

Stylized facts about the gender wage gap: Evidences from a region of Peru

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ABSTRACT

An exploration of the theoretical approach to the gender wage gap from 1993 to 2020 was carried out by using bibliometrics. Then, based on the National Household Survey (ENAH) of Peru - Lambayeque (2015 -2019), an analysis of the phenomenon of wage differences between men and women was made. The bibliometric analysis shows an important approach to the topic, as publications have been increasing and diversifying the areas of interest such as: social sciences, economics, business and medical sciences. Theoretical approaches to the subject are: neoclassical, heterodox institutional economics, the social provisioning approach and other important theoretical contributions are abstractions such as the Sticky floor effect and glass ceiling effect and discrimination theories. Stylized facts show that the monetary labor income obtained by workers, both on a monthly and hourly basis, is different according to the sex of the worker, resulting in the gender wage gap going from 42.7% in 2015 to 34.4% in 2019 in its monthly form and from 26.5% in 2015 to 18.6% in 2019 when hourly income is taken into account, in addition, the presence of the phenomenon called "sticky-floor" and "glass-ceiling" has been evidenced.

Keywords: Gender pay gap, sticky floor and glass ceiling, gender gap.

JEL classification: J7

RESUMEN

Usando bibliometría en un primer momento, se ha realizado una exploración del abordaje teórico sobre la brecha salarial de género desde el 1993 al 2020, luego en base a la Encuesta Nacional de Hogares (ENAH) del Perú – Lambayeque (2015 -2019) se ha realizado un análisis del fenómeno de las diferencias salariales entre hombres y mujeres. El análisis bibliométrico da cuenta de un importante abordaje del tema, ya que se viene incrementando las publicaciones y diversificando las áreas de interés tales como: las ciencias sociales, económicas, negocios y las ciencias médicas. Los enfoques teóricos sobre el tema son: el neoclásico, heterodoxo de la economía institucional, el enfoque del aprovisionamiento social y otros aportes teóricos importantes son abstracciones como Sticky floor effect

y glass ceiling effect y las teorías de la discriminación. Los hechos estilizados demuestran que el ingreso laboral monetario que obtienen los trabajadores, tanto de forma mensual como por horas, es distinto según el sexo del trabajador, dando como resultado que la brecha salarial de género pase de 42.7% en 2015 al 34.4% en 2019 en su forma mensual y de 26.5% en 2015 a 18.6% en 2019 cuando se toma en cuenta el ingreso por hora, además se ha evidencia la presencia del fenómeno denominado “sticky-floor” y “glass-ceiling”.

Palabras Claves: Brecha salarial de género, piso pegajoso y techo de cristal, brecha de género

INTRODUCTION

In a scenario in which there is consensus on the need to fight against social inequalities, it is relevant to address the phenomenon of the persistence of gender gaps linked to salary allocations. Within this framework, the research addresses a topic of great social and political interest. The central variable is the wage, which is defined as a monetary consideration within a bilateral labor relationship, where the worker involves physical and intellectual resources in favor or for the benefit of a third party, this relationship transcends the labor market, as it includes other spheres of analysis related to the welfare of people (Cerquera-Losada & Arias-Barrera, 2019, p. 120).

In the analysis carried out on wages, related variables are identified that explain wage differences such as education, operational aspects of work, intellectual aspects, sectors of activity; however, many of the differences are related to aspects not linked to productivity, but to race or gender conditions. The latter are the ones that generate spaces of discrimination which are called gender wage gaps for example (Piñeros, 2009, as cited in Cerquera-Losada & Arias-Barrera, 2019).

In Peru in recent years, women have had a process of improvement in access to education and work experience, which is supposed to be reflected in salary levels, however, the persistence of salary gaps is still observed, i.e., there are still worrying levels of gender inequality. According to the World Economic Forum (2017), the gender wage gap in OECD member countries, averages 14.3% and in Europe on average is 16.3%; however, in Peru, the wage gap amounts to almost 30%, which would mean that women receive 30% less than the salary of men (Rios Cahuas, 2019). These figures in which the persistence of the wage gap in the world and in Peru is observed, requires to be observed and weighted in subnational contexts such as the Lambayeque Region in northern Peru, therefore the objective of this study is to evidence the gender wage gap based on the stylized facts of a region in northern Peru.

The study of this phenomenon presents approaches such as the orthodox and traditional neoclassical vision with a vision based on individualism and the contributions of the theory of preferences. This approach is based on the role of the labor market with its laws of supply and demand and the variables related to the salary, in this context from the market vision the gender variable has been present and therefore labor discrimination (Pham et al., 2018). Another look at the phenomenon is the social provisioning approach, which differs from neoclassical, uses an approach anchored in heterodox economics, to analyze the institutionality that generates and maintain the gender wage gap in the U.S. "The wage gap is not a natural phenomenon and, therefore, must be examined within a specific social and historical context" (Pham et al., 2018, p. 907).

A theoretical view widely used for the analysis of the wage gap phenomenon is the sticky floor effect and glass ceiling effect, indicating that the factors that are not observed in the studies and that would explain the inequalities in wages are related to differences in the valuation of the labor characteristics of workers, thus generating differences in remuneration, these would be considered as labor discriminatory to the detriment of some social groups. England (2010, cited in Pacheco & Del-Pozo Loayza, 2019).

Other outstanding theoretical approaches are those provided by the economic theory of discrimination by "tastes or preferences" and the theory of "statistical" discrimination (Becker, 1971; Arrow, 1971; and Phelps, 1972, cited by Cerquera-Losada & Arias-Barrera, 2019).

Regarding the factors that statistically explain the existence of the wage gap, there are contributions from several authors who coincide in valuing the contributions of Oaxaca (1973, Blinder (1973) and Reimers (1983), contributions such as those of Neumark and Jhun's decomposition are also valued and a technique of wide use in statistical decomposition is quantile regression (Barbezat & Hughes, 2005; Cerquera-Losada & Arias-Barrera, 2019; Pacheco & Del-Pozo Loayza, 2019).

In relation to the determinants of the wage gap, there are several contributions from authors who consider in their equations variables such as years of education, work experience, unionization levels, relationship with wage decision-makers, discrimination to social groups and gender discrimination (Barbezat & Hughes, 2005; Cerquera-Losada & Arias-Barrera, 2019; Gambhir et al, 2020; Pham et al., 2018; Pugsley et al., 2017; Sosin et al., 1998; Tobol et al., 2019).

This study begins with a bibliometric exploration of the approach to the phenomenon of the gender pay gap, based on the studies carried out and published in the scopus database, which serves as a theoretical platform for the search for evidence in the form of stylized facts in a given context.

METHODOLOGY

In the first part of the study, an analysis of bibliometrics has been conducted for the exploration and theoretical systematization on the phenomenon of the gender pay gap, regarding this method, for Broadus (1987) and Pritchard (1969), cited in Cancino et al. (2017), "Bibliometrics is the field of research in library and information sciences that studies bibliographic material through the use of quantitative methods" (p. 7).

For the bibliometric analysis of the phenomenon

Bibliometrics is a working method that is frequently used to analyze the state of the art of phenomena, since it allows information to be classified according to criteria and categories of analysis such as the historical evolution of studies, sources, countries, authors, among others.

Some decades ago, it took a lot of time to classify the data because the process of collecting the information was manual, today with the advancement of computer systems that improve data processing, it is possible to obtain more accurate and reliable information (Ding et al., 2014; Garfield, 1955; and Merigó et al. 2015b, cited in Cancino et al., 2017)

To carry out the search for information concerning the gender pay gap phenomenon, a general search protocol was carried out in the Scopus database. The argument used is the following:

(ALL "gender salary gap" OR ALL "gender salary gap"), which allowed 152 documents to be located.

With these documents, a bibliometric analysis was made of the evolution of publications per year, per author, per area of knowledge and per country.

The export of the data in XML format made it possible to integrate the information into the VOS Viewer program with which the analysis of co-occurrences of the key terms was carried out, as an exploration of the thematic associated with the gender pay gap.

For evidence through stylized facts of the gender wage gap.

For the analysis of the gender wage gap in the context of the Lambayeque Region in Peru through stylized facts, a quantitative approach at a descriptive level was used.

The population is made up of all the people who make up the Economically Active Population (EAP) employed and who have reported having received monetary income from the main occupation located in Lambayeque, Peru, during the period 2015 - 2019. Consequently, based on the database provided by the National Household Survey (ENAHO), conducted by the National Institute of Statistics and Informatics (INEI), a sample has been constructed with a number of valid observations for each year, which are:

- **2015:** 2,296 workers in Lambayeque who reported receiving monetary income from the main occupation located in Lambayeque in 2015.
- **2016:** 2,462 workers in Lambayeque who reported receiving monetary income from the main occupation located in Lambayeque in 2016.
- **2017:** 2,416 workers in Lambayeque who reported receiving monetary income from the main occupation located in Lambayeque in 2017.
- **2018:** 2,397 workers in Lambayeque who reported receiving monetary income from the main occupation located in Lambayeque in 2018.
- **2019:** 2,369 workers in Lambayeque who reported receiving monetary income from the main occupation located in Lambayeque in 2019.

The data source used to create the database used in this research work comes from Module 5, Employment and Income, of the ENAHO. It should be noted that the methodology used by the INEI to prepare this survey was probabilistic, area-based, stratified, multistage and independent for each department, and a confidence level of 95% was used. Finally, STATA econometric software was used to organize and process the database, as well as to perform the econometric calculations, make the graphs and organize the data in tables.

RESULTS AND DISCUSSION

Bibliometrics shows that key terms such as the gender pay gap have motivated research interest with greater emphasis since 1993, however, greater interest has been shown from 2009 to the present, as shown in Figure 1.

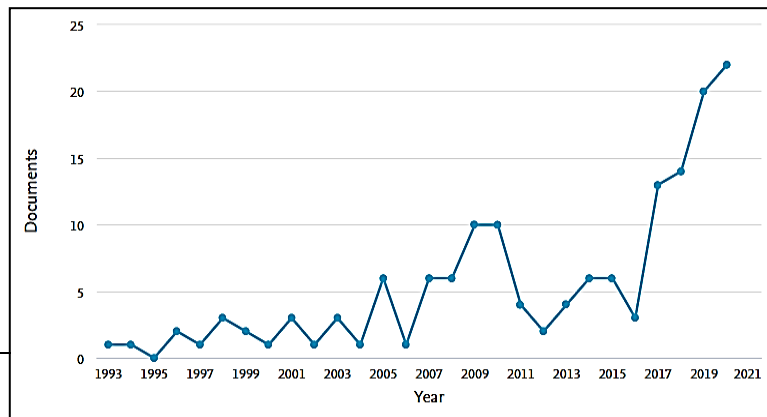


Figure 1. Papers published by year.

Source: Scopus database

Own elaboration

This exploration also allows to observe that publications have been mainly in the form of scientific papers 78.3%, literature reviews 7.9%, book chapters 5.3% and the rest in the other modalities, as shown in Figure 2.

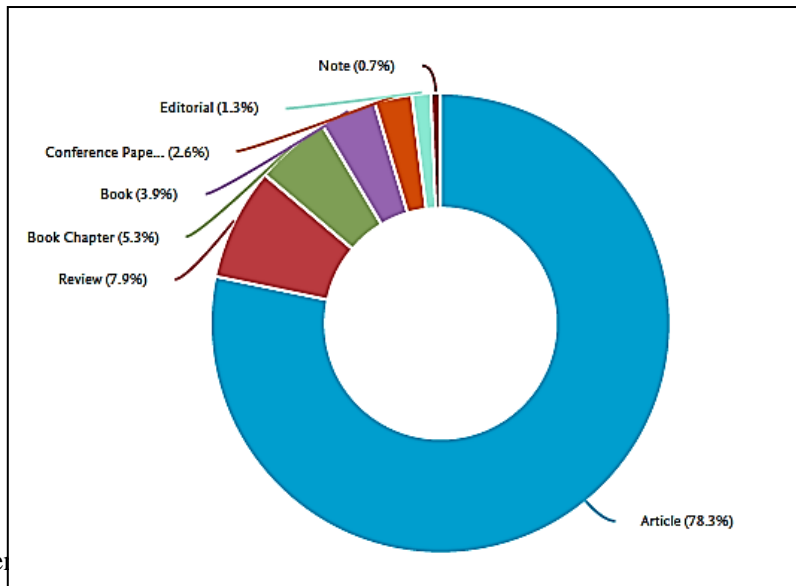


Figure 2. Document types

Source: Scopus database

Own elaboration

According to the discipline that has shown interest in the study of the gender gap phenomenon, the social sciences stand out, followed by economic sciences, business sciences and a more recent development in the medical sciences, as shown in Figure 3 below.

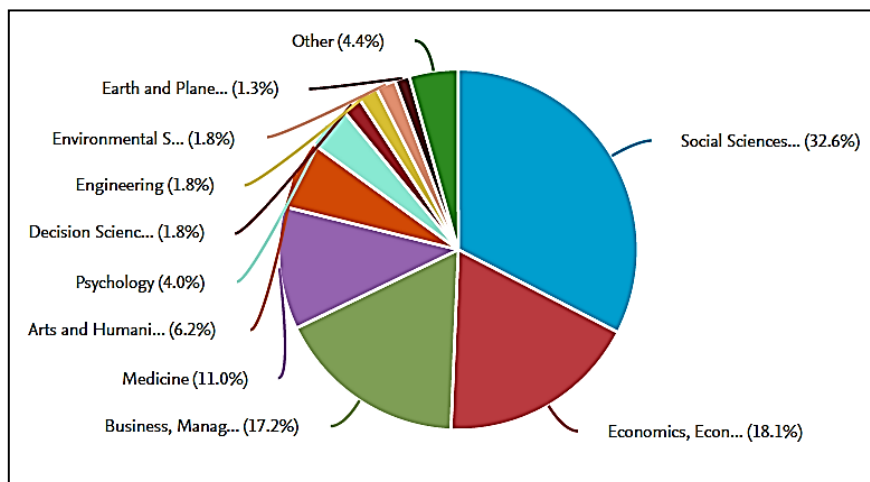


Figure 3. Documents by study area (1993 - 2020)

Source: Scopus database

Own elaboration

Figure 4 clearly shows the *clusters* of key terms, the sizes of the spheres indicate the cooccurrences of the terms and the distances indicate the relationship between them. A coloration according to the age of the approach can be seen, such is the case that in recent years studies of the gender pay gap have been carried out in the world of medical sciences with key terms such as surgery, general surgery. In this same graphical scheme, we observe in the lower cluster the co-occurrence of the term discrimination, which evidences the findings of salary differences not explained by conventional factors and attributed to salary differences due to the fact of being a woman.

Statistical exploration of the National Household Survey (ENAH) database in Peru during the years from 2015 to 2019 allows to observe the following:

The stylized facts show that the monthly labor income of women has had a growth of 28% in the study period (2015 -2019). Likewise, the monthly labor income of males had a growing trend, however, it has not been constant as in the case of women. This behavior is also reflected for self-employed workers, on the other hand, males and females who were dependent workers show a little constant growth in their income; in summary, the monthly income of females had a higher growth than the monthly income of males. What is most representative of Figure 5 is the difference in the perception of monthly labor income between men and women; in fact, it can be observed with greater notoriety that self-employed men have an income that was 2 times more than the income of self-employed women. These differences were a reflection of the wage gap that exists between the two groups, which has narrowed as women's income has grown more than men's income. From this graph it can be calculated that the gender wage gap in the main occupation went from 42.7% in 2015 to 34.4% in 2019, if dependent workers are taken, then, the wage gap went from 23.2% in 2015 to 20.8% in 2019, on the other hand, in the self-employed group, the wage gap was 64.5% in 2015 and went to 48.8% in 2019. The results are consistent with those found in the United States who argue that the gender wage gap has been persistent since women have achieved their incorporation into the workplace in the nineteenth century, although it is true that time has seen a reduction of the same, the concern about this phenomenon remains (Madison Sosa et al., 2018). In another research developed in Serbia in 2019 based on the Survey on Living and Working Conditions has evidenced the persistence, even the increase of wage gaps between men and women (Anić & Krstić, 2019).

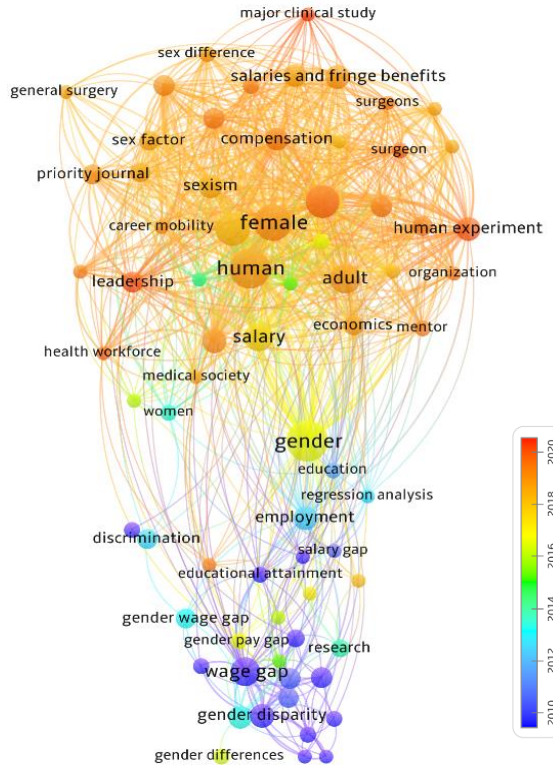


Figure 4. Semantic map with evolution (2010 -2020)
 Note: Map with semantic network (*general view*) made with VOS Viewer
 Own elaboration.

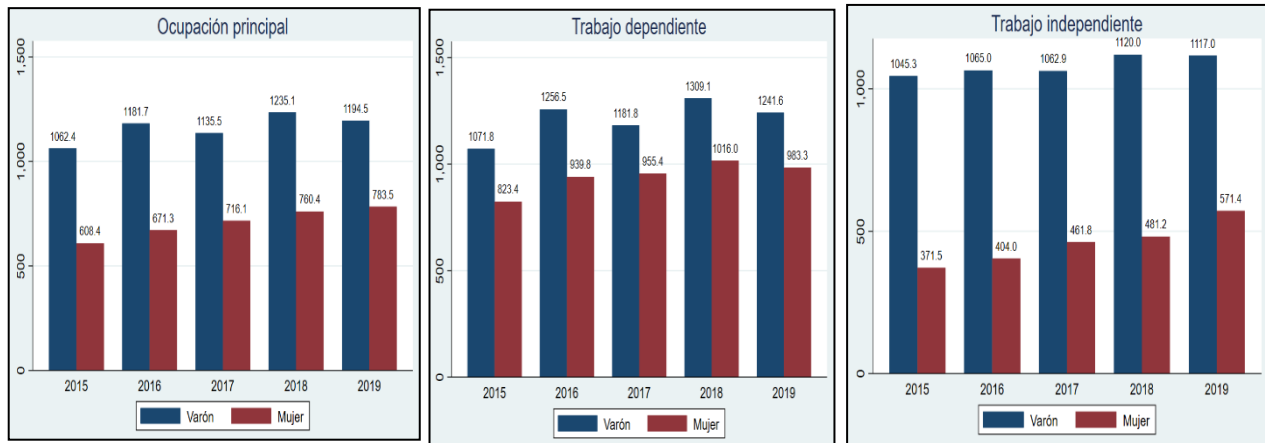


Figure 5. Evolution of the average monthly monetary labor income according to the type of work of the main occupation in the period 2015 - 2019. (Current soles)
 Source: Own elaboration based on National Household Survey - National Institute of Statistics and Informatics.

Figure 6 shows that the wage gap was very present in decile 10, which leads us to assume the existence of the "glass ceiling" in the labor market in Lambayeque in 2015, especially in the group of self-employed workers, Slight differences are also observed in the monthly salaries in the lower deciles, however, these

are not so high, in fact, in some deciles it can be noted that the monthly salary of women is higher than that of men, therefore, the existence of "sticky-floor" in the same year cannot be completely noticed. In 2019, it was observed that the difference in the monthly salaries of males and females has decreased compared to what was observed in 2015, i.e., the salary gap decreased. In addition, the monthly salary obtained in the deciles of labor income has grown at a higher rate in the upper part of the distribution, which leads to the assumption of the existence of inequality in monthly wages, regardless of the sex of workers and type of work.

The results regarding the existence of "sticky-floor effect" and "glass-ceiling effect", are aligned with those found in a sectoral analysis in Peru, where they argue when performing the decomposition of wage differences, these are higher at the extremes of the distribution which evidences the case of "sticky-floor effect" and "glass-ceiling effect" (Pacheco & Del-Pozo Loayza, 2019).

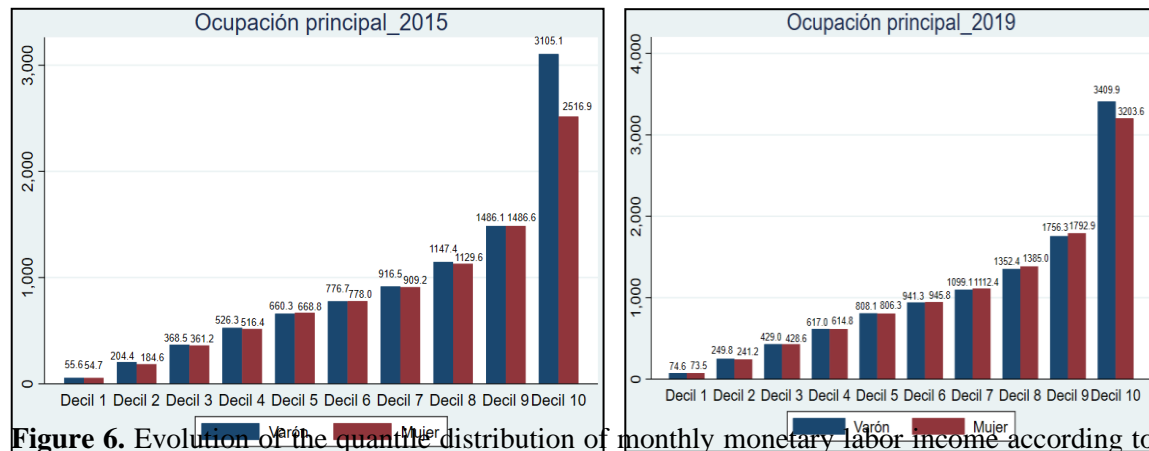


Figure 6. Evolution of the quantile distribution of monthly monetary labor income according to the type of work of the main occupation in the period 2015 – 2019 (current soles).

Source: Own elaboration based on National Household Survey - National Institute of Statistics and Informatics.

When analyzing the behavior of the average hourly income of the main occupation, it can be noted that it has had an increasing trend in the study period for both males and females, however, the growth has not been constant and falls are reported for both groups, in this way, the wage gap went from 26.5% in 2015 to 18.6% in 2019; it should be noted that in 2017 the gap was 32.9%. When disaggregating the hourly income according to the type of main occupation, it can be seen that the hourly income of male dependent workers reached its highest point in 2017 and decreased in 2019, the hourly income of women was also little constant, but maintained an increasing trend; as for the wage gap of dependent workers, it was 13.2% in 2015, almost 28% in 2017 and 6% in 2019. Finally, the hourly income of male self-employed workers expresses a notable difference in relation to the hourly income of female self-employed workers, moreover, despite also pointing to a decrease, it is still too wide compared to the wage gap of dependent workers; the gender wage gap was 42% in 2015 and decreased to 32.1% in 2019.

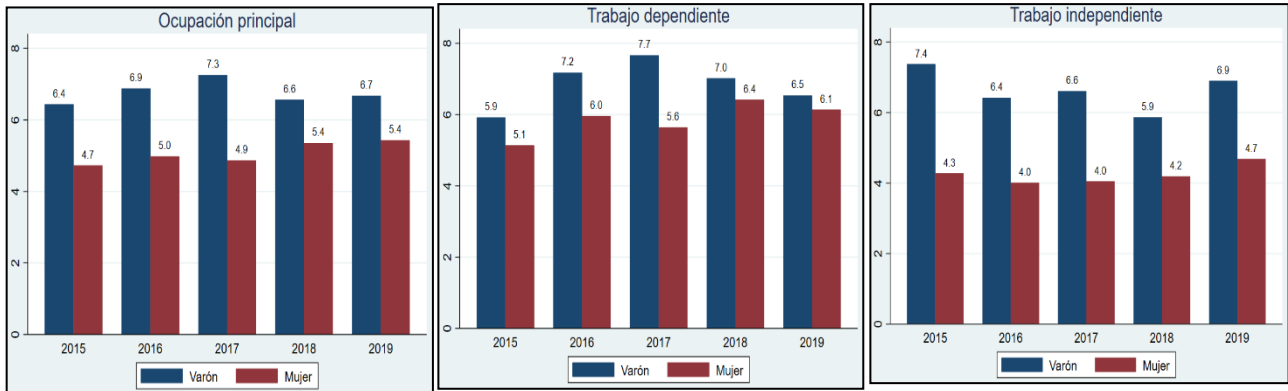


Figure 7. Evolution of average hourly monetary labor income by type of work in the main occupation in the period 2015 - 2019 (Current soles)

Source: Own elaboration based on National Household Survey - National Institute of Statistics and Informatics.

Figure 8 analyzed the behavior of the hourly income wage gap through its distribution in its deciles. First, the wage gap of the hourly income of their main occupation in 2015 had a greater presence at the extremes of the distribution, being 7.5% in decile 1, 5.1% in decile 2, 3.0% in decile 3 and 16.9% in decile 10; by 2019, the wage gap maintained its presence at the extremes of the distribution, however, variations in its percentages are noted, since, in decile 1 it was 19.3%, 2.6% in decile 2 and 4.0% in decile 10; this behavior is related to the reduction of the wage gap in the average hourly income from the main occupation. The empirical evidence points to the fact that in 2015 the wage gap in hourly income could have the presence of the sticky-floor and glass-ceiling, likewise, in 2019 evidence has also been found that can be related to the presence of the sticky-floor and glass-ceiling. Finally, there is evidence of inequality in the monetary labor income obtained by workers, both in the amount they obtain and in the rate of growth of the hourly income obtained.

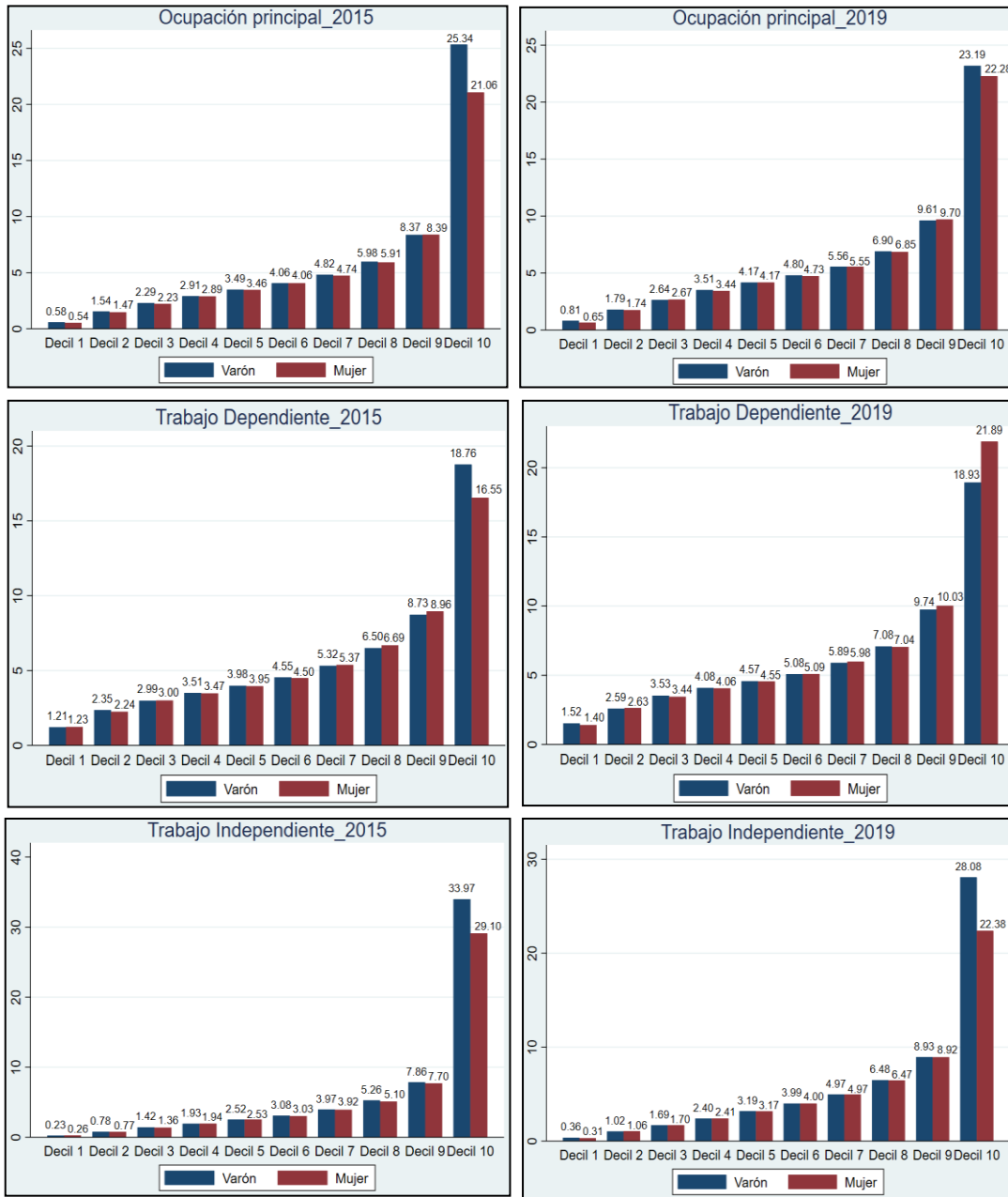


Figure 8. Evolution of the quantile distribution of hourly monetary labor income according to the type of work of the main occupation in the period 2015 - 2019 (Current soles)

Source: Own elaboration based on the National Household Survey - National Institute of Statistics and Informatics.

Figure 8 also shows the behavior of the wage gap according to the type of work of the main occupation. In the case of dependent workers, it has been obtained that the hourly income wage gap in 2015 had greater representation in the upper end of the distribution being 11.8% in decile 10, while the lower end of the distribution does not show a significant wage gap; however, the hourly income wage gap by 2019 had a notable change in its quantile distribution through its deciles, since, in decile 1 it was 7.5% and in decile

10 no wage gap is observed. These results are in line with the decrease in the wage gap of the average hourly income within the group of dependent workers, in fact, it is also similar to the reduction of the wage gap in the monthly income from dependent work.

Within the group of self-employed workers, the hourly income wage gap has been more entrenched in the highest deciles of the distribution in 2015, being 14.3% in Decile 10, 2.1% in Decile 9 and 3.1% in Decile 8; in the lower part of the distribution, only in Decile 3 has been found the existence of the wage gap, which was 4.2%. In 2019, the wage gap has increased both at the top and at the bottom of the distribution, because in Decile 1 it was almost 15% and in Decile 10 it grew to 20.3%. These results show that the wage gap tends to be higher within the self-employed group and the estimates found can be related to the existence of "sticky - floor" and "glass - ceiling". These calculations shown in the stylized facts show a reference on the behavior of the wage gap in Lambayeque, however, econometric applications will be fundamental to reach more accurate conclusions on the wage gap and the existence of the "sticky - floor" and the "glass - ceiling".

Figure 9 shows the existence of a semi-elasticity between the logarithm of monthly income and the number of hours worked per week, which is positively related. On the other hand, it is observed that the monthly income has been less and less dispersed as the years have gone by; however, when reviewing the graphs and comparing their differences according to the sex of the worker, it can be seen that the reduction in the dispersion of the observations has been more noticeable for men than for women.

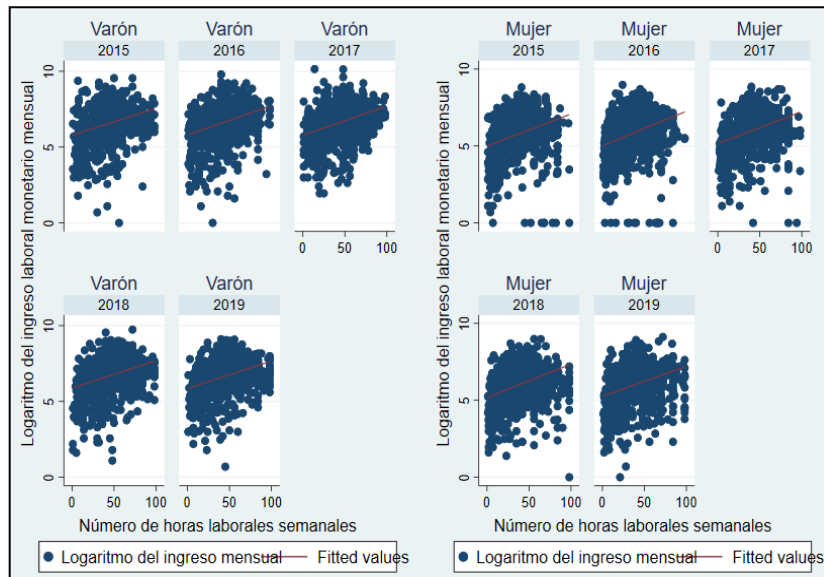


Figure 9. Dispersion of the logarithm of the monthly monetary labor income of the main occupation according to the number of weekly working hours and the sex of the worker in the period 2015 - 2019 (*Current soles*).

Source: Own elaboration based on National Household Survey - National Institute of Statistics and Informatics.

Plotting the dispersion between the logarithm of hourly income with respect to the number of weekly working hours, we observe an inverse relationship between both variables in the study period. This relationship implies the existence of semi-elasticity between the logarithm of hourly income with respect to the number of weekly working hours, and indicates that an increase in the number of hours worked in a week leads to changes in income becoming smaller. The behavior of the point cloud showed that as the years pass, the dispersion has become smaller and smaller.

In contrast to Figure 9, where a positive relationship is observed between monthly income and the number of weekly hours worked, Figure 10 shows an inverse relationship between hourly income and the number of weekly working hours. One explanation for this situation would be related to the low productivity of companies, which offer jobs with precarious conditions and low labor returns, in addition to a labor demand composed of individuals with limited accumulation of human capital. These conditions are congruent with the high rate of informal employment in the region. In this sense, these graphs refer to underemployment by income, a labor phenomenon that afflicts the majority of workers in Lambayeque, since it can be seen that the increase in the number of working hours does not lead to a sustained increase in their hourly income, which can be explained by the very conditions of informality.

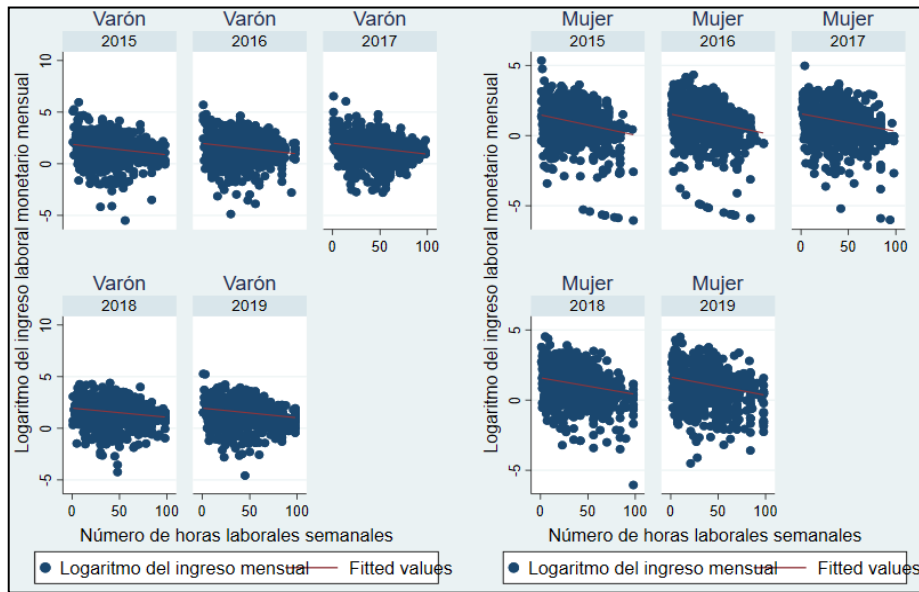


Figure 10. Dispersion of the logarithm of hourly monetary labor income of the main occupation according to the number of weekly working hours in the period 2015 - 2019 (Current soles). Source: Own elaboration based on the National Household Survey - National Institute of Statistics and Informatics.

Table 1 reflects one of the most deeply rooted problems in Lambayeque's labor market, informality. As can be seen, formal workers receive a monthly income that is much higher than the income obtained by informal workers, especially among women. From this first observation, it can be deduced that the wage gap between genders is present in the groups that are characterized by working in conditions close to informality, in fact, the wage gap between males and females was 50.1% in 2015 and became almost 41% in 2019 within the group of informal workers, meanwhile, the wage gap within the group of formal workers went from 25.5% in 2015 to 15% in 2019.

When separating workers according to the type of work they perform, it is observed that within the group of formal workers, male self-employed workers tend to receive a monthly income on average much higher than that obtained by women in their same group, likewise, within the group of informal self-employed workers the same behavior is observed; when calculating the wage gap between genders, we obtained that it was 60.4% in 2015 and 40.2% in 2019 in the group of formal workers, for its part, in the group of informal workers the wage gap was 62.6% in 2015 and 46.3% in 2019. Finally, the wage gap for formal dependent workers went from 9.7% in 2015 to 4.7% in 2019, and from 35.5% in 2015 to 33.7% in 2019 in the group of informal dependent workers.

Table 1. Evolution of the average monthly monetary labor income according to the type of work of the main occupation and informality condition in the period 2015 - 2019. (Current soles)

Year	Main occupation		Self-employment		Dependent work	
	Male	Woman	Male	Woman	Male	Woman
Formal employment						
2015	1779.0	1325.4	2401.8	950.9	1605.7	1449.7
2016	1829.0	1483.3	2021.8	1065.5	1780.1	1599.1
2017	1806.7	1544.3	2214.1	1335.0	1699.2	1607.3
2018	1880.3	1587.0	1937.5	1112.4	1867.2	1714.0
2019	1899.9	1619.4	2093.0	1251.5	1835.0	1748.0
Informal employment						
2015	816.6	407.3	792.1	296.5	833.0	537.1
2016	909.9	436.2	892.0	332.7	925.7	581.1
2017	866.5	458.3	854.5	350.2	876.8	598.0
2018	964.9	489.8	986.5	404.0	945.3	601.2
2019	919.4	544.1	893.0	479.6	939.1	622.8

Source: Own elaboration based on National Household Survey - National Institute of Statistics and Informatics.

Table 2 shows the analysis of hourly income of workers according to their sex and informality status, and the data obtained are similar to the interpretations in Table 1. It is observed that informal workers tend to have an hourly income notoriously lower than that perceived by their peers in the formal sector, in addition, the hourly income of women is significantly lower than the hourly income of women in the group of informal workers than in the group of formal workers, in fact, the wage gap in the first group was 28.2% in 2015, 42.8% in 2017 and 22.9% in 2019, while the wage gap in the formal workers group was 17.8% in 2015, 7.8% in 2017 and less than 1% in 2019. When disaggregating workers according to their main occupation type, it can be noted that the hourly income wage gap is higher for self-employed workers than for dependent workers, regardless of their informality status; in the self-employed group, the wage gap has been higher within the formally employed, however, it has reduced at a higher rate in the study period, while the wage gap within the self-employed informal workers has almost not changed, since, the wage gap was 67.6% in 2015 and 44.7% in 2019 for formal employees, and was 28.6% in 2015 and 22.2% in 2019 for informal self-employed workers. In the case of dependent workers, the hourly income wage gap has not been elevated for formal dependent workers in the indicated period, however, it has been noted that the wage gap within informal dependents has remained elevated and has had a slow reduction due to the fact that in 2015 it was 31.2% and in 2019 it was 25.7%. These appreciations indicate that the existence of the wage gap in Lambayeque according to the condition of informality, point to the fact that in the informal sector it has remained almost constant in the period, while in the formal sector the wage gap has been able to reduce at a faster pace.

Table 2. Evolution of the average hourly monetary labor income according to the type of work of the main occupation and informality condition in the period 2015 - 2019.

Year	Main occupation		Self-employment		Dependent work	
	Male	Woman	Male	Woman	Male	Woman
Formal employment						

2015	9.6	7.9	15.5	5.0	7.9	8.8
2016	10.0	8.8	10.7	6.0	9.8	9.6
2017	9.9	9.1	14.5	8.7	8.7	9.2
2018	9.7	10.1	9.6	7.2	9.7	10.8
2019	10.0	9.9	12.4	6.8	9.2	11.0
Informal employment						
2015	5.4	3.8	5.9	4.2	5.0	3.5
2016	5.6	3.9	5.6	3.8	5.5	4.0
2017	6.2	3.5	5.2	3.4	7.1	3.7
2018	5.3	3.8	5.2	3.8	5.3	3.8
2019	5.4	4.1	5.6	4.4	5.2	3.9

Source: Own elaboration based on the National Household Survey - National Institute of Statistics and Informatics.

When evaluating the hourly earnings of the main occupation received by workers according to their sex, it is necessary to describe their distribution in order to approximate the phenomenon of differences in their returns. The Kernel density function of the logarithm of the hourly income of the main occupation shows us slight differences in the distribution during the period 2015-2019, first of all, the curves of the hourly income has shifted to the right in both sexes, which leads to the assumption that the hourly income has grown in 2019 with respect to 2015 for both males and females, In addition, a slight decrease in the dispersion of the 2019 distributions can be noted in relation to the 2015 distributions in both sexes, this evidence can be explained by the decrease in inequality and the improvement in the living conditions of the population of Lambayeque; However, the distributions of women have a greater dispersion compared to the distribution of men.

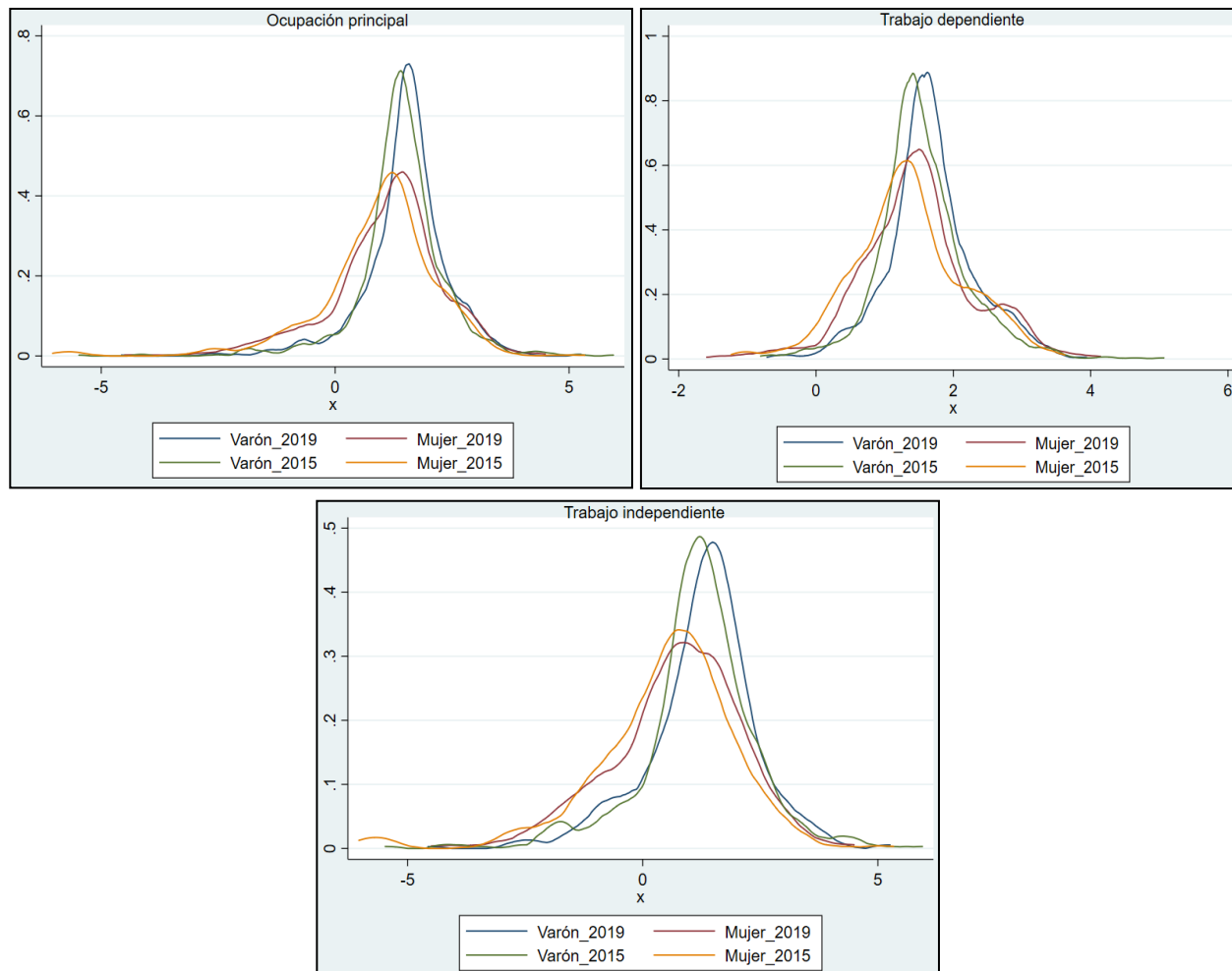


Figure 11. Kernel density function of the logarithms of hourly monetary labor income according to the type of work of the main occupation (Current soles).

Source: Own elaboration based on the National Household Survey - National Institute of Statistics and Informatics.

However, what is most representative of this analysis is the evident difference in the density curves between both sexes, which is maintained throughout the study period, thus, it is deduced that the concentration of men and women is totally different throughout the distributions. The shape of these figures is evidence of the existence of a wage gap in hourly earnings between men and women. This feature is observable regardless of the labor group according to the type of main occupation, even the reduction in the dispersion of the distributions of men to a greater extent than the reduction in the dispersion of women in 2019 compared to 2015 has also been maintained.

CONCLUSIONS

The issue of wage gaps is a phenomenon that has evolved significantly in recent years, judging by the increase in the number of publications, which are mainly in the United States, followed by the United Kingdom, Germany, Spain and Mexico.

Research on the subject is being conducted from the perspectives of the social sciences, economic sciences, business sciences and recently with good performance in the medical sciences to analyze wage differences in hospitals and medical centers.

The approaches that allow a theoretical approach to the gender gap phenomenon can be classified according to their link with the current system, such as the neoclassical view of the economy, i.e. the rationality of the labor market, or the heterodox institutionalist perspective, which includes the social provisioning approach. Other important theoretical contributions in this regard are the Mincer equation and the *sticky floor effect and glass ceiling effect* theory.

From the systematic review it has been observed that various authors consider observable factors that affect wage gaps such as years of education, work experience, training and other unobservable factors that are not related to productivity, such as discrimination by gender and other social groups.

With respect to the methodologies used in the search for empirical evidence on the subject, the following stand out: Oaxaca (1973), Blinder (1973) and Reimers (1983), Neumark's method and Jhun's decomposition also stand out. A widely used technique for statistical decomposition is quantile regression.

The stylized facts show that in the Northern Region of Peru (Lambayeque), the monetary labor income obtained by workers, both on a monthly and hourly basis, is different depending on the sex of the worker, resulting in the gender wage gap going from 42.7% in 2015 to 34.4% in 2019 on a monthly basis and from 26.5% in 2015 to 18.6% in 2019 when hourly income is taken into account.

Considering all workers, without distinguishing their main type of occupation, the analysis confirms the presence of sticky-floor and glass-ceiling, and only a reduction of the latter is observed in the study period. In dependent workers, "glass-ceiling" was only present in 2015 and "sticky-floor" was maintained in the study period, while in the group of independent workers, the wage gap associated with discrimination in the labor market was strongly marked both at the top and at the bottom of the dispersion, therefore, there was both "sticky-floor" and "glass-ceiling".

REFERENCES

1. Anić, A., & Krstić, G. (2019). What lies behind the gender wage gap in Serbia? *Economic Annals*, 64(223), 137-169. <https://doi.org/10.2298/EKA1923137A>
2. Barbezat, D. A., & Hughes, J. W. (2005). Salary structure effects and the gender pay gap in academia. In *Research in Higher Education* (Vol. 46, Issue 6, pp. 621-640). <https://doi.org/10.1007/s11162-004-4137-1>
3. Cancino, C., Merigó, J. M., Coronado, F., Dessouky, Y., & Dessouky, M. (2017). Forty years of Computers & Industrial Engineering: A bibliometric analysis. *Computers and Industrial Engineering*, 113, 614-629. <https://doi.org/10.1016/j.cie.2017.08.033>.
4. Cerquera-Losada, O.-H., & Arias-Barrera, C.-J. (2019). View of The Gender Wage Gap in Colombia and in the Department of Caldas. *Anfora*, 27(48), 117-140. <https://doi.org/https://doi.org/10.30854/anf.v27.n48.2020.671> Universidad.
5. Gambhir, S., Daly, S. C., Elfenbein, D., Sheehan, B., Maithel, S., Smith, M., & Nguyen, N. T. (2020). The effect of transparency on the gender-based compensation gap in surgical disciplines within a large academic healthcare system. *Surgical Endoscopy*. <https://doi.org/10.1007/s00464-020-07679-1>
6. Madison Sosa, B., Van Hoy, J., Valiska Gregory, M., & Appel, H. (2018). *Gender Pay Gap Analysis*.
7. Pacheco, E., & Del-Pozo Loayza, C. (2019). *DETERMINANTS OF GENDER WAGE GAPS IN*

THE PERUVIAN TOURISM SECTOR: AN ANALYSIS OF QUANTILE DECOMPOSITIONS. 1-65.

https://www.cies.org.pe/sites/default/files/investigaciones/determinantes_de_las_brechas_salariales_de_genero_en_el_sector_turismo_peruano.pdf

8. Pham, X., Fitzpatrick, L., & Wagner, R. (2018). The US gender pay gap: the way forward. *International Journal of Sociology and Social Policy*, 38(9-10), 907-920. <https://doi.org/10.1108/IJSSP-01-2018-0002>
9. Pugsley, M. K., Authier, S., Brabham, T., Soloviev, M., Markgraf, C. G., Correll, K., Traebert, M., Greiter-Wilke, A., Valentin, J. P., Vargas, H., Botchway, A., Leishman, D. J., & Curtis, M. J. (2017). The Safety Pharmacology Society salary survey. *Journal of Pharmacological and Toxicological Methods*, 88(August), 85-91. <https://doi.org/10.1016/j.vascn.2017.08.002>.
10. Rios Cahuas, P. O. (2019). *Educación y Brecha Salarial de Género en el Perú* [Pontificia Univeridad Católica del Perú]. http://tesis.pucp.edu.pe/repositorio/bitstream/handle/20.500.12404/14943/RIOS_PAMELA_EDUCACION_BRECHA_SALARIAL.pdf?sequence=1
11. Sosin, K., Rives, J., & West, J. (1998). Unions and gender pay equity in academe: A study of U.S. institutions. *Feminist Economics*, 4(2), 25-45. <https://doi.org/10.1080/135457098338419>
12. Tobol, Y., Bar-El, R., Arbel, Y., & Azar, O. H. (2019). Gender differences in the effect of employee-manager friendships on salary dynamics in CPA firms. *Heliyon*, 5(10). <https://doi.org/10.1016/j.heliyon.2019.e02658>