The Rise in Women's Labor Force Participation in Mexico- Supply vs Demand Factors*

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Abstract

We estimate the relative importance of alternative supply and demand mechanisms in explaining the rise of female labor force participation (FLFP) over the last 55 years in Mexico. The growth of FLFP in Mexico between 1960 and 2015 followed an S-shape, with a considerable acceleration during the 1990s. Using descriptive decomposition methods and a shift-share design, we show that, put together, supply and demand factors can account for most of the rise of FLFP over the entire period, led by increases in women's education, declining fertility, and shifts in the occupational structure of the workforce. However, there is unexplained variation in the 1990s, when FLFP spiked.

JEL Codes: J16; J21; J22; J23; O14; O33; O54

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1 Introduction

At a global level, gender gaps in labor force participation have narrowed, with over half a billion women joining the workforce in the last 30 years (The World Bank, 2012). However, there is enormous variation in women's labor force participation across low- and middle-income countries (Nopo, 2012; The World Bank, 2012; Ortiz-Ospina and Tzvetkova, 2017), and there is no clear consensus on why (Klasen et al., 2021). In this paper, we estimate the relative importance of alternative mechanisms in explaining the rise of female labor force participation (FLFP) over the last 55 years in Mexico. In particular, we estimate the importance of demand-side versus supply-side forces using decomposition analysis and a shift-share design. The estimates are descriptive rather than causal.

The growth of FLFP in Mexico between 1960 and 2015 followed an S-shape pattern similar to that documented for the United States (Goldin, 2006; Fogli and Veldkamp, 2011; Fernández, 2013; Olivetti and Petrongolo, 2016), but that contrasts with the U-shaped pattern that has been associated with structural transformation (Goldin, 1994; Mammen and Paxson, 2000; Olivetti, 2013; Greenwood et al., 2017; Bertrand, 2020). There was a fairly gradual increase through the three decades from 1960 to 1990, averaging 3.7 percentage points (pp) per decade (Figure 1). For a decade from 1990 there was a considerable acceleration of 15.6 pp in FLFP. After 2000, the decadal growth rate slowed, reverting to 4.7 pp. Veiled by these average rates of growth was considerable spatial variation. The analysis here will leverage variation across 1,806 commuting zones (CZs) in Mexico. The speed and timing of the rise in FLFP and the availability of abundant high-quality sources of data on different relevant dimensions for the analysis make Mexico an ideal setting for the research.

We consider three of the main supply-side determinants of female labor supply in the literature: education, marital status, and fertility, and quantify their impacts on FLFP using a Oaxaca–Blinder decomposition that includes flexible controls for the state of labor demand in local labor markets. Together, we estimate that these supply-side factors account for 43.5% of FLFP growth between 1960 and 2015 and up to 71% post-1970. Moreover, education alone accounts for 36.7% of the increase between 1960-2015. The three supply-side factors do a poorer job of explaining the acceleration in FLFP in the 1990s—they can account for only 37.7% of that increase.

On the demand side, we consider the two determinants often discussed in the literature: structural change and non-neutral technological change. Structural change refers to changes in the sectoral composition of production and employment that characterize the growth process as economies modernize, and that are sometimes fueled by trade-induced economic specialization. Non-neutral technological change are shifts in production technologies that favor some labor groups, such as skilled or female labor, over others. It affects the occupational structure by changing the relative demands for different tasks across jobs, usually because they are being substituted or complemented by the new technologies.

We use a shift-share design to predict changes in female labor demand across commuting zones that are linked to changes in the occupational or sectoral composition of employment. We find that changes in occupational composition can account for about 17.9% of the total increase in FLFP over the entire period, albeit a much smaller share of the 1990s spurt. Sectoral composition has no explanatory power once we account for changes in the occupational composition. This finding contrasts with an extensive literature emphasizing structural change as a major driver of long-term female labor force participation trends (Akbulut, 2011; Heath and Jayachandran, 2018; Olivetti and Petrongolo, 2016; Ngai and Petrongolo, 2017). In fact our results do not contradict this literature but, instead, offer a more nuanced understanding of how structural change can impact female labor demand– by reallocating production to sectors with distinct requirements for tasks in which women have a comparative advantage or where they might face lower resistance on account of societal norms.

Our estimates suggest that the supply and demand factors considered can, together, account for 70% of the rise in FLFP since the 1960s and 92% since 1970, when our preferred variables to capture changes in fertility become available in the data. Among the variables considered, educational attainment emerges as the most influential factor behind the increase in FLFP, contributing to 43.3% of the post-1970 rise in female labor supply. Fertility ranks second (17.5%), followed by labor demand changes that reshape the occupational composition of employment (11.7%) and a decline in the marriage rate (11.0%). However, these findings are derived within a partial equilibrium framework that does not consider the interplay between demand and supply factors, which is likely to be important (Eckstein and Wolpin, 1989; Galor and Weil, 1996; Schultz, 1997; Heckman et al., 1998; Becker et al., 2010; Eckstein and Osnat, 2011; Do et al., 2016; Atkin, 2016; Adda et al., 2017; Bhalotra et al., 2022). Moreover, there was significant unexplained variation in the 1990s, when FLFP spiked. We discuss potential explanations, pointing to a plausible role for changing social norms about gender roles (Fernandez et al., 2004; Fortin, 2005; Fogli and Veldkamp, 2011; Marianne, 2011; Fernández, 2013; Alesina et al., 2013; Bertrand et al., 2015; Fortin, 2015; Jayachandran, 2021; Bertrand, 2020).

Our results contribute to a large and recently active literature on FLFP, which we discuss extensively in Section 3. In addition to presenting new results for Mexico, we contribute by providing estimates of the role of key supply- and demand-side factors for a given sample. A common feature of most studies is that each focuses on isolating one mechanism rather than the relative play of alternative mechanisms. Moreover, these studies use different identification strategies for different locations and time periods. This makes it hard to assess the weight of the different potential mechanisms. Similar to us in using a common sample to assess different explanations are Klasen et al. (2021) and Gasparini and Marchionni (2015), who investigate FLFP determinants in 8 and 18 countries, respectively. Klasen et al. (2021) focus exclusively on supply-side factors. Gasparini and Marchionni (2015) analyzes supply and demand factors, but they study variation across countries in Latin America at different stages of the transition. We focus on one country to better understand the forces at work.

The rest of the paper is laid out as follows. Section 2 describes the data and the definition of the variables used in the analysis. Section 3 describes trends in the FLFP rate between 1960 and 2015, discussing potential mechanisms. Section 4 considers the supply-side determinants of FLFP and quantifies their relative importance, while Section 5 considers the demand-side determinants of FLFP and quantifies their relative importance. Section 6 discusses the supply and demand side decompositions together, and concludes.

2 Data and Sample Selection

Our primary source of data consists of samples from the Mexican census of 1960 (1.5% fraction), 1970 (1 percent fraction), 1990 (10 percent fraction), 2000 (10.6 percent fraction), 2010 (10 percent fraction), and 2015 (9.5 percent fraction), made available by the Minnesota Population Center through IPUMS-International (henceforth IPUMSI) (Minnesota Population Center, 2020).[1] There are two advantages of using census data for our analysis: first, it allows us to go much further back in time than household surveys so that we can study long-term trends of FLFP and their determinants. More traditional alternatives, like Mexico's main labor force survey, go back only to the mid-1980s, it became nationally representative in 2000, and had significant methodological changes introduced in 2005, so there are problems of comparability over time (Campos-Vazquez and Lustig, 2020). The Household Income Expenditure National Survey (ENIGH), also used to study the Mexican labor market, is available only since the mid-1980s and has a relatively small sample size.[2] Second, given the geographical coverage of the censuses, we can study spatial variation in changes in FLFP, an essential feature for our empirical strategy.

For each year available, the Mexican census asks questions about individual and work characteristics, including educational attainment, marital status, participation in the workforce, occupation, sector, fertility,

[1]The samples from each census are publicly available and can be accessed through the website https://international.ipums.org/international/. The data available for the 1995 Mexican census is only a 0.4 percent sample of the population. The 2005 Mexican census has no information on work status. We do not use these censuses in our estimates.

[2]The census data are consistent with labor and household surveys. Our paper builds on Bhalotra et al. (2022), where we study changes in FLFP during the period 1989–2014 in Mexico using the ENIGH. There, we show that patterns in the census and the ENIGH are similar in terms of participation and earnings within the periods in which they overlap. The census is not designed to collect labor market outcomes information, so results should be interpreted with this caveat in mind.

and household composition.[3] We restrict the analysis to a sample of women aged 25-55 (henceforth referred to as prime-age women). This is done to ameliorate selection problems arising from changes in younger and older cohorts' educational and retirement choices.

We define the FLFP rate as the ratio between the number of prime-age women who report working or seeking work during the previous week and the total number of women in the same age bracket. Our definition of work includes all sectors, occupations, and the informal economy, irrespective of the nature of the activities or if the work complies with the country's formal labor laws and protections (*i.e.*, if the job is formal or informal). This implies that individuals working in agriculture[4] or family businesses[5] and those in informal work arrangements[6] are counted as part of the labor force.

Since the questionnaires applied in the different censuses changed over time, we now describe how we constructed the participation rates in each census in detail. For the census of 1960, we use three variables from IPUMSI. The first variable, "*CLASSWKD*," reports each individual's employment status, with eight possible alternatives including employer, own account in agriculture, own account other, member of cooperative, white-collar (non-manual), blue-collar (manual), day laborer, and unpaid family worker. If there is an affirmative answer to these alternatives, the individual is classified as part of the labor force. The second variable, "*MX1960A_DAYWK*," asks how many days each person worked the week before the census interview. 3.7% of women did not report an affirmative answer to any of the alternatives in "*CLASSWKD*," but reported working a positive number of days in the week prior. We include them as part of the labor force, as this is a criterion for inclusion in the rest of the years. Lastly, we use the variable "*MX1960A_LOOKWORK*," which asks if the person is actively searching for employment. Those who answer in the affirmative are also included in the labor force.

In the census years after 1960, we use the variable "*EMPSTAT*" (not available in 1960). IPUMSI constructs this variable in a manner that allows for comparability across years. "*EMPSTAT*" is categorized into five alternatives: not in the universe (*i.e.*, not part of the working-age population), employed, unemployed, inactive, and unknown. Our baseline sample comprises individuals aged 25 to 55; thus, everyone is part of the universe. Individuals who participate in the labor force are those who report being either employed or

[3] A list of all the variables used in the analysis, including the original label used by IPUMSI and a short description, can be found in Table **??** in the Online Appendix.

[4] We can identify people working in agriculture either through the occupation (variable "*OCCISCO*") or industry classification (variable "*INDGEN*"). Importantly, agricultural workers are always a subset of individuals who reported working the week before the census interview, ensuring they are counted in the labor force.

[5] Every census includes questions that allow us to identify "unpaid family worker". Similarly to workers in agriculture, unpaid family workers are always a subset of individuals who reported working the week before the census interview, ensuring they are counted as part of the labor force.

[6] Before the census of 2000, the questionnaires do not ask about contributions to social security or other measures to identify if the work arrangement is formal or informal. Although an interesting and relevant dimension, we can not include it in the analysis.

unemployed. Individuals who report being inactive are categorized as not in the labor force, while unknown values are treated as missing.[7] To address concerns about comparability between the underlying variables used to define labor force participation in the 1960 census and subsequent years, we constructed a labor force participation variable using "CLASSWKD" in the post-1960 censuses (as this variable is available in all years). Our findings reveal that 98% of the sample shares the same classification between the two measures, which gives us confidence that our results are unlikely to be affected by this issue.

Mexico uses its own classification of occupations and sectors, which has changed over time. IPUMSI provides two modified variables with a consistent coding scheme to ensure comparability. The occupation variable we use is "*OCCISCO*". It is disaggregated at the 1-digit level (11 groups) and coded according to the major categories in the International Standard Classification of Occupations (ISCO) of 1988.[8] The sector variable is "*INDGEN*". It is disaggregated at the 1-digit level (16 groups) with groupings that roughly conform to the International Standard Industrial Classification (ISIC).[9] While it is possible to further disaggregate occupational and sectoral groups based on the original classifications of each census, we take advantage of the work done by the Minnesota Population Center in homogenizing the schemes, prioritizing consistency to ensure comparability over time.

In the analysis that exploits spatial variation in participation rates, we focus on commuting zones (CZs) as the unit of observation. CZs are clusters of municipalities characterized by strong commuting connections within the cluster and weak connections across different CZs. CZs are preferred over individual municipalities because they provide a more meaningful representation of integrated local labor markets. To create the CZs, we utilize the variable "*GEOLEV2*," a spatiotemporally harmonized variable that identifies the municipality where the household was enumerated. This variable encompasses 2,347 out of the 2,454 municipalities in Mexico. The harmonization process adjusts for changes in boundaries and census geography over time, ensuring consistency. To define the clusters of municipalities, we adopt the approach proposed by Atkin (2016) and Faber (2020). Firstly, all municipalities within a Zona Metropolitana are grouped into a single

[7]In the 1990 census, the construction of the variable "*EMPSTAT*" is based on the question about the principal economic activity performed in the previous week, which may raise concerns about potential under-reporting of participation rates for specific groups as students, homemakers, family workers, and semi-retired individuals. However, the census manual for 1990, which serves as a guide to surveyors, explicitly addresses this possibility. The manual states that "*If the person worked and also studied; or worked and is dedicated to household chores; or worked and is a pensioner, you must mark only that he/she worked*" (INEGI (1990), page 35). Therefore, even if working was not the primary activity, as long as an individual was engaged in some capacity of work, they are classified as part of the labor force.

[8]The categories are: 1. Legislators, senior officials and managers, 2. Professionals, 3. Technicians and associate professionals, 4. Clerks, 5. Service workers and shop and market sales, 6. Skilled agricultural and fishery workers, 7. Crafts and related trades workers, 8. Plant and machine operators and assemblers, 9. Elementary occupations, 10. Armed forces, and 11. Other occupations.

[9]The groups are: 1. Agriculture, fishing, and forestry, 2. Mining and extraction, 3. Manufacturing, 4. Electricity, gas, water and waste management, 5. Construction, 6. Wholesale and retail trade, 7. Hotels and restaurants, 8. Transportation, storage, and communications, 9. Financial services and insurance, 10. Public administration and defense, 11. Services, not specified, 12. Business services and real estate, 13. Education, 14. Health and social work, 15. Other services, and 16. Private household services.

larger municipality. Next, the authors estimate the intensity of commuting from municipality i to j by dividing the number of people commuting from i to j by the total number of residents in municipality i. Finally, municipalities that have commuting flows exceeding 10% of their population with each other are clustered together.[10] This process results in the identification of 1,806 individual CZs, which serve as the basis for our analysis.

Finally, when doing individual-level analysis or aggregating the information at CZs or national levels, we use the individual weights provided in the data. These are only available after the year 2000. For the pre-2000 censuses, we use "flat" weights (equal for all individuals) proportional to each census sample. All the results have been replicated using "flat" weights for the entire sample. There are no significant changes.

3 Evolution of FLFP and Potential Mechanisms

FLFP increased substantially over the last half-century in Mexico. In 1960, only 13.2% of all prime-age women participated in the labor force. By 2015, that number reached 46.8% (Figure 1). Although the FLFP rate remains low compared to other countries with a similar income level, and to other countries in Latin America,[11] this dramatic increase fundamentally changed the landscape of the Mexican labor market.

Improvements in the participation rate happened throughout most of the last 60 years, but the rate at which women joined the labor force was not constant over time. First, there was a period of relatively slow but sustained growth between 1960 and 1990. In those 30 years, FLFP grew by 11 pp, a decadal average growth of about 3.7 pp. As a point of comparison, Olivetti and Petrongolo (2016) find that, for a sample of 19 high-income countries between 1947 and 2008, female employment among working-age women grew by 6 pp per decade. Still, by the end of the 1980s, only one in four prime-age women in Mexico were in the labor force.

It was during the 1990s that FLFP took off, increasing by 15.6 pp in a decade. The growth rate of FLFP in the 1990s was more than four times faster than the decadal average growth of the previous 30 years. Similar trends, albeit more muted, were also observed in other Latin American countries (Nopo, 2012; The World Bank, 2012; Gasparini and Marchionni, 2017; The World Bank, 2022); however, they contrast with the patterns observed in most emerging economies where participation increased modestly (Klasen et al., 2021). After the growth spurt of the 1990s, FLFP growth decelerated in Mexico, increasing at a decadal rate

[10] Both papers adopt a similar strategy, but we use Faber (2020) coding since it was readily available in the paper's replication package.

[11] The average FLFP rate among prime-age women in Latin America in 2010 was close to 60% (Busso and Fonseca, 2015; Serrano et al., 2019). For women ages 15 and older, the rate is closer to 50% (Ortiz-Ospina and Tzvetkova, 2017).

of 7 pp during the 2000s and finally stagnating between 2010 and 2015. This deceleration of FLFP growth has also been documented in the United States (Blau and Kahn, 2007, 2017) and other Latin American countries (Gasparini and Marchionni, 2017; Serrano et al., 2019).

The S-shape pattern of the FLFP rate in Mexico since the 1960s contrasts with the hypothesized U-shape female labor supply function across economies' process of structural transformation (Goldin, 1994). According to this hypothesis, during the early stages of development, when certain types of agriculture dominate, women tend to participate extensively in the labor force, often as unpaid workers on family farms. As economies industrialize, female labor force participation rates fall. This has been attributed to income effects resulting from higher labor earnings among men in the manufacturing sector, along with a division of household work skewed against women and social norms that discourage women from pursuing certain job opportunities considered less respectable (Goldin, 2006). When the services sector gains prominence in the later stages of development, FLFP rates begin to rise again. The argument is that the expansion of the service sector increases the relative demand for female workers, considering women's comparative advantage in service production (Standing, 1999; Akbulut, 2011; Olivetti and Petrongolo, 2016; Heath and Jayachandran, 2018; Ngai and Petrongolo, 2017). The higher relative demand for women in these jobs can increase wages, raising the opportunity cost of staying in home production and thereby encouraging greater female labor supply (Blau and Kahn, 2007; Bhalotra et al., 2022).

Numerous studies have examined the relationship between female labor supply and economic development, with some finding support for the U-shaped pattern (Goldin, 1994; Mammen and Paxson, 2000; Cordourier and Gómez-Galvarriato, 2004; Olivetti, 2013; Heath and Jayachandran, 2018; Greenwood et al., 2017; Bertrand, 2020), while others finding mixed or null results (Jacobsen, 1999; Gaddis and Klasen, 2014; Olivetti and Petrongolo, 2016), particularly in countries like Mexico that industrialized later. To explain this heterogeneity, Olivetti and Petrongolo (2016) and Heath and Jayachandran (2018) argue that the timing of a country's process of structural transformation can influence the shape of women's labor supply. In countries that industrialized later, the share of employment in manufacturing may experience smaller gains as manufacturing production becomes more capital-intensive over time. Unlike early industrialized nations, these countries may bypass the intense intermediate phase characterized by a substantial employment shift from agriculture to manufacturing (Sáenz, 2022). Additionally, the nature of manufacturing production in later industrializing countries might be cleaner and less physically demanding. These differences, compounded by a service sector that is rapidly expanding, make it less likely to trigger social norms that discourage women's participation in the workforce.

The patterns observed in Mexico appear consistent with this interpretation. However, there has yet to be a consensus in the literature, especially regarding the acceleration of FLFP in the 1990s. The fact that this period coincides with major market-oriented reforms and trade liberalization programs has led some authors to argue that there is a causal connection between the two phenomena. The hypothesis is that reforms positively impacted production in sectors and occupations where women typically participate more, effectively increasing the demand for female labor (Meza González, 2001; Cordourier and Gómez-Galvarriato, 2004; Atkin, 2009; Juhn et al., 2014). For example, Juhn et al. (2014) show that tariff reductions associated with the North American Free Trade Agreement (NAFTA), implemented in 1994, induced more productive firms to modernize their technology and enter the export market. This, in turn, improved the employment prospects of women, especially in blue-collar occupations. Cordourier and Gómez-Galvarriato (2004) also show evidence that female participation in industry jobs increased after the late 1980s and early 1990s trade liberalization reforms. Bhalotra et al. (2022) estimate a structural equilibrium model of the Mexican labor market, finding evidence that demand-side trends during the 1990s and 2000s were favorable to women, independently of their level of schooling. Technological change could also have played a role. By lowering the need for physically intensive tasks in the jobs while increasing the relative importance of analytical and social skills, new technologies could generate better opportunities for women in the labor market (Rendall, 2013; Jayachandran, 2021).

If FLFP was triggered by structural transformation, openness to trade, or technological change, the tell-tale signs would manifest in changes in labor demand's sectoral and occupational composition.[12] In Section 5, we study this relation leveraging spatial variation in baseline characteristics of CZs in Mexico to quantify how changes in labor demand across local labor markets affected FLFP growth. To motivate the analysis, Figure 2 shows the distribution of the FLFP rate across CZs over a subset of the census years. In 1960, half of the CZs had FLFP rates below 10 percent. By 2015, the FLFP rate of the CZ at the median was 50 percent. The highest participation rates are observed in Mexico City and its surrounding states, located at the country's center (Figure 3). The two other locations with relatively high FLFP rates are the border regions in the north, which include the states of Baja California (north and south), Sonora, Chihuahua, Coahuila, and Nuevo León; and the Yucatán Peninsula in the south-east. Mexico City (and the central area in general) and the border states have a high share of national employment in manufacturing. They are the locations where most *maquiladoras* (foreign in-bond assembly plants) got established after the trade reforms (Hanson, 1997; Atkin, 2016). The Yucatán Peninsula, on the other hand, is a tourist hub with a robust service sector. These three regions have the highest GDP per capita and were where FLFP grew the most

[12]For literature studying the broader effect of structural and technical change on the sectoral and occupational composition of labor demand, see, among others, Katz and Murphy (1992); Acemoglu (2002); Autor et al. (2003, 2006); Herrendorf et al. (2014); Acemoglu and Autor (2011); Altonji et al. (2014); Autor and Dorn (2013); Goos et al. (2014); Michaels et al. (2014); Autor et al. (2016); Acemoglu and Restrepo (2019, 2020).

(Figure 4).

Regarding the more recent deceleration of FLFP growth, Gasparini and Marchionni (2017) argue that faster economic growth during the 2000s, fueled in part by the commodity price boom (Erten and Ocampo, 2013), reduced the incentive for women, especially married women with lower levels of education, to join the workforce. This would be consistent with previous work showing that FLFP follows a countercyclical pattern (Serrano et al., 2019), and it is negatively related to the husband's earnings (Klaauw, 1996; Klasen and Pieters, 2015). It can also reflect ingrained cultural norms. For example, in a nationally representative public opinion survey by Latinobarómetro in 2015, 51 percent of respondents, including men and women, said they either agreed or strongly agreed with the statement that "Women should work only if the couple does not earn enough."

In parallel to labor demand changes and sharp economic cycles, the last 60 years in Mexico were also a time when women made substantial gains in educational attainment, and fertility and marriage rates declined. These supply-side factors are generally associated with higher FLFP rates, a relationship we study in Section 4. For example, education enhances individuals' productivity and earning potential, thus incentivizing women to participate in the labor force (Mincer and Polachek, 1974; Killingsworth and Heckman, 1986; Becker, 1994; Goldin, 2006; Becker et al., 2010; Eckstein and Osnat, 2011; Heath and Jayachandran, 2018). The types of jobs available to potential workers also vary depending on their level of education, with high-skilled occupations being more intensive in analytical tasks for which women may face lower entry barriers or even have a comparative advantage (Goldin, 2006; Bhalotra et al., 2022). Interestingly, the positive relationship between education and female labor supply is not universal, with some studies finding a U-shape relation or even a null correlation (Klasen and Pieters, 2015; Klasen et al., 2021). Moreover, the direction of causality can go both ways: investments in education can respond to perceived changes in returns to schooling and the opportunities available in the labor market (Eckstein and Wolpin, 1989; Schultz, 1997; Heckman et al., 1998; Becker et al., 2010; Eckstein and Osnat, 2011; Atkin, 2016). This implies that education and participation decisions are jointly determined and dependent on the state of labor demand.

As educational attainment was improving in Mexico, fertility was declining. In recent years, one of the most active research areas regarding female labor supply is the relationship between fertility and FLFP, with numerous studies documenting a negative association between the two. The evidence shows that having children, especially of young ages, increases the probability of having out-of-work spells (Francesconi, 2002; Goldin, 2006; Kleven et al., 2019; Aguilar-Gomez et al., 2019), and induces withdrawals from the workforce (Korenman and Neumark, 1992; Coleman and Pencavel, 1986; Costa, 2000; Cruces and Galiani, 2007), primarily because of increased caregiving responsibilities. Medical advancements, such as the introduction of the contraceptive pill, have allowed women greater control over the extent and timing of their fertility decisions, impacting their career plans and participation choices over their life cycle (Goldin and Katz, 2002; Bailey, 2006; Albanesi and Olivetti, 2016). However, in an analogous way to decisions about schooling, fertility choices will also depend on a country's level of development and the state of labor demand (Galor and Weil, 1996; Do et al., 2016; Adda et al., 2017). For example, empirically, the negative relation between fertility and FLFP is not as strong in less developed economies (Agüero and Marks, 2008, 2011; Klasen et al., 2021; Aaronson et al., 2021) and countries with a comparative advantage in industries employing primarily women exhibit lower fertility (Do et al., 2016). Finally, cultural norms regarding women's roles have been shown to be important in the connection between fertility and female labor supply (Fernandez and Fogli, 2009; Fogli and Veldkamp, 2011; Fernández, 2013; Campos-Vazquez and Velez-Grajales, 2014; Bertrand, 2020), a factor that could be particularly relevant in Mexico.

The final supply-side determinant of FLFP we study is marital status. There are two stylized facts in the literature regarding the relationship between marital status and FLFP. First, married women have significantly lower labor force participation rates than unmarried women. Second, the largest gains in FLFP over the past century are usually accounted for by the incorporation of married women into the workforce (Killingsworth and Heckman, 1986; Goldin, 2006; Fogli and Veldkamp, 2011; Goldin and Olivetti, 2013; Gasparini and Marchionni, 2017; Greenwood et al., 2017; Blau and Kahn, 2017). These two facts underscore the importance of household structure in studying female labor supply. Moreover, they suggest that changes in marriage patterns could significantly affect the FLFP rate.

Among couples, decisions about participation, in the extensive and intensive margin, will be jointly determined so that income, substitution, and risk-insurance effects can play a role (Eckstein and Wolpin, 1989; Browning and Chiappori, 1998; Attanasio et al., 2005, 2008; Voena, 2015). Inherent to the labor supply decisions is the trade-off between family commitments and work outside the home, including wage opportunities expected in the labor market and the value of time in the home (Grossbard-Shechtman and Neuman, 1988). In practice, the burden of household work is disproportionately assumed by women. This is unlikely the result of optimal time allocation based on comparative advantages or efficiency considerations but reflects ingrained social norms regarding women's role in society (Baker and Jacobsen, 2007; Bertrand et al., 2015; Bertrand, 2020; Siminski and Yetsenga, 2022). In this sense, declining fertility and improvements in home production technologies (Costa, 2000; Greenwood et al., 2005; De Cavalcanti and Tavares, 2008; Coen-Pirani et al., 2010), compounded with changes in social norms and attitudes towards women's work (Rindfuss et al., 1996; Costa, 2000; Fernandez et al., 2004; Goldin, 2006; Fernández, 2013; Deshpande et al., 2019) will generally work in favor of inducing a higher FLFP rate.

To summarize, the evolution of FLFP in Mexico since the 1960s can be characterized by three distinct periods: sluggish growth (1960–1990), fast expansion (1990–2000), and deceleration (2000–2015). Both supply and demand factors have likely contributed to shaping the evolution of female labor supply. However, there is no clear notion of their relative quantitative importance. The following sections explore how different supply and demand factors shaped these trends.

4 Supply-Side Determinants: Education, Fertility, and Marital Status

We first describe the main stylized facts about the evolution of education attainment, fertility and marital status in Mexico. We then use decomposition methods to quantify their relative importance across the three sub-periods.

Education. The first supply-side predictor of FLFP is education. There were sharp gains in educational attainment over the last 60 years in Mexico (Figure 5(a)). During the 1960s, the majority of prime-age women (96 per cent) had at most completed primary education, approximately 6–8 years of formal schooling. Policies to expand secondary education started in the 1950s (Gómez, 1999; Binelli and Rubio-Codina, 2013), but the results began to show among the prime-age group from 1970 onward. The share of women with secondary schooling completed increased steadily from 5 to 47 percent between 1970 and 2015, an average growth of 9.3 pp per decade.

On average, women with secondary education are 1.4 to 3.2 times more likely to be in the workforce relative to those with at most primary education (Figure 5(b)). This suggests that the expansion of secondary schooling could have played a significant role in the rise of FLFP, although the fact that the growth rate was reasonably constant indicates that it was probably not the main factor behind the acceleration of FLFP in the 1990s. Interestingly, the participation rate of women with primary education doubled between 1990 and 2000. Atkin (2016) provides a possible explanation for why the FLFP rate among the least educated increased profusely. They show that the growth of export manufacturing during the period of trade reforms increased school drop-out in Mexico because of an increase in the demand for less-skilled jobs that raised the opportunity cost of schooling. This is one example of how demand and supply factors can interact to determine education and participation choices jointly.

The share of women with tertiary education also increased, from 1 to 22 percent since the 1960s. Notably, the labor force participation gap between college- and secondary-educated women increased over time, going from a 14 pp gap in 1960 to a 27 pp gap in 2015. This is accounted for by an increase in the participation rate of college-educated women, which went from 44% in 1970 to 72% in 2015. In fact, the FLFP rate of women with secondary education changed very little: it remained between 39 and 45 percent throughout the period. In this case, the boost in the unconditional participation rate comes from two sides: having a larger share of women with tertiary education and an increasing participation rate of higher-educated women over time.

Fertility. The second main supply-side predictor of FLFP is fertility. We proxy fertility by the number of a woman's own children that are living in the household. Following Goldin (2006), we divide the fertility measure into two according to the children's ages: five years old and younger and above five years of age. The former is what Goldin calls the child burden. Since these variables are only available from 1970 onward, we use the alternative variable "*CHBORN*" from IPUMSI in some analyses. This variable reports the number of children ever born to each woman to whom the question was asked. We then construct a dummy variable equal to one if the woman had at least one child ever born.

Consistent with international trends, fertility declined steadily in Mexico (Figure 6(a)). The average number of own children five years old or younger in the household declined from 0.83 in 1970 to 0.28 in 2015 (–66 percent). The same numbers looking at children older than five are 2.5 and 1.42 (–43 percent). In principle, the reduction in fertility, especially the child burden, could be a driver of FLFP trends. However, fertility fell at a relatively constant rate, so it might not be able to explain the S-shape pattern. Also, it is clear from Figure 6(b)) that the child career penalty for women (*i.e.*, the difference in the FLFP rate between women with and without a child ever born) was large but stable at 23–30 percent between 1960 and 2015.

Marital status. The last main supply-side predictor of FLFP is marital status. Although most research finds that the largest gains in FLFP over the past century are due to the incorporation of married women into the workforce,[13] this was not the case in Mexico (Figure 7(b)).[14] The participation rates of married and single women increased by 31 pp and 35 pp, respectively, implying an average growth rate of about 6 pp per decade. However, because married women have significantly lower participation rates, proportionally, the gains among this group were substantial: the 2015 rate was sixfold the one in 1960.

The share of the prime-age population that reports being married began to decline around 1990 (Figure 7(a)). To our knowledge, this fact has not been pointed out before in the literature on FLFP in Mexico. It is not clear what drives the change in the trend. Divorce has legally existed in Mexico for more than a century, and the only major reform in this respect came in 2008 when unilateral divorce was approved, first in Mexico City and then in 17 other of the 31 states in the country (Aguirre, 2019; Hoehn-Velasco and

[13]See Section 3 for a detailed discussion.

[14]We make no distinction between women who are married and those who have a permanent partner.

Penglase, 2021). It seems plausible that improved labor market opportunities for women led them to delay marriage or incur divorce. Of course, marriage and labor supply are decisions that are jointly determined (Killingsworth and Heckman, 1986; Grossbard-Shechtman and Neuman, 1988; Eckstein and Wolpin, 1989; Klaauw, 1996; Fernández and Wong, 2014; Greenwood et al., 2016), so it is not easy to establish the direction of causality.

Given that single or divorced women were, on average, 32 pp more likely to participate in the labor market, the declining trend in marriage could have contributed to the rise of FLFP. Notably, the decline in the share of married women started in 1990, which is also when FLFP accelerated.

4.1 Relative Importance of Supply-Side Determinants of FLFP

To quantify the relative importance of education, marital status, and fertility in explaining the evolution of FLFP, we estimate an Oaxaca–Blinder decomposition that accounts for unobserved heterogeneity across CZs and time. We start by discussing the econometric model that underlies the decomposition. Let $i \in \{1, ..., N\}$ index individuals, $z \in \{1, ..., Z\}$ index commuting zones, and $t \in \{1960, 1970, 1990, 2000, 2015\}$ index census years. We define $Part_{i,z,t}$ as a variable that takes the value of 1 if individual i in CZs z and year t participates in the workforce. We assume the probability of participating can be characterized by the linear probability model:

$$Part_{i,z,t} = X'_{i,z,t}\beta_t + \mu_{z,t} + e_{i,z,t} \tag{1}$$

where $X_{i,z,t}$ is a vector of explanatory variables specific to individual i that includes the maximum level of education attainment (primary, secondary, or tertiary), marital status (married/permanent partner or single/divorced), the number of own children aged five and younger and over the age of five living in the household, a dummy variable equal to one of the women ever had a child, age, and age squared. Only some of the fertility variables are available in all the years. In particular, our preferred measure of fertility, the number of own children below and above 5 in the household, is unavailable in 1960. We then report results for different specifications when pooling census years, sometimes starting in 1960 and other times in 1970.

$\mu_{z,t}$ are CZs $\times$ year fixed effects, which flexibly capture omitted trends at the commuting zone level. These will include the CZ unemployment rate and general economic conditions in the local labor market where i lives. Importantly, they also capture the sectoral and occupational structure of the local labor market at each point in time. Aggregate shocks to the economy, particularly demand-side shocks, tend to be differentiated across local labor markets and are rarely geographically uniform (Moretti, 2011). These fixed effects will absorb most of this variation. This serves the purpose of allowing us to isolate supply-side variation.

Table 1 shows the results of estimating Equation 1. Recognizing that decisions over education, labor supply, marital status, and fertility are typically jointly determined, we refrain from making causal claims. The associations are nevertheless informative of how these variables relate to the changes in FLFP. The estimated effects are all in line with previous results in the literature. Higher educational attainment consistently corresponds to a higher probability of workforce participation. Specifically, compared to women with primary education or less, those with secondary education exhibit a 13 pp increase in participation probability when considering all census years. The participation rate gap between these two groups tends to decrease over time, particularly after 1990, as depicted in Figure 5(b). Women with tertiary education have a 20 pp higher probability of participation than those with at most a secondary education.

Being married is associated with a reduction in the probability of participation by approximately 31 pp, and this estimate remains stable over time. Having an additional child aged five or younger leads to a 5 pp decrease in the participation rate. However, if the additional child is older than five, the decline in the participation rate is smaller, around 1 pp. When not accounting for the specific number of children at different ages in the household, women who have ever had a child exhibit, on average, a 2 pp lower probability of participation. However, once we control for these variables, the probability of participation becomes positive in certain specifications.

Decomposition. Let t and t' correspond to two census years such that $t' > t$. The specification of the Oaxaca–Blinder decomposition based on Equation 1 takes the form:

$$\Delta_{t,t'}LFP = \left(\overline{X'}_{t'} - \overline{X'}_{t}\right)\hat{\beta}_{t,t'} + \underbrace{\overline{X'}_{t,t'}\left(\hat{\beta}_{t'} - \hat{\beta}_{t}\right) + \text{FE residual}}_{\text{Unexplained}} \tag{2}$$

where $\Delta_{t,t'}LFP$ is the change in the participation rate between t and t'. Overbars denote averages, and $\hat{\beta}_{t,t'}$ and $\overline{X'}_{t,t'}$ correspond to the estimated vectors of parameters and explanatory variables when we pool the observations across the two years, as in Oaxaca and Ranson (1994).[15] The term FE residual captures the variation in the participation rate that is not accounted for by the composition (first term of the RHS

[15] This specific counterfactual allows us to analyze composition effects relative to a baseline defined by the (population-weighted) mean returns and (population-weighted) mean characteristics over the two periods, eliminating the interaction term present in other decompositions (Oaxaca and Ranson, 1994).

of the equation) or price (second term of the RHS of the equation) effects associated with the variables in X. We report the estimates separately for different sub-periods, choosing t and t' accordingly.

We focus on the overall composition effects, which capture the change in the FLFP rate that can be accounted for (in the decomposition sense) by changes in the three supply-side determinants considered (plus age). However, we further separately report the composition effects associated with education, marital status, and fertility. We take the variation that cannot be accounted for by compositional effects linked to these three variables- both price effects and the FE residual- as unexplained. We have abstained from interpreting changes in the coefficients in the Oaxaca–Blinder decomposition. As Fortin et al. (2011) show, the detailed decomposition associated with changes in the coefficients is not identified.[16] The fixed effects are intended to capture changes in the demand side specific to the local labor markets. Since we observe clear spatial clustering of high vs. low FLFP (see Section 3), part of the heterogeneity will be absorbed by the FEs. Given that they capture various factors (not only demand-side trends), we do not interpret them directly, but they end up subsumed in the unexplained part.

There are three main takeaways from this analysis. First, taken together, changes in the composition of the workforce in terms of educational attainment, marital status, and fertility can account for a large share of the increase in the FLFP rate across all sub-periods. Specifically, between 1960 and 2015, compositional changes account for 44.5% of the growth in FLFP (column 1 of Table 2(b)). Focusing on 1970 to 2015, when our preferred fertility measures are available, this value is 71% (column 2 of Table 2(b)). Education is the most influential supply-side factor, accounting for 61% of the overall composition effect since 1970 and 43.3% of the FLFP rate increase. Additionally, the decline in marriage contributes to 11.0% of the FLFP rate increase, while declining fertility accounts for 17.5%.[17] In summary, the supply-side determinants, particularly education, played a crucial role in shaping the FLFP rate over the long term in Mexico.

The second takeaway is that the importance of these changes in the characteristics of workers varied significantly across sub-periods. During the periods of most sluggish growth (1970–90) and deceleration (2000–15) of FLFP, these changes accounted for more than the entire increase in the FLFP rate, indicating that the unexplained variation negatively affected female labor supply (columns 4 and 6 of Table 2(b)). In contrast, during the 1990s, when FLFP accelerated, changes in worker characteristics explained a maximum of 38%

[16] The problem arises because one has to choose a base category, which in turn affects the detailed decomposition results. Yun (2005) has proposed a solution to this identification problem based on a normalization. However, the solution makes it difficult to interpret the results. Our experience with these types of detailed decompositions is that results tend to be sensitive to changes in the specification. Hence, we prefer only to interpret the effect of changes in composition.

[17] To benchmark our results, Bhalotra et al. (2022), studying the case of Mexico between 1989-2014 using a general equilibrium labor demand and supply framework, estimate that marriage, fertility, household appliances, and the increasing scope of legislation designed to facilitate the economic participation of women jointly explain about a third of the increase FLFP rate. Eckstein and Osnat (2011) find, in the context of the United States and using a dynamic structural model, that the rise in education levels accounts for about 33% of the increase in female employment between 1962-2007. The decline in fertility and the increase in divorce account for only a marginal share of the increase in female employment rates.

of the increase (6.2 pp out of the 16.4 pp increase). It is worth noting that the predicted changes in FLFP resulting from the combined supply-side variables remained relatively stable over time, with average decadal predicted changes ranging from 2.0 pp (1960-1990) to 6.2 pp (1990-2015) (Table 2(a)). This suggests that when considered together, these supply-side variables consistently and somewhat uniformly influenced female labor supply. Deviations from the secular upward trend in FLFP that generate the S-shape pattern are unlikely to be explained by them.

Finally, the quantitative importance of education and fertility was constant since the 1970s, but marital status only began to have important effects after 1990 (Table 2(a,b)). This is consistent with the fact that the share of married women was stable at around 80% until 1990, when it began the downward trend (Figure 7(a)). After 1990, we estimate that changes in marriage patterns can account for approximately the same fraction of the FLFP increase as fertility.

Clearly, supply-side determinants of female labor supply played a significant role in the rise of FLFP in Mexico. However, they cannot by themselves explain the full growth or the acceleration in the 1990s. The following section studies whether demand-side forces can generate the S-shaped pattern.

5 Demand-Side Determinants: Occupation and Sectoral Composition of Employment

The two most common drivers of changes in labor demand are structural change, manifest in changes in the sectoral composition of (production and) employment, and non-neutral technological change, reflected in the occupational composition of employment.[18] Among factors that can fuel structural change are the transition of countries from agriculture to manufacturing and services, trade-induced economic specialization, and demographic changes like aging that shift the spending patterns of the population. Non-neutral technological change is a shift in production technology that favors some labor groups, such as skilled or female labor, over others. It affects the occupational structure by changing the task content of jobs, either replacing or complementing specific tasks performed by workers.

If women benefited from labor demand trends, we should observe that the sectors and occupations in which they tend to work have grown disproportionately, and that occupational and sectoral segregation of employment by sex is diminished. To assess this, we first chart the descriptive patterns in the data. We then use a shift-share design to quantify the relative importance of demand-side changes for the evolution of FLFP.

[18] See, among others, Acemoglu and Autor (2011), Altonji et al. (2014), Autor and Dorn (2013), Autor et al. (2003, 2006), Dorn (2009), Goos et al. (2014), Herrendorf et al. (2014), Michaels et al. (2014), Acemoglu and Restrepo (2019), Acemoglu and Restrepo (2020).

Occupational composition. There is clear gender-based occupational segregation in Mexico, albeit it has lessened over time. In 1960, occupations like crafts and related trades (*e.g.*, carpenters, plumbers, structural metal workers, welders), plant and machine operators, and higher-skilled occupations like managers were almost exclusively occupied by men, with female shares of employment below 10% (see Figure 8(a)). The few women in the labor market were concentrated in clerical occupations (*e.g.*, secretaries and administrative assistants), services and sales, and, at the high end of the skill distribution, they worked as technicians and associated professionals (see Figure 8(b)). Nevertheless, even in these "female occupations," the female employment share was at most 27%.

As women joined the workforce, they did so in occupations that already had a relatively high share of employment. By 2015, women accounted for 61% of all workers in clerical occupations and 60% of technicians and associated professionals. In the case of services and sales, there was an even split in the share of employment between men and women in 2015, but there was an acceleration of the female share starting in 1990. Although the female share also increased in "male occupations", only in the case of managers do we see significant gains in absolute terms, going from 9 to 38% between 1960 and 2015. Segmentation is consistent with women selecting into specific occupations either because of comparative advantage or social norms dictating the kinds of jobs that were "appropriate" for them.

Importantly, the overall share of employment in "female occupations" tended to increase, which is indicative of labor demand in these occupations increasing (Figure 8(d)). This is particularly true for services and sales, which almost doubled its occupation share, going from 11 to 20 percent, with most of the gains coming after 1990. Services and sales occupations rely mostly on non-routine tasks and personal interaction, which makes them harder to automate. The combination of higher overall occupation share of employment and higher within-occupation female share suggests that demand forces associated with non-neutral technological change could have incentivized women to join the labor force or at least provided the opportunities for them to do so.

Sectoral composition. There is also clear gender segregation by sector, though less so than by occupation (see Figure 9(a,b)). In 1960, half of all workers in the education and health sectors were women, which is impressive since women only accounted for 13% of the workforce. These numbers increased to 67 and 62%, respectively, by 2015, an important gain but not so dramatic as the increase observed across "female occupations". Sectors like wholesale and retail trade, which also had a high female share in 1960 (21%), did show significant gains, with the female share more than doubling in the 55-year span. Moreover, in sectors like manufacturing, where the female share was relatively low to begin with (15%), the participation of women increased substantially, especially after 1990. This is consistent with the findings of Juhn et al. (2014), who showed that after NAFTA, export-oriented firms modernized, improving women's employment prospects, particularly those with primary education. A clear sign of structural change lies in the sharp decline of agriculture in the overall employment share, from 36% in 1970 to only 9% in 2015. On average, women only accounted for 1.5–4.1 percent of all employment in agriculture, so its relative decline suggests that the transition of the Mexican economy from a primary goods producer to a manufacturing and services producer could have benefited women. Agricultural jobs are intensive in "brawn" while expanding sectors like wholesale and retail sales are more intensive in interactive social skills.

5.1 Relative Importance of Demand-Side Determinants of FLFP

Let $z \in \{1, ..., Z\}$ index commuting zones, $t \in \{1960, 1970, 1990, 2000, 2010, 2015\}$ index census years, $s \in \{1, ..., S\}$ index states,[19] and $k \in \{1, ..., K\}$ index either occupations or sectors. Let $\Delta FLFP_{z,t}$ be the CZ-specific change in the FLFP rate between consecutive census years. Our measure of changes in the demand for female labor is given by $\Delta \log L^f_{z,t}$, defined as the change in the (log) number of females employed in the CZ. In fact, $\Delta \log L^f_{z,t}$ is an equilibrium object defined by the interaction of supply and demand for female labor. We will discuss this in detail in the following paragraphs. For the moment, the econometric model is

$$\Delta FLFP_{z,t} = \beta \Delta \log L^f_{z,t} + X'^f_{z,t}\gamma + \eta_{t,s} + \alpha_z + e_{z,t}, \tag{3}$$

where α_z is a CZ fixed effect capturing all idiosyncratic determinants of FLFP that are time-invariant—for example, geographical characteristics like distance to trade ports or major cities—and ingrained cultural norms that are time-invariant in the medium-run; $\eta_{t,s}$ is a state-specific flexible time trend capturing all determinants of FLFP that are time-varying but common across CZs within a state, such as economic cycles and demographic trends that might vary at a regional level; and $e_{z,t}$ is the idiosyncratic stochastic term. Given the fixed effects set-up, the variation we use in the estimation of β is restricted to within-CZ *changes* in female labor demand that deviate from state-specific trends.

$X^f_{z,t}$ is a vector of controls that includes (1) the change in the (log) number of women with each level of schooling (primary, secondary, or tertiary) in the CZ; (2) the change in the proportion of women that are married in the CZ, and (3) the change in the proportion of women who have ever had a child born in the CZ. These variables aim to control for the supply-side determinants of FLFP discussed in the previous sections.

[19] There are 32 states in Mexico, including Mexico City.

Consistent with the individual-level analysis, CZs where education attainment increased more, or fertility and marriage rates declined more, over the entire period had higher gains in FLFP (Figure 10(a,c)).

$\Delta \log L^f_{z,t}$ increases as total female employment increases. In that sense, the parameter of interest, β, can be interpreted as the semi-elasticity of the FLFP rate with respect to changes in labor demand for female workers. However, $\Delta FLFP_{z,t}$ and $\Delta \log L^f_{z,t}$ are also mechanically related within a CZ. In particular, $\Delta L^f_{z,t} \approx N^f_{z,t} \Delta FLFP_{z,t}$, where $N^f_{z,t}$ is total female prime-aged population in the CZ at time t. To isolate this mechanical relation and distinguish between sectoral and occupational demand changes, we use a shift-share design.

Shift-share design. First, note that we can express $\Delta \log L^f_{z,t}$ as the weighted sum of occupation- or sector-specific changes in (log) total (male + female) employment, $\Delta \log L_{z,k,t}$, where the weights, $\alpha_{z,k,t}$, correspond to the female employment share in the respective occupation/sector. In particular:

$$\begin{aligned} \Delta \log L^f_{z,t} &= \sum_k \frac{L^f_{z,k,t}}{L_{z,k,t}} \Delta \log L_{z,k,t} \\ &= \sum_k \alpha_{z,k,t} \Delta \log L_{z,k,t}. \end{aligned} \tag{4}$$

$\Delta \log L^f_{z,t}$ increases as the *total* demand for labor in an occupation/sector within a CZ increases, but the importance of each occupation/sector is proportional to its female share of employment. If the occupational or sectoral composition of the economy changes, labor will have to reallocate within each labor market. The effect on female labor will depend on whether the occupations or sectors that are growing in importance tend to use more or less female labor. If they do, this would be equivalent to a positive shock to female labor demand. This setup is flexible enough to allow us to analyze occupation- and sector-specific demand shifts separately.

To isolate the mechanical relation between FLFP and employment locally, we decompose occupation-/sector-specific changes in (log) total employment within a CZ between country-wide shifts, excluding the CZ, and idiosyncratic shifts:

$$\Delta \log L_{z,k,t} = \Delta \log L^{-z}_{k,t} + \varepsilon_{z,k,t}, \tag{5}$$

where $\varepsilon_{z,k,t} \equiv \Delta \log L_{z,k,t} - \Delta \log L^{-z}_{k,t}$ and the superscript $-z$ indicates that the sum across CZs is taken net of CZ z.[20] $\Delta \log L_{k,t}^{-z}$ then captures aggregate trends in occupation-/sector-specific labor demand which are not mechanically driven by local shifts in female labor supply.

The weight of each occupation/sector, $\alpha_{z,k,t}$, is given by its female share of employment, but female shares are also changing in time both as a result of shifts in female labor supply and female labor demand. We fix the *exposure* of a CZ to aggregate changes in female labor demand using the female share in the occupation/sector at a baseline period t_0, which in our case is the average during the pre-1990 census years (*i.e.*, the average female share in employment prior to the acceleration in the growth of FLFP).[21]

We thus construct the variable

$$\Delta \log B_{z,t}^{k} = \sum_{k} \alpha_{z,k,t_0} \Delta \log L_{k,t}^{-z}. \tag{6}$$

The purpose of $\Delta \log B_{z,t}^{k}$ is to isolate the variation resulting from changes in the demand side of the economy, which can be observed through shifts in the sectoral or occupational composition of employment. Essentially, it represents a prediction of the CZ change in female labor demand arising from these compositional shifts. In our estimation, we substitute $\Delta \log L_{z,t}^{f}$ with $\Delta \log B_{z,t}^{k}$ in Equation 3 for $k \in \{occ, sec\}$. $\Delta \log B_{z,t}^{k}$ is also known in the literature as a Bartik instrument (Goldsmith-Pinkham et al., 2020; Borusyak et al., 2022).

Table 3 displays the results of estimating Equation 3 with seven different specifications. These specifications vary depending on the inclusion of fixed effects, supply-side controls, or the two predictive measures for changes in labor demand. In columns 1 and 2, we present the estimates using $\Delta \log L_{z,t}^{f}$ directly. Columns 3 and 4 show the estimates when utilizing the predictions for occupations ($\Delta \log B_{z,t}^{occ}$), while columns 5 and 6 utilize the predictions for sectors ($\Delta \log B_{z,t}^{sec}$). Our preferred specification, shown in the last column, incorporates both predictive measures in the same regression.

To get a better sense of the quantitative importance of the demand-side determinants of FLFP and derive estimates that are comparable to the supply-side decomposition results, Table 4 reports the predicted increase in the FLFP rate coming from changes in the composition of labor demand. The predictions are generated by multiplying the estimated semi-elasticities associated with $\Delta \log B_{z,t}^{occ}$ and $\Delta \log B_{z,t}^{sec}$ in our preferred specification, by their respective values. We then compute a population-weighted average of those predictions across CZs for the sub-periods of interest. We calculate standard errors using clustered bootstrap sampling

[20] For example, $\Delta \log L_{k,t}^{-z} = \sum_{i \neq z}^{Z} \Delta \log L_{i,k,t}$.

[21] We have explored alternative specification using other baseline years (*e.g.*, 1960, 1970, and average between 1960 and 1970) and results are qualitatively unchanged.

of the entire procedure with 1,000 repetitions.

There are two main takeaways from the results. First, FLFP has been responsive to changes in the composition of labor demand, especially those coming from changes in the occupational structure of employment (column 7 of Table 3). In particular, we estimate that changes in labor demand for female workers arising from changes in the occupation structure of employment can account for up to 17.9% of the increase in FLFP between 1960-2015 (column 1 of Table 4(b)). Notably, the predicted impacts on FLFP are slightly negative for the deceleration period between 2000-2015 (column 6 of Table 4(a)), which suggests that the demand push observed since the 1960s was no longer at work in the new millennium. Bhalotra et al. (2022), using an equilibrium model of supply and demand for labor in Mexico, find a similar deceleration of female relative demand across different occupational groups in the same years. However, they cannot pinpoint what drives this trend. Gasparini and Marchionni (2017), looking at different countries in Latin America, also find a deceleration of FLFP and show that supply-side factors like education, reduced marriage, and fertility cannot account for the slowdown in female labor supply. However, they propose that income effects linked to strong economic growth could be at play. Our results suggest that the changes in the occupational structure are an essential part of the story.

The second takeaway is that changes in the sectoral structure of labor demand appear less important for Mexico's rising female labor supply. Column 6 of Table 3 show that the estimated semi-elasticity tends to be positive and marginally significant (p-value 0.073), with point estimates that are of a slightly smaller magnitude than the ones for occupations (0.014 vs. 0.010). However, once we control for the predicted change in labor demand coming from shifts in the occupational structure (columns 7 of Table 3), the estimated coefficient halves, and we can no longer reject the null hypothesis. Quantitatively, sectoral demand changes can still have some explanatory power for the changes in FLFP: column 1 of Table 4(b) suggests they can account for 9.2% of the growth in FLFP between 1960-2015, but the uncertainty around the estimated value is too large to say something conclusively.

This finding contrasts with extensive literature that emphasizes structural change as a major driving force of long-term female labor force participation trends.[22] However, our results do not contradict this literature but offer a more nuanced understanding of how structural change can impact female labor demand. Studies on the market drivers of income inequality have highlighted the importance of the task content of occupations in explaining earnings polarization. The idea is that capital and new technologies can complement or substitute workers depending on the specific tasks involved in a job, shaping labor demand (Autor et al., 2003; Acemoglu and Autor, 2011; Autor and Dorn, 2013; Altonji et al., 2014; Acemoglu and Restrepo, 2019, 2020). In this

[22]See Section 3 for a comprehensive discussion.

framework, firms require workers to perform specific tasks, which are then combined to produce goods and services in different sectors. Rather than the type of goods produced (*i.e.*, the sector of production), it is the nature of the tasks involved in the production process that directly determines labor demand (*i.e.*, the occupations). This does not imply that the sectoral composition of production and employment is irrelevant. Different sectors have distinct demands for certain types of tasks (*e.g.*, physical, "brawn-intensive" tasks in agricultural production, interpersonal interactions in the service sector), and any economic force that leads to a reallocation of activities across sectors can potentially alter labor demand due to compositional effects.

In the literature on the effect of structural change on FLFP, some of the work omits the occupational dimension altogether (Standing, 1999; Akbulut, 2011; Heath and Jayachandran, 2018), but others do consider it. Olivetti and Petrongolo (2016), for example, study how the expansion of the service sector impacted growth in female hours of work in a sample of 19 high-income countries since the mid-19th century. The main finding is that the growth in the service share can explain at least half of the overall variation in female hours across countries and over decades. They then split the within-industry component into a between-occupation component *within* industries and an interaction term. They find that in none of the countries, female hours' share growth occurred via the expansion of female-friendly occupations *within* sectors. Again, the argument is not that occupations do no matter, but that the bulk of the growth in female-friendly occupations occurred via the expansion of the service share (*i.e.*, via a compositional effect).

Analyzing the effects of trade on gender inequality in Mexico, Juhn et al. (2014) find that tariff reductions after NAFTA led new firms entering the export market to increase investment in machinery and equipment, lowering the need for physically demanding tasks. They show that this technological upgrading increased the ratio of female to male workers in blue-collar tasks but had no effect in white-collar tasks, where the relative importance of physically demanding skills is unlikely to have changed. This a good example of how trade-induced demand shifts, concentrated in specific sectors (*i.e.*, manufactured goods for the export market), can operate through changes in the relative demand for specific tasks.

6 Supply and Demand: Taking Stock of the Decomposition Results

Combining the decomposition results of supply and demand-side determinants of female labor force participation reveals three main findings. First, these factors can account for a significant portion of the rise in FLFP in Mexico: 70% over the 1960-2015 period and 92% when focusing on the post-1970 period. We arrive at these numbers by adding up the predicted overall (supply-side) composition effect (columns 1 or 2 of Table 2(b)) with the sum of demand effects coming from changes in the occupational and sectoral structure (columns 1 or 2 of Table 4(b)). It is important to note that these decompositions provide a descriptive, non-causal characterization, and should be interpreted with caution. Nonetheless, the findings suggest that conventional variables identified in the literature as influential in female labor supply have contributed significantly to FLFP growth in Mexico since the 1960s.

The second key finding is that among the variables considered, educational attainment emerges as the most influential factor behind the increase in FLFP, contributing to 43.2% of the post-1970 rise in female labor supply. This finding aligns with previous studies such as Eckstein and Osnat (2011) in the United States and Klasen et al. (2021) in eight developing economies. In this "horse race" comparison, fertility ranks second (17.5%), followed by labor demand changes that reshape the occupational composition of employment (11.7%) and a decline in the marriage rate since 1990 (11.0%). These results provide valuable benchmarks for discussions on promoting women's labor market participation in emerging markets. However, it is essential to acknowledge that these findings are derived within a partial equilibrium framework that does not consider the interplay between demand and supply factors. Considering their potential interaction can be important. For example, improved labor market conditions for women can raise wages, foster human capital accumulation, and influence women's decisions regarding childbirth timing. Therefore, further investigation is necessary to understand the intricate relationships among these variables.

Finally, our findings suggest there is important heterogeneity in the explanatory power of supply and demand factors in the different sub-periods. For example, between 1960-1990, when FLFP growth was sluggish, supply and demand factors can account for more than the observed change: the FLFP rate increased by 10.4 pp while the prediction based on the decompositions is 12 pp. Something similar happened in the deceleration period (2000-2015): FLFP rate increased by 6.5 pp while the prediction was 7.3 pp. However, during the decade of rapid expansion (1990-2000), the predictive capacity of these factors is much smaller: 16.4 pp observed vs. 9.2 pp predicted (42.7% smaller). In sum, the factors considered cannot account for the rapid expansion of FLFP in the decade starting in 1990.

A significant unexplained part of FLFP growth is not unusual in the literature (Eckstein and Osnat, 2011; Ganguli et al., 2014; Blau and Kahn, 2017; Gasparini and Marchionni, 2017). A natural place to start thinking about the unaccounted part of female labor supply growth is to look at factors that are not included in the standard analysis because of absent data or difficulties in measurement. For example, a growing strand of work on the rise in female participation has emphasized the role of changing social norms about gender roles (Fernandez et al., 2004; Fortin, 2005; Fogli and Veldkamp, 2011; Marianne, 2011; Fernández, 2013; Alesina et al., 2013; Bertrand et al., 2015; Fortin, 2015; Jayachandran, 2021; Bertrand, 2020).[23]

Gender norms often prescribe roles where men are the primary earners and women focus on domestic work. As a result, women may be less likely to participate in the labor force due to perceived societal expectations and the internalized need to affirm their gender identity.[24] It has been difficult to design credible causal testing of the impact of gender identity norms on women's labor market choices, but some empirical evidence supports the claim. For instance, Fortin (2005) and Fortin (2015) use survey data to show that gender role attitudes correlate strongly with women's labor force participation. Bertrand et al. (2015) provides evidence of how gender identity norms can impact marriage formation, marital satisfaction, and the division of home production, all of which can indirectly affect women's labor force participation.

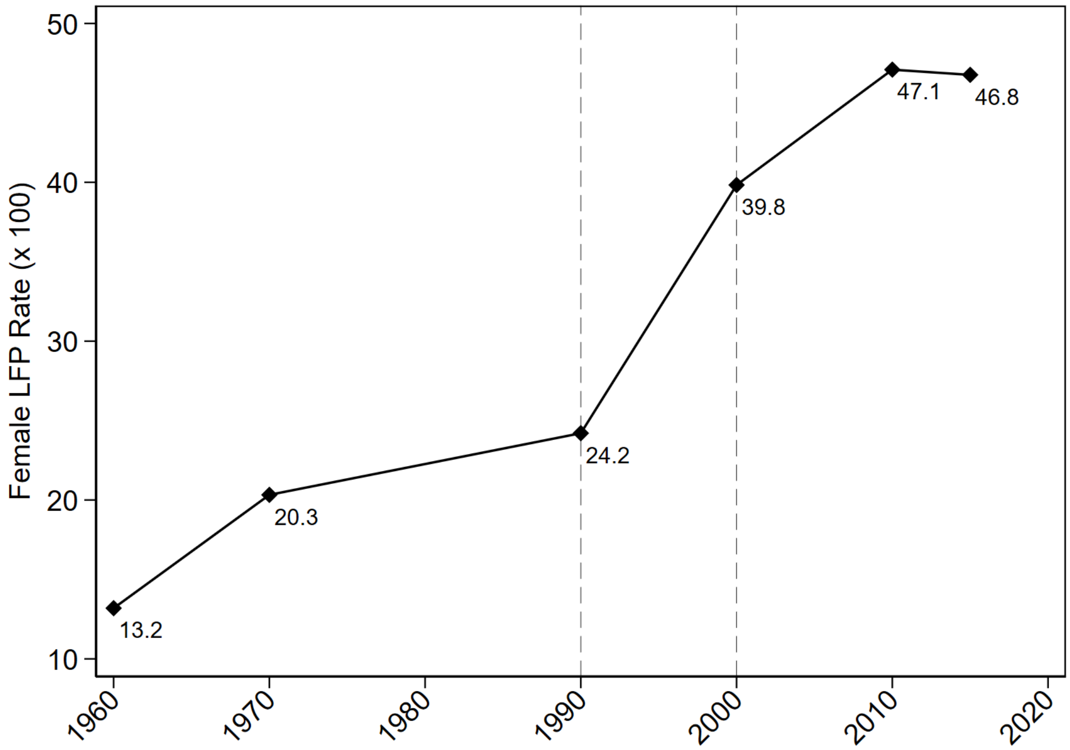
Interestingly, some of the theoretical models proposed to examine the relation between changing social norms and female labor force participation generate the S-shape pattern in female labor supply observed in Mexico. The specific pattern is primarily the result of the nature of learning processes and how the diffusion of information evolves. For example, Fogli and Veldkamp (2011) uses a learning model to show how the participation of women in the labor force can increase as more information becomes available about the effects of maternal employment on children. Fernández (2013) proposes a model where cultural change is an intergenerational learning process, with female labor force participation and culture co-determined. As women gather more information about the long-run payoffs of working, beliefs evolve, and more women decide to work. Fernandez et al. (2004) further posits that family models where the mother works can reduce stereotypical gender roles over time. The gradual transformation of the family acted as a propagation mechanism of change in women's roles, affecting participation rates across generations. Testing whether changing social norms are behind the acceleration of FLFP in the 1990s in Mexico is beyond the scope of this paper, but this merits further analysis.

[23] Social norms are informal rules about appropriate or acceptable behavior within a society. These norms are often internalized and used to shape individuals' behavior in various contexts. Social norms are essential in shaping gender roles, where certain behaviors are viewed as appropriate or expected for men and women.

[24] Akerlof and Kranton (2000) suggests that gender identity can change the payoffs from different actions, causing discomfort when norms are violated.

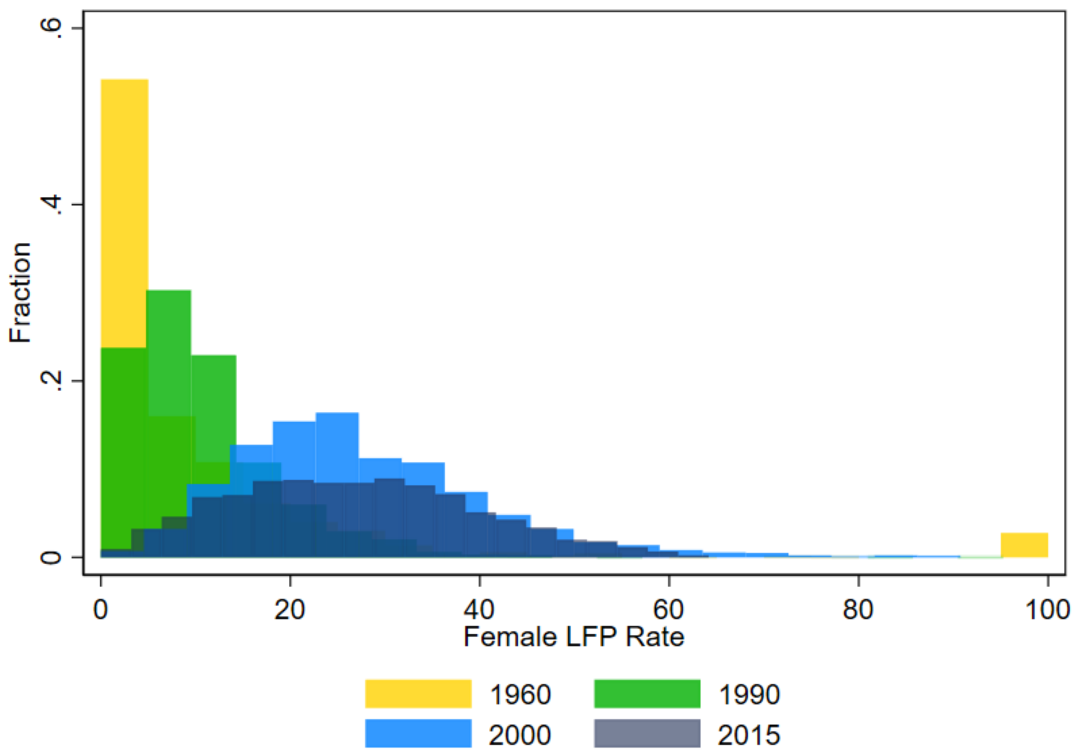
Figures and Tables

Figure 1: Female Labor Force Participation Rate in Mexico, 1960-2015



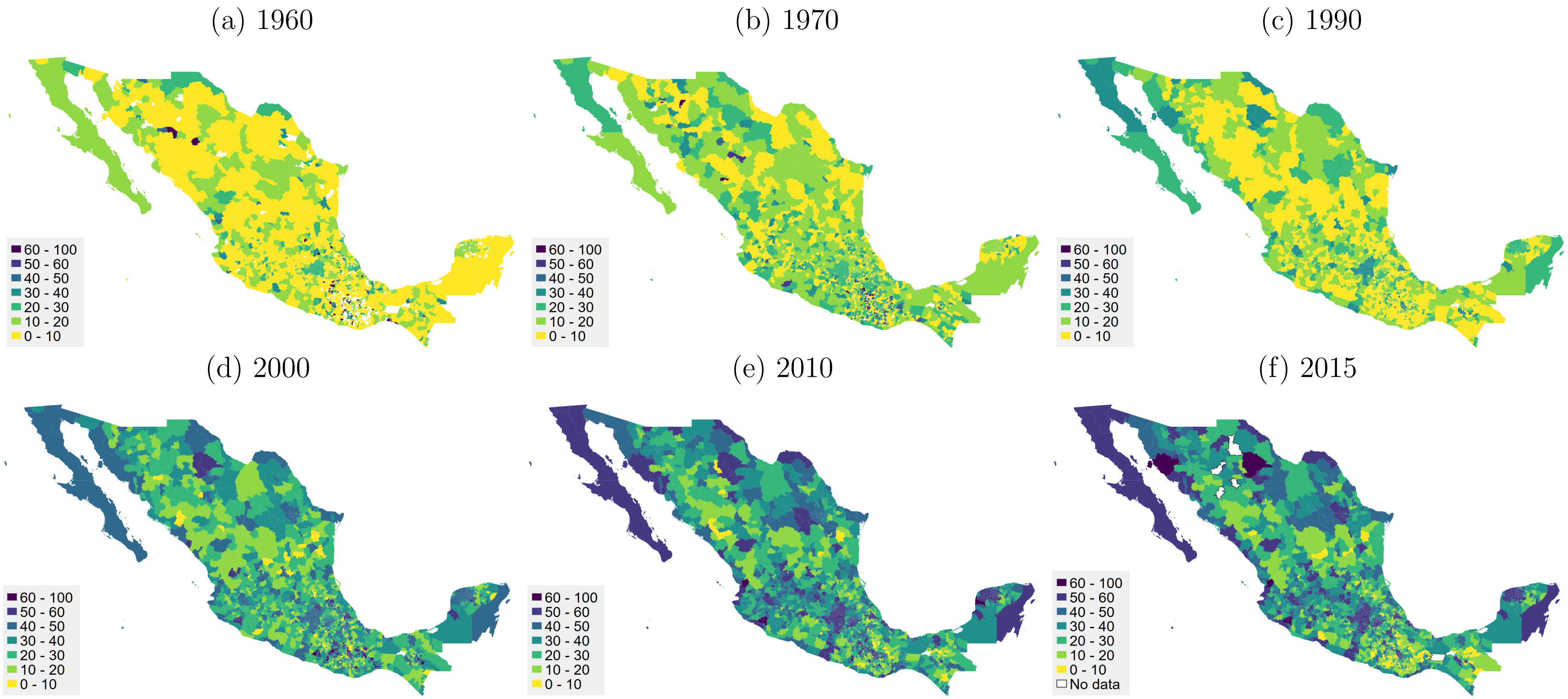
Note: Sample restricted to women between ages 25-55. For details on the construction of the series see Section 2.

Figure 2: Distribution of the Female Labor Force Participation Rate Across Commuting Zones and Years



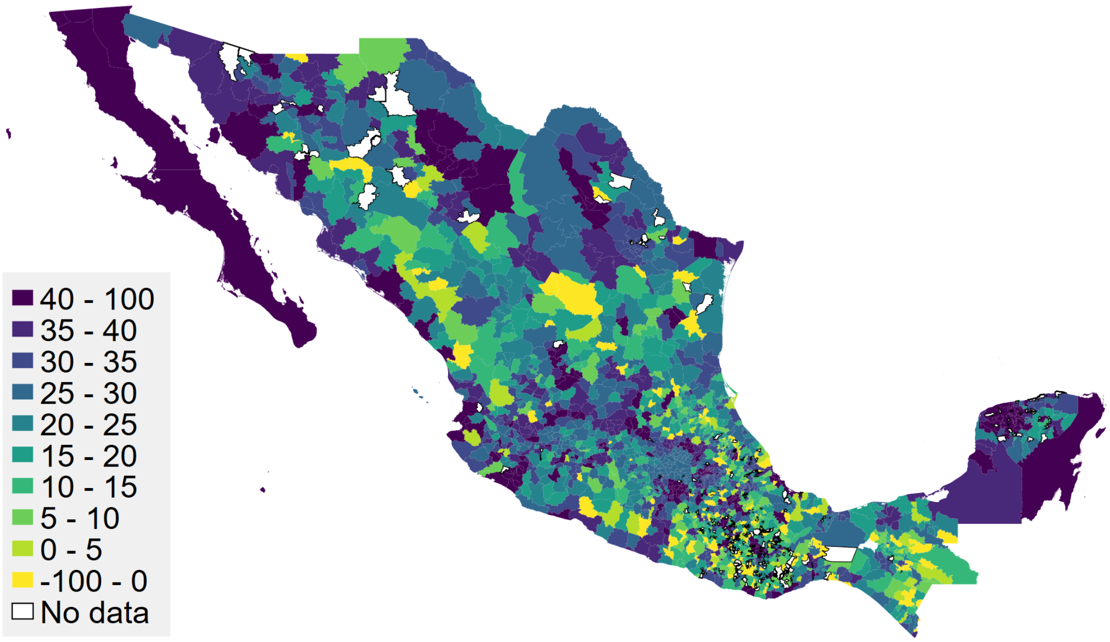
Note: The figure shows distribution of the FLFP rate across CZs in a subset of the census years. Sample restricted to women between ages 25-55. For details on the construction of the series and the definition of CZs see Section 2.

Figure 3: The Geography of Female Labor Force Participation Between 1960 and 2015



Note: Each map shows the female labor force participation rate for every CZ in a census year. Sample restricted to women between ages 25-55. For details on the construction of the series and the definition of CZs see Section 2.

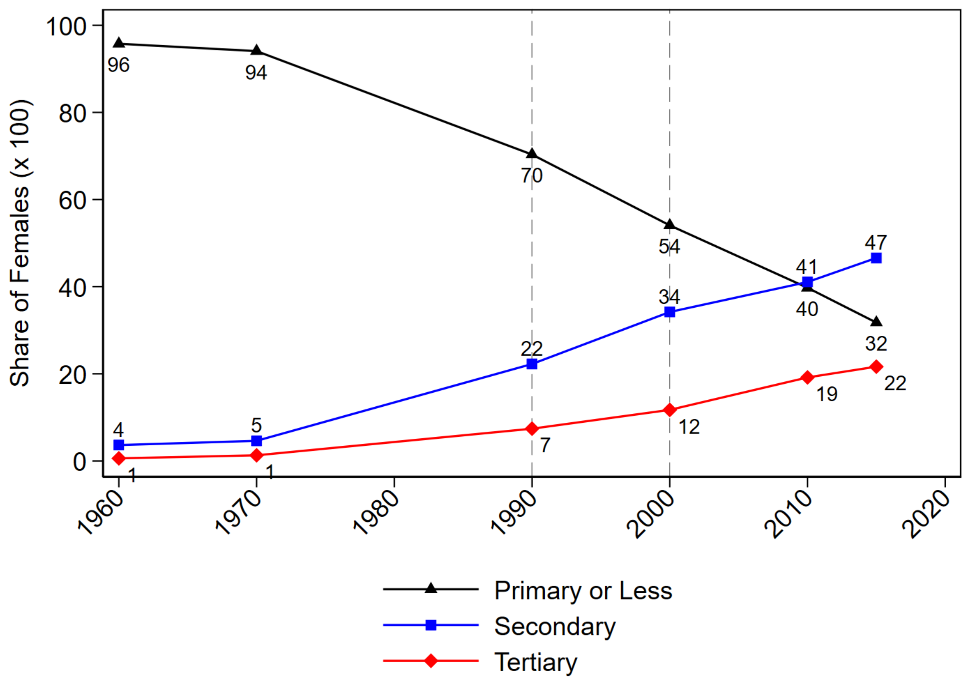
Figure 4: Changes in Female labor Force Participation by CZ Between 1960-2015



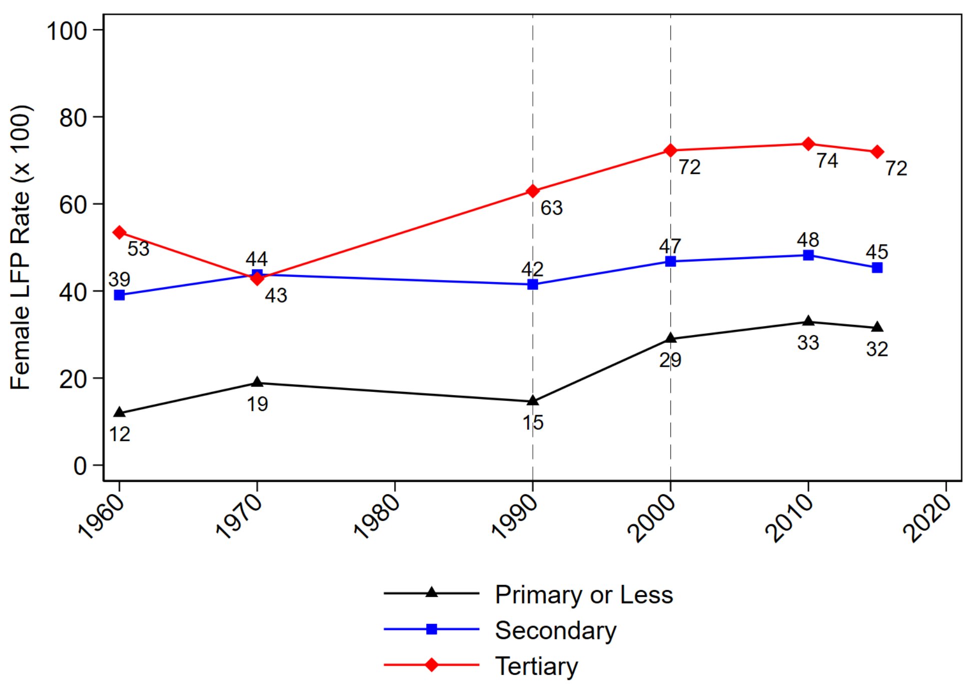
Note: The map shows the change in the female labor force participation rate for every CZ between 1960 and 2015. Sample restricted to women between ages 25-55. For details on the construction of the series and the definition of CZs see Section 2.

Figure 5: Education Attainment and Labor Force Participation

(a) Share of Females by Education Group



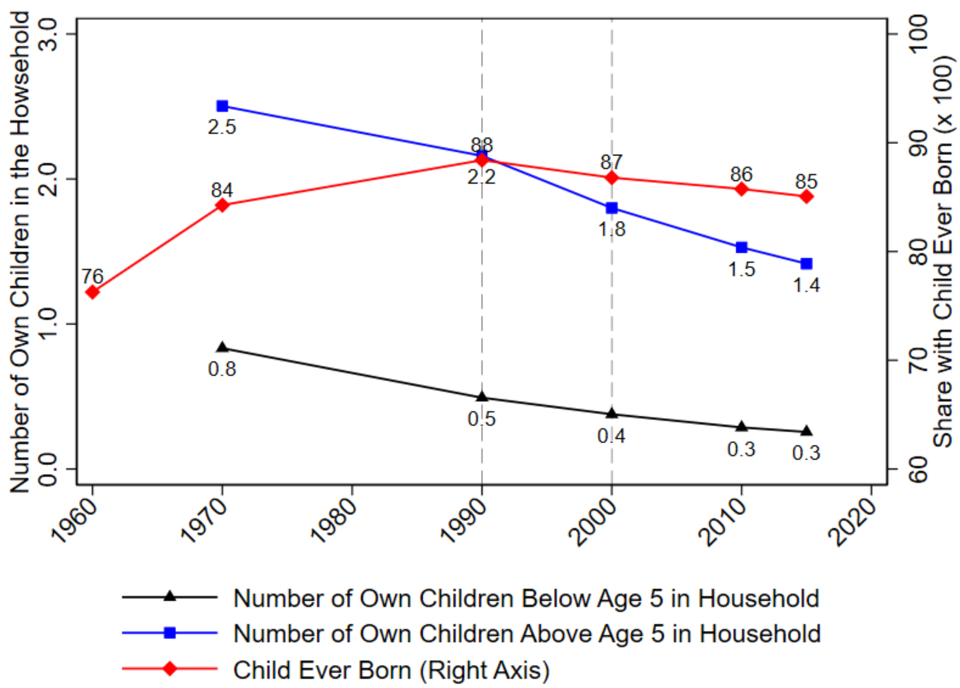
(b) Female LFP Rate by Education Group



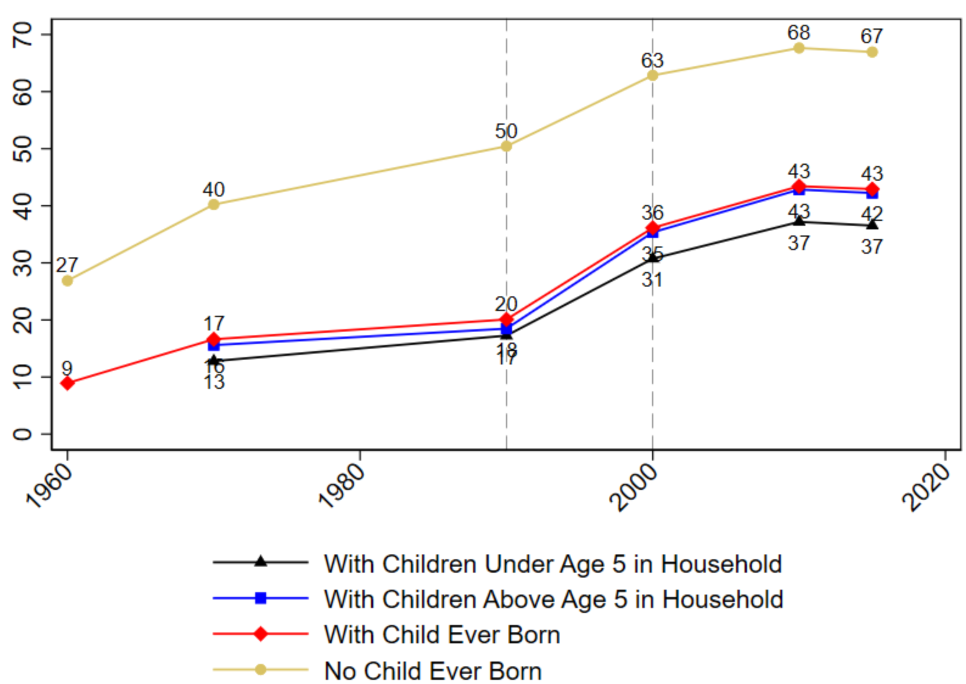
Note: Panel (a) reports the share of females aged 25-55 according to maximum education attainment between 1960 and 2015. We consider three educational groups: primary or less, secondary, and tertiary. Panel (b) reports the labor force participation rate of females aged 25-55 conditional on education attainment.

Figure 6: Fertility and Labor Force Participation

(a) Average Number of Own Children in the Household and the Proportion of Women who have Ever Given Birth to a Child.



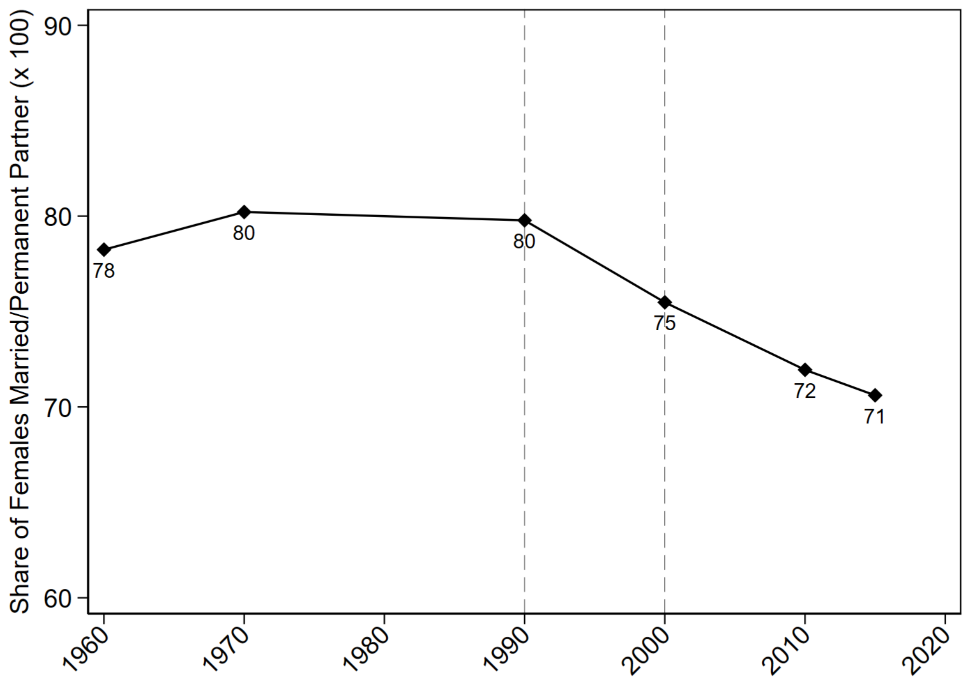
(b) LFP Rate Conditional on Fertility Measures



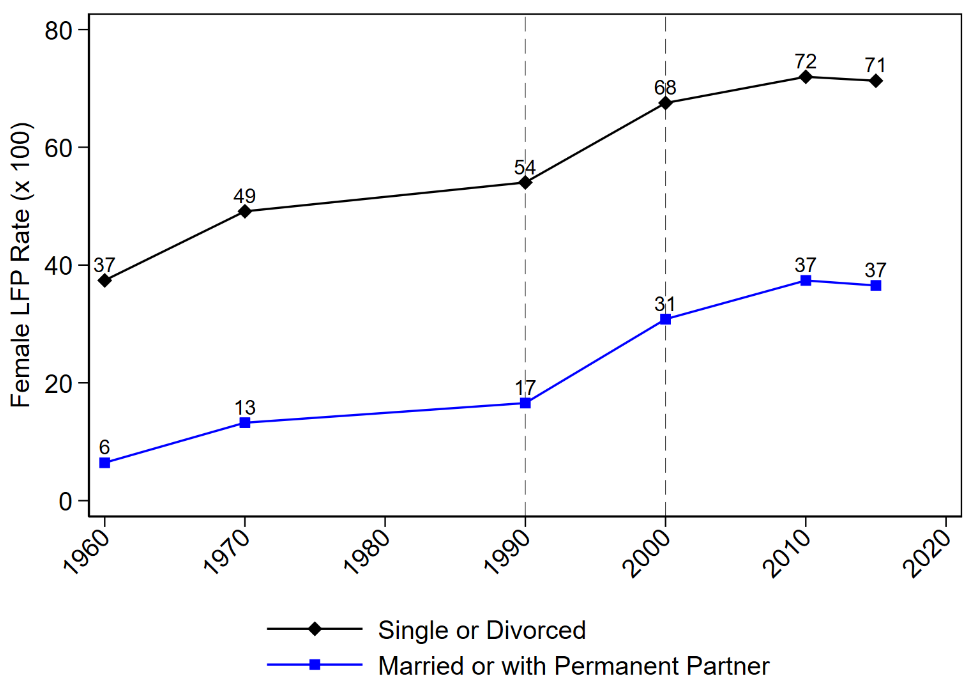
Note: Panel (a) reports the average number of (own) children below and above age five that are living in the household (left axis) and the proportion of women who have ever given birth to a child (right axis). Panel (b) reports the LFP rate conditional on each fertility measure. Sample restricted to individuals between ages 25-55.

Figure 7: Marital Status and Labor Force Participation

(a) Share of Females/Males Married/Permanent Part.



(b) LFP Rate of Females/Males by Marital Status

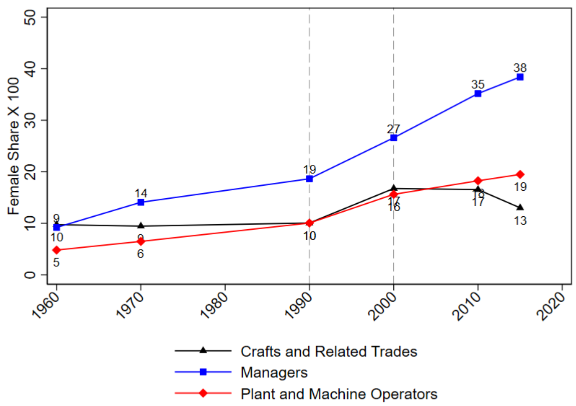


Note: Panel (a) reports the share of females between ages 25-55 that are either married or live with a permanent partner between 1960 and 2015. Panel (b) reports labor force participation rate conditional on marital status. Sample restricted to individuals between ages 25-55.

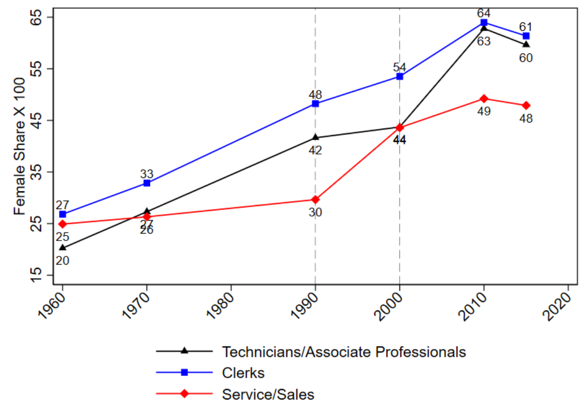
Figure 8: Occupation Share and Share of Female Workers in the Occupation: Evolution Between 1960 and 2015

Female Employment Share

(a) "Male Occupations"

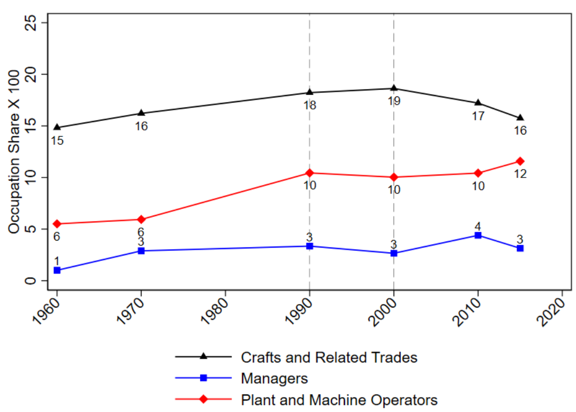


(b) "Female Occupations"

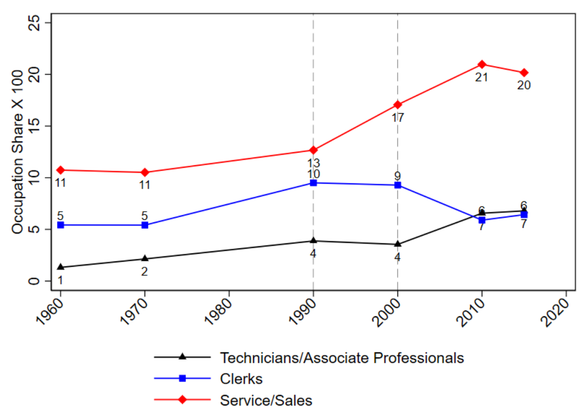


Occupation Share of Employment

(c) "Male Occupations"



(d) "Female Occupations"

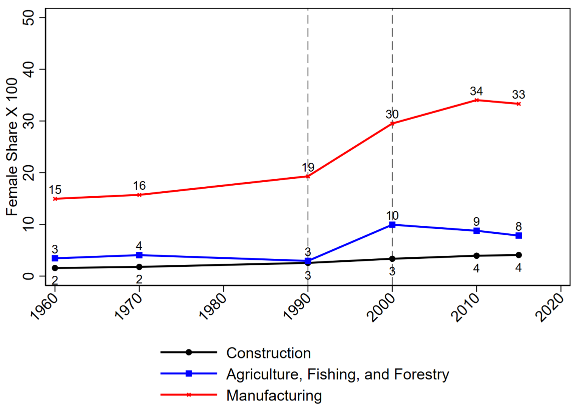


Note: Panels (a) and (b) show the female share of employment for occupations that are mostly done by men and those were women have a relatively higher share. Panels (c) and (d) show the share of the workforce in each occupation. Sample restricted to individuals between ages 25-55.

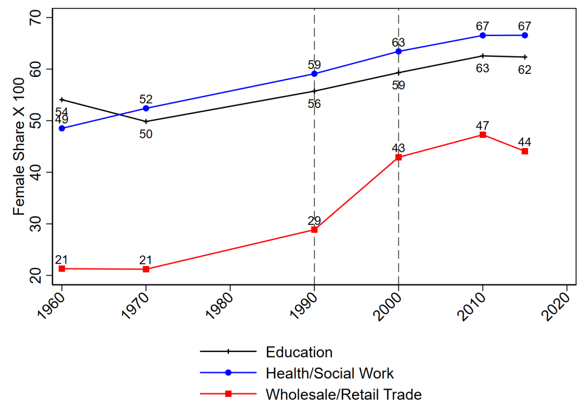
Figure 9: Sector Share and Share of Female Workers in the Sector: Evolution Between 1960 and 2015

Female Sectoral Share

(a) "Male Sectors"

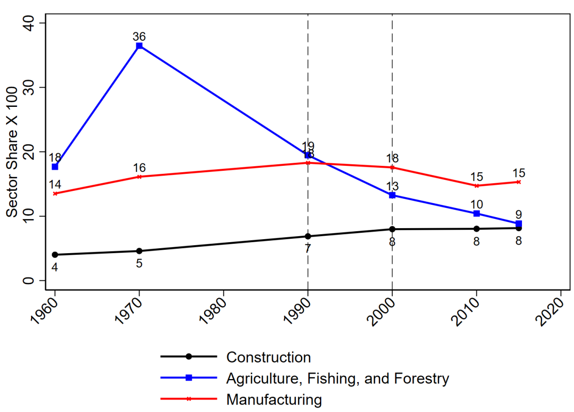


(b) "Female Sectors"

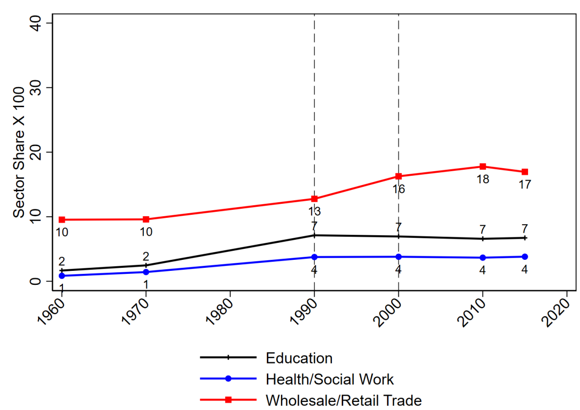


Sectoral Share of Employment

(c) "Male Sectors"



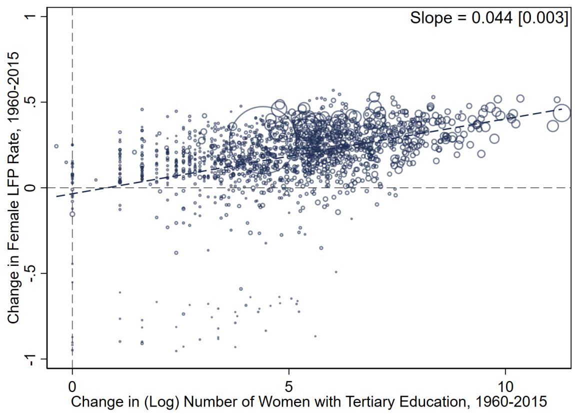
(d) "Female Sectors"



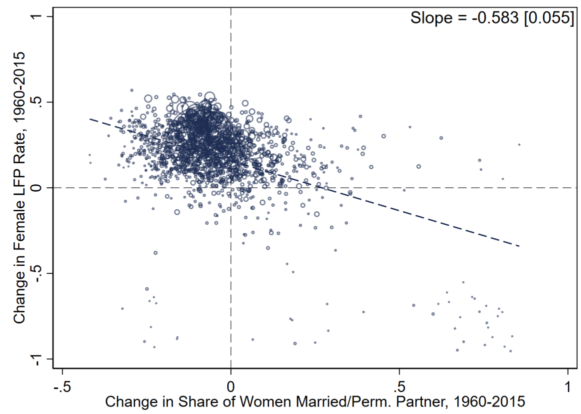
Note: Panels (a) and (b) show the female share of employment for sectors that are mostly done by men and those were women have a relatively higher share. Panels (c) and (d) show the share of the workforce in each sector. Sample restricted to individuals between ages 25-55.

Figure 10: Changes in FLFP and Changes in Education, Marital Status, and Child Burden by Commuting Zone: 1960-2015

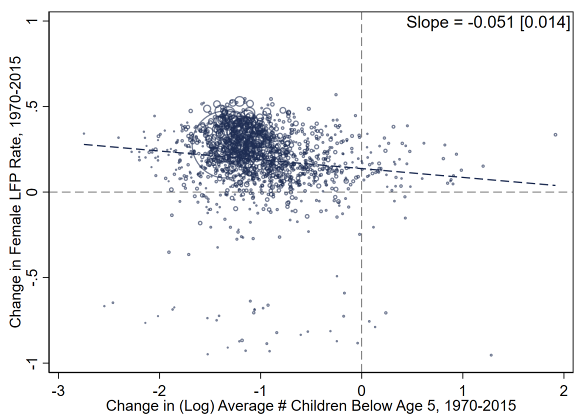
(a) Education



(b) Marital Status



(c) Fertility



Note: Panel (a) shows the relationship between changes in the municipal FLFP rate and changes in the (log) number of women with tertiary education between 1960-1990. Panel (b) and (c) replicate this exercise using the proportion of married women and the municipal average number of own children below five living in the household, respectively.

Table 1: Probability of Participation in the Labor Force

	Dep Var: =1 if in Labor Force							
			Census Year					
	1960-2015	1970-2015	1960	1970	1990	2000	2010	2015
Education								
=1 if Secondary	0.13	0.12	0.18	0.17	0.20	0.13	0.11	0.09
	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)	(0.00)
=1 if Tertiary	0.33	0.32	0.29	0.16	0.37	0.34	0.31	0.30
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Marital Status								
=1 if Married	-0.32	-0.31	-0.27	-0.30	-0.31	-0.33	-0.30	-0.30
	(0.01)	(0.01)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)
Fertility								
=1 if Child Ever Born	-0.02	0.03	-0.05	-0.04	0.01	0.04	0.05	0.05
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
N. Children ≤ 5		-0.05		-0.03	-0.03	-0.06	-0.07	-0.07
		(0.00)		(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
N. Children > 5		-0.01		-0.01	-0.01	-0.01	-0.02	-0.02
		(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age								
Age	0.04	0.04	0.01	0.02	0.03	0.04	0.04	0.04
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age Squared	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations (in millions)	90.7	85.6	5.0	6.8	12.8	17.7	23.0	25.3
CZ × Year FE	✓	✓						
CZ FE			✓	✓	✓	✓	✓	✓

Note: Robust standard errors in parenthesis, clustered by commuting zone. The table reports the OLS estimates of a linear probability model relating labor force participation to a set of observable characteristics. The sample used in the first column includes all women ages 25-55 across all census years. The one in the second column includes census years between 1970 and 2015. The sample in the rest of the columns are for women in the same age bracket but conditional on census year.

Table 2: Oaxaca-Blinder Decomposition of the Change in Female Labor Force Participation Based on Supply Side Determinants

	Census Years					
	1960-2015 (1)	1970-2015 (2)	1960-1990 (3)	1970-1990 (4)	1990-2000 (5)	2000-2015 (6)
Δ Female LFP Rate in pp	33.3	26.2	10.4	3.3	16.4	6.5
Panel (a) Supply Composition Effect (in percentage points)						
Overall Composition	14.8	18.6	5.9	6.8	6.2	7.6
	(0.9)	(0.8)	(0.7)	(0.5)	(0.3)	(0.4)
Education	12.2	11.3	6.8	5.8	3.6	4.9
	(0.8)	(0.8)	(0.7)	(0.6)	(0.2)	(0.3)
Marital Status	2.3	2.9	-0.7	0.0	1.5	1.5
	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)
Fertility	-0.1	4.6	-0.3	1.2	1.0	1.4
	(0.1)	(0.4)	(0.1)	(0.2)	(0.1)	(0.1)
Composition per Decade	2.70	4.13	1.98	3.41	6.19	5.09
Panel (b) Share of Δ Female LFP Rate Accounted (x 100)						
Overall Composition	44.5 %	71.0 %	57.1 %	209.9 %	37.7 %	117.3 %
	(2.6)	(3.1)	(7.1)	(16.2)	(1.5)	(5.7)
Education	36.7 %	43.3 %	65.0 %	178.2 %	21.9 %	76.0 %
	(2.4)	(3.0)	(6.8)	(19.4)	(1.5)	(4.7)
Marital Status	7.0 %	11.0 %	-6.4 %	-1.2 %	9.2 %	23.4 %
	(0.5)	(0.7)	(1.2)	(2.5)	(0.5)	(1.5)
Fertility	-0.4 %	17.5 %	-3.2 %	37.9 %	5.9 %	22.0 %
	(0.2)	(1.5)	(1.0)	(5.5)	(0.7)	(2.1)

Note: Robust standard errors in parenthesis, clustered by commuting zone. The table reports the estimates of the Oaxaca-Blinder decomposition described by Equation 2. Our preferred measure of fertility, the number of own children below and above 5 in the household, was unavailable in 1960. All the results that include this year use the alternative measure: an indicator variable equal to one if the woman ever had a child.

Table 3: Effect of Changes in Female Labor Demand on FLFP Growth

	Δ Demand		Δ Occupational Composition		Δ Sectoral Composition		Δ Occupational and Sectoral Composition
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Δ Female Labor Demand ($\Delta \log L^{f}_{z,t}$)	0.033 (0.004)	0.031 (0.004)					
Predicted Δ Female Labor Demand by Occ. Composition ($\Delta \log B^{occ}_{z,t}$)			0.015 (0.003)	0.014 (0.003)			0.013 (0.003)
Predicted Δ Female Labor Demand by Sec. Composition ($\Delta \log B^{sec}_{z,t}$)					0.014 (0.007)	0.010 (0.006)	0.004 (0.005)
Observations	8,289	8,289	8,289	8,289	8,289	8,289	8,289
CZ FE	✓	✓	✓	✓	✓	✓	✓
Year × State FE	✓	✓	✓	✓	✓	✓	✓
Supply-Side Controls		✓		✓		✓	✓

Note: Robust standard errors in parenthesis, clustered by commuting zone. The Table reports the results of estimating Equation 3 for seven different specifications, depending on whether we include fixed effects, supply-side controls, or the predictive measures for changes in female labor demand.

Table 4: Decomposition of the Change in Female Labor Force Participation Based on Demand Side Determinants

	Census Years					
	1960-2015 (1)	1970-2015 (2)	1960-1990 (3)	1970-1990 (4)	1990-2000 (5)	2000-2015 (6)
Δ Female LFP Rate in pp	33.3	26.2	10.4	3.3	16.4	6.5
Panel (a) Demand Effect (in percentage points)						
Δ *Demand by Occ. Composition*	6.0	3.1	4.4	1.5	2.3	-0.8
	(0.9)	(0.5)	(0.7)	(0.2)	(0.4)	(0.2)
Δ *Demand by Sec. Composition*	3.1	2.4	1.7	1.0	0.9	0.5
	(3.7)	(2.9)	(2.0)	(1.2)	(1.0)	(0.6)
Δ *Demand by Occ. + Sec. Composition*	9.0	5.5	6.1	2.6	3.2	-0.3
	(3.7)	(2.9)	(2.1)	(1.2)	(1.1)	(0.7)
Δ Demand by Occ. + Sec. Composition per Decade	1.63	1.22	2.06	1.3	3.2	-0.2
Panel (b) Share of Δ Female LFP Rate Accounted (x 100)						
Δ *Demand by Occ. Composition*	17.9 %	11.7 %	42.7 %	46.8 %	14.2 %	-12.5 %
	(2.7)	(1.7)	(6.6)	(6.9)	(2.5)	(3.5)
Δ *Demand by Sec. Composition*	9.2 %	9.2 %	16.1 %	31.3 %	5.3 %	7.9 %
	(11.0)	(11.1)	(19.2)	(37.6)	(6.4)	(9.4)
Δ *Demand by Occ. + Sec. Composition*	27.1 %	20.9 %	58.8 %	78.1 %	19.5 %	-4.6 %
	(11.1)	(11.0)	(19.8)	(37.3)	(6.7)	(10.1)

Note: Standard errors in parenthesis, calculated using clustered bootstrap with 1,000 repetitions, clustered by commuting zone. The table reports the predictive increase in the FLFP rate coming from changes in the composition of labor demand. The predictions are generated by multiplying the estimated semi-elasticities associated with $\Delta \log B^{occ}_{z,t}$ and $\Delta \log B^{sec}_{z,t}$ in column 7 of Table 3, by their respective values. We then compute a population-weighted average of those predictions across CZs for the sub-periods of interest.

References

Aaronson, D., Dehejia, R., Jordan, A., Pop-Eleches, C., Samii, C. and Schulze, K. (2021). The Effect of Fertility on Mothers' Labor Supply over the Last Two Centuries. *The Economic Journal* 131: 1–32, doi:10.1093/ej/ueaa100.

Acemoglu, D. (2002). Technical Change, Inequality, and the Labor Market. *Journal of Economic Literature* 40(1): 7–72.

Acemoglu, D. and Autor, D. (2011). Skills, Tasks and Technologies: Implications for Employment and Earnings. In Ashenfelter, O. and Card, D. (eds), *Handbook of Labor Economics*. Elsevier, Handbook of Labor Economics *4*, chap. 12, 1043–1171, doi:10.1016/S0169-7218(11)02410-5.

Acemoglu, D. and Restrepo, P. (2019). Automation and New Tasks: How Technology Displaces and Reinstates Labor. *Journal of Economic Perspectives* 33: 3–30, doi:10.1257/jep.33.2.3.

Acemoglu, D. and Restrepo, P. (2020). Robots and Jobs: Evidence from US Labor Markets. *Journal of Political Economy* 128: 2188–2244, doi:10.1086/705716.

Adda, J., Dustmann, C. and Stevens, K. (2017). The Career Costs of Children. *Journal of Political Economy* 125: 293–337, doi:10.1086/690952.

Agüero, J. M. and Marks, M. S. (2008). Motherhood and Female Labor Force Participation: Evidence from Infertility Shocks. *American Economic Review* 98: 500–504, doi:10.1257/aer.98.2.500.

Agüero, J. M. and Marks, M. S. (2011). Motherhood and Female Labor Supply in the Developing World. *Journal of Human Resources* 46: 800–826, doi:10.3368/jhr.46.4.800.

Aguilar-Gomez, S., Arceo-Gomez, E. and Cruz Toledo, E. De la (2019). Inside the Black Box of Child Penalties. *SSRN Electronic Journal* doi:10.2139/ssrn.3497089.

Aguirre, E. (2019). Do changes in divorce legislation have an impact on divorce rates? The case of unilateral divorce in Mexico. *Latin American Economic Review* 28: 9, doi:10.1186/s40503-019-0071-7.

Akbulut, R. (2011). Sectoral Changes and the Increase in Wome's Labor Force Participation. *Macroeconomic Dynamics* 15: 240–264.

Akerlof, G. A. and Kranton, R. E. (2000). Economics and identity. *Quarterly Journal of Economics* 115, doi:10.1162/003355300554881.

Albanesi, S. and Olivetti, C. (2016). Gender Roles and Medical Progress. *Journal of Political Economy* 124: 650–695, doi:10.1086/686035.

Alesina, A., Giuliano, P. and Nunn, N. (2013). On the Origins of Gender Roles: Women and the Plough *. *The Quarterly Journal of Economics* 128: 469–530, doi:10.1093/qje/qjt005.

Altonji, J. G., Kahn, L. B. and Speer, J. D. (2014). Trends in Earnings Differentials across College Majors and the Changing Task Composition of Jobs. *American Economic Review* 104: 387–393, doi:10.1257/aer.104.5.387.

Atkin, D. (2009). Working for the Future: Female Factory Work and Child Health in Mexico. *Unpublished Manuscript* .

Atkin, D. (2016). Endogenous Skill Acquisition and Export Manufacturing in Mexico. *American Economic Review* 106: 2046–2085, doi:10.1257/aer.20120901.

Attanasio, O., Low, H. and Sánchez-Marcos, V. (2005). Female Labor Supply as Insurance against Idiosyncratic Risk. *Journal of the European Economic Association* 3: 755–764, doi:10.1162/jeea.2005.3.2-3.755.

Attanasio, O., Low, H. and Sánchez-Marcos, V. (2008). Explaining Changes in Female Labor Supply in a Life-Cycle Model. *American Economic Review* 98: 1517–1552, doi:10.1257/aer.98.4.1517.

Autor, D., Dorn, D. and Hanson, G. H. (2016). The China Shock: Learning from Labor-Market Adjustment to Large Changes in Trade. *Annual Review of Economics* 8: 205–240, doi:10.1146/annurev-economics-080315-015041.

Autor, D. H. and Dorn, D. (2013). The Growth of Low-Skill Service Jobs and the Polarization of the US Labor Market. *American Economic Review* 103: 1553–1597, doi:10.1257/aer.103.5.1553.

Autor, D. H., Katz, L. F. and Kearney, M. S. (2006). The Polarization of the U.S. Labor Market. *American Economic Review* 96: 189–194, doi:10.1257/000282806777212620.

Autor, D. H., Levy, F. and Murnane, R. J. (2003). The Skill Content of Recent Technological Change: An Empirical Exploration. *The Quarterly Journal of Economics* 118: 1279–1333, doi:10.1162/003355303322552801.

Bailey, M. J. (2006). More Power to the Pill: The Impact of Contraceptive Freedom on Women's Life Cycle Labor Supply*. *Quarterly Journal of Economics* 121: 289–320, doi:10.1162/qjec.2006.121.1.289.

Baker, M. J. and Jacobsen, J. P. (2007). Marriage, Specialization, and the Gender Division of Labor. *Journal of Labor Economics* 25: 763–793, doi:10.1086/522907.

Becker, G. S. (1994). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. March. University of Chicago Press, 3rd ed.

Becker, G. S., Hubbard, W. H. J. and Murphy, K. M. (2010). Explaining the Worldwide Boom in Higher Education of Women. *Journal of Human Capital* 4: 203–241, doi:10.1086/657914.

Bertrand, M. (2020). Gender in the Twenty-First Century. *AEA Papers and Proceedings* 110: 1–24, doi:10.1257/pandp.20201126.

Bertrand, M., Kamenica, E. and Pan, J. (2015). Gender Identity and Relative Income within Households *. *The Quarterly Journal of Economics* 130: 571–614, doi:10.1093/qje/qjv001.

Bhalotra, S., Fernandez, M. and Wang, F. (2022). The Distribution of the Gender Wage Gap: An Equilibrium Model. IZA DP No. 15258.

Binelli, C. and Rubio-Codina, M. (2013). The Returns to Private Education: Evidence from Mexico. *Economics of Education Review* 36: 198–215, doi:10.1016/j.econedurev.2013.06.004.

Blau, F. D. and Kahn, L. M. (2007). Changes in the Labor Supply Behavior of Married Women: 1980–2000. *Journal of Labor Economics* 25: 393–438, doi:10.1086/513416.

Blau, F. D. and Kahn, L. M. (2017). The Gender Wage Gap: Extent, Trends, and Explanations. *Journal of Economic Literature* 55: 789–865, doi:10.1257/jel.20160995.

Borusyak, K., Hull, P. and Jaravel, X. (2022). Quasi-Experimental Shift-Share Research Designs. *The Review of Economic Studies* 89: 181–213, doi:10.1093/restud/rdab030.

Browning, M. and Chiappori, P. A. (1998). Efficient Intra-Household Allocations: A General Characterization and Empirical Tests. *Econometrica* 66: 1241, doi:10.2307/2999616.

Busso, M. and Fonseca, D. (2015). Female Labor Force Participation in Latin America: Patterns and Explanations. Documento de Trabajo - CEDLAS No. 187.

Campos-Vazquez, R. M. and Lustig, N. (2020). Labour income inequality in Mexico: Puzzles solved and unsolved. *Journal of Economic and Social Measurement* 44: 203–219, doi:10.3233/JEM-200468.

Campos-Vazquez, R. M. and Velez-Grajales, R. (2014). Female Labour Supply and Intergenerational Preference Formation: Evidence for Mexico. *Oxford Development Studies* 42: 553–569, doi:10.1080/13600818.2014.900006.

Coen-Pirani, D., León, A. and Lugauer, S. (2010). The effect of household appliances on female labor force participation: Evidence from microdata. *Labour Economics* 17: 503–513, doi:10.1016/j.labeco.2009.04.008.

Coleman, M. T. and Pencavel, J. (1986). Angrist1998. *The American Economic Review* 88: 450–477.

Cordourier, G. and Gómez-Galvarriato, A. (2004). La Evolución de la Participación Laboral de las Mujeres en la Industria: una Visión de Largo Plazo. *Economía Mexicana. Nueva Época* XIII: 63–104.

Costa, D. L. (2000). From Mill Town to Board Room: The Rise of Women's Paid Labor. *Journal of Economic Perspectives* 14: 101–122.

Cruces, G. and Galiani, S. (2007). Fertility and female labor supply in Latin America: New causal evidence. *Labour Economics* 14: 565–573, doi:10.1016/j.labeco.2005.10.006.

De Cavalcanti, T. V. and Tavares, J. (2008). Assessing the "engines of liberation": Home appliances and female labor force participation. *Review of Economics and Statistics* 90: 81–88, doi:10.1162/rest.90.1.81.

Deshpande, A., Kabeer, N. and Ashwini Deshpande and Naila Kabeer (2019). '(In)Visibility, Care and Cultural Barriers: The Size and Shape of Women's Work in India'. Tech. Rep. 0, Ashoka University, Department of Economics.

Do, Q.-T., Levchenko, A. A. and Raddatz, C. (2016). Comparative advantage, international trade, and fertility. *Journal of Development Economics* 119: 48–66, doi:10.1016/j.jdeveco.2015.10.006.

Dorn, D. (2009). Essays on Inequality, Spatial Interaction, and the Demand for Skills. Ph.D. thesis, University of St. Gallen, Graduate School of Business Administration, Economics, Law and Social Sciences (HSG).

Eckstein, Z. and Osnat, L. (2011). Dynamic Female Labor Supply. *Econometrica* 79: 1675–1726, doi:10.3982/ECTA8803.

Eckstein, Z. and Wolpin, K. I. (1989). Dynamic Labour Force Participation of Married Women and Endogenous Work Experience. *The Review of Economic Studies* 56: 375–390, doi:10.2307/2297553.

Erten, B. and Ocampo, J. A. (2013). Super Cycles of Commodity Prices Since the Mid-Nineteenth Century. *World Development* 44: 14–30, doi:10.1016/j.worlddev.2012.11.013.

Faber, M. (2020). Robots and reshoring: Evidence from Mexican labor markets. *Journal of International Economics* 127: 103384, doi:10.1016/j.jinteco.2020.103384.

Fernández, R. (2013). Cultural Change as Learning: The Evolution of Female Labor Force Participation over a Century. *American Economic Review* 103: 472–500, doi:10.1257/aer.103.1.472.

Fernandez, R. and Fogli, A. (2009). Culture: An empirical investigation of beliefs, work, and fertility. *American Economic Journal: Macroeconomics* 1: 146–177, doi:10.1257/mac.1.1.146.

Fernandez, R., Fogli, A. and Olivetti, C. (2004). Mothers and Sons: Preference Formation and Female Labor Force Dynamics. *The Quarterly Journal of Economics* 119: 1249–1299, doi:10.1162/0033553042476224.

Fernández, R. and Wong, J. C. (2014). Divorce Risk, Wages and Working Wives: A Quantitative Life-Cycle Analysis of Female Labour Force Participation. *The Economic Journal* 124: 319–358, doi:10.1111/ecoj.12136.

Fogli, A. and Veldkamp, L. (2011). Nature or Nurture? Learning and the Geography of Female Labor Force Participation. *Econometrica* 79: 1103–1138, doi:10.3982/ECTA7767.

Fortin, N. (2015). Gender Role Attitudes and Women's Labor Market Participation: Opting-Out, AIDS, and the Persistent Appeal of Housewifery. *Annals of Economics and Statistics* : 379doi:10.15609/annaeconstat2009.117-118.379.

Fortin, N., Lemieux, T. and Firpo, S. (2011). Decomposition Methods in Economics. In Ashenfelter, O. and Card, D. (eds), *Handbook of Labor Economics*. Amsterdam: North-Holland, *4*, chap. 1, 1–102, doi:10.1016/S0169-7218(11)00407-2.

Fortin, N. M. (2005). Gender Role Attitudes and the Labour-market Outcomes of Women across OECD Countries. *Oxford Review of Economic Policy* 21: 416–438, doi:10.1093/oxrep/gri024.

Francesconi, M. (2002). A Joint Dynamic Model of Fertility and Work of Married Women. *Journal of Labor Economics* 20: 336–380, doi:10.1086/338220.

Gaddis, I. and Klasen, S. (2014). Economic Development, Structural Change, and Women's Labor Force Participation:. *Journal of Population Economics* 27: 639–681, doi:10.1007/s00148-013-0488-2.

Galor, O. and Weil, D. N. (1996). The Gender Gap, Fertility, and Growth. *American Economic Review* 86(3): 374–387, doi:10.2307/2118202.

Ganguli, I., Hausmann, R. and Viarengo, M. (2014). Closing the gender gap in education: What is the state of gaps in labour force participation for women, wives and mothers? *International Labour Review* 153: 173–207, doi:10.1111/j.1564-913X.2014.00007.x.

Gasparini, L. and Marchionni, M. (2015). Bridging gender gaps? The rise and deceleration of female labor force participation in Latin America: An overview. Tech. Rep. 185, Documento de Trabajo, La Plata.

Gasparini, L. and Marchionni, M. (2017). Deceleration in Female Labor Force Participation in Latin America. *Economía Journal, The Latin American and Caribbean Economic Association - LACEA* 18: 197–224, doi:10.2307/90017439.

Goldin, C. (1994). The U-Shaped Female Labor Force Function in Economic Development and Economic History. Tech. rep., National Bureau of Economic Research, Cambridge, MA, doi:10.3386/w4707.

Goldin, C. (2006). The Quiet Revolution That Transformed Women's Employment, Education, and Family. *American Economic Review* 96: 1–21, doi:10.1257/000282806777212350.

Goldin, C. and Katz, L. F. (2002). The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions. *Journal of Political Economy* 110: 730–770, doi:10.1086/340778.

Goldin, C. and Olivetti, C. (2013). Shocking labor supply: A reassessment of the role of world war II on women's labor supply. *American Economic Review* 103: 257–262, doi:10.1257/aer.103.3.257.

Goldsmith-Pinkham, P., Sorkin, I. and Swift, H. (2020). Bartik Instruments: What, When, Why, and How. *American Economic Review* 110: 2586–2624, doi:10.1257/aer.20181047.

Gómez, R. R. (1999). The modernisation of higher education in Mexico. *Higher Education Policy* 12: 53–67, doi:10.1016/S0952-8733(98)00031-2.

Goos, M., Manning, A. and Salomons, A. (2014). Explaining Job Polarization: Routine-Biased Technological Change and Offshoring. *American Economic Review* 104: 2509–2526, doi:10.1257/aer.104.8.2509.

Greenwood, J., Guner, N., Kocharkov, G. and Santos, C. (2016). Technology and the changing family: A unified model of marriage, divorce, educational attainment, and married female labor-force participation. *American Economic Journal: Macroeconomics* 8: 1–41, doi:10.1257/mac.20130156.

Greenwood, J., Guner, N. and Vandenbroucke, G. (2017). Family Economics Writ Large. *Journal of Economic Literature* 55: 1346–1434, doi:10.1257/jel.20161287.

Greenwood, J., Seshadri, A. and Yorukoglu, M. (2005). Engines of liberation. *Review of Economic Studies* 72: 109–133, doi:10.1111/0034-6527.00326.

Grossbard-Shechtman, S. A. and Neuman, S. (1988). Women's Labor Supply and Marital Choice. *Journal of Political Economy* 96: 1294–1302, doi:10.1086/261588.

Hanson, G. H. (1997). Increasing Returns, Trade and the Regional Structure of Wages. *The Economic Journal* 107: 113–133, doi:10.1111/1468-0297.00145.

Heath, R. and Jayachandran, S. (2018). The Causes and Consequences of Increased Female Education and Labor Force Participation in Developing Countries. In Averett, S. L., Argys, L. M. and Hoffman, S. D. (eds), *The Oxford Handbook of Women and the Economy*, no. 22766 in Working Paper Series. Oxford University Press, 344–368, doi:10.1093/oxfordhb/9780190628963.013.10.

Heckman, J. J., Lochner, L. and Taber, C. (1998). Explaining Rising Wage Inequality: Explorations with a Dynamic General Equilibrium Model of Labor Earnings with Heterogeneous Agents. *Review of Economic Dynamics* 1: 1–58, doi:10.1006/redy.1997.0008.

Herrendorf, B., Rogerson, R. and Valentinyi, A. (2014). Growth and Structural Transformation. In *Handbook of Economic Growth*, *2*, 855–941, doi:10.1016/B978-0-444-53540-5.00006-9.

Hoehn-Velasco, L. and Penglase, J. (2021). Does unilateral divorce impact women's labor supply? Evidence from Mexico. *Journal of Economic Behavior & Organization* 187: 315–347, doi:10.1016/j.jebo.2021.04.028.

INEGI (1990). Manual de Empadronador. XI Censo General de Población y Vivienda, 1990. Tech. rep., Instituto General de Estadística, Geografía e Informática.

Jacobsen, J. P. (1999). Labor force participation. *The Quarterly Review of Economics and Finance* 39: 597–610, doi:10.1016/S1062-9769(99)00020-4.

Jayachandran, S. (2021). Social Norms as a Barrier to Women's Employment in Developing Countries. *IMF Economic Review* 69: 576–595, doi:10.1057/s41308-021-00140-w.

Juhn, C., Ujhelyi, G. and Villegas-Sanchez, C. (2014). Men, women, and machines: How trade impacts gender inequality. *Journal of Development Economics* 106: 179–193, doi:10.1016/j.jdeveco.2013.09.009.

Katz, L. F. and Murphy, K. M. (1992). Changes in Relative Wages, 1963-1987: Supply and Demand Factors. *The Quarterly Journal of Economics* 107: 35–78, doi:10.2307/2118323.

Killingsworth, M. R. and Heckman, J. J. (1986). Female labor supply: A survey. In Ashenfelter, O. and Layard, R. (eds), *Handbook of Labor Economics*. Elsevier, Handbook of Labor Economics *1*, chap. 2, 103–204, doi:10.1016/S1573-4463(86)01005-2.

Klaauw, W. V. D. (1996). Female Labour Supply and Marital Status Decisions: A Life-Cycle Model. *The Review of Economic Studies* 63: 199, doi:10.2307/2297850.

Klasen, S., Le, T. T. N., Pieters, J. and Santos Silva, M. (2021). What Drives Female Labour Force Participation? Comparable Micro-level Evidence from Eight Developing and Emerging Economies. *The Journal of Development Studies* 57: 417–442, doi:10.1080/00220388.2020.1790533.

Klasen, S. and Pieters, J. (2015). What Explains the Stagnation of Female Labor Force Participation in Urban India? *The World Bank Economic Review* 29: 449–478, doi:10.1093/wber/lhv003.

Kleven, H., Landais, C. and Søgaard, J. E. (2019). Children and Gender Inequality: Evidence from Denmark. *American Economic Journal: Applied Economics* 11: 181–209, doi:10.1257/app.20180010.

Korenman, S. and Neumark, D. (1992). Marriage, Motherhood, and Wages. *The Journal of Human Resources* 27: 233.

Mammen, K. and Paxson, C. (2000). Women's Work and Economic Development. *Journal of Economic Perspectives* 14: 141–164, doi:10.1257/jep.14.4.141.

Marianne, B. (2011). New Perspectives on Gender. In Card, D. and Ashenfelter, O. (eds), *Handbook of Labor Economics*. Elsevier, Handbook of Labor Economics *4*, 1543–1590, doi:10.1016/S0169-7218(11)02415-4.

Meza González, L. (2001). Wage Inequality and the Gender Wage Gap in Mexico. *Economía Mexicana NUEVA ÉPOCA* X: 291–323.

Michaels, G., Natraj, A. and Van Reenen, J. (2014). Has ICT Polarized Skill Demand? Evidence from Eleven Countries over Twenty-Five Years. *The Review of Economics and Statistics* 96: 60–77, doi:10.1162/REST{_}a{_}00366.

Mincer, J. and Polachek, S. (1974). Family Investments in Human Capital: Earnings of Women. *Journal of Political Economy* 82: S76–S108, doi:10.1086/260293.

Minnesota Population Center (2020). Integrated Public Use Microdata Series, Integrated Public Use Microdata Series, International: Version 7.3 [dataset].

Moretti, E. (2011). Local labor markets. In Ashenfelter, O. and Card, D. (eds), *Handbook of Labor Economics*. Elsevier, Handbook of Labor Economics *4*, chap. 14, 1237–1313, doi:10.1016/S0169-7218(11)02412-9.

Ngai, L. R. and Petrongolo, B. (2017). Gender Gaps and the Rise of the Service Economy. *American Economic Journal: Macroeconomics* 9: 1–44, doi:10.1257/mac.20150253.

Nopo, H. (2012). *New Century, Old Disparities*. No. 11953 in World Bank Publications. The World Bank, doi:10.1596/978-0-8213-8686-6.

Oaxaca, R. and Ranson, M. (1994). On Discrimination and the Decomposition of Wage Differentials. *Journal of Econometrics* 61(1): pp. 5 – 21.

Olivetti, C. (2013). The Female Labor Force and Long-run Development: The American Experience in Comparative Perspective. Tech. rep., National Bureau of Economic Research, Cambridge, MA, doi:10.3386/w19131.

Olivetti, C. and Petrongolo, B. (2016). The Evolution of Gender Gaps in Industrialized Countries. *Annual Review of Economics* 8: 405–434, doi:10.1146/annurev-economics-080614-115329.

Ortiz-Ospina, E. and Tzvetkova, S. (2017). Working women: Key facts and trends in female labor force participation. Published online at OurWorldInData.org. Retrieved from: https://ourworldindata.org/female-labor-force-participation-key-facts.

Rendall, M. (2013). Structural Change in Developing Countries: Has it Decreased Gender Inequality? *World Development* 45: 1–16, doi:10.1016/j.worlddev.2012.10.005.

Rindfuss, R. R., Brewster, K. L., Andrew, K. and Kavee, A. L. (1996). Women, Work, and Children: Behavioral and Attitudinal Change in the United States. *Population and Development Review* 22: 457, doi:10.2307/2137716.

Sáenz, L. F. (2022). Time-varying capital intensities and the hump-shaped evolution of economic activity in manufacturing. *Journal of Macroeconomics* 73: 103429, doi:10.1016/j.jmacro.2022.103429.

Schultz, T. P. (1997). Chapter 8 Demand for children in low income countries. In *Handbook of Population and Family Economics*, *1*, 349–430, doi:10.1016/S1574-003X(97)80025-6.

Serrano, J., Gasparini, L., Marchionni, M. and Glüzmann, P. (2019). Economic Cycle and Deceleration of Female Labor Force Participation in Latin America. *Journal for Labour Market Research* 53: 13, doi:10.1186/s12651-019-0263-2.

Siminski, P. and Yetsenga, R. (2022). Specialization, Comparative Advantage, and the Sexual Division of Labor. *Journal of Labor Economics* 40: 851–887, doi:10.1086/718430.

Standing, G. (1999). Global Feminization Through Flexible Labor: A Theme Revisited. *World Development* 27: 583–602, doi:10.1016/S0305-750X(98)00151-X.

The World Bank (2012). *World Development Report 2012 - Gender Equality and Development*. No. 4391 in World Bank Publications. The World Bank.

The World Bank (2022). La Participacion Laboral de la Mujer en Mexico. Washington, D.C. Tech. rep., The World Bank.

Voena, A. (2015). Yours, Mine, and Ours: Do Divorce Laws Affect the Intertemporal Behavior of Married Couples? *American Economic Review* 105: 2295–2332, doi:10.1257/aer.20120234.

Yun, S.-M. (2005). A Simple Solution to the Identification Problem in Detailed Wage Decompositions. *Economic Inquiry* 43(4): 766–772.