Factors that Influence Women's Economic Participation in Mexico

Rafael Garduño-Rivera*

Abstract: This paper analyses women's economic participation (WEP) in Mexico. The hypothesis is that the regional disparities of women's participation are based on education, industrialization, urbanization and other non-observed factors. The question that this study addresses is: What regional factors influence women's participation and cause disparities in their participation across municipalities? Additionally, this paper measures the progress and the current state of WEP during the last decades, and the evolution of the differences across regions. The study tests an econometric model about the influence of various socio-economic factors on WEP. The results show that the main barriers to female participation are the lack of higher education and the absence of diverse work possibilities in industries such as manufacturing and hoteling. Other factors mentioned in the literature that also affect WEP are the number of children per household and poverty in each municipality. Therefore, these variables contribute to increasing WEP and should be the focus of any attempt to increase their labor force participation in the formal sector.

Keywords: gender economics, urbanization, demographic economics, geographic labor mobility, demographic trends.

Factores que influyen en la participación económica de las mujeres en México

Resumen: Este artículo analiza la participación económica de las mujeres (PEM) en México. La hipótesis es que las disparidades regionales de participación de las mujeres se basan en la educación, la industrialización, la urbanización y otros factores no observables. La pregunta que aborda este estudio es: ¿qué factores regionales influyen en la participación de las mujeres y causan disparidades en su participación a través de los municipios? Además, este artículo mide el progreso y el estado actual del PEM durante las últimas décadas, y la evolución de las diferencias entre las regiones. El artículo pone a prueba un modelo econométrico sobre la influencia de diversos factores socioeconómicos en la PEM. Los resultados mues-

*Rafael Garduño-Rivera, rafael.garduno@cide.edu, profesor-investigador, División de Economía-Sede Región Centro, CIDE. Aguascalientes, Ags. Mexico.

tran que los principales obstáculos para la participación de las mujeres son la falta de educación superior y de otras posibilidades de trabajo en industrias como la manufacturera y la hotelera. Otros factores mencionados en la literatura que también influyen en la PEM son el número de niños por hogar y la pobreza en cada municipio. Por lo tanto, estas variables contribuyen a incrementar la PEM y deben ser consideradas para aumentar su participación en la fuerza laboral en el sector formal.

Palabras clave: economía de género, urbanización, economía demográfica, movilidad geográfica de la mano de obra, tendencias demográficas.

JEL *Classification:* J1, J10, J16, J61, J11.

Introduction

Since the 1950's the social and economic importance of women has been increasingly accepted worldwide (Mehra, 1997). In a global context, studies such as Klasen and Lamanna (2009) show a general increase in the economic participation rates of women over the analyzed period. In Mexico the first claims on gender equality occurred in the 1970's, where several feminist groups were created to support the economic, educative and social aspects of the equality movement (Bartra, Fernández Poncela and Lau, 2002). The women's economic participation (WEP) in the country has increased from 32.9 per cent in 1987 to 41 per cent in the last quarter of 2010. This reflects the economic situation of Mexican households and some degree of women's empowerment (INEGI, 2010). In this study I examine the demographic and economic factors affecting the WEP in Mexico, and its evolution over a twenty year period (from 1990 to 2010). I am specifically concerned with this topic from an economic growth and, consequently, poverty alleviation perspective (Aguirre *et al.*, 2012; World Bank, 2012).

Female participation in the labor market has been highly studied because of the economic and social implications. An important focus from recent literature has been the gap between male and female schooling levels, and its repercussion on women's ability to find jobs. Barro (1996), using around 100 countries, estimates that the effect of higher education for women on economic growth was practically zero. Meanwhile, more recent studies indicate that the effect of higher education for women leads to higher WEP rates. Among the latest studies on this topic, Klasen and Lamanna's (2009) stands out. They found that for a wide temporal range, and including information from over 130 countries, the effect of educative discrimination is determinant on the employment opportunities for wom-

en and, indirectly, on growth patterns. This result agrees with those found by Knowles, Lorgelly and Owens (2002) and Aguayo and Lamelas (2011). Aguayo and Lamelas (2011) study Mexico and find that for the 2000-2005 period, education plays a decisive role on WEP, although it will not estimate the female occupational levels.

In classical and modern literature, having children is seen as a factor that facilitates or hinders WEP, depending on the country. Schockaert (2005) demonstrates the divergent effect of children over WEP. Evidence for North-American women's conditions allow them to conciliate their reproductive and professional spheres, while children in Latin-American countries represent an obstacle to getting a (better) job or obtaining a higher wage for women. From this perspective, Crespo Garrido (2012) studies the different public policies taken from a sample of European countries to reconcile women's family and professional lives. Meanwhile, García and de Oliveira (1997) express that motherhood is seen as *their main source of identity* by an important segment of society, varying between social classes.

Marital status has traditionally been highly related to women's employment rates. In a recent study, Grantham (2012) concludes that even for mid-nineteenth century France, marital status mattered for women entering the labor market, as reflected in the divergent signs associated with the coefficients of married and widowed women. Anderson and Dimon (1998) provide a detailed analysis of the economic behavior of married women, demonstrating that the earnings of the husband or other members whom contribute to familial income are negatively related to the probability of women joining the labor market.

Meanwhile, literature has not been focused on the barriers associated with women's entry into the labor market, but instead on the conditions women have to deal with once they get a job. England *et al.* (2006) present evidence indicating that the feminization of occupations lowers the wages of these positions; they conclude that the initial composition of the workforce by gender was a determinant of this phenomenon, and that it has prevailed due to the *inertial relationship between highly female occupations and low wages*. In contrast, Kriesi *et al.* (2010) report that, even for highly developed countries such as Switzerland, gender plays a fundamental role in job opportunities, and therefore wage levels. Besides the characteristic of lower wages associated with female employments, the lack of social security puts the familial economy at a higher risk. Domínguez-Villalobos and Brown-Grossman (2010) demonstrate that

the export-oriented industries have contributed to lower wages in absolute and relative terms with respect to women's wages relative to those of men's.

Another factor that restricts the WEP for Mexican women is the *machismo*. Although machismo is not reinforced by any law, as in Islamic countries, its effects prevail even after 40 years of feminist demands (Sidani, 2005). Contreras and Plaza (2010) argue that for the Chilean case, machismo represents an obstacle for WEP, leading them to occupy the last places on this category among OECD countries. Cerruti and Zenteno (2000) show that, for the Mexican case, the probability of women's joining the labor market decreases if they are living with a partner and he is the household head.

While a significant aspect of the Mexican economy, this paper does not discuss women participation in the informal sector. It neither discusses in depth the gender gaps in employment and wages. Proof of those gender gaps has been carefully researched in other studies (i.e. Duryea *et al.*, 2007).

This paper looks at the different factors that can affect women's participation and explains the disparities of WEP among Mexican regions. The hypothesis is that the regional disparities of women's participation are based on education, presence of *maquiladoras*, urbanization and other non-observed factors. The question that this study addresses is: What regional factors influence women's participation and cause disparities in their participation across municipalities? Additionally, this paper measures the progress and the current state of WEP during the last decades and the evolution of the differences across regions.

Women are the largest social group in Mexico (51.17% of the population according to the 2010 census), and are a potential source of labor for national economic growth (Aguirre *et al.*, 2012). Thus, a better understanding of the causes that increase WEP will help to identify measures to foster a greater inclusion in the labor market and construct a more dynamic economy.

I. Women's Situation in Mexico

The situation of women in Mexico has shown promises of transformation during the last 30 years. This section analyses aspects such as fecundity, economic and work environment, and women's economic participation to observe if they had suffered a transformation too.

I.1. Fecundity

Between 1970 and 2010 an important variation in the demographic growth was found. This change refers to the fecundity in women aged 12 and over. INEGI (2010) shows that in 2009 the number of children per woman was 2.39, while in 1970 was 3.1; a reduction of almost one child per women during the last 40 years. The main factors that INEGI identifies as causes of this variation are the level of education and economic conditions. They believe that the higher the level of education the lower the average number of children.

Despite these fecundity changes, INEGI (2010) noted that by the end of 1990 the lower fecundity level was not reflected in a more equitable percentage of women and men participating in the work place —326 men were working for every 100 women—. This effect was only perceived starting in 2009, when the ratio of economic participation among women and men was 151 men working for every 100 women, a reduction of 115 per cent from the 1990 levels.

I.2. Recession and Crisis

Since 1970, Mexico engaged in a process of liberalizing and opening up its economy. This was in response to the downturn and recession that hit Mexico, like many Latin American countries, during the eighties. The deterioration of living standards made it increasingly necessary for the population —especially the ones with low incomes— to look for new and different strategies to sustain their household income levels. Levine (1993) explains that the 1982 crisis led more family members into the work force, which meant school-age boys looking for after-school employment and housewives looking for jobs that could be done at home. Women were obliged to participate in order to contribute to the family budget along with continuing domestic work. Furthermore, the growth of the informal sector was a result of the formal sector's stagnation. The former was characterized by high women's participation. For his part, Campos-Vázquez (2010) analyses the effects of macroeconomic shocks on employment during the last crises, finding that the most vulnerable were young and unskilled populations, but that women's participation seems not to be affected by previous crisis. Using a twenty years database, from 1990 to 2010, this paper analyses the variations of our data on three major crises (1994, 2001 and 2008) and the effect of the crises on it.

I.3. Type of Work

With respect to the type of work undertaken by women, INEGI (2009) shows that it was mostly concentrated on health and educational services. Both types of work are tightly correlated with demographic density, indicating that the higher the population the higher the number of women economically active. Among the traditional activities that have characterized WEP are working-at-home, in *maquiladoras*, and in restaurant, hotel and health services. The work undertaken by women at home or in the factory was low remunerated due to the low skill requirements, and did not significantly contribute to household income. In relation to this information, ILO (2009) reports that the expected balance after financial crises will be an increase in the participation of women in economic life in more vulnerable jobs, not necessarily resulting in significant increases in the monetary income contributions.

I.4. Women's Age and Participation

Some of the studies consider age as one of the main factors that affect WEP. Age is used as a life cycle indicator because it is related to family responsi-

Figure 1. Gender participation rates by age, 2009
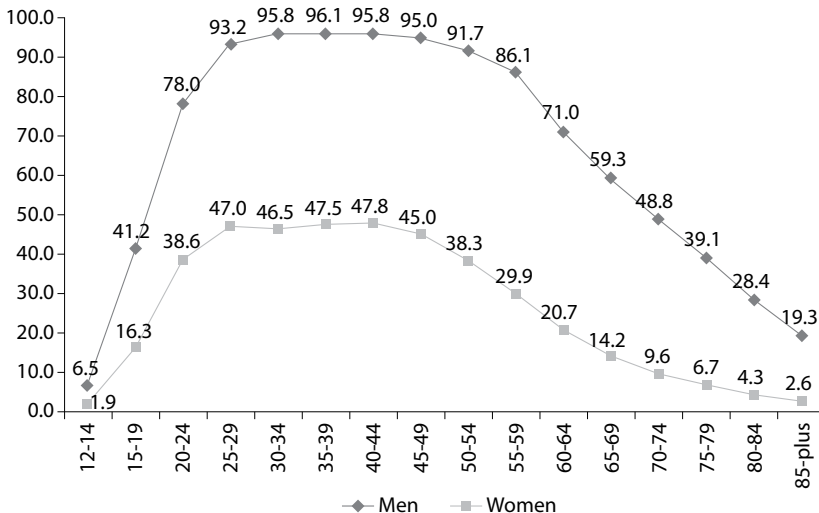
Source: Author's own calculations using INEGI's Encuesta Nacional de Empleo Urbano (1999) data.

bilities and with female participation in the labor market. Figure 1 shows the gender participation rates in Mexico by age in 2009.
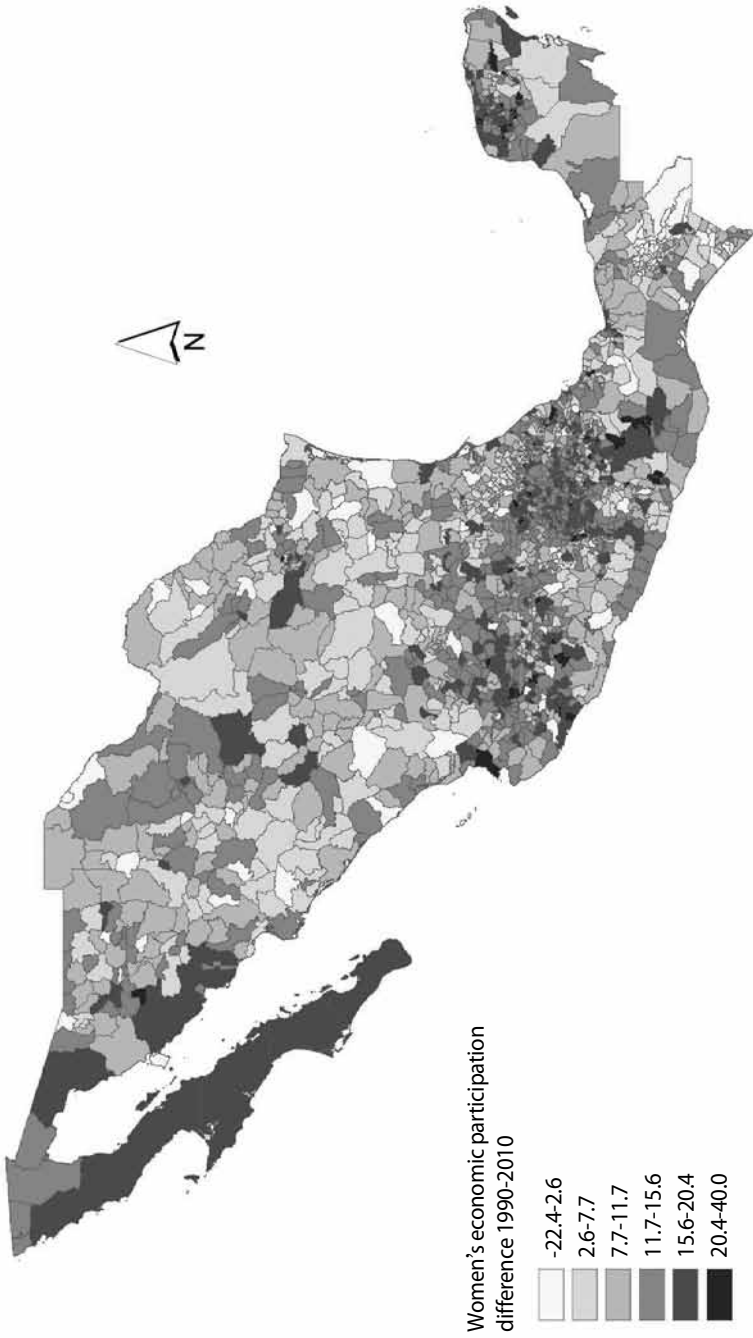
It is noticeable how economic participation changes when I control for age. First, both sexes seem to behave in a similar way, showing an accented increase in economic participation before the age of 29, which coincides with this education status. Subsequently, from 30 to 50 years old there is a stationary stage on economic participation characterized by economic participation rates around 95 per cent for males and 45 per cent for females. After finishing this stage a decreasing phase takes place, presenting a more marked downturn trend in the female's case.

I.5. Regional Women's Economic Participation

In 1990, the effect of the opening of the economy in 1986 and the rise in the activity of *maquiladoras* is noticeable in the northern states (Coubes, 2003). This explains why the five states with the highest WEP, except DF (30.66%), are northern states at the border (Baja California (BC) 27.4%, Nuevo Leon 23.64%, Chihuahua 23.49%, Baja California Sur (BCS) 22.59%, and Tamaulipas 22.27%). Nevertheless, the effect vanishes at municipal level as we move away from the US-Mexico border line. For the case of Quintana Roo, a WEP of 22.95 per cent shows that the effect of the high investment in tourism is still apparent. Baja California Sur did not benefit from the *maquiladora* sector; it experienced an increase in the social and communal services (from 3 332 women employed in 1980 to 5 753 in 1990), commerce (from 2 031 to 4 469), and restaurants and hotel services (from 781 to 2 675). To observe how spatial patterns of economic activity have evolved in the different regions, I utilize WEP at the municipal level, which is the share of women economically active on the total female population for municipality *i*. Map 1 demonstrates the positive effect that being situated near the border with the main commercial partner of Mexico (the US) had on WEP.

In 1996, regional disparities prevailed and even increased. Although the overall WEP in Mexico is still growing —mainly because of the states with maquiladoras— the differences persist. The northern states and the three main cities continued with the highest WEP. Moreover, the spill-over effect seems to be lost among the states around Jalisco and DF, and increased in the Border States. In addition the DF, which has been the region with more participation during the three decades (70s, 80s, and 90s), lost its position, and Baja California Sur (BCS) and Nayarit have risen

Map 1. WEP percentage increase (1990-2010)

Women's economic participation
difference 1990-2010

-22.4-2.6
2.6-7.7
7.7-11.7
11.7-15.6
15.6-20.4
20.4-40.0

above it. The cause of these results could be the industrial restructuring and relocation that Sánchez-Reaza (2000) finds:

> Firms facing foreign competition, plausible over-crowding effects in Mexico City and the opportunity to export to the larger market of the US, could be deciding to move away from the City. Some firms could be relocating in the northern export-oriented Border States. Some others in need of being close to the largest domestic market and to the federal government could only be moving away to the neighbouring Estado de Mexico or to nearby states such as Tlaxcala, Puebla, and Queretaro (p. 7).

The year 2000 presented a complicated scenario for most countries, especially those highly involved in the world's economy, such as Mexico. The two major crises that Mexico suffered in such a short period put serious restrictions on employment generation. The burst of the dotcom bubble in 2001 indirectly affected the Mexican economy, causing a contraction of 5 percentage points of GDP in the first trimester of 2001. Despite this decrease on GDP, Mexico has shown a revitalized economy since the fourth trimester of 2001, increasing the speed of GDP growth and the financial stability of the country.

After a growth period, the strong connection between Mexico and the US caused the Mexican economy to decline due to the effects of the 2009 financial crisis. The crisis especially hurt the most vulnerable sectors of society, among them women. The 10 percentage points decrease on GDP during the first trimester of 2009 was one of the strongest shocks in recent history, and was accompanied by a stagnation of export oriented manufacturing enterprises.

With the world's most developed economies stagnated, Mexico showed a reactivated economy since June 2009, allowing for the creation of new firms and the expansion of existing ones. Several counter cyclic measures were created aiming to alleviate the effect of the shock, and especially, the poverty caused by the financial crisis that mainly affected women. Moreover, insecurity created an inhospitable environment for attracting investment. The *war against drugs*, started in 2006 by the former Mexican President Felipe Calderón, increased the cost associated with establishing an enterprise in Mexico, which also affected WEP.

The year 2010 shows a similar pattern to the observed one in 1990. WEP still stood higher in the northern states, especially Baja California Norte and Baja California Sur. This could be due to a combined event: on the one hand, both States are close to the US and this proximity makes them at-

tractive to new investments, while on the other these states are renowned for being some of the most preferred by international and domestic tourists. Jalisco, Guanajuato, Estado de Mexico and DF present a high WEP associated with overall economic concentration.

After two decades of structural changes, political alternation and economic crises, Mexico shows a similar picture for women's incorporation to formal economic market to the one presented in 1990. In map 1 we appreciate an interesting fact: municipalities with a high WEP in 1990 present a higher growth rate of WEP compared to municipalities with a small WEP that same year. In other words, initial WEP has effects on the speed at which women are included in the formal labor sector.

II. Empirical Model

Based on the theory and the regional differences previously showed, this section presents a model to observe the factors that influence WEP. A twenty years period will be analyzed in this model, from 1990 to 2010 with decennial gaps. This allows for observation of the effects of the variables over the WEP in a wide temporal frame. It will account for the different political and economic contexts in those years, including the changing political scene. The model to be used is the following:

$$WEP_{it} = \beta_0 + x_{it}\beta + u_{it}$$

where i indexes municipalities and t indexes time (1990, 2000, and 2010). Let WEP denote the share of women economically active on the total female population for municipality i at time t. Let x_{it} be a vector of time-varying explanatory variables, and u_{it} is the idiosyncratic error.[1] Overall, there are 7 131 observations related to all the 2 377 Mexican municipalities, and 3 years (1990, 2000 and 2010). Table 1 shows the variable definition and summary statistics.

Between the 1989 and 2004 censuses, 48 new municipalities were created by splitting some of the old municipalities. To analyze the same municipalities through the years, I merged the new municipalities back to their 1988 boundaries.[2]

---

[1] $u_{i,t} = e_t + v_i + \varepsilon_{it}$, where e_t affects all observations for time period t, v_i affects all observations for cross-sectional unit i, and ε_{it} affects only observation it. I assume that $E(v_i) = 0$ & $E(z_i'v_i) = 0$.

[2] I obtained the list of new municipalities, and from what municipalities they were created, from INEGI (2006). For those created from more than one municipality, I calculate the percent-

Table 1. Variable definitions and summary statistics for each year analyzed

Variable	Definition	1990	2000	2010
n	Observations	2377	2377	2377
WEP	% of economically active women	0.1050 (0.066) [0, 0.7788]	0.2202 (0.0947) [0.0164, 0.8088]	0.2302 (0.0962) [0.0174, 0.6691]
<sec	% of women with less than secondary (middle school) education	0.7678 (0.1271) [0.2477, 1.0]	0.6930 (0.1441) [0.1833, 0.9826]	0.5521 (0.1405) [0.1101, 0.9383]
Comsec	% of women with complete secondary (middle school) education	0.1297 (0.0683) [0, 0.3633]	0.1904 (0.0692) [0.0026, 0.5212]	0.18 (0.0551) [0.0244, 0.4037]
>sec	% of women with high school education or more	0.0742 (0.0708) [0, 0.5269]	0.1065 (0.0879) [0, 0.6172]	0.1829 (0.103) [0.0023, 0.7426]
chxhh	Average number of children per household	1.7500 (0.36) [0.54, 3.44]	1.4100 (0.37) [0.37, 5.71]	1.0200 (0.28) [0.29, 3.8]
Companion	% of married women or in cohabitation	0.5611 (0.0441) [0.3786, 0.7549]	0.5512 (0.0412) [0.3534, 0.7182]	0.5531 (0.0416) [0.3301, 0.7089]
No_compan	% of separated, divorced, widowed and single women	0.4320 (0.0446) [0.2363, 0.6143]	0.4465 (0.0411) [0.2818, 0.6442]	0.4451 (0.0417) [0.2847, 0.6699]
ln(density)	Population density (population / km²)	3.75 (1.52) [-1.56, 9.81]	3.85 (1.6) [-1.84, 9.78]	3.90 (1.67) [-1.86, 9.69]

Table 1. Variable definitions and summary statistics for each year analyzed (Cont.)

Variable	Definition	1990	2000	2010
n	*Observations*	*2377*	*2377*	*2377*
maq	% of women working in the manufacturing sector	0.0216 (0.0381) [0, 0.7458]	0.0451 (0.053) [0, 0.5717]	0.0259 (0.055) [0, 0.7153]
hotels	% of women in the tourist sector	0.0048 (0.0067) [0, 0.0918]	0.0133 (0.0112) [0, 0.1063]	0.0128 (0.013) [0, 0.1826]
ln(income)	Average income by municipality (2010 pesos)	2.05 (1.43) [0, 5.43]	2.15 (1.27) [0, 7.66]	2.31 (1.17) [0, 6.11]
food poverty	% of total population in food poverty situation	0.3736 (0.1762) [0.014, 0.949]	0.4439 (0.2408) [0.016, 0.968]	0.3165 (0.1869) [0.01, 0.832]
2000	Dummy variable for year 2000	0 (0) [0, 0]	1 (0) [1, 1]	0 (0) [0, 0]
2010	Dummy variable for year 2010	0 (0) [0, 0]	0 (0) [0, 0]	1 (0) [1, 1]

Source: Author's own calculations using NEGI 1990, 2000 and 2010. *Note:* Reported statistics are mean (standard error) and [minimum, maximum] values.

In the following section, I explain the different variables used in the model and their importance for testing our hypothesis. I also describe the method used to construct each variable.[3]

II.1. Dependent Variable

I use the share of female economically active population over 12 years old; this variable is known by INEGI as women's PEA (*Economically Active Population*). I chose the years 1990 through 2010, with decennial gaps, because these were the years in which INEGI did the most recent censuses. These years allow for an analysis of the changes from one decade to another. In addition, these years have the most detailed regional data and permit an observation of precise differences in WEP, as well as in the right hand side variables.

II.2. Independent Variables

Based on the different theories, I selected the variables that most probably influence female labor participation. For this model I first include the variables of education, *maquiladoras,* hotels service sector, population density, average income, level of poverty, number of children per household, marital status and year dummies.

II.2.1. Education
Many studies have been aimed at demonstrating the effect of education on the supply side of the labor market. With regard to the Mexican case, Aguayo and Lamelas (2011) observed that from 2000 to 2005 the levels of education increased, proving that employers' preferences for young and more educated employees had also grown.

The educational effect, and especially the difference between men and women, has part of its roots in the past exclusion of women from educational opportunities. It is possible to observe these differences when I ana-

---

age of how many people (or how much land) was taken from the former municipalities (information provided by (Segob, 2005)). I then allocate the information (e.g. total labor, total population, number of *maquiladoras*) of the new municipality back to the former municipality based on those percentages.

[3] I want to emphasize that this study is based on secondary information which in some cases did not replicate the effect of the agents analyzed over the WEP.

lyze the gap between men and women in the average level of schooling[4]. While Chiapas, Guerrero and Oaxaca have the lowest levels in average education for women, Distrito Federal, Sonora, Tamaulipas and Nuevo León present the highest levels. I can anticipate a positive correlation between WEP and education, which could lead to a stronger economic development for the region.

I use two different variables to measure the level of education for municipality i at time t: per cent of women with Complete Secondary school[5] *(Comsec)* and Complete High School and Higher (>*sec*) as a share of the female population with 15 years and over, in order to capture the diverse impact of education on WEP. I omit the share of female with less than secondary education (<*sec)* from the model as the benchmark category.

II.2.2. Number of Children per Household and Marital Status
These two variables are present in practically all the literature aimed at analyzing WEP. The appearance of both variables is due to the focal value they have: while children are seen as "barriers" to extra-domestic job due to the higher opportunity cost associated with them, marital status gives an estimate of the family members who contribute to the household income. When we include the number of children (ages 12 and below) per household, we can expect a lower economic participation of women (Schockaert, 2005). Also of importance are the presence of other members that help in domestic activities, and the services available to support childcare[6] (Anderson and Dimon, 1998; Harkness and Waldfogel, 1999). In order to observe the effect of children on WEP, this study considers the number of children per household (*chxhh*), which is the average number of children (ages 12 and below) per household per municipality. I expect a negative nexus between CA and WEP.

Another variable to consider is marital status. For this, I use the share of women without a partner (*no_companion*), which includes separated, divorced, single and widowed women, omitting the share of women with partner (*companion*) as the benchmark category, which includes cohabiting and married women. Theoretically, I expect that the higher the rate of

---

[4] Author's own calculation using INEGI's Encuesta Nacional de la Dinámica Demográfica (2009) data.

[5] A.K.A. Elementary School in the US.

[6] Unfortunately I could not obtain the necessary data to test the federal program *Estancias infantiles*, implemented by former Mexican president Felipe Calderón, or the presence of other members in those households.

women without a partner, the higher women's participation in the labor force; and the higher the rate of women with a partner, the lower WEP becomes. This causality should arise because, first, many women without a partner stay single most of their childbearing years (15-49),[7] with the responsibility to sustain the house in terms of the domestic and extra-domestic work.

II.2.3. Population Density

I include the population per sq. kilometer in municipality i for period t, $\left(\frac{pop_i}{km^2_i}\right)$, $ln\,(density)_{it}$ as a Market Size proxy. The population density reflects the net centripetal and centrifugal force in the model since it represents both market size and congestion costs. Market size may facilitate economies of scale and induce a twofold attraction towards the market center in terms of backward and forward linkages (Krugman, 1991). Therefore, I expect that population density positively influences WEP.

II.2.4. Maquiladoras

During the last decades, the economy in Mexico has significantly changed as a result of structural adjustment and stabilisation policies —especially due to conditional programs implemented by the IMF and the World Bank in developing countries (Afshar and Barrientos, 1999). After the economic crisis of 1982, Mexico abandoned the model of government dependence in favor of a more "neo-liberal" model with a free market approach.

Chronologically, I can identify two periods. First, the Import Substitution Industrialization (ISI) period (1930-1985), where both tariff and non-tariff barriers were used in order to promote industrialization. Now Mexico is using an export lead growth approach, observed through the numerous agreements that Mexico has signed with several countries (most notably NAFTA). These changes brought the creation and growth of the *maquiladoras*, which play a significant role in increasing women's participation rates caused by the high number of women employed in rural and urban areas (Fontana and Wood, 2000; Wilson, 1991). It is necessary to emphasize that this type of growth was the result of Mexico's "competitive advantage" in low skill labor, low regulations and vicinity to the US market.

---

[7] In 2002, 92.2 per cent of female household heads were living without a partner. Predominantly widows (39.3%), although there is a large group of single (16%), separated and divorced women (34.7%). In contrast, 95 per cent of the men heading households were living with their partner (INEGI, 2005).

The model takes the share of workers occupied by the *maquiladora* sector in every single municipality (INEGI, 1998) (*maq*) from 1990 through 2010. This study anticipates a positive correlation between manufacturing presence and WEP, as has been observed in diverse countries (i.e. Bangladesh) due to female-intensive manufactured exports (Fontana and Wood, 2000).

II.2.5. Hotels
Since 1970's, tourism has been highlighted as a focal point for the development of Mexico. The fundamental role that tourism plays on employment is indispensable in explaining the dynamics followed by the population. Tourism is a control variable, since there are certain states, such as Quintana-Roo and Guerrero, with a gross domestic product largely drawn from tourist activities (Diaz-Briquets and Weintraub, 1991). This sector has typically high levels of female employment, due to the demands of this work. Consequently, the participation of women is especially high in these states.[8] To observe the effect of the tourist sector on the model, I include the share of active women over 12 years old hired in the hotel service sector.

II.2.6. Labor Markets
To capture the effect of the labor market on WEP I include the remuneration per worker and the share of people living in food poverty. Remuneration per worker is calculated as the total remuneration paid[9] in a municipality divided by the number of workers registered that year in that region. The share of people living in food poverty[10] is calculated by Coneval (2010) using the income information provided by INEGI's 1990, 2000 and 2010 Household and Population Censuses.

II.2.7. Year Dummies
A set of year dummy variables was included in the regression. This accounts for socio-economic factors that might have evolved over time (such as the opening of the Mexican economy) and are not explained by the other independent variables included in this model.

---

[8] Author's own calculation using INEGI's 2009 Economic Censuses.
[9] Remunerations are presented in real thousand pesos from 2003.
[10] Food poverty is defined by Coneval as the inability to obtain a basic food basket, even if you make use of all disposable income at home just to buy goods from the basket.

III. Empirical Results

Table A (in the Appendix) reports the regression results using panel data of 7 131 observations related to all 2 377 Mexican municipalities over three years (1990, 2000 and 2010). To test for geographically-specific omitted variables, separate regressions on the same model were run using random effects (RE; column 1) and another regression using fixed effects (FE; column 2), which considers the unobserved characteristics of individual municipalities. I performed the Hausman's test. Since the test rejects the null hypothesis at p-value = 0.0000, I conclude that the RE is inconsistent, as it is not capturing an important part of the average individual municipal effects. As a result of this finding, I based my results on the FE model (column 2).

Our findings in education coincide with those expressed in previous studies: the greater the years in the classroom the higher the probability of joining the formal labor market. In fact, I found that complete secondary school (*Comsec*) is negatively related to WEP, while high school or more education (>*sec*) are positively related to it. Both variables, as a group, reflect the same fact: increasing access to school for women and, as a consequence, school years of study will result in an increase of WEP, which could lead to economic growth and poverty alleviation.

The coefficient associated with women without a partner (divorced, single, separated and widowed) is negative but not significant at the 5 per cent level, indicating that being divorced, single, separated or widowed does not increase the probability of entering the formal labor market in comparison with the benchmark category: women with a partner (*companion*). In other words, women without a partner participate the same as women with a partner in the formal labor market.

As expected, the presence of *maquiladoras* and hotels has a positive effect on WEP. These results support the hypothesis that states that have high investment in these two sectors, and consequently high demand of female labor, have a high WEP. It also confirms our previous findings in map 1 that borderline states such as Baja California, Chihuahua, Coahuila, Nuevo León, Sonora and Tamaulipas, which have historically been recognized as the main destination of foreign direct investment (FDI) attract more WEP. WEP follows a similar dynamic to the one presented by industrial concentration in Mexican regions (Gómez-Zaldívar and Ventosa-Santaulària, 2009; Baylis, Garduño-Rivera and Piras, 2012). Regional disparities persist for WEP and lead women to enter the labor market only

in those regions which manage to attract investment, especially in the *maquiladora* and hotel sectors.

Different from expected, the coefficient of population density ($ln(density)$) was not significant at the 5 per cent level. The result shows that WEP is not influenced by the population —in terms of inhabitants per km²—. That is, a more densely populated region does not increase women participation in the formal labor market.

Within the labor market's variables, the coefficient of remuneration per worker was not significant, indicating that the impact of remuneration per worker did not influence WEP. But the share of people living in food poverty is positively significant, indicating that the bigger the number of people in food poverty in a region the higher women participation is in the formal labor market in that region.

The coefficient of the number of children per household ($chxhh$) is positive and significant, indicating that, on average, one extra child in a household increases WEP in 3 per cent. I attribute this effect to the economic performance of Mexico during the last two decades and, particu-

Figure 2. Real wage by year (base year 2003)
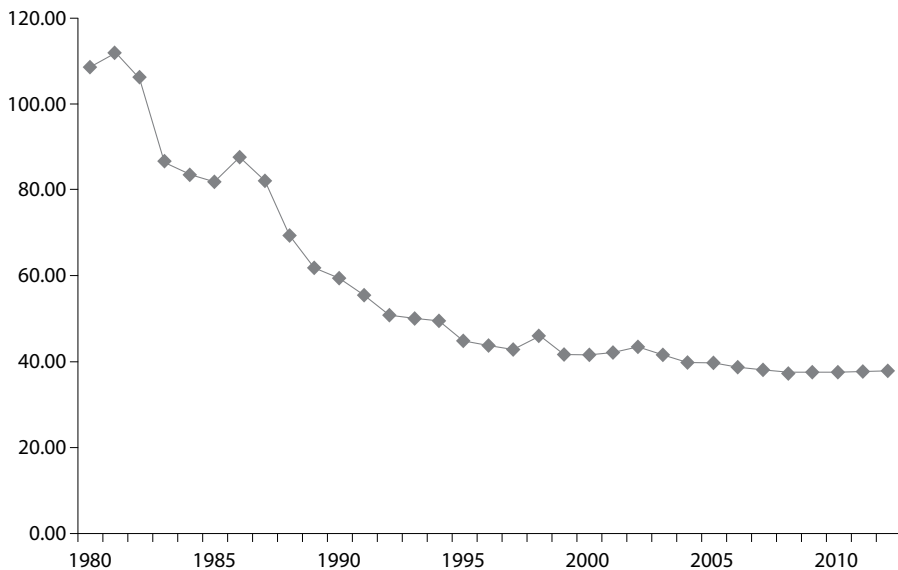
Source: Author's own calculations using SAT (2011) data.

larly, to the loss of purchasing power that forced any family member, with the capacity to work, to find a job in order to contribute to family income. Since 1980 the purchasing power in Mexico has been reduced in 65 per cen (see figure 2), which compelled Mexican families to increase the number of members who contribute to the family's income, especially as the number of household members without the capacity to work increases.

Furthermore, the program *Estancias infantiles* implemented by former President Felipe Calderón, seems to have reduced the barrier between having children and WEP. According to governmental information, by the end of 2012 there were 9 473 child care centers, benefiting over 270 thousand women. This child care cost allows women to get a job and contribute to familial income (Presidencia de la República, 2013).

Finally, we observed that the coefficients of the year dummies were both significant, indicating that the pattern of WEP has increased in 2000 and 2010 relative to 1990. This confirms that socioeconomic factors, different from the ones included in the model (i.e. the opening of the Mexican economy), have evolved over time and influenced a higher WEP.

IV. Conclusions

This paper has analyzed the factors that influence women's economic participation in Mexico's economy. In order to observe the effect of the variables, the analysis has focused on a period of twenty years, from 1990 through 2010. The model considered the rate of the economically active female population within a municipality as a dependent variable. From the results of this model I found evidence that supports our hypotheses: First, I found that women with complete secondary studies have a negative relationship with WEP, whereas women who have completed their high school studies and higher have a positive propensity to enter the formal labor market. I consider that the negative sign on women with complete secondary studies is due to the lack of skills of the population with these characteristics.

Second, there is not a significant relationship between women without a partner and WEP, indicating that women in this group are likely to be in the labor market when they are alone as well as when they are not. Hence, an increase in the share of women without a partner is not reflected in a higher rate of women's economic participation.

Third, I found that the poorer the community the more likely it is that women will participate. We also observed that the effect of population den-

sity on WEP has proved to be not significant. Further research is required to shed light on the exact link between population density and female participation. A likely causality arises from increased work opportunities in a densely populated setting, which include more possibilities of work for women.

Regarding the control variables, *maquiladoras* and hotels were both positive and highly significant. The behavior of both variables seems to respond to the process of economic openness and public policies created to increase FDI in Mexico. This means that the attraction of foreign or national investors will result in higher demand for female labor in the formal sector. Sustained public policies seem to be determinant for the increased role that they play over the creation of manufacturing and tourist enterprises and, indirectly, female economic incorporation.

Summarizing the results, I observe that the main barriers to female participation are a lack of education and undiversified possibilities of work in the less dense section of the economy. This study reinforces the results obtained by Rendón (1990) and García and De Oliveira (1994), namely that crises, higher education, and manufacturing create more employment opportunities for women.

Thus far, this study has analyzed the different variables that affect women's labor participation and increasing regional employment disparities. However, it is necessary to remember that this study did not consider some factors which are mentioned in the literature, such as household size and childcare responsibilities. Moreover, the use of secondary information could have decreased the effect of some important variables that would have shown their weight and given more precise data.

References

Afshar, Haleh and Stephanie Barrientos (1999), *Women, Globalization and Fragmentation in the Developing World,* New York, St. Martin's Press.

Aguayo, Eva and Nélida Lamelas (2011), "Educación y empleo: Desigualdad de género en las regiones mexicanas, 2000-2005", *Revista Estudios Feministas*, 19 (3), pp. 733-750.

Aguirre, De Anne, Leila Hoteit, Christine Rupp, and Karin Sabbagh (2012), *Empowering the Third Billion: Women and the World of Work in 2012*, New York Booz & Co.

Anderson, Joan B. and Denisse Dimon (1998), "Married Women's Labor

Force Participation in Developing Countries: The Case of Mexico", *Estudios Económicos*, 13 (1), pp. 3-34.

Barro, Robert J. (1996), "Determinants of Economic Growth: A Cross-Country Empirical Study", *National Bureau of Economic Research*, Working Paper No. 5698.

Bartra, Eli, Anna M. Fernández Poncela and Ana Lau (2002), *Feminismo en México, ayer y hoy*, Mexico, UAM.

Baylis, Kathy, Rafael Garduño-Rivera and Gianfranco Piras (2012), "The Distributional Effects of NAFTA in Mexico: Evidence from a Panel of Municipalities", *Regional Science and Urban Economics*, 42 (1-2), pp. 286-302.

Campos-Vázquez, Raymundo (2010), "The Effects of Macroeconomic Shocks on Employment: The Case of Mexico", *Estudios Económicos*, 25 (1), pp. 177-246.

Cerrutti, Marcela and René Zenteno (2000), "Cambios en el papel económico de las mujeres entre las parejas mexicanas", *Estudios Demográficos y Urbanos*, 15 (1), pp. 65-95.

Consejo Nacional de Evaluación de la Política de Desarrollo Social (Coneval) (2010), http://www.coneval.gob.mx/ (accessed July 19, 2013).

Contreras, Dante and Gonzalo Plaza (2010), "Cultural Factors in Women's Labor Force Participation in Chile", *Feminist Economics* 16 (2), pp. 27-46.

Coubes, Marie-Laure (2003), "Evolución del empleo fronterizo en los noventa: Efectos del TLCAN y de la devaluación sobre la estructura ocupacional", *Frontera Norte,* 15 (30), pp. 7-32, julio-diciembre.

Crespo Garrido, María (2012), "Economic Development, Family Wealth and Settlement of the Personal Life and Work", *Comunitania International Journal of Social Work and Social Sciences*, pp. 43-61.

Diaz-Briquets, Sergio and Sidney Weintraub (1991), *Regional and Sectoral Development in Mexico as Alternatives to Migration,* II, Oxford, West View Press.

Domínguez-Villalobos, Lilia and Flor Brown-Grossman (2010), "Trade Liberalization and Gender Wage Inequality in Mexico", *Feminist Economics,* 16 (4), pp. 53-79.

Duryea, Suzanne, Sebastian Galiani, Hugo Nopo, and Claudia C. Piras (2007), "The Educational Gender Gap in Latin America and the Caribean", IDB Research Department, Inter-American Development Bank, Washington, D. C., Working Paper.

England, Paula, Paul Allison and Yuxiao Wu (2006), "Does Bad Pay cause Occupations to Feminize, Does Feminization Reduce Pay and How Can

we tell with Longitudinal Data?", *Social Science Research*, 36 (3), pp. 1237-1256.

Fontana, Marzia and Adrian Wood (2000), "Modeling the Effects of Trade on Women, at Work and at Home", *World Development,* 28 (7), pp. 1173-1190.

García, Brígida, and Orlandina De Oliveira(1997), "Motherhood and Extradomestic Work in Urban Mexico", *Bulletin of Latin American Research*, 16 (3), pp. 367-384.

_____ (1994), *Trabajo femenino y vida familiar en México*, Mexico, El Colegio de México.

Gómez-Zaldívar, Manuel and Daniel Ventosa-Santaulària (2009), "Liberación comercial y convergencia regional del ingreso en México", *Trimestre Económico,* LXXVI (301) pp. 212-235.

Grantham, George (2012), "Occupational, Marital, and Life-Cycle Determinants of Women's Labor Force Participation in Mid Nineteenth-Century Rural France", *Feminist Economics,* 18 (4), pp. 97-119.

Harkness, Susan and Jane Waldfogel (1999), *The Family Gap in Pay: Evidence from Seven Industrialised Countries*, Centre for Analysis of Social Exclusion, London, School of Economics, Working Paper 29.

INEGI (2010), *Censo General de Población y Vivienda 2010.*

_____ (2009), *Censos Económicos 2009.*

_____ (2006), *Principales resultados por localidad 2005 (ITER) from II Conteo de Población y Vivienda 2005.* http://www.inegi.gob.mx/est/contenidos/espanol/sistemas/conteo2005/localidad/iter/default.asp (accessed June 1, 2008).

_____ (2005), *Los hogares con jefatura femenina.*

_____ (2000), *Hombres y mujeres en México.*

_____ (1999), *Encuesta Nacional de Empleo Urbano, 1980-1997.*

_____ (1998), *Industria Maquiladora de Exportación.*

_____ (1990), *XI Censo General de Población y Vivienda.*

International Labour Office (2009), *Global Employment Trends for Women,* Geneva, ILO.

Klasen, Stephan and Francesca Lamanna (2009), "The Impact of Gender Inequality in Education and Employment on Economic Growth: New Evidence for a Panel of Countries", *Feminist Economics*, 15 (3), pp. 91-132.

Knowles, S., P. K. Lorgelly and P. D. Owen (2002), "Are Educational Gender Gaps a Brake on Economic Development? Some Cross-Country Empirical Evidence", *Oxford Economic Papers*, 54 (1), pp. 118-149.

Kriesi, Irene, Marlis Buchmann and Stefan Sacchi (2010), "Variation in Job Opportunities for Men and Women in the Swiss Labor Market 1962-1989", *Research in Social Stratification and Mobility,* 28 (3), pp. 309-323.

Krugman, P. (1991), "Increasing Returns and Economic Geography", *The Journal of Political Economy,* 99 (3), pp. 483-499, June.

Levine, Sarah (1993), *Dolor y Alegría: Women and Social Change in Urban Mexico,* Wisconsin, University of Wisconsin Press.

Mehra, Rekha (1997), "Women, Empowerment, and Economic Development", *Annals of the American Academy of Political and Social Science,* 554, pp. 136-149.

Presidencia de la República (2013), *México: Presidencia de la República,* http://www.presidencia.gob.mx/articulos-prensa/beneficios-del-programa-estancias-infantiles/ (accessed February 20, 2013).

Rendon, Teresa (1990), "Trabajo femenino remunerado en el siglo veinte: Cambios, tendencias y perspectivas", in Elia Bautista and Hilda R. Davila Ibañez (comps.), *Trabajo femenino y crisis en México: Transformaciones y tendencias actuales*, Mexico, Universidad Autónoma Metropolitana.

Sánchez-Reaza, Javier (2000), "The Impact of Trade Policies on Mexican Regional Growth", *The London School of Economics and Political Sciences, Department of Geography, Mimeo*.

Schockaert, Ingrid (2005), "Travail Féminin et Fécondité en amérique Latine: Un État de la Question", *Population,* 60 (1/2), pp. 157-177.

Secretaría de Gobernación (Segob) (2005), *Enciclopedia de los Municipios de México,* edited by Instituto Nacional para el Federalismo y el Desarrollo Municipal. http://www.e-local.gob.mx/wb2/ELOCAL/ELOC_Enciclopedia (accessed May 13, 2008).

Servicio de Administración Tributaria (SAT) (2011), *Cuadro Histórico de los Salarios Mínimos (1982 - 2010),* November, http://www.sat.gob.mx/sitio_internet/asistencia_contribuyente/informacion_frecuente/salarios_minimos/45_7369.html (accessed March 20, 2013).

Sidani, Yusuf (2005), "Women, Work, and Islam in Arab societies", *Women in Management Review*, 20 (7), pp. 498-512.

Wilson, Fiona (1991), *Sweaters: Gender, Class and Workshop-Based Industry in Mexico,* London, Macmillan.

World Bank (2012), *The Effect of Women's Economic Power in Latin America and the Caribbean.*

Appendix

Table A. WEP Regressions

	(1)	(2)
	RE	FE
Comsec	-0.0988***	-0.0590*
	(-5.74)	(-1.98)
>sec	0.413***	0.382***
	(26.87)	(10.35)
No_companion	0.137***	-0.0247
	(7.36)	(-0.81)
Maq	0.701***	0.502***
	(46.18)	(20.91)
hotels	1.253***	0.607***
	(15.76)	(4.90)
ln(density)	0.00673***	0.00607
	(10.85)	(1.64)
Ln(income)	-0.00137	0.00128
	(-1.79)	(1.09)
food poverty	-0.0141*	0.0502***
	(-1.99)	(4.76)
chxhh	-0.0103***	0.0291***
	(-3.54)	(5.61)
y2000	0.0758***	0.0954***
	(30.33)	(25.19)
y2010	0.0614***	0.103***
	(21.96)	(17.07)
cons	0.00754	-0.0141
	(0.78)	(-0.67)
N	7131	7131
R-sq		0.664
adj. R-sq		0.494

Source: Author's own calculations using INEGI 1990, 2000 and 2010. *Note: t* statistics in parentheses. *p<0.05 **; p<0.01; *** p<0.001.