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IZA DP No. 16806

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in Bolivia's Labor Market**

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ABSTRACT

Beyond the Usual: Understanding the Multidimensional Nature of Job Quality in Bolivia's Labor Market*

Job quality can impact workers' productivity and contribute to societal well-being. To analyze the evolution of job quality in Bolivia, this paper employs Bolivian household survey data spanning 2007 to 2021 to construct a synthetic job quality index. The index incorporates a broad definition of a good job, encompassing six dimensions: adherence to regulations, working conditions, establishment of an appropriate wage-job linkage, productive usage and adaptability of skills, availability of career opportunities, and employment resilience. The findings indicate that job quality in Bolivia has mostly remained incessant, exhibiting limited change even during periods of high growth in economic output. However, this result masks heterogeneities, with significant variation in job quality associated with workers' demographic and job-specific characteristics and across regions.

JEL Classification: J21, J26, J28, J81

Keywords: labor market, principal component analysis, job quality, Bolivia

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1 Introduction

The significance of job quality is widely acknowledged, with a link established between good jobs, productivity and living standards (World Bank 2012). For instance, Oswald et al. (2015) provide causal evidence of the linkage between happiness shocks and human productivity using experimental and observational evidence. In their study, they are able to distinguish between “short term” positive affect and long term well-being and find that both have significant impacts enhancing productivity. Related to the former one, Lyubomirsky et al. (2005) use different sources of evidence to show that positive affect provokes success, not only related to work life but across other life domains as well.

In this sense, what defines a good job? There is increasing recognition that job quality encompasses multiple dimensions. SDG8 on Decent Work and Economic Growth includes indicators on, for example, protecting labor rights and promoting safe working environments, and ending child labor. Similarly, the ILO’s Decent Work Indicators cover issues of adequate earnings, decent working time, stability and security at work, and social security, among others. Despite this recognition of the multidimensionality of a quality job, the notion of what a good job is has often been limited to single indicators, such as informality.

The increasing focus on indices of job quality aims at providing a more holistic view of what a good job is. Attempts to measure job quality have demonstrated its substantial role in the wellbeing of individuals, particularly in developing countries where labor markets exhibit weaknesses and disparities (Clark 2005a) as well as a higher segmentation between the formal and informal sectors.

Bolivia has made strides in labor market indicators related to participation rates; however, despite these notable advancements, the country still grapples with several structural labor market challenges, evident in a sizable informal sector and outdated labor market regulations that have resulted in unsatisfactory job conditions (Muriel & Machicado 2014). For example, the labor law (*Ley General de Trabajo*) dates back to the 1940s when it was enacted as a solution to the feudal relationship between employers and workers.^{1 2} The

¹There is empirical evidence from developing countries showing how stricter labor regulations can affect economic performance in terms of output, employment, investment and productivity (Besley & Burgess 2004).

²Muriel & Machicado (2014) show that firms with high temporary worker rates (that is, with lower labor regulated workers) in Bolivia are the ones with higher job reallocation rates and higher net employment growth. Moreover, they were the sole contributors to employment growth during the national economic downturn between 1998-1999. Similarly, Davalos et al. (2020) analyzes how other labor regulations, like

pronounced focus on informality in Bolivia when analyzing the quality of employment has made less visible other dimensions of a good job such as working conditions, stability and the linkage between wages and the job.³

This paper proposes a Job Quality Index (JQI) that encapsulates key elements that define a good job. It builds on the literature on measuring the quality of jobs, and also incorporates country-specific considerations related to Bolivia’s regulatory and institutional labor market context. We employ a Principal Component Analysis (PCA) to facilitate the aggregation of various labor dimensions into a composite value, with each component representing a distinct job quality aspect. Additionally, the usage of the PCA allows to endogenously select the job dimensions’ weights and avoid any arbitrary assignment. These dimensions are derived from the Bolivian Household Survey, which offers extensive information on workers’ labor conditions, including contract types, pension enrollment, monthly wages and other relevant factors. The analysis utilizes data from 2007 to 2021 to assess the evolution of these labor conditions over time, examining the economic boom in Bolivia during the past decade as well as the pandemic crisis.

We find that job quality mostly remained constant during the analysis period, hovering around 0.46 (in an index between 0 and 1, where values closer to 1 indicate higher quality). At the same time, the index highlights high variation in the quality of jobs across groups. For example, men have jobs with a quality 28% better than those of women, representing a gap that has been persistent over time. We also find that workers in micro and small firms have jobs with a quality 0.17 points below that of self-employed workers (representing a quality 42% lower).

Overall, these results suggest that Bolivia faces challenges in increasing job quality as evidenced by a relatively steady measure even during an economic boom. In addition, it shows the disparities that exist and persist among different groups. Namely, women, workers in micro and small firms and workers in rural areas face jobs of lower quality compared to their respective counterparts. Policy implications developed from these results could address dimensions with lower satisfactory levels, such as access to social security, and at the same time, target and extend coverage on disadvantaged groups.

This paper contributes to three strands of the literature. First, it expands the research

Doble Aguinaldo, restrict SME growth in Bolivia.

³For instance, [Hovhannisyan et al. \(2022a\)](#) summarize the principal dimensions that overlap across different frameworks proposed by international panels of experts at the macro and micro levels.

that has aimed to measure job quality. To construct our measure, we follow the approach of [Del Carpio et al. \(2017\)](#), and complement it using tetrachoric correlation matrices to account for the dichotomous nature of the indicators that compose the PCA. Furthermore, this represents the first job quality study using a PCA in Bolivia and adds to previous literature that uses different methodologies ([Yañez \(2018\)](#), [Brummund et al. \(2018\)](#), [Hovhannisyan et al. \(2022a\)](#)). As such, we measure job quality from the supply side of the labor market. Second, this paper uses a rich household dataset to assess the quality of jobs across time and in a country characterized by stringent labor market regulations and a high segmentation between formal and informal sectors. Our data allows us to assess the quality of jobs for non-wage workers in a developing country context, contributing to a literature that has, in many cases, been restricted to data availability only for the salaried cases ([Hovhannisyan et al. 2022a](#)). Finally, our time period allows us to assess the consequences of the pandemic on job quality, contributing to the literature on the economic impacts of the COVID-19 shock.

Assessing job quality will provide policy makers with valuable insights into the state of labor markets, complementing traditional variables such as participation or unemployment rates that may mask labor market performance in developing countries with significant informal sectors. Firstly, it aids in identifying workers who experience poor job quality, taking into account not only sociodemographic characteristics but also analyzing the economic sector and employment structure. Secondly, recognizing that job quality holds welfare implications for workers and their families ([Clark 2005b](#)), the study identifies specific dimensions of labor conditions that require improvement to enhance overall job quality, considering common factors such as social benefits, wages, and contracts, as well as additional factors like overqualification and child labor. Thirdly, it presents an easily replicable and evaluative approach for assessing labor conditions across different contexts. Finally, evaluating how different economic shocks, such as the COVID-19 pandemic, affect labor conditions is crucial, particularly for informal sector workers and those engaged in face-to-face (F2F) interactions.

This paper is organized as follows: Section 2 reviews the relevant literature in this research domain. Section 3 provides a concise overview of the labor regulation landscape, while Section 4 outlines the methodology employed for constructing the index. In Section 5 we present the diverse findings of the constructed Job Quality Index (JQI), and finally, Section 6 concludes the study with key insights and conclusions.

2 Where do we stand? A brief review of the literature

The literature on employment quality has evolved significantly in recent decades. In the case of developed countries, [Jencks et al. \(1988\)](#) were the first to develop a job desirability index for the United States, which considered both monetary and non-monetary aspects of jobs. Similarly, [Muñoz de Bustillo et al. \(2011\)](#) comprehensively review different perspectives and approaches to evaluating workers' wellbeing and job quality, constructing a job quality index for the European region. Additionally, [OECD \(2015\)](#) introduced a Job Quality Framework that considers earnings, labor market security, and the quality of the working environment as key dimensions for job evaluation. Furthermore, the International Labour Organization (ILO) presented a set of statistical indicators related to the Decent Work Agenda in 2008 and 2009. These indicators encompass fundamental dimensions such as labor standards, rights at work, employment opportunities, social protection, and social dialogue. These indicators allow for studying and monitoring labor markets in developing countries, including their informal sectors. However, job quality measurement in developing countries has been more limited due to data availability constraints, which hinder the construction and comparison of job quality indices across different countries.

In the context of developing countries, some studies have utilized the [Alkire & Foster \(2011\)](#) framework to measure job quality. For example, in the case of Latin America, [Brummund et al. \(2018\)](#), [Senhbruch et al. \(2020\)](#), and [Apablaza et al. \(2021\)](#) propose multi-dimensional measures of job quality based on this method. [Brummund et al. \(2018\)](#) employ the Socio-Economic Database for Latin America and the Caribbean (SEDLAC) for a subset of 15 countries between 1995 and 2012. The authors use income, health insurance, retirement benefits, tenure, job contract, job stability, and job satisfaction components to create a composite job quality index. One of their key findings is that Argentina, Brazil, Chile, Costa Rica, and Uruguay exhibit higher job quality, primarily due to a lower share of their employed population working in the agriculture sector compared to other countries. Additionally, they found that the average job quality in the region increased by approximately 25 percent between 2004 and 2012.

On the other hand, [Senhbruch et al. \(2020\)](#) developed a synthetic indicator of the quality of employment for 10 countries in Latin America using household and labor force surveys from 2015.⁴ The authors select three dimensions in their study, each operationalized

⁴The list of countries includes Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, and Uruguay.

by five sub-dimensions (income generated by work, occupational status, tenure, social security affiliation, and excessive working hours). Consistent with the findings of [Brummund et al. \(2018\)](#), they observe that Chile, Uruguay, and Brazil outperform their regional peers. Furthermore, they identify a gender gap in employment quality across all countries in their study, particularly in the dimensions of income and tenure. Similarly, [Apablaza et al. \(2021\)](#) employ a similar method to evaluate employment quality across regions in Chile between 1996 and 2017. Their results highlight the heterogeneity of job quality across the country but also indicate a process of convergence driven by minimum wage regulations and the statutory working week.

Another set of studies has developed job quality indices using alternative methodologies. For example, [Del Carpio et al. \(2017\)](#) examine the dynamics of job quality in Turkey between 2009 and 2016. The authors define various components related to job quality and employ the principal component analysis (PCA) method to aggregate them into a composite index. Their findings reveal an improvement in the quality of wage employment at the aggregate level over the specified period. These improvements are largely attributed to a shift towards more formal wage jobs. However, the authors also observe a wide distribution of employment quality across Turkey.

Closely related is a study conducted by [Yañez \(2018\)](#), which examines the evolution of job quality in Bolivia from 2006 to 2015. The author employs the National Household Surveys as the primary dataset and constructs a job quality index using the fuzzy sets theory developed by [Zadeh \(1965\)](#).⁵ The index incorporates variables such as labor income, weekly hours worked, unemployment, number of jobs, contract availability and tenure.⁶ The findings indicate that the index witnessed a modest increase of approximately 0.7 percent over the decade, which is lower than anticipated given the commodity boom period. Consistent with other research, the study highlights the presence of a gender gap in employment quality, as well as a widening disparity in job quality between urban and rural areas.⁷

The most recent contribution to the literature, [Hovhannisyan et al. \(2022a\)](#), aims at measuring job quality with a global view, using a harmonized dataset for 40 developing countries and across four dimensions: sufficient income, access to employment benefits, job stability, and adequate working conditions. Employing the Alkire and Foster framework, it

⁵The Fuzzy Sets theory had been traditionally used to construct a multidimensional poverty index. [Lelli \(2001\)](#) provides a solid review and comparison between factor analysis and the use of fuzzy sets.

⁶The social security benefits and workplace variables are also included as components of the index.

⁷We replicate the model presented by [Yañez \(2018\)](#) using the Bolivian household surveys. Similarly, we also find a steadiness of the job quality index based on the fuzzy sets theory.

shows significant variation in job quality across countries and regions and across population groups defined by sector of employment and sociodemographic characteristics such as age, location, and educational attainment.

3 Context: A description of the legal content

Before delving into the data and statistics used to define the Job Quality Index for Bolivia, it is important to consider the labor market laws and regulations, as highlighted by [ILO \(2013\)](#). Each indicator used for analysis has a legal dimension, and in the Bolivian context, there exists a complex and diverse set of laws that typically define a job of good quality. Following the explanation provided by [Muriel & Ferrufino \(2011\)](#), the most crucial laws to consider for a comprehensive analysis are as follows: Section three of the constitution⁸ recognizes the right of every individual to work in a job that offers dignity and security. It also stipulates that each Bolivian has the right to a stable job with fair compensation and social security, emphasizing the obligation for employers to provide access to these benefits. Moreover, this law safeguards the rights of women and young people, ensuring that they are entitled to all labor benefits. The labor law⁹ is the primary legislation that regulates various labor activities and relationships. For instance, its fifth chapter, article 52, establishes that every contracted employee must receive at least the minimum wage. Furthermore, this law specifies the maximum number of working hours per week, limiting it to 48 hours for men and 40 hours for women and young individuals.

Additionally, [Muriel & Ferrufino \(2014\)](#) mention several regulations that support the inclusion of certain indicators considered in previous research papers examining the job quality situation in the labor market. These authors complement the description of labor regulations in Bolivia with the following laws: 1) The minimum wage legislation, which is updated annually through new laws. For example, the increase in the minimum wage in 2014 was announced by the supreme decree number 1988. 2) The General Labor Law regulates labor stability, and the reinforcement of this regulation was announced in 2006 through Supreme Decree 28699. 3) Labor benefits, such as bonuses and short-term and long-term social security, are all covered in the General Labor Law and have been complemented and updated by different laws. For instance, in 2013, Supreme Decree 1802 confirmed the second Christmas bonus. 4) Child labor is regulated by law number 548, which establishes the legal

⁸Constitución Política del Estado.

⁹Ley General del Trabajo.

age to start working as 10 years old. By considering these labor laws and regulations, a more comprehensive understanding of the Job Quality Index can be achieved, considering the legal framework that defines the characteristics of good-quality jobs in Bolivia.

4 Data and methodology

4.1 Data and components of the JQI

The main data used in this paper are derived from the National Household Survey, spanning from 2005 to 2021 and collected by the National Statistics Office. The National Household Survey is the primary survey in the country for measuring poverty, employing a probabilistic sampling procedure. Since 2011, the survey has been representative at both national and regional levels.¹⁰ To ensure comparability across the years, we created the Job Quality Index starting in 2007, which coincides with the commodity boom in Bolivia. This period witnessed high economic growth until 2014, followed by slower growth.

To construct the job quality index, we only consider observations from individuals employed at the time of the survey and who reported the variables required for creating the different dimensions of the index. The sample comprised approximately 6,800 individuals between 2007 and 2009 and around 15,500 individuals since 2011. Table 1 compares demographic variables for the employed population between the complete sample from the National Household Survey and the sample used in our study. The patterns of evolution for different characteristics are roughly similar between both samples, indicating that the sample used in this paper adequately captures the observed changes in the labor market.

¹⁰For the case of the departments of Beni and Pando, it is necessary to include both regions together in order to obtain representative statistics.

Table 1: Share of workers by demographic groups (% of employed population, age 15-64)

	Full Sample				Sample in this study			
	Female	Low-skilled workers	Informal workers	Agriculture	Female	Low-skilled workers	Informal workers	Agriculture
2007	44.7	61.8	77.5	30.6	44.7	61.7	77.4	30.6
2008	45.3	60.8	79.0	29.0	45.2	60.9	79.0	28.9
2009	44.9	58.7	78.1	27.7	44.9	58.7	78.0	27.5
2011	44.2	56.9	77.6	28.0	44.2	56.9	77.6	28.0
2012	44.1	54.2	76.5	25.8	44.1	54.3	76.5	25.8
2013	44.3	48.8	72.4	25.9	44.2	48.9	72.5	25.9
2014	44.0	49.7	77.4	28.3	44.0	49.7	77.4	28.3
2015	41.5	46.3	77.0	25.0	41.6	46.3	77.1	25.2
2016	44.1	53.6	78.1	26.4	44.2	53.7	78.1	26.3
2017	43.1	50.9	78.0	24.6	43.0	51.1	78.2	24.8
2018	43.0	50.3	76.4	25.9	43.0	50.2	76.3	25.7
2019	44.2	48.3	76.5	25.6	44.2	48.4	76.6	25.6
2020	43.7	46.6	-	26.4	43.7	46.6	-	26.2
2021	42.5	44.7	-	22.4	42.5	44.7	-	22.4

Notes: Based on data from EH 2007-2021. We define low-skilled workers for people with incomplete secondary education or below and informality for employees with some kind of written contract and employers, self-employed with a Tax Identification Number (TIN).

Table 2 provides summary statistics that offer an overview of the labor market in Bolivia over the years. The first two rows indicate that the aggregate participation and employment rates have remained relatively stable over the past decade. However, Row (3) reveals a 10-percentage point increase in the share of the population aged 15 to 64 years old who were self-employed between 2007 and 2021. Moreover, the labor income of this population ceased to increase in 2014, following the national average trend. This slump in income disproportionately affected this type of workers as laborers and employees did not suffer a significant income contraction (Davalos et al. 2020). In this sense, it may be important to distinguish between entrepreneurs (growth-oriented business owners) and self-employed individuals driven by necessity to characterize the dynamics of the Bolivian labor market fully.

Table 2: Characteristics of workers in employment and labor income (national level, age 15-64)

	2007	2009	2011	2013	2015	2017	2019	2020	2021
Activity Rate	73	74	74	72	69	70	74	74	72
Employment rate	69	72	72	70	67	68	70	68	69
Self-employed workers (%)	34	34	35	37	41	42	42	44	44
Workers in MSE (%)	33	30	30	26	25	26	27	28	25
Workers in public firms (%)	26	25	26	30	25	26	25	27	-
Real average monthly income	1,489	1,559	1,672	2,228	2215	2,105	2,124	2,113	2,070
Real average monthly income (for self-employed)	1,176	1,365	1,658	1,730	1923	1,644	1,686	1,735	1,490

Notes: Based on data from EH 2007-2021. We define workers in micro and small enterprises (MSE) for people who are employed in a firm with less than five employees, domestic workers and unpaid workers. Average income is in 2010 prices.

In constructing the index, we rely on the methodology proposed by [Del Carpio et al. \(2017\)](#). Due to data availability and the need for comparability across time, we include a reduced number of components in our study. Furthermore, given the specific focus on the Bolivian labor market, our index is designed to assess job quality not only for workers receiving wages, but also for those engaged in non-wage employment, who account for over 40 percent of the occupied labor force. The study covers individuals aged 15 to 64.

The Job Quality Index (JQI) comprises four dimensions that operate through seven components. Each dimension and component can be used independently to assess individual progress toward job quality in Bolivia. Table 3 presents the dimensions and components used to measure job quality. The four dimensions of the JQI are: i) Benefits and protection under labor law, ii) job-wage linkage, iii) career advancement and growth, and iv) level of productivity. These dimensions, as briefly explained earlier, have a legal foundation. Columns (1) to (4) outline the different components and describe the criteria for evaluating a good job.

Social Security Benefits: We define a proxy binary variable for social security benefits equal to one if the worker stated being registered to the Pension Fund Administration¹¹ (AFP) at the moment of the survey, even if the worker was not contributing at that time to the system. It is important to mention that both waged and non-waged workers may be affiliated with the pension system in Bolivia, regardless of their type of employment.

Minimum wage compliance: We define minimum wage compliance for full-time workers whose income per hour equals or exceeds the minimum wage per hour. As the

¹¹Administradora de Fondos de Pensiones.

number of hours worked per week greatly differs between workers based on variables such as educational attainment, economic sector, or type of employment, we decided to use a minimum threshold for hourly wage compliance. In this sense, we assumed a maximum of 240 hours worked per month (or 8 hours per day in 30 days) to calculate a minimum hourly income compliance and account for workers who work more than 40 hours per week.

Low incidence of child labor: We use the definition from [Del Carpio et al. \(2017\)](#) based on a normative threshold. According to the authors, the reasoning behind this indicator lies in its proximity to regulation and protection by the Labor Law as well as working conditions exhibited in a given economic sector. Even though the *2014 Ley No 548* allows children aged 10 and above to work under specific conditions,¹² we define child labor for children under 14 who were employed at the time of the survey. In this sense, we define a binary variable equal to one if the sector's contribution to structural child labor is below the mean contribution across all sectors in a given year.¹³

¹²According to this law, for children aged between 10 and 12, work is allowed if they attend school, are self-employed and get parental permission. And from 12, children can do light work for others.

¹³For instance, in 2015, 75 percent of the children between 7 and 14 years old were employed in the agriculture sector. In consequence, we excluded it when calculating the national mean contribution across sectors. Moreover, the binary variable for this component is equal to zero for people employed in this sector.

Table 3: Dimensions and Components of Job Quality

Dimension	Components	Type of Threshold	Definition
A. Benefits and Protected by Law	Social security benefits	Yes/No	The worker is registered to the AFP (pension system).
	Minimum wage compliance	Yes/No	A full-time worker's wage complies with the statutory minimum wage. (Part-time workers are given a value of 0).
	Low incidence of child labor (under 14 years old)	Normative	The sector's contribution to structural child labor is below the mean contribution to child labor (excludes the agriculture sector).
B. Wage-Job Linkage	Low incidence of relative underpayment	Cell-based threshold	The worker's hourly wage is not in the bottom 30 percent of the cell-based wage distribution in the sector-occupation-education-potential labor market experience cell.
	Low incidence of compensatory moonlighting	Yes/No	A full-time worker earning below the low-pay threshold does not have a secondary job. <i>Low-pay threshold</i> is defined as a monthly wage less than 2/3 of median pay of all full-time wages.
C. Career advancement and growth	Tenure	Cell-based threshold	The worker has tenure, defined as working more years than those of the median worker in the sector-occupation-potential labor market experience cell.
D. Linkage between education and job	Low incidence of overqualification	Cell-based threshold	The worker's level of education is not above the education level of the median worker in the sector-occupation-birth cohort-graduation cohort cell.

Notes: Based on data from EH 2007-2021. We define workers in micro and small enterprises (MSE) for people who are employed in a firm with less than five employees, domestic workers and unpaid workers. Average income is in 2010 prices.

Low incidence of relative underpayment: We create a cell-based threshold equal to one (and zero otherwise) if the worker’s hourly wage is above the third decile of the cell-based wage distribution in the sector-occupation-education-potential labor market experience cell.¹⁴

Low incidence of compensatory moonlighting: We define this component equal to one for a full-time worker earning below the low-pay threshold and who does not have a secondary job. The low-pay threshold is defined under the OECD low pay definition as a monthly wage less than two-thirds of the median pay of all full-time wages.

Labor stability: This component is equal to one for people working more years than the median worker in the sector-occupation-potential labor market experience cell. The idea to include tenure as a job quality indicator is because of its relationship to job stability as workers who have been in the same jobs for several years, are more likely to work there for more years (Hovhannisyan et al. 2022a).¹⁵

Low incidence of overqualification: We define this variable equal to one if the worker’s level of education is not above the education level of the median worker in the sector-occupation-birth cohort-graduation cohort cell.

Table 4 shows the percentage of workers who report success in each of the components between 2007 and 2021. Column (1) reveals the compliance of social security benefits and reports that only one out of five workers in the country has benefited from them, although the rate has increased since 2007, when only 15 percent of workers in Bolivia had access to social security benefits. Column (2) reveals that minimum wage compliance has been higher, reaching more than 60 percent of workers in Bolivia since 2007. However, it is important to mention that, in comparison to the years before 2013, this compliance rate has decreased. This is likely not only due to the end of the commodity boom (which limited the increase of wages) but also to a continuous increase in the mandatory minimum wage in the country.¹⁶ Column (3) shows the percentage of workers who are employed in a sector with a

¹⁴The share of workers satisfying this component will depend on the distribution of the component and the number of values equal to 0 for income per hour. We only compute the percentile for positive values of income per hour and assume that all workers with values equal to 0 do not satisfy the indicator. Hence, the share of workers satisfying the indicator within each cell group may differ from 60 percent.

¹⁵The share of workers satisfying this indicator within each cell group may differ from 50 percent because weights are included in the calculation of the median. We also include weights when constructing the other components.

¹⁶Between 2013 and 2019, the minimum wage in Bolivia increased by 77 percent reaching 2122 bolivianos per month (308 USD) by the start of the COVID-19 pandemic.

contribution to structural child labor below the average contribution across all sectors.¹⁷ As shown, less than 50 percent of workers in Bolivia have, on average, worked in a sector with low contribution to child labor in the past decade.

Table 4: Percentage of workers who satisfy each JQI component, by year

	Components						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Social Security Benefits	Minimum wage compliance	Low incidence of child labor	Low incidence of relative underpayment	Low incidence of compensatory moonlighting	Labor stability	Low incidence of overqualification
2007	14.6	63.6	46.3	60.9	59.4	56.1	66.5
2008	13.4	66.1	37.2	60	58	57.8	68.2
2009	15.6	67.7	39.5	60.5	57.5	57.4	67.2
2011	18.1	68.7	39.3	58.9	58.5	55.5	66.5
2012	18.8	68.2	41.3	61.9	60.2	56.5	64.4
2013	22.4	68.1	41.6	61.3	58.1	55.7	66.5
2014	16.8	62.8	47.1	59.3	57.2	56.5	66.3
2015	18.9	63.3	41.4	61.4	58.3	56.7	71.4
2016	19.2	62	46.5	61	53.3	57.1	67.5
2017	18.9	60.5	48.1	61.6	54.8	56.7	66.8
2018	20.4	62.1	41	61.4	54.3	55.8	68.1
2019	21.7	62.8	40.6	61.1	51	55.9	67.9
2020	21.1	58.5	44.3	60.2	53.1	55.5	67.3
2021	17.0	62.8	42.1	63.3	52.6	57.5	68.8

Notes: Based on data from EH 2007-2021.

Column (4) shows that approximately 60 percent of workers in Bolivia have an hourly income above the third decile of the income distribution of their respective cohorts. Moreover, the share of workers complying with this component has remained relatively stable over the decade, with a peak in 2021, reporting the highest percentage throughout the period. On the other hand, Columns (5) to (7) report the share of jobs for the components with higher success rates compared to other variables. In other words, these variables exhibit the lowest variance across workers. For instance, less than 50 percent of workers in Bolivia have been engaged in compensatory moonlighting, although this rate has increased since 2013. In addition, Column (6) shows that slightly more than 50 percent of the employed population in Bolivia has worked more years than their respective cohorts, serving as a proxy for tenure. Finally, Column (7) reports that, on average, one out of three workers in the country has been affected by overqualification, and this component has shown modest changes over the decade.

¹⁷As above-mentioned, we excluded the agriculture sector when calculating the average contribution in the economy to child labor.

4.2 Aggregation methodology

The aim of this study is to determine a multidimensional measure of job quality in Bolivia. To achieve this, we aggregate the seven components of job quality into a single dimension to facilitate comparisons over time and across different groups. Following the methodology proposed by [Del Carpio et al. \(2017\)](#), we employ a principal component analysis (PCA) to condense correlated variables into uncorrelated components, avoiding any arbitrary assignment of weights to each dimension, as other methodologies do. However, we complement our analysis using a tetrachoric correlation matrix as input for the PCA to account for the dichotomous scale of the index components.¹⁸ ¹⁹ Moreover, as we construct the same components for every year in our data and follow the same methodology to aggregate them, our results allow us to compare the quality of jobs over time and across groups.

Tetrachoric correlations assume a latent bivariate normal distribution (X_1, X_2) for each pair of variables (v_1, v_2) , where $v_i = 1$ if and only if $X_i > 0$, i.e. a threshold model for the observed variables v_i . Correlation of X_1 and X_2 is estimated from the joint distribution of v_1 and v_2 (i.e. the indicators we construct) and computed using a maximum likelihood estimator obtained from a bivariate probit model without explanatory variables.²⁰

Next, following the standard practice, we predict the PCA scores using the first principal component, which contains the most information extracted from the original variables and has a maximal overall variance. Furthermore, we create the Job Quality Index by re-scaling the PCA scores to range between 0 and 1 for ease of interpretation. In this re-scaled indicator, a value close to 1 represents high job quality, while a value close to 0 indicates precarious employment. A limitation of this strategy is that the principal component analysis assumes that the relationships between variables are linear. If the relationships in the data are nonlinear, PCA may not effectively capture the underlying patterns. Moreover, the PCA gives more weight to indicators with more variance which will not necessarily reflect the ones people care more about. In this paper, we take the weights produced by the PCA to avoid any arbitrary assignment as people have heterogeneous preferences with respect to what makes a “good job”.

¹⁸Table 5 presents further results of the correlation matrices for the 7 components of the job quality index.

¹⁹Since we push for in country analysis with this index, the aggregation method is less conservative than previous studies (e.g. [Hovhannisyan et al. \(2022b\)](#), [Brummund et al. \(2018\)](#), [Hovhannisyan et al. \(2022a\)](#)), allowing a larger set of variables which in most cases assigns satisfaction of an indicator based on comparisons within cell-groups. However, a drawback of this approach is that it may restrict cross-country comparability when compared to the studies mentioned above.

²⁰[Edwards & Edwards \(1984\)](#).

4.2.1 Tetrachoric correlation matrix and eigendecomposition

Table 5 presents the tetrachoric correlation matrices among the seven components of the job quality index for 2007, 2011, 2014, and 2021. As expected, the correlation coefficients are higher among the first four components, which assess a job's regulatory and income dimensions. For example, in 2007, access to social security benefits exhibited a strong correlation (coefficient of 0.77) with minimum wage compliance, and this association remained consistent across the years. Similarly, minimum wage compliance and the incidence of relative underpayment showed a correlation coefficient above 0.85. On the other hand, compensatory moonlighting, job stability, and the incidence of overqualification demonstrated low levels of correlation with the other variables. Furthermore, most of the relationships between the components maintained similar magnitudes over the decade, suggesting a time-independent and structural correspondence between the components used to assess job quality.

Table 6 presents the results of the eigen-decomposition of the covariance matrix between 2007 and 2021. This table provides the eigenvalues associated with each principal component and allows for calculating the explained variance. Generally, it is observed that for almost every year, only the first three components had eigenvalues above one, which collectively accounted for 60 percent of the total variance. For further exploratory analysis, we present the rotated principal components (eigenvectors) for 2007, 2011, 2014, and 2021 in Table 7 (including only components with eigenvalues larger than one). Column (1) illustrates that across different years, the first principal component predominantly consists of variables such as access to social security benefits, minimum wage compliance, child labor, and relative underpayment. Consequently, the underlying factor behind this component could be interpreted as labor market formality or a rule of law dimension. Column (2) shows that labor stability and the incidence of overqualification have a higher weight in constructing the second component, suggesting a likely dimension related to career advancement and opportunities. Column (3) also reveals that the third principal component exhibits a stronger correlation with compensatory moonlighting, suggesting a latent factor associated with an income dimension.²¹

²¹Separate estimations of the JQI including an underemployment component (between 2007 and 2019) also had a higher weight of this variable jointly with compensatory moonlighting into the latent factor related to income.

Table 5: Tetrachoric Correlation Matrices for JQI components (2007, 2011, 2014 and 2020)

	Components						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Social Security Benefits	Minimum wage compliance	Low incidence of child labor	Low incidence of relative underpayment	Low incidence of compensatory moonlighting	Labor stability	Low incidence of overqualification
Panel A: 2007							
Social Security Benefits	1.00	0.77	0.58	0.45	-0.09	0.16	0.01
Minimum Wage Compliance	0.77	1.00	0.68	0.88	0.06	-0.01	-0.01
Child Labor	0.58	0.68	1.00	0.38	0.00	0.05	0.09
Relative underpayment	0.45	0.88	0.38	1.00	0.05	-0.01	0.00
Compensatory moonlighting	-0.09	0.06	0.00	0.05	1.00	0.04	0.01
Labor stability	0.16	-0.01	0.05	-0.01	0.04	1.00	0.02
Incidence of overqualification	0.01	-0.01	0.09	0.00	0.01	0.02	1.00
Panel B: 2011							
Social Security Benefits	1.00	0.70	0.60	0.40	-0.13	0.11	0.06
Minimum Wage Compliance	0.70	1.00	0.68	0.87	0.11	-0.03	-0.02
Child Labor	0.60	0.68	1.00	0.31	-0.04	0.05	0.08
Relative underpayment	0.40	0.87	0.31	1.00	0.04	0.01	-0.04
Compensatory moonlighting	-0.13	0.11	-0.04	0.04	1.00	0.02	-0.01
Labor stability	0.11	-0.03	0.05	0.01	0.02	1.00	0.03
Incidence of overqualification	0.06	-0.02	0.08	-0.04	-0.01	0.03	1.00
Panel C: 2014							
Social Security Benefits	1.00	0.69	0.64	0.38	-0.10	0.04	-0.04
Minimum Wage Compliance	0.69	1.00	0.66	0.89	0.05	-0.09	-0.05
Child Labor	0.64	0.66	1.00	0.32	0.06	0.00	0.04
Relative underpayment	0.38	0.89	0.32	1.00	0.01	-0.03	-0.05
Compensatory moonlighting	-0.10	0.05	0.06	0.01	1.00	0.02	-0.02
Labor stability	0.04	-0.09	0.00	-0.03	0.02	1.00	0.04
Incidence of overqualification	-0.04	-0.05	0.04	-0.05	-0.02	0.04	1.00
Panel D: 2021							
Social Security Benefits	1.00	0.71	0.59	0.37	-0.09	0.06	0.00
Minimum Wage Compliance	0.71	1.00	0.61	0.88	0.08	-0.03	0.06
Child Labor	0.59	0.61	1.00	0.25	0.10	0.01	0.21
Relative underpayment	0.37	0.88	0.25	1.00	0.01	-0.01	0.01
Compensatory moonlighting	-0.09	0.08	0.10	0.01	1.00	-0.02	0.05
Labor stability	0.06	-0.03	0.01	-0.01	-0.02	1.00	0.05
Incidence of overqualification	-0.00	0.06	0.21	0.01	0.05	0.05	1.00

Notes: Based on data from EH 2007-2021.

Table 6: Eigendecomposition, Eigenvalues for Principal Components

	Principal Components						
	(1) Component 1	(2) Component 2	(3) Component 3	(4) Component 4	(5) Component 5	(6) Component 6	(7) Component 7
2007	2.90	1.05	1.03	1.00	0.64	0.38	0.00
2008	2.84	1.13	1.05	0.97	0.64	0.37	0.00
2009	2.83	1.09	1.04	0.99	0.68	0.37	0.00
2011	2.81	1.12	1.03	0.97	0.70	0.38	0.00
2012	2.78	1.11	1.03	0.91	0.79	0.38	0.00
2013	2.80	1.11	1.01	0.95	0.78	0.34	0.00
2014	2.82	1.06	1.03	0.96	0.78	0.33	0.00
2015	2.74	1.08	1.03	0.99	0.77	0.38	0.01
2016	2.75	1.03	1.02	1.00	0.78	0.42	0.00
2017	2.75	1.07	1.05	0.96	0.74	0.41	0.02
2018	2.79	1.07	1.04	0.98	0.76	0.36	0.01
2019	2.78	1.11	1.01	0.95	0.76	0.39	0.02
2020	2.79	1.11	1.04	0.92	0.75	0.36	0.03
2021	2.76	1.12	1.05	0.94	0.80	0.34	0.00

Notes: Based on data from EH 2007-2021.

Table 7: Eigendecomposition, Eigenvectors for Principal Components (2007, 2011, 2014 and 2020)

	Principal Components - Eigenvectors		
	(1)	(2)	(3)
	Principal Component 1	Principal Component 2	Principal Component 3
Panel A: 2007			
Social Security Benefits	0.48	0.17	-0.17
Minimum Wage Compliance	0.59	-0.08	0.06
Child Labor	0.44	0.15	-0.06
Relative underpayment	0.49	-0.17	0.13
Compensatory moonlighting	0.01	0.03	0.97
Labor stability	-0.01	0.79	0.06
Incidence of overqualification	-0.02	0.53	-0.02
Panel B: 2011			
Social Security Benefits	0.47	0.17	-0.22
Minimum Wage Compliance	0.59	-0.09	0.12
Child Labor	0.45	0.17	-0.16
Relative underpayment	0.48	-0.18	0.19
Compensatory moonlighting	0.01	0.05	0.90
Labor stability	-0.01	0.71	0.21
Incidence of overqualification	-0.02	0.62	-0.13
Panel C: 2014			
Social Security Benefits	0.48	0.12	-0.17
Minimum Wage Compliance	0.58	-0.10	0.06
Child Labor	0.47	0.17	0.02
Relative underpayment	0.46	-0.16	0.07
Compensatory moonlighting	0.00	0.02	0.96
Labor stability	-0.01	0.71	0.15
Incidence of overqualification	-0.01	0.65	-0.14
Panel D: 2021			
Social Security Benefits	0.49	0.04	-0.22
Minimum Wage Compliance	0.60	-0.03	0.07
Child Labor	0.40	0.36	0.03
Relative underpayment	0.50	-0.19	0.07
Compensatory moonlighting	-0.02	0.33	0.71
Labor stability	-0.04	-0.39	-0.66
Incidence of overqualification	-0.04	0.75	0.04

Notes: Based on data from EH 2007-2021.

5 Results

5.1 Evolution and heterogeneity across groups

In the Bolivian context, the approach used to create a job quality measure reveals that job quality is far from reaching high quality levels. None of the yearly values exceed 0.50, indicating that, on average, workers experience jobs of medium to low quality.²² Examining the indicator's trend over time, the average job quality between 2007 and 2021 is displayed in Column (1) of Table 8. The results indicate a slight improvement in job quality from 2007 to 2013, with a 9 percent increase, resulting in a final average of 0.49. However, average job quality declined after 2013 and remained relatively stable thereafter. Consequently, the job quality trends show minimal overall change since 2007, contrasting with the country's high economic growth (see Figure 1). These findings align with the results of [Yañez \(2018\)](#), who reported minor changes in job quality between 2006 and 2015.²³

Columns (2) and (3) present the estimation results for urban and rural areas, respectively. As expected, job quality is higher on average in urban areas compared to their rural counterparts. For instance, in 2019, prior to the COVID-19 pandemic, the gap between the two areas was nearly 0.3 points. Furthermore, the trends over time indicate a consistent quality gap between the populations in both areas, aligning with the national constant trend. This finding is in line with the research of [Brummund et al. \(2018\)](#), which suggests that the disparity can be attributed to the share of the employed population in the agriculture sector. Regarding gender disparities, Columns (4) and (5) show that, on average, men have better job quality compared to women. Moreover, the sharp decline in job quality between 2013 and 2014 was more pronounced for women than for men, with a decrease of 9 percent and 5 percent, respectively.

²²As we use a 0-1 scale, by construction we interpret values of 0.5 or higher as an average satisfaction of the conditions of a high-quality job.

²³In his study, the author uses the fuzzy set theory as the base methodology to measure job quality. In a similar exercise, we also measured job quality using fuzzy sets and found similar results of steadiness in the quality of jobs for the same period.

Table 8: Average Job Quality between 2007-2021, by demographic groups

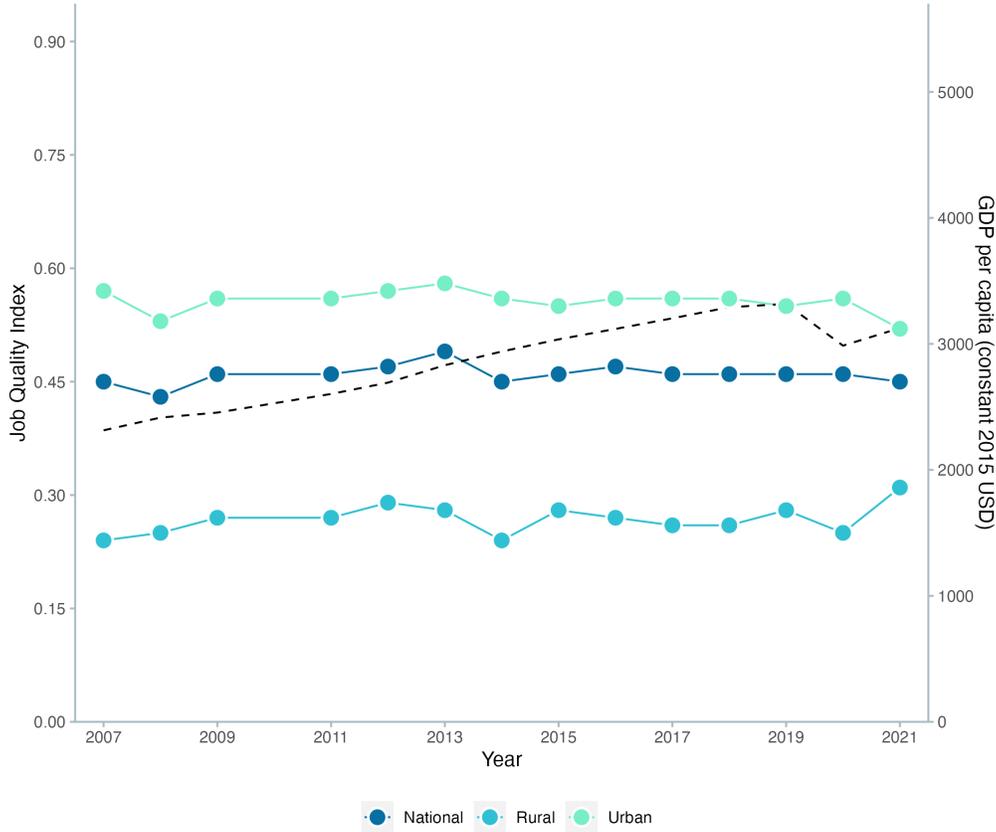
	Average	Area		Gender		Age Group		
	(1)	Urban (2)	Rural (3)	Men (4)	Women (5)	15-24 (6)	25-54 (7)	55-64 (8)
2007	0.45	0.57	0.24	0.51	0.37	0.33	0.50	0.37
2008	0.43	0.53	0.25	0.50	0.34	0.32	0.47	0.37
2009	0.46	0.56	0.27	0.52	0.38	0.34	0.50	0.40
2011	0.46	0.56	0.27	0.54	0.37	0.34	0.51	0.44
2012	0.47	0.57	0.29	0.54	0.40	0.36	0.51	0.43
2013	0.49	0.58	0.28	0.55	0.41	0.35	0.53	0.43
2014	0.45	0.56	0.24	0.52	0.37	0.34	0.50	0.39
2015	0.46	0.55	0.28	0.52	0.37	0.35	0.50	0.50
2016	0.47	0.56	0.27	0.53	0.38	0.34	0.51	0.40
2017	0.46	0.56	0.26	0.53	0.38	0.33	0.51	0.38
2018	0.46	0.56	0.26	0.52	0.38	0.32	0.51	0.41
2019	0.46	0.55	0.28	0.53	0.38	0.29	0.51	0.42
2020	0.46	0.56	0.25	0.52	0.38	0.29	0.51	0.42
2021	0.45	0.52	0.31	0.51	0.38	0.31	0.49	0.42

Notes: Based on data from EH 2007-2021. Estimation using a rescaled score from the first principal component of the PCA.

Columns (6) and (7) reveal that younger workers not only have lower job quality on average across age groups but have also experienced a decline in job quality over time, decreasing from 0.35 in 2015 to 0.29 in 2020. In contrast, workers between the ages of 25 and 54 have better job quality on average and have not experienced significant declines except during the 2013-2014 period. The oldest population shows a similar trend to that of workers aged 25-54.

Regarding the COVID-19 pandemic, job quality declined in 2019, 2020 and 2021 as a consequence of the economic crisis. Although the national average in the quality of jobs slightly decreased, different groups were disproportionately affected. For instance, while job quality increased between 2019 and 2020 from 0.55 to 0.56 for workers in urban areas, it experienced a major decrease in 2021, dropping to 0.52. On the other hand, job quality initially declined from 0.28 to 0.25 for workers in rural regions, but later increased to 0.31. Similarly, job quality sequentially decreased for men from 2019 to 2021, with a variation of -0.01 points each year, while it remained unchanged for women (0.53 to 0.51 vs. 0.38, respectively, for all years). In the case of age-groups, the pandemic affected younger workers more - exacerbating their pre-existing declining trend- in comparison to older workers who experienced little to no changes. However, job quality for the youngest cohort recovered in 2021, returning to the pre-pandemic level.

Figure 1: Job quality index and GDP per capita (constant 2015 USD)



Notes: Own elaboration based on EH 2007-2019 and from the World Bank World Development Indicators (WDI). These figures show the estimated Job Quality Index across the years in comparison to the economic growth in the country (proxied by the GDP per capita in a dashed line).

The average job quality presented in Table 8 may potentially mask wider gaps in the distribution of job quality across economic sectors. Table 10 shows that job quality in the agriculture sector in 2019, prior to the COVID-19 pandemic, was 71 percent below the average job quality in Bolivia. Similarly, there was a 0.24-point gap in job quality between the wholesale and retail sector and the national average before the crisis. Generally, jobs in the agriculture sector, hotels and restaurants, and wholesale and retail sectors tend to have lower quality. Conversely, public administration, mining, financial and enterprise services, and social and personal services exhibit high levels of job quality throughout the period considered in this study. Finally, consistent with national trends, the quality of jobs has shown modest variation within each sector over the years, despite Bolivia’s growth during the commodity boom.

Disparities in job quality are also observed across regions (see Table 9). A cross-

regional analysis before the pandemic reveals that Santa Cruz had the highest employment quality level, reaching 0.54 throughout the entire period. This value surpasses the national average and other departments, and even after the lifting of pandemic lockdown measures, job quality in Santa Cruz remained unchanged. Regions with similar worker participation, such as La Paz and Cochabamba, reported job quality levels of 0.42 and 0.45, respectively, placing them at the average national level. Conversely, Potosi and Chuquisaca had low job quality, with levels below the national average. During the pandemic, the quality of jobs in Potosi decreased by almost 10 points, making it the region with the lowest job quality.

In addition to this analysis, Figure 2a illustrates the distribution of job quality among regions by comparing two different periods: 2011 and 2019. The analysis based on the full 2011 household survey shows that the llanos orientales (Santa Cruz, Pando, and Beni) had higher job quality, while the rest of the departments had an average Job Quality Index (JQI) of 0.44. Comparing this situation to the 2019 one (see Figure 2b), the pattern seems to remain the same, with the exceptions of Oruro, which increased its job quality, and Cochabamba, which experienced the opposite change. In summary, these regional disparities remained relatively similar between 2011 and 2019. These findings align with the distribution of salaried workers in medium and large companies, which is higher in Santa Cruz and lower in the southern departments of Potosi and Chuquisaca.

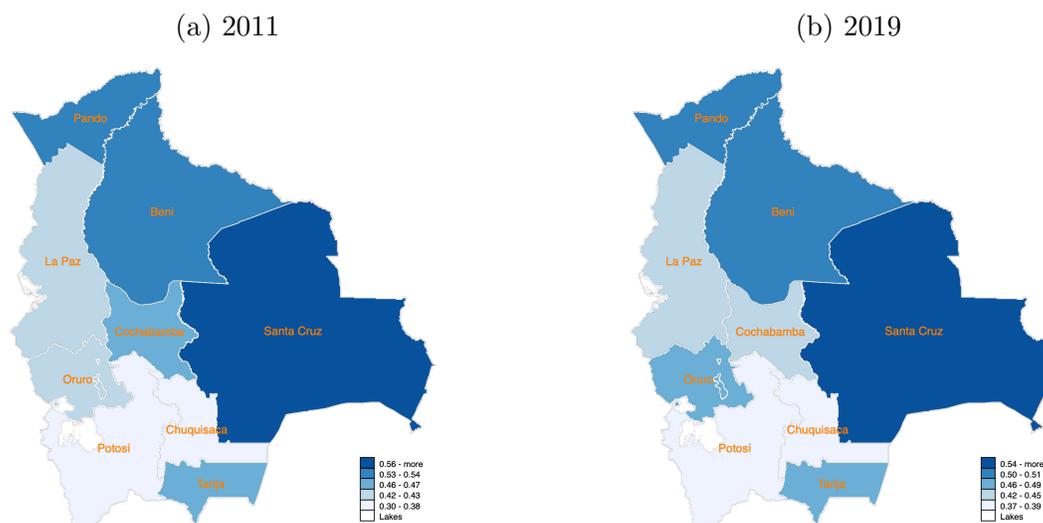
Table 9: Average Job Quality between 2011-2021, by departments

	Departments							
	(1) Chuquisaca	(2) La Paz	(3) Cochabamba	(4) Oruro	(5) Potosi	(6) Tarija	(7) Santa Cruz	(8) Beni-Pando
2011	0.38	0.42	0.47	0.43	0.30	0.46	0.57	0.53
2012	0.41	0.42	0.47	0.45	0.34	0.57	0.57	0.51
2013	0.38	0.43	0.49	0.50	0.37	0.51	0.59	0.55
2014	0.37	0.42	0.44	0.49	0.31	0.49	0.52	0.54
2015	0.43	0.43	0.43	0.42	0.33	0.48	0.54	0.50
2016	0.34	0.46	0.43	0.46	0.29	0.49	0.56	0.49
2017	0.35	0.42	0.44	0.45	0.33	0.50	0.57	0.49
2018	0.38	0.41	0.47	0.44	0.33	0.48	0.55	0.52
2019	0.39	0.42	0.45	0.46	0.38	0.49	0.54	0.51
2020	0.35	0.45	0.45	0.46	0.29	0.44	0.54	0.50
2021	0.35	0.45	0.41	0.45	0.31	0.42	0.54	0.50

Notes: Based on data from EH 2011-2021. Estimation using a rescaled score from the first principal component of the PCA. Following INE's methodology, the estimation for the Beni and Pando regions was done together.

Table 11 explores the evolution of job quality across different types of employment

Figure 2: Job quality index in 2011 and 2019, by departments



Notes: Own elaboration based on EH 2011-2019. These figures show the Job Quality Index for 2011 and 2019. Darker shades of blue encode higher levels of job quality.

structures since 2007. As mentioned earlier, self-employed individuals and salaried employees in micro and small enterprises accounted for an average of 67 percent of total employment between 2011 and 2021. However, workers in these occupations had the lowest job quality. For example, in 2019, self-employed workers had a job quality of 0.41, while workers in micro and small firms had a job quality 0.18 points lower (reflecting a 36 percent difference in job quality). This contrasts sharply with individuals employed in medium and large firms and employers, who had JQI values of 0.78 and 0.54, respectively, in 2019. This trend persists in the post-pandemic period, with medium and large firms maintaining the highest job quality, albeit with a 3-point decrease from 2019. Self-employed individuals and employers experienced decreases in job quality, while micro and small enterprises slightly increased their quality, reaching pre-pandemic levels in 2021. These numbers likely reflect the existence of constraints and/or disincentives for micro and small firms that prevent them from offering higher-quality jobs, which has become more evident considering Bolivia’s period of high economic growth in the last decade.

Regarding the disparities in job structure, Table 12 expands the analysis and shows that formal workers (regardless of their type of job) have a higher job quality than their counterparts. For instance, Columns (1) and (2) reveal that salaried workers under an employment contract²⁴ have the highest quality jobs, not only in comparison to salaried

²⁴Considering written fixed-term contracts or employees with a permanent contract (known as item in

workers under an oral employment agreement or no contract at all, but also when compared to the national average.

Bolivia).

Table 10: Average Job Quality between 2007-2021, by economic sectors

	Economic Sectors											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Agriculture	Mining	Food and bev- erages	Textiles, wood and others	Utilities	Construction	Wholesale and retail	Transport and communica- tions	Financial and enterprise services	Social and personal services	Hotels and Restaurants	Public Ad- ministration
2007	0.15	0.53	0.41	0.58	0.60	0.63	0.35	0.63	0.70	0.73	0.36	0.85
2008	0.15	0.69	0.45	0.38	0.84	0.65	0.34	0.62	0.73	0.75	0.35	0.84
2009	0.17	0.79	0.46	0.38	0.71	0.66	0.37	0.66	0.71	0.75	0.35	0.84
2011	0.18	0.76	0.47	0.41	0.63	0.66	0.36	0.65	0.75	0.76	0.37	0.86
2012	0.18	0.80	0.46	0.40	0.84	0.67	0.37	0.66	0.73	0.76	0.36	0.87
2013	0.19	0.81	0.46	0.39	0.90	0.68	0.37	0.67	0.78	0.78	0.37	0.88
2014	0.16	0.75	0.42	0.57	0.88	0.65	0.32	0.64	0.72	0.74	0.34	0.86
2015	0.18	0.77	0.43	0.40	0.82	0.65	0.35	0.63	0.74	0.73	0.36	0.87
2016	0.17	0.58	0.43	0.58	0.92	0.66	0.33	0.64	0.75	0.74	0.36	0.88
2017	0.15	0.80	0.41	0.58	0.61	0.66	0.33	0.63	0.74	0.73	0.34	0.88
2018	0.16	0.80	0.45	0.39	0.92	0.66	0.35	0.64	0.74	0.76	0.35	0.90
2019	0.17	0.75	0.47	0.39	0.90	0.67	0.35	0.65	0.75	0.75	0.34	0.92
2020	0.18	0.77	0.41	0.58	0.70	0.65	0.35	0.63	0.75	0.76	0.33	0.90
2021	0.20	0.73	0.41	0.38	0.87	0.61	0.32	0.58	0.68	0.73	0.34	0.88

Notes: Based on data from EH 2007-2021. Estimation using a rescaled score from the first principal component of the PCA.

Table 11: Average Job Quality between 2007-2021, by employment structure

	Employment Structure			
	(1) Micro and Small Firms	(2) Medium and Large Firms	(3) Self-employed	(4) Employer
2007	0.25	0.74	0.38	0.54
2008	0.23	0.72	0.38	0.47
2009	0.24	0.71	0.39	0.51
2011	0.22	0.74	0.42	0.55
2012	0.26	0.75	0.40	0.51
2013	0.24	0.76	0.41	0.55
2014	0.22	0.75	0.40	0.49
2015	0.23	0.73	0.40	0.51
2016	0.23	0.77	0.41	0.50
2017	0.23	0.76	0.40	0.54
2018	0.22	0.77	0.40	0.54
2019	0.23	0.78	0.41	0.54
2020	0.22	0.79	0.43	0.58
2021	0.24	0.75	0.40	0.52

Notes: Based on data from EH 2007-2021. Estimation using a rescaled score from the first principal component of the PCA. Workers in micro and small firms are defined for people employed in a firm with less than 5 employees, domestic workers and unpaid workers. Workers in medium and large firms are defined for people employed in firms with more than 5 workers or workers in the public sector. Self-employed workers are defined for independent workers and production cooperative members.

On the other hand, when considering the Tax Identification Number (TIN) as a formality indicator for non-salaried workers, those with a TIN registration have higher quality jobs than their peers without any TIN registration (with a JQI pre-pandemic value of 0.56 vs. 0.41, respectively). While this gap is smaller than the one for salaried workers with and without a contract, these figures show that formal jobs are also higher-quality jobs, irrespective of which indicator is used.

Table 12: Average Job Quality between 2007-2019, by formality

	Employees		Entrepreneurs and Self-employed	
	(1) Formal	(2) Informal	(3) Formal	(4) Informal
2007	0.81	0.32	0.59	0.38
2008	0.77	0.31	0.53	0.38
2009	0.80	0.35	0.56	0.39
2011	0.81	0.32	0.57	0.43
2012	0.83	0.35	0.56	0.40
2013	0.84	0.34	0.60	0.41
2014	0.82	0.30	0.55	0.40
2015	0.83	0.34	0.56	0.40
2016	0.83	0.33	0.53	0.41
2017	0.82	0.32	0.56	0.40
2018	0.84	0.30	0.58	0.40
2019	0.85	0.29	0.56	0.41

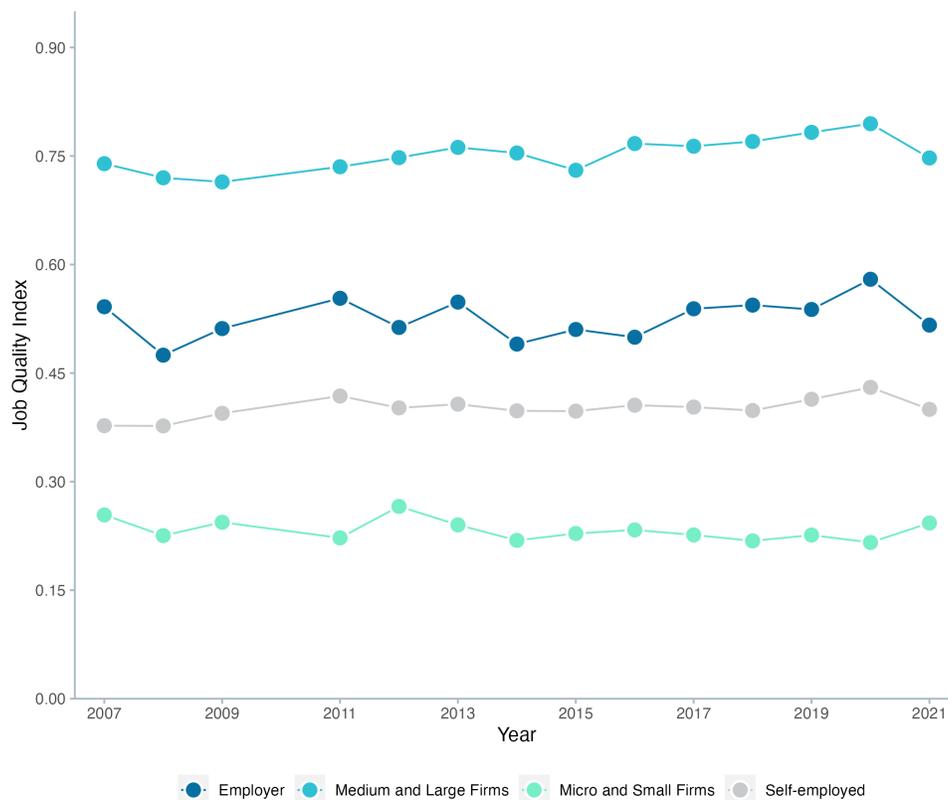
Notes: Based on data from EH 2007-2019. We define formality for employees with some written contract and employers and self-employed with a Tax Identification Number (TIN). The 2020 and 2021 values are not included as the National Household Survey for those years did not capture information on the Tax Identification Number.

5.2 Drivers of job quality

As Figure 3 illustrates, job quality has consistently been higher for workers in larger firms and employers compared to those in micro and small firms and the self-employed. However, as above-mentioned, the latter group represents approximately 70 percent of the employed population in Bolivia. The differences in job quality across these groups can be attributed to the varying shares of good jobs within each component. Table 4 (presented in section 3) provides the distribution of good jobs for each component in Bolivia from 2007 to 2021.

Examining gender disparities, Table 13 highlights the differences between men and women in the percentage of workers who satisfy each component of job quality. Unsurprisingly, men exhibit higher satisfaction rates than women in almost every component except overqualification. It is worth noting, however, that the gap in the share of good jobs is more pronounced in components related to income rather than access to the pension system (as depicted in Figure 4). These findings, in line with [Brummund et al. \(2018\)](#), suggest that the income gap between genders poses a greater challenge for equity in the labor market than access to formal jobs, which is approximated by access to social security.

Figure 3: JQI by employment structure



Notes: Own elaboration based on EH 2007-2021. The figure shows the difference in the average JQI by employment structure.

Regarding social security benefits, employees in medium-sized and large firms exhibit the highest, and almost exclusive, enrollment in the AFP (refer to Figure 5). Prior to the COVID-19 pandemic, around 70 percent of workers in these firms were registered for social security benefits, while the registration rate for other workers remained below 15 percent.

Table 13: Gender Gaps in Components of the Job Quality, 2007-2021 (differences in percentage points)

	Job Quality Components						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Social security benefits	Minimum wage compliance	Low incidence of child labor	Low incidence of relative underpayment	Low incidence of compensatory moonlighting	Tenure	Low incidence of overqualification
2007	4.27	19.20	14.88	19.84	16.52	4.84	-3.73
2008	3.62	21.87	16.41	21.81	17.44	2.83	-7.34
2009	3.73	19.60	14.86	22.31	18.32	0.45	-7.28
2011	4.87	22.56	16.79	23.10	20.78	-0.57	-7.15
2012	3.09	19.58	17.41	17.16	17.29	1.25	-4.63
2013	4.23	20.53	16.67	19.38	18.43	-0.09	-4.34
2014	2.19	20.82	20.67	20.36	19.14	0.81	-5.15
2015	3.78	20.46	20.81	18.29	19.79	1.88	-1.76
2016	2.72	20.49	19.18	19.45	22.76	-0.82	-5.67
2017	2.82	19.49	22.33	18.53	21.32	0.35	-6.27
2018	2.93	18.04	19.39	18.82	21.74	0.46	-6.55
2019	4.85	21.11	20.93	19.00	22.87	0.76	0.58
2020	2.84	18.19	22.17	19.97	18.84	1.95	-4.90
2021	0.53	19.69	19.51	17.56	21.55	2.02	-1.84

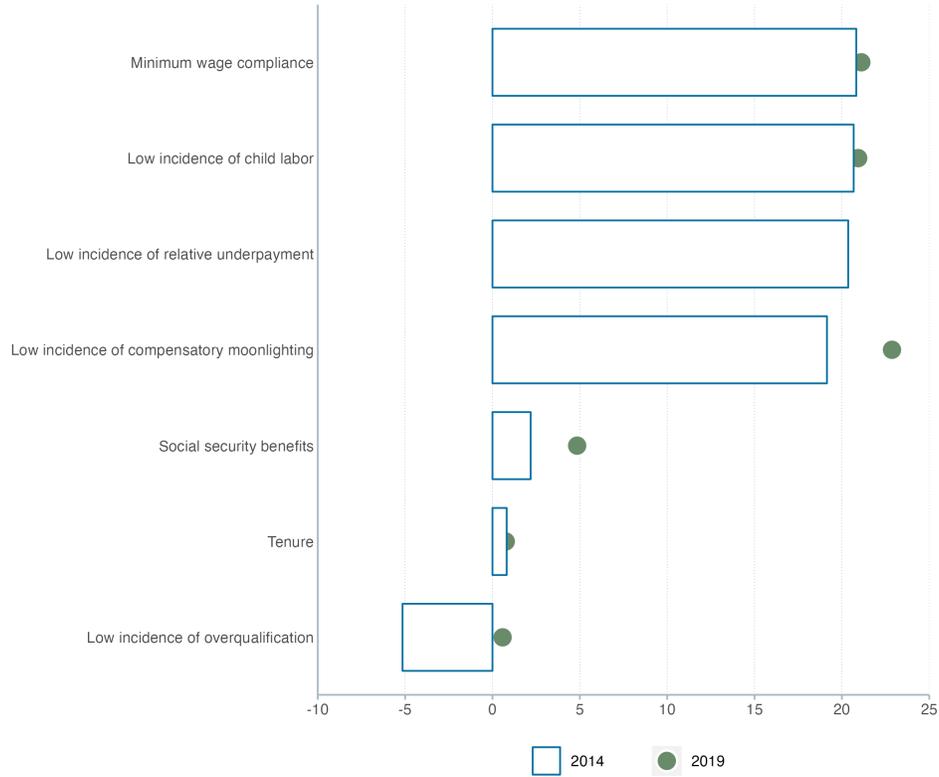
Notes: Based on data from EH 2007-2021.

This likely explains the significant variance (and weight) assigned to this component in the Principal Component Analysis. Furthermore, it is important to acknowledge that strict labor regulations limit the creation of formal jobs that provide access to the AFP. Only 5.6 percent of the country's unemployed population (including the unemployed and low-income self-employed) secure formal sector employment in a given quarter. Combined with over two-thirds of the population being self-employed or employed in micro and small enterprises, this has contributed to low levels of access to social security, ultimately impacting job quality. Moreover, these figures highlight the ongoing fragility of establishing a safety net for the future elderly population.

It is critical to note that the decline in job quality observed between 2013 and 2014 was primarily driven by a decrease in the share of workers with social security benefits and compliance with the minimum wage, as evident in Columns (1) and (2) of Table 4. Furthermore, the deterioration in access to social security predominantly occurred in the mining sector, with the share of jobs with access to social security decreasing from 63 percent to 40 percent between 2013 and 2014. Other sectors, such as financial and enterprise services, utilities, and public administration, also experienced a reduction in access to social security.²⁵

²⁵For these cases, access to social security benefits declined by 10 p.p., 9 p.p. and 8 p.p. in the financial and enterprise services, utilities and public administration sectors, respectively.

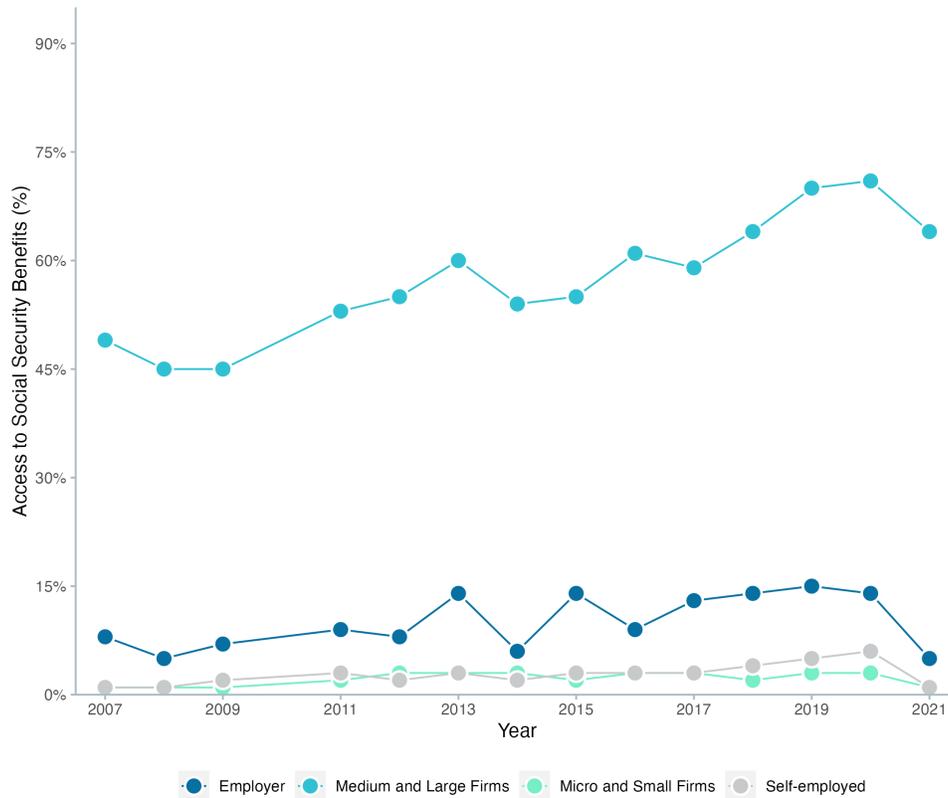
Figure 4: Gender Gaps in the Components of Job Quality, 2014-2019 (differences in percentage points)



Notes: Own elaboration based on EH 2011-2019. The figure shows the difference in percentage points across the seven components of the JQI by gender in 2014 and 2019

In terms of the job-wage linkage dimension, our analysis reveals a higher prevalence of workers with salaries lower than their counterparts among employees in micro and small enterprises (MSE) (refer to Figure 6a). Furthermore, this rate of relative underpayment, which refers to workers in the lowest 30 percent of the wage scale compared to workers with similar characteristics, is more pronounced among MSE employees compared to the self-employed. This trend particularly affects workers in the agriculture sector, as depicted in Figure 6b. This observation may indicate, among other factors, the underlying reasons behind the shifts observed in the composition of the labor market since 2014, specifically the increase in the share of self-employed workers relative to the employed population. Additionally, our estimation of compensatory moonlighting demonstrates a higher incidence among MSE workers. However, this becomes more evident when disaggregating the analysis by gender, highlighting evidence of the wage gap between men and women. For instance, as illustrated in Figure 7.G, women are more likely to engage in moonlighting, even when their primary job is already full-time.

Figure 5: Access to social security benefits, by employment structure (2007-2021)



Notes: Own elaboration based on EH 2007-2021. The figure shows the percentage of workers with access to social security benefits (proxied by enrollment the pension system) between 2007 and 2021 by employment structure.

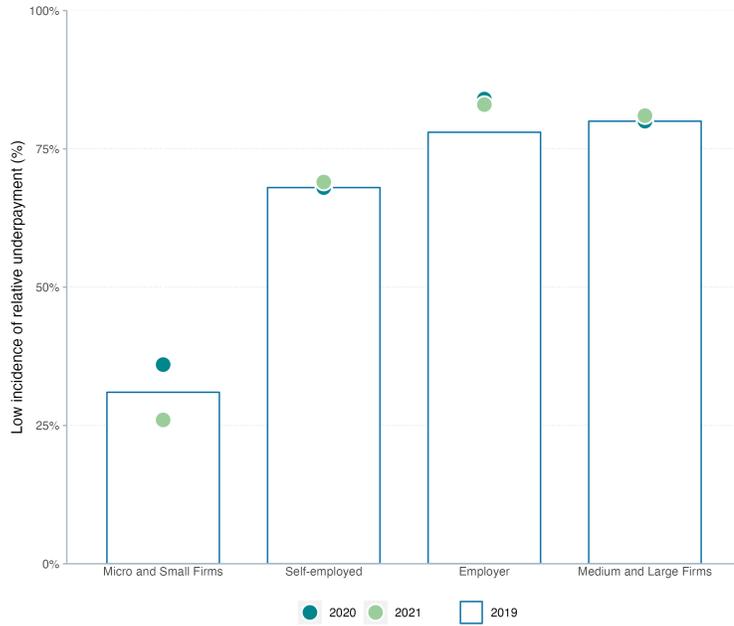
While slightly greater for employers, job stability is a more homogeneous component across occupations. Nonetheless, a closer analysis of formal and informal²⁶ salaried workers based on 2019 data reveals a nearly 20 percent-point gap between the two groups, which has also widened over time.²⁷

²⁶We define formality as the availability of a written contract.

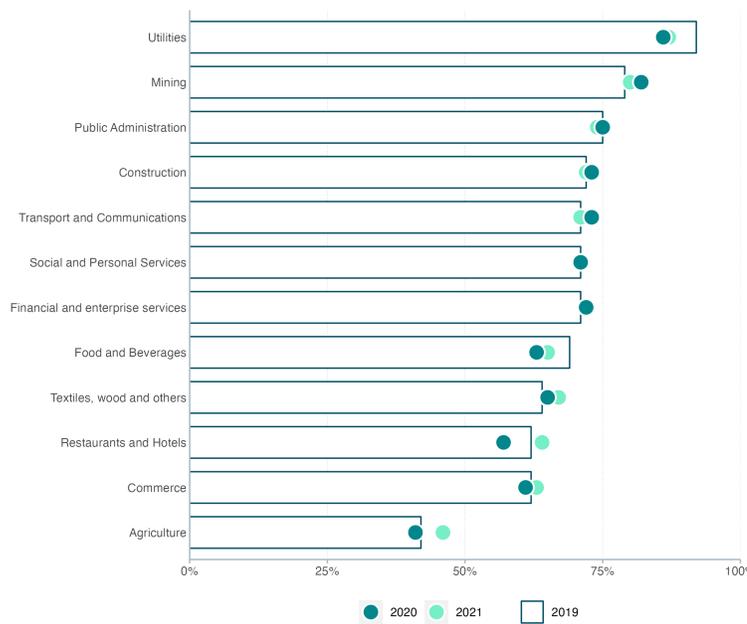
²⁷Where employees are not paid employees, the job stability gap in 2018 hit 10 percentage points.

Figure 6: Low incidence of relative underpayment

(a) Low incidence of relative underpayment, by type of employment (2019, 2020 and 2021)

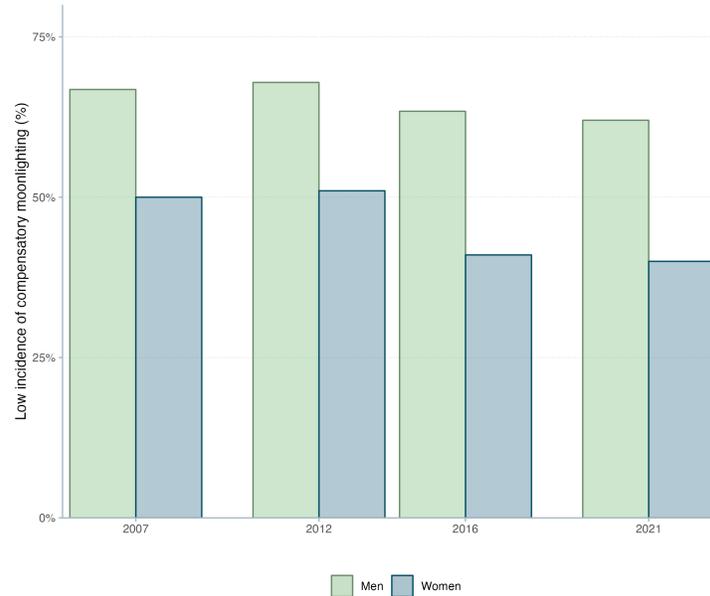


(b) Low incidence of relative underpayment, by economic sector (2019, 2020 and 2021)



Notes: Own elaboration based on EH 2019-2021. Figure (a) shows the incidence of relative underpayment by employment structure from 2019 to 2021. Figure (b) shows the incidence of relative underpayment across a classification of 12 economic sectors from 2019 to 2021.

Figure 7: Low incidence of compensatory moonlighting, by gender



Notes: Own elaboration based on EH 2007-2021. The figure shows the percentage of workers with low incidence of compensatory moonlighting by gender across different years.

5.3 Inequality of the quality of jobs

Finally, this section examines Bolivia's inequality of the Job Quality Index (JQI). Table 14 presents the evolution of inequality measures since 2007. Column (1) displays the P75/P25 ratio, which consistently demonstrates a common trend over the years. However, the inequality between these two percentiles is higher, indicating the existence of a greater degree of inequality in job quality within Bolivia's labor market. The ratio reached its highest value in 2020 during the pandemic, increasing by 0.07 points compared to its pre-pandemic level in 2019, highlighting the impact of the COVID-19 crisis on employees' job quality. However, by 2021, the inequality had decreased to levels similar to those reported in 2007.

Table 14: P75/P25 ratio and Gini Index for the quality of jobs

	(1)	(2)
	P75/P25	Gini
2007	3.42	0.38
2008	3.33	0.39
2009	3.22	0.37
2011	3.21	0.36
2012	3.25	0.36
2013	3.23	0.37
2014	3.27	0.38
2015	3.16	0.36
2016	3.27	0.37
2017	3.38	0.38
2018	3.28	0.38
2019	3.47	0.38
2020	3.54	0.38
2021	3.40	0.37

Notes: Based on data from EH 2007-2021.

Another inequality indicator that we consider is the Gini Index, a commonly used measure to analyze income inequality across the population. This indicator has remained relatively stable since 2007, consistently hovering around 0.38. Even during the pandemic, the inequality in job quality, as measured by the Gini Index, remained at levels similar to those reported since 2017. However, in 2021, the Gini index decreased by 0.01 point, indicating a slight improvement in reducing job quality inequality (evidenced as well by the P75/P25 ratio). By analyzing these two inequality indicators, it becomes evident that not all jobs offer the same labor conditions, and they are far from all workers. Despite the expectation that inequality would be greater given the average values reported over the years, the Gini Index did not indicate a high level of inequality. Nonetheless, it is clear that labor conditions still fall short of guaranteeing good quality jobs for all workers.

6 Conclusion

In this paper, we assess the quality of jobs in the Bolivian labor market. Given the unique characteristics of this market, distinguished by high employment rates due to the sizable informal sector and sectoral heterogeneity, coupled with labor legislation that aims to protect and ensure good jobs for all employees, the outcomes are expected to be varied.

The evaluation was conducted through the construction of an index ranging from 0 to 1, where a lower value indicates poorer job quality, while a higher value reflects a better situation. We develop this index using Principal Component Analysis, incorporating relevant labor dimensions based on their significance and legal regulations. Seven components were selected, including commonly analyzed factors such as contracts, benefits, earnings/wages, and working hours, as well as additional factors like child labor and overqualification.

The index, calculated over a considerable period from 2007 to 2021, reveals that job quality in Bolivia falls below desirable levels. The calculated value hovers around 0.46 throughout the years, including the post-pandemic period, suggesting that the crisis did not significantly impact job quality despite the implementation of numerous restrictions. Nevertheless, the index shows high heterogeneity in job quality across various groups. For instance, men tend to have better jobs than women, with a persistent gender gap over time. Additionally, jobs with higher quality are primarily concentrated in urban areas. However, the guarantee of equal job quality for all workers is contingent on other demographic characteristics. Notably, youth and elderly workers experience job quality below the national average.

Job quality also varies across employment sectors and structures. The agriculture sector consistently exhibits the lowest quality, while the public sector and the electricity, gas, and water sectors offer higher-quality positions, surpassing the national average. In terms of employment structure, small firms generally provide lower job quality compared to medium and large firms. Interestingly, self-employed workers report job quality above the national average. Regional disparities in job quality were also evident, with Santa Cruz exhibiting the highest quality among the main regions, surpassing La Paz and Cochabamba, despite similar employment rates. Conversely, Potosi and Chuquisaca have the lowest Job Quality Index values.

In light of these findings, it is clear that Bolivia faces challenges in achieving high

job quality, with significant heterogeneity among demographic groups. Moreover, these disparities extend to the individual components of the Job Quality Index. For instance, men exhibit nearly a 20-point advantage over women in the satisfaction of the minimum wage compliance component, suggesting that women do not receive the legal minimum wage as consistently as a reward for their work.

Therefore, this study provides an initial snapshot that can inform the development of a policy agenda to enhance job quality and ensure a more equitable distribution. This can be achieved through two primary approaches: First, addressing dimensions that perform better relative to others by implementing policies to extend coverage and make them nearly universal. Second, improving dimensions in which satisfaction is relatively low, such as enhancing access to and enrollment in social security, as these components exhibit lower levels of satisfaction among employees. Such improvements would benefit labor outcomes and positively impact other aspects of people's lives.

Future avenues of investigation could expand the analysis to incorporate additional dimensions to further refine the understanding of job quality. Similarly, it would be important to understand in more detail the mechanisms by which the particular labor regulations in Bolivia impact job quality and its evolution over time, and in different periods of the economic cycle.

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