THE RIGHT TAIL AND THE RIGHT TALE: THE GENDER WAGE GAP IN MEXICO ☆

Sonia R. Bhalotra[a], Manuel Fernández[b] and Atheendar S. Venkataramani[c]

[a]*University of Essex*
[b]*Oxford University*
[c]*Massachusetts General Hospital and Harvard Medical School*

ABSTRACT

We analyze the evolution of the gender wage gap in Mexico between 1989 and 2012, a period in which skill-biased technological change accelerated. We deviate from most prior work investigating the gap across the wage distribution. We find substantial gender wage convergence in the decade of the 2000s at the mean and, more markedly, at the upper and lower ends of the wage distribution, alongside little change in the median wage gap. The gender wage gap at the 90th percentile was largely eliminated by the

☆ We thank Solomon Polachek, Konstantinos Tatsiramos and two anonymous referees as well as participants from the IZA Workshop on Gender Convergence in Bonn in April 2014 for helpful comments and suggestions. All errors are our own.

Gender Convergence in the Labor Market
Research in Labor Economics, Volume 41, 299−341

ISSN: 0147-9121/doi:10.1108/S0147-912120140000041016

year 2012 and, at the 10th percentile, it narrowed by a fourth of its 1990 level. This narrowing of gender inequality in wages occurred alongside a narrowing of inequality in wages within each gender group. The share of college-educated women relative to men in the work force grew substantially over the two decades, and they sorted disproportionately into brain-intensive occupations, where the gender wage gap fell sharply. The wage return to being in a brain-intensive occupation was, in both periods, greater for women; it declined for men while rising for women during the 2000s. Our findings demonstrate how structural economic change may interact with a biologically premised comparative advantage of women in brain-intensive occupations to raise their relative wages. Our results also underline the relevance of studying changes across the wage distribution.

Keywords: Gender wage gap; Mexico; skill-biased technological change; comparative advantage; skills

JEL classifications: D3; J16; J31; O33

1. INTRODUCTION

Large differences in the returns to skill between men and women have been a consistent feature of the economic landscape in most countries.[1] This has implications for the incentive of younger generations of women to invest in education and to enter the labor market, with potentially dramatic implications for fertility, family life, human capital creation, and economic growth. Supply-side changes such as the introduction of the pill (Bailey, 2006; Goldin & Katz, 2002) and new household technologies (Greenwood, Seshadri, & Yorukoglu, 2005) have stimulated large increases in women's education and labor force participation, often despite persistently large gender wage gaps. However, more recently, the gender wage gap has narrowed, with women "swimming against the tide" of generally rising income inequality (Jacobsen, Khamis, & Yuksel, 2014; Mulligan & Rubinstein, 2008). For instance, in the United States, the wage gap narrowed in the 1980s, this tendency slowed down somewhat in the 1990s, and then convergence picked up

1. By this we mean that, in most countries, there have been long periods of time during which men earn more than women for a given level of education.

again in the 2000s, and by 2007 women were, on average, earning just under 80 percent of the wages of men (Blau & Kahn, 2007).

While there is no consensus on the causes, a growing body of recent work set in developed economies suggests that skill-biased technological change (SBTC) can explain the recent male−female convergence in wages (see, e.g., Autor, Levy, & Murnane, 2003; Galor & Weil, 1996; Juhn, Murphy, & Pierce, 1993; Katz & Autor, 1999; Katz & Murphy, 1992; Rendall, 2010; Welch, 2000). Underlying this hypothesis is the premise that men hold a biologically rooted comparative advantage in physical (or "brawn-intensive") tasks and, thereby, women in skilled (or "brain-intensive") tasks. Consequently, technological change that raises the demand for skill will tend to raise the relative wages of women (Galor & Weil, 1996; Rendall, 2010). There is some empirical support for this hypothesis in Black and Spitz-Oener (2010), Lup Tick and Oaxaca (2010), Rendall (2010), and Beaudry and Lewis (2014).

Working in conjunction with SBTC, a different strand in the literature has emphasized the role demographic changes as a potential driver for male−female convergence in wages. For example, higher divorce rates and lower fertility can increase the incentives for women to participate in the labor force, rise their investments in education, sort into occupations with higher skill requirements, and change the division of labor at home (Polachek, 1975; Polachek, Zhang, & Zhou, 2014). These mechanisms can reinforce the effect of structural changes in the economy brought by SBTC and help reduce the gender wage gap.

Recent studies have extended this line of inquiry to developing countries. Rendall (2013) demonstrates declines in the gender wage gap in Brazil and Thailand, arguing that these were driven by decreasing labor market returns to physical attributes and tasks. Pitt, Rosenzweig, and Hassan Nazmul (2012), Rosenzweig and Zhang (2013), and Bhalotra and Venkataramani (2013) show that parental investments in the nutrition and schooling of their children respond to positive early life health shocks in a gender-specific fashion in Bangladesh, China, and Mexico, respectively, with investments favoring nutrition for boys and schooling for girls. They argue that this behavior is consistent with women sorting disproportionately into skilled (or low-brawn) occupations and hence attracting a greater average return to schooling investments. Developing countries have, since about the 1990s, seen secular increases in education and in many countries, girls have shown a stronger trend than boys, but there is limited research linking relative trends in girls' education to SBTC and this possibility does not yet figure in public policy discussions of education, for example, UNESCO (2012).

In this paper, we analyze the evolution of the gender wage gap in Mexico between 1989 and 2012, SBTC deviating from most prior work on gender wage convergence by investigating the gap across the wage distribution. This time period is of importance to our inquiry given that Mexico saw increasing SBTC from the 1980s, when it liberalized foreign trade and investment policies and this was reinforced in 1994 with the NAFTA agreement (Hanson, 2003). The peso crisis followed close upon the heels of the NAFTA agreement, but the post-crisis economy has seen considerable structural change. In this time, growth in the education and labor force participation rates of women have been much stronger than for men. At the high end, the more rapid growth in the supply of skilled women than in the supply of skilled men at a time of rising skill demand will have tended to raise the relative wage of women, but as women have also entered the market in service jobs at the low end, the impact on their average relative wage is ambiguous. This potential heterogeneity motivates our changes in the distribution of wages of women relative to men.

During the sample period, the median wage gap remained stable at about 10 percent, but there was considerable heterogeneity in the evolution of the gender wage gap across the wage distribution, with much stronger convergence in the lower and upper ends of the distribution. What is possibly most remarkable is that the wage gap at the 90th percentile, which was almost 20 percent in 1990, was more or less eliminated by 2012. Between the 1990s and the 2000s, the gender wage gap also narrowed at the 10th percentile, from 40 to 30 percent. This is notable given that previous studies have highlighted a widening of the gender wage gap in the 1990s when the share of women in low-end jobs increased (see Section 4).

Trends in the gender gap at the tails of the wage distribution are mirrored in trends in the gender education gap. There were substantial declines in the gender wage gap among individuals with less than high school (low end) and those completing college (high end), alongside no change in the gender wage gap among workers with completed high school (middle level). There were concomitant increases in the share of all jobs classified as brain-intensive rather than brawn-intensive, a common feature of structural change associated with SBTC. This increase in employment in brain-intensive occupations was entirely absorbed by women and, in particular, educated women. The share of women with college degrees in brain-intensive occupations increased sharply, from 11 percent at the start of the 1990s to 22.6 percent at the end of the decade. There was a large wage premium to brain-intensive occupations conditional upon education (in fact the marginal return to being in a brain-intensive occupation conditional upon education was similar to the return to education conditional upon occupation), and this return increased for women in the 2000s, whilst declining for men. The gender wage gap was larger in brawny occupations consistent with a comparative advantage for men in such occupations, but it fell more sharply in brain-intensive occupations. In brawny occupations, the wage gap fell from about 42 percent at the beginning of the 1990s to about 24 percent in 2012 while, in brain-intensive occupations, the gender gap in mean wages fell from 32.7 percent to 5.8 percent.

Our analysis is descriptive, and does not account for selection of women into the workforce, but the patterns we uncover provide a rich set of stylized facts for future research on gender wage gaps in Mexico or the effects of structural economic change on wages, more generally. The Mexican experience may be argued to be of particular interest as it is a country in transition to being a rich economy and women's labor force participation rate is low despite a strong trend. Also, while trade liberalization, skill-biased technical change and the gender wage gap in Mexico have probably been studied more extensively than in any other country, this literature has tended to conclude that there has been no gender convergence in Mexico. We describe previous studies of Mexico in the discussion section following the results, where we also indicate how we reach substantively different conclusions by studying the upper tail of the wage distribution and also because our sample period extends through the 2000s, when the narrowing of wage gaps between men and women occurred.

The remainder of this paper is as follows. Section 2 describes trends in the gender wage gap in Mexico in the last two decades, alongside trends in the educational attainment and occupational composition of the workforce by gender. Section 3 shows gender-specific estimates of a Mincerian wage equation for wages at the mean and at the 10th and 90th percentiles, which describe returns to characteristics, occupation, and sector. Section 4 sets the study in the context of a recent literature on trade liberalization and gender wage gaps in Mexico and Section 5 concludes.

2. TRENDS IN WAGES, EDUCATIONAL ATTAINMENT AND LABOR FORCE PARTICIPATION BY GENDER

2.1. Data

In this section we identify the key stylized facts. We utilize data from the Encuesta Nacional de Ingresos y Gastos (ENIGH), a nationally representative household survey collected by the Instituto Nacional de

Estadistíca y Geografía (INEGI), that has been fielded since 1984. From 1992 onward, the ENIGH was collected biannually. We used all waves between the years 1989 and 2012. The data contain information on labor force participation in the last week, net monetary remuneration in the main occupation in the last month, and usual hours worked per week in the main occupation for all household members over the age of 12. These variables were used to construct hourly wages, which is our main focus of analysis. We drop individuals who report a zero wage income; i.e., we condition upon employment. We focus upon wages conditional upon employment and we describe education and occupation for the employed sample without adjusting for selection into employment. However we do present the underlying trends in women and men's labor force participation and employment. We restricted the sample to individuals aged 25−55 at the survey date in order to capture adults that had completed post-graduate education but were not old enough to face any substantial risk of retirement or ill-health.

2.2. The Gender Wage Gap

Fig. 1 plots the mean of the logarithm of real wage rates by gender during 1989−2012. The wage profiles for men and women show a broadly similar trend, falling through the 1990s and rising in the 2000s, with the fall being greater for women in the 1990s and the rise being greater for women in the 2000s, creating a reversal of the gender wage gap.[2] Towards the end of the 2000s, wages show a decline consistent with the global economic crisis of 2008−2009 (Freije, Lopez-Acevedo, & Rodriguez-Oreggia, 2011). On average, the onset of the Great Recession in 2008 hurt women more than men, but this was entirely among individuals with less than high school education, and so will have tended to contribute to a slowdown of the narrowing of the gender wage gap after 2008 but only at the bottom of the wage distribution.[3]

2. During 1989−1999, mean real wages for women declined by 22 log points for women and 18 log points for men, while in 2000−2012, mean real wages increased by 10 log points for women and declined by 3 log points for men.

3. At the beginning of the 1990s, men earned 22.2 percent more on average than women, and this difference increased to about 28 percent by the year 2000. At this point, a different pattern started to emerge and throughout the last decade the mean gender wage gap declined. By 2012, it had narrowed to about 12.4 percent. Most of the increases in the wage gap during the 1990s were at low-wage levels; the gender wage gap for wages at the 10th percentile increased

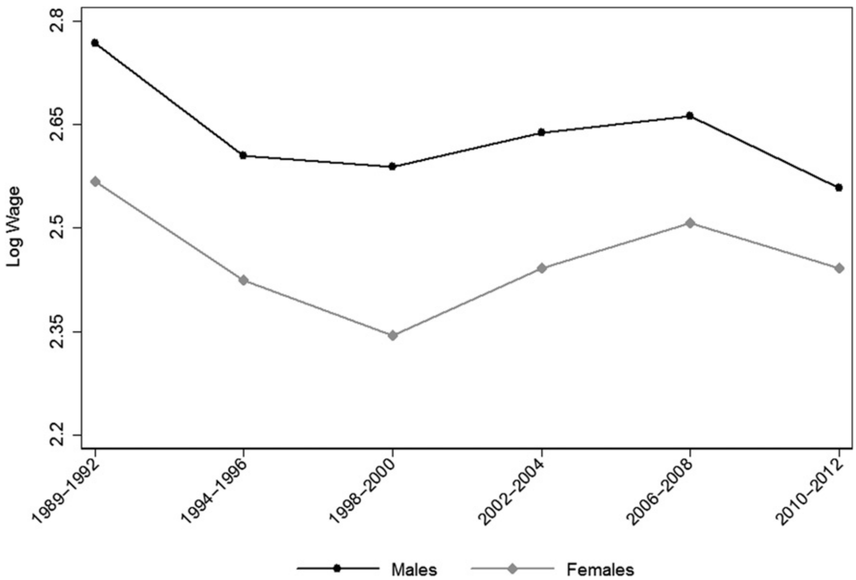

Fig. 1. Evolution of Mean Real Wages by Gender. *Notes*: Population between ages 25 and 55. *Source*: Author's calculation based on ENIGH.

The evolution of the gender wage gap is summarized in Fig. 2, which plots the gap at the mean and at the 10th, 50th, and 90th percentiles of the wage distribution. Two key stylized facts emerge from this figure. First, as discussed in Section 1, the gender wage gap at the mean was halved between 1989 and 2012, there was no change in the wage gap at the median, and there were large declines at the 10th and 90th percentile of the wage distribution. Second, declines in the gender wage gap started to occur after 2000.

Fig. 3 further explores these stylized facts, plotting the inter-decadal growth in wages (the difference in the average log wage in the 1990s and the 2000s) in the left panel and and inter-decadal changes in the

by 23 log points during the 1990s, while the median increase was only 5.3 log points. At the top end of the distribution, the wage gap remained largely unchanged in the 1990s. During the 2000s, the gender wage gap closed at both the upper and lower tails. At the 10th percentile, it fell by 38 log points between the years 2000 and 2012, recovering the lost ground of the previous decade. At the 90th percentile, the gender wage gap fell by 18 log points in the 2000s, a decline that has eliminated the gender wage gap.

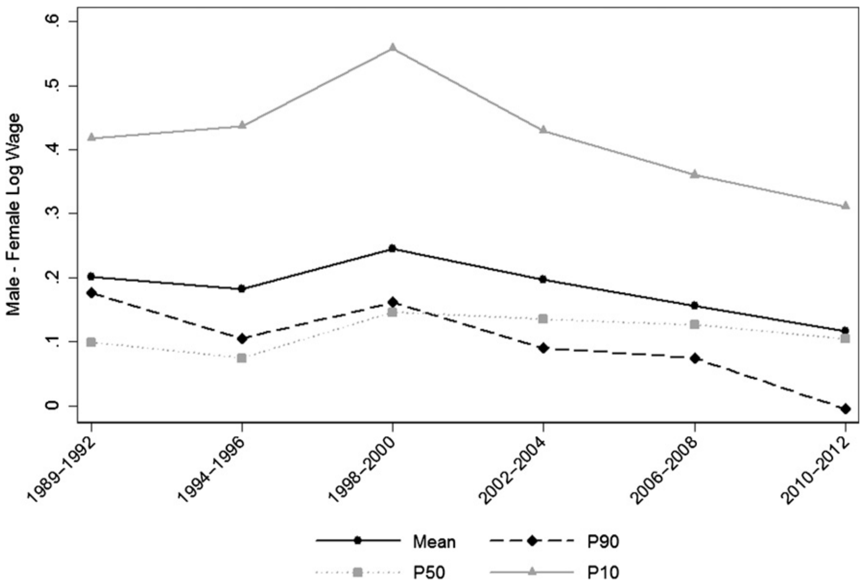

Fig. 2. Trends in the Gender Wage Gap at Different Points of the Wage Distribution. *Notes*: Population between ages 25 and 55. *Source*: Author's calculation based on ENIGH.

gender wage gap in the right panel, both by decile of the wage distribution. As expected from Fig. 2, the left panel shows that female wage growth between the 1990s and 2000s dominated male wage growth at the upper and lower parts of the wage distribution. Although we present statistics for the 10th and 90th percentile, this figure makes clear that the narrowing of the wage gap occurred everywhere below the 40th and above the 70th percentile, being most marked at the ends of the distribution. Male wages actually fell in the upper part of the wage distribution, which may be explained by the differential negative impact of the 2008−2009 financial crisis on formal sector jobs in industries traditionally dominated by men, such as construction, manufacturing, agriculture, and mining (Freije et al., 2011).

Another stylized fact that emerges from the plot is that inequality in wages within each group declined in the 2000s: wage growth for men and women was decreasing by wage decile, being larger at the bottom of the distribution and smaller at the top. In this way, the Mexican case illustrates a narrowing of the gender wage gap alongside a narrowing of wage inequality

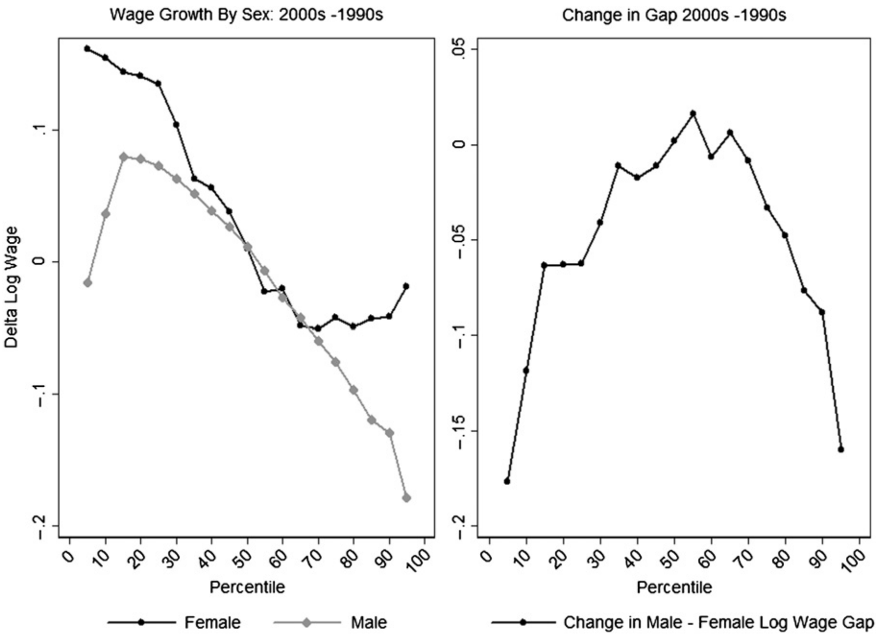

Fig. 3. Interdecadal Wage Growth and Changes in the Gender Wage Gap by Decile. *Notes*: Log real wages in each percentile are estimated for the periods 1989–2000 and 2002–2012 by pooling the respective surveys. The figures show the change in the log wage by percentiles between the final and initial period. *Source*: Author's calculation based on ENIGH.

within each gender group. The right hand panel of Fig. 3 may be thought to frame this paper. It transforms the data in the left panel to display changes in the gender wage gap by wage decile. This exhibits a clear bell-shape, with a flat middle and a significant dip at both tails.

It is clear from Fig. 2 that the reduction in the gender wage gap across the distribution started after the year 2000 and continued all the way to 2012 where our sample ends. Given that our data are bi-annual, the first post-2000 observation we have is 2002. To test for a trend break in the gender wage gap we pooled observations for male and female workers, using the log real wage as the dependent variable, and including year, period (dummy indicating post-2002 years) and sex as covariates, along with all of their possible interactions; see Table 1. The estimation is done by OLS in the case of the mean, and by conditional quantile regression in the case of

Table 1. Trend Break Regressions. Dependent Variable: Log Real Wages.

	Mean	P10	P90
Year	−0.109***	−0.155***	−0.066***
	(0.014)	(0.017)	(0.013)
Year × Male	0.023	0.074***	0.011
	(0.016)	(0.020)	(0.016)
Post 2002 × Year	0.107***	0.188***	0.036***
	(0.017)	(0.021)	(0.016)
Post 2002 × Year × Male	−0.062**	−0.136***	−0.056**
	(0.020)	(0.025)	(0.020)
Male	0.164***	0.330***	0.118**
	(0.036)	(0.046)	(0.036)
Post 2002	−0.189**	−0.339***	−0.023
	(0.058)	(0.074)	(0.058)
Post 2002 × Male	0.188**	0.350***	0.159**
	(0.070)	(0.092)	(0.072)
Constant	2.662***	1.424***	3.869***
	(0.030)	(0.039)	(0.030)
Observations	198,935	198,935	198,935

Source: Author's calculation based on ENIGH.
Notes: estimation for the mean is done by OLS; for the 10th and 90th percentiles we do a conditional quantile regression.
Standard errors in parentheses.
Post 2002 corresponds to a dummy variable that takes the value of one for years after 2002 (inclusive), and zero otherwise.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.001$.

the 10th and 90th percentiles. The estimated coefficient of interest, the triple interaction between year, period, and a male dummy, is negative and statistically significant in all cases, which confirms that after 2002, there was a significant decline in the gender wage gap in Mexico, with real wages for men increasing (decreasing at the 90th percentile) by a lesser (greater) extent than for women.

It is useful to analyze the main effects and the double interaction terms in Table 1. The coefficient on "year" indicates the trend in women's wages in the 1990s, which is negative across the distribution and twice as strong at the 10th percentile than at the 90th. The coefficient on "year*male" is positive but smaller, indicating that wage growth for men also declined in the 1990s, but significantly less than for women. So, in the 1990s, women's relative wage deteriorated and this was most clear for low-wage women. The coefficient on "post-2002*year" indicates the change in the trend in wages for women after the year 2000, which is significantly positive and which suggests complete reversal of the trend in the 1990s at the mean and at the 10th percentile, and a half-way recovery at the 90th percentile. The coefficient of interest, post-2002*year*male, indicates that the recovery of the 2000s was significantly larger for women's wages and that, at each of the three points of the distribution, the trend in the gender gap was reversed, leading to significant narrowing of the gap in the 2000s.

2.3. Education

We now look at trends in education in order to illuminate heterogeneity in evolution of the gender wage gap across the distribution. So as to investigate whether convergence in wages was accompanied by convergence in schooling levels, Fig. 4 presents gender gaps in the shares of women and

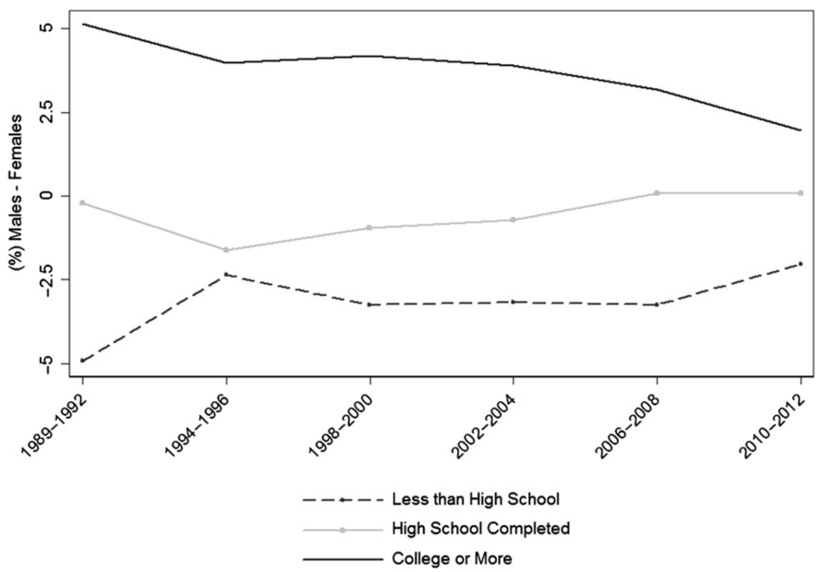

Fig. 4. Gender Gaps in Educational Attainment by Level. *Notes*: Each line corresponds to the difference between the male and female share of population between ages 25 and 55 with the respective education level. *Source*: Author's calculation based on ENIGH.

men who have (1) not yet finished a high school degree, (2) completed high school, and (3) completed a college degree. The figure demonstrates convergence in educational attainment across genders, particularly at higher levels of schooling. At the beginning of the 1990s, almost 10 percent of men between the ages of 25 and 55 had a college degree, compared with only 5 percent of women. By the end of 2012, 15 percent of men had completed college as opposed to 13.3 percent of women. Similarly, the share of women not finishing high school was 81.7 percent in 1990, declining to 68 percent by the end of the 2000s. The fraction of men not completing high school fell from 76 to 66 percent over the same time frame.

Fig. 5 links the trends in educational attainment by gender to the trends in the gender wage gap described in Figs. 2 and 3, plotting the mean wage gap for each of the three education groups. The gender wage gap for college-educated workers remained stagnant during the 1990s, but declined sharply after 2002. Between the years 2000 and 2012, the difference in mean wage earnings for workers with tertiary schooling degree was reduced by 22.2 log points in favor of women. A similar pattern is evident at lower levels of education: Men with less than a high school education at the start

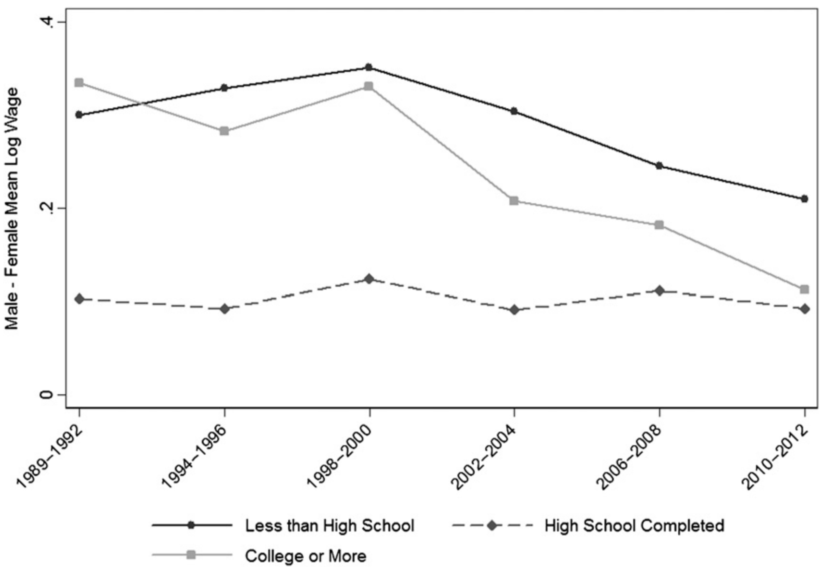

Fig. 5. Gender Wage Gaps by Educational Level. *Notes*: Population between ages 25 and 55. *Source*: Author's calculation based on ENIGH.

of the 1990s were earning 35 percent more on average than their female counterparts, and by the end of the 2000s, this difference fell to 21 log points. For workers with intermediate levels of education (high school degree), the mean gap remained unchanged in our sample period. Overall, wages for women at the two ends of the education spectrum increased relative to those for men (and relative to wages for women in the middle of the distribution), which lines up our observation of a narrowing of the gender gap in wages that occurred at the two ends of the wage distribution.

2.4. Occupation

We classify occupations as brawn versus brain-intensive, as this is relevant to assessing the hypothesis that a biologically determined comparative advantage of men in brawn-intensive tasks implies that structural change that lowers the share of brawny jobs in the economy increases opportunities for women and raises the relative return to their skills. The ENIGH uses the national occupation classification system (Clasificación Mexicana de Ocupaciones (CMO)) which bears some important differences from commonly used systems of classification at disaggregate levels, but has maintained comparability with the International Standard Classification of Occupations (ISCO) at the 1-digit level. Exploiting this comparability, we divide the aggregate occupational groups into brain-intensive and brawny jobs following Vogl (2014), who classifies 1-digit occupations in the Mexican Family Life Survey into brain intensive and brawn intensive jobs on the basis of measures of the intelligence aptitude and strength requirements of occupations derived from the U.S. Dictionary of Occupational Titles (DOT). Brain-intensive occupations include professionals, managers, technicians, and clerks; while brawn-intensive occupations include agricultural workers, jobs in commerce, services, craft and trades, and plant and machine operators.

We examine the evolution of the share of brain-intensive occupations, overall and by education level, and the wage gap by occupation. Fig. 6 depicts the share of the total population of workers, men and women, employed in brain-intensive jobs. This share was fairly stable during the 1990s at about 25.4 percent, but began to increase after 2002, rising to about 27.7 percent by the year 2012. This increase was driven by women. The share of males in brain-intensive occupations remained stable across the two decades (with a small decline by the end of the 1990s and a recovery thereafter), while the share of women increased from 10.4 to 12.4 percent,

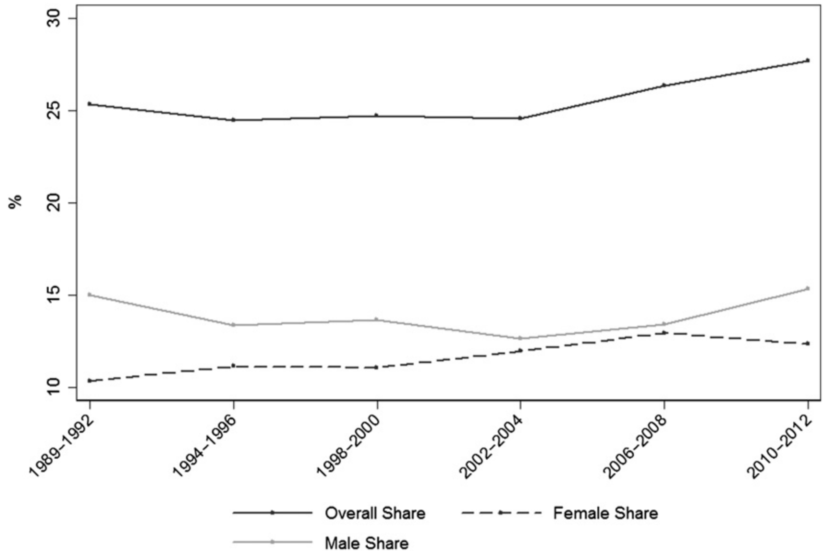

Fig. 6. Share of the Workforce in Brain-Intensive Occupations: Overall and by Gender. *Notes*: Shares of overall occupied population between ages 25 and 55. *Source*: Author's calculation based on ENIGH.

with the bulk of the increase in the 2000s. This suggests that structural changes in the economy favored women as a result of an increasing demand for skill after 2000.

Fig. 7 presents trends in gender-based occupational sorting by level of education. The increase in the share of workers in brain-intensive occupations is primarily driven by the movement of (college) educated women into skilled occupations. The share of women with college degrees in brain-intensive occupations increased at a remarkable pace, from 11 percent at the start of the 1990s to 22.6 percent at the end of the decade, with most of this increase occurring after 2002. While the share of men with college degrees in brain-intensive occupations is greater, it did not change as much, rising from 22 percent in the early 1990s to 25.5 percent at the end of the 2000s. So, overall, women almost fully caught up with men in terms of the share of college-educated workers who hold brain-intensive jobs.

We also consider the decadal means available among the summary statistics in Table 2 to study the sorting of workers across occupations by education. We see that almost 80 percent of women with a high school or college degree work in brain intensive jobs, compared with 61 percent of men. As many as 92 percent of college educated women were in brain-

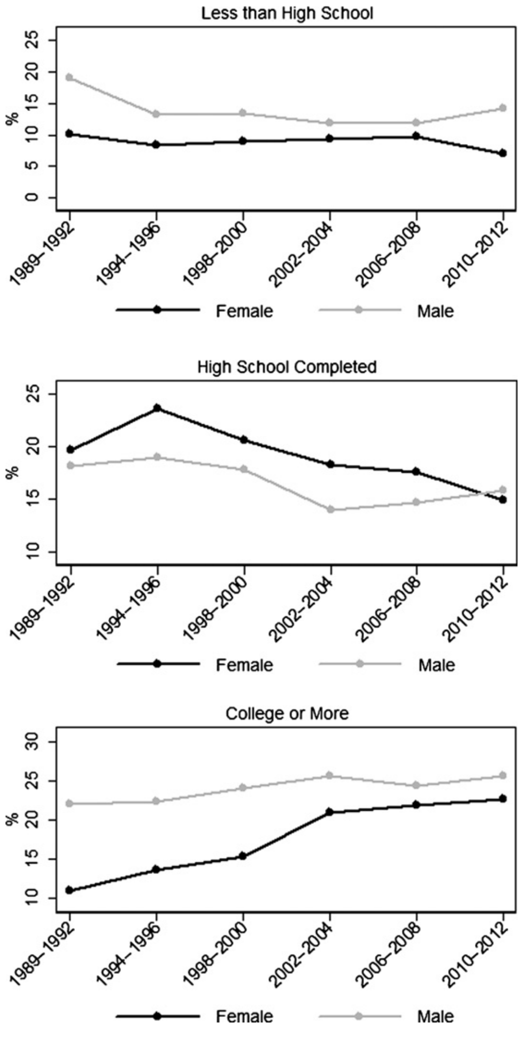

Fig. 7. Share of the Workforce in Brain-Intensive Occupations: By Gender and Education. *Notes*: The lines correspond to the share of each group within brain occupations. *Source*: Author's calculation based on ENIGH.

intensive occupations, compared with 79 percent of men. So the sharp convergence of college-attainment among male and female workers led to women meeting most of the growth in demand for brain-intensive jobs. In order to assess education-based sorting into occupation, we estimated a

Table 2. Sample Summary Statistics (Means).

	Female T0	Male T0	Female T1	Male T1	P-Val DiD
Mean Log Wage	2.408	2.686	2.439	2.651	0.000
	(1.159)	(1.002)	(1.082)	(0.976)	
Log Wage 10th percentile	0.966	1.598	1.125	1.640	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	
Log Wage 25th percentile	1.775	2.116	1.912	2.175	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	
Log Wage 75th percentile	3.183	3.250	3.123	3.173	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	
Log Wage 90th percentile	3.780	3.920	3.740	3.816	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	
Education and experience (shares)					
Less than high school	0.692	0.750	0.664	0.696	0.000
	(0.462)	(0.433)	(0.472)	(0.460)	
High school	0.198	0.141	0.187	0.163	0.000
	(0.399)	(0.348)	(0.390)	(0.369)	
College or more	0.110	0.109	0.149	0.142	0.061
	(0.312)	(0.312)	(0.356)	(0.349)	
Years of education	7.761	7.691	8.999	8.922	0.896
	(5.220)	(5.069)	(4.850)	(4.716)	
Age	38.400	38.661	39.927	39.952	0.008
	(7.968)	(8.278)	(7.977)	(8.218)	
Experience	24.639	24.970	24.928	25.030	0.040
	(10.569)	(10.498)	(10.034)	(9.859)	
Brain versus Brawn (shares)					
Brain occupations	0.313	0.212	0.291	0.229	0.000
	(0.464)	(0.409)	(0.454)	(0.420)	
Brain × Less than high school	0.067	0.059	0.057	0.057	0.002
	(0.249)	(0.235)	(0.231)	(0.231)	
Brain × High school	0.146	0.066	0.107	0.064	0.000
	(0.353)	(0.249)	(0.308)	(0.245)	
Brain × College or more	0.101	0.087	0.128	0.109	0.081
	(0.301)	(0.282)	(0.334)	(0.311)	
Fertility					
Number of children	2.091	2.385	1.610	1.811	0.000
	(1.643)	(1.732)	(1.344)	(1.411)	
Sectors (shares)					
Agriculture	0.097	0.212	0.053	0.157	0.007
	(0.296)	(0.408)	(0.223)	(0.364)	
Manufacturing	0.165	0.177	0.151	0.174	0.014
	(0.371)	(0.382)	(0.358)	(0.379)	
Construction	0.004	0.111	0.007	0.132	0.000
	(0.064)	(0.314)	(0.081)	(0.339)	

Table 2. (*Continued*)

	Female T0	Male T0	Female T1	Male T1	P-Val DiD
Commerce	0.299	0.228	0.345	0.227	0.000
	(0.458)	(0.419)	(0.475)	(0.419)	
Electricity, gas, water and transport	0.014	0.082	0.009	0.089	0.000
	(0.117)	(0.274)	(0.094)	(0.285)	
Finance and professional services	0.038	0.048	0.053	0.060	0.139
	(0.191)	(0.214)	(0.225)	(0.238)	
Public administration and defense	0.039	0.050	0.049	0.062	0.612
	(0.193)	(0.217)	(0.217)	(0.241)	
Education, health and personal services	0.221	0.086	0.212	0.092	0.000
	(0.415)	(0.280)	(0.409)	(0.290)	
Domestic services	0.123	0.006	0.121	0.006	0.301
	(0.329)	(0.079)	(0.326)	(0.079)	
Observations	15,379	38,260	37,859	65,286	

Table 3. Probability of Working in Brain Occupation, OLS Regression. Dependent Variable: Brain Occupation Dummy.

	Female T0	Male T0	Female T1	Male T1
High school	0.363***	0.300***	0.289***	0.230***
	(0.016)	(0.011)	(0.010)	(0.008)
College or more	0.474***	0.544***	0.470***	0.526***
	(0.021)	(0.014)	(0.014)	(0.009)
Constant	0.102***	0.025	0.110***	0.028*
	(0.025)	(0.018)	(0.020)	(0.015)
Observations	15,379	38,260	37,859	65,286
R^2	0.655	0.445	0.599	0.426

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989−2000; period T1 corresponds to 2002−2012.
Standard errors in parentheses.
Sectoral, fertility, and potential experience variables included but not reported.
$*p < 0.10$, $**p < 0.05$, $***p < 0.001$.

simple linear probability model regressing a dummy for being employed in a brain-intensive occupation on education; see Table 3. The marginal return to a college degree measured in terms of the probability of working in a brain occupation is slightly larger for men than for women, but remained stable for women between the 1990s and the 2000s and it decreased for men.

Fig. 8 presents the evolution of the mean gender wage gap for brain-intensive and brawn-intensive occupations. The gender wage gap is higher in brawny occupations; it fell in both brawny and brain-intensive occupations, but more steeply in brain-intensive occupations. Men in brawny occupations at the beginning of the 1990s were earning 42.1 percent more on average than women and, by 2012, the difference had narrowed to 23.6 percent. In brain-intensive occupations, the gap in mean wages fell from 32.7 percent to 5.8 percent during the same period. The bulk of these decreases occurred in the 2000s. The larger gender wage gap in both periods in brawn-intensive occupations is consistent with men having a comparative advantage in brawny tasks. The larger drop in the gender wage gap in brain-intensive occupations is consistent with the larger growth of women with college degrees in these occupations relative to the corresponding growth for men that we noted above.

Fig. 9 shows the evolution of mean wages for men and women within education levels and for both brain-intensive and brawn-intensive occupations. The figure is re-scaled so that the mean log wage for years 1989–1992 equals zero. Mean wages for males with at least a high school

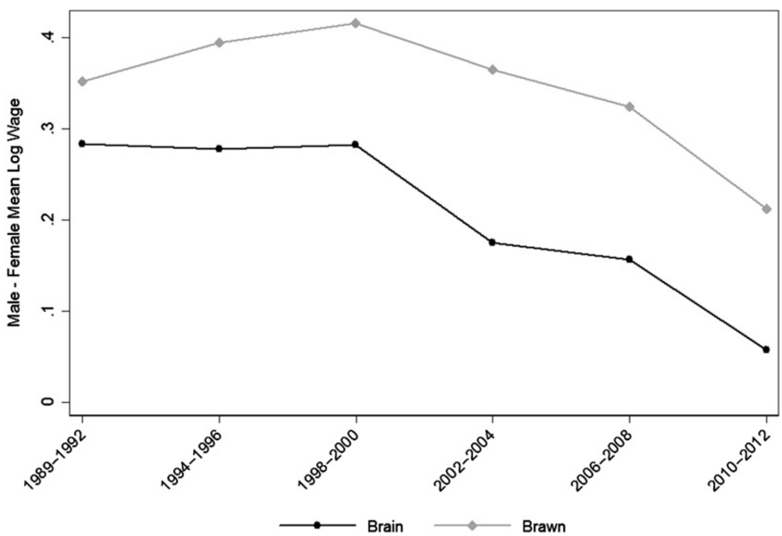

Fig. *8*. Gender Wage Gap by Occupation. *Notes*: Population between ages 25 and 55. *Source*: Author's calculation based on ENIGH.

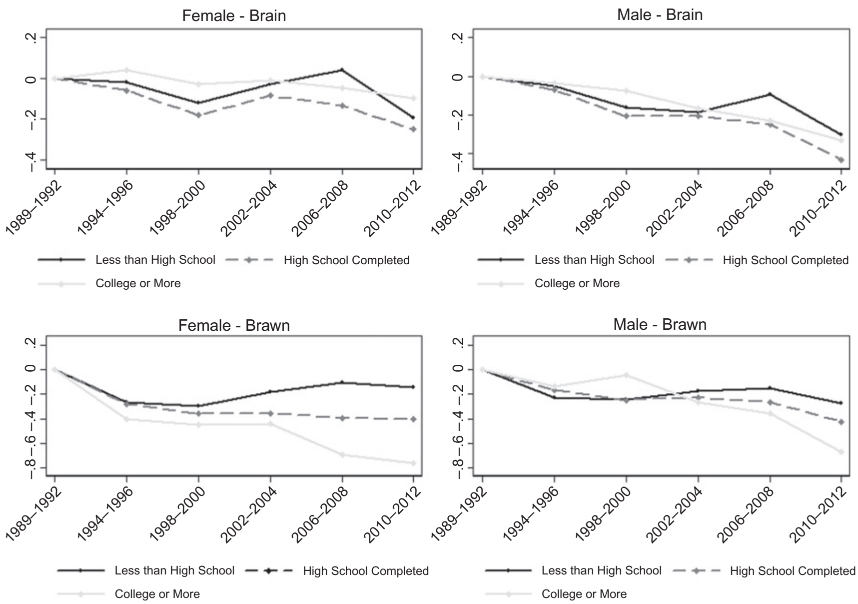

Fig. 9. Wage Trends by Sex, Occupation and Education Level: Indexed Mean Log Wage. *Notes*: Population between ages 25 and 55. *Source*: Author's calculation based on ENIGH.

degree in brain-intensive jobs fell sharply throughout the full period, with loses of about 30 percent, while mean wages for women with similar education levels remained much more stable. The evolution of mean wages in brawn-intensive occupations was more similar for men and women with at least a high school degree, and shows important declines in mean real wages of about 50 percent in both cases. For workers with less than a high school degree, the evolution of mean wages was more stable, and even presented some small increments for women during the 2000s.

If we focus not on mean wages within educational and occupational groups but on the upper and lower tails of the distribution, the substantive message remains the same (see Figs. 10 and 11). Among males whose earnings were at the the 90th percentile and who work in brain-intensive occupations, wages declined significantly, irrespective of their education level. Females in similar occupations, on the other hand, sustained their earning capacity and even experienced a small increment in wages during the 2000s. At the 10th percentile of the distribution, the

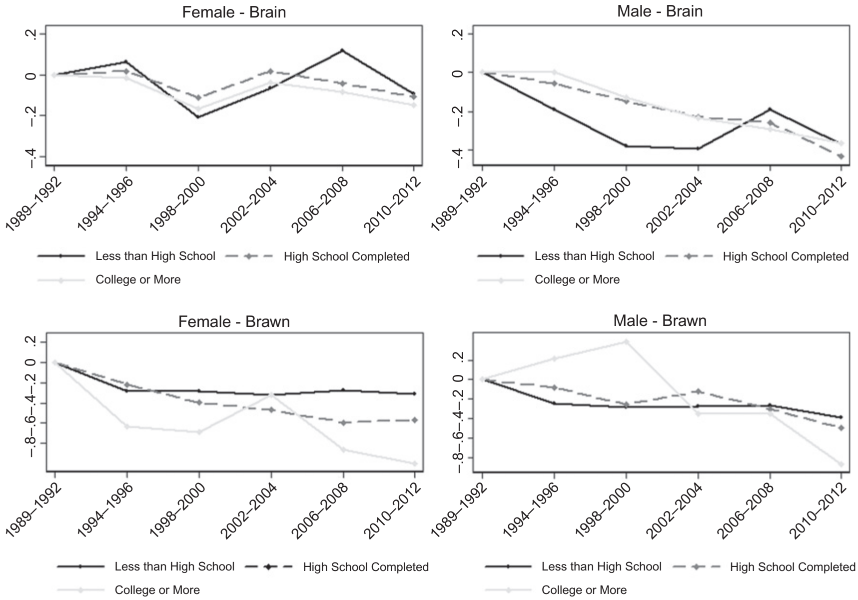

Fig. 10. Wage Trends by Seopx, Occupation and Education Level: Indexed 90th Percentile of Log Wage. *Notes*: Population between ages 25 and 55. *Source*: Author's calculation based on ENIGH.

evolution of wages was similar at all education levels for men and women in brain-intensive jobs; while in brawn-intensive jobs women saw their wages rise during the 2000s by 2.6 percent, compared with a 16 percent decline for males.

2.5. Labor Force Participation and Employment Rates

Fig. 12 displays the aggregate trend in labor market participation for men and women. There was a dramatic increase in female labor force participation from 36 percent to 57 percent over the study period. The participation rate for men remained stable, declining slightly. Fig. 13 illustrates that there was an increase in female labor force participation at all levels of education, but that it was most prominent among college-educated women.

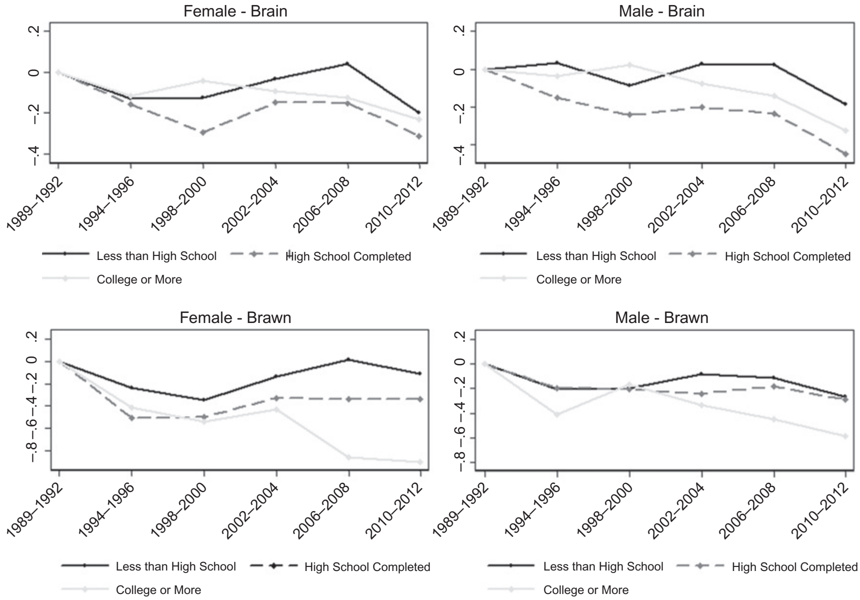

Fig. 11. Wage Trends by Sex, Occupation and Education Level: Indexed 10th Percentile of Log Wage. *Notes*: Population between ages 25 and 55. *Source*: Author's calculation based on ENIGH.

2.6. *Summary of Trends*

To summarize our findings so far, we show that the median gender wage gap in Mexico persisted at a fairly constant level through the last two decades but that the mean gap declined significantly and that these average tendencies conceal an even more substantial narrowing of the gap at both tails of the wage distribution during the 2000s. Previous studies have documented a rise in the gender wage gap in the 1980s and either a rise or a slight narrowing in the 1990s and 2000s (Section 4). Highly educated women, in particular, women with college education, selected disproportionately into brain-intensive occupations in the 2000s, and the gender wage gap narrowed more for brain-intensive than for brawn-intensive jobs. The trends in education, occupation, and wages by gender are consistent with structural economic changes leading to increases in the demand for skilled labor that, being aligned with women's comparative advantage in brain-intensive tasks, drive down the gender wage gap.

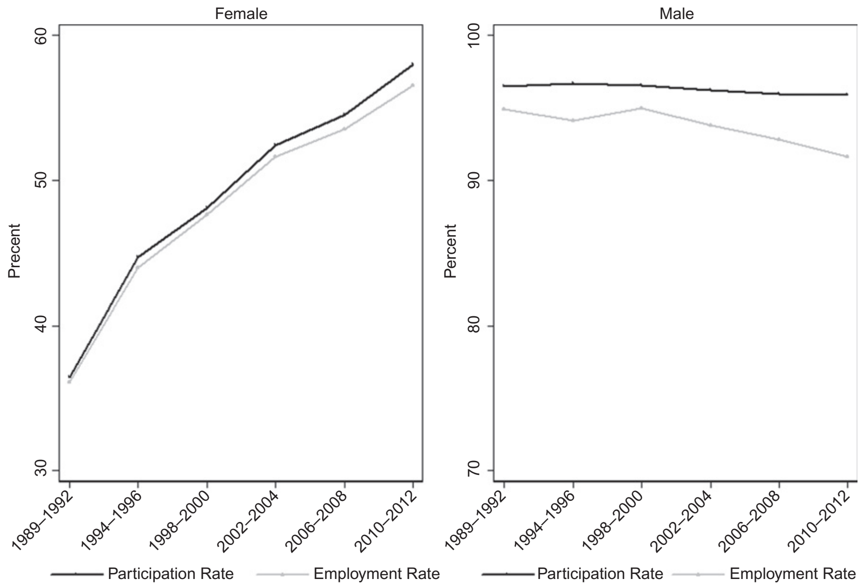

Fig. *12*. Labor Force Participation and Employment by Gender. *Notes*: Shares of overall population between ages 25 and 55. *Source*: Author's calculation based on ENIGH.

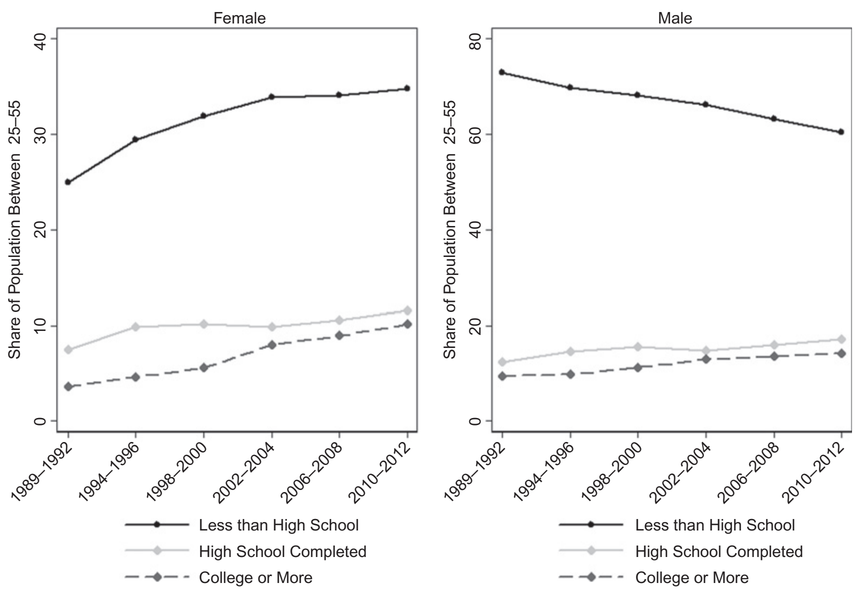

Fig. *13*. Employment Rates by Gender and Education. *Source*: Author's calculation based on ENIGH.

3. WAGE EQUATIONS

3.1. Procedure

In the preceding section we analyzed trends in education and occupation of men and women, which make clear that there was considerable compositional change in the work force between the 1990s and 2000s and, in particular, a large increase in the share of skilled women. In this section we present wage equation estimates for five points of the wage distribution and for the 1990s and 2000s to assess the inter-decadal change in the returns to education and occupation for men versus women. We estimate the parameters of the wage function from estimation of a traditional Mincer equation which takes the form:

$$w_{itg} = \beta_{0tg} + \sum_{j=2}^{3} Education_{itg}^{(j)} \beta_{1tg}^{(j)} + Experience_{itg} \beta_{2tg} + Experience_{itg}^{2} \beta_{3t}$$
$$+ Fertility_{itg} \ldots + Brain_{itg} \beta_{4tg} + \sum_{s=2}^{9} Sector_{itg}^{(s)} \beta_{5tg}^{(s)} + \varepsilon_{itg}$$
$$\text{for } t = 0, 1 \text{ and } g = m, f \quad (1)$$

where w_{itg} is the log real hourly wage of individual i at period t who is of gender g. $Education_{itg}^{(j)}$ is the maximum level of education attained by the individual, corresponding to (1) less than high school completed, (2) high school completed/college incomplete; and (3) college completed or more. $Experience_{itg}$ is the potential experience (defined as age − years of education − 6) for each agent. $Fertility_{itg}$ corresponds to the number of sons and daughters below 18 years of age and that live in the house of each individual. $Brain_{itg}$ is a dummy variable that takes the value of one if the individual works in *brain* occupation and zero otherwise; $Sector_{itg}^{(s)}$ corresponds to dichotomous indicators for the different sectors (see summary statistics in Table 2); and ε_{itg} is the error term that is assumed to have zero conditional mean.

3.2. Sample Summary Statistics by Period

Sample characteristics are presented in Table 2 by period, the two periods being the 1990s (T0) and the 2000s (T1). Amongst the employed, women tend to have higher levels of education attainment than men and this is most clear for college attainment. The share of women with a college degree increased by 36 percent between the two periods (from 11.0 percent to 14.9 percent). The fraction of men completing college also increased, but by a smaller 30 percent. A higher share of women than men participated in brain-intensive occupations in both periods. Women's share declined slightly from 31.3 to 29.1 percent, while men's share increased from 21.2 to 22.9 percent. But this aggregate change conceals how the distribution of skills within brain-intensive occupations evolved between the periods. Specifically, the share of women working in brain occupations who had attained a college degree increased by 27 percent (from 10.1 percent to 12.8 percent), while the corresponding increase was 20 percent for men.

3.3. Wage Equation Estimates – Mean

The OLS estimates of the (mean) wage equation (Table 4) show that the college degree premium, was higher for men (100 percent in the 1990s) than for women (80 percent in the 1990s) in both periods; it declined for both genders, but by a greater proportion for men (falling to 87 percent for men and 78 percent for women). The premium attached to a high school degree, compared to leaving school before finishing this level, was very similar for men and women and it declined similarly for both. In the 1990s, high school graduates earned around 42 percent more on average than their counterparts without a high school degree; and this advantage declined during the last decade to about 35 percent. The return to experience increased by about 50 percent for women while remaining stable for men so that, in the 2000s, the return to experience for women was very similar to that for men.

The wage return to being in a brain-intensive occupation was, in both periods, greater for women and it declined for men while rising for women. During the 1990s, women working in brain-intensive occupations earned 52 percent more on average than women working in a brawny occupation conditional upon their education, potential experience, and sector of employment. This difference increased during the 2000s to about 55 percent. For men the wage premium from working in brain-intensive occupations declined from 43 percent to 37 percent.

3.4. Wage Equation Estimates – Quantile

Tables 5 and 6 present unconditional quantile regressions for the 10th and 25th wage percentile by sex and period. There are some dramatic

Table 4. OLS Regression by Sex and Period. Dependent Variable: Log Real Wages.

	Female T0	Male T0	Female T1	Male T1
Education				
High school	0.422***	0.457***	0.353***	0.342***
	(0.035)	(0.020)	(0.022)	(0.015)
College or more	0.805***	1.024***	0.781***	0.873***
	(0.043)	(0.033)	(0.030)	(0.019)
Brain versus Brawn				
Brain occupations	0.525***	0.430***	0.555***	0.373***
	(0.034)	(0.022)	(0.024)	(0.015)
Potential experience				
Experience	0.022***	0.035***	0.034***	0.031***
	(0.005)	(0.003)	(0.003)	(0.002)
Experience Sq. (/100)	−0.052***	−0.068***	−0.076***	−0.067***
	(0.009)	(0.006)	(0.006)	(0.005)
Fertility				
Number of children	−0.048***	−0.014***	−0.050***	−0.023***
	(0.007)	(0.004)	(0.006)	(0.004)
Constant	1.203***	1.592***	0.878***	1.507***
	(0.076)	(0.042)	(0.062)	(0.035)
Observations	15,379	38,260	37,859	65,286
R^2	0.359	0.352	0.364	0.348

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989−2000; period T1 corresponds to 2002−2012.
Standard errors in parentheses.
Sectoral variables included but not reported.
*$p<0.10$, **$p<0.05$, ***$p<0.001$.

developments here. At the 10th percentile, the returns to high school and college education are large and increasing over time for both men and women, and are much greater for women by the second period. For instance, the premium of acquiring a college degree in the 2000s was almost 40 percent for women and just under 21 percent for men. The return to being in a brain-intensive rather than a brawn-intensive job (conditional upon education, experience, and sector) was also substantially larger for women in both periods. The return to experience was much greater for men in the 1990s but the returns for women rose sharply and had overtaken returns for men in the second period.

Even though returns to brain-intensive occupations at the 10th percentile were declining for women and increasing for men, the effect of this

Table 5. Unconditional Quantile Regression by Sex and Period, 10th Percentile. Dependent Variable: RIF Log Real Wages.

	Female T0	Male T0	Female T1	Male T1
Education				
High school	0.113	0.116***	0.414***	0.191***
	(0.080)	(0.019)	(0.053)	(0.024)
College or more	0.083	0.106***	0.399***	0.208***
	(0.074)	(0.019)	(0.059)	(0.025)
Brain versus Brawn				
Brain occupations	0.546***	0.180***	0.386***	0.192***
	(0.062)	(0.017)	(0.050)	(0.022)
Potential experience				
Experience	0.027**	0.023***	0.074***	0.039***
	(0.011)	(0.005)	(0.009)	(0.005)
Experience Sq. (/100)	−0.090***	−0.066***	−0.187***	−0.107***
	(0.023)	(0.010)	(0.020)	(0.011)
Fertility				
Number of children	−0.127***	−0.023**	−0.162***	−0.072***
	(0.022)	(0.008)	(0.019)	(0.009)
Constant	−1.378***	0.381***	−2.316***	−0.063
	(0.208)	(0.061)	(0.192)	(0.072)
Observations	15,379	38,260	37,859	65,286
R^2	0.146	0.172	0.136	0.174

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989–2000; period T1 corresponds to 2002–2012.
Standard errors in parentheses.
Sectoral variables included but not reported.
$*p<0.10$, $**p<0.05$, $***p<0.001$.

change on the wage gap at the lower tail is small given that very few low income workers of both sexes have jobs in these occupations. Table 7 shows summary statistics for workers that have earnings in the lower quartile of the wage distribution in each period. Only between 2.7 percent of females in the 1990s and 3.5 percent in the 2000s reported working in a brainy occupation. The share of males in brain-intensive jobs at the bottom end of the wage distribution is also small, with values between 2.9 during the 1990s and 4.7 in the 2000s.

At the 25th percentile, the unconditional quantile regression results continue to show an increase in the returns to education for women, going from a 25.7 to a 27.5 percent premium in the case of high school graduates (compared to workers with less than high school), and from a 25.6 to 30.9

Table 6. Unconditional Quantile Regression by Sex and Period, 25th Percentile. Dependent Variable: RIF Log Real Wages.

	Female T0	Male T0	Female T1	Male T1
Education				
High school	0.257***	0.268***	0.275***	0.237***
	(0.045)	(0.017)	(0.028)	(0.017)
College or more	0.256***	0.302***	0.309***	0.310***
	(0.044)	(0.018)	(0.029)	(0.016)
Brain versus Brawn				
Brain occupations	0.489***	0.252***	0.438***	0.236***
	(0.041)	(0.016)	(0.028)	(0.015)
Potential experience				
Experience	0.017**	0.014***	0.030***	0.018***
	(0.006)	(0.003)	(0.004)	(0.003)
Experience Sq. (/100)	−0.057***	−0.038***	−0.080***	−0.051***
	(0.012)	(0.006)	(0.008)	(0.005)
Fertility				
Number of children	−0.075***	−0.007	−0.075***	−0.023***
	(0.011)	(0.005)	(0.008)	(0.005)
Constant	0.702***	1.297***	0.705***	1.367***
	(0.091)	(0.039)	(0.067)	(0.035)
Observations	15,379	38,260	37,859	65,286
R^2	0.204	0.203	0.177	0.184

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989−2000; period T1 corresponds to 2002−2012.
Standard errors in parentheses.
Sectoral variables included but not reported.
$^{*}p<0.10$, $^{**}p<0.05$, $^{***}p<0.001$.

premium for college graduates across the two periods. For males the situation is reversed. The high school premium at the 25th percentile declined from 26.8 to 23.7 percent, while it remained stable for college educated workers. In the cases of both males and females, the premium of working in a brain-intensive occupation declined, but it continued to be much higher for women in both periods.

Moving to the upper end of the wage distribution, some differences start to appear. Table 8 shows summary statistics for workers that have wages in the upper quartile of the earnings distribution. As opposed to what was observed in the lower quartile, almost 70 percent of employed females and 55 percent of employed males work in brain-intensive occupations at this income segment, with the majority of them having attained at least a high

Table 7. Sample Summary Statistics Lower Quartile.

	Female T = 0	Male T = 0	Female T = 1	Male T = 1
Education and experience (shares)				
Less than high school	0.954	0.960	0.910	0.910
	(0.210)	(0.196)	(0.286)	(0.286)
High school	0.042	0.034	0.076	0.073
	(0.200)	(0.182)	(0.265)	(0.260)
College or more	0.004	0.006	0.014	0.017
	(0.064)	(0.075)	(0.118)	(0.130)
Years of education	4.156	4.389	5.869	6.011
	(3.523)	(3.466)	(3.813)	(3.778)
Age	39.491	39.594	40.344	40.626
	(8.150)	(8.631)	(8.369)	(8.542)
Experience	29.335	29.205	28.475	28.615
	(9.806)	(10.295)	(10.100)	(10.031)
Brain versus Brawn (shares)				
Brain occupations	0.027	0.029	0.035	0.047
	(0.162)	(0.169)	(0.183)	(0.212)
Brain × Less than high school	0.017	0.021	0.022	0.029
	(0.129)	(0.144)	(0.145)	(0.167)
Brain × High school	0.008	0.006	0.008	0.012
	(0.091)	(0.077)	(0.091)	(0.109)
Brain × College or more	0.002	0.002	0.005	0.007
	(0.042)	(0.045)	(0.070)	(0.082)
Fertility				
Number of children	2.571	2.733	1.861	2.022
	(1.886)	(1.963)	(1.516)	(1.648)
Observations	4,258	10,670	9,758	17,117

Source: Author's calculation based on ENIGH.
Notes: Period T = 0 corresponds to 1989–2000; period T = 1 corresponds to 2002–2012.

school degree. With a higher share of workers in brainy occupations, changes in the relative premium over time in these jobs become more important for explaining the evolution of the gender wage gap. For example, at the 75th percentile (see Table 9), the premium of working in a brain-intensive occupation (with respect to a brawn-intensive occupation) increased from 56.7 to 83.4 percent for women, while it declined from 60 to 56 percent for males. At the 90th percentile, the dynamics were similar although the magnitudes changed. The premium women received for working in a job in a brainy occupation went from 31 to 54 percent between the 1990s and 2000s, while that for men declined from 61 to 56 percent.

Table 8. Sample Summary Statistics Upper Quartile.

	Female T = 0	Male T = 0	Female T = 1	Male T = 1
Education and experience (shares)				
Less than high school	0.305	0.401	0.273	0.333
	(0.461)	(0.490)	(0.445)	(0.471)
High school	0.364	0.251	0.289	0.237
	(0.481)	(0.434)	(0.453)	(0.425)
College or more	0.330	0.348	0.438	0.429
	(0.470)	(0.476)	(0.496)	(0.495)
Years of education	12.216	11.961	13.162	12.891
	(4.780)	(5.117)	(4.259)	(4.489)
Age	37.974	39.382	40.096	40.785
	(7.700)	(7.963)	(7.750)	(7.799)
Experience	19.758	21.421	20.934	21.893
	(9.799)	(9.865)	(9.241)	(9.135)
Brain versus Brawn (shares)				
Brain occupations	0.690	0.512	0.698	0.552
	(0.462)	(0.500)	(0.459)	(0.497)
Brain × Less than high school	0.069	0.069	0.068	0.066
	(0.253)	(0.254)	(0.251)	(0.249)
Brain × High school	0.310	0.152	0.225	0.131
	(0.463)	(0.359)	(0.418)	(0.337)
Brain × College or more	0.312	0.290	0.405	0.355
	(0.463)	(0.454)	(0.491)	(0.479)
Fertility				
Number of children	1.722	2.010	1.378	1.604
	(1.352)	(1.448)	(1.167)	(1.210)
Observations	3,537	8,764	9,596	16,438

Source: Author's calculation based on ENIGH.
Notes: Period T = 0 corresponds to 1989–2000; period T = 1 corresponds to 2002–2012.

As was the case for the results at the mean of the distribution, the overall participation of women in brain-intensive jobs did not change much at the upper quartile, but the educational level of female workers in these occupation exhibited a significant shift. During the 1990s, 45 percent of women in brain-intensive jobs had a college degree, but by the 2000s this proportion increased to almost 60 percent. For males, the educational upgrading in these occupations was significantly smaller, with the share of college graduates within brainy jobs increasing from 56 to 63 percent.

Tables 9 and 10 show the results of the unconditional quantile regression for the 75th and 90th percentiles. At both percentiles, the high school and college premia for both men and women are much higher than at the 10th

Table 9. Unconditional Quantile Regression by Sex and Period, 75th Percentile. Dependent Variable: RIF Log Real Wages.

	Female T0	Male T0	Female T1	Male T1
Education				
High school	0.705***	0.785***	0.507***	0.494***
	(0.061)	(0.038)	(0.038)	(0.025)
College or more	1.570***	1.720***	1.451***	1.387***
	(0.082)	(0.049)	(0.056)	(0.030)
Brain versus Brawn				
Brain occupations	0.567***	0.599***	0.834***	0.558***
	(0.064)	(0.038)	(0.045)	(0.026)
Potential experience				
Experience	0.022**	0.041***	0.026***	0.024***
	(0.008)	(0.005)	(0.005)	(0.003)
Experience Sq. (/100)	−0.035**	−0.066***	−0.042***	−0.041***
	(0.013)	(0.009)	(0.009)	(0.006)
Fertility				
Number of children	−0.004	−0.017**	−0.005	0.005
	(0.009)	(0.005)	(0.008)	(0.004)
Constant	2.243***	2.213***	2.017***	2.304***
	(0.109)	(0.066)	(0.078)	(0.045)
Observations	15,379	38,260	37,859	65,286
R^2	0.301	0.293	0.343	0.307

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989–2000; period T1 corresponds to 2002–2012.
Standard errors in parentheses.
Sectoral variables included but not reported.
$*p < 0.10$, $**p < 0.05$, $***p < 0.001$.

and 25th percentiles, and declining over time, with the decline for men being larger. The sharper decline in returns to higher levels of education among males is a significant factor in the closing of the wage gap at the upper tail, since the share of college educated workers in this income segment increased substantially from 34 to 43 percent for both males and females.

Overall, changes in returns for men and women in the 2000s relative to the 1990s favoured women, with some interesting differences in levels and changes at the three different points of the wage distribution. The rising importance of education, experience, and brain-intensive labor in the 2000s relative to the 1990s suggests that the rising demand for skilled labor is an important contributor to the narrowing of the gender wage gap. However, the gender wage gap widened in the 1990s, so the convergence of male and

Table 10. Unconditional Quantile Regression by Sex and Period, 90th Percentile. Dependent Variable: RIF Log Real Wages.

	Female T0	Male T0	Female T1	Male T1
Education				
High school	0.434***	0.617***	0.319***	0.442***
	(0.059)	(0.056)	(0.040)	(0.038)
College or more	1.506***	2.398***	1.532***	2.062***
	(0.120)	(0.102)	(0.079)	(0.060)
Brain versus Brawn				
Brain occupations	0.312***	0.609***	0.540***	0.563***
	(0.065)	(0.062)	(0.052)	(0.043)
Potential experience				
Experience	0.025**	0.068***	0.036***	0.037***
	(0.011)	(0.009)	(0.008)	(0.006)
Experience Sq. (/100)	−0.038**	−0.108***	−0.055***	−0.058***
	(0.018)	(0.015)	(0.013)	(0.011)
Fertility				
Number of children	−0.004	−0.026***	0.002	0.009
	(0.010)	(0.008)	(0.008)	(0.007)
Constant	3.028***	2.568***	2.750***	2.769***
	(0.146)	(0.114)	(0.109)	(0.086)
Observations	15,379	38,260	37,859	65,286
R^2	0.156	0.210	0.193	0.220

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989−2000; period T1 corresponds to 2002−2012.
Standard errors in parentheses.
Sectoral variables included but not reported.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.001$.

female wages occured well after trade liberalization policies were first put into effect. This pattern is consistent with initially increasing supplies of post-secondary school educated workers (especially women) and the 1994−1995 Mexican peso crisis depressing wages for skilled workers through increasing supply and depressing demand, but the evidence in this paper suggests that trade liberalization policies sowed the seeds for increased skilled demand in the longer-run (Airola & Juhn, 2008). For women in particular, there was a stronger trend in labor supply than for men and this will have initially depressed their wages but, at the two tails of the wage distribution, this appears to have been overwhelmed by a decrease in the demand for brawn-intensive jobs.

3.5. Marital Status and Fertility Trends

So far we have focused upon changes in the skill levels of employed workers and in their allocation across occupations. We have cast skill-biased technological change as creating an increase in the demand for skilled workers in brain-intensive occupations, taking the supply of skill as given. In this section we investigate whether adjusting for demographic trends that influence women's labor supply alters our findings.

In particular, we show that there was a secular decline in both the marriage rate and fertility in Mexico in the sample period. Although both marriage and fertility rates were lower in the 2000s than in the 1990s, the rate of decline slowed after the year 2000. We then estimate the wage equation parameters but now conditioning upon marital status.

Fig. 14 shows the shares of married men and women by year, both for the overall and for the occupied population (left panel), and the average number of children for both groups and sexes (right panel). The ENIGH survey provides information on the marital status of individuals from 1996

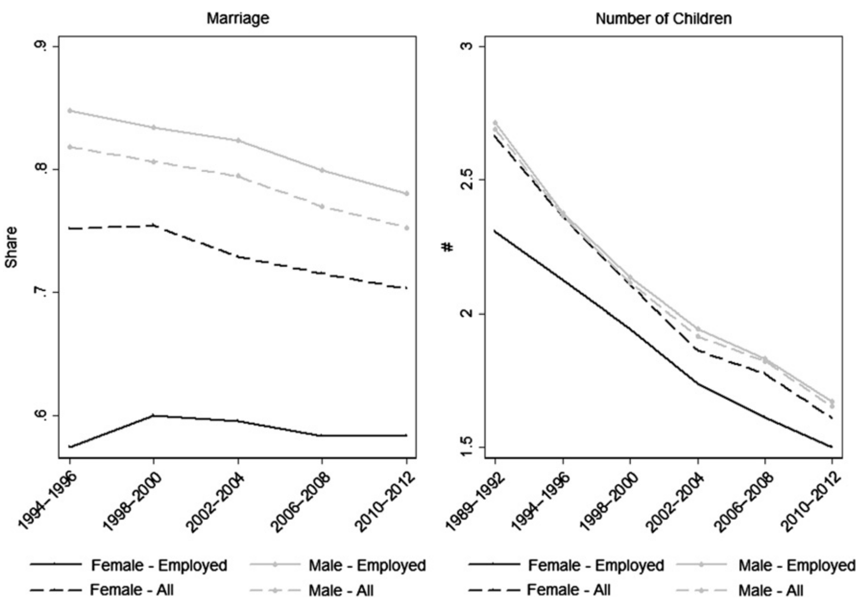

Fig. 14. Marriage and Fertility Trends. *Notes*: Shares of overall population between ages 25 and 55. *Source*: Author's calculation based on ENIGH.

Table 11. Sample Summary Statistics (Means): Married Women Only.

	Female T = 0	Male T = 0	Female T = 1	Male T = 1
Mean Log Wage	2.289	2.588	2.423	2.651
	(1.163)	(1.003)	(1.118)	(0.976)
Log Wage 10th percentile	0.795	1.532	1.039	1.640
	(0.000)	(0.000)	(0.000)	(0.000)
Log Wage 25th percentile	1.655	2.021	1.887	2.175
	(0.000)	(0.000)	(0.000)	(0.000)
Log Wage 75th percentile	3.102	3.145	3.140	3.173
	(0.000)	(0.000)	(0.000)	(0.000)
Log Wage 90th percentile	3.703	3.828	3.747	3.816
	(0.000)	(0.000)	(0.000)	(0.000)
Education and experience (shares)				
Less than high school	0.665	0.731	0.657	0.696
	(0.472)	(0.444)	(0.475)	(0.460)
High school	0.210	0.152	0.188	0.163
	(0.407)	(0.359)	(0.391)	(0.369)
College or more	0.125	0.117	0.155	0.142
	(0.330)	(0.322)	(0.362)	(0.349)
Years of education	8.195	8.152	9.112	8.922
	(5.223)	(5.004)	(4.835)	(4.716)
Age	37.742	38.870	39.200	39.952
	(7.693)	(8.278)	(7.847)	(8.218)
Experience	23.548	24.718	24.089	25.030
	(10.270)	(10.372)	(9.866)	(9.859)
Brain versus Brawn (shares)				
Brain occupations	0.317	0.215	0.296	0.229
	(0.465)	(0.411)	(0.457)	(0.420)
Brain × Less than high school	0.058	0.055	0.055	0.057
	(0.235)	(0.228)	(0.227)	(0.231)
Brain × High school	0.146	0.068	0.107	0.064
	(0.353)	(0.251)	(0.309)	(0.245)
Brain × College or more	0.113	0.092	0.135	0.109
	(0.316)	(0.289)	(0.342)	(0.311)
Fertility				
Number of children	2.164	2.189	1.755	1.811
	(1.570)	(1.632)	(1.343)	(1.411)
Sectors (shares)				
Agriculture	0.100	0.186	0.057	0.157
	(0.301)	(0.389)	(0.232)	(0.364)
Manufacturing	0.172	0.181	0.153	0.174
	(0.378)	(0.385)	(0.360)	(0.379)
Construction	0.004	0.111	0.006	0.132
	(0.062)	(0.315)	(0.075)	(0.339)
Commerce	0.293	0.235	0.343	0.227
	(0.455)	(0.424)	(0.475)	(0.419)

Table 11. (*Continued*)

	Female T = 0	Male T = 0	Female T = 1	Male T = 1
Electricity, gas, water and transport	0.012	0.088	0.009	0.089
	(0.111)	(0.283)	(0.092)	(0.285)
Finance and professional services	0.036	0.052	0.051	0.060
	(0.185)	(0.222)	(0.220)	(0.238)
Public administration and defense	0.040	0.051	0.046	0.062
	(0.195)	(0.221)	(0.210)	(0.241)
Education, health and personal services	0.227	0.087	0.223	0.092
	(0.419)	(0.282)	(0.416)	(0.290)
Domestic services	0.116	0.008	0.113	0.006
	(0.320)	(0.089)	(0.317)	(0.079)
Observations	6,217	18,751	27,953	65,286

Table 12. OLS Regression by Sex and Period (Married Women Only). Dependent Variable: Log Real Wages.

	Female T0	Male T0	Female T1	Male T1
Education				
High school	0.460***	0.464***	0.374***	0.342***
	(0.054)	(0.027)	(0.025)	(0.015)
College or more	0.916***	1.047***	0.810***	0.873***
	(0.066)	(0.049)	(0.035)	(0.019)
Brain versus Brawn				
Brain occupations	0.538***	0.391***	0.566***	0.373***
	(0.054)	(0.032)	(0.027)	(0.015)
Potential experience				
Experience	0.030***	0.039***	0.034***	0.031***
	(0.007)	(0.004)	(0.004)	(0.002)
Experience Sq. (/100)	−0.068***	−0.077***	−0.077***	−0.067***
	(0.013)	(0.008)	(0.008)	(0.005)
Fertility				
Number of children	−0.070***	−0.041***	−0.055***	−0.023***
	(0.011)	(0.005)	(0.007)	(0.004)
Constant	1.136***	1.428***	0.835***	1.507***
	(0.110)	(0.062)	(0.071)	(0.035)
Observations	6,217	18,751	27,953	65,286
R^2	0.383	0.381	0.368	0.348

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989–2000; period T1 corresponds to 2002–2012.
Standard errors in parentheses.
Sectoral variables included but not reported.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.001$.

onward, so all graphs and regressions that are conditional on marriage start from this year. We see that women participating in the labor market are less likely to be married when compared both to men and to women not participating in the labor market. While around 59 percent of employed women report being married, the same number for men is above 78 percent on average. Second, the share of married women in the labor market remained stable during the 1990s and 2000s, while it declined from 85 percent in 1996 to 78 percent in 2012 for males. In terms of fertility trends, we can see that employed women have, on average, less children than their male counterparts, but that in both cases there is a significant negative trend. The average number of children under 18 years of age that live in the house fell from 2.3

Table 13. Unconditional Quantile Regression by Sex and Period (Married Women Only), 10th Percentile. Dependent Variable: RIF Log Real Wages.

	Female T0	Male T0	Female T1	Male T1
Education				
High school	0.389***	0.131***	0.473***	0.191***
	(0.105)	(0.026)	(0.061)	(0.024)
College or more	0.372***	0.124***	0.447***	0.208***
	(0.108)	(0.026)	(0.066)	(0.025)
Brain versus Brawn				
Brain occupations	0.509***	0.125***	0.399***	0.192***
	(0.074)	(0.021)	(0.056)	(0.022)
Potential experience				
Experience	0.048**	0.037***	0.061***	0.039***
	(0.018)	(0.007)	(0.011)	(0.005)
Experience Sq. (/100)	−0.123***	−0.096***	−0.162***	−0.107***
	(0.037)	(0.014)	(0.023)	(0.011)
Fertility				
Number of children	−0.171***	−0.067***	−0.177***	−0.072***
	(0.035)	(0.011)	(0.022)	(0.009)
Constant	−1.576***	0.131	−2.177***	−0.063
	(0.320)	(0.087)	(0.216)	(0.072)
Observations	6,217	18,751	27,953	65,286
R^2	0.148	0.199	0.137	0.174

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989–2000; period T1 corresponds to 2002–2012.
Standard errors in parentheses.
Sectoral variables included but not reported.
$*p < 0.10$, $**p < 0.05$, $***p < 0.001$.

to 1.5 in the case of female workers; while male workers saw a decline from 2.7 to 1.7.

For both marriage and fertility patterns, the graphs show that there is no particular change in the trends between the 1990s and 2000s that could be driving our main results. The lack of significant changes in the trends of marital status and fertility patterns in Mexico across the two decades, on the other hand, does not necessarily imply that demographic changes might not be reinforcing the effect of structural changes in the economy in reducing the gender wage gap. As discussed by Polachek (1975), there are possible lags in the impact of demographic changes on labor market outcomes, so that both channels could be acting in the same direction. As a robustness check, Tables 11–16 report the summary statistics and main estimates of the wage equations using only the subset of married women. The main

Table 14. Unconditional Quantile Regression by Sex and Period (Married Women Only), 25th Percentile. Dependent Variable: RIF Log Real Wages.

	Female T0	Male T0	Female T1	Male T1
Education				
High school	0.316***	0.287***	0.339***	0.237***
	(0.071)	(0.022)	(0.033)	(0.017)
College or more	0.304***	0.310***	0.376***	0.310***
	(0.072)	(0.024)	(0.036)	(0.016)
Brain versus Brawn				
Brain occupations	0.498***	0.199***	0.474***	0.236***
	(0.061)	(0.020)	(0.033)	(0.015)
Potential experience				
Experience	0.024**	0.023***	0.029***	0.018***
	(0.009)	(0.004)	(0.005)	(0.003)
Experience Sq. (/100)	−0.069***	−0.057***	−0.081***	−0.051***
	(0.018)	(0.008)	(0.010)	(0.005)
Fertility				
Number of children	−0.101***	−0.047***	−0.083***	−0.023***
	(0.016)	(0.006)	(0.010)	(0.005)
Constant	0.677***	1.131***	0.612***	1.367***
	(0.140)	(0.052)	(0.081)	(0.035)
Observations	6,217	18,751	27,953	65,286
R^2	0.210	0.231	0.187	0.184

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989–2000; period T1 corresponds to 2002–2012.
Standard errors in parentheses.
Sectoral variables included but not reported.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.001$.

Table 15. Unconditional Quantile Regression by Sex and Period (Married Women Only), 75th Percentile. Dependent Variable: RIF Log Real Wages.

	Female T0	Male T0	Female T1	Male T1
Education				
High school	0.646***	0.827***	0.493***	0.494***
	(0.090)	(0.054)	(0.044)	(0.025)
College or more	1.742***	1.825***	1.478***	1.387***
	(0.117)	(0.071)	(0.068)	(0.030)
Brain versus Brawn				
Brain occupations	0.547***	0.641***	0.823***	0.558***
	(0.105)	(0.056)	(0.052)	(0.026)
Potential experience				
Experience	0.029**	0.040***	0.033***	0.024***
	(0.011)	(0.007)	(0.006)	(0.003)
Experience Sq. (/100)	−0.046**	−0.066***	−0.055***	−0.041***
	(0.019)	(0.013)	(0.011)	(0.006)
Fertility				
Number of children	−0.015	−0.022**	−0.008	0.005
	(0.013)	(0.008)	(0.010)	(0.004)
Constant	2.118***	2.082***	1.935***	2.304***
	(0.156)	(0.097)	(0.089)	(0.045)
Observations	6,217	18,751	27,953	65,286
R^2	0.334	0.320	0.341	0.307

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989−2000; period T1 corresponds to 2002−2012.
Standard errors in parentheses.
Sectoral variables included but not reported.
$*p<0.10$, $**p<0.05$, $***p<0.001$.

results discussed in the previous section remain unchanged in this exercise, with relative returns moving in similar directions and magnitudes.

3.6. Selection into Employment

A concern that may complicate the interpretation of our estimates is selection into the labor market, which our estimates do not account for. As discussed above, the share of women in the labor force increased markedly over the study period, which makes it possible that convergence in the gender wage gap was simply driven by compositional change, with more educated and able women entering the labor market and driving down the

Table 16. Unconditional Quantile Regression by Sex and Period (Married Women Only), 90th Percentile. Dependent Variable: RIF Log Real Wages.

	Female T0	Male T0	Female T1	Male T1
Education				
High school	0.415***	0.608***	0.307***	0.442***
	(0.096)	(0.077)	(0.046)	(0.038)
College or more	1.697***	2.520***	1.447***	2.062***
	(0.209)	(0.146)	(0.092)	(0.060)
Brain versus Brawn				
Brain occupations	0.263**	0.518***	0.533***	0.563***
	(0.126)	(0.089)	(0.058)	(0.043)
Potential experience				
Experience	0.028	0.070***	0.046***	0.037***
	(0.019)	(0.012)	(0.009)	(0.006)
Experience Sq. (/100)	−0.043	−0.111***	−0.072***	−0.058***
	(0.033)	(0.021)	(0.015)	(0.011)
Fertility				
Number of children	0.001	−0.030**	−0.002	0.009
	(0.018)	(0.011)	(0.009)	(0.007)
Constant	2.845***	2.458***	2.637***	2.769***
	(0.251)	(0.166)	(0.121)	(0.086)
Observations	6,217	18,751	27,953	65,286
R^2	0.181	0.225	0.190	0.220

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989−2000; period T1 corresponds to 2002−2012.
Standard errors in parentheses.
Sectoral variables included but not reported.
$^*p<0.10$, $^{**}p<0.05$, $^{***}p<0.001$.

relative wage for men. We have conditioned upon education but there may be selection on unobservables such as ability and tastes that we have not conditioned upon. While this mechanism seems less likely to explain the convergence seen at the lower end of the wage distribution, we explored this possibility by assessing how the probability of being employed depends on the schooling levels and experience profiles of potential workers in each period and for each sex. Table 17 presents estimates of a linear probability model in which a dummy indicating employment is the dependent variable. This shows that the probability of being employed increases with schooling level for women, while this effect is quantitatively insignificant for men. However this relationship for women is weaker in the 2000s than in the 1990s. On the premise that selection on unobservables operates

Table 17. Probability of Being Employed, OLS Regression. Dependent Variable: Employment Dummy.

	Female T0	Male T0	Female T1	Male T1
High school	0.195***	−0.009**	0.124***	−0.000
	(0.010)	(0.004)	(0.007)	(0.004)
College or more	0.374***	0.021***	0.294***	0.008*
	(0.016)	(0.004)	(0.008)	(0.005)
Experience	0.005**	0.008***	0.007***	0.010***
	(0.001)	(0.001)	(0.001)	(0.001)
Experience Sq. (/100)	−0.010***	−0.017***	−0.016***	−0.021***
	(0.003)	(0.001)	(0.002)	(0.002)
Constant	0.338***	0.867***	0.423***	0.830***
	(0.019)	(0.009)	(0.013)	(0.011)
Observations	56,408	50,596	105,609	92,305

Source: Author's calculation based on ENIGH.
Notes: Period T0 corresponds to 1989−2000; period T1 corresponds to 2002−2012.
Standard errors in parentheses.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.001$.

similarly to that on observables, these results suggests that selection is unlikely to be driving our results.

4. RELATION TO PREVIOUS RESEARCH

Trade liberalization in Mexico was initiated in the mid-1980s and later reinforced by the North American Free Trade Agreement in 1994 (Hanson, 2003). A number of studies analyze changes in the gender wage gap, focusing primarily on the 1980s and 1990s. Brown, Pagan, and Rodriguez-Oreggia (1999) and Artecona and Cunningham (2002) document a rise in the gender wage gap in Mexico in the 1980s. They observe that the gap is largest among laborers and in the manufacturing sector, respectively, consistent with men drawing a relatively high return to brawn. They attribute the widening gap to larger increases in human capital attainment and experience for men relative to women. Studies of trends in the 1990s present mixed evidence, some indicating a continuing widening of the gap, and some a slight narrowing of the gap. Using data that cover the latter half of the 1990s (1989−2000), Aguayo-Tellez, Airola, Juhn, and Villegas-Sanchez (2013) find that NAFTA tariff reductions led to expansion of sectors that were traditionally dominated by female workers so that female wages and employment both increased relative to men. Juhn, Ujhelyi, and Villegas-Sanchez (2014) find, using establishment level data, that the share of female workers increased primarily in blue-collar firms as these were the firms that entered export markets and updated their technologies in a manner that reduced the importance of physical labor. So, although Mexico pursued manufacturing rather than service growth in the 1990s, there was a growth in labor market opportunities for women. Gonzalez (2001) shows that after the Peso Crisis in the mid-1990s the demand for female workers in manufacturing firms in free trade zones (maquiladoras) rose, leading to an increase in the gender wage gap at the low end of the distribution. Comparing 1990 and 2005, Rendall (2013) similarly finds a widening of the gender wage gap on average. She documents a rise in the return to brain-intensive relative to brawn-intensive jobs and that this on its own contributes to narrowing the gender gap, but shows that this is overwhelmed by other factors that tend to widen it.

Overall, the extant evidence base is disjointed in its temporal focus, which makes it difficult to understand and interpret trends in the wage gap over time, much less the longer-run relationship between structural change in the economy and the gender wage gap. Second, more recent studies have focused specifically on women in blue-collar professions, and there is comparatively less evidence on the impacts of structural changes in the economy on wage gaps outside of this group of lower wage earners. We uncover substantial movement in women's relative wages in the upper tail of the wage distribution.

The only previous study that has analyzed Mexican gender wage gaps in the 2000s is Rendall (2013), who studies the evolution of the wage gap between 1990 and 2005. We differ in using continuous bi-annual data through 1989–2012 rather than two points, which could matter since the two particular years selected by Rendall may not be representative of trends. The other important difference in our approach is that we study the gender gap across the wage distribution and look at gender-differentiated sorting into brain versus brawn-intensive occupations conditional upon education, experience and sector. These changes in approach produce substantive differences in our conclusions. In particular, Rendall concludes that there was a widening of the gender wage gap in Mexico between 1990 and 2005 despite SBTC, primarily because the share of women in brawny low-wage jobs in maquiladoras increased. In contrast, we conclude that there was a significant narrowing of the wage gap at the mean, and especially at the two ends of the wage distribution. By isolating the top end of the wage distribution we see evidence consistent with SBTC driving up the returns to worker-attributes that women have a comparative advantage in.

Our estimates cohere with, for instance, the results of Lup Tick and Oaxaca (2010) who analyze the gender wage gap in the United States between 1979 and 2001 insofar as they find that non-neutral technological change has contributed to narrowing of the gender wage gap, but that the magnitude of the effect has varied across different skill levels. In particular, technological change was found to have a greater impact in narrowing the gap for high skill occupations (managerial and professional) than in low skill occupations.

5. DISCUSSION AND CONCLUSIONS

We extend the literature on the gender wage gap by examining the evolution of the gap over the last two decades in Mexico, focusing on the dynamics of wage differentials across different parts of the earnings distribution. We find a narrowing of the gender wage gap in Mexico in the 2000s relative to the 1990s, which is most evident at the upper and lower ends of the wage distribution. This tendency is similar for the sample of married women. We find concomitant decreases in the gender schooling gap amongst the employed, with the largest increase in the relative share of women workers with a college degree. Due to the increased supply of educated workers, returns to education declined on average and in the upper tail but increased in the lower tail. However, through the wage distribution, the change in returns to education favored women. Educated women and especially college-educated women sorted differentially into brain-intensive occupations. There was a sharp rise in the average wage return to being in brain-intensive occupation for women relative to men conditional upon education, which is driven by the upper tail of the wage distribution. We also see substantial increases in the returns to experience for women alongside no change in the return to experience for men at the mean and at the tails of the wage distribution. This was against a backdrop of a strong trend in female labor force participation and fairly stable male labor force participation through the sample period.

While we clearly have not nailed this down, the results are consistent with the hypothesis that SBTC stimulates gender wage convergence by increasing the returns to attributes that women have an inherent comparative advantage in. Had we not studied the gender gap across the wage distribution but focused upon the median wage, we may have concluded that there was not much change. While our estimates are descriptive rather than causal, they provide insights for future research. In particular, our results highlight that the consequences of SBTC for gender wage gaps will tend to depend upon the dynamics of the supply of and demand for women's labor, and that it is useful to track wages over a long period of time. Moreover, our findings underline the critical importance of examining the gender wage gap at different parts of the wage distribution since changes in both women's education and the structure of the economy tend to be non-uniform across the distribution.

REFERENCES

Aguayo-Tellez, E., Airola, J., Juhn, C., & Villegas-Sanchez, C. (2013). Did trade liberalization help women? The case of Mexico in the 1990s. In S. Polachek & K. Tatsiramos (Eds.), *New analysis of worker well-being* (Vol. 38). Research in Labor Economics. Bingley, UK: Emerald Group Publishing Limited.

Airola, J., & Juhn, C. (2008). Wage inequality in post-reform Mexico. *Journal of Income Distribution*, *17*(1), 110–135.

Artecona, R., & Cunningham, W. (2002). *Effects of trade liberalization on gender wage gap in Mexico*. World Bank Policy Research Report on Gender and Development Working Paper No. 21.

Autor, D., Levy, F., & Murnane, R. (2003). The skill content of recent technological change: An empirical exploration. *The Quarterly Journal of Economics*, *118*(4), 1279–1333.

Bailey, M. (2006). More power to the pill: The impact of contraceptive freedom on women's lifecycle labor supply. *The Quarterly Journal of Economics*, *121*(1), 289–320.

Beaudry, P., & Lewis, E. (2014). Do male-female wage differentials reflect differences in the return to skill? Cross-city evidence from 1980–2000. *American Economic Journal: Applied Economics*, *6*(2), 178–194.

Bhalotra, S., & Venkataramani, A. (2013). *Cognitive development and infectious disease: Gender differences in investments and outcomes*. IZA Discussion Paper No. 7833.

Black, S., & Spitz-Oener, A. (2010). Explaining women's success: Technological change and the skill content of women's work. *The Review of Economics and Statistics*, *92*(1), 187–194.

Blau, F., & Kahn, L. (2007). The gender pay gap have women gone as far as they can? *The Academy of Management Perspectives*, *21*, 7–23.

Brown, C., Pagan, J., & Rodriguez-Oreggia, E. (1999). Occupational attainment and gender earnings differentials in Mexico. *Industrial and Labor Relations Review*, *53*(1), 123–135.

Freije, S., Lopez-Acevedo, G., & Rodriguez-Oreggia, E. (2011). *Effects of the 2008–09 economic crisis on labour markets in Mexico*. World Bank Policy Research Working Paper No. 5840.

Galor, O., & Weil, D. (1996). The gender gap, fertility, and growth. *The American Economic Review*, *86*(3), 374–387.

Goldin, C., & Katz, L. (2002). The power of the pill: Oral contraceptives and women's carreer and marriage decisions. *Journal of Political Economy*, *110*(4), 730–770.

Gonzalez, L. (2001). Wage inequality and the gender wage gap in Mexico. *Economia Mexicana. Nueva Epoca*, *10*(2), 291–323.

Greenwood, J., Seshadri, A., & Yorukoglu, M. (2005). Engines of liberation. *The Review of Economic Studies*, *72*, 109–133.

Hanson, G. (2003). *What has happened to wage in Mexico since NAFTA? Implications of hemispheric free trade*. National Bureau of Economic Research. NBER Working Paper 9563.

Jacobsen, J., Khamis, M., & Yuksel, M. (2014). Convergences in men's and women's life patterns: Lifetime work, lifetime earnings, and human capital investment. In S. Polachek, K. Tatsiramos, & K. Zimmermann (Eds.), *Gender convergence in the labor market* (Vol. 41). Research in Labor Economics. Bingley, UK: Emerald Group Publishing Limited.

Juhn, C., Murphy, K., & Pierce, B. (1993). Wage inequality and the rise in returns to skill. *The Journal of Political Economy*, *101*(2), 410–442.

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

Katz, L., & Autor, D. (1999). Changes in the wage structure and earnings inequality. In O. Ashenfelter & D. Card (Eds.), *Handbook of labor economics* (Vol. 3A). Amsterdam: North-Holland.

Katz, L., & Murphy, K. (1992). Changes in relative wages, 1963–1987: Supply and demand factors. *The Quarterly Journal of Economics*, *107*(1), 35–78.

Lup Tick, S., & Oaxaca, R. (2010). Technological change and gender wage gaps in the us service industry. *Annals of Economics and Statistics*, *99–100*, 47–65.

Mulligan, C., & Rubinstein, Y. (2008). Selection, investment, and women's relative wages over time. *The Quarterly Journal of Economics*, *123*, 1061–1110.

Pitt, M., Rosenzweig, M., & Hassan Nazmul, M. (2012). Human capital investment and the gender division of labor in a brawn-based economy. *American Economic Review*, *102*(7), 3531–3560.

Polachek, S. (1975). Differences in expected post-school investment as a determinant of market wage differentials. *International Economic Review*, *16*(2), 451–470.

Polachek, S., Zhang, X., & Zhou, X. (2014). Convergence in men's and women's life patterns: Lifetime work, lifetime earnings, and human capital investment. In S. Polachek, K. Tatsiramos, & K. Zimmermann (Eds.), *Gender convergence in the labor market* (Vol. 41). Research in Labor Economics. Bingley, UK: Emerald Group Publishing Limited.

Rendall, M. (2010). *Brain versus Brawn: The realization of women's comparative advantage*. Institute for Empirical Research in Economics University of Zurich. Working Paper No. 1424-0459.

Rendall, M. (2013). Structural change in developing countries: Has it decreased gender inequality? *World Development*, *45*(1), 1–16.

Rosenzweig, M., & Zhang, J. (2013). Economic growth, comparative advantage, and gender differences in schooling outcomes: Evidence from the birthweight differences of Chinese twins. *Journal of Development Economics*, *104*, 245–260.

UNESCO. (2012). World atlas of gender equality in education. UNESCO report.

Vogl, T. (2014). Height, skills, and labor market outcomes in Mexico. *Journal of Development Economics*, *107*(1), 84–96.

Welch, F. (2000). Growth in women's relative wages and in inequality among men: One phenomenon or two? *The American Economic Review*, *90*(2), 444–449.