ECONSTOR
Make Your Publications Visible.

A Service of
ZBW
Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Lopez-Acevedo, Gladys; Freije-Rodriguez, Samuel; Vergara Bahena, Mexico Alberto; Cardozo Medeiros, Diego

Working Paper

Changes in Female Employment in Mexico: Demographics, Economics, and Policies

IZA Discussion Papers, No. 13404

Provided in Cooperation with:
IZA – Institute of Labor Economics

Suggested Citation: Lopez-Acevedo, Gladys; Freije-Rodriguez, Samuel; Vergara Bahena, Mexico Alberto; Cardozo Medeiros, Diego (2020) : Changes in Female Employment in Mexico: Demographics, Economics, and Policies, IZA Discussion Papers, No. 13404, Institute of Labor Economics (IZA), Bonn

This Version is available at:
https://hdl.handle.net/10419/223846

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

WWW.ECONSTOR.EU

Mitglied der Leibniz-Gemeinschaft

I Z A Institute
of Labor Economics
Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 13404

Changes in Female Employment in Mexico: Demographics, Economics, and Policies

Gladys Lopez-Acevedo
Samuel Freije-Rodriguez
Mexico Alberto Vergara Bahena
Diego Cardozo Medeiros

JUNE 2020

I Z A Institute
of Labor Economics

Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 13404

Changes in Female Employment in Mexico: Demographics, Economics, and Policies

Gladys Lopez-Acevedo
World Bank and IZA

Samuel Freije-Rodriguez
World Bank

Mexico Alberto Vergara Bahena
World Bank

Diego Cardozo Medeiros
Chicago Booth School of Business

JUNE 2020

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Changes in Female Employment in Mexico: Demographics, Economics, and Policies*

The unemployment and labor force participation gender gaps narrowed in Mexico after the 2008 global economic crisis, when female labor force participation increased. This paper aims to understand female labor force participation growth and identify its main determinants. For that purpose, the paper estimates a probit model with data from the National Employment Survey of 2007 and 2017, when the unemployment rate returned to the pre-crisis level. Broadly, the results show that increasing labor force participation of women ages 36 to 65 sustained the growth of overall female labor force participation, women's educational attainment can offset any individual or household obstacle to women's employability, and childcare availability significantly supports mothers' employability.

JEL Classification: J21, J22, O54

Keywords: female labor force participation, Mexico, gender gap, female education, childcare services

Corresponding author:
Gladys Lopez-Acevedo
World Bank
1818 H Street, NW
Washington, DC 20433
USA

E-mail: gacevedo@worldbank.org

* This paper is a product of the Poverty and Equity Global Practice of the World Bank Group. We thank Carlos Rodriguez-Castelan, Gabriela Inchauste, Deeksha Kokas, Stuti Manchanda, and Matias Morales for their comments. All remaining errors are the responsibility of the authors. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

I. Introduction

The 2008 global financial crisis caused a severe 6.6 percent decrease in Mexico's GDP in 2009, the sharpest decline of any Latin American country (Villareal, 2010). Unemployment also increased significantly: after ranging around 3.6 percent since 2005, the unemployment rate rapidly increased to 5.7 percent in the second quarter of 2008. Despite an immediate but slight decrease in the following quarters, the unemployment rate took almost 10 years to return to pre-crisis levels. Surprisingly, however, the gender gap—measured as the difference between the male and female unemployment rates—closed to a 0.25 percentage point difference after the crisis, from a 0.61 percentage point difference in 2007.

The labor participation gender gap also narrowed as female labor force participation (FLFP) rates increased. Despite Mexico having a historically lower FLFP rate than Latin America (World Bank, 2020), the gender gap shortened from 39.3 to 34.7 percentage points from 2005 to 2017. Considering that FLFP in Mexico has grown at a slower pace than the region's average and labor market conditions deteriorated after the crisis (Villareal, 2010), the closing of the work gender gap after the economic downturn is puzzling, despite the economic recovery that followed.

Gender labor gaps convey great economic and social opportunity losses for women, their families, households, and countries in general (Ichauste G., Torres P. et Al., 2019). In Mexico, if working-age women were to participate in the labor market in the same proportion as male counterparts, the economic gain is estimated to be about 21-22 percent of GDP (Cuberes and Teignier, 2016; Cuberes and Teigner, 2018). This tremendous proportion, however, could have been even bigger decades ago.

Understanding the determinants of female employability in Mexico is important to advance gender equality and women's contribution to economic growth. Understanding what factors support women's labor market inclusion and how these change through time can point to policies that help women benefit from economic growth (Klasen and Pieters, 2015) and avoid economic crises from erasing gains.

This paper aims to explain the increase in female employment in Mexico and to identify the main determinants underpinning women's employability that allowed the narrowing of the gender gap in unemployment and labor participation. We take two approaches: to understand the demographic component, we decompose unemployment, gross employment, and labor force participation rates in 2005 compared to 2017 by age group and gender. Subsequently, we investigate the economic crisis and governmental policy implications on the probability of a woman being employed by estimating a probit model that considers individual and household characteristics, labor indicators as controls, and availability of childcare facilities as an explanatory variable.

We use data from the National Employment and Occupation Survey (ENOE), Census, and the National Childcare Facilities Directory for Working Mothers of the Social Development Ministry (SEDESOL) to estimate explanatory coefficients for 2007 and how they changed 10 years later. The Childcare Facilities for Working Mothers program (CFWM) granted a bimonthly cash transfer to mothers and children tutors without access to childcare facilities granted by their labor benefits. Eligible mothers were expected to work or study. We chose 2007 as the year to begin our study because it coincides with the program's first

implementation, and we select 2017 as the year to end our study because unemployment rates finally returned to pre-crisis levels that year.[1]

Our findings show that the increased participation of women aged 36 to 65 in the labor market explains the growth in female employment and labor force participation between 2007 and 2017. We also identify the main factors associated with women's employability in both 2007 and 2017: (i) having secondary and tertiary education, (ii) increased availability of childcare facilities, and (iii) higher wages in the services sector.

Most of these determinants even support female employability with a stronger effect after the crisis. Results show that wage rises in the services sector increased women's propensity to be employed by more than 18 percentage points in 2017. Access to childcare facilities helped increase the employment of women living in households with children aged 0 to 4 by 13.8 percentage points in 2007, and this impact doubled 10 years later. In 2017, a generalized positive effect was observed for the whole female population. In other words, childcare facilities more than compensate for the negative effect of child dependency rates. Further, a woman with a college or university degree can offset any negative individual or household characteristic effect on her employability.

This paper's main contribution is to study the determinants of female employment in Mexico from 2007 to 2017, a period marked by crisis and recovery. This paper also contributes to the literature by testing the extent of several substitution and income effects after a period of economic downturn and finds evidence of a long-term and increasing effect of childcare

[1] After this year, changes in the female labor force participation and unemployment rates have been marginal and lower than 0.2 percentage point for both 2018 and 2019.

services 10 years after the CFWM program implementation. Further, we highlight how changes in the population's demographic profiles, as the Mexican population ages, pose a new important area of study as growing elderly dependency rates may limit Mexican women's future employability.

The paper is organized as follows. Section II highlights salient features of the literature on determinants of female employment worldwide and in Mexico, and how our efforts contribute to this literature. Section III describes our gender and age group data decomposition for unemployment, labor force participation, and gross employment rates to explain the demographic changes accompanying the contraction of the gender gap. Section IV details our data sources and specifies our empirical strategy to estimate the probability of a woman being employed in our study period. Section V reports summary statistics for individual, household, and labor market variables, and presents our estimation results. Section VI concludes.

II. Academic Literature and Previous Studies

Most of the world's adult women work many hours a day, although most of their work is unpaid care and household labor (ILO, 2017). Unlike in Mexico, where FLFP has risen in recent decades, FLFP rates worldwide have been decreasing since the end of the 1990s[2] (Sher, 2014), contrary to the Millennium Development Goals. This section highlights salient

[2] Women's share of the global labor force has declined by more than 3 percentage points since 2000, from 50.8 to 47.8 percent in 2018 (World Bank, 2020). Although FLFP rates have increased in Europe, Africa, and Latin America and the Caribbean, the opposite has occurred in regions such as North America, East Asia, and South Asia.

features of the literature on the main FLFP determinants. Moreover, we emphasize where a gap exists in the literature and how this paper contributes to fill it.

Economic Development and Education Attainment

There is a strong relationship between economic growth, education, and labor market outcomes. Economic growth and education can significantly affect women's labor inclusion (Sinha, 1981). International comparisons illustrate that FLFP is high in both low-income and highly developed countries, while relatively low in middle-income countries, creating a "U-shaped" relationship between national income and female participation (Lincove, 2008).

Most authors explain this phenomenon by showing that during the early stages of industrialization, subsistence activities declined in many countries, a prime sector for women who perform agricultural work (Psacharpoulos and Tzannatos, 1989). Later in the process of economic development, the upward slope of FLFP is associated with women's entry to modern and white-collar jobs. As industrial and service sectors expand, female workers enter higher wage markets and substitute work at home for work outside the home.

The inclusion of women in the labor market during industrialization depends largely on the initial endowments of women´s human capital (Lincove, 2008). To what extent depends on the interaction of two competing dynamics: human capital raises earnings potential and increases the cost of not working, but higher pay for educated workers allows them to achieve target incomes faster and allocate more time to leisure.

These are well-known substitution and income effects. For a person not working, increasing wages reduces leisure demand, substituting it with increased labor supply. An increase in

non-labor income or other household members' wages, on the other hand, increases leisure and thus reduces labor supply. According to Psacharpoulos and Tzannatos (1989), Blau et al. (2010), and Ferber and Winkler (2010), empirical evidence suggests that female labor supply is usually more responsive to wages than to changes in non-labor income. However, these dynamics depend on each country's context.

For example, Klasen and Pieters (2015) estimate a probit model of FLFP to decompose the effect of supply and demand factors explaining the low and stagnated FLFP rate in urban India. Using cross-sectional surveys for five years, they found a strong negative income effect —due to increasing male income and education— that contributed to a withdrawal of women from the labor force. On the other hand, they argue that the substitution effect found has become weaker in the last years: women's education effect on FLFP, although positive, has been diluted by the erosion of positive selection into higher education and rising marriage market returns.

In any case, more educated women usually access to higher wages, which explains why educated women have higher involvement in the labor market than less or uneducated women. This reinforces the importance of education on FLFP (Lam and Duryea, 1999; Matas, Raymond, and Roig, 2010; Contreras, De Mello, and Puentes, 2011). Nevertheless, Mexico has experienced precarious wage growth over the last decades, yet FLFP has still grown. One explanation is that an incremental share of highly educated women is entering the labor market. In this paper, we contribute to the literature by testing the extent of the substitution effect after a period of economic downturn.

Parker and Skoufias (2004) and Parrado and Zenteno (2001) argue that recurrent recessions and adjustment policies in the 1980s, where traditional male occupations suffered most, dramatically changed households' survival strategies as more family members sought work to protect against labor instability. This led to a common income effect found after periods of economic downturn: the "added-worker effect".

The added-worker effect happens when more married women, regardless of their education, start working after husbands become unemployed in a crisis. This phenomenon was observed in Mexico after the national economic crisis in 1994, resulting in immediate large increases in FLFP rates (Parker and Skoufias, 2004; Parrado and Zenteno, 2001). There is no evidence on the duration of this added-worker effect in Mexico; the literature has focused on the immediate consequences of the 1994 economic crisis. Our study sheds some light on the long-term consequences of the added-worker effect after the 2008 financial crisis.

Traditional Gender Roles and Childcare

Gender roles are important when analyzing FLFP. For some women, having the primary role for household duties, including family or childcare responsibilities, prevents them from working outside the home (ILO, 2017). In many communities, traditional gender roles prevent women from working at all and are often the main factor for low FLFP.

The negative correlation between fertility and FLFP reflects, under traditional gender structures, the strain between mothering and work. In developed countries, a strong negative relationship between the two roles prevailed until the mid-1970s, but correlation became low afterwards (Engelhardt, Kökogel, and Prskawetz, 2004). Studies argue that this was due to greater availability of childcare, family policies (such as maternity leave), changing attitudes

to working mothers, and the growth of part-time jobs (Rindfuss and Brewster, 2000; Bernhard, 1993). Although the balance between mothering and employment is still negative in some developing countries, even as they experience strong economic growth (Contreras, De Mello, and Puentes, 2011), the same reasons can help explain the rise in FLFP rates in developing countries.

In Mexico, cultural structures seem to have a strong effect on FLFP. Marriage seems to discourage Mexican women from working outside the home (Anderson and Dimon, 1998; King, 2011). The composition of Mexican households is also relevant. In the many families with gender-asymmetric child-rearing responsibility, the presence of other adult females, close networks, or community support can substitute for childcare services and encourage women with young children to work (Gong and Van Soest, 2002). Household and community assistance increases the primary caregiver's, usually the mother, time availability to work; and if that assistance is removed, women are usually the first to stop working (Talamás, 2019).

Similarly, childcare services provide women the time, money, or both to work. Although the literature analyzing the effects of childcare services mainly focuses on developed countries (Gelbach, 2002; Baker, Gruber, and Millighan, 2008; Givord and Marbot, 2015; Bettendorf et al., 2015; Vuri, 2016; Kawabata,2015; Lee and Lee, 2014), a few cases provide evidence for the positive effects on female labor supply in developing countries (Mateo and Rodrigues-Chamussy, 2013; Martinez and Perticara, 2017). However, childcare expansion in developing countries can even increase household income and reduce poverty and inequality, depending on the population groups these programs target (Contreras et al, 2012).

In Mexico, the only two impact evaluations of childcare interventions, to our knowledge, find similar results. Seira et al. (2011) use surveys and data for seven Mexican states to show that mothers, especially those who were unemployed before signing up for government-provided childcare services, increased their labor participation and number of hours worked. Calderón (2014) looked at national data to find that the National Childcare Facilities for Working Mothers (NCFWM) program increases FLFP, but argues it only explains 23 percent of the total increase of FLFP in the period studied. We intend to fill that gap by presenting other determinants of FLFP.

Further, both papers evaluate the short-term impacts of governmental childcare services in 2007-2010, immediately after the NCFWM program's implementation and the 2008-2009 economic crisis. This study explores the relevance and long-term effects of childcare services 10 years later.

III. Decomposition of Labor Market Indicators

Mexico still has one of the lowest FLFP rates in Latin America at 43.6 percent in 2017 (Figure 1). Although FLFP in Mexico has increased significantly by about 10 percentage points since 1990, this number is still low compared to the average FLFP rate for Latin America, close to 53 percent.[3] Nevertheless, after the crisis, Mexican women swiftly entered the labor force, narrowing the labor participation gender gap. Figure 2 shows how the gap

[3] In Peru and Chile, for example, the FLFP rates increased 26.3 and 17.4 percentage points, respectively, during 1990-2017. Hence, their labor force participation gender gaps also reached lower levels: Peru reduced the gender FLFP gap from 30.43 to 14.8 percentage points, while the FLFP gap in Chile decreased from 40.5 to 23.3 percentage points (World Bank, 2020).

steadily shortened from 39.3 to 34.7 percentage points between the second quarters of 2005 and 2017.[4]

The 2008 global financial crisis also sharply increased Mexico's unemployment (Figure 3), yet the gender unemployment gap still closed. Before the crisis, some periods showed female unemployment rates close to one percentage point higher than male unemployment rates, but this gap closed after the crisis. Specifically, the gender unemployment rate gap between the second quarter of 2005 and the second quarter of 2008 averaged 0.53 percentage point, compared to 0.25 percentage point during and after the crisis (2008Q3 to 2016Q4).

Substantial changes across populations accompanied the evolution of unemployment and labor participation gaps between 2005 and 2017. A disaggregated demographic approach is therefore required to understand the context in which gender gaps narrowed. In this section, we carry out an age and gender group decomposition for three labor market indicators: unemployment, gross employment, and labor force participation rates.

Three different effects can explain changes in each of these indicators: (i) changes in the incidence of employment within each group, (ii) changes in the demographic composition among distinct groups, or (iii) the interaction between these two effects.

The equation describing the decomposition is:

$$x_{t+h} - x_t = \sum_k (x_{k,t+h} - x_{k,t}) n_{k,t} + \sum_k (n_{k,t+h} - n_{k,t}) x_{k,t} + \sum_k (n_{k,t+h} - n_{k,t}) (x_{k,t+h} - x_{k,t}) \tag{1}$$

[4] We start our analysis in 2005 because it is the first year of the National Employment and Occupation Survey (ENOE) data release. For FLFP estimations before that date, we used ILO's modeled estimations considering the national population above 15 years old.

We define x_t as the national unemployment rate, the gross employment rate, or the labor force participation rate in period t; $n_{k,t}$ represents the share of group k relative to the entire labor force (in the case of unemployment rates) or the entire working-age population (in the case of gross employment and participation rates). The first term on the right side represents the intra-group effect, which is the contribution to changes in x due to variations in employment within group k. The second term represents the inter-group effect; that is, contribution to changes in x caused by changes in the demographic composition across age and gender groups. The last term in the equation describes the interaction effect between the intra-group and inter-group effects.

Figure 4 displays the decomposition of the selected labor market indicators and illustrates the demographic changes after the crisis. We use the second quarter of each year to control for seasonality when estimating changes or for comparisons. Panel A in Figure 4 decomposes changes in Mexico's national unemployment rate between 2005 and 2017. The unemployment rates increased for the youngest segment of the population, including both males and females aged 18 to 45 years (light-gray bars). However, since the population's demographic composition changed due to a decline in the proportion of young people, these population groups contributed less to the overall change in the national unemployment rate (dark-gray bars).

Labor force participation differs notably by gender, as shown in Panel C in Figure 4. No changes in labor force participation (intra-group effects) stand out for any male age group, except the youngest; changes in demographic composition drive the changes in male national labor participation. Conversely, females in most age groups—except the 18-to-25 group—

sharply increased their labor participation rates between 2005 and 2017. However, the 26-to-36 age group shows a strong population effect that counters its increased labor participation.

Indeed, the group of women aged 36 to 65 contributed the most to the increase of the FLFP rate. The demographic component explains 29 percent of the total growth in the female labor participation rate. The intra-group effect of this group (changes in incidence of labor participation) accounts for 44 percent of the national female participation rate growth. These two components can help explain the labor participation gender gap contraction since together they account for 73 percent of the total FLFP increase.

The decomposition of changes in gross employment shows similar patterns as those we observe in labor force participation rates. Most of the variations in male employment are due to a demographic component, while changes in the female employment rate are due to both demographic (increased shared of adult women) and economic (increased labor force participation) factors.

Real wages persistently declined for all male groups and most females, with a starker fall for males (Figure 5). For both males and females, the 36-to-54 age group experienced greater declines; and for the oldest group of females (56-to-65), real wages stagnated but did not decline. Therefore, the economic forces driving the increase in FLFP cannot be wage considerations or a substitution effect. The increase in FLFP in Mexico after the protracted 2008 crisis is due to an important demographic component, but it also may be associated with the added-worker effect (income effect) or some other factors (addressed later in this paper).

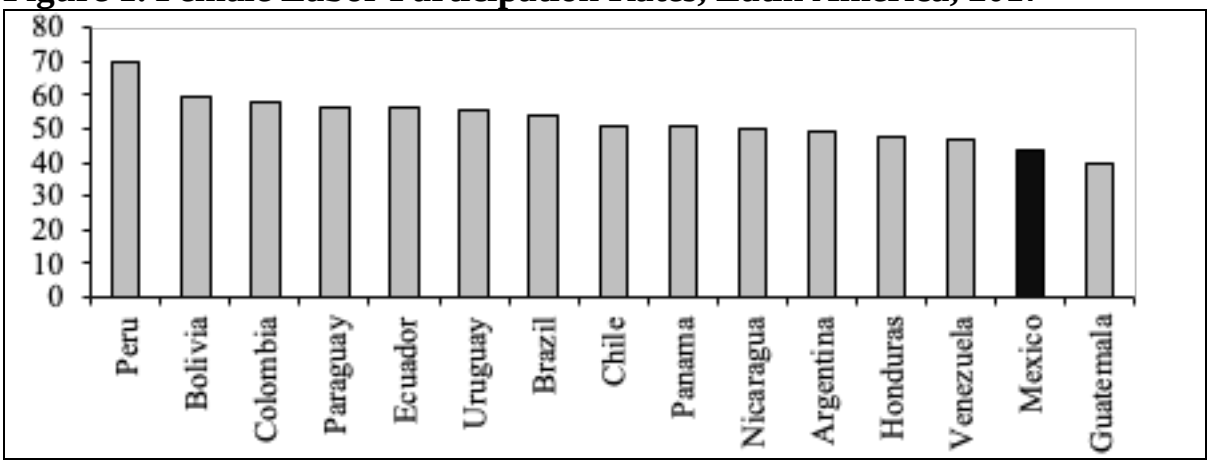
We tested the validity of the economic and demographic effects found in the decomposition that explains the increase in FLFP over the last decade. We predicted the propensity of women being employed by studying the marginal effects using a simple probit model (detailed information about the specification in Appendix 1).

Figure 6 shows the estimated propensity of females being employed according to their age and educational attainment, compared to a male with middle-school education in the 26-to-35 age group. We estimated coefficients and their respective confidence intervals for 2005 (light-gray bars) and 2017 (black bars). Only where confidence intervals do not overlap can we conclude statistical significance regarding a change in the propensity of women being employed between 2005 and 2017.

For males, no characteristic has a statistically significant effect on the change of employability over the period, similar to the previously explained disaggregated labor indicators. For women, on the other hand, the propensity to be employed does change throughout the years for the 36-to-65 age brackets with basic education. For these three groups of females, the propensity to be employed increased by approximately 5 percentage points.

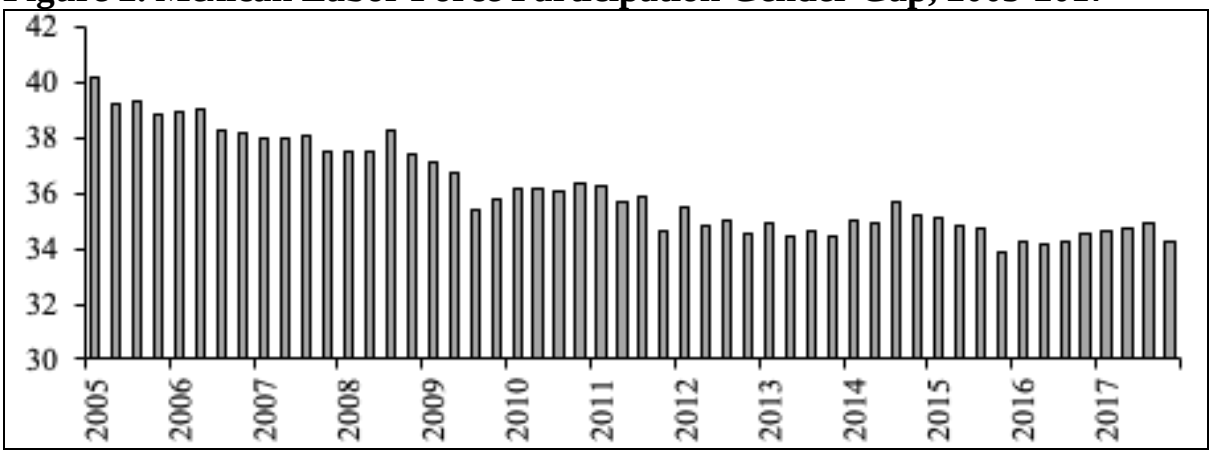
Results reinforce our previous findings that older women (36-to-65) account for the demographic component explaining the increase in female labor market participation and employment in the last decade. They also suggest that specific characteristics, such as education, explain these changes, despite stagnant or declining wages.

Figure 1. Female Labor Participation Rates, Latin America, 2017



Source: World Development Indicators, World Bank

Figure 2. Mexican Labor Force Participation Gender Gap, 2005-2017

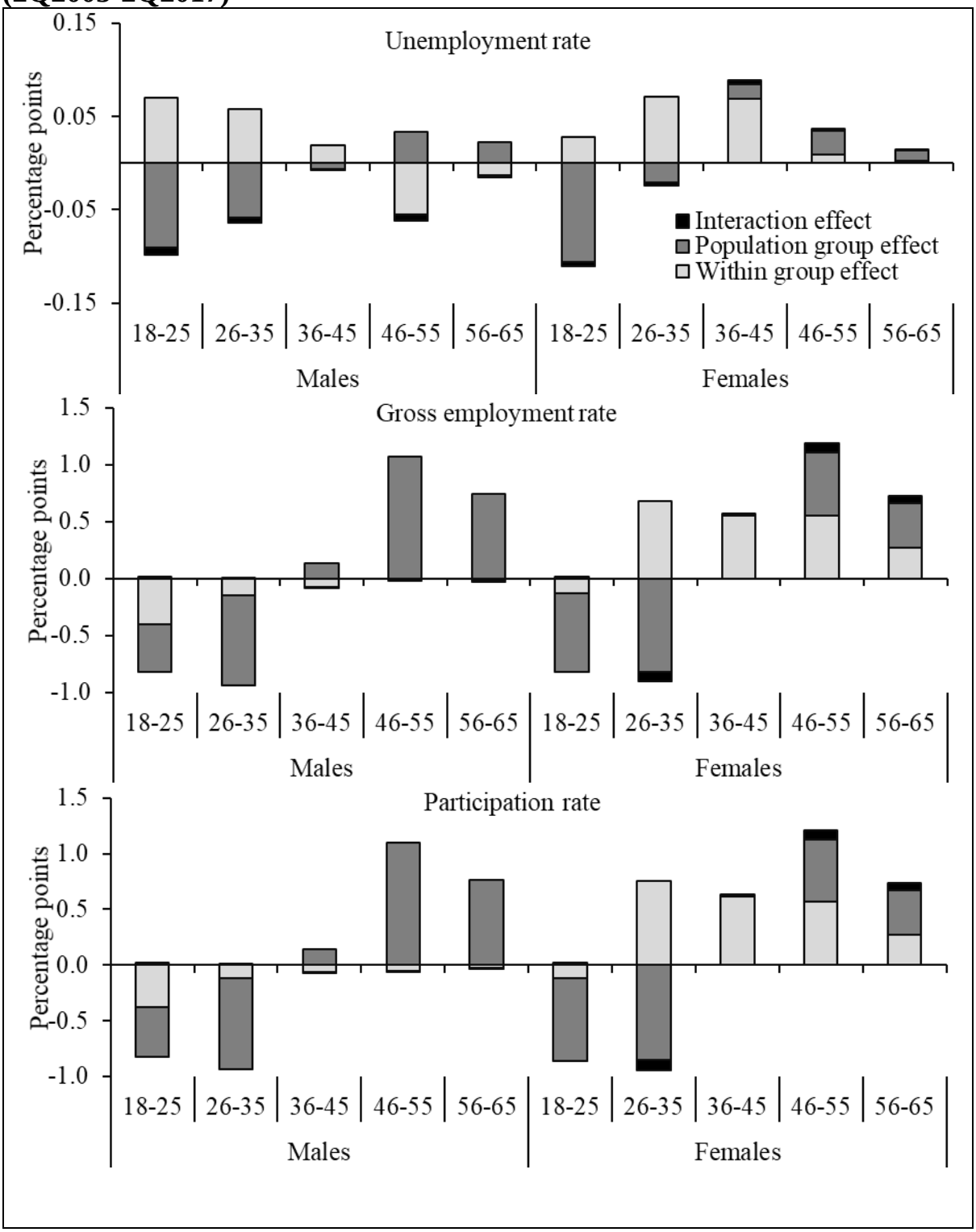


Source: Mexican Secretariat of Labor and Social Welfare (STPS).
Notes: Difference between male and female labor force participation rates.

Figure 3. Mexico Unemployment Rate, 2005-2017

Source: Secretariat of Labor and Social Welfare (STPS).
Notes: Seasonally adjusted.

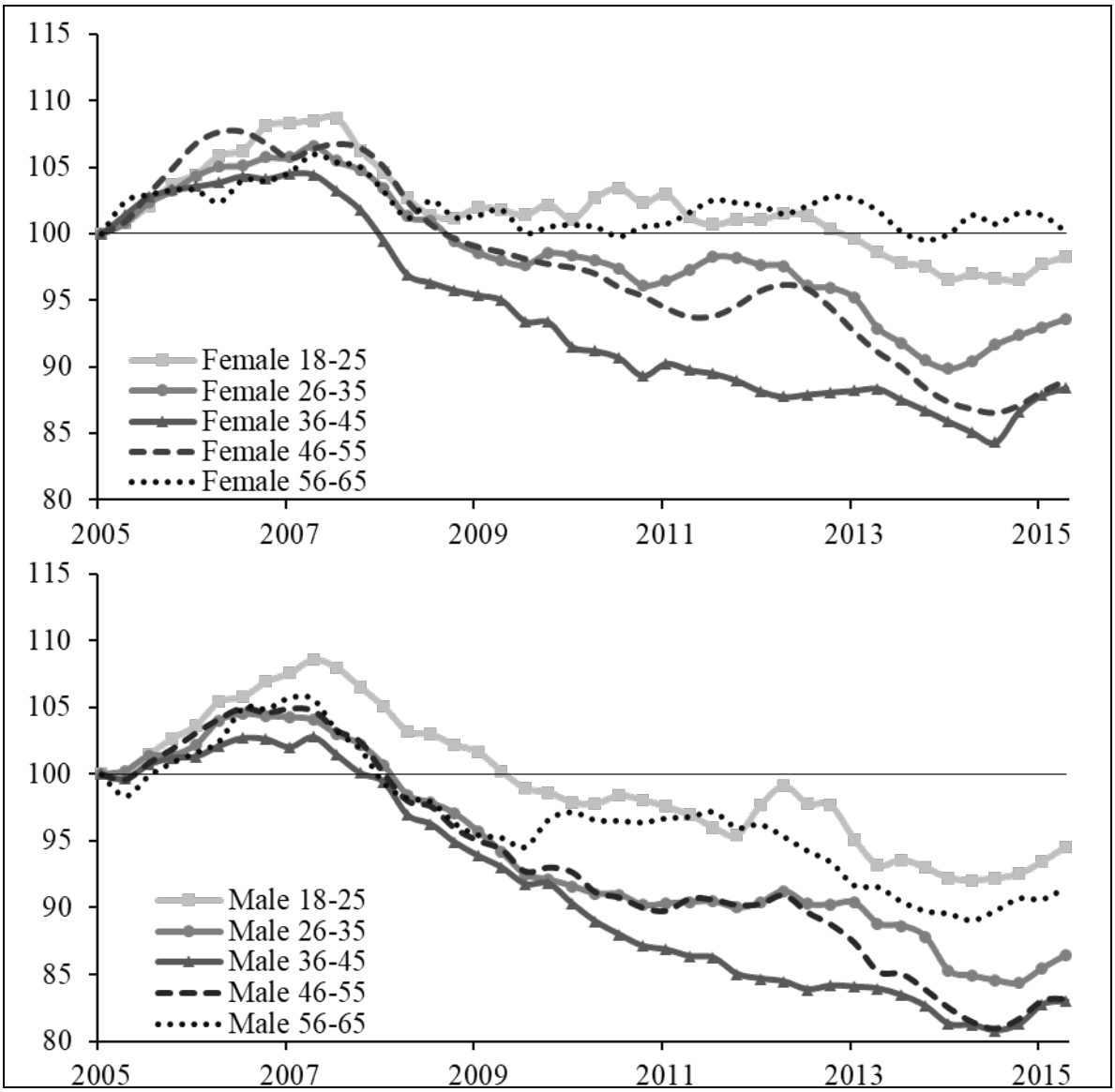
Figure 4. Decomposition of Changes in Mexican Labor Market Indicators (2Q2005-2Q2017)



Source: Own calculations using ENOE data.

Note: Within group effect: changes in incidence of employment within each group. Population group effect: changes in demographic composition among distinct groups. Interaction effect: interaction between the other two effects.

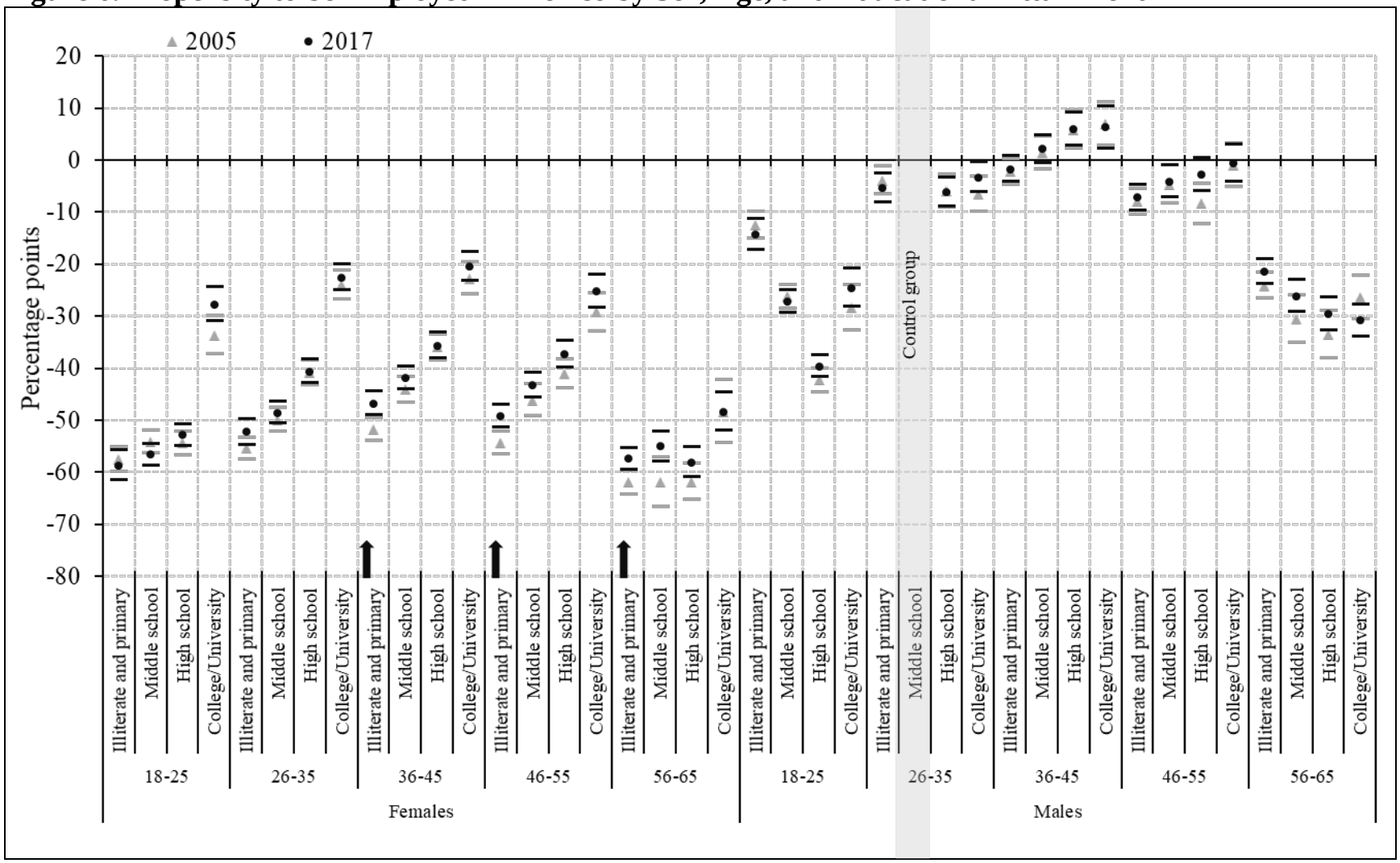
Figure 5. Real hourly wages index (2005Q1=100)



Source: Own calculations using data from ENOE.

Note: The average hourly wage by gender and age group was computed using quarterly ENOE data. These data were deflated using the national consumer price.

Figure 6. Propensity to be Employed in Mexico by Sex, Age, and Educational Attainment



Source: Own estimates using data from ENOE.

Note: The horizontal lines correspond to confidence intervals. The arrows show those cases where the 95% confidence intervals for 2017 and 2005 regression coefficients do not overlap.

IV. Methodology and Data

The previous sections explained the demographic component of women's increased labor market participation. Now we explore individual and household characteristics and labor market indicators to estimate a model to identify the main determinants of the increase in women's employment. We follow Klasen and Pieters' (2015) approach –mentioned in Section II– estimating a probit model to decompose marginal contributions of different covariates to women's propensity to be employed. Nevertheless, we pool the selected years, 2007 and 2017, in the same regression rather than estimating a model for each year separately. We also include a new variable for Mexico's context—namely "childcare facilities"—in consideration that in 2007 the Mexican government initiated its National Program of Childcare Services for Working Mothers (CFWM) that operated throughout the decade. We also included lagged labor market indicators to control for possible endogeneity.

Data

We use Mexico's National Employment and Occupation Survey (ENOE), a quarterly household-level rotating panel for which each individual is interviewed for five consecutive periods.[5] The ENOE, Mexico's official labor force survey since 2005, provides representative information on labor market characteristics at the national, state, urban, and rural levels. It includes information for individuals aged 15 and above; however, we restrict our sample to women aged 18-to-65. Our analysis includes observations from 2007—when CFWM started operating and one year before

[5] For this paper, we do not use the ENOE panel data design since comparing the same population after 10 years is not feasible. As mentioned, each individual is surveyed for 15 months at the most, making it difficult to identify the before and after dynamics of the 2008 economic crisis.

the financial crisis—and 2017, when unemployment rates returned to pre-crisis levels. Again, we use the second quarter data to avoid seasonal effects.

ENOE questionnaires include broad thematic information, such as labor and socio-demographic characteristics of respondents, their current economic condition, type of work, industry, and earnings. The ENOE also includes information on the respondent's educational attainment. Based on questions regarding the number of school years and whether the respondent had concluded each grade, we constructed four categories of formal education: illiterate and primary, middle school, high school, and college/university.

Urban households are those in localities with more than 2,500 inhabitants. We computed household real income as the sum of all members' labor earnings, and then deflated these earnings using the official Mexican Consumer Price Index (INPC). The ENOE also provides the number of hours worked by each individual. We defined people working fewer than 35 hours per week as part-time workers. Also, we calculated average wages for different industries using the North American Industry Classification System (NAICS).

We built a "childcare facilities availability" variable using data from population censuses and the national childcare facilities directories. This variable is defined as the number of childcare facilities per 1,000 people in each municipality. First, we used the National Childcare Facilities Directory for Working Mothers of the Social Development Ministry (SEDESOL)—the largest childcare provider in Mexico—to calculate the number of public childcare facilities in each municipality.

We used the December 2008 and December 2016 directories as they provide the closest data available to 2007 and 2017, respectively. Second, we use the Population and Housing Censuses to calculate each municipality's population size. We use the Census data instead of the ENOE since

the latter is not representative at the municipal level. Census data are available from 1990 to 2010, but only every five years, so we matched the 2005 and 2010 Census data with the 2007 and 2017 ENOE surveys, respectively.

Model

We are interested in explaining the growth in female employment during the last decade in Mexico. Hence, we model the probability of a woman being employed as:

$$E[P_i|\, X_i^I, X_i^H, X_i^M, Year17] = F\left(\beta_0 + \beta_1 Year17 + \sum_I (\beta^I X_i^I + \gamma^I X_i^I * Year17) + \sum_H (\beta^H X_i^H + \gamma^H X_i^H * Year17) + \sum_M (\beta^M X_i^M + \gamma^M X_i^M * Year17)\right) \quad (2)$$

Where F is the standard normal cumulative distribution function; and X_i^I, X_i^H, X_i^M are sets of explanatory variables at the individual, household, and labor market levels, respectively. Unlike Klasen and Pieters (2015), we do not estimate the model separately for each year but pool both years in the same regression, and we include a dummy variable for the year 2017. We also include an interaction term for each variable with the 2017 dummy to observe whether the explanatory variables have a different effect on women's employability in 2017 compared to 2007.

The set of individual characteristics starts with the age and age-squared variables. We then include the set of educational attainment dummies in which "primary education" and "being illiterate" represent the reference category. Concerning household variables, Klasen and Pieters (2015) argue that information on household head's highest educational degree can proxy for household wealth

or “permanent income beyond earnings”. Therefore, we include a dummy variable for female-headed households, and then we include the education level of the male household head as a substitute for a housing asset index.[6] Since less than 1 in 5 households are headed by a female in Mexico, this alternative income measure covers most of the sample.[7]

We also include a dummy variable that takes the value of “1” if there is at least one male household member with salaried employment, which proxies for “security of household income”. We add the natural logarithm of the household’s total monthly real income in Mexican pesos, which excludes the individual’s own earnings; this estimates an individual’s leisure cost, as we assume that the higher the earnings of other household members, the lower the need for women in the household to seek employment.

In addition, we include variables for household children and elderly dependency because these affect female employment in two ways: higher dependency discourages women from working outside the home because of the need to take care of children or older people; on the other hand, in low-income households, having a larger number of non-working dependents requires additional earnings, which could encourage women to participate in the labor market. We also include a measure of the supply of nearby childcare facilities—that is, the number of childcare facilities per 1,000 people in the municipality—and an interaction term with a “children between 0-4 years old” dependency variable. These indicators estimate whether having access to childcare services encourages women to work.

[6] Hence, we define six categories for this variable: i) being the household head; ii) not being the household head and living in a female-headed household (reference group); iii-vi) living in a male-headed household (four categories depending on the male household head educational attainment).

[7] Further, including female household head education would generate a collinearity problem with the household head dummy previously mentioned and would not allow us to differentiate effects from male or female household heads on their cohabitant females.

Finally, labor market conditions comprise: (i) the state's female and male unemployment rates (as an indicator of labor demand); (ii) state's average real hourly earnings of women and men in non-white-collar services and industrial production sectors, respectively[8]; and (iii) state's share of part-time employees to total employment (to measure access to jobs with flexible conditions). We estimated labor market condition variables using data from the corresponding previous year, that is 2006 or 2016, to control for potential endogeneity. Standard errors are clustered by sampling design substratum,[9] acknowledging a possible correlation between residuals and households' characteristics within the same substratum.

V. Results

Table 1 summarizes statistics for variables we used in the analysis and sets the stage to understand how the Mexican context changed after one decade. Looking at individual characteristics, we observe that female employment increased between 2007 and 2017. Similarly, substantial improvement in overall education occurred throughout this period: the share of illiterate women decreased 13 percentage points, while higher educational attainment levels increased. Also, the percentage of women being household heads grew slightly from 17 to 19 percent.

Male household heads' educational attainment increased, as well. Household real income decreased, while the share of households with at least one male salaried employee slightly increased during these 10 years. Household dependency rates for children 0-to-4 and 5-to-14 decreased almost 4 and 5 percentage points, respectively; while elderly dependency rates slightly

[8] The non-white-collar services sectors are traditionally associated with female employment, while the industrial production sector is associated with male employment.

[9] Substratum is the most detailed ENOE grouping of households in its sample design. Access to public services, the presence of certain goods, and population characteristics, such as education and income, are some variables considered for substratum grouping.

increased, suggesting population aging. However, Mexico's population and the number of childcare facilities grew at similar rates, since the average number of government childcare facilities per 1,000 people in each municipality remained almost stable (decreased less than 1 percent).

Concerning labor market characteristics, states' average unemployment rates for both males and females increased.[10] Surprisingly, the share of part-time employees did not increase from 2007 to 2017, despite structural labor reforms implemented in 2012 to promote labor market flexibility. Agriculture sector employment share declined by more than a percentage point, while the industrial, white-collar, and services sectors all expanded, with the latter—where 49 percent of all women work—experiencing the biggest increase.

Estimation results from our model to explain women's employability are presented in Table 2. These represent the average marginal effects of probit model (2) and show the change in the probability of a woman being employed with every unit change in the explanatory variables.

The year dummy of "2017" has a negative and significant coefficient, but its magnitude and sign should not be interpreted as a decrease in women's employment at the end of the decade; the effect varies for each population group due to the interaction terms. Therefore, no simple interpretation of this coefficient is possible. In any case, this variable captures unaccounted factors beyond the explanatory variables in our fixed-effects model.

[10] Labor market characteristics averages in Table 1 might not coincide with those observed for the national aggregates. We first computed the states' industry employment shares, part-time employment shares, unemployment rates, and average real hourly wages using the full sample of the ENOE and frequency weights. We then restricted the sample to women aged 18 to 65 and generated the labor market characteristics indicators. Small differences between the sample and population averages are explained by differences in people's distribution across states.

Regarding individual characteristics, as previously suggested, older women have a higher probability of being employed. Also, results show that educational attainment encouraged women's labor inclusion throughout the decade. College or university education has a substantial positive effect, increasing the employability of women by 35.4 and 28.3 percentage points in 2007 and 2017, respectively. Middle and high school education—compared to being illiterate or having only primary education— also raised employability by 8.3 and 15.4 percentage points, respectively, in 2007, but had a diminished effect of 3.1 and 5.8 percentage points, respectively, 10 years later. Despite the reduced effects of education after a decade, this is still indicative of a broad demand for more educated and skilled workers.

Regarding household characteristics, results in Table 2 show the differences in the propensity of being employed depending on the role of the individual within the household and the household head's educational attainment. As discussed before, the reference group includes those women living in a household headed by another female.[11] Being the household head increases the probability of being employed by 9.2 percentage points in any year. On the other hand, living in a household headed by a male reduces women's employability. Every additional educational level has a stronger negative effect on the probability of a woman being employed, ranging from -8.5 to -16.3 percentage points.

Household head's educational attainment proxies for household wealth or permanent income (Klasen and Pieters, 2015), and in Mexico, 83 percent of households were headed by a male in 2007 and 81 percent in 2017. Therefore, higher permanent household income may cause Mexican

[11] When the model specification is changed and considers female households' education, household education coefficients increase and remain statistically significant. However, coefficients also capture the effect of not being a household head, and no distinction can be made between female or male household's education. Therefore, we select the current specification to have a more approachable interpretation. All results are robust across model specifications.

women to delay or forego labor market entry. Male household head´s education has a persistent negative coefficient throughout the decade; however, it is smaller than the woman's educational attainment at all educational levels. That is, the education effect for women overcomes the permanent income effect of having a highly educated male heading the household. Women's education appears to be a major enabler for female labor participation.

Having at least one salaried male employee in the household shows a similar pattern: it decreased a woman's probability of working by 5.3 percentage points in 2007, although without an additional effect in 2017. At the beginning of the decade, the traditional division of work and an income effect associated with salaried males discouraged women from entering the labor market. Nonetheless, since male wages and household income dramatically decreased after the 2008 economic crisis, it is notable that the coefficients related to household income and having a salaried male in the household variables did not change 10 years later.

In other words, wages drop affecting household income did not impact women's employability any further after the crisis. An increase in the monthly household income has the same negative effect on the employability of women in both 2007 and 2017, even as the cost of leisure increased after the economic downturn. After the 1994 economic crisis in Mexico, women entered the labor market as the male unemployment rate increased, and household income was at stake (Parker and Skoufias, 2004; Parrado and Zenteno, 2001). In this paper, however, we do not find any statistically significant effect of male unemployment on women's likelihood to be employed any year. Therefore, we do not find evidence of a long-term added-worker effect.

This previous finding implies that households are a decision-making unit in which, under traditional gender roles, women are less attached to the workforce than their male counterparts. A

favorable economic environment, or higher parental educational attainment, raises family earnings and allows women in the household to wait longer for a better job (Marchionni and Gasparini, 2017; Klasen and Pieters, 2015). The implications could be adverse for women: staying out of the labor market can decrease their productivity, cost them valuable work experience, and reinforce traditional household gender roles that could later inhibit female work prospects. However, one possible scenario is that wealthier households or households with higher educated heads, support women while pursuing higher education instead of working, as previous studies in Mexico have found (Bentaouet and Székely, 2014; De Hoyos, Rogers, and Széquely, 2016).

Estimates show that living in an urban household is associated with an 11.1 percentage point higher propensity of being employed in both 2007 and 2017. The effect's magnitude did not change despite Mexico's sharp GDP contraction (the region's largest), with severe unemployment—especially in urban areas—and stark decreases in formal blue-collar jobs (Villareal, 2010).

Consistent with the literature, younger children have a large, negative effect on mothers' probability to work; children require more care, which is traditionally delegated to women. In 2007, younger infant dependency—having children between ages 0 and 4—decreased a woman's probability of working by 8.9 percentage points, and having children between ages 5 to 14 decreased a woman's probability of working by 1.9 percentage points. Ten years later, the magnitude of the negative effect grew 1 percentage point only for women in the second group, while remaining equally negative for mothers of youngest children.

Notably, having elderly dependents shows a positive effect of 3.6 percentage points on female employability in 2007 and 2017. Some studies imply that the presence of senior adults in households could encourage labor participation for women with young children as older adults

substitute for childcare services, especially in households with a female head (Tienda and Glass, 1985; King, 2011; Talamás, 2019). However, as stated before, childcare dependency rates dropped, and elderly dependency rates rose since 2007 (Table 1). Although not statistically significant, the coefficient of elderly dependency is negative in 2017.

The literature has shown that Mexican women traditionally bear informal eldercare provisions (Naranjo and Gameren, 2015). As the population pyramid shifts and the share of older people increases, traditional gender roles could cause more women to stop working and take care of older family members (Johnson and Lo Sasso, 2006; Ettner, 1995). The negative effect of having younger children on women's employability is counteracted by the expansion of childcare facilities, and probably by having older adults who can substitute for childcare, but this might not compensate for rising elderly dependency in the long run.

Government policies—specifically the provision of childcare facilities—can offset the effect of having children. Although not significant in 2007, a one-unit increase in the number of childcare facilities per 1,000 people in the municipality is associated with a 13.8 percentage point rise in a woman's propensity to be employed 10 years later. The positive effect is not exclusively for mothers; having more childcare facilities increases *all* women's likelihood to be employed. It is possible that other women within the household, or in mothers' close network, are also entering the labor market as they are less constrained to provide childcare.

Three reasons could explain the lack of a significant effect in 2007: (i) we are using the 2008 childcare directory, with much more childcare facilities, instead of the 2007 directory, (ii) we are evaluating CFWM's impact soon after its implementation, leaving no opportunity for positive

externalities to the general female population, and (iii) the program targeted mothers with children 0-4 years old.

Thus, accessibility to childcare facilities has a stronger benefit for women living in households with children aged under 4. Childcare facilities helped increase these women's employment by 13.8 percentage points in 2007, and this impact doubled in 2017. The size of this broader effect results from adding the marginal contributions of the childcare facilities indicator in 2017 and its interaction with the "children between 0-4 years old" dependency variable.

Regarding labor market characteristics: the small positive effect of part-time employment share in 2007 became null 10 years later. Literature associates the growth of part-time jobs with more women in the labor market due to flexible work schedules that ease their entrance (Rindfuss and Brewste, 2000; Bernhard, 1993). In Mexico—despite national labor reform in 2012 and a new legal basis for flexible contracts designed to create more jobs (Bank of Mexico, 2013)—part-time employment decreased by the end of the decade. This likely explains the small but negative coefficient in 2017.

Further, the industrial sector real hourly wages for men is only positively correlated with women's labor inclusion in 2007, while higher service sector wages for women have a strong positive effect on their employability in 2017. Increased service sector real hourly wages for women raised their employability by 18.6 percentage points in 2017. Despite declining or stagnating wages for all women (Table 1) after the crisis, it appears that they are still heavily drawn into sectors where they have traditionally worked.

Table 1: Basic Statistics

	2007				2017			
Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**Mean**	**Std. Dev.**	**Min.**	**Max.**
Dependent variable								
Employed	0.48	0.50	0.00	1.00	0.50	0.50	0.00	1.00
Individual characteristics								
Age	37.06	12.83	18.00	65.00	38.53	13.18	18.00	65.00
Age^2	1538	1021	324	4225	1658	1065	324	4225
Illiterate and primary	0.38	0.49	0.00	1.00	0.25	0.43	0.00	1.00
Middle school	0.25	0.43	0.00	1.00	0.31	0.46	0.00	1.00
High school	0.26	0.44	0.00	1.00	0.28	0.45	0.00	1.00
College/University	0.11	0.31	0.00	1.00	0.16	0.37	0.00	1.00
Household characteristics								
Household head	0.17	0.37	0.00	1.00	0.19	0.39	0.00	1.00
Household head education								
Illiterate and primary (male HH head)	0.34	0.47	0.00	1.00	0.24	0.43	0.00	1.00
Middle school (male HH head)	0.16	0.37	0.00	1.00	0.20	0.40	0.00	1.00
Highschool (male HH head)	0.12	0.32	0.00	1.00	0.13	0.34	0.00	1.00
College/University (male HH head)	0.11	0.31	0.00	1.00	0.12	0.32	0.00	1.00
Urban	0.85	0.36	0.00	1.00	0.86	0.35	0.00	1.00
Male salaried emp.	0.57	0.49	0.00	1.00	0.59	0.49	0.00	1.00
Log real income	9.06	0.87	3.23	13.76	8.89	0.79	3.55	13.02
Children 0-4	0.32	0.47	0.00	1.00	0.28	0.45	0.00	1.00
Children 5-14	0.52	0.50	0.00	1.00	0.47	0.50	0.00	1.00
Elderly	0.14	0.35	0.00	1.00	0.16	0.36	0.00	1.00
Childcare facilities per 1,000 population	0.119	0.08	0.00	0.59	0.118	0.08	0.00	0.79
Labor market characteristics								
State employment shares								
Agriculture	15.44	9.39	0.43	37.25	14.22	9.69	0.63	38.53
Industrial production	25.62	5.97	16.78	35.14	25.88	7.23	14.94	40.11
Services	48.83	5.14	38.01	61.69	49.34	5.96	38.22	64.83
White-collar services	10.11	2.91	5.86	20.93	10.56	2.92	6.40	21.59
Part-time employment share								
Part-time employment	26.79	5.68	13.47	36.83	26.31	5.12	17.32	36.55
Unemployment rates								
Female unemployment rate	3.32	1.34	1.19	6.01	3.58	1.25	1.54	7.41
Male unemployment rate	2.84	1.10	1.08	6.02	3.38	1.18	1.15	7.20
Average real hourly wages								
Female - agriculture	3.23	0.38	2.59	4.33	3.14	0.31	2.63	3.84
Female - industrial production	3.48	0.22	2.98	4.00	3.39	0.20	2.92	3.75
Female - services	3.75	0.12	3.55	3.99	3.58	0.12	3.35	3.88
Female - white-collar services	4.00	0.10	3.79	4.19	3.88	0.12	3.66	4.14
Male - agriculture	3.16	0.27	2.47	3.79	3.15	0.26	2.40	3.76
Male - industrial production	3.74	0.15	3.48	4.05	3.60	0.14	3.38	3.97
Male - services	3.82	0.11	3.62	4.08	3.62	0.12	3.37	3.88
Male - white-collar services	3.99	0.12	3.68	4.22	3.83	0.13	3.53	4.12
N	129,184				126,311			

Source: Own estimates using data from ENOE and Census.
Note: The results are sample summary statistics. All labor indicators were estimated before restricting our sample and do not reflect national estimates.

Table 2: Probit (Average Marginal Effects) 2007-2017

Pr (Employment)		Interaction with "Year 2017"
Year 2017	**-0.531*** **	
	(0.000)	
Individual characteristics		
Age	**0.042*** **	0.002
	(0.000)	(0.341)
Age^2	**-0.001*** **	-0.000
	(0.000)	(0.877)
Own education (Ref. Illiterate or primary ed.)		
Middle school	**0.083*** **	**-0.031*** **
	(0.000)	**(0.000)**
High school	**0.154*** **	**-0.058*** **
	(0.000)	**(0.000)**
College/University	**0.354*** **	**-0.071*** **
	(0.000)	**(0.000)**
Household characteristics		
Household head	**0.092*** **	-0.012
	(0.000)	(0.276)
Household head education (Ref. female-headed households.)		
Illiterate or primary school (male HH head)	**-0.085*** **	0.008
	(0.000)	(0.434)
Middle school (male HH head)	**-0.117*** **	**0.018* **
	(0.000)	**(0.075)**
High school (male HH head)	**-0.119*** **	0.018
	(0.000)	(0.113)
College/University (male HH head)	**-0.163*** **	0.014
	(0.000)	(0.280)
Urban	**0.111*** **	-0.002
	(0.000)	(0.895)
Male salaried emp.	**-0.053*** **	0.010
	(0.000)	(0.152)
Log real income	**-0.007** **	0.000
	(0.037)	(0.986)
Children 0-4	**-0.089*** **	0.002
	(0.000)	(0.844)
Children 5-14	**-0.019*** **	**-0.010* **
	(0.000)	**(0.064)**
Elderly	**0.036*** **	-0.013
	(0.000)	(0.109)
Childcare facilities	0.045	**0.138** **
	(0.213)	**(0.013)**
Children 0-4 * Childcare facilities	**0.138** **	0.031
	(0.011)	(0.682)
Labor market characteristics		
Part-time employment share		
Part-time employment	**0.002*** **	**-0.002** **
	(0.000)	**(0.019)**
Unemployment rates		
Female unemployment rate	**-0.007** **	-0.006
	(0.039)	(0.285)
Male unemployment rate	-0.006	0.002
	(0.147)	(0.702)
Average real hourly wages		
Female - services	0.011	**0.186*** **
	(0.769)	**(0.003)**
Male - industrial production	**0.078** **	-0.014
	(0.016)	(0.795)
N	179362	

Notes: The sample is restricted to females between 18 and 65 years old. P-values in parentheses, *** p<.01, ** p<.05, * p<.10.
Source: Own calculations using data from Census, ENOE and SEDESOL.

VI. Conclusions

A decade after 2007, improvement in several conditions has supported female inclusion in the Mexican labor market. Despite the 2008 economic crisis, the unemployment gender gap almost closed, and the labor force participation gender gap narrowed. Demographics, economic decisions, and government policies supported the change.

Analyzing our decomposition of labor market indicators, both an increased share of women aged 36 to 65 and higher labor participation rates among this group were the main contributors to the overall FLFP growth since 2005. Further, we estimated a probit model to identify the primary determinants of women's employability, in which we define a set of individual and household characteristics and labor market indicators as covariates. Our results show that increased schooling and returns to secondary and tertiary education, an increase in service sector wages, and having access to childcare facilities were the main determinants of women's employability, contributing to narrow labor gender gaps during our study period.

Demographic dynamics accompanying inversion of the population pyramid have an important role in explaining women's inclusion in the labor market. Women aged 15 to 34 experienced weaker gross employment rates due to the decline in the share of young people and higher labor force participation. However, rising employment rates for older cohorts of women combined with their increasing share of the population more than compensated for this at the national level: women aged 36 to 65 were responsible for the increase in FLFP between 2005 and 2017, as they represent 73 percent of national female participation rate growth during that period.

Economic household decisions also explain a large part of the contraction in the labor gender gap, with strong income effects manifesting. The existence of a male salaried employee in the

household—an indicator of household alternative income sources—decreases the likelihood of a woman working in both 2007 and 2017. With no additional effect after the crisis, but stagnant or decreasing wages for all women, a woman's probability of working is still conditioned by household-level decisions and traditional roles in which men are the main income providers, even as income instability is at stake.

Further, a higher male household-head educational level—a proxy for household wealth or permanent income (Klasen and Pieters, 2015)—delays women's entry into the labor market. Although women may be delaying or foregoing labor market entry due to the traditional division of work, it could also reflect that wealthier households support dependent women to focus on their education or other activities. In any case, household-level decisions once more condition women's probability of working.

However, female educational attainment seems to be the predominant factor supporting woman's employability and mitigating traditional gender roles. Although all levels of educational attainment lost momentum, highly educated women are less employment constrained regardless of household characteristics, including the household head's education level and sharing a household with a male salaried employee. According to our results, a woman with a college or university degree can offset any negative household characteristic effect on her likelihood to be employed, even when combining all constraining factors. This finding holds at both the beginning and the end of the decade we studied.

Some government policies—in specific, providing childcare facilities—also appear to encourage female labor market inclusion in Mexico, consistent with international experience and previous empirical work. On the other hand, despite legislative reforms to expand flexible work schemes,

we observe no changes in the share of women working part-time, and no sizeable change in its impact upon likelihood to work.

We find evidence of sustained and increasing effects of childcare schemes after their implementation. Their existence enhanced the employability of women and offset the adverse effects of child dependency. The positive effect is not exclusively for mothers: childcare services expansion increased *all* women's likelihood to be employed. Further, for women with children under age four, the positive effect of childcare availability is doubled at the end of the decade.

Data on the availability of private childcare facilities over the 10-year period are limited, hence we might be underestimating the benefits of childcare availability on women's employability in 2017. By mid-2017, the supply of private formal childcare institutions rose to 8,655 facilities from 3,012 in 2010 (INEGI, 2010; CONEVAL 2008; CONEVAL 2019), a number close to the 9,157 Government National Program of Childcare Services for Working Mothers institutions. Further investigation is needed related to the benefits of private childcare.

Elderly dependency rates had a positive effect on women's employability in 2007 and 2017, likely because older adults substitute for childcare (Talamás M., 2019). However, elderly dependency rates rose in 2017. It is possible that, under traditional gender roles, more women will abandon work outside the home to care for older family members. As the population ages, elderly substitution for childcare might not compensate for rising elderly dependency rates in the long term. It is crucial to better understand this relationship going forward to inform policies to address elderly dependency, quality of retirement lifestyles, and support for women's employability.

[12] The first National Statistical Directory of Economic Units available in Mexico is from 2010. To our knowledge, no detailed public information about private provision of childcare services in Mexico is available before that.

In any case, our results suggest that Mexico follows the development theory that economic shift away from agriculture to the non-white collar sector—the service sector in this context—supports female employment. Increasing real service sector average hourly wages increased the employability of women by 18.6 percentage points in 2017. This indicates that women's occupations in Mexico still concentrate in traditional service sectors; but this also implies that higher wages encourage women to enter labor markets as they substitute leisure or work at home for wage work (substitution effect).

Our study coincides with a long-term crisis between 2007 and 2017, whereby more women needed to join the labor market to sustain household income (Parker and Skoufias, 2004; Parrado and Zenteno, 2001), even as wages declined or stagnated. However, gender stereotypes are being counteracted thanks to higher female educational attainment and government policies, such as providing childcare facilities, which combine to support female employability. The increase in women's employability in Mexico represents progress in gender equality and women's empowerment.

To continue expanding female inclusion in labor markets, policy makers should be aware of the implications of the demographic shifts occurring in Mexico and expand policies that have succeeded, such as investment in childcare facilities and support for women's education. Given the results from our analysis, and the world economic shift to a service-oriented economy (ILO, 2017), governments seeking to promote female labor participation should prioritize providing women with access to quality education. Considering industry sophistication, combined with our results, increasing accessibility to tertiary education will be critical for women to attain formal, well paid, quality jobs.

References

Anderson, J., & Dimon, D. (1998). Married Women's Labor Force Participation in Developing Countries: The Case of Mexico. Estudios Económicos, 13:1 (25), 3-34.

Bank of Mexico. (2013). "Estimación del Efecto de la Reforma Laboral sobre el Crecimiento del PIB Potencial y el Empleo Formal. Extract from the Quarterly Inflation Report of October-December 2012". Banco de México. Available at https://www.banxico.org.mx/publicaciones-y-prensa/informes-trimestrales/recuadros/%7BABDF9F96-888A-025F-2D92-94F88D333FE8%7D.pdf

Baker M., Gruber J. & Milligan K. (2008). "Universal childcare, maternal labor supply, and family well-being." Journal of Political Economy 116:4. 709−745.

Bentauouet R., and Székely M. (2014). "Dropout in Upper Secondary Education in Mexico: Patterns, Consequences and Possible Causes." World Bank Policy Research Working Paper 7083.

Bernhard E. (1993). "Fertility and Unemployment". European Sociological Review. 9. 1:25-42

Bettendorf L., Egbert L., Jongen W., & Muller P. (2015) "Childcare subsidies and labour supply—Evidence from a Dutch reform." Labour Economics 3. 112−123.

Blau F., Ferber M. and Winkler A. 2010. "The Economics of Women, Men, and Work". Upper Saddle River, NJ, United States: Prentice-Hall/Pearson, 2010. (428)

Calderón G. (2014). "The Effects of Child Care Provision in Mexico". Banco de México. 2014(07). Available in https://www.banxico.org.mx/publications-and-press/banco-de-mexico-working-papers/%7B7D832060-28E6-FEB5-DB81-3F10617035C9%7D.pdf

CONEVAL. (2008). "Informe de Evaluación Especifica de Desempeño 2008: Programa de guarderías y estancias infantiles para apoyar madres trabajadoras". Available in https://www.coneval.org.mx/rw/resource/coneval/eval_mon/3855.pdf

CONEVAL. (2019). "Programa de estancias infantiles para apoyar a madres trabajadoras. Recuento de evidencia de las evaluaciones 007-2019". Consejo Nacional de Evaluación de la Política de Desarrollo Social. Available in https://www.coneval.org.mx/Evaluacion/RDPS/Documents/NOTA_ESTANCIAS_INFANTILES.pdf

Contreras D., Puentes E. & Bravo D. (2012). "Female labor supply and childcare supply in Chile". Departamento de Economia, Universidad de Chile.

Contreras D., Mello L., and Puentes E. (2011) “The determinants of labor force participation and employment in Chile”. Applied Economics, 43. 2765-2776.

Cuberes, D. y M. Teignier. (2016). “Aggregate Costs of Gender Gaps in the Labor Market: A Quantitative Estimate”. Journal of Human Capital 10 (1): 1–32.

Cuberes, D. y M. Teignier. (2018). “Macroeconomic costs of gender gaps in a model th entrepreneurship and household production: the case of Mexico”. World Bank Group. Available at http://documents.worldbank.org/curated/en/754451556803462951/Macroeconomic-Costs-of-Gender-Gaps-in-a-Model-With-Entrepreneurship-and-Household-Production-the-Case-of-Mexico

De Hoyos, R., Rogers, H. and Székely, M. (2016). “Out of School and Out of Work: A Diagnostic of Ninis in Latin America”. Policy Research Working Paper; No. 7548. World Bank, Available at https://openknowledge.worldbank.org/handle/10986/23723

Engelhardt H., Kökogel T. & Prskawetz A. (2004). “Fertility and women’s employment reconsidered: A macro-level time-series analysis for developed countries, 1960-2000”. Population Studies. 58. 1:109-120

Ettner, S. (1995). The Impact of "Parent Care" on Female Labor Supply Decisions. Demography, 32(1), 63-80. Retrieved May 20, 2020, DOI: 10.2307/2061897

Gameren, E., & Velandia Naranjo, D. (2015). “Working and Caring: The Simultaneous Decision Of Labor Force Participation And Informal Elderly And Child Support Act Ivities In Mexico”. Latin American journal of economics, 52(2), 117–148. https://doi.org/10.7764/LAJE.52.2.117

Gelbach J. (2002). “Public schooling for young children and maternal labor supply.” American Economic Review 92:1. 307−322.

Givord, P., & Marbot C. (2015). “Does the cost of childcare affect female labor market participation? An evaluation of a French reform of childcare subsidies.” Labour Economics 36. 99−111.

Gong X. & Van Soest A. (2002). “Family Structure and Female Labor Supply”. The Journal of Human Resources. 37. 1:163-191

Ichauste G., Torres P. et Al. (2019). “Mexico Gender Assesment”. World Bank Group, Poverty and Equity Global Practice Group. Available in http://documents.worldbank.org/curated/en/377311556867098027/Mexico-Gender-Assessment

ILO, International Labor Organization. (2017). “Women, Gender and Work”. International Labor Office. Geneve.

INEGI. (2010). “Directorio Estadístico Nacional de Unidades Economicas 2010”. Available at https://en.www.inegi.org.mx/app/mapa/denue/

Johnson, R. W., & Lo Sasso, A. T. (2006). The Impact of Elder Care on Women’s Labor Supply. INQUIRY: The Journal of Health Care Organization, Provision, and Financing, 195–210. https://doi.org/10.5034/inquiryjrnl_43.3.195

Kawabata M. (2015). “Childcare access and employment: The case of women with preschool-aged children in Tokyo.” Review of urban & regional development studies. 26(1):40-56.

Klasen S. and Pieters J. 2015. “What Explains the Stagnation of Female Labor Force Participation in Urban India?”. The World Bank Economic Review. 29(3):449-478. DOI: 10.1093/wber/lhv003

King M. (2011). “Mexican Women and Work on Both Sides of the U.S.-Mexican Border”. The American Journal of Economics and Sociology. 70(3):615-638.

Lam D. and Duryea S. 1999. “Effects of Schooling on Fertility, Labor Supply, and Investments in Children, with Evidence from Brazil”. Journla of human Resources. 34(1):160-192

Lee G. & Lee S. (2014). “Childcare availability, fertility and female labor force participation in Japan”. Journal of The Japanese and International Economies. 32:71-85.

Lincove J. (2008). “Growth, Girls’ Education and Female Labor A Longitudinal Analysis”. The Journal of Developing Areas. 41. 2:45-68

Marchionni M. & Gasparini L. (2017). “Deceleration in Female Labor Force Participation in Latin America”. Economía. Brookings Institution Press. 18. 1:197-224

Martinez C. & Perticara M. (2017). “Childcare effects on maternal employment: Evidence from Chile”. Journal of Development Economics. 126:127-137.

Matas A., Raymond J. & Roig J. (2010). “Job accessibility and female employment probability: The cases of Barcelona and Madrid”. Urban Times. 47. 4:769-787

Mateo M. and Rodriguez-Chamussy. (2013). “Cashing in Education. Women, Childcare and Prosperity in Latin America and the Caribbean. Latin American Development Forum. Washington, DC: World Bank and Inter-American Development Bank. Available in https://openknowledge.worldbank.org/handle/10986/25082

Parker S. & Skoufias. (2004). “The Added Worker Effect over the Business Cycle: Evidence from Urban Mexico”. Applied Economic Letters. 11. 134:225-241

Parrado E. & Zenteno R. (2001). “Economic Restructuring. Financial crises, and Women’s Work in Mexico”. Social Problems. 48. 4:454:477.

Psacharpoulos G. & Tzannatos Z. (1989). “Female Labor Force Participation: An International Perspective”. The World Bank Research Observer. The Oxford University Press. 4. 2:187-201

Rindfuss R. and Brewster K. (2000). “Fertility and Women’s Employment in Industrialized Nations”, Anuual Review of Sociology. 16(26):271-96, DOI: 10.1146/annurev.soc.26.1.271

Seira E., et Al. (2011). “Evaluación de Impacto del Programa Estancias Infantiles para apoyar Madres Trabajadoras. Informe Final de Evaluación de Impacto”. Instituto Nacional de Salud Pública y Centro de Investigación n Evaluación y Encuestas (CEEI). Available at https://www.dgtic.sedesol.gob.mx/work/models/SEDESOL/Resource/2342/1/images/Evaluacion_impacto_PEI/Inf_Final_PEI.pdf

Sinha J. (1981). “Dynamics of Female Participation in Economic Activity”. Proceedings of the world Population Conference 1967. 4. 336-337

Talamás M. (2019). “Grandmothers and the Gender Gap in the Mexican Labor Market”. Working Paper. Northwestern University. Available in https://cpb-us-e1.wpmucdn.com/sites.northwestern.edu/dist/3/3530/files/2020/01/2020.01.14-Grandmothers-and-the-Gender-Gap-Talamas-4.pdf

Tienda, M., & Glass, J. (1985). “Household Structure and Labor Force Participation of Black, Hispanic, and White Mothers. Demography”, 22(3):381-394. DOI: 10.2307/2061067

Verick Sher. (2014). “Female labor force participation and development”. IZA World of Labor.

Villareal A. (2010). “The Mexican Economy After the Global Financial Crisis”. Congressional Research Service. R41402. 1-21

Vuri D. (2016). “Do childcare policies increase maternal employment?”. IZA World of Labor. University of Rome for Tergata. 241

World Bank. (2020). “Labor force participation rate, female (% of female population ages 25+) (modeled ILO estimate)”. DataBank.

Appendix 1

We define the probit model as follows:

$$E[P_i|\, Sex, Age, Educ]$$

$$= F\left(\beta_0 + \beta_1 Sex + \beta_2 Age + \beta_3 Educ + \sum_J (\beta^J Sex * Age)\right.$$

$$\left. + \sum_K (\beta^K Sex * Educ) + \sum_L (\beta^L Educ * Age) + \sum_M (\beta^M Sex * Educ * Age)\right) \tag{3}$$

Where F is the standard normal cumulative distribution function; and Sex, Age, and Educ are sets of dummy variables. Age dummies include five categories: 18-25, 26-35, 36-45, 46-55, and 56-65 years old. Education dummies include four categories: Illiterate and primary, middle school, high school, and college/university. After estimating the model and computing the marginal effects, we predict the expected conditional probability of being employed given the sociodemographic characteristics, and relative to a reference group's average (26-35 years old males with middle school education).