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An analysis from 1993 to 2018.

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Labor Markets Division

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The gender labor income gap in Bolivia[*]
An analysis of its evolution between 1993 and 2018

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October 2020

Abstract

In Bolivia, women working in similar positions as men face lower remunerations, besides being concentrated in low-paid jobs. This paper sheds lights over the gender labor income gap evolution in Bolivia over a 25-year period (1993 to 2018). Using household surveys and applying two different methods, the Blinder-Oaxaca decomposition and the Ñopo decomposition, we find sound evidence of an important reduction in the gender labor income gap during the analyzed period. This reduction is due to, firstly, the reduction of the number of observable characteristics affecting the labor market such as education and the impact of family characteristics on access to employment. Secondly, it shows the reduction in the unexplained component, which is usually assumed to be discrimination.

JEL Codes: J16, J31, J71

Keywords: Gender Economics, Wage Differentials, Discrimination

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1. Introduction

Latin America and the Caribbean (LAC) has made considerable progress towards gender equality (Chioda, 2011). In recent years, the visibility of women at home, at school, in the labor market, and in the political arena has evolved significantly (Ñopo, 2012). Despite all this progress, in most LAC countries men still earn more than women while doing the same work and differences in income in favor of men persist. The former is still considered one of the most unjustifiable forms of inequality (ILO, 2019).

Although in Bolivia the regulations for issues related to gender equality are advancing, women still suffer from discrimination in a variety of fields. Subject to high levels of domestic violence and *machismo*, women not only have fewer opportunities for studying, accessing medical care, and finding a job, but their income is lower and they are more likely to be poor.

In economic terms, Bolivia holds the 105th place (out of 153) in the area of economic participation and opportunity in the World Economic Forum's Global Gender Gap Index (WEF, 2020), and the 134th place (out of 153) in the area of income inequality between men and women in similar jobs. Likewise, data from the Information System on Labor Markets and Social Security (SIMS) of the Inter-American Development Bank (IDB) confirm this fact, showing that in 2018, women earned an average of 82% of their hourly male counterparts' income; when the LAC's average was 93%[1]. Furthermore, about 50% of women have a monthly income below the national minimum wage, and are more likely to work in worse conditions, execute informal jobs or be unemployed.

Despite such a situation, available information on the matter is still limited and there are only a few studies analyzing the gender labor income gap between women and men in Bolivia. Moreover, because these few studies apply different empirical methods, to compare them and hence conduct a follow-up on the problem's evolution is a difficult task.

This paper's purpose is to reduce the lack of knowledge about this topic by proposing a rigorous analysis on the income gap evolution between men and women in Bolivia between 1993 and 2018. To this end, the analysis examines the evolution of the labor income gap using two methodologies: the Blinder-Oaxaca decomposition and then the Ñopo decomposition, which opens the possibility to compare evidence obtained through a parametric model with a nonparametric one for a large period of time. The application of both methodologies enables us to count on a wide analytical spectrum from where we can identify the variables determining said evolution.

The results display a significant reduction in the gender labor income gap along the 25 years analyzed. The reduction can be explained by two facts. The first, the reduction of the observable differences between men and women in the labor market, mainly due to the decrease of women's educational gap and the changes in the social and family environment that allowed women to enter the labor market. The second fact is the reduction of the component associated with gender discrimination. Additionally, this study found evidence that the gender labor income gap is smaller at higher levels of education and in the formal sector.

The rest of this document is divided as follows: section 2 presents a review of the relevant literature; section 3 describes the data used in this study and the descriptive statistics on the income gap evolution over the 25 years analyzed; section 4 explains the methodologies used

[1] Information from 2018 which includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, México, Panama, Paraguay, Peru, Dominican Republic, and Uruguay. [Accessed in March 2020].

for calculating the gender labor income gap; section 5 presents the analysis's results; section 6, the consistency tests; and, lastly, section 7 shows the main conclusions.

2. Literature review

The recent years' progress in LAC in gender equality has been fostered by the greater visibility of women in various fields. One relevant point is related to the increased participation of women in the labor market since 1980 [2] (Chioda, 2011). Nonetheless, such evolution happened in unequal conditions, since women continue to be mainly employed in low-paid jobs, in the informal sector, and the labor income gap remains a relevant issue (Ñopo, 2012).

Regarding the labor income gap, the literature has tried to differentiate the income gap referring to individual characteristics and human capital endowments; particularly, the unexplained gap supply, which is mostly related to gender biases and/or discrimination (Atal et al., 2009).

Psacharopoulos and Tzannatos (1992) studied the difference in labor income in 15 LAC countries in the late 1980s. The authors found evidence that women earned only 65% of a man's labor income. Along this line, the income gap percentage explained by the differences in the level of education and human capital represented purely a third of the total difference, leaving unexplained a large part (about 43%) -possibly associated with discrimination. Slightly more recent evidence displays the gender income gap narrowed from 16% to 9% (Ñopo and Hoyos, 2010) between 1992 and 2007. However, the unexplained difference represented 34% in 1992 and 30% in 2007.

It is worth pointing out that a significant part of the recent reduction in the gender income gap can be explained by the increase of women's educational level enabling them to enter the labor market (Chioda, 2011; Gasparini and Marchionni, 2015). Ultimately, the International Labor Organization (ILO) (2019) in a 17-country analysis and through the nonparametric decomposition of Ñopo, found that the unexplained gender income gap reduced from 2012 to 2017 (a 5-year period) by approximately 2 percentage points (pp) to 3 pp. The gap being more pronounced among lower-income employees and in self-employed employees.

In the case of Bolivia, there is some evidence regarding the evolution of the gender income gap. Psacharopoulos and Tzannatos (1992), with data from 1989, found that women earned 62% of men's income. Of this observed gap, only 15% could be explained by differences in human capital endowment [3]. Rivero and Jiménez (1999) analyzed income differences in Bolivian urban areas between 1981 and 1997, determining that the gender income gap reduced from 32% in 1981 to 11% in 1997. Likewise, Contreras and Galvan (2003) reviewed the evolution of discrimination against women and indigenous people in Bolivia between 1994 and 1999 [4]. Their study confirms the existence of income discrimination based on gender and ethnicity, specifying that being a woman and an indigenous person increased the income gap between 3.2 pp and 4 pp [5]. Ñopo (2010), working with 2005 national level data, found evidence that the unexplained gender income gap could be as high as 17%. Lastly, the ILO (2019) found the unexplained gender income gap, using the decomposition of Ñopo, is 30 pp for self-employed employees and 8 pp for salaried employees.

[2] Evidence suggests that the insertion of women in the labor market is due to the economic growth of the region, i.e., trade, liberalization, urbanization, the increase of the average educational level, and the decrease of the fertility rate. Gasparini and Marchionni (2015) assert that the increase in female participation in the labor markets of LAC countries can also be explained by the 2000 economic growth along with the policies implemented fostering and protecting women's work.

[3] Information in Table A-1 of the Psacharopoulos and Tzannatos study (1992).

[4] This study uses Mincer equations corrected for selection bias followed by the Fields's decomposition.

[5] By means of its Fields's decomposition.

Nevertheless, and despite the evidence described above, the studies described used different empirical models and examined different population groups, making it impossible to compare them; and, hence, to examine the evolution of the gender gap. This fact is particularly relevant for the design and implementation of public policies addressed at narrowing the gender gap and allowing women to have access to the labor market according to their needs. This paper aims at contributing to the literature and proposes the analysis of the gender gap evolution in Bolivia from 1993 to 2018.

3. Data and descriptive statistics

Data

The data used in this study comes from the harmonized Household Surveys of the Inter-American Development Bank (IDB)[6]. For the 25-year period under analysis, five surveys are used, based on their availability. Data comprises the 1993 Integrated Household Survey, followed by Household Surveys of 1999, 2006, 2013 and 2018. All of them were collected by the National Institute of Statistics (INE).

An important feature to note is that all surveys used for this study have a similar design and the same level of representativeness. The sole difference is that the 1993 survey has representativeness only at the level of capital cities. To overcome such a divergence, this study limits its analysis scope to urban areas[7], although results are presented at a general level in section 5. We must emphasize that the harmonization process of household surveys ensures their comparability along the 25-year analysis.

Our analysis is restricted to people between the age range of 15 and 65 and considers exclusively information related to the primary economic activity.

To begin, we will analyze the sample from the five surveys determined for this study. Table 1 displays the 1993 survey with a total of 10,723 observations within the age range determined for the analysis. The 1999 survey sample is smaller with only 4,444 observations, survey 2006 has 7,017 observations, survey 2013 increases its sample size to 16,341 observations, and finally survey 2018 has collected 19,210 observations. The reduction in the sample size between 1993 and 1999 is explained by INE's decision to include rural areas along with some survey sections[8]. From 1999 until 2018, it is clear that the sample size has gradually increased.

[6] Database of Harmonized Household Surveys.
[7] The 1993 Integrated Household Survey exclusively covered capital cities and El Alto City while excluding Cobija, whereas the 1999, 2006, 2013 and 2018 surveys had nation-wide representation. In view our study restricted the analysis to urban areas, we suggest being cautious when comparing the 1993 results with other years.
[8] The 1999 survey was conducted as part of the Improving Surveys & Life Conditions Measurements Program in Latin America and the Caribbean (MECOVI). As of 1999 household surveys in Bolivia incorporated national representation.

Table 1: Number of observations for each survey

	1993		1999		2006		2013		2018	
	N	***%***	**N**	***%***	**N**	***%***	**N**	***%***	***N***	***%***
Gender										
Men	5.487	46%	2.038	47%	3.197	47%	8.309	47%	8.908	47%
Women	6.402	54%	2.294	53%	3.630	53%	9.269	53%	9.853	53%
Age										
15-25 years old	4.476	38%	1.668	39%	2.601	38%	5.880	33%	6096	32%
26-35 years old	2.855	24%	996	23%	1.586	23%	4.224	24%	4458	24%
36-45 years old	2.235	19%	827	19%	1.266	19%	3.264	19%	3721	20%
46-55 years old	1.425	12%	543	13%	872	13%	2.496	14%	2552	14%
56-65 years old	898	8%	298	7%	502	7%	1.714	10%	1934	10%
Total	11.889	100%	4.332	100%	6.827	100%	17.578	100%	18.761	100%

Source: Own table developed on household surveys from years 1993, 1999, 2006, 2013 and 2018.

On average, 53% of the sample is made up of women and this trend is observed in all five surveys used in the study. The age distribution is similar in all the surveys, although the number of people older than 55 participating in the survey is increasing, a trend consistent with the country's demographic evolution.

Descriptive statistics

The table below shows information regarding the income differences by gender in Bolivia. Table 2 presents the income difference between men and women, based on the actual hourly income, differentiating by certain demographic characteristics. To facilitate their comparison, the data corresponds to women's hourly income in relation to men's income (100%) for each category.

Table 2: Women's hourly income compared to men's hourly income

	1993	1999	2006	2013	2018
General	61.4%	82.8%	63.0%	81.8%	89.6%
Age					
15-25 years old	60.0%	69.6%	48.6%	81.9%	84.3%
26-35 years old	74.4%	84.2%	73.2%	79.9%	94.1%
36-45 years old	61.3%	90.7%	64.0%	82.1%	87.8%
46-55 years old	57.6%	75.7%	62.2%	85.6%	95.5%
56-65 years old	39.5%	87.5%	69.8%	75.2%	78.9%
Education level					
None	62.7%	78.2%	70.0%	67.2%	82.7%
Primary cycle	54.8%	67.1%	76.0%	76.7%	86.5%
Secondary cycle	74.7%	105.6%	61.0%	79.3%	85.9%
Tertiary education	60.4%	79.7%	63.5%	90.2%	88.9%
Economic sector					
Mining & hydrocarbons	n.d.	27.6%	n.d.	82.6%	77.6%
Manufacture	61.2%	65.0%	76.0%	71.3%	60.9%
Construction	n.d.	47.4%	37.7%	85.0%	83.5%
Trade	57.1%	83.4%	61.7%	74.8%	78.2%
Transport & storage	n.d.	n.d.	n.d.	60.8%	69.5%
Financial services	61.9%	71.5%	31.6%	86.1%	129.3%
Social services	51.9%	75.3%	64.3%	82.7%	92.2%
Occupation					
Professional, technician & executive	74.2%	94.1%	57.5%	94.5%	92.7%
Managers	88.5%	88.7%	87.1%	95.6%	110.0%
Traders & salespeople	48.0%	86.5%	61.6%	59.4%	77.0%
Services	52.8%	103.4%	90.6%	101.0%	99.8%
Non-agricultural or livestock employees	59.2%	49.9%	72.5%	60.6%	68.7%
The army & the police	n.a.	n.d.	54.9%	n.d.	69.3%
Formality					
Informal	n.a.	75.4%	60.0%	74.4%	84.1%
Formal	n.a.	112.4%	83.4%	98.9%	103.6%

Source: Own table developed based on household surveys from years 1993, 1999, 2006, 2013 and 2018.
Note: Social Services include electricity, water, and gas utilities.
n.a.= Not Available. When available, data are not enough to calculate the percentage.

As shown in the table, in 1993, in relation to men's income, women earned 39% less. This difference reduced to 10% in 2018, showing the first evidence of the gender labor income gap reduction in Bolivia.

As for age ranges, the smallest difference between men and women occurs in the age range between 26 and 35 years. That is true for all the analyzed years, although the magnitude of the difference was also considerably reduced. In 1993, a woman between the age of 26 and 35 earned only 74% compared to the income of a man of the same age range, whereas in 2018, women earned 94% of a man's hourly income. A relevant fact is that the reduction of

gender income gaps holds for all age ranges, including those between 56 and 65 years old, the age range with the most observed income differences.

With respect to the educational level, women with tertiary education went from obtaining 60% of a man's hourly income in 1993, to earning a relatively similar income to men's (89%) in 2018. There is also evidence of a gap reduction for all educational levels, although women lacking formal education obtain 17% less than a man with the same educational level.

Regarding the economic sector, in 2018, the financial, construction and services sectors are the ones with equal income for men and women, whereas in the trade and manufacturing sectors, differences linger in more than 20 pp. It is important to remark on the evolution of the income gap in the financial and social services sectors over the 25 years analyzed. If we consider the wage gap by occupation, managers, professionals, technicians, and administrative services show the highest levels of income equality. In 1993, a woman in a managerial, professional or technician position earned 74% compared to the 100% of a man's income, while in 2018, she earned a similar income per hour worked (93%).

Finally, in relation to the formality[9] area to which employees in Bolivia have access, women working at formal jobs earn an income equal to or higher than that of men. The penalty in labor income for women in the informal sector went from approximately 25% in 1999 to 16% in 2018.

4. Empirical strategy

Blinder & Oaxaca's decomposition

This section seeks to quantify and analyze the evolution of the gender gap in Bolivia over the last 25 years. To this end, we will analyze the part of the labor income gap explained by divergences of human capital (whether education, work experience or other), and the part that cannot be explained, which would be associated with gender discrimination[10].

The literature has usually addressed this question using the Blinder-Oaxaca decomposition, which uses the Mincer-type wage equations to divide the difference in labor income into two groups. One that could be "explained" by group differences and productive characteristics such as education or work experience, and the second group covering the "unexplained" part that is the residual component, generally associated with discrimination (Jann, 2008).

The formal rationale of the methodology is the following: considering two groups, men (H) and women (M); a result of interest which is our variable Y (in this case, the logarithm of hourly income); and a group of explanatory variables X (education, experience, and others). The question of interest to be answered is: How much of the labor income average difference derives from the group differences in the X predictors?

$$EGap = E(Y_H) - E(Y_M) \quad [1]$$

Where $E(Y_g)$ refers to the expected value of the variable of interest. Applying a Mincer-type equation to explain income, we can disaggregate it as $Y_g = \alpha_g + \sum_{i=1}^{k} X_{ik}\beta_{gik} + \epsilon_{gi}$, where *g*

[9] For this paper's study, a formal employee is the one with access to long-term social security benefits (pension funds).
[10] Several economic models have formally analyzed the offer and supply of factors that could explain the labor income gap of minorities. Becker (1957), for instance, proposes his known theory "*Taste for Discrimination*" whereby discrimination is due to a personal prejudice or a personal "preference" from not being part of a specific group. Consequently, employers act as if there were a non-economic cost for giving employment to a specific group. Another common explanation is the so-called "*statistical discrimination*", which defines discrimination as the act of rational agents using added group characteristics for the evaluation of individual characteristics. This implies, in other words, that agents of different groups can be treated in different ways. For example, if enterprises believe fertile-age women are more likely to make a pause in their careers in order to bear children, said enterprises would pay these women lower salaries to mitigate the probability of losing a female employee (Hoyos et al., 2010).

describes whether the equation is done for men (H) or women (M). The expression could be replaced in the equation [1], so:

$$EGap = E\left(\alpha_H + \sum_{i=1}^{k} X_{ik}\beta_{Hik} + \epsilon_{Hi}\right) - E\left(\alpha_M + \sum_{i=1}^{k} X_{ik}\beta_{Mik} + \epsilon_{Mi}\right) \text{ [2]}$$

$$EGap = \hat{\alpha}_H + \sum_{i=1}^{k} \overline{X_{ık}}\,\hat{\beta}_{Hik} - \hat{\alpha}_M - \sum_{i=1}^{k} \overline{X_{ık}}\,\hat{\beta}_{Mik} \text{ [3]}$$

By reordering some variables, we can identify the contribution of predictors' group differences to the result.

$$EGap = (\hat{\alpha}_H - \hat{\alpha}_M) + \sum_{i=1}^{k} \bar{X}_{ik}\,(\hat{\beta}_{Hik} - \hat{\beta}_{Mik}) + \sum_{i=1}^{k} (\bar{X}_{Hik} - \bar{X}_{Mik})\,\hat{\beta}_{Hik} \text{ [4]}$$

Where the last component of equation [4] refers to the income gap explained by the observable differences, whereas the first two components refer to the non-observable differences.

The Blinder - Oaxaca decomposition is the method most widely used for the calculation of income gaps; however, it presents some limitations worth mentioning. First, the relationship between characteristics and income may not necessarily be linear as the Blinder - Oaxaca model assumes. Second, this method only informs about the income gap decomposition. Third, this method fails to restrict itself to the comparison of comparable people due to differences in the support of the empirical distribution of people's characteristics (Ñopo, 2012).

Decomposition of Ñopo

In response to limitations, Ñopo (2008) developed a nonparametric decomposition method. This method answers to the same counterfactual question, considering differences in the entire income distribution and not only to the average as the Blinder - Oaxaca decomposition does.

In this sense, the Ñopo methodology restricts the comparison of differences to exclusively men and women with comparable characteristics. To this end, it creates a synthetic sample of individuals by matching men and women with identical observable characteristics and, in doing so, the method has no need to assume any functional form to linking the characteristics with the income. Matching takes place through the connection of discrete characteristics; thus, matching does not need to use a propensity score sample or any other notion of distance between the characteristics of men and women (Ñopo, 2008).

This procedure creates three sets of individuals: i) those women and men already matched (denominated the common set); ii) those women with observable characteristics for whom no comparable men exist (known methodologically as the Maid Effect); and, iii) those men for whom no comparable women exist (known as the CEO Effect). Due to its construction, those men and women in the common set do not present different observable characteristics; and, consequently, should there exist any differences in income, they could not be explained based on these characteristics.

In this sense, the procedure breaks down the income gap into four elements:

$$\delta = \delta_X + \delta_H + \delta_M + \delta_0 \text{ [5]}$$

The first element explains the income difference in relation to observable characteristics (δ_X); the second and third elements explain the difference of those individuals outside the common set (δ_H and δ_M); and the fourth and last element can be interpreted as discrimination (δ_0). An outstanding fact is that the Ñopo unexplained component can be compared to the Blinder-Oaxaca model's unexplained component, but only restricted to the common set and within the distribution.

Although the Ñopo decomposition method has important attributes correcting specific limitations of the Blinder-Oaxaca method, the former has its own limitations. First, due to the fact that matching is made with discrete variables, the probability of finding a person with the same characteristics and endowments for each man or woman decreases when the number of variables included increases (Enamorado et al., 2009), reducing the common set if the analysis is conducted with a significant number of observable characteristics. In the literature this phenomenon is known as the "Curse of Dimensionality." In general, the size of the common set depends on the number of variables included in the analysis.

A fact concerning these methodologies is that both only take into consideration observable characteristics. Unobservable characteristics such as effort, the interest of participating in the labor market or the household responsibilities are omitted, thus generating more likely biased estimates. Results from other research on women's labor market participation show evidence that men and women's preferences and attitudes towards work are not necessarily identical (Chioda, 2011).

This study will apply both methods for the analysis of the income gap evolution between men and women in Bolivia. By using both methodologies, this study allows us the methodological advantages of each one to be able to understand and explain the income gap evolution. Likewise, using both methodologies enables us to develop a methodological framework that can be compared with other existing studies and future updates, regardless of the methodology used.

5. Results

In view of this study using both evaluation methodologies, the same explanatory variables for both decompositions will be applied. The following variables are included: years of education; estimated work experience [11] ; work experience squared; one dummy variable for each educational group (there are four groups: no education or lower than primary, primary completed, secondary completed and tertiary education. The base group is the group without education); one dummy variable for each age group (15-25, 26-35, 36-45 and 56-65. The base group is the age ranging from 45 and 56); one dummy variable with the value of (1) one if the person is married; one dummy variable for each economic sector; one dummy variable with the value of (1) one if the person works formally; and, one dummy variable with the value of (1) one if there are children under 6 years old at home. Due to the comparability with the Ñopo decomposition, in this first analysis the occupational group is not included, although it is included later.

[11] Calculated as Experience = age-years of education-6.

Table 3: Blinder – Oaxaca decomposition

	Logarithm of Hourly Income				
	1993	1999	2006	2013	2018
Differential					
Men estimation	1,696***	1,973***	1,921***	2,200***	2,258***
	(116,29)	(76,61)	(98,33)	(214,02)	(268,25)
Women estimation	1,158***	1,560***	1,594***	1,964***	2,095***
	(59,30)	(42,10)	(60,87)	(140,61)	(166,14)
Difference	0,538***	0,413***	0,327***	0,235***	0,163***
	(22,08)	(9,15)	(10,02)	(13,58)	(10,72)
Decomposition					
Explained	0,191***	0,120***	0,0903***	0,0662***	0,0291**
	(10,04)	(3,69)	(4,05)	(5,91)	(2,83)
Non- explained	0,347***	0,293***	0,237***	0,169***	0,133***
	(14,63)	(6,57)	(7,43)	(9,83)	(8,51)
Decomposition (as a percentage of the hourly labor income for men)					
Total	32%	21%	17%	11%	7%
Explained	11%	6%	5%	3%	1%
Non- explained	20%	15%	12%	8%	6%
Observations:	6.313	2.330	3.807	10.418	10.603

Statistic t between parenthesis

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Own table developed based on data from household surveys from years 1993, 1999, 2006, 2013 and 2018.

Table 3 displays the results of the hourly income gap calculation using the Blinder-Oaxaca method. Results show that in 1993 the gender difference in the hourly income was 32% of the men's average labor income. Out of this difference, simply 11% represents the explained component, whereas 20% [12] is the unexplained component. In other words, the explained gap part corresponds to men's higher level of education and work experience. In 1999, the income difference was roughly 21%, of which 15% was the gap's unexplained component. In 2006, the income gap narrowed to 17% of which 12% was not explained by any observable characteristic. In 2013, the downward difference trend reached 11%, of which 8% was the unexplained component. Finally, by 2018, the income gap represented only 7%, of which 6% was the unexplained component.

It is interesting to note that the decrease in the gender income gap over the last 25 years ranged from 32% in 1993 to 7% in 2018. Being noteworthy as well is the gap reduction of the explained percentage that went from 11% to 1%, yet also is the reduction of the unexplained component that went from 20% to 6%.

[12] The gender gap is calculated as the Difference/Man Estimation. The explained gap is calculated as the "Explained"/Man Estimation. The unexplained gap is calculated as the "Non-Explained"/Man Estimation.

Table 4: Components from the explained difference – Blinder-Oaxaca

	Logarithm of Hourly Income				
	1993	**1999**	**2006**	**2013**	**2018**
Explained Difference	0.191***	0.120***	0.090***	0.066***	0.029**
Education	0.113***	0.091***	0.041**	0.016**	-0.005
Experience	-0.007	-0.020	-0.013	-0.004	0.001
Personal & family characteristics	0.021***	0.009	0.017**	0.013***	0.002
Activity sector	0.055***	0.034	0.028*	0.036***	0.026***
Region	0.009	0.000	0.002	-0.002	0.000
Formal sector	n.d.	0.007	0.015**	0.007**	0.004

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Source: Own table developed based on data from household surveys from years 1993, 1999, 2006, 2013 y 2018.

To analyze the causes of the reduction in the explained gap, Table 4 presents a breakdown of the main components explaining the differences between men and women. To this end, we add variables related to educational characteristics, experience, personal and family characteristics, the activity sector, along with the region and formality. The gap reduction of the explained component associated with educational differences stands out, ranging from being the most relevant to not being significant. This is due to the greater access of women with higher levels of education to the labor market, as shown in Table A1.

Similarly, we found that family characteristics are no longer relevant in explaining the difference in income, which is related to the impact of cultural and role changes in the country; for example, being a married woman is no longer relevant in explaining income differences. Along this line, it is important to note that the activity sector where women work is still relevant in explaining the income difference since it sheds light on sectoral segregation. The same analysis is presented under the annexes, including the occupation variable (Table A2.), showing that women have less access to occupations linked with higher income. The contrast among such statements is showed in Annex 2, presenting the methodology for income decomposition based on the explanatory variables used and known as the Fields' decomposition.

Table 5 presents the Ñopo decomposition results. Although the same set of explanatory variables is used –bearing in mind the Ñopo methodology uses discrete data for matching- variables from the educational level group are included instead of the years of education variable. Taking into account the Curse of Dimensionality –given the inclusion of explanatory variables has a negative impact on the common set-- the result does not include the labor occupation variable as is the case of the above reported Blinder-Oaxaca decomposition. Section 5 presents results using this variable.

The first column of Table 5 shows that the 1993 gender income gap was 43% of men's average income, of which 31% was the unexplained component, and 8% the explained one. The CEO Effect (men for whom the procedure did not find women with the same characteristics) has a positive impact on the gender gap and is equal to 5%. On the other hand, the Maid Effect (women for whom the procedure did not find men with the same characteristics) has a negative impact (-0.4%). It is interesting to note that the common set's percentage for men and women is 55% and 72%, respectively – as expected due to the application of the matching methodology.

Table 5: Ñopo decomposition

	1993	1999	2006	2013	2018
δ (Total)	43%	28%	23%	13%	7%
$\delta_0\delta_0$ (Non-Explained)	31%	21%	16%	11%	5%
$\delta_M\delta_M$ (Maid Effect)	-0%	-4%	-1%	-2%	-2%
$\delta_F\delta_F$ (CEO Effect)	5%	4%	2%	2%	1%
$\delta_X\delta_X$ (Explained)	8%	8%	6%	2%	2%
% Men	55%	36%	41%	57%	53%
% Women	72%	53%	58%	76%	78%
Standard Error					
Standard Error δ_0	2%	4%	3%	1%	1%

Source: Own table developed based on data from household surveys from years 1993, 1999, 2006, 2013 and 2018.

Continuing with the analysis, in 1999 the gap was reduced to 28%, 21% representing the unexplained component and 8% the explained one. The CEO Effect was 4% and the Maid Effect negative and equal to -4%. Out of all observations for that year, 36% of the men and 53% of the women were in the common set.

By 2006, the gap further reduced to 23%, with the unexplained component being 16%[13], a CEO Effect of 2% and a Maid Effect of -1%. In 2013, the gender income gap reached 13% of the average income, basically composed of the unexplained or discrimination component equal to 11%.

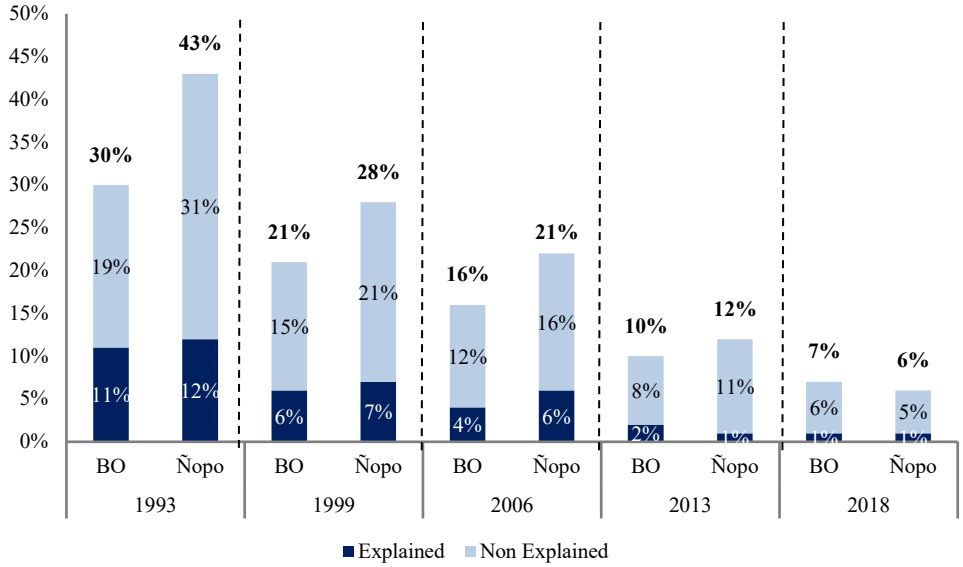
Lastly, by 2018, the income gap was halved to 7% of the average income and the unexplained gap was 5%. In this case, 53% of men and 78% of women were in the common set.

Two results stand out from the analysis. First, the Ñopo decomposition shows a process of closing the gap during the period studied with a gender income gap going from 43% to 7%. Second, the gap reduction explained by the observable differences is consistent with the Blinder-Oaxaca (BO) analysis, reducing from 8% to 2%. The CEO Effect reduction is also important to highlight because it represents the part of the difference explained by non-replicated men characteristics in women, which was reduced. It is traditionally associated with the presence of men in top management positions—and could be interpreted as a sign of women having greater access to management positions. Nevertheless, the Bolivia's National Institute of Statistic's (INE) report on private sector remunerations presents a lower participation of women in management positions concurring with the Bolivian Labor Demand Survey [14] data -showing evidence that companies continue to prefer hiring men in management positions.

Graph 1 presents a summary of the total gender gap found with the calculations of both methodologies for the 25-year period analyzed. The summary includes both components, the explained and unexplained, highlighting the gap difference convergence yielded by both methodologies.

[13] This percentage is like the 17% found by Ñopo (2010) for year 2005.
[14] Survey conducted by the IDB in Bolivia between 2015 and 2016. Urquidi et al. (2018) "*Encuesta Mercado Laboral: Oferta 2016, Demanda 2015-2016."*

Graph 1: Total income gap estimation applying the Blinder-Oaxaca & Ñopo methodologies

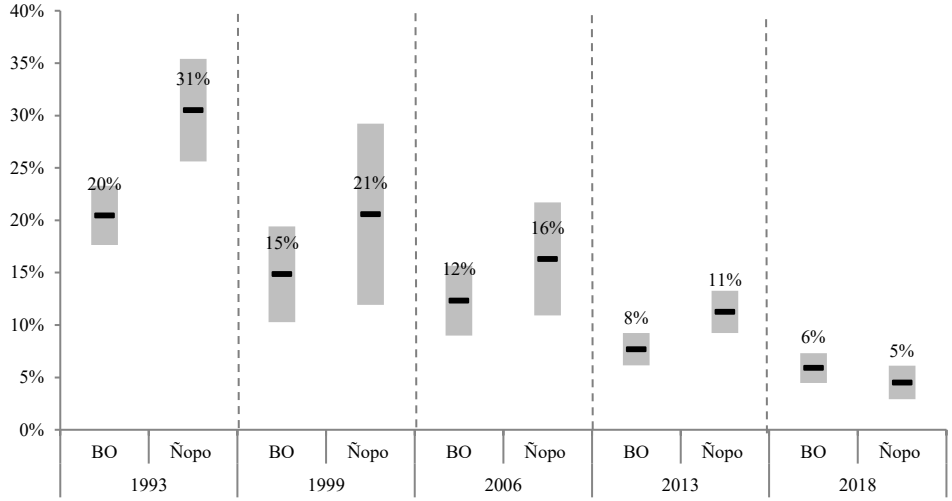


Source: Own development using household surveys data from years 1993, 1999, 2006, 2013 and 2018. Bars represent the explained and non-explained components of the gender income gap. For the Ñopo methodology, the explained component data is calculated as the sum of the explained component, the *CEO Effect,* and the *Maid Effect*.

The evolution of the unexplained income gap component is presented for the period analyzed applying both procedures. Graph 2 shows the unexplained gap including variations and two standard deviations above and below the estimator. Results show a robust evolution of the unexplained gap with both methodologies, of which is noteworthy that both estimators are not statistically different, with the exception of the year 1993.

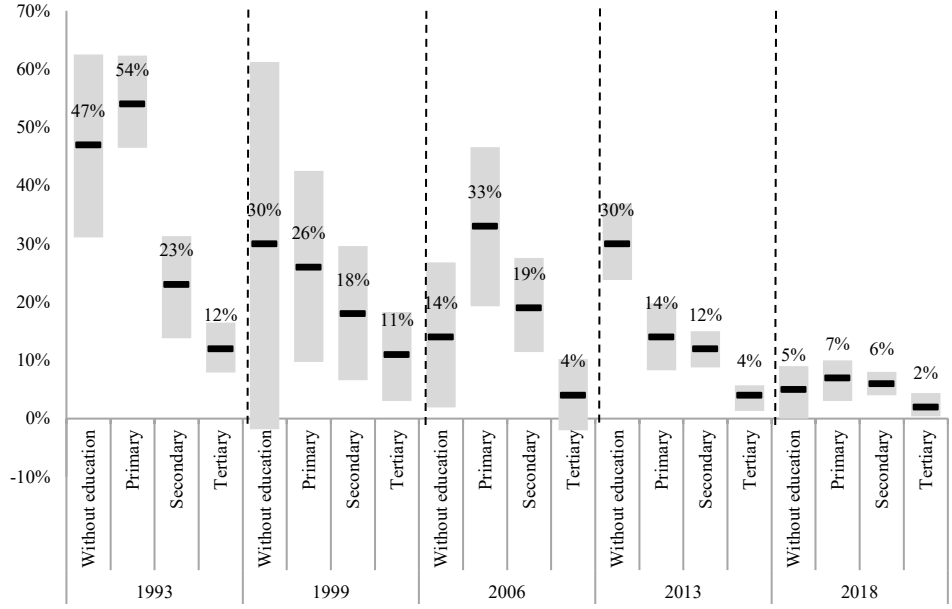
The Ñopo decomposition enables us to explore the disaggregated income gap. Graph 3 displays the differences of gender gap depending on educational level. As the level of education increases, it is observed that the unexplained component of the income gap is reduced. The income gap for those women without education or only primary education was 47% and 54% respectively in 1993. Such gap reached 23% and 12% when compared with women with secondary and tertiary education. In 2018, the unexplained gap for women with no education was 5%, for women with primary and secondary education 7% and 6%, respectively, and for those with tertiary education, the income gap was only 2%. It is worth noting that in 1993, the unexplained gap drastically reduced to the secondary educational level, while in 2018, the gap falls for women with tertiary education. This phenomenon can be explained by the increase in the educational level of the labor force.

Graph 2: Comparison of the non-explained income gap



Source: Own development using household survey data from years 1993, 1999, 2006, 2013 and 2018. Bars represent the non-explained component with a 95% confidence interval.

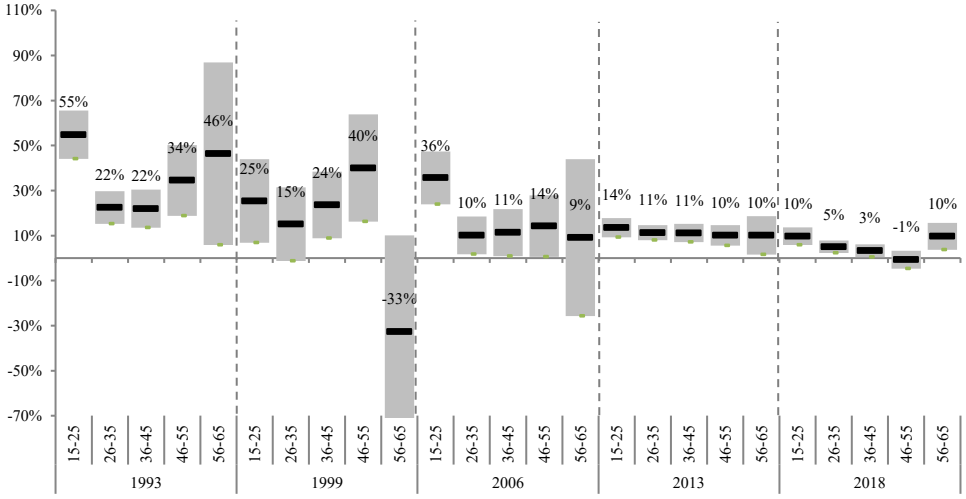
Graph 3: Non-explained income gap by level of education using the Ñopo decomposition



Source: Own development using household surveys data from years 1993, 1999, 2006, 2013 and 2018. Bars represent the non-explained component with a 95% confidence interval.

Regarding the evolution of the labor income gap unexplained component by age group, it is demonstrated that there is greater discrimination for female employees in the tails of age distribution, meaning young people between 15 and 25 years old, and people closer to retirement age (56 to 65). are the groups that show more unexplained income differences (Graph 4).

Graph 4: Non-explained income gap by age using the Ñopo decomposition

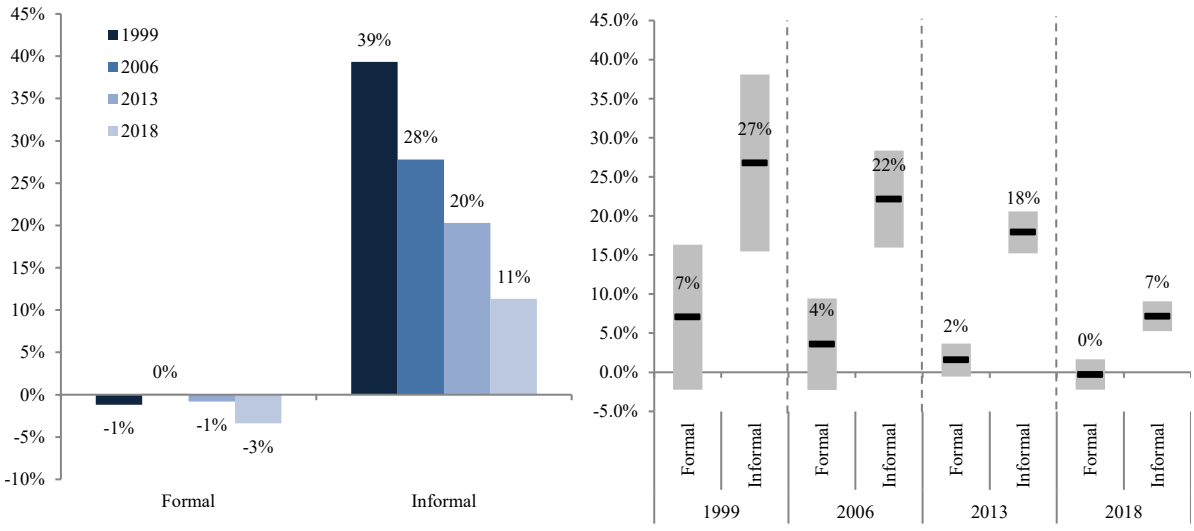


Source: Own development using household surveys data from years 1993, 1999, 2006, 2013 and 2018. Bars represent the non-explained component with a 95% confidence interval.

Disaggregating the impact of the unexplained gap by formality, the unexplained component of the gap is shown to be much greater in the informal sector. This analysis excludes the 1993 information because this survey did not have any information allowing the homogeneous calculation of the definition of informality (access to long-term social security) as the other surveys did. The unexplained gap, in the formal sector, narrowed from 7% in 1999 to 0% in 2018. For the informal sector instead, the unexplained gap was as high as 27% in 1999, reduced to 22% in 2006, then to 18% in 2013, and finally to 7% in 2018 (Graph 6, right panel). We must note that in the formal sector the total income gap is negative (Graph 5, left panel), due to the presence of women with higher educational levels; and, consequently, with better jobs.

Graph 5: Income gap by formality using the Ñopo decomposition

Total gap (left), non-explained gap (right)



Source: Own development using household survey data from years 1993, 1999, 2006, 2013 and 2018. Bars represent the non-explained component with a 95% confidence interval.

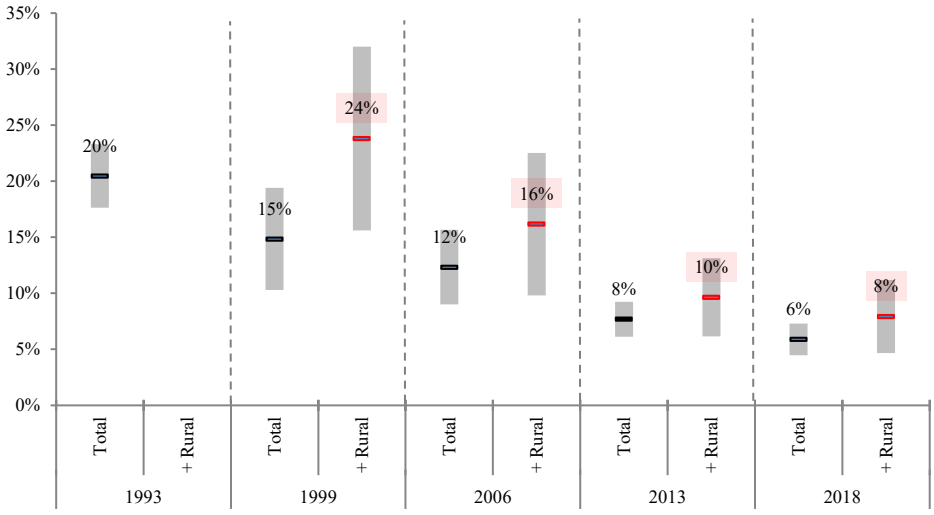
With respect to the income gap in the informal sector, we must remember Bolivia's high level of informality, which reaches 80% of the working population, out of which 73% belongs to urban areas. Taking the foregoing into account, the informality analysis can be broken down in two groups. The first group is that of informal employees, whose unexplained income gap reduced from 23% in 1999 to 4% in 2018. Such reduction can possibly be explained by the lower degree of governmental control resulting from the characteristics of these occupations and due to the lack of access to social security of the informal sector (Graph A1). The second group, of self-employed informal people that are the (analyzed) group with the highest levels of unexplained gap, going from 29% in 1999 to 9% in 2018, and whose differences could be understood by the women's over-representation in occupations that generate the lowest incomes (Table A3).

6. Robustness Test

To evaluate the validity of the results, the effect on the estimates is analyzed, including the rural area and the omitted occupation variable, in the case of the Ñopo decomposition.

Graph 6 presents the Blinder-Oaxaca methodology's results from the unexplained income after including the rural area, whereas the inclusion shows a significant impact on the estimated gap. As expected, the rural areas inclusion increases the unexplained gap going from 15% to 24% in 1999, from 12% to 16% in 2006, from 8% to 10% in 2013, and from 6% to 8% in 2018[15]. The income gap is greater in rural areas due to the agricultural and livestock employment characterization, i.e., independent or family based. For this reason, it is the household head (generally a man) the person usually reporting the labor income, which may include the work of other household or family members, especially women's labor.

Graph 6: Non-explained labor income gap applying the Blinder-Oaxaca decomposition, including rural area



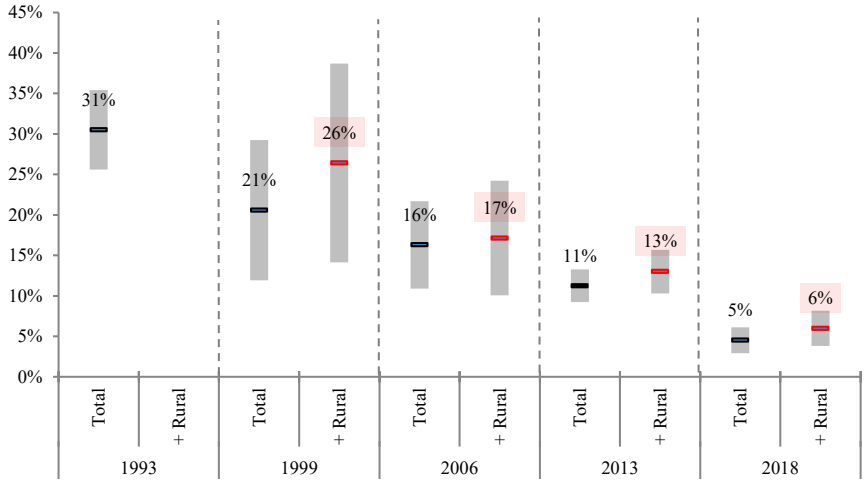
Source: Own development using household survey data from years 1993, 1999, 2006, 2013 and 2018. Bars represent the non-explained component with a 95% confidence interval. The Household Survey of 1993 does not contain information for the rural areas.

Graph 7 shows the calculation results of the Ñopo decomposition, including the rural area. Such an inclusion has a significant impact on the unexplained income gap increase, although in a smaller proportion than under the Blinder-Oaxaca method's application. In 1999, the

[15] The household survey of 1993 contains only urban data.

indicator goes from 21% to 26%; in 2006, from 16% to 17%; in 2013, from 11% to 13%; and, in 2018, the income gap presents a slight increase from 5% to 6%.

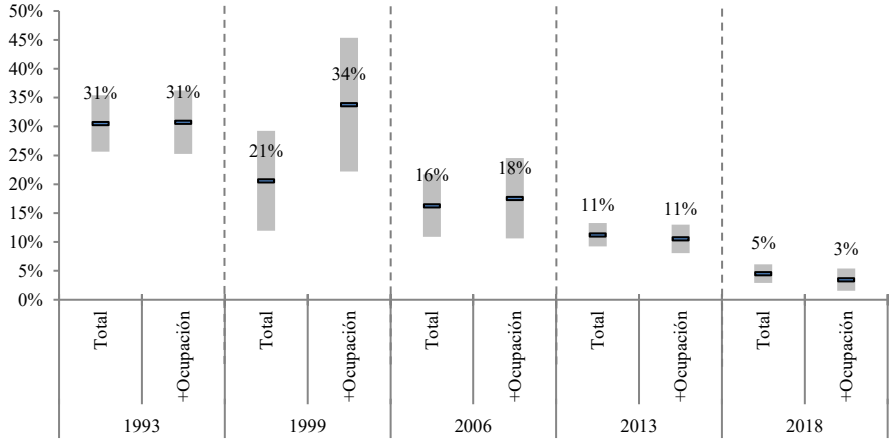
Graph 7: Non-explained income gap applying the Ñopo Decomposition, including the rural area



Source: Own development using household survey data from years 1993, 1999, 2006, 2013 and 2018. Bars represent the non-explained component with a 95% confidence interval. The Household Survey of 1993 does not contain information for the rural areas.

Graph 8 displays the calculation results of the impact on the labor income gap, including the occupation variable, applying the Ñopo decomposition. The variable was omitted because of its impact on the percentage of men and women in the common set. Results show that despite a significant increase (13 pp) in the 1999 unexplained gap, such a gap is not statistically different from the calculation when the variable is omitted. The core issue of including the variable is the loss of external validity since the common set is reduced by 20 pp for women and 15 pp for men.

Graph 8: Non-explained income gap including the occupation variable applying the Ñopo decomposition



Source: Own development using household survey data from years 1993, 1999, 2006, 2013 and 2018. Bars represent the non-explained component with a 95% confidence interval.

Conclusions

In Bolivia, women not only have fewer opportunities in some sectors and occupations, but they also receive lower incomes than men and are concentrated in lower-paid jobs. The main objective of this study is to quantify and analyze the evolution of the gender income gap and to propose rational explanations for the evolution of the gap over the last 25 years in Bolivia.

By means of five household surveys and two different income decomposition methods: one parametric, the Blinder-Oaxaca decomposition; and another nonparametric, the Ñopo decomposition, we find robust evidence of a significant reduction in the gender income gap using both procedures. The study also demonstrates that both procedures have determined a similar evolution and estimates. The Blinder-Oaxaca decomposition shows a gender income gap reduction from 32% in 1993 to 7% in 2018, and the Ñopo decomposition a gender income gap reduction from 43% to 7% during the same period.

This reduction in the gender gap can be explained by the reduction of two components. The first, explained by the reduction of observable characteristics differences, in particular the improvement of women's educational levels and the impact of family characteristics. The second, explained by the gap reduction due to the contraction of the unexplained component, assumed to be discrimination. The explained component displays a reduction from 11% to 1% using the Blinder-Oaxaca methodology, and from 8% to 2% using the Ñopo methodology. The unexplained component also displays a reduction of 14 pp or 26 pp using parametric and nonparametric procedures, respectively.

The Ñopo decomposition has the advantage of exploring income differentials based on observable characteristics, showing the radical reduction of the unexplained gender income gap for women with tertiary education, which represented just 2% of the average male income in 2018.

On the other hand, considering the formality variable, we find an absence of non-explained gender gap in the formal sector, whereas in the informal sector it is almost 7% of the average income. Moreover, the total gender income gap is negative in the formal sector, and possibly attributable to the fact that women need more educational credentials to access better jobs; and, consequently, higher incomes.

Once the rural area variable is included, results remain robust, endorsing the findings and hypotheses around the reduction of the explained and unexplained components' gap (discrimination) in the last 25 years.

These results have important implications for the implementation of public policies. The ongoing reduction of the income gap is a necessity, and for this we need to promote an equal access to sectors and occupations generating higher income to women. The former can be achieved through training and labor insertion of women to non-traditional occupations and sectors, allowing them to improve their labor productivity; and, consequently, their labor income. This is especially relevant for women with lower educational levels and/or working in the informal sector. Nevertheless, such set of policies must be designed to be friendly to the role women play at home and in society. In this way, improvements can be ensured not only in the aspects of employability and remuneration, but also in family welfare.

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Annexes

Table A1: mean data by year & gender –Blinder-Oaxaca decomposition

	1993		1999		2006		2013		2018	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**
Years of education	9.9	8.3	10.6	9.3	10.9	10.0	12.2	11.5	11.7	11.2
None	12%	28%	16%	29%	17%	27%	10%	18%	12%	21%
Primary	44%	34%	33%	26%	29%	23%	20%	18%	23%	18%
Secondary	26%	16%	33%	28%	33%	29%	42%	34%	45%	37%
Tertiary education	18%	22%	17%	17%	21%	21%	28%	30%	19% [16]	25%
Years of experience	19.9	20.7	19.6	20.9	19.2	20.4	19.5	20.5	20.5	21.9
15-25 years old	22%	26%	22%	21%	22%	21%	18%	18%	16%	14%
26-35 years old	31%	28%	29%	29%	29%	28%	30%	28%	29%	28%
36-45 years old	26%	26%	26%	28%	24%	27%	25%	24%	27%	28%
46-55 years old	15%	14%	17%	15%	17%	17%	18%	19%	17%	19%
56-65 years old	6%	6%	6%	7%	7%	7%	10%	10%	11%	11%
Married	73%	53%	75%	59%	72%	59%	67%	54%	71%	54%
Children younger than 6 at home	53%	46%	46%	42%	45%	41%	37%	34%	35%	30%
Mining & hydrocarbons	3%	0%	2%	0%	3%	0%	3%	0%	2%	0%
Manufacture	20%	13%	18%	14%	18%	14%	17%	10%	16%	11%
Construction	16%	0%	16%	0%	17%	0%	16%	1%	21%	1%
Trade	20%	41%	20%	46%	18%	39%	18%	42%	18%	47%
Transport & storage	15%	1%	17%	1%	16%	4%	15%	1%	17%	1%
Financial services	5%	3%	1%	1%	8%	5%	2%	3%	2%	2%
Social services	21%	41%	26%	38%	20%	38%	30%	43%	24%	38%
Formal sector	n.a.	n.a.	26%	22%	25%	21%	33%	31%	28%	27%

Source: Own development based on household survey data from years 1993, 1999, 2006, 2013 and 2018.
Na.= Not available

[16] The reduction in the men's percentage with tertiary education in 2018 compared to 2013 deserves to be analyzed in the next household survey for the purpose of confirming its causes.

Table A2: Components of the explained difference, including occupation – Blinder-Oaxaca

	1993	1999	2006	2013	2018
Explained Difference	0.231***	0.144***	0.117***	0.101***	0.048***
Education	0.092***	0.079***	0.033**	0.015**	0.001
Experience	-0.004	-0.020	-0.011	-0.004	0.000
Personal & family characteristics	0.016**	0.010	0.017***	0.014***	0.004
Activity sector	0.048***	0.031	0.008	0.017*	0.027**
Occupation	0.070***	0.040	0.056**	0.055***	0.012
Region	0.009*	-0.001	0.002	-0.001	0.000
Formal sector	n.d.	0.004	0.012**	0.005**	0.004

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Source: Own development based on household survey data from years 1993, 1999, 2006, 2013 and 2018.

Graph A1: Non-explained income gap by formality applying the Ñopo Decomposition

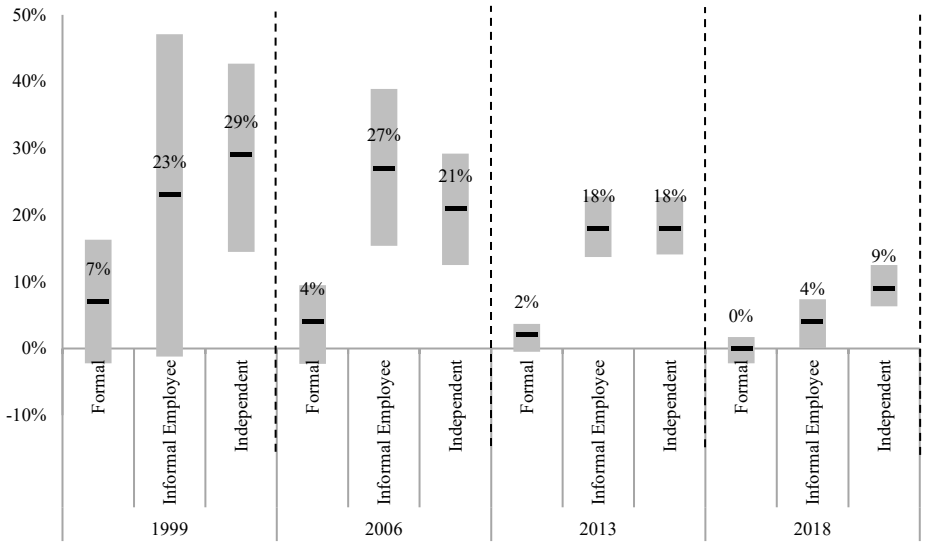

Table A3: Participation by occupation & hourly mean income for independent formal employees

	1993		1999		2006		2013		2018	
	Women's participation	**Hourly income (Bs)**	**Women's participation**	**Hourly income (Bs)**	**Women's participation**	**Hourly income (Bs)**	**Women's participation**	**Hourly income (Bs)**	**Women's participation**	**Hourly income (Bs)**
Executives, professionals & technicians	26%	24.8	25%	21.8	33%	31.3	29%	17.3	29%	16.4
Administratives	70%	7.0	24%	7.1	51%	5.5	42%	8.9	50%	9.8
Traders & y salespeople	79%	5.2	82%	8.7	76%	7.2	76%	11.1	76%	9.5
Services	77%	5.3	86%	10.5	89%	10.1	89%	13.9	88%	12.9
Employees	22%	6.6	20%	8.4	24%	8.0	18%	10.3	16%	9.6
Total	**50%**	**8.0**	**52%**	**9.7**	**51%**	**10.9**	**46%**	**11.9**	**43%**	**10.6**

Source: Own development based on household survey data from years 1993, 1999, 2006, 2013 and 2018.

Annex 2 – Fields' decomposition [17]

A convenient and consistent way to decompose income inequality has been developed by Gary S. Fields (Andersen, 1999). His method applies to standard Mincer income equations requiring each estimated coefficient be multiplied by the standard deviation of the explanatory variable and the correlation between the variable and the dependent variable. Its result is the Relative Inequity Weight (R.I.W.) which is found on a scale that reaches 1 (Andersen, 1999).

Formally the R.I.W. should be calculated as follows:

A standard Mincer equation is:

$$Y = \sum_j a_j * X_j \quad \text{[A1]}$$

Where Y is a vector containing the logarithm of the hourly income of all individuals and X is the matrix with j explanatory variables.

Considering that a simple measure of inequality is the variance of the logarithm of the hourly labor income, in this line of thinking, the variance can be applied to both sides of the equation following the Mood, Graybill & Boes theorem, stating that:

Theorem of Mood, Graybill & Boes: *With $X_1, \ldots, X_j$ y $Y_1, \ldots, Y_M$ two sets of random variables y $a_1, \ldots, a_j$ y $b_1, \ldots b_M$ two sets of constants. Then,*

$$cov\left[\sum_{j=1}^{J} a_j X_j ; \sum_{m=1}^{M} b_m Y_m\right] = \sum_{j=1}^{J} \sum_{m=1}^{M} a_j b_m \, cov\left[X_j; Y_m\right] \quad \textit{[MG\&B]}$$

Thus, applying the theorem to the equation A1, we obtain

$$cov\left[\sum_{j=1}^{J} a_j X_j ; Y\right] = \sum_{j=1}^{J} cov\left[a_j X; Y\right] \quad \text{[A2]}$$

Where the left coefficient is the value of the covariance between Y and itself, which is the variance of Y. Thus, by dividing both sides by the variance of Y, we obtain

$$1 = \frac{\sum_{j=1}^{J} cov[a_j X; Y]}{\sigma^2(Y)} \equiv \sum_{j=1}^{J} s_j \quad \text{[A3]}$$

Where each weight s_j is defined as:

$$s_j = \frac{cov[a_j X_j; Y]}{\sigma^2(Y)} = \frac{a_j \sigma(X_j) * corr[X_j; Y]}{\sigma(Y)} \quad \text{[A4]}$$

Where sj are the inequality weights that add up to 1 over all the explanatory variables. Each sj is positively affected by increases in the coefficient (aj), by the standard deviation (σXj) and by the correlation between the explanatory variable and the dependent variable $corr\left[X_j; Y\right]$.

[17] Text adapted from Andersen "Wage Differentials Between Bolivian Cities" (1999).

This method has been applied in Bolivia by Fields et al. (1998), Andersen (1999), and Andersen (2001), who conclude that approximately half of the explained income inequality is due to the education variable, whereas the other independent variables can only explain a smaller part of the income difference. Nevertheless, the explanatory power of income equations is generally low.

Following the above described methodology, our estimates for the studied period demonstrate that between 1993 and 2018, education (both in years and in dummy variables of levels) explained roughly half of the "explained" differences in income, whereas the other variables affect the explained difference in a lower degree.

It is interesting to note the decrease of the relevance of education as a factor of income inequality, possibly caused by the increase in the educational level of the Bolivian population and the closing of the educational gap.

Table A3: Fields decomposition

	Logarithm of the Hourly Income									
	1993		1999		2006		2013		2018	
	Coefficient	R.I.W.	Coefficient	R.I.W.	Coefficient	R.I.W.	Coefficient	R.I.W.	Coefficient	R.I.W.
Explained Differential	**38%**		**31%**		**31%**		**22%**		**22%**	
Years of education	0.077	**19.2%**	0.080	**14.8%**	0.078	**14.8%**	0.053	**8.6%**	0.024	**5.0%**
Gender (woman=1)	-0.357	**5.0%**	-0.290	**2.6%**	-0.237	**1.9%**	-0.166	**1.2%**	-0.131	**0.9%**
Experience	0.033	**-1.3%**	0.012	**-0.6%**	0.023	**-0.7%**	0.025	**0.6%**	0.014	**-1.2%**
Experience squared	0.000	**1.8%**	0.000	**-0.3%**	0.000	**0.8%**	0.000	**0.7%**	0.000	**1.7%**
Primary (=1)	0.013	**-0.1%**	-0.140	**1.0%**	-0.312	**2.5%**	-0.203	**1.3%**	-0.003	**0.0%**
Secondary (=1)	0.149	**0.7%**	-0.054	**-0.2%**	-0.311	**0.4%**	-0.219	**1.2%**	-0.007	**0.0%**
Tertiary (=1)	0.541	**9.5%**	0.185	**2.3%**	0.037	**0.6%**	-0.014	**-0.3%**	0.279	**5.5%**
26 to 35 years old	0.052	**0.2%**	0.107	**0.2%**	-0.066	**-0.1%**	-0.070	**0.0%**	-0.018	**0.0%**
36 to 45 years old	0.001	**0.0%**	0.111	**0.3%**	-0.089	**-0.2%**	-0.124	**-0.4%**	-0.004	**0.0%**
46 to 55 years old	-0.102	**-0.2%**	-0.038	**-0.1%**	-0.099	**-0.3%**	-0.159	**-0.5%**	0.022	**0.0%**
56 to 65 years old	-0.208	**0.1%**	-0.253	**0.2%**	-0.273	**0.1%**	-0.199	**-0.2%**	0.150	**0.2%**
Married (=1)	0.103	**1.0%**	0.095	**0.5%**	0.126	**0.7%**	0.090	**0.5%**	0.020	**0.0%**
Construction	0.144	**0.1%**	0.416	**0.6%**	0.094	**0.0%**	0.270	**0.3%**	0.169	**0.0%**
Trade	-0.052	**0.5%**	0.162	**-1.1%**	-0.025	**0.2%**	0.021	**-0.2%**	0.006	**-0.1%**
Transport & storage	0.185	**0.5%**	0.195	**0.2%**	0.069	**0.0%**	0.099	**-0.1%**	0.072	**-0.1%**
Financial services	0.236	**0.7%**	0.634	**0.6%**	0.138	**0.4%**	0.164	**0.2%**	0.172	**0.2%**
Social services	0.058	**0.2%**	0.257	**2.1%**	0.111	**1.0%**	0.193	**2.5%**	0.175	**2.7%**
Children at home (< to 6 age)	-0.031	**0.1%**	-0.118	**0.6%**	0.001	**0.0%**	0.013	**0.0%**	-0.019	**0.1%**
La Paz			0.116	**-0.6%**	-0.040	**0.1%**	-0.028	**0.2%**	-0.003	**0.0%**
Cochabamba			0.462	**1.1%**	0.223	**0.4%**	0.063	**0.0%**	0.068	**0.1%**
Oruro			-0.062	**0.1%**	-0.234	**0.3%**	-0.019	**0.0%**	-0.005	**0.0%**
Potosí			0.083	**-0.1%**	0.000	**0.0%**	0.105	**0.0%**	-0.011	**0.0%**
Tarija			0.337	**0.0%**	0.211	**0.2%**	0.270	**0.6%**	0.026	**0.0%**
Santa Cruz			0.558	**2.3%**	0.256	**0.4%**	0.228	**0.7%**	0.076	**0.1%**
Beni			0.446	**0.5%**	0.177	**-0.1%**	0.157	**0.0%**	-0.009	**0.0%**
Pando			0.687	**1.4%**	0.601	**0.7%**	0.206	**0.1%**	0.076	**0.1%**
Formal sector (=1)			0.178	**2.1%**	0.368	**5.8%**	0.266	**4.6%**	0.285	**6.0%**

Source: Own development based on household survey data from years 1993, 1999, 2006, 2013 and 2018.