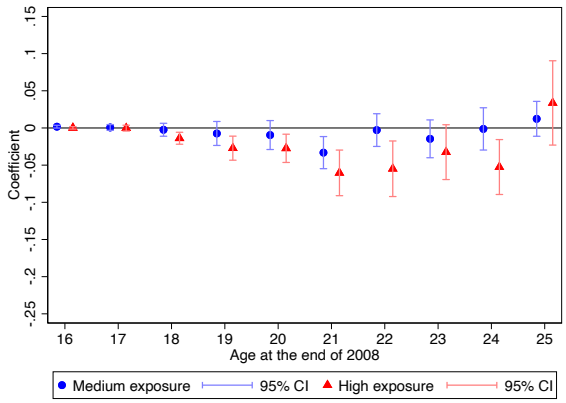
In this subsection we explore how sensitive our main results are to the set of including provinces by including only provinces in which at least one district-cohort pair is classified as *high* exposure. Specifically, we estimate our main regression, equation 2, but impose this restriction on the set of provinces included. We report results for marriage, being a mother, and number of children in Figure B24. In Figure B25, we report results for the share of the district that is women and the share of women that migrated across districts. The general pattern of results in the short and long run continues to hold.



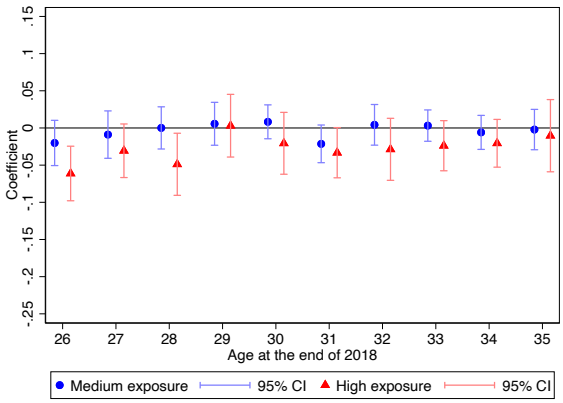
(a) 2009 - Married



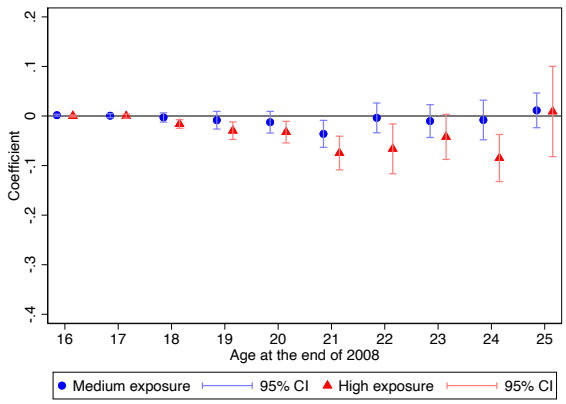
(b) 2019 - Married



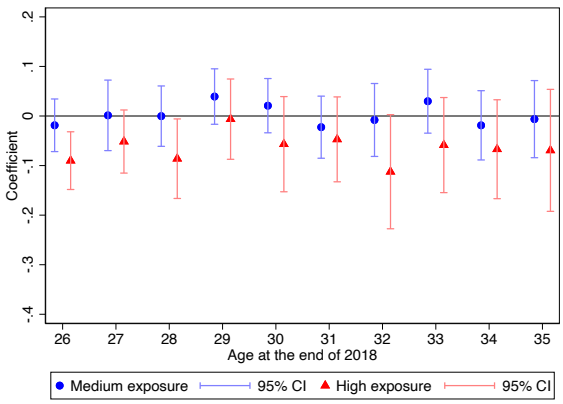
(c) 2009 - Mom



(d) 2019 - Mom



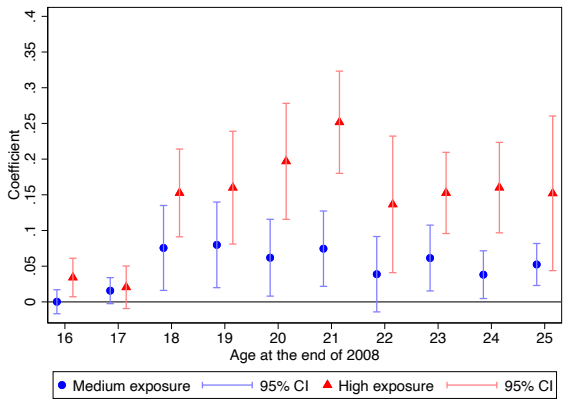
(e) 2009 - Number of Children



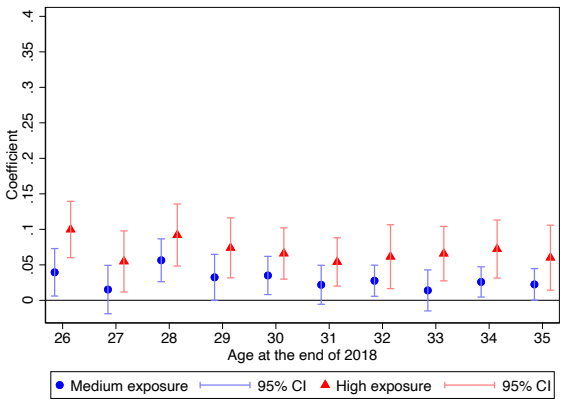
(f) 2019 - Number of Children

Figure B24: Foreign manufacturing jobs and marriage, motherhood, and number of children, including only high exposure provinces

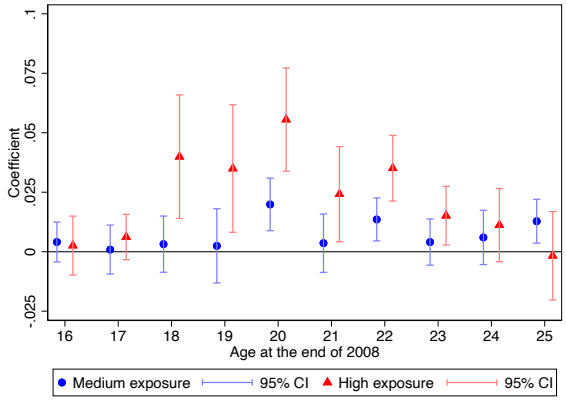
Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variables are the difference in the share of women that are married or mothers or the average number of children per woman in district d and cohort c in 2009 or 2019 (by column) relative to women in the same district in cohort $c-10$ or $c-20$ (by column) in 1999. Controls include the share of women within the district in 1999 in cohort $c-10$ (for 2009) or $c-20$ (for 2019) that work in foreign manufacturing, that work in agriculture, that are in school, and that are in-migrants, as well as the share (or average) of marriage, motherhood or number of children, interacted with the cohort, as well as cohort fixed effects. Controls also include the share of women in the district-cohort who are an ethnic minority interacted with cohort. The sample of districts is restricted such that only the most exposed districts in 1999 were included. Standard errors are clustered by district.



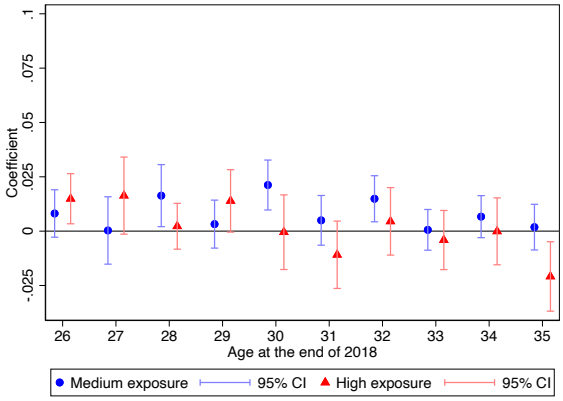
(a) 2009 - Migrate across districts



(b) 2019 - Migrate across districts



(c) 2009 - Share Female



(d) 2019 - Share Female

Figure B25: Foreign manufacturing jobs and migration and share female, excluding least exposed provinces

Notes: Each point (line) is a coefficient (95% confidence interval) from estimating equation 2. The dependent variables are the difference in the share of women that migrated across districts in district d and cohort c or the share of people in district d and cohort c that were women in 2009 or 2019 (by column) relative to the same district in cohort $c-10$ or $c-20$ (by column) in 1999. Controls include the share of women within the district in 1999 in cohort $c-10$ (for 2009) or $c-20$ (for 2019) that work in foreign manufacturing, that work in agriculture, that are in school, and that are in-migrants, as well as the share of women who were migrants or the share of the district who were women, interacted with the cohort, as well as cohort fixed effects. Controls also include the share of women in the district-cohort who are an ethnic minority interacted with cohort. The sample of districts is restricted such that only the most exposed districts in 1999 were included. Standard errors are clustered by district.