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The Gender Inequality in The Peruvian Labor Market, 2004-2021

Ángel Renato Meneses Crispín[1], Mg. Alberto Rojas Balletta[2], Juan Carlos Ocampo Risco[3], José Luis León Untiveros[4], Mg. William Moises Cruzado Pérez[5], Mg. Omar Cosme Silva[6]

Abstract

The objective of the research is to describe gender inequality in the Peruvian labor market, 2004-2021, identifying the main factors that trigger this problem. The metho-dology applied is documentary type because different articles, works and research reports are collected. For this purpose, a descriptive and comparative analysis was carried out by gender of the following aspects: economically active population, activity rate employ-ment, economically active employed population, labor income, gender wage gap, emplo-yed population in the secondary sector, underemployment, salaried employment and une-mployment. Despite the advances in gender equality, a constant and wide gap remains between men and women in the labor market. Likewise, the results found show that most of the labor market variables by gender have a positive impact and are statistically signifi-cant on the human development index, the estimates would be affected by other gender inequalities that exist in the labor market such as discrimination, stereotypes, among ot-hers.

Keywords: *Inequality, Gender, Labor, Gap, Market.Jel: E24, I28, J08.*

Introduction

This research aims to analyze the main factors that do not allow gender equality between men and women in the Peruvian labor market; this inequality generates an opportunity gap and has an impact on human development.

According to Vaca (2019), in Latin America and the Caribbean, women at work are characterized by: a greater overload of unpaid work, lower labor participation and higher rates of underemployment, concentration in economic sectors and occupations with lower productivity, lower income levels, vertical segregation, among others. Indeed, Cebrián and Moreno (2018) point out that, "precarious employment, occupational segregation and concentration in certain branches of activity are characteristics of part of female employment. Furthermore, their participation in jobs with higher salaries is lower than that of men" (p. 47). In this sense, the existence of discrimination and difficulty in accessing certain jobs is observed.

For this reason, access to better paid positions retains women because cultural, social, etc. obstacles continue to exist and prevent equality at work between men and women (Cebrián and Moreno, 2018).

There are several investigations related to the problem of gender inequality in the labor market, different theories of economics have identified possible causes that point to inequality in the labor market. According to Rojo and Tumini (2008):

The neoclassical theory that assumes labor markets that function efficiently, entrepreneurs that maximize profits and workers that optimize their labor income establishes that the determination of wages is a function of the marginal productivity of labor. From this perspective, the differences in the labor supply of men and women (individual skills and preferences) would be the only justification for both the gender wage gaps and the different patterns of labor insertion that men and women present. (p. 55)

[1] Universidad Privada del Norte, Email: angel.meneses@upn.edu.pe, https://orcid.org/0000-0002-4496-9003.
[2] Universidad Privada del Norte, Email: Alberto.rojas@upn.edu.pe, https://orcid.org/0000-0001-8543-5748.
[3] Universidad Privada del Norte, Email: juan.ocampo@upn.edu.pe, https://orcid.org/0000-0003-0851-7488.
[4] Universidad Peruana del Centro, Email: jl.leon@upecen.edu.pe, https://orcid.org/0000-0002-2923-9168.
[5] Universidad Privada del Norte, Email: william.cruzado@upn.edu.pe, https://orcid.org/0000-0003-2881-5909
[6] Universidad Privada del Norte, Email: omar.cosme@upn.edu.pe, https://orcid.org/0000-0002-5772-9236

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On the other hand, the theory of human capital proposes another approach regarding labor inequality between women and men. According to Rojo and Tumini (2008):

The theory of human capital postulates the existence of a direct relationship between labor income and job skills acquired through formal education, training, experience, etc. In the case of women, the greater burden of parenting and family care responsibilities would limit their possibilities of accumulating human capital, limiting the productivity of their paid work and, therefore, their salaries. (p. 55)

The theory of segmented or dual markets refers to situations where groups of workers with comparable characteristics are compartmentalized and isolated (segregated) into main and secondary segments within the company's occupational structure. The needs derived from the use of technology and greater job training give rise to a main segment that, as it requires stable workers, offers better working conditions (higher salaries) to retain workers. (pp. 55-56)

Therefore, neoclassical theory, human capital theory and the theory of segmented markets provide important elements to examine the inequality that exists in the labor market between women and men. Figure 1 shows the main problems that exist and prevent gender equality between men and women.

Figure 1. Structural Nodes to Achieve Gender Equality in Latin America and the Caribbean.

Economic inequality and persistence of poverty within the framework of exclusive growth.	Patriarchal, discriminatory and violent cultural patterns and predominance of the culture of privilege.
Social division of labor and unjust social organization of care.	Concentration of power and hierarchical relations in the public sphere.
Structural nodes to achieve gender equality.	

Note. Adapted from "Indicators that make gender gaps visible in the labor market", Source: Va-ca (2019). Prepared: ECLAC Seminar - Government of Norway.

The sexual division of labor and unjust social organization of care in a society refers to the social distribution of tasks taking into consideration biological sex, following the established gender roles that are considered for each sex. This fact translates into inequality that affects the access, insertion and continuation of the female sex in the labor market. This inequality is also shown in the unequal distribution of resources, time and responsibilities between men and women, causing obstacles to better levels of income and wealth on the part of the female gender. This division causes a devaluation of the work that women usually do, domestic and care work, which is transferred to the public and work space, which is why women tend to occupy more precarious jobs with lower remuneration.

Acosta (2011) in his work "Role and behavior of the human development index in Ecuador: 2009-2010". It demonstrates that the Human Development Index (HDI) not only encompasses the concept of Human Development in economic terms but also relates to the role of people and the general vision of the situation of a country. The author mentions that the HDI plays an important role at both the national and regional levels, in addition, one of the objectives that influence the HDI is to promote gender equality and the autonomy of women, this would help raise one of the dimensions that make up Human Development, reducing gender inequality gaps in income.

Likewise, Ordoñez (2014) in his article "Human development and well-being, proposal for a complementary indicator to the Human Development Index in Mexico" proposes an indicator that manifests the direct relationship that exists between human development, poverty, inequality and social coverage that the State provides to its citizens, with the objective of empirically verifying their statistical relationship. In addition, it expanded the understanding of the dimensions that must be considered to encourage human development and consider public attention as social policy.

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On the other hand, Herrera (2020) in her work on "Gender gap and human development in the regions of Peru: 2005-2017", used an econometric panel data model to explain the effect of the level of the gender gap on the human development in the regions of Peru. The results found show that the labor gender gap generates a negative effect and is not statistically significant on the HDI in the regions of Peru.

Ribas (2004) in his research article "Gender inequalities in the labor market: a current problem". He argued that one of the features or factors that has influenced the perpetuation of the division of tasks between men and women has been the very conception of promoting gender equality in the labor market, it is necessary that policies focus as much in promoting employment and equality, as well as in reconciling family and work life.

Likewise, Pérez (2018) in his article "Job insertion of young people and gender inequalities in recent Argentina." Using quantitative data from the Permanent Household Survey (2003-2014) and the National Youth Survey of INDEC (2014), he maintained that the presence of lower rates of labor participation and employment for women is due to following the social norm and not To make a rational choice, women work a double shift (productive and reproductive work).

For the Peruvian case, according to Lévano et al. (2017) in their article "Public spending and its relationship with the gender inequality index in Peru, in the periods 2006-2010 and 2011-2015", demonstrates that public spending has contributed to the increase in proportion of adult women who have completed at least secondary school, rising 1.6 percentage points, from 31.22% in the period of President Alan García to 32.82% in the period of President Ollanta Humala. Furthermore, the percentage of women participating in the labor market was 65% in the government of President Alan García, while in the government period of President Ollanta Humala it was 64%, that is, the gender gap in this appearance has increased. Coinciding with the report of the United Nations Development Program (UNDP, 2014), which points out that "levels of income inequality continue to increase, and inequality in education continues to be the highest."

González (2021) mentions that the law (gender equality policy) is fundamental for the female Economically Active Employed Population (PEAO), with a positive impact due to having a higher coefficient than the level of education, which is why the main Priority is in the law, followed by the educational level (population with at least secondary level) and finally economic income.

In Peru, the wage gap between men and women has made significant progress, according to the National Institute of Statistics and Informatics (INEI). In 2018, women earned an average of 29.6% less than men, where one of the main causes It was because women work fewer hours to dedicate themselves to their families (INEI, 2019). In that sense, a constant wage gap that continues for decades is still observed.

This situation for Loayza (2021) is also explained because men are the ones who have a greater impact on strategic management jobs, compared to women who, most of them only attend to and obey the requirements of men according to the pyramid organization in which they are located.

In this context, this article aims to describe gender inequality in the Peruvian labor market 2004-2021, identifying the main factors that trigger this problem to be addressed.

Methodology

This research work presents an explanatory level because the relationship between the dependent variable and the independent variables will be analyzed. It also presents a non-experimental design because the variables were not manipulated.

The population and sample are made up of all the statistical information regarding the study variables for the annual series from 2004 to 2021 in Peru. The time series have been constructed based on information

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collected from the INEI and constructed by the Socio-Economic Labor Research Directorate (DISEL) of the Ministry of Labor and Employment Promotion.

As a first step, a data collection was carried out from the statistical reports, mainly annual historical series, on the official website of the Ministry of Labor and Employment Promotion, in addition to the Regional Information System for Decision-Making website. The collected information was then processed and classified for the purpose of descriptive and inferential statistical analysis to prepare graphs and tables on each of the variables under study. The evolution of gender inequality in the labor market was described and analyzed based on the variables: unemployment, underemployment, salary differences, among others; and the HDI. Finally, the econometric analysis was carried out and the relevant tests were used such as the multicollinearity test, the autocorrelation test and the heteroscedasticity and normality test.

The following mathematical model was proposed using Stata software:

$$\boldsymbol{LIDH = \beta_0 + \beta_1\, LBRECHSA + \beta_2 VOCUSEC + \beta_3\, MOCUSEC + \beta_4 LEVN + \beta_5\, LPAE + u} \quad (1)$$

Where:

LIDH: logarithm of the human development index

LBRECHSA: logarithm of the wage gap between men and women

VOCUSEC: Percentage of men employed in the secondary sector

MOCUSEC: Percentage of women employed within the secondary sector

LEVN: logarithm of life expectancy at birth

LPAE: logarithm of the average years of school

Results

Economically active population (EAP)

According to the INEI (2017), the economically active population can be defined as follows:

It is the supply of labor in the labor market and is made up of the group of people, who, having the established minimum age (14 years in the case of Peru), offer the available labor for the production of goods and services. /or services during a given reference period. Therefore, people are considered economically active if they contribute or are available for the production of goods and services. The EAP includes people who during the reference period were working (employed) or actively looking for a job (unemployed). (p147)

Figure 2. Peru: Economically Active Population By Gender, 2004-2021 (In Thousands Of People)

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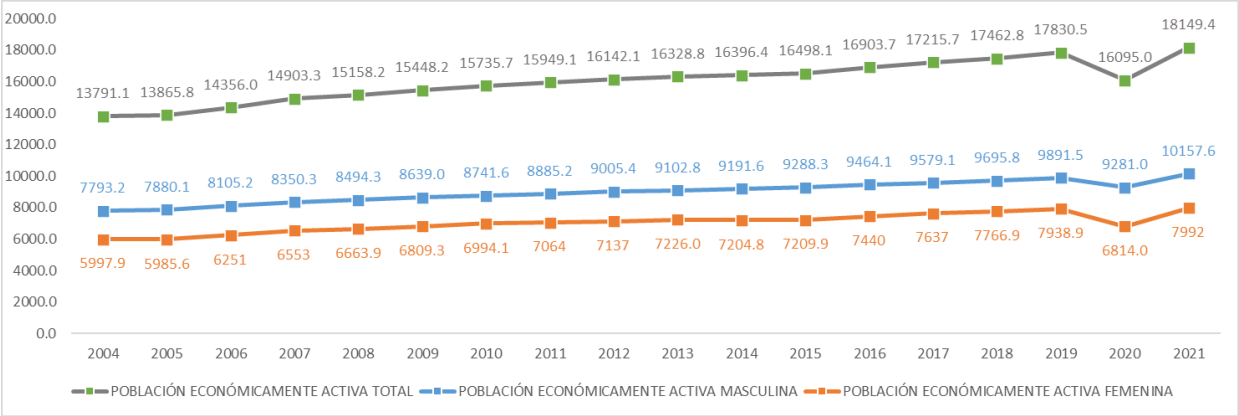

Note. The figure shows the figures of the economically active population in Peru, 2004-2021. Source: INEI (2021). Own elaboration.

From figure 2 we can see the evolution of the EAP that goes from 2004 to 2021. We note that there is a gap between the male and female EAP, at the beginning of 2004 the male EAP was 7,793.2 and for women it was 5,997.8; This means that of the total EAP, 56.51% and 44.49% represent the male and female population respectively. As the years go by, we notice that even so, the male EAP has been increasing and likewise the female EAP, but there is still a gap that remains throughout the years between 2004 and 2021. This existing gap is one of the reasons why It is due to the fact that the female population is not fully integrated into the labor market despite being of working age, often due to the sexist ideology that has existed in the country for years and that is still maintained despite the evident advances. that have not been noted in the figures of other indicators such as the labor participation rate. In 2020, both amounts decreased due to massive deaths from covid-19. In 2021, both amounts were recovered, due to the vaccination against Covid-19 of the population at the beginning of that year. The figure shows us that there are still problems that must be improved to achieve an increase in the percentage of the economically active female population in Peru.

Activity Or Labor Participation Rate

"The activity rate is the quotient of the Economically Active Population (population employed or looking for work) divided by the Working Age Population (14 years and older)" (INEI, 2020, p. 43)

$$\boldsymbol{S = \frac{PEA}{PET}} \qquad (2)$$

Talking about the labor activity rate in gender comparison makes us take a look at the past, at the situation of women. It should be noted that the participation of women in the labor market is a constant situation, women have always worked, but these forms of work have been different from the current ones, added to the volume of it, currently the form of work has evolved female. If we compare the situation in the period 1900-2010, the female labor participation rate was increasing in Latin America, going from 22.30% to 48%; this improvement situation has increased further in recent years (Maubrigades, 2018). . This successive progress is also reflected in the country.

Figure 3. Perú: Male And Female Activity Rate, At The National Level, 2004-2021 (Percentage)

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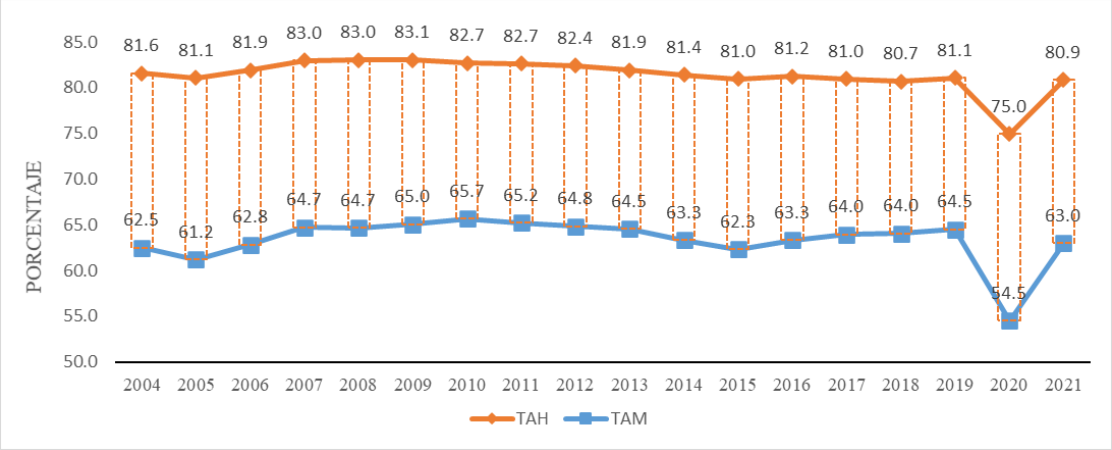

Note. The figure shows the figures in percentage of the progress in the activity rate by gender, 2004-2021. Source: INEI (2021). Own elaboration.

From figure 3 we can observe this evolution and variations in the male and female labor activity rate that goes from 2004 to 2021, at the beginning of 2004 the male activity rate rose to 81.6%, and the female activity rate 62.5%, There is a gap of 19.1 percentage points that favors men, in subsequent years this gap has been reduced, but passively, one of the largest reductions in this gap occurs in 2010 where it reaches 17 %. In 2021, the male activity rate fell to 80.9%, and the female activity rate dropped to 63%, leaving a gap of 17.9 percentage points that favors men.

Employed Economically Active Population

"The employed population is the set of all people who, having the specified minimum age, 14 and over, during the reference period, were doing some work" (13th International Conference of Labor Statisticians (ICLS) cited by INEI, 2020, p. 49). This work may be subject to a salary or salary, also a monetary income; also in the case of being independent where there is a family benefit or gain. In Peru it is considered that the notion of work must be interpreted by at least one hour of work in the reference period (INEI, 2020).

In order to determine when a person is employed, the following criteria are followed: (i) Employed persons are people 14 years of age and older who were participating in some economic activity during the reference period (ii) Dependent workers, who, having a permanent job, did not work the previous week because they were on vacation. , strike, sick leave, pre- and post-natal leave, etc., all of them paid (iii) Self-employed workers, who were temporarily absent from work during the reference period; but, the company or business continued to operate and (iv) People who were not in any of the previous conditions are asked if they carried out any economic activity in the reference period, at least one hour, for which they will receive payment in money and/or kind. (INEI, 2020, p. 49)

Following the previous criteria we can analyze the reality of this employed population, but in comparison by gender and be able to see the progress or setback in the reduction of inequality in the labor market.

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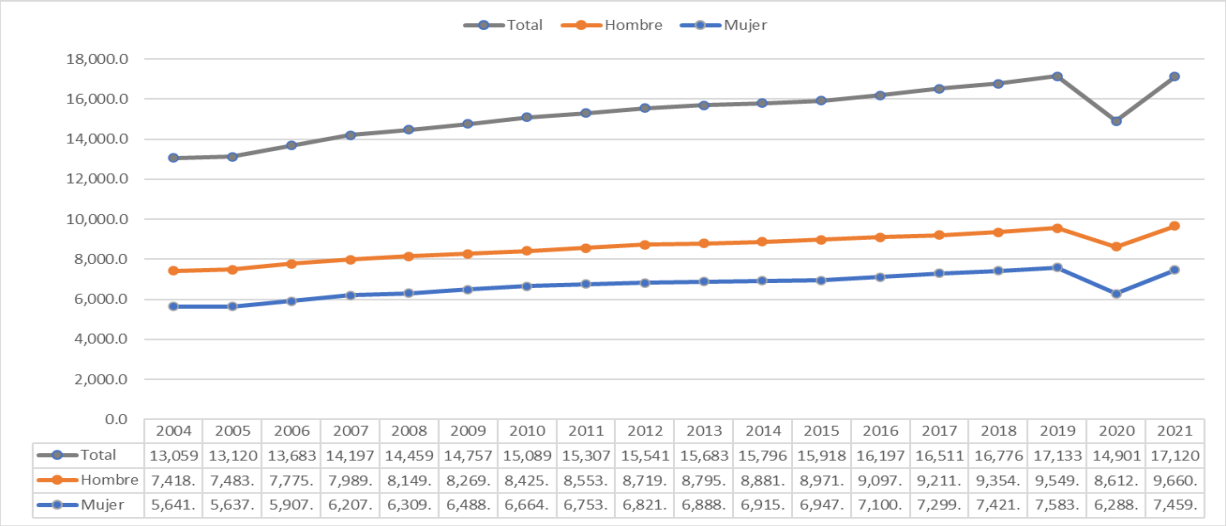
Figure 4. Peru: Economically Active Employed Population by Gender, 2004 - 2021 (Thousands of People)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total	13,059	13,120	13,683	14,197	14,459	14,757	15,089	15,307	15,541	15,683	15,796	15,918	16,197	16,511	16,776	17,133	14,901	17,120
Hombre	7,418.	7,483.	7,775.	7,989.	8,149.	8,269.	8,425.	8,553.	8,719.	8,795.	8,881.	8,971.	9,097.	9,211.	9,354.	9,549.	8,612.	9,660.
Mujer	5,641.	5,637.	5,907.	6,207.	6,309.	6,488.	6,664.	6,753.	6,821.	6,888.	6,915.	6,947.	7,100.	7,299.	7,421.	7,583.	6,288.	7,459.

Note. The figure is prepared based on the document "Peru: Evolution of Employment and Income Indicators by Department, 2007-2021". Source: INEI (2022). Own elaboration.

The situation between men and women belonging to the employed EAP in the period 2004-2021 shows a significant growth in female labor participation among women (1.09%), at a slightly lower rate than that of men (1.12%). (INEI, 2020).

Of the total employed population in 2021, women represent 7 million 459 thousand 200, which is equivalent to 44.6% of the total employed, compared to 6 million 288 thousand 800 registered the previous year, equivalent to 44.2%, meanwhile, the male employed population went from having 9 million 418 thousand 100, equivalent to 56.4% of the total employed in 2004, to having 9 million 660.9 thousand 900 in 2021, representing 9660.7% of the total employed (INEI, 2022). This means that the gap between the employed male and female EAP has been slightly reduced, due to the empowerment of women in the labor market, thus reducing this existing gap.

Secondary Sector

It is the sector of the economy related to industry, that is, manufacturing. It represents 19.8% of the country's Gross Domestic Product for the year 2021. Figure 5 shows that in 2004 the percentage of men employed in the secondary sector was 17.5% compared to 8.4% of women occupied, that is, there was a gap of 9.1%. For the year 2021, the percentage of men employed in the secondary sector was 21.9% and the percentage of women employed in the same sector was 8.7%. For this year the gap is 13.2%, that is, the gap increased. For both men and women, the percentage of those employed in the secondary sector increased in the years after 2004. In the case of women, in 2008 it reached a peak of 10.8% and then decreased over time. In the case of men it has been increasing and decreasing, but such reduction is less than the increases.

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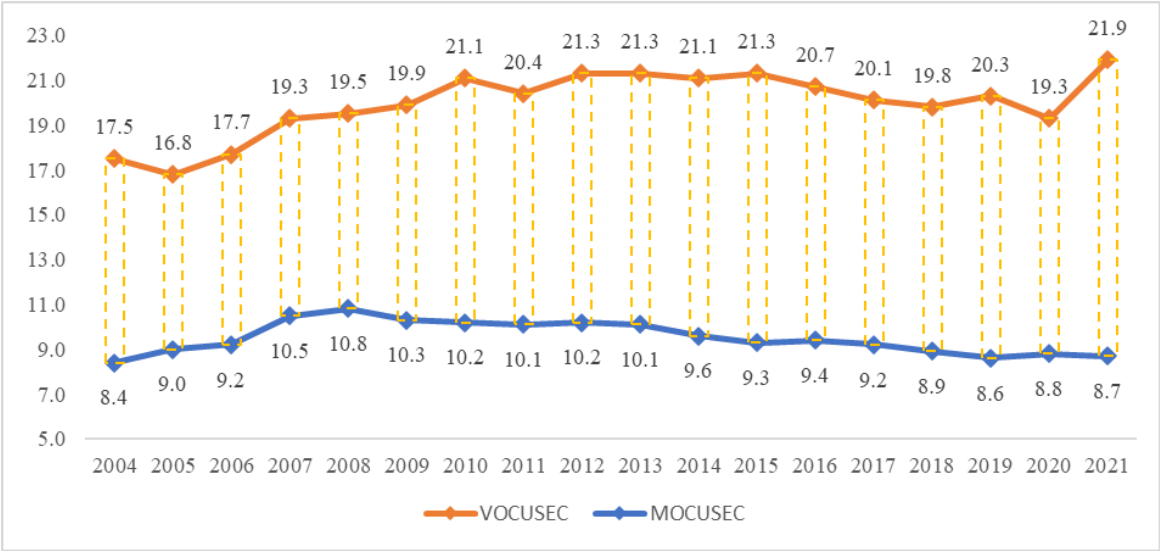
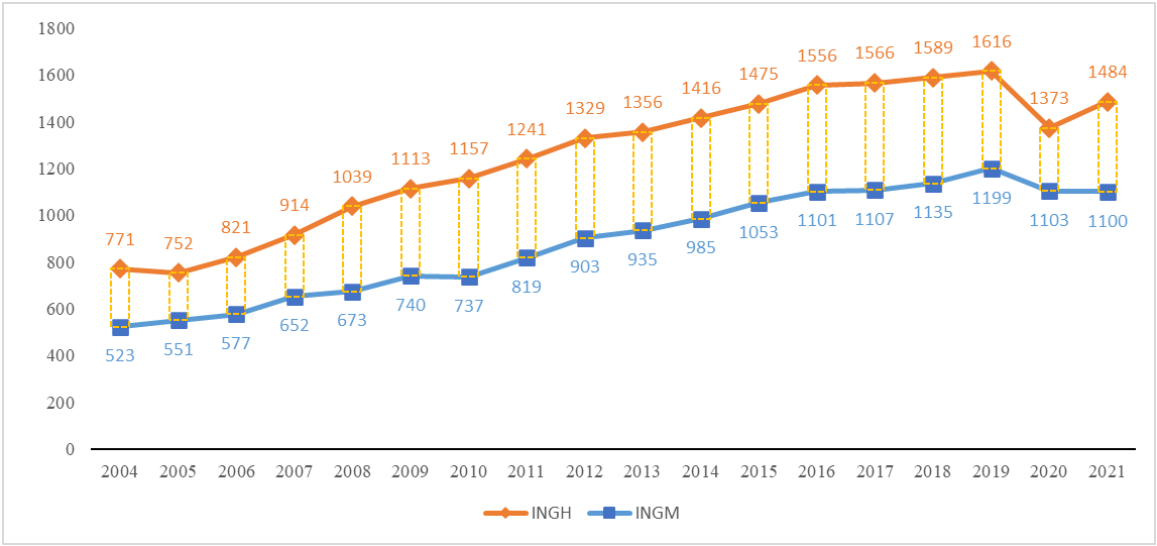
Figure 5. Perú: Percentage of Men and Women Employed Within the Secondary Sector



Note. The figure is prepared with the data obtained from the Regional Information System for decision making. Own elaboration.

Labor Income of Men and Women

Figure 6. Perú: Averague Monthly Income From Work of the Employed Male and Female Population, During 2004-2021 (in Current Soles)



Note. Data expressed in current soles. Source INEI (2022). Own elaboration.

Figure 6 shows the notable difference between the average monthly income of men compared to the income of women. In 2004 the average income of men was S/ 771 while that of women was S/ 523, having a difference of S/ 248; Over the following years, this gap has increased, reaching a salary difference of S/ 458 in 2017, but in 2020 there was a notable reduction to S/ 270 in the difference in income by sex; However, for the year 2021 the figure increased again, reaching S/ 384 of the difference in income by sex.

Several studies agree that the income gap by sex is explained by various factors, such as the difference in years of education, area of residence, ethnic self-identification, among others. But there are other stronger

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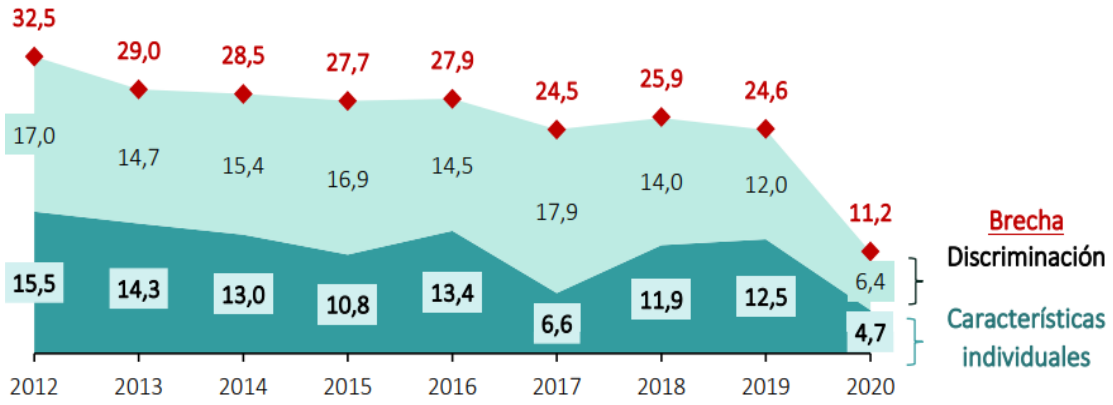
factors that largely determine this gap, which are discrimination, stereotypes, and cognitive biases (Ministry of Labor and Employment Promotion [MTPE], 2021).

Figure 7. Is Shown Below, Which Describes the Main Differences in The Wage Gap Between Men and Women in Peru.



Note. Adapted from the "Annual report on women in the labor market." Source: MTPE (2021).

In 2012, the average hourly labor income of women was 32.5% lower compared to that received by men (17% explained by discrimination and 15.5% explained by education, area of residence, among others). Then for the following years there was a slow decrease in the wage gap. But for the year 2020, the average hourly labor income of women was 11.2% lower compared to what men received (6% explained by discrimination and 4.7% explained by education, area of residence, among others).

There is increasing salary equality between men and women, however, promotions for women in the different jobs in which they are employed continue to be difficult unlike their peers (Loayza, 2021). In the Peruvian case, according to MTPE "In 2018, only 0.1% of employed women belonged to managerial, administrative and civil servant positions" (MTPE, 2021, as cited in Loayza, 2021, p. 39).

Gender Pay Gap

According to UN WOMEN "The gender pay gap is the percentage resulting from dividing two quantities: the difference between the salary of men and women, divided by the salary of men" (UN WOMEN, sf).

Given this definition, the gender wage gap has been obtained with the following formula:

$$BRECHASA = \frac{INGH - INGM}{INGH} \qquad (3)$$

Where:

BRECHASA: Gender pay gap

INGH: Average monthly income from work of the employed male population.

INGM: Average monthly income from work of the female employed population.

"If the figure is negative, it means that women would earn more," (UN WOMEN, sf)

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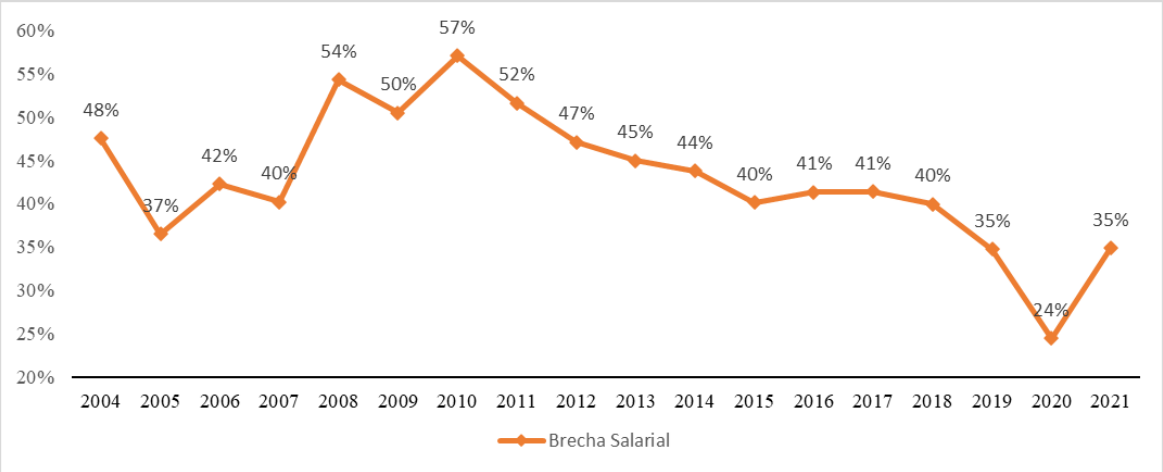
Figure 8. Perú: Wage Gap Between Men and Women, 2004-2021 (Percentage)



Note: Ther figure shows the gender wage gap in percentage, 2004 -2021. Source: MTPE. Own elaboration.

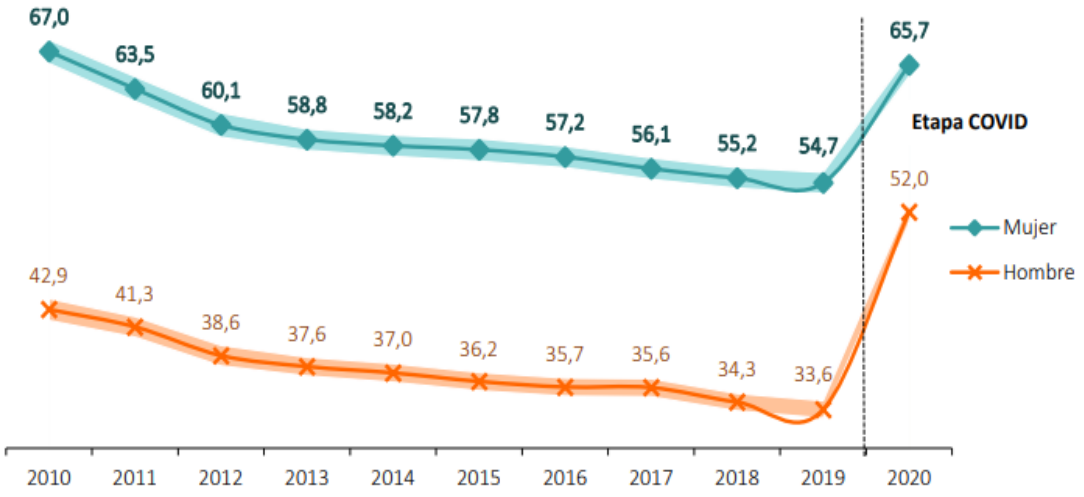
It is observed that throughout the period 2004 – 2021 the gender wage gap fell. In 2004 the gap was 32% and by 2021 it reached 26%. The highest wage gap occurred in 2010 and the lowest was in 2020 as a result of Covid-19.

Labor Underemployment of Men and Women

In Perú, one of the major problems that persist in the labor market is the problem of underemployment and that there is a large gap between the underemployment of men and the underemployment of women.

$$\boldsymbol{S = \frac{PEA\ Subempleada}{PEA}} \quad (4)$$

Figure 9. Perú: Underemployment Rate By Gender in Peru, 2010-2020 (In Percentage)



Note. Adapted from "Annual Report on Women in the Labor Market." Source: MTPE (2021).

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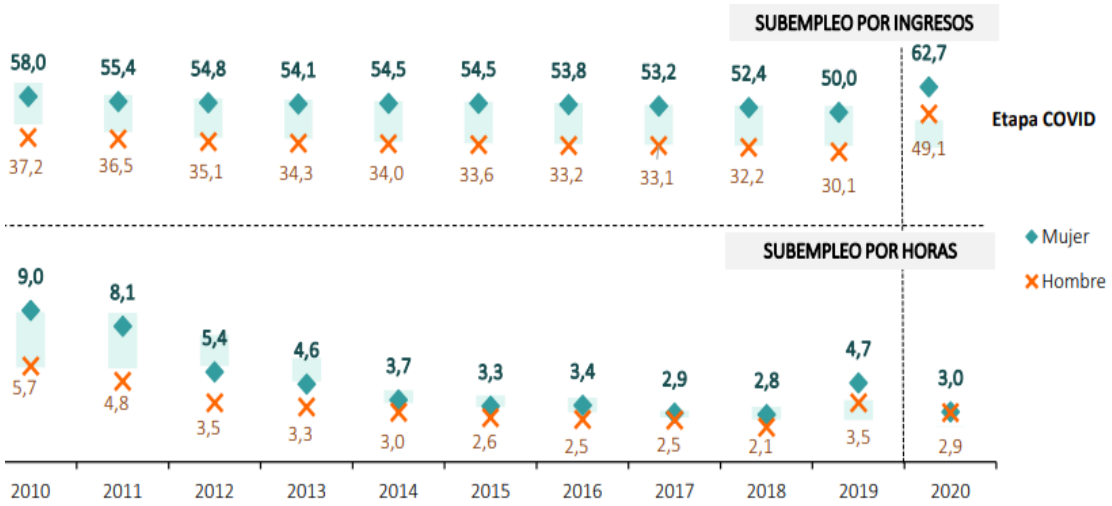
It is observed that throughout the years 2010 until 2018 there was a constant decrease in underemployment. In 2019, underemployment increased significantly, but at the same time there was a reduction in the underemployment gap between men and women.

Underemployment by gender has shown a wide gap in recent years; For the year 2020, the underemployment rate for women was 65.7%, this means that, of every 100 women who participated in the labor market, 66 were underemployed; and the underemployment rate for men was 52%, that is, of every 100 men who participated in the labor market, 52 were underemployed. This reflects that "in 2020, women have presented higher rates of underemployment, according to demographic characteristics: rural area 89.7%, age group 60 and older 81.3% and educational level up to primary school 86.2%" (MTPE, 2021, p).

Figure 10. Perú: Underemployment Rate By Hour and By Income in Peru, 2010-2020 (In Percentage)



Note. Adapted from the "Annual report on women in the labor market." Source: MTPE (2021).

In figure 10, a great difference is evident between the underemployment rate by income and the underemployment rate by hours, since the average of the rates was 54.8% and 4.6% respectively.

When evaluating underemployment by gender, it was evident that there is a wide gap in underemployment by income between men and women. "For 2020, the underemployment rate due to female income was 62.7%, increasing (4.7 p.p.) compared to 2010; and the female hourly underemployment rate was 3.0%, decreasing (-6.0 p.p.) compared to 2010" (MTPE, 2021, p. 15).

Paid Employment of Men and Women

A salaried employee is defined as "any worker who performs manual or non-manual activities, providing services to a publlic or private employer and receives remuneration for it" (MTPE, 2003, p. 15).

In Latin America, job creation increased as did female participation. However, job creation generates low growth in labor productivity. Therefore, the jobs that are created are of poor quality; and it is women who are more likely than men to work in low-productivity activities, which are distinguished by being insecure, unstable and poorly paid.

In table 1 we observe thar in Peru during the period 2007-2021, the growth rate of salaried women increased an average of 2.0% annually, while salaried men grew at average rate f 1.70% annually, being lower than the female growth rate. Comparing the year 2021 with respect to 2020, the total employed salaried population grew by 19.3%, likewise, men showed an increase of 18.8% and women 20.1%, being higher than the male salararied population. (INEI, 2022).

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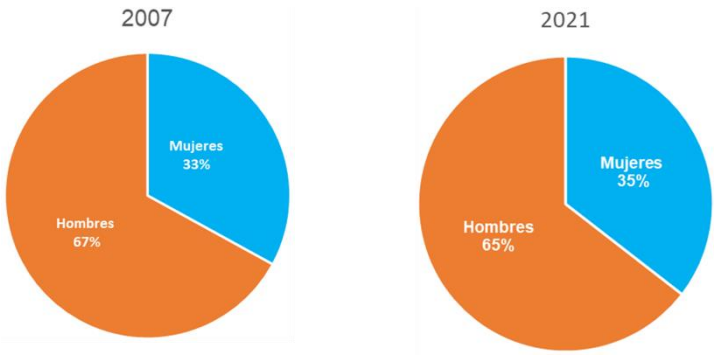
Table 1. Perú: Employed Salaried Population, By Sex, 2007, 2020 And 2021 in Peru (Thousands Of People)

Occupational category/sex	2007	2020	2021	Average Annual Growth Rate (%) 2007-2021	Percentage Variation (%)2020/2021
Total Asalariado	5 861.8	6 503.6	7 757.1	2.0	19.3
Hombres	3 928.0	4 210.4	5 004.0	1.7	18.8
Mujeres	1 933.8	2 293.2	2 753.1	2.6	20.1

Note. Adapted from "Peru: Evolution of Employment and Income Indicators by Department, 2007-2021". Source: INEI–ENAHO (2022).

In the same way, the gender structure of the employed salaried population has changed during this period, as we can see in figure 11 due to the increase in female participation, since, in 2021, 65% of salaried employees are men and 35% women, while in 2007 the participation of men was 67% and women, 33%. (INEI, 2022).

Figure 11. Perú: Composition of The Employed Salaried Population, By Sex, 2007 And 2021 (Percentage)



zNote. Adapted from "Peru: Evolution of Employment and Income Indicators by Department, 2007-2021". Source: INEI–ENAHO (2022). Own elaboration.

Labor Unemplyment of Men and Women

Obtaining a job is more difficult for a woman due to cultural patterns, which is why they find themselves in vulnerable situations where they must accept lower salaries or choose to help with household chores or unpaid family work, thus demonstrating the marked division of labor by gender with advantages towards men since these activities are not economically recognized. Unemployment generates an increase in job inactivity, therefore, it helps to continue the cycle of poverty in homes due to the lack of equity in job opportunities for both sexes.

Another important point to analyze is the transitions of employment status or unemployment rotation:

The dynamics of the labor market imply that not all unemployed people are always the same and that many of them find themselves changing status frequently. In fact, at any point in time unemployment is made up of flows that enter unemployment and flows that leave it. (INEI, 2001, p. 26)

For this reason, unemployment is changing and varies over the years, and its analysis is important to reduce poverty rates with the help of the increase in the creation of stable and well-paid jobs in the labor market.

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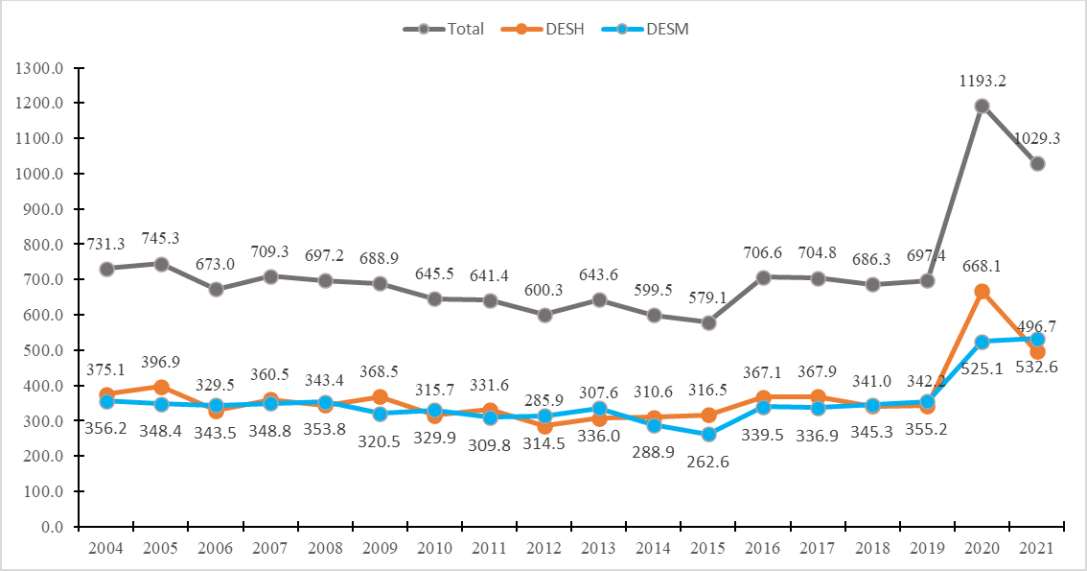
In Peru during the period 2004-2021, as we see in figure 12, the male unemployed population decreased until 2019 compared to 2004, while the female unemployed population did not show a significant variation. On the other hand, in 2020 we see a different phenomenon, due to the pandemic that broke out and caused high unemployment rates for both genders, with male unemployment being higher than female unemployment due to the paralysis of economic activities. For the year 2021, both unemployment rates were reduced, but the one that shows the greatest reduction is male unemployment.

Figure 12. Perú: Unemployed Population in Peru, By Sex, 2007-2021 (Thousands Of People)



Note. This figure shows how the number of unemployed people varies by sex. Source: INEI (2022). Own elaboration.

Inferential Analysis

Table 2. Descriptive Statistcs of the Variables, From the Period 2004 to 2019

Variable	***Obs***	***Promedio***	***Desviación Estándar***	***Varianza***	***Mínimo***	***Máximo***
IDH	*18*	*0.73*	*0.03*	*0.00*	*0.69*	*0.78*
LBRECHSA	*18*	*0.30*	*0.04*	*0.00*	*0.20*	*0.36*
VOCUSEC	*18*	*19.96*	*1.43*	*2.05*	*16.80*	*21.90*
MOCUSEC	*18*	*9.52*	*0.73*	*0.53*	*8.40*	*10.80*
EVN	*16*	*74.28*	*1.27*	*1.60*	*72.38*	*76.16*
PAE	*16*	*8.97*	*0.68*	*0.46*	*7.92*	*9.89*

Note. Data obtained from INEI (2022). Own elaboration.

The average human development index was 0.73; On the other hand, the average gender pay gap was 0.3. The average percentage of men and women employed in the secondary sector was 19.96% and 9.52% respectively.

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Econometric Analysis

In order to achieve a robust result, we analyze whether the series are stationary; if not, we proceed to seasonalize them with first or second differences.

Table 3. Stationarity Test

Variables	***Levell***	***Logarithm***	***First difference of logarithm***	***Second difference of the log-arithm***
	P-value	***P-value***	***P-value***	***P-value***
IDH	*58.84%*	*56.77%*	*2.65%*	*0.00%*
BRECHSA	*40.32%*	*33.90%*	*0.00%*	*0.00%*
VOCUSEC	*43.46%*	*42.64%*	*0.05%*	*0.00%*
MOCUSEC	*52.42%*	*50.70%*	*3.42%*	*0.00%*
Muestra	*18*	*18*	*17*	*16*

Note: The test performed is Dikecy Fuller Augmented.

H_0: The series has a unit root (it is not stationary)

H_1: The series does not have a unit root (it is stationary)

The p-value rejects H_0 if it is less than 0.05. In this case, it was preferred to use the second differences to have more robust results.

Table 4. Ordinary Least Squares (OLS) Model

Source	SS	df	MS	Number of obs	=	16
				F(5, 10)	=	225.01
Model	.001983858	5	.000396772	Prob > F	=	0.0000
Residual	.000017633	10	1.7633e-06	R-squared	=	0.9912
				Adj R-squared	=	0.9868
Total	.002001491	15	.000133433	Root MSE	=	.00133

LIDH2	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
LBRECHSA2	.0183116	.0023367	7.84	0.000	.0131051	.023518
LVOCUSEC2	.0172855	.0075903	2.28	0.046	.0003732	.0341977
LMOCUSEC2	.0366867	.007688	4.77	0.001	.0195568	.0538166
LEVN2	.7177124	.0462908	15.50	0.000	.61457	.8208549
LPAE2	.1097445	.0120042	9.14	0.000	.0829975	.1364915
_cons	.0002676	.000356	0.75	0.470	-.0005256	.0010608

Note. This table shows the regression carried out on the variables in second differences. Own elaboration.

$$\boldsymbol{LIDH = 0.03 + 1.83\ LBRECHSA + 1.73 VOCUSEC + 3.67\ MOCUSEC + 71.77 LEVN + 10.97\ LPAE}$$

The independent variables LBRECHASA2, LVOCUSSEC2, LMOCUSEC2 LEVN2 and LPAE2 positively impact the dependent variable LIDH in 0.03%, 1.83%, 1.73%, 3.67%, 71.77% and 10.97% respectively.

$$H_0: \beta_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$$

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$$H_1: \beta_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 \neq 0$$

The p-value of the parameter β_5 is < 5%, that is, it is statistically significant since we would be rejecting the null hypothesis and accepting the alternative hypothesis. However, the other parameters are not statistically significant.We proceed to analyze whether the model follows the white noise assumptions so that the parameters are unbiased and consistent.

Multicollinearity Analysis

Table 5. Variable Correlation Matrix

	LIDH2	LBRECH~2	LVOCUS~2	LMOCUS~2	LEVN2	LPAE2
LIDH2	1.0000					
LBRECHSA2	0.7384	1.0000				
LVOCUSEC2	0.7833	0.5533	1.0000			
LMOCUSEC2	-0.0761	-0.3429	-0.0040	1.0000		
LEVN2	0.7877	0.5144	0.5029	-0.3571	1.0000	
LPAE2	0.5738	0.2961	0.5501	0.2391	0.0460	1.0000

Note. This table shows the relationships between variables and between themselves. Own elaboration.

The values of the correlations (r) are small, that is, the correlation coefficients show that there is no high multicollinearity between the variables.

Autocorrelation Analysis

Table 6. Autocorrelation With the Breusch-Godfrey Test With One Lag

Lags (p)	Chi 2	degrees of freedom	Prob > chi2
1	0.245	1	0.6209

Note. It shows whether there is autocorrelation in the model with a lag. Own elaboration.

The P-value is greater than 0.05, which means that there is no autocorrelation in the model.

Analysis of Heteroskedasticity

Table 7. Heteroskedasticity, White Test

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```
White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(15)     =     16.00
         Prob > chi2  =    0.3821

Cameron & Trivedi's decomposition of IM-test
```

Source	chi2	df	p
Heteroskedasticity	16.00	15	0.3821
Skewness	7.36	5	0.1950
Kurtosis	0.35	1	0.5531
Total	23.71	21	0.3071

Note. It shows whether heteroscedasticity exists in the model. Own elaboration.

Hypothesis

H0: There is no heteroscedasticity problem; H1: If there is a problem of heteroskedasticity;

The p-value is greater than 0.05 and the null hypothesis is accepted, that is, there is no problem of heteroscedasticity.

Normality Analysis

Table 8. Shapiro-Wilk Normality Test

```
. swilk residuos

                    Shapiro-Wilk W test for normal data
```

Variable	Obs	W	V	z	Prob>z
residuos	16	0.93096	1.399	0.667	0.25247

Note. This table shows the normal or non-normal distribution of each variable. Own elaboration

Hypothesis

H_0: The distribution of the variable does not differ from a normal distribution

H_1: The distribution of the variable differs from a normal distribution

The P-value is greater than 0.05 and H_0 is accepted, that is, the data follow a normal distribution.

Conclusions

After the research carried out, it was concluded that over the years participation in the labor and economic sphere by gender has been perpetuated, differentiating the work between men and women. Despite the insertion of women into the labor market, it is identified that they do not do so under the same conditions as men, since there are still gaps in salary and participation in different sectors and occupations.

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The collection and descriptive analysis of the activity rates between men and women indicate that there is a slight improvement in this gap over the years. This improvement is reflected in the case of the female activity rate, due to the improvement of working conditions for women, leaving aside the classic jobs in which women were immersed. In turn, it is reflected in the Employed EAP since in recent years this gender labor gap has been constantly reduced, thus explaining the improvement and the entry of more women into the labor market, although there is no adequately employed job.

The empirical evidence collected has shown that there is significant progress in equality of labor income between women and men, however, there are still factors that largely determine the wage gap such as discrimination, stereotypes, among others. Promotions for women in the different jobs in which they are employed are also difficult, unlike their peers. On the other hand, underemployment in 2020, despite a gradual reduction from 2011 to 2019, has become one of the major problems for the labor market, but the difference in underemployment between women and men has shown a wide gap except for the year 2020; Likewise, a great difference was evident between the underemployment rate by income and the underemployment rate by hours.

In Peru, the inability of the salaried labor market generates independent and entrepreneurial activity as an alternative solution to the precarious situations of poor quality employment and low productivity. With what has been analyzed we see a notable increase in female participation in the recent years, but the problem of inequality remains latent, which is why they are exposed to less productive, lower paid and more risky jobs. Likewise, we observed how male unemployment was higher compared to female unemployment when the pandemic began, due to the damage to the economy due to the decrease in jobs and the paralysis of economic activities.

The gender wage gap has been gradually reduced over the years, revealing improvements in employment and wages for women, but such gaps still persist.

In the secondary sector of the economy there is a very large gap that has not been reduced over time but on the contrary has been exacerbated.

The results found show that the labor market variables by gender: such as the gender wage gap and the percentage of men and women employed in the secondary sector have a positive impact and are statistically significant on the human development index. With respect to the gender wage gap, a first review could be counterintuitive, however, the explanation could be simpler is that there are other variables that better describe the gender inequality that exists in the labor market, such as discrimination, stereotypes, among others such as the cultural factor of the country, the political context, etc.

Recommendations

To encourage the recognition of the female role in the Peruvian labor market, the Peruvian State must be encouraged to carry out inclusion programs for women who are in strata of poverty and extreme poverty. Raise awareness that both a woman and a man have the same capacity to function in different sectors and occupations, reducing the existing machismo in society by promoting inclusive and equitable education that promotes gender equality and opportunities.

Generate a public policy for the State and private companies so that when sending the curriculum vitae, gender is not evident, and that only the capabilities of the applicants are evaluated so that there is no discrimination against women. Likewise, it is recommended to incentivize companies (such as giving a bonus to improve their efficiency) that have a greater participation of women in job contracts or promotions.

Increase formal employment through the incorporation of informal companies, initially requesting low or zero tax rates from them, then begin to charge little by little, and also help formal MYPES to be more efficient so that they grow and with -try more workers; In this way underemployment could be reduced.

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Promote the entry of women into better-paid occupations with stable labor demand for the coming years; therefore, quality and inclusive education with ethical and moral values from an early age is necessary, eradicating discrimination, harassment and gender violence with the aim of having better human development.

Deepen the research carried out focusing on the gender wage gap variable, considering in turn the variables that affect it such as the discrimination factor, stereotypes, regional area and political context.

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