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Gender wage gap in Hidalgo, post-pandemic scenario COVID-19

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Abstract. Since the beginning of the 21st century, it has been found that men are paid more than women in the same job position, without this depending on their productivity or work skills. The objective of this paper is to analyze the gender wage gap in the state of Hidalgo, after the COVID-19 pandemic, through the statistical indicators provided by INEGI in the National Occupation and Employment Survey (ENOE) during the period from the first quarter of 2021 (2021.01) to the fourth quarter of 2023 (2023.04), using the Oaxaca-Blinder methodology.

Keywords: Wage Gap, Gender, Economy, Employment discrimination, Oaxaca-Blinder Decomposition

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1 Introduction

Over the years Mexico has tried to close the gaps that perpetuate discrimination against certain groups of the population; in the case of the labor market there is a variable that is indicated by the gender of individuals. The objective of this paper is to examine this gap and to know the importance of the differences in parameters and endowments in Hidalgo during the 12-quarter period between the beginning of 2021 and the end of 2023.

For this purpose, this article is divided into three sections. The first section describes the context of the gender wage gap in Mexico and Hidalgo before and during the pandemic using population indicators published by different government agencies. The second section presents the Oaxaca-Blinder decomposition methodology and the third section shows the results of the post-pandemic wage gap model, analyzing the mean variables of wages, education and hours worked through a linear decomposition.

2. The pre-pandemic gender wage gap and the inequalities it perpetuated, Mexico and Hidalgo.

Based on the censuses carried out from 1990 to 2010, there was a decrease in the urban areas of the country, from 14.2%, 11.6% and 7.8% for the years 1990, 2000 and 2010 respectively, showing a favorable evolution in the participation of women in the labor market; however, this has not been due to structural changes in terms of gender but to national effects such as economic liberalization in the first decade or the progress in educational levels in the second decade.

2.1 Gap behavior during and after the COVID-19 pandemic

In 2019 the difference in salary remuneration between men and women was calculated at 13.6% starting from the basis that in January of the same year the average daily salary received by men attached to the Mexican Social Security Institute (IMSS) was 390.85 pesos, while that of women was 341.36 pesos.

One of the first actions that was promoted in the change of government in 2018 was the increase in the minimum wage, arguing not only the benefits to the general population, but the positive effect it had in reducing the gap due to the fact that within the wage distribution by sex there are more women earning the minimum wage than men (CONASAMI, 2019). However, that year 88.1% of women belonging to the employed population were located in the informal sector, so this measure did not really have direct effects on the labor inequality faced by women in the country.

In Hidalgo, one of the states with the highest levels of poverty in the country, the picture was not very different, in 2019 it was estimated that Hidalgo women performed 63 percent of domestic chores along with child care work. Domestic work is a variable to take into account when analyzing the gender wage gap, this is because it is unpaid work, to which Mexican women spend an average of three hours more than men.

In 2020 due to the COVID-19 pandemic the Mexican population was forced to abandon workplaces and take refuge in their homes, so domestic activities intensified; and although participation in the household dynamics of men increased, Mexican women contributed 2.7 times more economic value of unpaid work in a country where if this type of activities were a sector, it would be the largest.

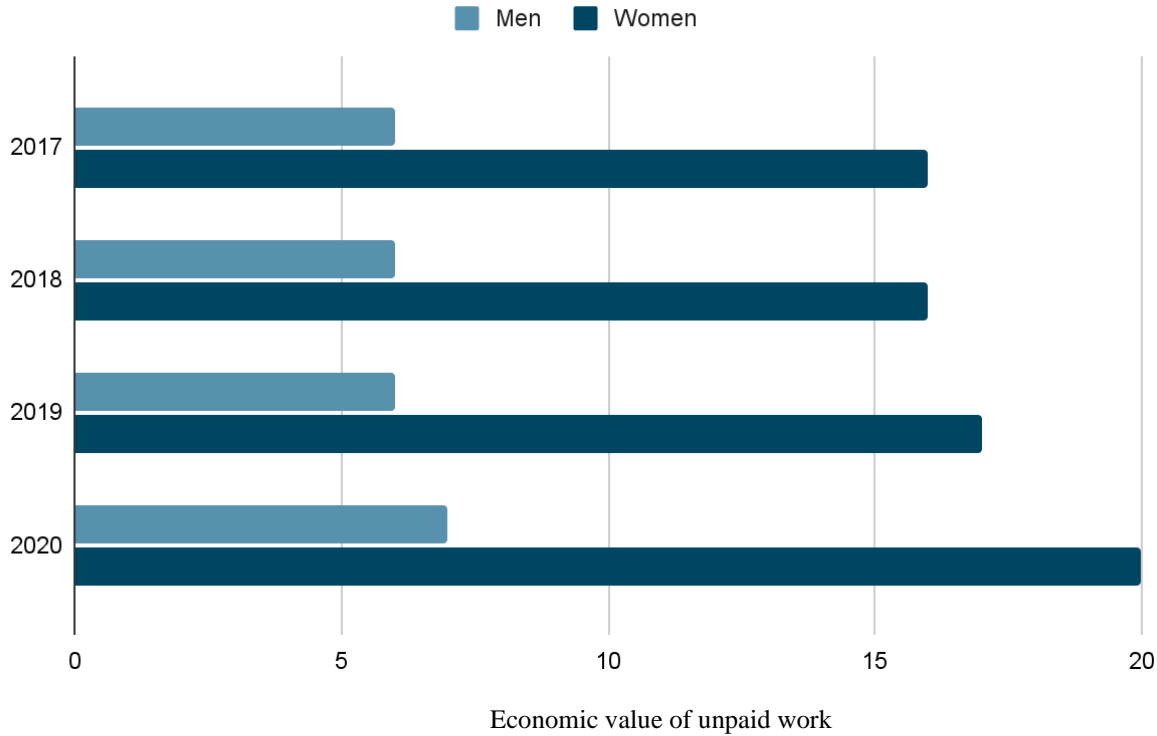
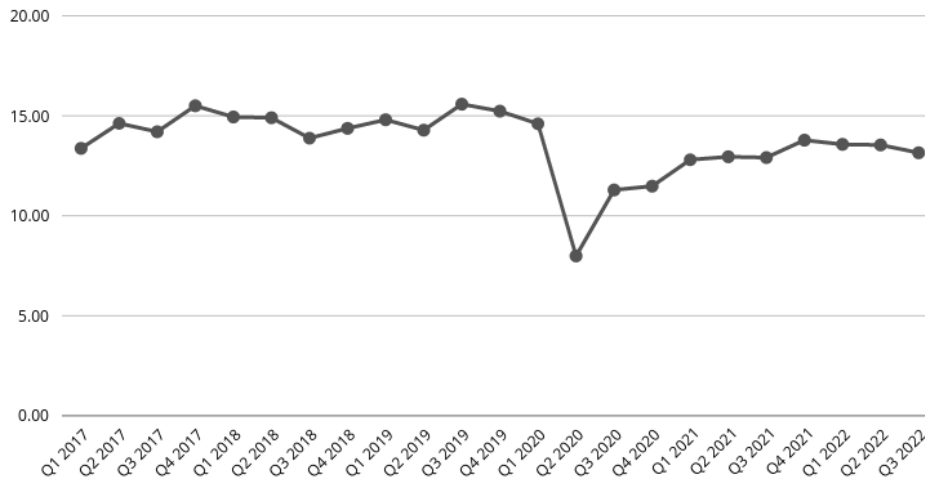


Figure 1. Unpaid work of households as a percentage of GDP

Source: Own elaboration with data from the Unpaid Work Satellite Account of Mexican Households (2022).

Each year the National Institute of Statistics and Geography (INEGI) measures the economic value of unpaid work and calculates its equivalent share in the national economy, by 2020 domestic and care work had a value of more than 6.4 trillion Mexican pesos.

During the second quarter of 2020, the gap narrowed to 11% (see Graph 2), but it is important to mention that this reduction was not only due to the entry of more women into the labor market, but also to a drop in men's income.



Graph 2. Gender wage gap, 2017.01-2022.03 (percentage)

The aforementioned unpaid work performed by Mexican women reduces the hours they can dedicate to professional activities and limits their ability to attain a higher level of education, forcing them to devote themselves professionally to care work, work that normally offers lower income and perpetuates the situation of inequality. In other professional areas, they are forced to occupy entry-level positions with few opportunities to reach management positions, demonstrating the importance of gender assignment in the study.

On the other hand, in fields related to science, technology, engineering and mathematics (STEM), which present less wage discrimination, only 3 out of 10 graduates are women.

By 2021, with the health situation more under control and a staggered return to work activities, we are once again faced with reality, where despite the decrease caused by the initial impact of the pandemic, the gap was returning to its previous values (Graph 2). This, in official data, placed Hidalgo as the third state with the largest income gap between men and women, with 24.9% lower earnings for the same work (INEGI, 2021), which will be analyzed with greater precision in the next section. At the national level, this results in Mexican women having to work 51 extra days to obtain the same salary as a man.

2. Oaxaca-Blinder decomposition for time series and cross-sectional data.

The Blinder-Oaxaca Index is a statistical technique used in economics and social sciences to decompose observed differences in outcomes between two groups (e.g., men and women, different ethnic groups,...) in terms of observable and unobservable characteristics of individuals or groups.

The Blinder-Oaxaca Index methodology is based on comparing differences in outcomes, such as wages or income, between two groups, and then decomposing those differences into two components: one that can be explained by differences in observable characteristics of the groups (such as education, work experience, geographic location, etc.), and another that is attributed to differences in unobservable characteristics or factors unexplained in the available data.

For example, if a wage gap between men and women is observed, the Blinder-Oaxaca Index can decompose that gap into a portion that can be attributed to differences in characteristics such as education and work experience, and another portion that is attributed to unobserved factors, such as discrimination or biases in the labor market.

This technique is useful because it makes it possible to identify and quantify the relative contribution of different factors in explaining the disparities observed between groups. This can provide valuable information for designing public policies aimed at reducing inequalities and promoting equity in various areas, such as employment, education and income.

Some of the advantages of the Blinder-Oaxaca Index include its ability to provide a deeper understanding of observed differences between groups, its relative simplicity of implementation compared to other more complex difference decomposition techniques, and its ability to identify specific areas where interventions may be needed to address inequalities. However, it is also important to keep in mind its limitations, such as its reliance on certain assumptions and the need for high quality and representative data to obtain accurate results.

Let us present the formal approach of the Blinder-Oaxaca decomposition: given two groups, an outcome variable and a set of characteristics, the objective is to know the magnitude of the difference in the mean of both groups, which is defined as follows:

$$R = E(Y_a) - E(Y_b) \quad (1)$$

where $E(Y)$ is the expected value of the variable. Establishing a linear relationship as follows:

$$Y_i = X_i'\beta_i + \varepsilon_i, \quad E(\varepsilon_i) = 0 \quad i \in \{A, B\} \quad (2)$$

where X is a vector containing the predictor variables and the constant, β is the vector of parameters and intercept, and ε is the error term. Based on the above expression the difference of the means between groups is as follows:

$$R = E(Y_a) - E(Y_b) = E(X_a'\beta_a) - E(X_b'\beta_b) \quad (3)$$

The above expression can be broken down into three components:

$$E = [E(X_a) - E(X_b)]'\beta_b \quad (4)$$

It is the part of the difference that is attributed to the characteristic vectors or endowment effect.

$$C = E(X_b)'(\beta_a - \beta_b) \quad (5)$$

Measures the contribution of the coefficients to the difference in the expected values of the dependent variable.

$$I = [E(X_a) - E(X_b)]'(\beta_a - \beta_b) \quad (6)$$

It is the simultaneous interaction term between the endowments and the coefficients of both groups.

In other words, E measures the expected change in the mean of group B, if group B has the characteristics of group A. C , on the other hand, measures the expected change in the mean of group B, if group B has the coefficients of group A.

3. Linear decomposition in the period from 2021.01 to 2023.04, Hidalgo.

Regressions elaborated in Stata with the commands `nldecompse` and `oaxaca` (Jann, 2008) with the data obtained from the Interactive Tabulations published by the National Institute of Statistics and Geography (INEGI) in the National Survey of Occupation and Employment, New Edition for the quarters of the years 2021 and 2022 and the National Survey of Occupation and Employment for the quarters of 2023 that in Figure 3 are shown as:

- lw_hrmed: Income (pesos) per hour worked of the employed population (logarithm of the real wage deflated per year)
- educ: Years of schooling of the economically active population
- hours_w_med: Hours worked per week by the employed population

```
. oaxaca lw_hrmed educ hours_w_med, by(sex) noisily
```

Model for group 1

Source	SS	df	MS	Number of obs	=	12
				F(2, 9)	=	12.95
Model	.018364945	2	.009182473	Prob > F	=	0.0022
Residual	.006379767	9	.000708863	R-squared	=	0.7422
				Adj R-squared	=	0.6849
Total	.024744713	11	.002249519	Root MSE	=	.02662

lw_hrmed	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
educ	.2068673	.0476933	4.34	0.002	.0989776	.314757
hours_w_med	.008472	.0031566	2.68	0.025	.0013312	.0156127
_cons	-.2223389	.4789867	-0.46	0.654	-1.305882	.8612043

Model for group 2

Source	SS	df	MS	Number of obs	=	12
				F(2, 9)	=	4.67
Model	.012662034	2	.006331017	Prob > F	=	0.0406
Residual	.012202975	9	.001355886	R-squared	=	0.5092
				Adj R-squared	=	0.4002
Total	.024865009	11	.002260455	Root MSE	=	.03682

lw_hrmed	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
educ	.1344218	.0507437	2.65	0.027	.0196314	.2492121
hours_w_med	.0202089	.0139026	1.45	0.180	-.011241	.0516588
_cons	-.1604029	.7546924	-0.21	0.836	-1.867636	1.54683

Blinder-Oaxaca decomposition Number of obs = 24

- 1: sex = 0
- 2: sex = 1

lw_hrmed	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Differential						
Prediction_1	2.145316	.0140784	152.38	0.000	2.117722	2.172909
Prediction_2	2.042793	.0144539	141.33	0.000	2.014464	2.071122
Difference	.1025226	.0201771	5.08	0.000	.0629762	.142069
Decomposition						
Endowments	.0166726	.1041844	0.16	0.873	-.1875251	.2208703
Coefficients	.225691	.0482039	4.68	0.000	.1312131	.320169
Interaction	-.139841	.1128498	-1.24	0.215	-.3610227	.0813406

Figure 3. Linear decomposition in the period 2021.01 to 2023.04, Hidalgo

3.1 Results and discussion

The objective of using the Oaxaca-Blinder model is to decompose the outcome differential between two groups using a linear regression model, `nldecompose` requires a variable indicating membership in the group with the highest income (group indicator =0) and the group with the lowest income (group indicator =1) As can be seen, the Oaxaca command first estimates two group-specific regression models and then performs the decomposition (the `noisily` option allows displaying the results of the group models and is specified in the paper for illustrative purposes) that reports the mean predictions by groups and their difference in the first panel. In our sample, the mean of the wage logarithms is 2.14 for men and 2.04 for women yielding a wage gap of 0.10.

In the second panel of the model decomposition, the wage gap is divided into three parts. The first, reflecting the average increase in women's wages if they had the same characteristics as men, the .017 increase in the regression indicates that differences in endowments account for about one-sixth of the difference, which tells us that there are other reasons not given by the variables used in the model behind the gap found.

The second part quantifies the change in women's wages by applying men's coefficients to women's characteristics which shows that there would be a change from 2.04 to 2.26 in women's real wages if they had the same endowments as men.

Finally, the third part is the interaction term that measures the simultaneous effect of differences in endowments and coefficients, because the study was based on a survey, the standard errors are presented to take into account sampling variations that could exist in the predictors used.

4. Conclusions

As we could observe there is a part of the gender wage gap in Hidalgo that can be explained by the endowments of education, income and hours worked of each group; however, most of it refers to the coefficients, so the main reason for the wage gap is discrimination. Despite its proximity to the capital of the country (the entity with the best results in gender parity) Hidalgo proves to be one of the entities with the greatest vulnerability for women in the labor market, so if national actions are not having a favorable effect in the state, internal measures should be taken to ensure equal opportunities and economic independence for the entire population.

Although the Mexican State contemplates protective norms for equality between men and women (Art. 86 of the Federal Labor Law), substantive gender equality has not been achieved, so it is necessary for the public sector to work and collaborate in establishing conditions that allow women to advance professionally and professionally, for example, by generating incentives for employers to implement good practices in the area of gender equity.

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