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The Evolution of Women's Labor Force
Participation in Mexico During the 20th Century:
An Economic Perspective

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Abstract

This paper studies female labor force participation (LFP) changes in Mexico during the 20th century. Using census data, we explore the evolution of female LFP by using a cohort analysis. We find that the labor decision of women over time shows a U-shape behavior in Mexico: the LFP first declined and then rose as the country developed. We make a comprehensive revision of the literature, trying to put together the different explanations provided in order to give a broad account of the changes that took place in Mexican women's fertility, marriage, education, and labor decisions during the last three decades. The results show that the female LFP increase might be explained by a decrease in the number of children per woman and to a substantial increase in the average years of schooling. The population laws in 1974, the use of contraceptives and delaying the marriage were reasons to understand this phenomenon. Later on, the opening up of the economy of the 1990s encouraged a further increase of the LFP.

Resumen

Este trabajo estudia los cambios de la participación laboral femenina (PLF) en México durante el siglo XX. Usando información de los censos, exploramos la evolución de la PLF a través de un análisis de las cohortes. Las decisiones laborales de las mujeres a lo largo del tiempo muestran un comportamiento en forma de U en México: la PLF primero disminuyó y luego aumentó a lo largo del tiempo. Hacemos una revisión detallada de la literatura, uniendo las diferentes explicaciones que han sido formuladas con el objetivo de construir un relato continuo de los distintos cambios que ocurrieron en las decisiones de las mujeres mexicanas en relación a su fecundidad, su estado civil, su nivel educativo y su participación en el mercado laboral. Los resultados muestran que el incremento de la PLF puede ser explicado por la disminución en el número de hijos por mujer y por un aumento sustancial en los años de escolaridad promedio. Las leyes de población en 1974, el uso de anticonceptivos y el retraso del matrimonio son razones para entender este fenómeno. Posteriormente, la apertura de la economía en la década de los noventa promovió el subsecuente aumento de la PLF.

Introduction

The female labor force participation (LFP) in Mexico is still very low compared to that in developed countries. Whereas, in 2000 in the United States, the female LFP was 46 percent, it was only 28 percent in Mexico.¹ Yet, LFP in Mexico has experienced a substantial increase in the last three decades, growing from 17 percent in 1970 to 28 percent in 2000. A change that has begun a transformation of the role of women in society.²

Women's LFP in Mexico did not increase secularly over the 20th century. On the contrary, data evidences a decline in the LFP of Mexican women until the 1970s when the cohort of women born in the 1940s decided to have fewer children and to spend more time working outside their households. It is the purpose of this paper to explore the reasons behind these changes.

There is a wide theoretical and empirical literature trying to explain the women decision of working and its evolution in several models that link the family size and structure with the female labor supply (Angrist and Evans 1998; Becker 1957, 1991; Cheng and Nwachukwu, 2001; Connelly 1992; Nakamura and Nakamura; 1992). Additionally, there are several studies on the relationship between female LFP and economic development, education, and fertility decisions (Goldin, 1990, 1994, 2002; Goldin and Katz, 2002; Levine 2002; Namkee and Mira; 2002, Psacharopoulos and Zafiris, 1989).

Until very recently we knew very little about the female LFP in Mexico. However, recent studies allow us now to form a broad picture of its evolution and the forces that have shaped it (Anderson and Dimon 1998, 1999; Cordourier and Gómez-Galvarriato, 2004; Dell, 2005; Knaul and Parker 1997; Madrigal, 2004). This literature is complemented by a several studies on the gender earnings gap between female and male workers in Mexico (García Cuellar, 1999, 2000, 2000; Mayer and Cordourier, 2001; Meza, 2001; Pagan and Ulibarri, 2000).

In this paper we will explore the evolution of female's LFP in Mexico using census data to carry out a cohort analysis. Then, we will make a thorough revision of the literature, trying to put together the different explanations provided by the studies carried out by ourselves and others, in order to give a broad account of the changes that took place in Mexican women's fertility, marriage, education, and labor decisions across the 20th century, and the changes in the opportunities and constraints that they encountered.

In section I we describe the evolution of female LFP in Mexico. Section II explores the possible relationship between development and the LFP trend in Mexico. Section III studies fertility changes and how they have shaped LFP

¹ The world bank group, gender stats, database gender of statistics, 2004

² Lucía Madrigal, La evolución de la participación laboral en México..., 2004.

in Mexico. Section IV deals with the causes behind fertility changes such as the use of contraceptives and education. Finally we conclude.

1.- The Evolution of the Labor force participation of Women

Female LFP in Mexico during the 20th century can be studied by dividing census information in different cohorts according to the decade in which women were born. Each cohort experiences a different set of opportunities and constraints in terms of schooling, work experience, fertility decisions, and attitudes toward paid jobs. As a result, analyzing data through cohorts allows us to describe and examine the evolution of the labor market decisions of women in Mexico from those born circa 1900 to those that were born from 1981 to 1990.³ From the census data available it was impossible to build the evolution of the LFP of every cohort through their whole life cycle, since we only have the data of older age groups for the older cohorts, and only of younger age groups for the youngest cohorts. Yet important insights can be obtained from this analysis.

Figures 1 and 2 show the percentage of LFP of each cohort according to its age group. By contrasting the evolution of LFP of men and women during this period (see Figures 1 and 2) the great differences between them become evident. As can be seen in Figure 1, the LFP of men remained almost constant through time, regardless of the different cohorts they belonged to. We find the expected inverted U-shape in which LFP increases until the age of 50 and then decreases, a behavior directly related to the life cycle. Men's employment in each cohort seems not to be affected by any external circumstance in any group of age.

In contrast, there is no inverted U-shape in Figure 2. Women's LFP did not smoothly increase and then decreased as women aged even when we look at a single cohort. Instead, the information suggests that the LFP rate in each cohort diminishes when women are in their reproductive age. The LFP of women is influenced by external variables such as marriage, education, and fertility.

Moreover, the data evidences that important changes in the labor behavior of the different cohorts took place during this period. The data shows a decrease in the LFP of women from the cohort born in 1901-10 to that born in 1921-30. Then we find a substantial increase in the LFP of each cohort from the generation born in 1941-50 on. This generation of women increasingly took the decision to work outside their home and began a

³ The cohorts that we use are "synthetic" because they connect data across various census years by the birth year of the individuals and are not constructed from longitudinal data, Censos Generales de Población y Vivienda, INEGI.

transformation that would affect women and their families for decades to come.⁴ What were the forces behind this transformation?

2.- The Labor Force Participation of Women and Economic Development

When we rearrange data by putting the cohorts in the horizontal axis generational changes in the LFP of women become more explicit (See Figure 3). This figure was constructed with the data available for women 50 years and older for each cohort, which was the age group for which more data was available.⁵ As we can see there is a decrease of the LFP of women from the cohorts born in the 1900s to those born in the 1930s, then LFP of women began to increase. A similar pattern can be observed in Figure 4, which shows an U-shape relationship between LFP and time for the women 40 to 49 years old that were part of the labor force from 1960 to 2000. In contrast, in Figure 5 we can see that when looking at the male LFP at same ages no U-shape can be found.

The decrease and then increase in the LFP in women found in Mexico for the 20th century could be related to a similar pattern found by Claudia Goldin (1994) for the United States for the period 1890-1980, and in a cross country data base of more than one-hundred countries for 1985, when she looked at the relationship between female LFP and development (measured by *per capita* income). Goldin explained the U-shape relationship between female LFP and development in the following terms.

The initial decline in the participation rate was due to the movement of production away from agriculture and the production of manufactures inside the household. As income increased, as a result of the expansion of markets, and the introduction of new technologies, the labor participation of women fell. Families implicitly bought the work of women that returned to their homes, even though their hours of work may not have changed. This process was in part the result of an income effect, but was reinforced by the decrease in the relative price of the goods produced at home and by a decrease in the demand for female labor in agriculture and manufacturing employment. Even when the relative wages of female increased, social factors such as social norms and stigma against the work of women, or the preference of employers, might have deterred the growth in the labor participation of women in the labor market.⁶ However, as the education of women increased, the value of the time of women in the market raised in relation to the price of goods, and

⁴ Claudia Goldin (2004) argues that a quiet revolution took place in the United States about 30 years ago. She founds changes occurred from the late 1960s to the early 1970s and for cohorts born during the 1940s.

⁵ This graph reports the percentage of female LFP for women at the same group of age for each cohort.

⁶ Goldin, *The U-Shape Female Labor...*, 1994, pp. 1-2.

they came back to form part of the labor force. At the same time, the social stigma might have diminished as women came back to work, as white-collar workers.⁷ Goldin (1994) develops a model that formalizes this explanation.

Similar forces to those described above might explain part of the reason for the U-shape evolution of the LFP of women in Mexico. Table 1 shows the shift between women occupations at agriculture and manufacturing activities to commerce and other related activities that require some level of education. Likewise, the data shows an increase in women's participation in white-collar activities, such as teaching and clerical work. Therefore, data suggests that some of the forces behind the U-shape of the LFP on women in Mexico could be similar to those explained by Goldin (1994) that relate female LFP with economic development.

However, in Mexico the relationship between female LFP and income per capita during the 20th century is also found for the industrial sector by itself as shown by Cordourier and Gómez-Galvarriato (2004) (See Figure 6). This indicates that other reasons beyond sector changes must be behind the U-shape relationship for Mexico. Cordourier and Gómez-Galvarriato did an econometric analysis for the textile industry during the period 1925-1934 and for the manufacturing industry during the period 1987-1999. Their results show that female LFP in manufacturing in the declining part of the U could be in part result of the passage from artisan to industrial manufacturing, greater unionization of the labor force, and that strong regional divergence in the LFP of women prevailed. The raising part of the U was related with a regional convergence in which those regions where fewer women worked outside their homes catch-up with those regions where female LFP was previously higher. This took place increasingly a result of the opening-up of the economy from 1985 on and more intensively after NAFTA in 1994.

Madrigal (2004) also found that Mexican regions tended to converge in terms of the LFP of married women from 1970 to 2000. The regional differences decreased their effect on the decision of LFP of women. Likewise, married women who lived in rural areas increased their LFP at the same period. These results suggest the influence of trade liberalization on female employment opportunities. Moreover, convergence between regions implied a change on the conditions in which women worked.

García Cuellar (2000) explored the impact of free trade on the gender wage gap in Mexico. She found that the opening of the economy produced by NAFTA decreased the gender gap between males and females. Low skilled female LFP increased in intensive industries, more than in other industries, and reduced the gender gap in wages. Moreover, her study suggests that after NAFTA, the gender gap decreased more in industries that had been non-competitive before NAFTA than in other industries.

⁷ Goldin, *The U-Shape Female Labor...*, 1994, p. 5-6.

As Melissa Dell (2005) explains, economic theory predicts that trade liberalization will cause female LFP in Mexico to increase for three reasons. First, it offers a direct trade effect as predicted by Heckscher-Ohlin / Stolper-Samuelson logic (Samuelson, 1948). Second, increased product market competition should decrease gender-based discrimination (Becker, 1957). Third, the augmented presence of foreign employers will increase female LFP to the extent that they have less of a taste for gender discrimination than national firms (Garcia-Cuellar, 2001). These forces all have regional implications for female LFP, but in general would predict an increase in women's LFP as Mexico became more open.

Melissa Dell (2005) uses a differences-in-differences approach to make causal statements about the impact of NAFTA on female LFP. She found that while NAFTA caused female LFP to increase in Mexico, its influence was not uniform throughout trade-impacted regions. The effect was significant only for central Mexico, which experienced a substantial rise in exports and FDI after 1994. NAFTA did not affect female LFP in the north, which already specialized in export production before 1994, and Female LFP in Mexico City and Guadalajara (Jalisco) also remained constant.

Melissa Dell's study also examines the channels through which NAFTA could have affected LFP. She found that the augmentation of female participation in Mexico did not occur by women displacing men. Nor does this study find evidence for the opposite hypothesis - that NAFTA led to the masculinization of the maquila labor force in the north. Rather, the specific channels through which NAFTA does appear to have mattered are a direct trade effect (as outlined by Heckscher-Ohlin) and a reduction in the ability of domestic firms to discriminate because of increased product market competition. While FDI might have played a role, data shortcomings prevented a full investigation of this aspect.

As Melissa Dell indicates in her conclusions, a study of the impact of NAFTA in agriculture and the non-tradable services sector would be necessary to have a better idea on the effect of the opening up of the economy on LFP, and her study does not examine working conditions. As she puts it, whether trade liberalization was good for Mexican women depends not only on female participation rates and relative wages, but also on the conditions in which women work on a daily basis. However, Melissa Dell's findings of this study, combined with the results of Garcia-Cuellar (2001) on Mexican gender wage differentials, strongly suggest that NAFTA created more and relatively higher-paying employment opportunities for Mexican women than would have been available in the absence of trade liberalization.

These studies give us a fair idea of the forces behind an increase in Mexican women LFP after the NAFTA. However most of the increase in the LFP of women took place before the economy was opened up to international

trade, in 1970s. In the following sections we will explore other variables that could account for this important transformation. (See Table 1.A)

3.- Fertility and Labor Force Participation

One of the most salient transformations that took place in Mexico during the years when female LFP increased was a substantial reduction in fertility rates. The number of children a woman has affects her decision to work outside the home. As part of the paid labor force women have to face the difficulty to combine maternity with their job outside the home. Therefore, the number of children a woman decides to have and when she decides to have them, is a key determinant in the female LFP.

Many studies revise the impact of fertility in the labor participation of women. Rachel Connelly (1992) examined the effect of childcare costs on the probability that married women with children will participate in the labor market. She found that the presence of young children is always expected to increase the reservation wage, lowering the probability of participation.⁸ Knaul and Parker (1997) analyze the interaction between childcare strategies and women's decision of employment in Mexico. The results suggest that the presence of one child reduces the probability of women to work in the labor market and even to work part time. Nevertheless, the probability of working increases with the presence of someone who helps at home in childcare.⁹

Figure 7 shows the average number of children ever born of women arranged by cohorts. It tells that fertility increased from the cohort of women born circa 1900 to that born in 1930s, which had the highest average of children per women. The transformation took place with the cohort of women born between 1941 and 1950. Thereafter fertility rates constantly diminished through the different cohorts. The decrease in fertility rates took place the 1970s, when the women born in 1940s were at their fertility age, as we can see in Figure 7.

Figure 8 shows the changes of the global rate of fertility (GRF). It shows that inflexion point in GRF took place in 1965-1970; thereafter it radically decreases from a GRF of 6.70 in 1966-1970 to 2.57 in 1996-2000.¹⁰ This decline in fertility took place both in urban and rural areas. From 1974 to 1996 the number of children women had in rural areas declined from 7.4 to 3.5, while in urban areas it declined from 5 to 2.3 children.¹¹ At the same time Mexico's

⁸ Rachel Connelly, *The effect of childcare costs on married women's...*, 1992, p. 83.

⁹ Felicia Knaul and Susan Parker, *Employment and child care strategies...*, 1997.

¹⁰ The global rate of fertility is the average number of children a woman of a synthetic cohort would have if during her fertile period (15 to 45 years) had children according with the fertility rates by age and if does not have risk of mortality since her birth until the end of fertile period. Formula: $GRF = n \sum f(x, x + n)$. Data from García Brígida and Orlandina de Oliveira (1994) and CONAPO.

¹¹ Censos de Población 1930-1970, INEGI Censos generales de población y vivienda, 1990-2000.

rural population declined from 41.3 percent in 1970 to 28.7 percent in 1990. This process was accompanied by a decrease in mortality rates.¹²

The pace of the decline in fertility rates corresponds exactly with the data presented on labor participation rates in Figure 2. Both show that a breaking point took place with the cohort born between 1941 and 1950. These women decreased the number of children they bared and increased their labor participation. The cohorts born later increasingly did so. Thus, fertility decisions appear to be completely interwoven with LFP decisions. The problem that arises is whether fertility decisions determine LFP or the other way around.

Research on the labor supply consequences of childbearing is complicated by the endogeneity of fertility. There is a debate regarding the causal interpretation of associations between fertility and labor supply mostly from the fact that there are strong theoretical reasons to believe that fertility and labor supply are jointly determined.

Madrigal (2004) studied the increase in the female labor participation of married women in Mexico between 1970 and 2000. She calculates the effect of fertility on the labor supply by exploiting a source of exogenous variability in family size first introduced by Angrist and Evans (1998). This method uses an instrumental variable strategy based on the sibling sex mix in families with two or more children. This instrument exploits the widely observed fact of parental preferences for a mixed sibling-sex composition. Parents of same-sex siblings are substantially more likely to go on to have an additional child. Because sex mix is randomly assigned, a dummy variable for whether the sex of the second child matches the sex of the first child provides a credible instrument for further childbearing among women with at least two children.¹³

The econometric results of this study prove that there is a strong relation between fertility and LFP, and that the causality goes in that direction. The results show that a third child reduces female LFP and that this effect is larger in 2000 than in 1970. At the same time, the female LFP of married women increased due to a decrease in the number of children per woman and to a substantial increase in the average years of schooling (See Table 2).¹⁴

¹² INEGI, *Las mujeres en el México rural*, 2002. The mortality rate of children was 72% in rural areas and 51% in urban ones from 1975 to 1979. In 1990-1994 the rate was 40.2% in rural areas and 28% in rural zones. Source: Encuesta Nacional de la Dinámica Demográfica. INEGI.

¹³ Married-wife women (marriage and unmarried partner) compose the sample. This group of women has a family and a husband. The number of children consider every born of each father, even when child is not alive. The sample was restricted for the number of children alive matched with the number of children women had reported in their home. Women age also was restricted from 12 to 49 years old to capture the more first births as possible. For 1970 72.50% of married women were two children or more, for 1990 72.44% and, for 2000 67.16%.

¹⁴ The difference between models (1) and (2) are geographical indicators. As coefficients do not change in two models, indicates that instruments are orthogonal to the additional controls. This result validates the strategy of using linear models to identify the parameter of interest.

Table 1 reports two sets of two-stage least squares (2SLS) estimates using same sex as instrument.¹⁵ The first two columns show results for 1970, the next two for 1990 and, the last two for 2000. These estimates show that having a third child caused a 4.1 percent reduction in women's labor supply in 1970. The labor supply effects estimated using the 1990 data suggest a reduction of 10.8 percent in women's labor force. The result that seems noteworthy is the larger negative impact of childbearing on married women's labor supply on 2000, of 12.5 percent.¹⁶

This outcome shows that the effect of fertility decisions on LFP is substantial. The increasing negative impact means that childbearing requires more time and resources throughout time, which indicates that the opportunity cost of having a third child is larger in 2000 than in 1970. Women have more years of schooling and the possibility of having a career, which makes pricey for women stay in home.

These conclusions do not disagree with the fact that female LFP increased over the last 35 years, since; the extraordinary raise of LFP can be explained by the change of women's fertility decisions. In Mexico, between 1970 and 2000 the number of women which had more than two children diminished by 20 percent (Madrigal 2004). As shown before, the fertility rate descended dramatically from 1970 to 2000.

In order to show the regional differences in the labor decisions of women, Mexico's data was divided in four regions based on their export performance and geographic market conditions.¹⁷ Moreover, this regionalization allows observing the effect of NAFTA because it considers trade and commercial openness.¹⁸ The omitted variable (comparison) in the estimation was region 2 (D.F, Jalisco y Mexico). The results show in region 1 (border), women participated less than women that live in region 2, for each year, but the

¹⁵ Two-stage least squares is a method of extending regression to cover models which violate ordinary least squares (OLS) regression's assumption of recursivity, specifically models where the disturbance term of the dependent variable is correlated with the causes of the independent variables. In the first stage, a new dependent variable is created to substitute for the original one, and in the second, the regression is computed by OLS, but using the newly created variables. The purpose of the first stage is to create new dependent variables that do not violate OLS regression's recursivity assumption. Instruments are the variables used in the first stage of 2SLS to create the new variables (called instrumental variables) that replace the problematic causal variables. The new variable will be uncorrelated with the disturbance term of the endogenous variable.

¹⁶ Data was not available for 1980.

¹⁷ The Border States were separated from the rest of the country since these cities have different characteristics than the rest (region 1). The central region is characterized by larger cities and the centralization of resources and foreign direct investment (region 2). Region 3 includes the northern cities, which are not in the border or in the center of the country. The south is a very similar region characterized by greater poverty and a less export-oriented economy

¹⁸ These regions are similar to those found in García-Cuéllar 2000, who divided the country by export performance of the States and similar to those found in Cordourier and Gómez 2004.

effect was diminishing. In general, these results show that female labor supply in the different regions had a tendency to converge.¹⁹

The variable indicating if women lived in urban areas was negative for 1970; living in urban areas reduced labor supply in 1.6 percent. This could be explained by a social stigma that went against having married women working outside the home. This result indicates that urban married women with more than two children were less likely to have a paid job outside home than rural women. This condition changed between 1970 and 1990. For the 1990 and 2000 data, the urban variable became positive, by 27 and 38 percent respectively, which means that living in urban areas increasingly made more likely that women worked outside the home.

It is generally argued that urban areas encouraged smaller families because of greater density, scarcer and more expensive housing, fewer child labor opportunities, more wage labor opportunities for women, better enforcement of child labor laws and compulsory education statutes. Child costs thus are thought to be higher in urban areas, as also might be the rewards to greater investment in human capital. Related to this are the views of Gary Becker (1991) that parents choose fewer children and more "quality" per child over time because the decline of the implicit price of child "quality". This reduced price of child quality has been caused by increased returns to human capital in the path of economic growth.²⁰

In rural areas, there are good opportunities for children to work; male wages are relatively high, encouraging early marriage. Differential net immigration of young adult males biased sex ratios in favor of earlier and more extensive marriage. Higher child mortality tended to shorten birth intervals. All this combined favor higher marital fertility.

When controlling in the estimations by mother age and schooling, the time when women had their children can be approximated. The effect of the mother age is positive for all the years studied. It shows that as women grew older the probability of working outside the home increased, which means that when children grew older women increased their chances to be part of labor force.

Notwithstanding, the sample of this study is restricted to women with two or more children, the results are likely to be of general interest because a significant fraction of the change in fertility between 1970 and 1990 was due to a reduction in the 3-2 number of children range. These results show a set

¹⁹ Region 1 (border), Baja California Norte, Baja California Sur, Sonora, Chihuahua, Coahuila and Nuevo Leon. Region 2 (center), D.F., Jalisco and Mexico. Region 3 consider center and north's cities that are not in zones 1 and 2. Region 4 (south), Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo and Yucatán.

²⁰ Gary Becker, *A Treatise on the family*. Enlarged, Cambridge, 1991, cap. 5.

of variables that can be used in the study of female LFP. In the next sections, we will analyze some of them.²¹

4.- Birth Control and Education

An important reason behind the strong decrease in fertility rates evidenced was a radical change in government policy. As in other parts of the world, the birth control pill appeared in Mexico in 1960. However, the use of this contraceptive was not socially accepted for several years after its emergence. It was until 1974, when the government drastically changed its policy on the issue and carried out a wide campaign to support population control that women began to accept birth control methods as a measure to provide wellbeing to their families. In 1974, the new general Law of Population came into effect. It was a modern, humanist and respectful demographic policy that allowed the couple to determine, freely and responsibly, their descendants.²² The use of birth control allows women to take control of their lives, lowered the costs to young, unmarried women to pursuing careers, particularly those involving substantial upfront investments of time. In addition, the use of contraceptives eliminates one potent reason for early marriage and in that sense, allows women take their own decisions about LFP and fertility, “thus, the pill may have enabled more women to opt for careers by indirectly lowering the cost of career investment”.²³

The use of contraceptives constantly increased in Mexico from 1976 to 1997 as we can see in Table 3. The cohort of women born during the 1940s were between 25 and 34 years old in 1976. As Table 3 shows around 38 percent of the women in this cohort used contraceptives, and they were the group age that more extensively used them. From the information available it is clear that the change in government’s policy that started in 1974 had an important effect in the reduction of fertility rates and on the concomitant increase in the labor participation of women in Mexico.

Women reduced their fertility not only through contraceptives but also by increasing the age of first marriage or of an unmarried union. Unfortunately we do not have data prior to the cohort born in 1953-1957, but from the data available we can see that there is a substantial reduction in the percentage of women married before the age of 16 and an increase in the women who

²¹ In general the results from the regressions are very robust. The sign and magnitude of the coefficients do not vary much from one specification to the other (each year specification (1) and (2)). Most all of the coefficients are significant well beyond the 1% confidence level.

²² Secretaría de la Presidencia, Seis informes de Gobierno: Luis Echeverría Álvarez, Crecimiento demográfico, 1 sept. 1974.

²³ Claudia Goldin and Lawrence Katz, “The power of the Pill...”, 2002, p. 731.

remained single by the age of 25, from the cohort born in the 1950s to that born in the late 1960s and the early 1970s (See Table 4).

By 2003 the number of children born to women aged 15-19 still remained substantially higher than in developed countries (See Table 5), but lower than in many Latin American Countries, even lower than in those countries, like Brazil or Costa Rica where the use of contraceptives was more extensive.

An important increase in schooling was another relevant change experienced by Mexican women during the second half of the 20th century (See Table 6). At the same time there was a narrowing in the education gap between males and females (See Table 7). The age group of 20-29 went from an average of 2.62 years of schooling in 1960 to 6.44 in 2000. Yet it still remains very low, indicating that on average in 2000 women had barely finished elementary school, a figure very similar to that of men.

The LFP of women is affected by the years of schooling women have in several ways. In the first place, the more education a woman has, the more income she receives per hour worked, and the more expensive it becomes the decision of not working outside the home. More years of schooling increase her opportunity cost of not working outside the home. Higher education levels allowed more women to work in clerical and other white-collar jobs (See Table 1). This must have diminished the social stigma against woman working outside the home in a process similar to that described by Goldin (1994). However, in Mexico there has also been a substantial increase in the LFP of women with very low schooling rates working in the manufacturing export sector after the opening up of the economy (García Cuéllar 2000, Cordourier and Gómez Galvarriato 2004, Melissa Dell 2005).

In the second place, education has an important influence on LFP by affecting fertility decisions, particularly by the diffusion of values and knowledge of family control practices. The data analyzed shows that the more educated a woman is the more likely she will use contraceptives, and the later she will marry or have an unmarried partner (See Tables 3 and 8). Psacharopoulos and Tzannatos (1989) stated that education exercises a positive effect on the decision to work. They said that "if education has been undertaken as an investment, a woman has to work to recoup the cost of that investment in human capital".²⁴ The authors point out that even if education was undertaken as a form of consumption, women will enter the labor market because their opportunity cost of not working increases. They also explain that since in theory, education has a positive effect on female LFP and a negative effect on fertility, and if greater participation of women in the labor force is a desirable goal, education for women may be the main policy option.²⁵

²⁴ George Psacharopoulos and Zafiris Tzannatos, *Female Labor Force Participation:...*, 1989, p. 196.

²⁵ *Ibid* p. 196-198.

The results show that the female LFP increase might be explained by a decrease in the number of children per woman and to a substantial increase in the average years of schooling. The population laws in 1974, the use of contraceptives and delaying the marriage were reasons to understand this phenomenon.

Conclusions

This study shows that there has been an U-shape trend in the female's LFP through time in Mexico. The LFP of Mexican women declined until 1970 when it started to raise. During most of the 20th century Mexico experienced a decline in the LFP. This was a consequence of several forces that are yet to be explored. However it seems it was partly ruled by the decline in the percentage of population devoted to agriculture and to the passage from handmade to industrial manufacturing. Moreover it seems that it was reinforced by unionization, and the presence of social stigma against the work of women outside their homes that was imbedded more strongly in some regions of the country than in others.

It was the generation of women born in the 1940s who started the change in the role of women in Mexico's society that we now evidence at the beginning of the 21st century. These women were more educated than their mothers and grandmothers, and were given the opportunity by a change in government policy that promoted the use contraceptives, beginning in 1974. These women eagerly used birth control methods and were the first generation that chose to have fewer children than their mothers. A trend that would be continued by the generations that came later. All this meant that more of them decided to work outside their home than their mothers did, a trend that would be continued by the generations to follow.

Then came the opening up of the economy, which has produced many jobs that require high manual abilities and low education. This has generated many job opportunities for women in the export manufacturing sector, and changed the mores in some regions which had previously very deep social stigma against the fact that women (especially married women) worked outside their homes. We have experienced a regional convergence between LFP by the catch up of some regions with previous very low levels of LFP. It seems that the forces behind the increase in the LFP will continue raising its levels in the following decades, so the raising trend that we describe in this essay would be only the beginning of a larger process.

The evolution of the female LFP in Mexico is just starting to be explored. There is much more that we ignore than that which we know. More and better studies would be necessary in order to have a better idea of the forces that have changed and keep changing the role of women in Mexico's society.

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Figures and Tables

T A B L E 1
DISTRIBUTION OF OCCUPATIONS, WOMEN, 1960 - 2000 (PERCENTAGES)

	YEAR			
	1960	1970	1990	2000
AGRICULTURE, MINING, OIL AND NATURAL GAS	30.6	8.5	3.0	3.7
MANUFACTURE	12.2	14.2	15.5	15.2
COMMERCE, COMMUNICATIONS AND TRANSPORTS	49.3	42.0	50.3	52.4
HOUSEKEEPING ACTIVITIES	N.A	16.4	8.7	9.4
CLERICAL JOBS	N.A	5.5	3.5	3.4
LIBERAL PROFESSIONS	7.1	1.0	7.5	7.1
TEACHERS	NA	5.2	7.3	5.8
OTHER	0.8	7.2	4.2	3.1
TOTAL (%)	100	100	100	100
WOMEN IN LABOR FORCE	2,035,293	2,466,257	5,521,271	10,750,400
% OF TOTAL LABOR FORCE	18.0	19.0	23.6	31.5

Source: *Censo General de Población y Vivienda*, 1960, 1970, 1980, 1990, 2000, INEGI.

T A B L E 1A
LABOR FORCE PARTICIPATION, WOMEN, 1960 - 2000

AGE	YEAR			
	1960	1970	1990	2000
12 - 19	11.84	16.61	12.28	16.44
20 - 29	17.32	22.16	28.80	37.40
30 - 39	16.75	16.72	25.95	39.77
40 - 49	21.31	16.76	20.79	37.39
50 - 59	25.58	15.81	13.90	26.17
60 AND MORE	19.32	12.63	6.69	11.50
AVERAGE	18.69	16.78	18.07	28.11

Source: *Censo General de Población y Vivienda*, 1960, 1970, 1980, 1990, 2000, INEGI.
Note: Data of 1980 was not included because is not reliable.

T A B L E 2
FEMALE LABOR FORCE PARTICIPATION ESTIMATES, 1970 - 2002

Dependent variable: Labor force participation. Sample: Married Women.						
Estimation method: 2SLS. Instrumental Variable: Same Sex.						
	1970		1990		2000	
	(1)	(2)	(1)	(2)	(1)	(2)
more than 2	-0.041 [0.018]**	-0.040 [0.018]**	-0.108 [0.018]***	-0.108 [0.018]***	-0.125 [0.018]***	-0.125 [0.018]***
children 1	-0.012 [0.004]***	-0.012 [0.004]***	-0.014 [0.003]***	-0.014 [0.003]***	-0.018 [0.003]***	-0.018 [0.003]***
children 2	-0.007 [0.006]	-0.007 [0.006]	-0.003 [0.004]	-0.003 [0.004]	-0.006 [0.004]	-0.006 [0.004]
schooling	0.015 [0.001]***	0.015 [0.001]***	0.028 [0.001]***	0.028 [0.001]***	0.029 [0.001]***	0.029 [0.001]***
urban	-0.015 [0.006]***	-0.016 [0.006]***	0.024 [0.005]***	0.027 [0.005]***	0.033 [0.004]***	0.038 [0.004]***
ownership	0.001 [0.004]	0.001 [0.004]	-0.008 [0.004]**	-0.008 [0.004]**	-0.004 [0.004]	-0.007 [0.004]*
mother age	0.003 [0.000]***	0.003 [0.000]***	0.008 [0.001]***	0.008 [0.001]***	0.01 [0.000]***	0.01 [0.000]***
electricity	-0.007 [0.006]	-0.008 [0.006]	-0.015 [0.006]**	-0.016 [0.006]**	-0.024 [0.007]***	-0.022 [0.007]***
water	-0.006 [0.006]	-0.007 [0.006]	0.003 [0.005]	0.006 [0.005]	0.006 [0.006]	0.011 [0.006]**
sewage	-0.001 [0.006]	-0.003 [0.006]	0.021 [0.005]***	0.021 [0.005]***	0.006 [0.004]**	0.011 [0.004]**
toilett	0.008 [0.005]	0.008 [0.005]	-0.001 [0.005]	0.002 [0.005]	0.001 [0.005]	-0.001 [0.005]
zone 1		-0.033 [0.006]***		-0.017 [0.004]***		0.019 [0.005]***
zone 3		-0.021 [0.005]***		0.001 [0.004]		0.015 [0.004]***
zone4		-0.006 [0.008]		0.031 [0.006]***		0.056 [0.005]***
constant	-0.039 [0.010]***	-0.02 [0.011]*	-0.245 [0.009]***	-0.253 [0.009]***	-0.28 [0.010]***	-0.313 [0.010]***
observations	17999	17999	54041	54041	67381	67381
R-squared	0.04	0.04	0.12	0.12	0.13	0.13
Sargan	0.000	0.000	0.000	0.000	0.000	0.000
Schwarz criteria	3.13	3.13	3.30	3.30	3.33	3.33

Source: IPUMS, 1970, 1990, 2000, Madrigal, 2004
(Integrated Public Use Microdata Series-International)
Standard errors in parenthesis
*signif. at 10% **signif. at 5% ***signif. at 15%
Note: Sargan test (overidentification test of all instruments): -0.000

T A B L E 3
WOMEN USE OF CONTRACEPTIVES, BY CHARACTERISTICS, 1976-1997

PERCENTAGE OF WOMEN, MARRIED OR WITH AN UNMARRIED PARTNER				
	1976	1987	1992	1997
TOTAL	30.2	52.7	63.1	68.5
AGE GROUPS				
15-19	14.2	30.2	36.4	45.0
20-24	26.7	46.9	55.4	59.3
25-29	38.6	54.0	65.7	67.8
30-34	38.0	62.3	70.1	75.4
35-39	37.9	61.3	72.6	76.1
40-44	25.1	60.2	67.4	74.5
45-49	11.8	34.2	50.5	61.4
NUM. OF CHILDREN BORN				
0	6.5	15.3	20.7	23.9
1	27.2	50.5	56.6	59.8
2	39.1	60.0	71.0	75.4
3	38.4	67.5	75.0	80.6
4 AND MORE	29.6	51.3	62.6	70.4
SCHOOLING				
WITHOUT SCHOOLING	12.8	23.7	38.2	48.0
INCOMPLETE ELEMENTARY SCHOOL	25.5	44.8	56.4	61.3
COMPLETE ELEMENTARY SCHOOL	40.3	62.0	66.7	69.8
SECONDARY SCHOOL AND MORE	55.8	69.9	73.6	74.8
PLACE OF RESIDENCE				
RURAL	13.7	32.5	44.6	53.6
URBAN	42.1	61.5	70.1	73.3
SPEAK NATIVE TONGUE				
SPEAK	N.A.	N.A.	N.A.	48.3
NOT SPEAK	N.A.	N.A.	N.A.	70.2

Source: Consejo Nacional de Población and EMF, 1976; ENFES, 1987; ENADID, 1992 y 1997

T A B L E 4
WOMEN AGE AT FIRST MARRIAGE

COHORT	PERCENTAGE IN 1997			
	LESS THAN 16 YEARS OLD	16-19 YEARS OLD	20-24 YEARS OLD	SINGLE AT 25 YEARS OLD
1953-1957	14.9	34.9	28.2	22.0
1958-1962	14.2	33.4	27.4	24.9
1963-1967	12.6	32.2	27.5	27.7
1968-1972	9.9	30.6	28.1	31.3

Source: Consejo Nacional de Población and ENADID, 1997

T A B L E 5
REPRODUCTIVE HEALTH INDICATORS

	CONTRACEPTIVE PREVALENCE, WORLD COMPARATIVE CHARTS, 2003		
	BIRTH PER 1,000 WOMEN AGED 15-19	CONTRACEPTIVE PREVALENCE	
		ANY METHOD	MODERN METHODS
MEXICO	64	67	58
COSTA RICA	78	75	65
GUATEMALA	111	38	31
BRAZIL	73	77	70
VENEZUELA	95	49	38
UNITED STATES	53	76	71
CANADA	16	75	73
JAPAN	4	59	53
CHINA	5	84	83
FRANCE	9	75	69
SWITZERLAND	5	82	78

Source: United Nations Population Fund, State of World Population, Monitoring ICPD Goals: Selected Indicators, 2003.

T A B L E 6
AVERAGE YEARS OF SCHOOLING

AGE	WOMEN				
	1960	1970	1980	1990	2000
10 - 19	2.03	3.33	4.45	5.57	5.90
20 - 29	2.62	3.00	4.21	5.42	6.44
30 - 39	1.81	2.43	3.34	4.26	5.53
40 - 49	1.81	1.83	2.44	3.05	4.37
AVERAGE	2.07	2.65	3.61	4.57	5.56

Source: *Censos Generales de Población y Vivienda*, 1960, 1970, 1980, 1990, 2000, INEGI

T A B L E 7
AVERAGE YEARS OF SCHOOLING

AGE	MEN - WOMEN DIFFERENCE				
	1960	1970	1980	1990	2000
10 - 19	0.02	0.11	0.04	-0.04	-0.07
20 - 29	0.14	0.27	0.35	0.44	0.19
30 - 39	0.29	0.27	0.40	0.52	0.45
40 - 49	0.29	0.03	0.40	0.76	0.53
AVERAGE	0.18	0.17	0.30	0.42	0.28

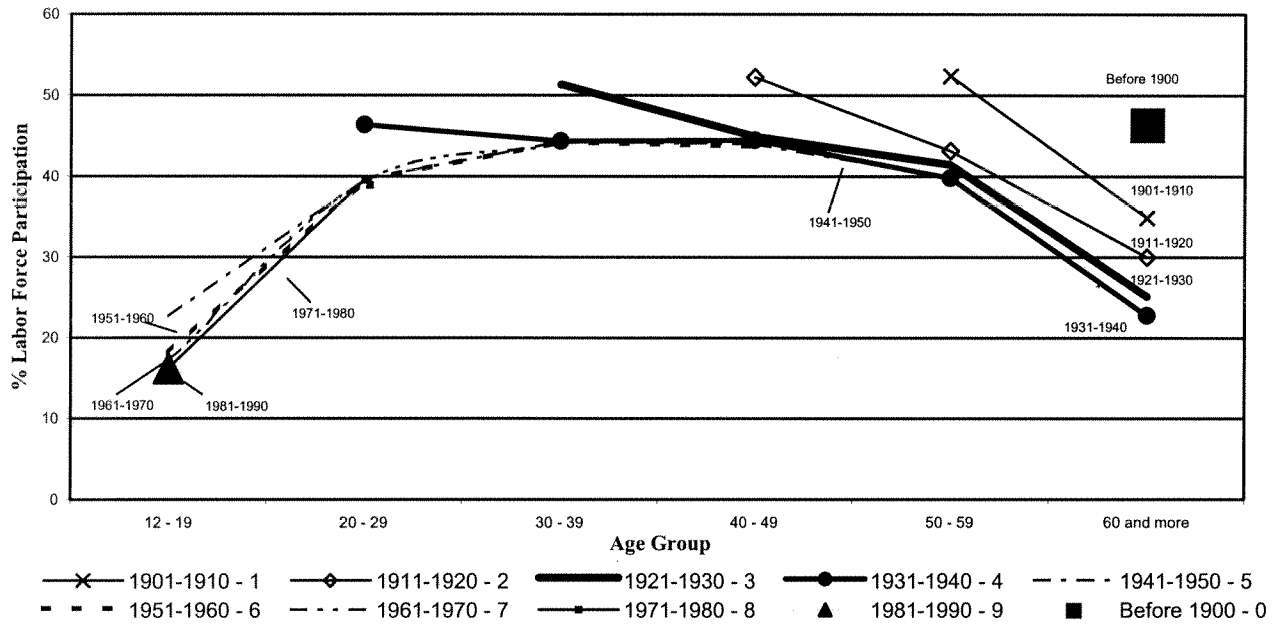
Source: *Censos Generales de Población y Vivienda*, 1960, 1970, 1980, 1990, 2000, INEGI

T A B L E 8
WOMEN AGE AT FIRST MARRIAGE, BY SCHOOLING AND PLACE OF RESIDENCE

PERCENTAGE IN 1997				
CHARACTERISTICS	LESS THAN 16 YEARS OLD	16-19 YEARS OLD	20-24 YEARS OLD	SINGLE AT 25 YEARS OLD
TOTAL	11.1	31.4	27.8	29.7
SCHOOLING				
WITHOUT SCHOOLING	34.9	34.3	14.1	16.7
INCOMPLETE ELEMENTARY SCHOOL	25.6	40.5	17.4	16.6
COMPLETE ELEMENTARY SCHOOL	15.0	40.0	23.8	21.1
SECONDARY SCHOOL AND MORE	4.0	25.7	33.2	37.1
PLACE OF RESIDENCE				
RURAL	20.2	38.9	22.0	18.9
URBAN	8.7	29.3	29.4	32.6

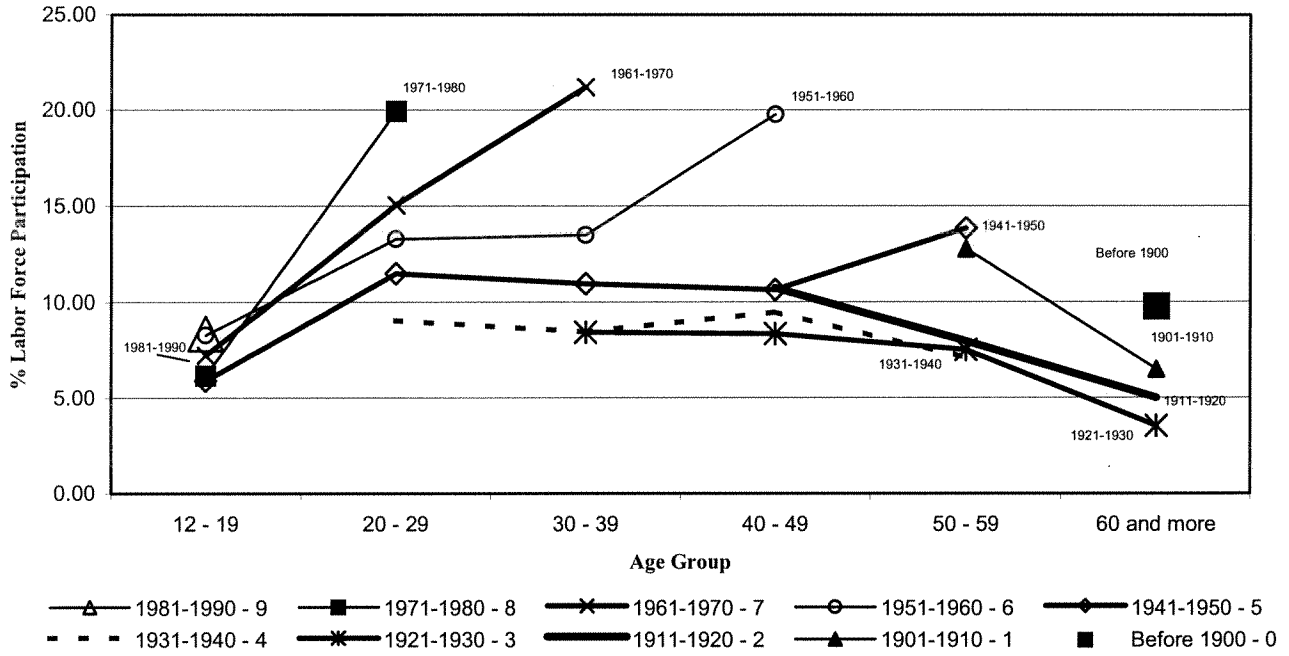
Source: Consejo Nacional de Población and ENADID, 1997

FIGURE 1
MALE LABOR FORCE PARTICIPATION



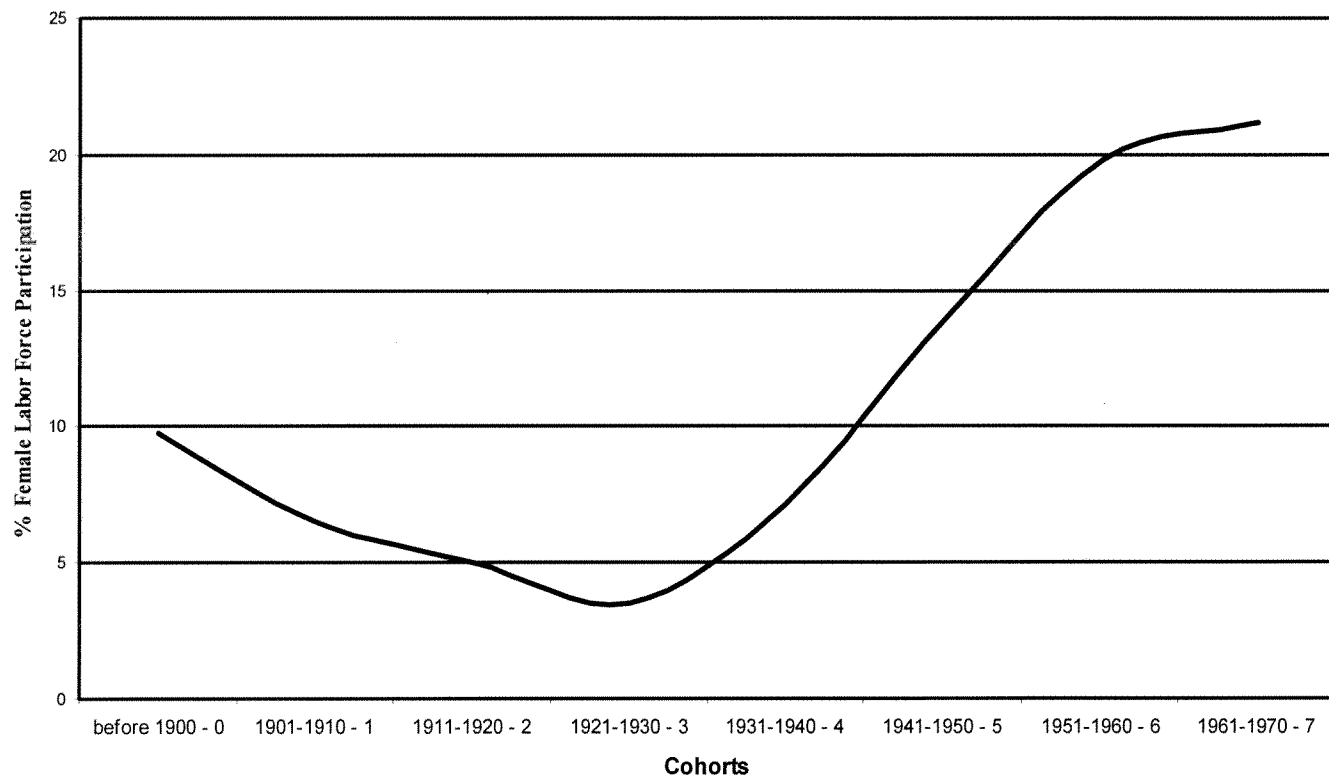
Source: *Censo General de Población y Vivienda*, 1960, 1970, 1980, 1990, 2000, INEGI

FIGURE 2
FEMALE LABOR FORCE PARTICIPATION



Source: Censo General de Población y Vivienda, 1960, 1970, 1980, 1990, 2000, INEGI

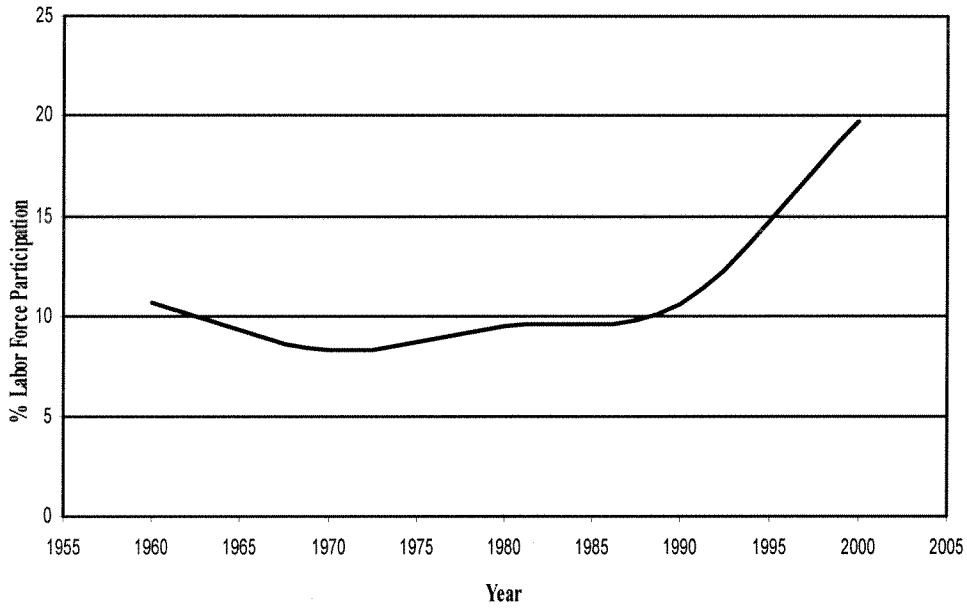
FIGURE 3
U-SHAPE FEMALE LABOR FORCE PARTICIPATION



Source: *Censo General de Población y Vivienda*, 1960, 1970, 1980, 1990, 2000, INEGI

F I G U R E 4

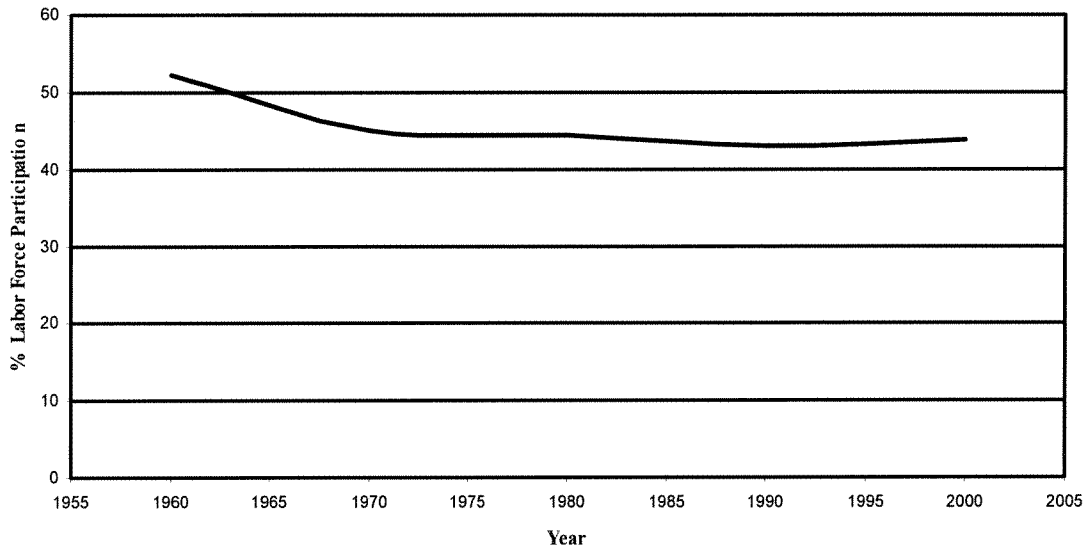
FEMALE LABOR FORCE PARTICIPATION, WOMEN 40 TO 49 YEARS OLD



Source: *Censo General de Población y Vivienda*, 1960, 1970, 1980, 1990, 2000, INEGI

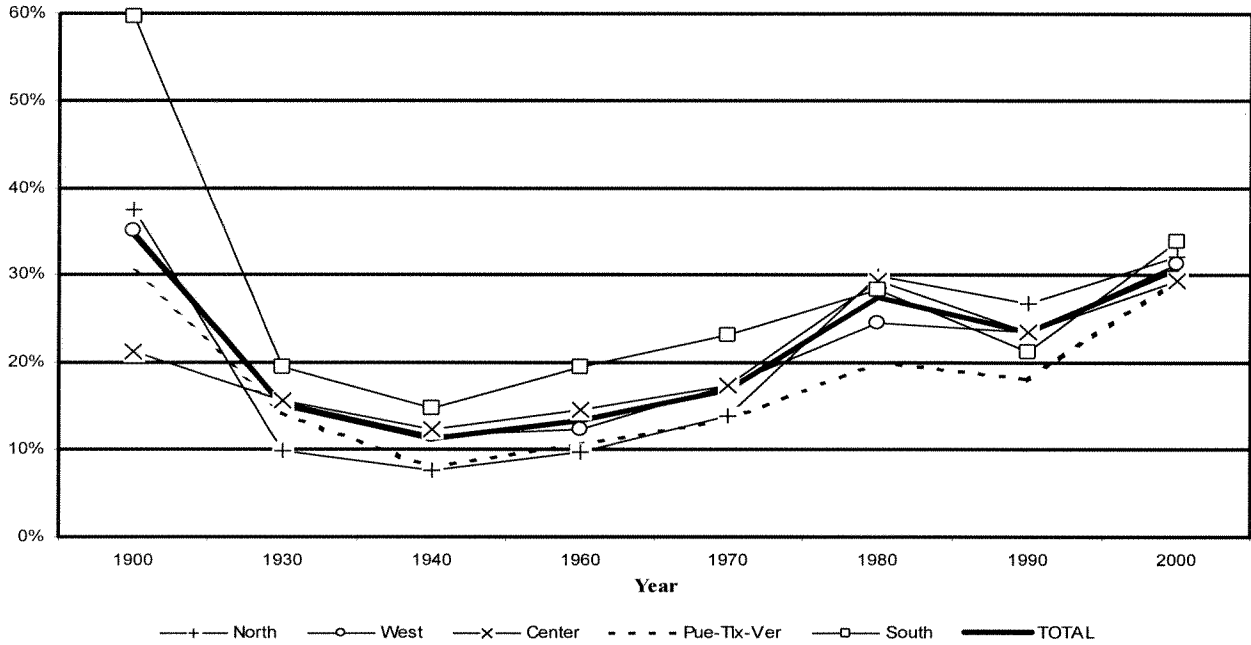
F I G U R E 5

MALE LABOR FORCE PARTICIPATION, MEN 40 TO 49 YEARS OLD



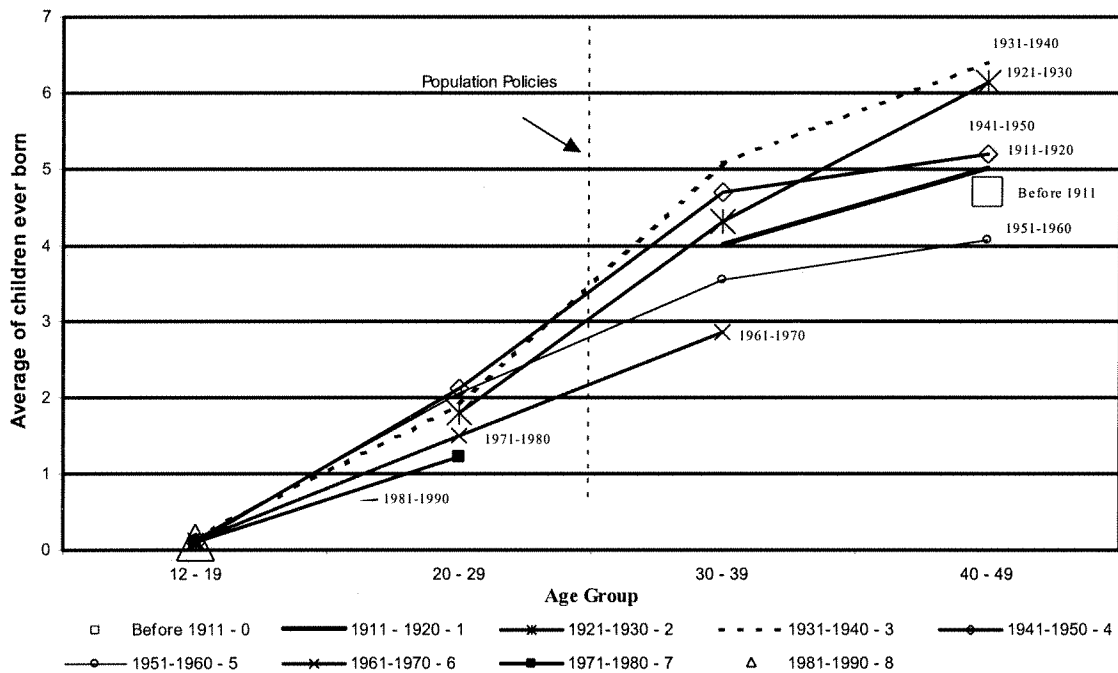
Source: *Censo General de Población y Vivienda*, 1960, 1970, 1980, 1990, 2000, INEGI

FIGURE 6
LABOR FORCE PARTICIPATION OF MEXICAN WOMEN IN MANUFACTURING



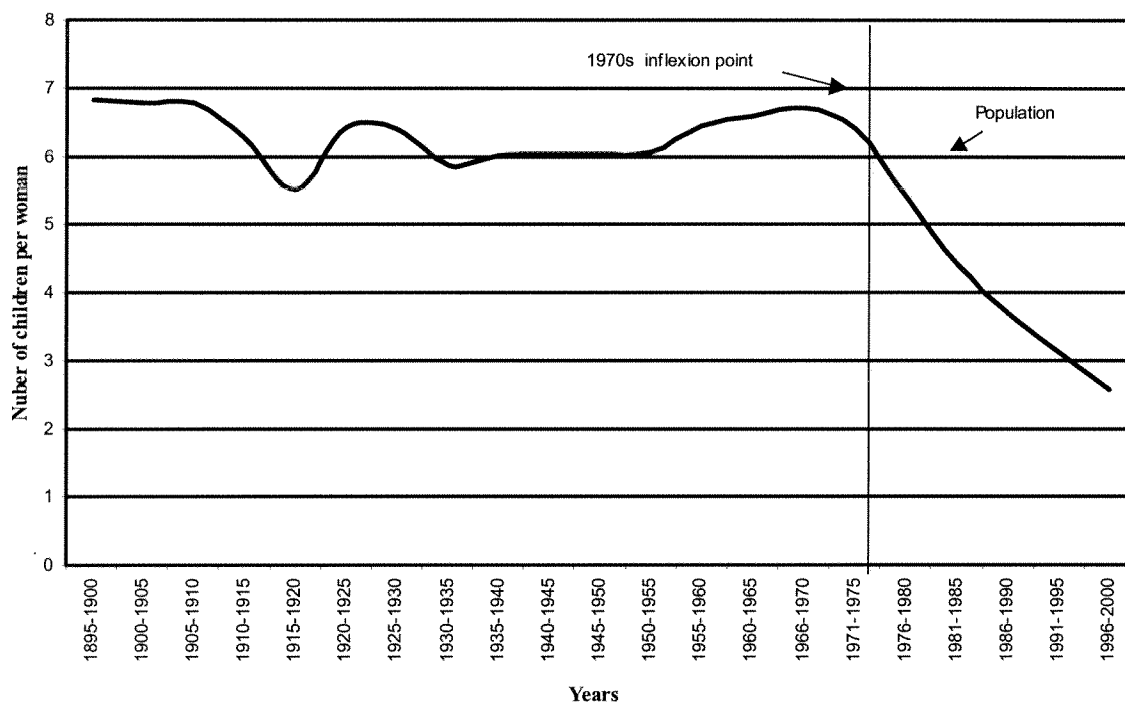
Source: Cordourier and Gómez Galvarriato (2004), pp. 67

FIGURE 7
FERTILITY



Source: Censos Generales de Población y Vivienda, 1950, 1960, 1970, 1990, 2000. INEG

FIGURE 8
GLOBAL FERTILITY RATE FROM 1895 TO 2000



Source: From 1895 to 1900: Mier y Terán, 1982; from 1971 to 1980, Celade, 1980; from 1981 to 2000, Consejo Nacional de Población.

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