Measuring job quality in Mexico from a gender perspective

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Abstract

This article measures and compares the quality of employment in Mexico from a gender perspective. Indices were constructed using principal components, including income, social security, job stability and work-life balance data from the ENOE for two periods (2012 and 2022). The results showed low and similar job quality in Mexico for both men and women, with significant heterogeneity between regions. The state with the highest job quality for women was Chihuahua, while Oaxaca had the lowest job quality across all indices. Income is the factor most affected over time for both genders, with a more significant disadvantage for women.

Keywords: quality of employment; decent work; gender; principal component analysis.

1. INTRODUCTION

Job quality is a multidimensional concept, also studied in a multidisciplinary way, and refers to how working conditions are provided in favor of employees (Rodríguez and Ibarguren, 2009); it is the most important aspect in determining the value of work by workers (Dueñas *et al.*, 2009). It is also a set of factors that influence the economic, social and psychological well-being and health of workers (Reinecke and Valenzuela, 2000). It must be recognized that job quality exists when the functionalities allow the worker to better develop their abilities to be and do things that are valued (Farné and Vergara, 2015).

Job quality is a multi-faceted concept that includes socio-economic security, worker education, vocational training, working conditions, the ability to reconcile work and family life and the promotion of gender equality (Davoine *et al.*, 2008).

The study of job quality from a gender perspective focuses on gender inequalities in working conditions. Emphasis is placed on aspects such as the pay gap, excessive unpaid workloads due to domestic work and home care, employment opportunities in managerial positions, among others, where there are often inequalities between men and women.

In terms of equality with respect to job quality, there has historically been a certain gap between men and women. Women have been delegated to the private sphere of household chores, culturally conceived as caregivers and their work as providers or as part of the unpaid labor force has been relegated, while men have been mainly in the public sphere of paid jobs, with higher social value. Although this gap has narrowed, it continues to be a problem since women tend to work in jobs that are an extension of domestic chores, which are associated with a lower social value and, therefore, lower pay. Likewise, the increase in women's participation in the labor force has not been accompanied by a rebalancing of men's participation in domestic work (Carnes and Valenciano, 2022).

The time that men and women spend on domestic work and care is one of the main obstacles to the development of women's careers. Domestic and home care activities are often a barrier to women's entry into the job market. The child penalty, a sanction associated with paternity, is a common factor in gender inequality in the labor market (Kleven *et al.*, 2024).

In the case of Mexico, women's working conditions are characterized by a low presence of women in the labor force, with low participation rates,[1] a high proportion of women working in the informal sector,[2] as well as in part-time jobs[3] and a persistent wage gap between men and women.[4]

The objective of this article is to measure and compare job quality in Mexico by federal state, delving deeper into the aspect of equality between men and women. The aim is to identify whether there are significant gaps, as well as to verify whether job quality for men and women in Mexico has improved.

To this end, the methodology of principal component analysis was used to generate an index of job quality by gender. This methodology was chosen because it allows us to create an index that is easy to calculate and interpret. This methodology has been used in gender analysis to study job quality in European countries by Clark *et al.* (2021) and Santero *et al.* (2015). The database is obtained from the National Occupation and Employment Survey (ENOE) of the National Institute of Statistics and Geography (INEGI, 2023), considering two periods to contrast possible changes: the first quarter of 2012 and the first quarter of 2022.

Following the introduction, the article is structured as follows: the second section presents the theoretical framework of job quality from a gender perspective, in particular the analysis of the dual theory. The third section presents studies on the measurement of job quality from a gender perspective, describing the methodologies, indicators and variables used, as well as the countries and dates on which the studies were carried out. The fourth section presents the measurement of job quality in Mexico from a gender perspective, through an index constructed using the method of principal components analysis. The fifth section presents the results and finally, the last section presents the conclusions.

2. THEORETICAL FRAMEWORK OF JOB QUALITY BY GENDER

In the field of work, historical discrepancies are observed in the forms of work performed by men and women (Carnes and Valenciano, 2022). Job quality from this perspective can be addressed based on the labor market segmentation theory and the dual market theory (Arora *et al.*, 2023; Lo Bue *et al.*, 2022; Pérez, 2020), which stem from the institutionalist current; these theories argue that there is no single labor market that functions competitively.

In particular, the dual theory proposed by Doeringer and Piore (1970) observes a segmentation of labor between the primary and secondary sectors. The primary sector is characterized by jobs with high wages, access to social security, increased equity and positive prospects for professional development corresponding to large companies that use advanced technology in their production processes. Meanwhile, the secondary sector, which is less attractive, is characterized by jobs with low wages, more precarious employment, strict and often arbitrary discipline, few opportunities for advancement and generally in small companies with less advanced technology (Arredondo, 2020; Kalleberg, 2011; Muñoz de Bustillo *et al.*, 2011; Piore, 1971).

A broader view of dual market theory identifies two subsegments in the primary sector: an upper primary sector, composed of workers in professional and managerial positions with high probabilities of career advancement and greater economic security, and a lower primary sector with fewer opportunities. This tiered labor market is associated with the sociological categories of lower (secondary sector), working (lower primary sector) and upper-middle (upper primary sector) class subcultures (Piselli, 2017).

Meanwhile, the labor market segmentation approach is based on the increasing polarization of labor and the creation of unequal and contrasting segments in the labor market, where the labor market is perceived as a discriminatory field. Segmentation is the result of multiple factors such as discrimination, social reproduction, labor relations and state regulation (Barroso, 2018; Muñoz de Bustillo *et al.*, 2011).

In practice, it is observed that some gender differences can be explained by differences in the skills that workers possess. However, it has been shown that there is discrimination in access to jobs among similarly skilled workers, in other words, gender, race, and age can be factors of job exclusion in the primary sector of the dual theory (Arora *et al.*, 2023).

In the case of Mexico, women's work tends to be concentrated in lower-paying jobs, in industries whose competitiveness and mobility limit their bargaining power. In other words, women face barriers to entering, remaining and advancing in the labor market. Examples of these barriers are the excessive burden of unpaid work or obstacles to occupying top management positions (IMCO, 2022).

In terms of the quality of women's employment, their participation in the labor market has increased but is still insufficient. In Latin America, especially in Mexico, an imbalance exists between women's entry into the educational system and their participation in the labor market; the educational gap tends to narrow, while labor participation does not show the expected evolution (Borrowman and Klasen, 2020; Seguino and Braunstein, 2019; Flores and Salas, 2015).

However, there are those who argue that despite the fact that women have had access to higher levels of education, their career choices have not changed much and the perception of women as less productive increases inequality in the labor market. Therefore, in addition to the low participation of women in the labor market, there is a concentration of women in low-paid jobs with a tendency towards occupational segregation by gender, in which there is an unequal distribution of job types and levels between men and women (IMCO, 2022).

Likewise, training, an essential factor in improving job quality, is less available for women than for men, partly because of stereotypes associated with their occupations in jobs involving simple and routine activities, and also because women's employment tends to be more intermittent related to imposed gender norms, such as domestic work, childcare and care of the elderly, which require more attention, implying that employers tend to invest less in training for women (Arora *et al.*, 20-23; Casanueva and Rodriguez, 2009).

3. EMPIRICAL FRAMEWORK: JOB QUALITY STUDIES FROM A GENDER PERSPECTIVE

The following are some of the studies that compare job quality between men and women, indicating where the study was conducted, the data sources from which the information was obtained, the methods and indicators used for the analysis and some of the main conclusions reached.

Job quality from a gender perspective has been studied in different areas and table 1 summarizes some of the studies that have been carried out. We can see that there are different methodologies to study the issue, such as principal component analysis, multidimensional synthetic indices, descriptive analysis and statistics, or fuzzy logic set models. Various indicators are also used to measure job quality, mainly related to equity, discrimination, remuneration, security, job stability and work-life balance.

Table 1. Studies on job quality from a gender perspective

Authors	Country and years of study	Resources	Methodology	Indicators	Independent or control variables
Arora *et al.* (2023)	Latin America (15 countries) 1990-2018	Household surveys at the micro level of weekly income.	Country-level time series of "good" jobs. Proportion of male/female jobs. Standard measures of gender segregation by industry and occupation. Time series of Duncan's dissimilarity indices. Fixed effects model.	One-dimensional dissimilarity index. Average wage by industry, social spending as a proportion of GDP, ratio between minimum and average wage.	Women, men and man/woman relationship. Manufacturing imports/GDP, manufacturing exports/GDP, industrial productivity, foreign direct investment (FDI) inflow as a percentage of investment, effective real exchange rate and financial openness.
Clark *et al.* (2021)	Europe (35 countries) 2015	*European Working Conditions Survey*	Principal component analysis. Ordinary Least Squares (OLS) model estimation.	Survey of six dimensions: (i) adequate pay; (ii) professional development; (iii) recognition; (iv) work environment; (v) motivation; and (vi) job stability.	Mostly female, mostly male, female boss.
Pérez (2020)	European Union (28 countries) 2000-2017	Leaken and UN indicators	Synthetic, multidimensional and relative indicator	QE global index: 6 partial indexes: equity and non-discrimination; intrinsic employment; work time and work-life balance; job stability and tenure; collective bargaining participation; training.	
De la Cueva and Palomares (2017)	Michoacán, Mexico 2016	Authors' survey	Survey. Descriptive analysis, descriptive statistics and explanatory analysis.	Dimensions: economic equity, training, job satisfaction, job security, employment security and labor democracy.	
Flores and Salas (2015)	Mexico IT 2014	ENOE Microdata	Multidimensional model based on fuzzy logic sets (polyvalence and graduality features) with high and low linguistic labels.	Characteristics of remuneration, job stability and benefits.	Characteristics of the individual (level of education, age and marital status) and labor activity (economic sector, occupation position and formality of employment).
Santero *et al.* (2015)	Hospitality industry Spain 2014	Longitudinal Sample of Working Lives	Construction of a composite index using principal component analysis.	Job security, labor income; working hours and work-life balance; skills and training; job security and gender equality.	
Casanueva and Rodriguez (2009)	Mexico 1992, 1999 and 2002	National Urban Employment Survey (ENEU) and National Survey on Employment, Wages, Technology and Training (ENESTYC).	Econometric analysis with reference to three cross-sections (Probit, Poisson, two-stage Heckmann).	Job stability 1 (full-time employment, dichotomous); job stability 2 (open-ended contract, dichotomous); wages; training; benefits; union representation.	Gender, education, work experience, exposure to globalization.

Source: prepared by the authors.

Some of the key findings of these studies are that gender-diverse workplaces are associated with higher levels of worker well-being (Clark *et al.*, 2021). In the European Union, for example, despite the wide heterogeneity of results, job quality was found to be higher for men in most countries. Of the 23 countries analyzed, only Sweden, Finland, Denmark and Slovenia had higher job quality for women than for men for most of the period considered. Furthermore, in the countries where job quality is higher for men, it is also higher for women, i.e. there is no trade-off (Pérez, 2020).

Several articles find that job quality is usually higher for men than for women (Casanueva and Rodriguez, 2009; Perez, 2020; Santero *et al.*, 2015); in particular, women are usually paid less than men, in other words, there is a gender wage gap (Arora *et al.*, 2023; Casanueva and Rodriguez, 2009; De la Cueva and Palomares, 2017; Mendoza and Garcia, 2009). Furthermore, another study shows that marriage and children are inversely related to women's labor force participation, while schooling, salary and age are positively related (Orraca *et al.*, 2023).

Particularly in Latin America, higher public social spending is associated with attracting women to better jobs, while labor market regulations related to the minimum wage tend to benefit men more than women, due to the high percentage of women working in the informal or self-employed sector (Arora *et al.*, 2023).

Among the studies in Mexico, those by Casanueva and Rodríguez (2009), Flores and Salas (2015) and De la Cueva and Palomares (2017) stand out. The work by Casanueva and Rodríguez (2009) shows, by means of an analysis over three periods (1992, 1999 and 2002), the disparities in job quality between men and women in Mexico. The authors found that the main differences are in wages and in the possibility of obtaining union representation. Unfavorable outcomes for women in terms of job stability and access to training over time were also observed, while the gap between men and women in relation to access to benefits is narrowing.

Flores and Salas (2015) try to quantify the degree of inequality between men and women in Mexico, taking into consideration different aspects such as educational level, marital status and age, among others. Using a fuzzy logic ensemble-based model, they analyze the first quarter of 2014. They

highlight the low participation of women in the Mexican labor market and observe that there are important differences for the same gender; for example, in the area of education, women with higher education have higher job quality than women with only basic education. The authors conclude that the gender gap is reversed in favor of women with higher education, who have a better combination of pay, access to health services, benefits, stability, and protection of labor rights.

Meanwhile, De la Cueva and Palomares (2017) present empirical evidence on the dual theory in the state of Michoacán, where they observe that MSMEs prefer to hire men with better qualifications than women, so wages and salaries tend to be higher for them, while women tend to be hired in firms with low technology and lower wages.

This paper analyzes, through the methodology of Principal Component Analysis, job quality between men and women in Mexico for two different periods, emphasizing different aspects that have a positive relationship with job quality, such as income, job stability, access to social security and work-life balance.

4. MEASURING JOB QUALITY IN MEXICO FROM A GENDER PERSPECTIVE

This section presents the development of the measurement of job quality with a gender comparison. First, the specification of the data and indicators used for the measurement is discussed, followed by an explanation of the principal component analysis methodology used to construct the multidimensional job quality indices.

As a source of information, we used the database of the National Employment and Occupation Survey (ENOE), conducted by INEGI (2023), whose sample design consists of 132,065 dwellings nationwide, approximately 2,900 per federal state and with a comparable statistical series since 2005.

Information from Mexico's 32 federal states was used, divided into men and women. Similarly, to show progress or setbacks over time, two periods were considered: the first quarter of 2012 and the first quarter of 2022. The first period was considered because it preceded the inclusion of regulations promoting decent work in the reform of the Federal Labor Law (LFT) in Mexico at the end of 2012, and the second because it was the most recent information at the time of the analysis.

In order to measure job quality, we sought indicators that would cover the multidimensionality of job quality, including those related to income, access to social security and health, job stability and reconciliation of family and work. Five indicators were selected that together could cover these dimensions.

The chosen data were indicators with a positive relationship to job quality, categorized between men and women and homogenized to make them comparable. For men, each indicator was analyzed as a percentage of employed men, while for women, each indicator was analyzed as a percentage of employed women. In other words, the information on the number of employees with a certain job quality indicator was divided by the number of employees of each gender. Table 2 shows the five indicators for men and women that were used to construct job quality indices by gender and dimension to be analyzed.

Table 2. Indicators for measuring job quality

Dimensions	Indicators
Income	Proportion of employed women (PEW) with an income level of more than five minimum wages. Proportion of employed men (PEM) with an income level of more than five minimum wages.
Social security and health	PEW with access to social security. PEM with access to social security. PEW with labor benefits. PEM with labor benefits.
Job stability	PEW with a written employment contract. PEM with a written employment contract.
Reconciliation between family and work	PEW working between 35 and 48 hours per week. PEM working between 35 and 48 hours per week.

Source: prepared by the authors.

The relative weight corresponding to each variable or indicator that makes up the job quality index from a gender perspective was determined using principal component analysis, a method often used to construct composite indicators by selecting the most relevant information.

The index was composed of three stages:

1) Preliminary analyses: data adequacy analysis checking the correlation between variables using Pearson's correlation matrix and Bartlett's sphericity test; and data adequacy analysis using the Kaiser-Meyer-Olkin sample adequacy measure;

2) Determination of the principal component and the resulting index: the R studio program was used to construct the index. The analysis was carried out with scaling due to the heterogeneity in the variances of the indicators. The job quality index (JQI) was constructed by multiplying the weight of each partial indicator (Wi), which represents the percentage of the explained variance, by the respective principal component (CPi). Where p is the number of correlated variables, the index can be represented as follows:

$$ICE = \sum_{i=1}^{p} w_i CP_i$$

For the analysis, only the first principal component with a percentage of variation higher than 70% in the four calculated indices was used to construct and normalize an index. Job quality indexes were constructed for each federal state, for men in the first quarter of 2012, for men in the first quarter of 2022, for women in the first quarter of 2012, and for women in the first quarter of 2022.

3) Evaluation and analysis of the global significance of the data obtained by means of Cronbach's alpha coefficient to measure the reliability of the measurement scale.

In the preliminary analysis, it could be observed that the indicators are correlated with a significance level above 90% in all cases, except for the percentage of men receiving more than five minimum wages and the percentage of men working between 35 and 48 hours in both periods. In the Kaiser-Meyer-Oklin test, all values were greater than 0.72, demonstrating that the considered indicators are suitable. This is also confirmed by a Cronbach's Alpha that shows values above 0.90. The preliminary analysis can be found in the appendix, while the determination of the principal component and the indices, as well as the evaluation analysis are presented in the results.

5. RESULTS

The first part of the results obtained is a descriptive statistical analysis of the data. In contrast, the second part shows the weighting of each indicator through principal component analysis and the resulting job quality index for each federal state. Finally, a map of Mexico is presented with the distribution of job quality based on this index.

Descriptive statistics analysis

Tables 3 and 4 present the summary of the descriptive statistical analysis of the indicators that make up the job quality index from a gender perspective. It shows low job quality for both men and women and a persistent precariousness of employment over time. On average, less than 50% of the working population, both men and women, have the job quality conditions considered by the separate indicators.

Looking at the changes between the first quarter of 2012 and the first quarter of 2022, we can see that the percentage of the employed population working between 35 and 48 hours increased by 6.7 percentage points (pp) for men and 6.4 pp for women. The states with the highest percentage of the employed population working between 35 and 48 hours are Zacatecas, Tabasco and Oaxaca, and the lowest are Chihuahua, Jalisco and Querétaro. The percentage of the working population with access to social security increased by 8.3 pp for men and 11.5 pp for women, with the lowest percentages in the states of Chiapas and Oaxaca and the highest in Nuevo León, Chihuahua and Coahuila. The percentage of the employed population with benefits increased by 8.9 pp for men and 9.3 pp for women, with the lowest percentages in the states of Guerrero and Oaxaca and the highest in Nuevo León, Chihuahua and Coahuila. The percentage of the working population with a written employment contract increased by 8.5 pp for men and 10.9 pp for women, with the lowest values in the states of Oaxaca and Chiapas and the highest in Nuevo León and Chihuahua.

Table 3. Summary of descriptive statistics of job quality indicators 2012

Variable	Obs.	Mean	Std. dev.	Min.	Max.	Mean	Std. dev.	Min.	Max.
		Men First quarter 2012				Women First quarter 2012			
Percentage of employed population with more than 5 s.m.	32	9.44	3.75	3.71 Mor.	20.32 BCS.	7.06	2.81	3.09 Oax.	16.48 BCS.
Percentage of the employed population working between 35 and 48 hours	32	44.69	7.60	33.11 Zac.	69.28 Chih.	42.51	7.71	30.19 Oax.	66.75 Chih.
Percentage of employed population with access to social security	32	34.86	11.32	14.36 Chis.	55.24 N.L.	35.63	10.51	17.73 Oax.	60.59 Chih.
Percentage of the employed population with benefits	32	39.99	11.93	18.28 Gro.	61.32 N.L.	44.15	11.41	20.98 Oax.	61.69 Chih.
Percentage of the employed population with a written employment contract	32	33.14	10.43	16.45 Chis.	51.55 N.L.	35.60	9.77	21.01 Oax.	59.52 Chih.

Source: prepared by the authors with data from INEGI (2023).

Table 4. Summary of descriptive statistics of job quality indicators 2022

Variable	Men First quarter 2022					Women First quarter 2022			
	Obs.	Mean	Std. dev.	Min.	Max.	Mean	Std. dev.	Min.	Max.
Percentage of employed population with more than 5 s.m.	32	1.85	1.23	0.45 Mor.	6.53 BCS.	1.09	0.74	0.19 Tlax.	3.52 BCS.
Percentage of the employed population working between 35 and 48 hours	32	47.70	6.34	34.59 Tab.	61.23 Jal.	45.25	7.61	26.41 Oax.	58.40 Qro.
Percentage of employed population with access to social security	32	37.77	13.62	14.03 Chis.	62.01 Coah.	39.73	13.10	15.07 Oax.	64.06 Chih.
Percentage of the employed population with benefits	32	43.55	14.16	17.11 Oax.	67.54 Coah.	48.27	13.73	17.35 Oax.	69.85 Chih.
Percentage of the employed population with a written employment contract	32	35.95	12.56	15.41 Oax.	58.98 N.L.	39.48	12.51	16.90 Oax.	64.51 Chih.

Source: prepared by the authors with data from INEGI (2023).

The only indicator in which a significant decrease was observed between the first quarter of 2012 and the first quarter of 2022 is the percentage of the employed population receiving more than five minimum wages, which decreased by 80.4 pp for men and 84.6 pp for women. The states with the lowest values are Morelos, Oaxaca and Tlaxcala, while in all cases, the state with the highest percentage of the employed population receiving more than five minimum wages is Baja California Sur.

This situation of reduction of the employed population receiving more than five minimum wages may be the result of several factors, one of which is the wage policy implemented in 2019 to substantially increase the minimum wage since this increase favors the income of lower-level workers but affects workers with higher incomes, who do not receive wage increases in the same proportions, which is reflected in a reduction of the employed population in the higher income levels. This shows, on the one hand, the low job quality in each of the indicators analyzed and, on the other hand, the great heterogeneity between the states. There are states in which more than 60% of the employed population have the desired working conditions according to the indicators analyzed, while in other states not even 20% of the employed population has them.

After completing a descriptive statistical analysis for each of the indicators that make up the job quality index, we continued with the analysis of job quality through the construction of the index.

Job quality index from a gender perspective

The results of the principal components analysis are presented in Table 5, which shows the values of the relative weight of each indicator with respect to the job quality index from a gender perspective. Likewise, Cronbach's α shows that the variables considered are adequate since, in all four cases, the value is close to 0.90. In addition, the variables selected together explain more than 70% of the variation in the sample.

Table 5. Results of principal component analysis

Variable	2012 First quarter Men	2012 First quarter Women	2022 First quarter Men	2022 First quarter Women
Percentage of employed population with more than 5 s.m.	0.3885614	0.3083965	0.3702774	0.2953178
Percentage of the employed population working between 35 and 48 hours	0.2894015	0.4500088	0.2878208	0.4424928
Percentage of employed population with access to social security	0.5120219	0.4900251	0.5156203	0.4938786
Percentage of the employed population with benefits	0.5010745	0.4759327	0.5065566	0.4840791
Percentage of the employed population with a written employment contract.	0.5020207	0.4855381	0.5075332	0.4886092
Cronbach's α	0.8923	0.9260	0.8674	0.9081
Variance ratio	0.7320	0.8015	0.7192	0.7976
Standard deviation	1.9130	2.0018	1.8964	1.9969

Source: prepared by the authors with R studio software.

Table 6 shows the results of the calculation of the job quality index for men and women for the two selected periods (first quarter of 2012 and first quarter of 2022). We can see that the job quality index for women is only higher than 50 in Chihuahua, which demonstrates the vulnerability of employment in Mexico in general. Less than 50% of the working population is employed in quality jobs.

Table 6. Job quality index for men and women in Mexico for the first quarter of 2012 and the first quarter of 2022

Estados	JQIMen2012	P.R.*	JQIWomen2012	P.R.	JQIMen 2022	P.R.	JQIWomen2012	P.R.
Aguascalientes	37.66	10	28.32	23	41.90	7 ▲	47.13	2 ▲
Baja California Norte	43.13	5	44.19	2	47.23	2 ▲	45.87	6 ▼
Baja California Sur	43.50	3	41.03	6	40.72	9 ▼	42.02	8 ▼
Campeche	31.35	18	30.90	18	28.72	23 ▼	29.75	23 ▼
Chiapas	18.49	31	22.83	29	17.55	31 =	22.40	29 =
Chihuahua	47.03	1	54.23	1	46.20	4 ▼	55.42	1 =
Ciudad de México	41.29	7	41.15	5	41.72	8 ▼	41.21	10 ▼
Coahuila	43.42	4	40.67	7	47.18	3 ▲	46.97	4 ▲
Colima	34.23	13	31.57	17	34.59	14 ▼	35.27	17 =
Durango	35.25	11	34.61	13	35.17	13 ▼	35.78	15 ▼
Guanajuato	29.06	21	30.76	19	31.11	19 ▲	36.72	14 ▲
Guerrero	21.62	30	20.99	31	23.78	27 ▲	20.13	31 =
Hidalgo	22.78	28	24.25	27	22.78	28 =	24.26	28 ▼
Jalisco	34.21	14	34.12	14	38.93	11 ▲	39.28	12 ▲
México	32.97	15	32.65	15	31.86	17 ▼	32.09	20 ▼
Michoacán	25.69	25	27.39	25	26.48	25 =	31.03	22 ▲
Morelos	29.16	20	28.75	21	29.26	22 ▼	28.17	24 ▼
Nayarit	27.18	23	28.51	22	29.62	21 ▲	31.43	21 ▲
Nuevo León	45.60	2	41.77	4	48.03	1 ▲	47.09	3 ▲
Oaxaca	17.79	32	18.23	32	14.83	32 =	14.83	32 =
Puebla	23.46	26	22.65	30	25.85	26 =	26.64	26 ▲
Querétaro	41.09	8	39.55	8	42.43	6 ▲	43.34	7 ▲
Quintana Roo	38.29	9	39.28	9	38.61	12 ▼	41.41	9 =
San Luis Potosí	30.72	19	34.65	12	31.64	18 ▲	35.31	16 ▲
Sinaloa	31.78	17	34.79	11	32.92	15 ▲	38.06	13 ▲
Sonora	41.39	6	42.98	3	43.55	5 ▲	46.36	5 ▲
Tabasco	32.39	16	31.91	16	31.00	20 ▼	27.82	25 ▼
Tamaulipas	35.18	12	37.75	10	39.42	10 ▲	40.19	11 ▲
Tlaxcala	22.68	29	23.06	28	22.72	29 =	22.00	30 ▼
Veracruz	23.43	27	25.71	26	21.70	30 ▼	24.28	27 =
Yucatán	28.90	22	28.32	24	31.93	16 ▲	32.16	19 ▲
Zacatecas	26.48	24	28.92	20	27.94	24 =	32.85	18 ▲
Promedio	32.41		32.70		33.36	▲	34.91	▲

Notes: ▲ Better relative position and higher job quality with respect to 2012; ▼ Worse relative position and lower job quality with respect to 2012 (except CDMX, Quintana Roo and Colima, which worsened their relative position but increased the job quality index); = Same relative position with respect to 2012. * P.R. Relative position.

Source: prepared by the authors.

Chihuahua is the state with the highest job quality according to all the indices calculated, except for the job quality index for men in 2022, in which it occupies fourth place, while Nuevo León is in first place. For women, the states with the highest job quality in the first quarter of 2012 are Chihuahua, Baja California Norte and Sonora, while in the first quarter of 2022 they are Chihuahua, Aguascalientes and Nuevo León.

For men, the states with the highest job quality according to the calculated index are Chihuahua, Nuevo León and Baja California Sur in the first quarter of 2012 and Nuevo León, Baja California Norte and Coahuila in the first quarter of 2022. Meanwhile, Oaxaca has the lowest job quality in all indexes, followed by Chiapas for men and Guerrero for women. The states of Puebla, Veracruz and Tlaxcala also have low job quality. When the indexes as a whole are considered together, the highest job quality for women is in Chihuahua in 2022, and the lowest job quality for women is in Oaxaca in both periods.

It is interesting to note that the job quality indexes are not so different for men and women; in fact, employed women seem to have slightly higher job quality in most countries over the two periods analyzed. Comparing job quality over time, working conditions have improved for both men and women, although a greater improvement is observed on average for women, as they present a job quality index of 32.7 in the first quarter of 2012 and an index of 34.91 in the first quarter of 2022, representing a variation of 6.7 pp, while men went from an index of 32.41 to 33.36, with a variation of 2.9 pp. This could be due to the struggle for gender equality in recent years, which has had an impact on the quality of women's employment.

Figures 1 and 2 show a high positive correlation between the employment quality index for men and women. In 2012, the correlation coefficient between the two indices was 0.938 and 0.956 in 2022. Likewise, it can be observed that the states above the 45-degree line are those where women have higher job quality than men, and those on or close to the line have similar job quality. Meanwhile, those below the 45-degree line are the states where men have higher job quality than women.

It can be observed that in 2012, men had higher job quality than women in 17 states, whereas in 2022, it decreased to only 8 states. In both periods, men have higher job quality than women in Tabasco, Tlaxcala, Morelos, Nuevo León, Guerrero and Coahuila. There is also a certain level of equality between the two years with several states close to the 45-degree line.

However, it is important to remember that the weighting of income, an essential factor in job quality, does not have the greatest weight in this index; however, it is a factor of vulnerability and represents a large gap between men and women. It should also be noted that aspects such as participation and informality are factors that are not included in the index and in which women are lagging behind; for example, in 2022 women had a participation rate of 45% compared to 76% for men. Similarly, the rate of informality of work is higher for women (55.8%) than for men (55.2%) (INEGI, 2023). Nevertheless, these variables have not been taken into account in this index, and the results are slightly more favorable for women.

Figure 1. Correlation of the job quality index for men with the job quality
index for women in the first quarter of 2012
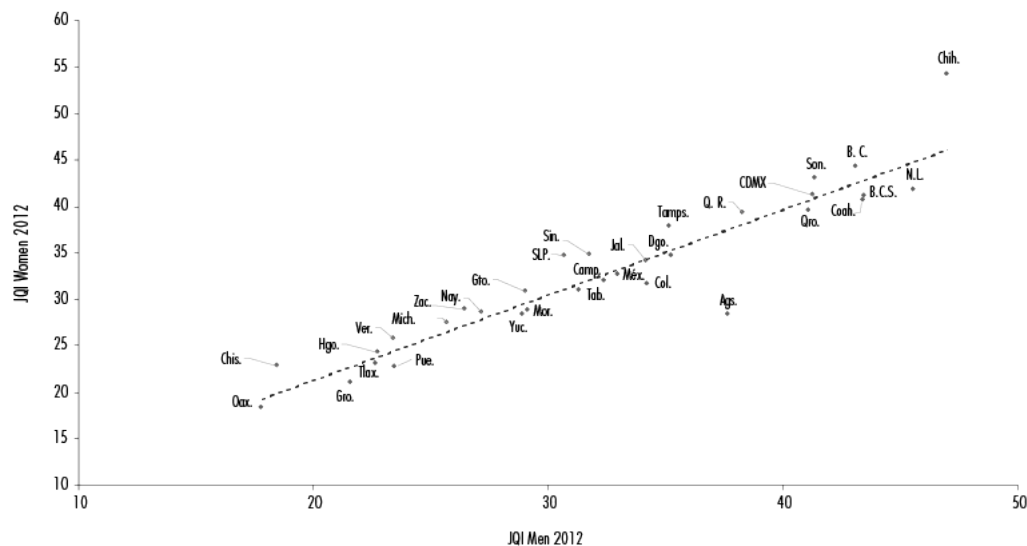
Source: prepared by the authors with data from INEGI (2023).

Figure 2. Correlation of the job quality index for men with the job quality
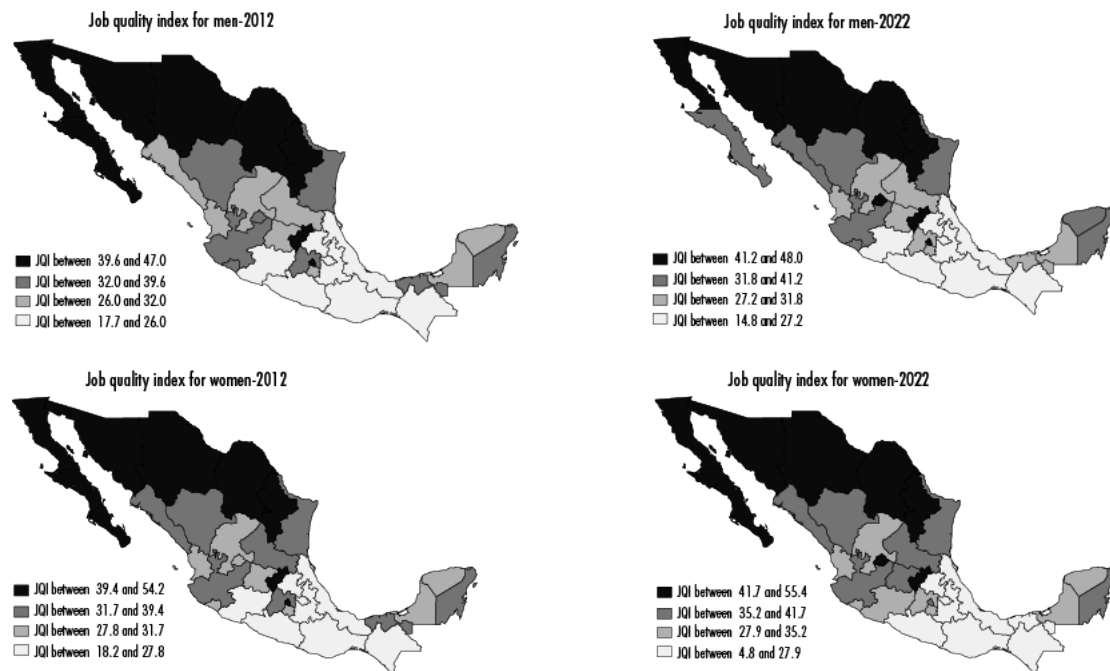index for women in the first quarter of 2022
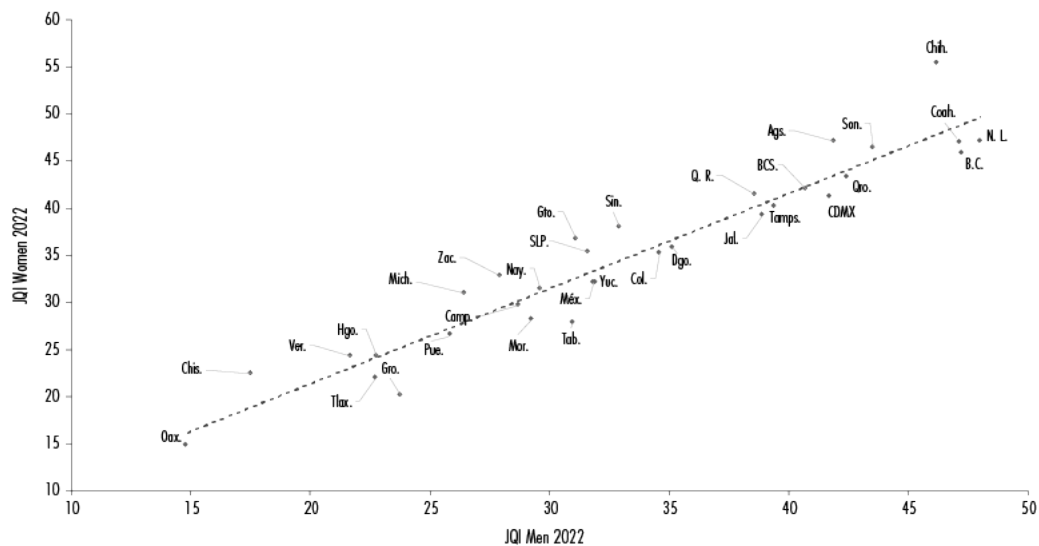
Source: prepared by the authors with data from INEGI (2023).

The information shows that in countries where men have higher job quality, women also have better working conditions. Rather than a gender gap, there is a regional gap. Northern states generally have higher job quality than southern states for both sexes. These structural differences persist even after the changes in the 2012 and 2019 labor reforms. Northern states are characterized by greater external labor and trade linkages, less educational backwardness, and better infrastructure in clear contrast to the South, which is more focused on the domestic economy and the primary sector and has greater economic deprivation.

Figure 3 shows the distribution of the job quality index by state in which a certain amount of agglomeration is observed, and neighboring states may be influencing the labor welfare of others. Neighboring states tend to have similar job quality, reflecting the polarization of the country. Likewise, the neglect in which the country's south finds itself and the need to improve its working conditions are evident.

Figure 3. Map of the distribution of job quality in Mexico

Job quality index for men-2012
- JQI between 39.6 and 47.0
- JQI between 32.0 and 39.6
- JQI between 26.0 and 32.0
- JQI between 17.7 and 26.0

Job quality index for men-2022
- JQI between 41.2 and 48.0
- JQI between 31.8 and 41.2
- JQI between 27.2 and 31.8
- JQI between 14.8 and 27.2

Job quality index for women-2012
- JQI between 39.4 and 54.2
- JQI between 31.7 and 39.4
- JQI between 27.8 and 31.7
- JQI between 18.2 and 27.8

Job quality index for women-2022
- JQI between 41.7 and 55.4
- JQI between 35.2 and 41.7
- JQI between 27.9 and 35.2
- JQI between 4.8 and 27.9

Source: prepared by the authors with Stata software.

6. CONCLUSIONS

Women's working conditions in Mexico are characterized by a degree of precariousness, low participation rates and low wages, as well as high rates of informality and part-time work.

This analysis sought to compare job quality between men and women in Mexico over two time periods (the first quarter of 2012 and the first quarter of 2022) in order to identify improvements or setbacks, as well as differences between the sexes. Therefore, multidimensional indices of job quality were created using principal component analysis. Several factors related to working conditions and workers' well-being were taken into consideration, such as income, access to social security, job stability and work-life balance.

Some of the contributions of this paper include its contribution to the analysis of job quality from a gender perspective in Mexico, identifying differences and similarities between men and women between regions of the country, which allows for a better understanding of the Mexican labor context, identifying the most vulnerable aspects and regions.

According to the dual theory and the labor segmentation theory, women's work is focused on jobs that tend to be lower paid, in industries that are not very competitive, with low mobility, limited bargaining power and barriers to access to top management positions. In addition, although women's educational levels have increased significantly, this has not been proportionately reflected in an increased presence of women in the labor market.

Some of the findings are compatible with those observed by Arora *et al.* (2023), Casanueva and Rodriguez (2009), and De la Cueva and Palomares (2017), who highlight the wage gap as one of the most vulnerable factors in the quality of women's employment. Likewise, the results are consistent with Flores and Salas (2015) in that access to health services and benefits are factors in which women are more equal.

A greater advantage for women was found in relation to job stability for the two periods analyzed, compared to the results of Casanueva and Rodriguez (2009), who show that this and other factors have created unfavorable conditions for women over time.

The final results show that women have higher job quality in the two periods of analysis, although in general, for both sexes, job quality in Mexico is low. This is similar to the results obtained by Flores and Salas (2015), who found that women have a better combination of factors related to job quality.

The results differ from those of authors analyzing job quality in Europe, such as Perez (2020) and Santero *et al.* (2015), who observe lower job quality for women than men and deterioration over time. In this analysis, on the other hand, we observe a slight increase in job quality over time.

Finally, this paper shows that in states where men have higher job quality, women also have better working conditions, although there are inequalities across regions, with northern states having higher job quality than southern states.

Improving working conditions and striving for greater equality benefits society as a whole, and to this end, it is important to promote programs and policies that foster quality employment, such as promoting wage increases and equality; establishing adequate rest and vacation time to reconcile work and personal life; promoting policies that reduce the penalization of women for marriage and child-rearing; promoting programs that help with home care, such as daycare centers or full-time schools; promoting formalization to increase the number of workers with work contracts, benefits and social security; and ensuring equal opportunities to reduce gaps by promoting fairness and equity.

Some limitations of this paper are found in the weighting of the income factor since although studies on job quality try to emphasize that quality should not be represented only by income, it is an important factor in working life and does not have the highest weighting in the presented index. Similarly, income is one of the variables often used in studies of the gender gap in employment.

APPENDIX

Table A1. Correlation matrix

	More than 5 s.m.	Between 35 and 48 hours	With access to S.S.	With benefits	With a written contract
More than 5 s.m.	1				
Between 35 and 48 hours	0.2254[a]				
	0.3900**[b]				
	0.2636[c]	1			
	0.3402*[d]				
With access to S.S.	0.6498***	0.4696***			
	0.4951***	0.8785***			
	0.5886***	0.4431**	1		
	0.4916***	0.8576***			
With benefits	0.6601***	0.3808**	0.9809***		
	0.5762***	0.7680***	0.9560***		
	0.5907***	0.3762**	0.9857***	1	
	0.5079***	0.8012***	0.9738***		
With a written contract	0.6073***	0.4999***	0.9603***	0.9241***	
	0.4842***	0.9001***	0.9694***	0.9052***	
	0.5571***	0.4543***	0.9730***	0.9454***	1
	0.4976***	0.8396***	0.9815***	0.9433***	

Notes: [a]Men 2012; [b]Women 2012; [c]Men 2022; [d]Women 2022. ** Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Source: prepared by the authors.

Table A2. Barlett's test and KMO test

		JQI M 2012	JQI W 2012	JQI M 2022	JQI W 2022
Bartlett's sphericity test	chi2	199.9319	220.4344	212.6078	231.4393
	p. value	1.67E-37	8.66E-42	3.76E-40	4.29E-44
KMO sample adequacy measure	Overall MSA	0.74	0.77	0.72	0.78
	More than 5 s.m.	0.99	0.78	0.99	0.94
	Between 35 and 48 hours	0.67	0.84	0.69	0.89
	Access to S.S.	0.65	0.7	0.63	0.67
	With benefits	0.70	0.72	0.69	0.77
	With a written contract	0.83	0.85	0.79	0.79

Source: prepared by the authors.

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[1] In 2023, the participation rate for women was 46% compared to 76% for men (INEGI, 2023).

[2] In 2023, the informality rate for women was 55.9%, compared to 54.4% for men (INEGI, 2023).

[3] In 2023, the partial employment and unemployment rate for women was 12.5% compared to 6.4% for men (INEGI, 2023).

[4] A 14% wage gap (Mexican Institute for Competitiveness [IMCO], 2022).