Skilled-Unskilled Workers Wage Gap in Mexico: a Regional Approach of the Exposure to trade Openness

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Abstract

The aim of this paper is to analyze the skilled-unskilled wage gap generated by the economic openness and determines if the Stolper-Samuelson theorem is accomplished in Mexico. This work analyses the years 2005, 2009 and 2014. The economic aperture's effect is showed by the regionalization of the country in three areas, according to their exposure to the economic aperture. The wage gap analysis is made by the Juhn, Murphy and Pierce decomposition method developed in 1991. As a result, it is observed that in the period of analysis the skilled-unskilled wage gap was reduced, according what the Stolper-Samuelson theorem predicts, however, this reduction was a result of the wage's precariousness of both skill and unskilled workers in Mexico and in its regions.

Keywords: Wage gap, labor markets, regions, globalization and labor

JEL codes: J31, R33, F66

I. Introduction

The current economic crisis shown by the slow or null economic growth of the developed countries and the economic deceleration in the developing countries has reopened the discussion about the effects of the economic system all around the world. One of the main characteristics of this system is the tendency to the globalization and the liberalization of inputs in different scales within and among the economies, having different consequences in each region of the world.

According to Pearson, Föster and D'Ercole (2008), the income inequality in the member countries of the Organization for Economic Co-operation and Development (OECD) has raised for the first decade of the XXI century compared to the 80's. Mexico is no stranger to this trend, where in order to reach growth and development the country has opened its economy to the rest of the world resulting in important structural changes such as the labor market shifting. However, contrary to theoretical expectations the results still fall short of the objective.

Nowadays 30 years after of the incorporation of México to the now-called World Trade Organization (WTO) and more than 20 years of North American Free Trade Agreement (NAFTA), it can be observed a relocation of economic activities among the country the center of the country is no more the only motor of the Mexican economy. In general, there is no common conclusions regarding the effects on the skilled and non-skilled workers in the researches about the effects of the economic openness but a wage gap between them has been found.

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Meanwhile some researchers has pointed out that this wage gap was reduced, some others have highlighted that it was increased over time. The main objective of this document is to observe the evolution of the skilled and non-skilled wage inequality in Mexico, determine the factors that have influenced this situation and observe the validity in Mexico of the Stolper-Samuelson theorem. This is made through a regional analysis according to the exposure of the economic aperture for the years 2005, 2009 and 2014.

Data is obtained by the National Survey of Occupation and Employment (ENOE) published by the National Institute of Statistics and Geography (INEGI) for the years 2005, 2009 and 2014. This paper use the decomposition method developed by Juhn, Murphy and Pierce in their works published in 1991 and 1993.

The results indicate that the skilled-unskilled wage inequality has been reduced during the study period. Even though the unskilled workers wage has fallen in this period, the tremendous fall of the skill workers wage has influenced to reduce the wage gap between workers. In addition, it is possible to observe that there is a wage difference among regions in Mexico having a higher wage for both, skill and unskilled workers, in the High-Exposition Region. However, this same region is the one that has reduced the most the wage gap. From this it can be concluded that the validity of Solper-Samuelson theorem in Mexico is partially applied.

The remainder of this paper is structured as follows: in section 2 is intended to describe the Stolper-Samuelson theorem and the empirical evidence for México. Section 3 is designed to show the methodology and data used in the study. In section 4 it is possible to find an empirical analysis about the skilled-unskilled workers inequality decomposition for Mexico and for each region of study. Conclusions are drawn in the last section of this research

2. Literature review

2.1 Free trade theory and its influence at wage inequality

The process of globalization in which all the economies around the world are involved, it is highlighted the enormous benefits of the international trade without barriers. In the economic science Adam Smith and David Ricardo where the first economists that mentioned the free trade benefits and stablished the absolute and comparative advantage theory, where was mentioned that the different international commerce and countries specialization were due for dissimilar levels of labor productivity among nations. Among the modern theories about international commerce, one of the most important contributions has been the theorem developed by Wolfgang Stolper and Paul Samuelson in 1941, which is one of the main results of the Heckscher-Ohlin theory (Neary, 2004). The general equilibrium theory of commerce contributed by Eli Heckscher and Bertil Ohlin opened a new line of research *"focused in the differences of the relative intensity of factors through industry and the differences in the relative abundance of factors through countries"* (McCulloch, 2006) concluding that each country will export those products that are made by the abundant production factor and will import products where the production factor is scarce.

According to Near (2004) and McChulloch (2006), that situation is formalized in the Stolper-Samuelson Theorem where under very rigid assumptions there are two economic sectors which produce using only capital and labor. These two factors are given in fixed quantities; however, there is free mobility between both countries. Under the assumption that each country has an endowment of different factors, some with abundance in capital and some others with abundance of labor, the international specialization will enable to those capital-abundant countries to clustering capital-intensive industries, and labor-abundant countries will specialize their production in labor-intensive industries. This will have as a result an effect on the income distribution, being "winner" the most abundant factor on the country. The international commerce will work as a "substitute" of the factor mobility, having as a consequence the equalization of factor prices between countries. As the author Aguilera (2012) cited the abundant unskilled labor in developing countries will raise their relative wages, while the skilled workers wages will be reduced. This hypothesis has encouraged the economic aperture process in Mexico during the late 80's and early 90's, where it was expected that this new economic model could help to reduce wage gap between skilled and unskilled workers in the country (Burgos & Mungaray, 2008; Blecker, 2009; Artecona & Cunningham, 2002).

2.2 Existing empirical evidence

In Mexico various studies about the impact of the commercial aperture in the economy, labor market and wages had been made. Moreno-Bid *et al.* (2008) through the analysis of diverse economic indicators for 1978-2003 concluded that NAFTA hasn't had the expected effects in terms of economic development and employment creation. Its direct impact through the exportations was limited and countered by a disruption of internal market.

Calderon-Villareal (2006) remarks the influence of NAFTA in the migratory process from Mexico to United States, increasing the amount of labor force between 1994 and 2005. A similar analysis was made by Gutierrez-Garza (2005) with a period of study that goes from 1980 to 2003, where was observed a stagnation in the Mexican economy since 2001 while the low achievement of export-orientated industrialization has not been able to relaunch the economic activity.

The Mexican skilled-unskilled wage inequality has been already studied by some authors such as Burgos and Mungaray (2008) whom basing their analysis in the National Survey of Household Income and Expenditure (ENIGH) and National Consumer Price Index (INPC) from 1984 to 2002, concluded that increasing inequality is a result of increasing rate of return of education. This work remarks that the wage inequality were not generated by the commercial aperture but was the result of other factors such as Mexican currency revaluation and changes in labor market.

These results are in line with those of Esquivel and Rodríguez (2003) where separating commerce and technology obtained that technology was the responsible of the increasing wage inequality during NAFTA period. Cortez (2001) ENIGH and the National Survey of Urban Employment identified the changes in the labor market that happened during the same period of the commercial aperture as causes of skilled-unskilled workers wage inequality.

Chiquiar (2004) through data obtained from the Industrial Census analyzed the wage inequality by regions in Mexico in the period from 1990 to 2000. This work concludes that the differences in regional wages during 90's seem to be a result of a heterogeneous impact of NAFTA in the enterprises potential through their regions. Finally, Freije *et al.* (2003) by adapting the Juhn, Murphy and Pierce decomposition method and based on National Survey of Urban Employment, found that the urban wage inequality behavior in Mexico was determined by the following three factors: 1) Homogeneity of labor force characteristics (decreasing inequality) 2) Price differences that market pays for this characteristics (increasing inequality) 3) Changes in participation probability and changes in non-observable productive characteristics (increasing in inequality).

In resume, most of the authors cited in this work concluded that during commercial openness the wage gap has increased. Even though the main reasons of this phenomenon continue under discussion, all authors agreed on the conclusion that there are internal economic problems and that the results obtained are different than expected.

3. Data and methodology

3.1 Data

This work is based in the analysis of individual data of National Survey of Occupation and Employment (ENOE), this survey is published quarterly by the National Institute of Statistics and Geography (INEGI). The study considers the third quarter of the following years: 2005, 2009 and 2014, which avoids the seasonal effects, tries to cover the most recent information of ENOE and intents to extend the analysis of similar previous studies.

Study population consists in skilled and unskilled workers from 16 to 65 years old. Classification of labor qualification considers as unskilled workers those who haven't any years of school until those who have until 11 years of school. The regional analysis considers the regionalization proposed by Aguilera and Castro (2012) which includes the political-administrative criteria of division in federal entities. It allows capturing the modifications in the actual regional dynamic observed in the country and delimits regions considering the coefficient of exposure that entities presents to international markets. The regions to consider are:

High-exposure region: Aguascalientes, Baja California, Chihuahua, Coahuila de Zaragoza, Estado de México, Guanajuato, Querétaro de Arteaga, Nuevo León, Puebla, San Luis Potosí, Sonora y Tamaulipas;

Middle-exposure region: Baja California Sur, Distrito Federal, Durango, Hidalgo, Jalisco, Michoacán de Ocampo, Morelos, Tlaxcala, Veracruz de Ignacio de la Llave y Zacatecas;

Low-exposure región: Campeche, Chiapas, Colima, Guerrero, Nayarit, Oaxaca, Quintana Roo, Sinaloa, Tabasco y Yucatán.

Worker wages are considered monthly, transformed in hours and deflated by the National Consumer Price Index issued by Bank of Mexico (2014). It's considered as full-time job when the working time is about 40 or more hours per week.

3.2 Methodology

Two methods of wage's decomposition are used for the empirical analysis (Oaxaca-Blinder 1973, Juhn-Murphy and Pierce 1991) to identify which part of the wage gap is due to differences in observable characteristics between skilled and unskilled workers and which part is related to differences associated with returns of these characteristics. In both methods the analysis starts with a mincer equation for each year and each segment:

$$w_i = X_i\,\beta + \varepsilon_i \qquad (1)$$

Where w_i corresponds to the net hourly wage logarithm for each worker i; X_i is a vector of individual characteristic plus a constant term; β is a parameter vector; ε_i is an observational error term. X_i vector includes individual controls, normally included in Mincer equations: years of study, potential experience at the labor market and its quadratic form, full or part-time job. Two types of analysis are made in this research:

1)   All regions: Where is added a dummy variable for each region
2)   Each region: Where is added a dummy variable that corresponds to economic activity branch

After estimate empirically the wage structure in the labor market with a pooled sample of skilled and unskilled workers of each segment and using the estimated wage structure for invidious of both collectives as decomposition reference, skilled-unskilled average wage gap (Δ) could be decomposed as follows:

$$\Delta = (\bar{W}^c - \bar{W}^{nc}) = (\bar{X}^c - \bar{X}^{nc})\hat{\beta}^* + \left\{ \bar{X}^c(\hat{\beta}^{nc} - \hat{\beta}^*) + \bar{X}^c(\hat{\beta}^* - \hat{\beta}^{nc}) \right\} (2)$$

Where $\bar{W}^c$ and $\bar{W}^{nc}$ are the skilled and unskilled average wage; $\bar{X}^c$ and $\bar{X}^{nc}$ are the average observed characteristics of invidious for both collectives and $\hat{\beta}^c$, $\hat{\beta}^{nc}$ and $\hat{\beta}^*$ are regression estimated coefficients from the explicative variables.

The first component on the equation's right side (2) represents the effect on the average wage gap caused by differences in the characteristics (component classified as "explained"), while the second corresponds to the coefficients effect (component classified as "non-explained"). It is necessary to remark that this procedure obtains detailed decomposition (perceiving the contribution of each individual explained component to wage gap, remarking the differences between the associated effects to endowments and returns). To avoid the identification inconvenient that comes with this kind of decomposition, equation's estimation has adopted the dummy variable normalization strategy suggested by Yun (2005). A proper estimation for real contribution of each variable to return component of decomposition is allowed with this strategy.

Alternative use of wage structure of skilled and non-skilled workers permits to use all the available information to estimate the wage returns and corresponds to a more natural approximation of a non-discriminatory wage structure of a country.

After the estimation of the wage structure for 2005 with the pooled sample of skilled-unskilled workers, skilled workers (c) average wage could be represented separately as:

$$\hat{w}_{05}^c = \bar{X}_{05}^c \hat{\beta}_{05} + \sigma_{05}\hat{\theta}_{05}^c \qquad (3)$$

Where $\hat{w}_{05}^c$ is the skilled workers average wage; $\bar{X}_{05}^c$ is a vector that contains the average simple value of individual characteristics of skilled workers; $\hat{\beta}_{05}$ is the estimated pooled parameter vector for skilled and unskilled workers from equation (1); $\hat{\theta}_{05}^c$ is the skilled workers standardized average wage residue; σ_{05} is the standard deviation of the skilled-unskilled workers pooled sample; Equation (3) would have its equivalent for unskilled workers (nc).
It is used the pooled estimated wage structure for skilled-unskilled workers as decomposition referential wage structure. The difference in the skilled-unskilled average hourly wage for 2005 (D_{05}) could be expressed as:

$$D_{05} = \bar{w}_{05}^c - \bar{w}_{05}^{nc} = (\bar{X}_{05}^c - \bar{X}_{05}^{nc})\hat{\beta}_{05} + (\bar{\theta}_{05}^c - \bar{\theta}_{05}^{nc})\sigma_{05} = \Delta\bar{X}_{05}\hat{\beta}_{05} + \Delta\bar{\theta}_{05}\sigma_{05} \quad (4)$$

Operator Δ indicates the difference between skilled and unskilled workers in the average of the variable. As in Oaxaca-Blinder decomposition, equation (4) allows identifying the contribution of explained and non-explained characteristics to the wage gap between skilled and unskilled workers for 2005. While the first expression shows the explained part, the rest of the terms are related with the non-explained part. The second term shows the effect of the difference in standardized average wage residue of the workers qualification (skilled and unskilled, related with factors as non-observed ability and others non-observed characteristics)$(\bar{\theta}_{05}^{c} - \bar{\theta}_{05}^{nc})$, and multiplied by the residues distribution dispersion (σ_{05}) determines the wage penalization of the lowest positioned collective in the residues distribution. If equation (4) is adapted to explain the wage gap by qualification for the year 2014 and it's subtracted the new equation to the last one, it's found that variation of qualification wage gap between 2005 and 2014 could be expressed as:

$$D_{14} - D_{05} = (\Delta\bar{X}_{14} - \Delta\bar{X}_{05})\hat{\beta}_{14} + \Delta\bar{X}_{05}(\hat{\beta}_{14} - \hat{\beta}_{05}) + (\Delta\bar{\theta}_{14} - \Delta\bar{\theta}_{05})\sigma_{14} + \Delta\bar{\theta}_{05}(\sigma_{14} - \sigma_{05}) \quad (5)$$

According to equation (5) the change in the magnitude of qualification wage gap between the two years may be due to four factors: First possibility is that skilled-unskilled relative productive characteristics endowments are modified. Second possibility is economy's wage gap structure is modified. Third possibility is possible changes in the relative effect of non-observable factors that approaches or moves away the average wage residues of workers qualification. Fourth and last possibility is the existence of modification on the dispersion wages residues and, as a consequence, in the associated penalization to the difference in the average standard residues. Components in decomposition methodology could be divided between the ones that have a nature of specific qualification (first and third component). Alternatively, the addition of first and second components corresponds to the associated factors pooled to the productive characteristics in experimented changes by the qualification wage gap and the addition of the third and fourth component to the pooled effect of non-observable factors.

4. Wage gap decomposition 2005-2009-2014

This section shows the results of the methodology Juhn-Murphy-Pierce (1991, 1993) about the wage gap decomposition by labor qualification, identifying the changes in wage gap during the study period. The upper side of table 1 shows the wage gap for the corresponding year, as the decomposition where it can be observed the part explained by characteristics and the wage's residues that correspond to the non-explained part (where a positive value indicates a favorable situation for unskilled workers). The bottom side of the table 1 shows the variations of the wage gap in the sub periods 2005-2009 and 2009-2014, for the complete sample, where it can be observed that in both periods exist a decreasing in the wage gap, however, it can be noted that this decreasing was more important for 2005-2009. Desegregation in temporal variations between the explained and non-explained part allows observing that for first period (2005-2009) the observable characteristics were the determinants of wage gap and for second period (2009-2014) the non-observable characteristics were more important. The productive differences in dotation of productive characteristics between skilled and unskilled workers were reduced in almost 50 percent.

Table 1: Juhn-Murphy-Pierce wage gap decomposition. Skilled and unskilled workers Mexico's labor market, third quarter 2005, 2009 & 2014.

	2005	2009	2014
Wage gap by qualification	-0.56325	-0.484113	-0.447284
Observed characteristics	-0.2342461	-0.1838789	-0.1860597
Wage residues	-0.3290039	-0.300234	-0.2612243
Differences	0.079137		0.036829
Explained	0.0503671		-0.0021808
Non-explained	0.0287699		0.0390098
Quantities (Q)	0.0245559		0.0183063
Princes (P)	0.0046246		0.0209238
QP	-0.0004106		-0.0002202

Source: Own elaboration with data of ENOE. Third quarter 2005, 2009 & 2014

The table 2 shows the decomposition of the explained part by productive characteristics in Mexico's labor market. It can be observed that for 2005-2009 the characteristics are based mostly in the quantities (0.02455) and not in prices (0.00462). In this period the most valuable variables are the years of education (0.0784), full-time job (0.01576) and work in professional, financial and corporative services (0.00818). For 2009-2014 it seems to be most important work in social services (0.03218), work in professional, financial an corporative services (0.01459)

Table 2: Detail of decomposition of explained part for charcteristics in Mexico's labor market
Third quart 2005-2009 and 2009-2014.

México	2005-2009				2009-2014			
	E	Q	P	QP	E	Q	P	QP
Total	0.050367	0.024555	0.004624	-0.000410	-0.002180	0.008102	-0.008458	-0.001824
Years of education	0.078406	0.011976	0.069385	-0.002955	-0.009460	0.009823	-0.020266	0.000982
Experience	-0.035872	0.016221	-0.048366	-0.003727	-0.005859	-0.008316	0.002580	-0.000122
Experience2	0.014289	-0.012630	0.024691	0.002228	-0.002027	0.001230	-0.003290	0.000032
Gender	-0.002069	-0.000169	-0.001925	0.000025	-0.002511	-0.001131	-0.001539	0.000159
Full-Time	0.015765	0.015796	-0.000263	0.000233	0.003974	0.004106	0.000137	-0.000269
High-Exposure Region	0.000652	0.006257	-0.002445	-0.003159	-0.000398	-0.001310	0.001197	-0.000285
Middle-Exposure Region	0.000768	-0.000616	0.000285	0.001098	0.000432	-0.000288	0.001372	-0.000651
Electricity and extractive industry	0.002854	0.002023	0.001310	-0.000480	-0.000670	-0.000713	0.000033	8.91E-06
Manufacturing Sector	-0.017661	-0.006335	-0.013451	0.002125	-0.007444	-0.000148	-0.007345	0.000048
Construction	-0.007856	-0.000711	-0.007276	0.000130	-0.008584	0.001402	-0.009564	-0.000422
Commerce	-0.000981	0.003857	-0.003188	-0.001650	-0.005168	-0.001513	-0.004771	0.001116
Hostelry Services	-0.002384	0.004275	-0.005088	-0.001572	-0.003154	0.000932	-0.003778	-0.000307
Transports, communications, mail and storage	0.000462	0.000885	-0.000159	-0.000263	0.000301	0.000934	-0.000326	-0.000305
Professional, financial and corporative services	0.008183	-0.001624	0.009381	0.000426	0.014596	-0.000128	0.014657	0.000068
Social services	0.006025	-0.003468	0.009155	0.000338	0.032184	0.010129	0.024934	-0.002879
Diverse services	-0.013353	-0.003416	-0.0108311	0.0008946	-0.0073086	-0.0017045	-0.0059672	0.000363
Government and government organizations	0.003139	0.002417	0.0007823	-0.0000604	-0.0010825	-0.0052035	0.0034785	0.000642

Source: Own elaboration with data of ENOE. Third quarter 2005, 2009 & 2014

Table 3 shows the wage gap in high-exposure region. The results mention that it exist a decreasing in the wage gap in 2009 and 2014, but it was most important in 2009. Decomposition indicates that wage gap corresponds mostly to the part non-explained by characteristics. With the analysis of variations in time of wage gap it can be observed that for both periods (2005-2009 and 2009-2014) the wage gap was reduced slightly due to non-explained factors. The explained part of variation is mostly influenced in 2005-2009 by quantities (Q), while for period 2009-2014 the quantities and prices have the same influence.

Table 3. Juhn-Murphy-Pierce wage gap decomposition.. Mexico High-Exposure's labor market
Third quarter 2005, 2009 & 2014.

	2005	2009	2014
Wage gap by qualification	-0.5574791	-0.4655491	-0.4331792
Observed characteristics	-0.2626961	-0.225636	-0.2225039
Wage residues	-0.294783	-0.2399131	-0.2106753
Differences	0.0919301		0.0323699
Explained	0.0370602		0.0031321
Non-explained	0.0548699		0.0292378
Quantities (Q)	0.0547654		0.0168465
Princes (P)	0.0020062		0.0145654
QP	-0.0019017		-0.002174

Source: Own elaboration with data of ENOE. Third quarter 2005, 2009 & 2014

Table 4 reveals explained components of human capital. It can be observed here that most of the explained part is mostly influenced by quantities (0.0348). It can be found as elements that have influence in quantities transformations for 2005-2009: years of education (0.01845), experience (0.01691) and full-time job (0.01563). In period 2009-2014 it can be observed that human capital variables are explained by quantities (work in social services (0.00819) and years of education (0.006464)) and by prices (social services (0.03352), professional, financial and corporative services (0.01097) and government and governmental organizations (0.00987).

Table 4: Detail of decomposition of explained part for characteristics in Mexico High Exposure Region Third quart 2005-2009 and 2009-2014.

High-Exposure	2005-2009				2009-2014			
	E	Q	P	QP	E	Q	P	QP
Total	0.037060	0.034873	0.006052	-0.003864	0.003132	0.010514	-0.006055	-0.001326
Years of education	0.057547	0.018455	0.041547	-0.002455	0.003714	0.006464	-0.002821	0.000071
Experience	-0.009192	0.016914	-0.024043	-0.002063	-0.030196	0.005875	-0.034977	-0.001093
Experience2	0.003065	-0.013989	0.015473	0.001582	0.020669	-0.002813	0.022998	0.000483
Gender	-0.001919	0.000122	-0.002024	-0.000017	-0.003327	-0.001198	-0.002362	0.000233
Full-Time	0.015647	0.015634	0.000123	-0.000109	-0.002690	-0.002285	-0.000185	-0.000218
Electricity and extractive industry	-0.000669	-0.001074	0.000307	0.000097	0.000923	0.000547	0.000434	-0.000058
Manufacturing Sector	-0.000892	-0.001923	0.001080	-0.000049	-0.012371	-0.000272	-0.012180	0.000081
Construction	0.005078	0.001333	0.003621	0.000124	-0.014147	-0.000837	-0.013567	0.000258
Commerce	-0.001427	-0.001281	-0.000205	0.000059	-0.002080	-0.001390	-0.001287	0.000597
Hostelry Services	-0.000442	0.000063	-0.000503	-2.09E-06	-0.006311	-0.000412	-0.006066	1.67E-04
Transports, communications, mail and storage	-0.001219	-0.000633	-0.000746	0.000160	0.000725	0.001150	-0.000255	-0.000169
Professional, financial and corporative services	0.006080	0.006725	-0.000813	0.000168	0.009978	-0.001699	0.010971	0.000706
Social services	-0.024093	-0.003064	-0.020222	-0.000806	0.038996	0.008195	0.033523	-0.002722
Diverse services	0.001501	-0.001287	0.002916	-0.000127	-0.011337	-0.001755	-0.010157	0.000574
Government and government organizations	-0.0120035	-0.0011217	-0.0104571	-0.0004248	0.010587	0.000946	0.009877	-0.000236

Source: Own elaboration with data of ENOE. Third quarter 2005, 2009 & 2014

Decomposition and changes in wage gap for middle-exposure region labor market is presented in table 5. It can be observed a reduction of wage gap during the complete period (0.0712 for 2005-2009 and 0.041 for 2009-2014). For period 2005-2009 the reduction of wage gap was due mostly by explained factors and for 2009-2014 was due by non-explicative factors.

Table 5: Juhn-Murphy-Pierce wage gap decomposition
Mexico Middle-Exposure's labor market Third quarter 2005, 2009 & 2014.

	2005	2009	2014
Wage gap by qualification	-0.5716595	-0.5004349	-0.4593765
Observed characteristics	-0.2167227	-0.1665347	-0.1667877
Wage residues	-0.3549367	-0.3339002	-0.292588
Differences	0.0712245		0.0410584
Explained	0.050188		-0.0002529
Non-explained	0.0210365		0.0413113
Quantities (Q)	0.0149968		0.0128952
Princes (P)	0.0065329		0.0277521
QP	-0.0004932		0.000664

Source: Own elaboration with data of ENOE. Third quarter 2005, 2009 & 2014

Elements that explain changes in human capital are explained in table 6. For 2005-2009 it can be observed that for quantity side (Q), full-time job, experience and years of education had influence in decreasing of the wage gap between skilled and unskilled workers. For price side (P), the factors that influenced the most were the years of education, social services and professional, financial and corporative services. For 2009-2014 the quantity side was influenced by social services, years of education and full-time job. Price side was influenced by experience, social services and financial, professional and corporative services.

Table 6: Detail of decomposition of explained part for characteristics in Mexico Middle-Exposure Region Third quart 2005-2009 and 2009-2014.

Middle-Exposure	2005-2009				2009-2014			
	E	Q	P	QP	E	Q	P	QP
Total	0.050188	0.025566	0.027345	-0.002723	-0.000252	0.011007	-0.006680	-0.004579
Years of education	0.090697	0.008821	0.084883	-0.003007	-0.024549	0.009197	-0.035829	0.002082
Experience	-0.059892	0.015704	-0.070345	-0.005252	0.021865	-0.013084	0.038279	-0.003329
Experience2	0.028414	-0.012071	0.037268	0.003217	-0.022678	0.003515	-0.027047	0.000853
Gender	-0.002670	-0.000490	-0.002266	0.000086	-0.002231	-0.001598	-0.000751	0.000118
Full-Time	0.015778	0.015896	-0.000923	0.000805	0.007924	0.008959	0.000386	-0.001421
Electricity and extractive industry	0.004456	0.003715	0.002071	-0.00133	-0.00121	-0.001649	0.000195	0.000243
Manufacturing Sector	-0.034313	-0.014880	-0.027766	0.008333	-0.007627	-0.000177	-0.007537	0.000087
Construction	-0.018511	-0.001211	-0.017773	0.000473	-0.009379	0.002036	-0.010614	-0.000801
Commerce	-0.004688	0.009865	-0.008648	-0.005905	-0.010633	-0.001319	-0.010770	0.001456
Hostelry Services	-0.0047575	0.009148	-0.0088435	-0.005062	-0.003744	0.001533	-0.0046431	-0.000634
Transports, communications, mail and storage	0.001856	0.002254	0.000478	-0.000876	0.000063	0.000775	-0.000318	-0.000393
Professional, financial and corporative services	0.017463	-0.008652	0.022399	0.003717	0.023889	-0.000024	0.023897	0.000016
Social services	0.033456	-0.005150	0.037088	0.001518	0.042128	0.014377	0.032870	-0.0051194
Diverse services	-0.033217	-0.0060305	-0.030065	0.002878	-0.009902	-0.002089	-0.008403	0.000589
Government and government organizations	0.016115	0.008647	0.009789	-0.0023213	-0.0041687	-0.0094461	0.003604	0.001672

Source: Own elaboration with data of ENOE. Third quarter 2005, 2009 & 2014

In table 7 is showed the wage gap for low-exposure region. It can be observed that in this region the skilled-unskilled wage gap has been reduced, however in this region the wage gap seems to be higher than others regions.
It is found that transformation in wage decomposition is influenced by the non-explained part for 2005-2009 and 2009-2014.

Table 7. Juhn-Murphy-Pierce wage gap decomposition
Mexico Low-Exposure's labor market Third quarter 2005, 2009 & 2014.

	2005	2009	2014
Wage gap by qualification	-0.5762866	-0.4984508	-0.4660622
Observed characteristics	-0.2747908	-0.2156631	-0.2082763
Wage residues	-0.3014958	-0.2827878	-0.2577859
Differences	0.0778358		0.0323886
Explained	0.0591278		0.0073868
Non-explained	0.0187081		0.0250019
Quantities (Q)	0.0062301		0.0123847
Princes (P)	0.0133332		0.0140111
QP	-0.0008553		-0.001394

Source: Own elaboration with data of ENOE. Third quarter 2005, 2009 & 2014

Table 8 shows the detailed information of variables that explain productive attributes in both periods of analysis. For 2005-2009 the price (P) is the most influential factor and for 2009-2014 the changes in quantities (Q) are the most important. For the first period, years of education (0.06719), divers services (0.01473) and hostelry services.

For period second period, years of education (0.01489), full-time job (0.00293) and gender (0.00232) are the most important factors in this period.

Table 8: Detail of decomposition of explained part for characteristics in Mexico Low-Exposure Region Third quart 2005-2009 and 2009-2014.

Low-Exposure	2005-2009				2009-2014			
	E	Q	P	QP	E	Q	P	QP
Total	0.059127	0.029798	0.038673	-0.009344	0.007386	0.015728	-0.008165	-0.000175
Years of education	0.078771	0.014372	0.067193	-0.002794	0.039646	0.014895	0.026214	-0.001463
Experience	-0.017925	0.022820	-0.037443	-0.003303	-0.045505	-0.011183	-0.035993	0.001671
Experience2	-0.006954	-0.018738	0.010545	0.001238	0.017767	-0.000178	0.017926	0.000019
Gender	0.000487	0.001525	-0.000878	-0.000160	0.000523	0.002321	-0.001423	-0.000374
Full-Time	0.012275	0.012314	0.000688	-0.000727	0.002945	0.002936	1.69E-06	8.01E-06
Electricity and extractive industry	0.002134	0.002564	-0.000642	0.000212	-0.000455	0.001041	-0.001837	0.000340
Manufacturing Sector	0.004709	-0.000074	0.004918	-0.000134	-0.001338	-0.000949	-0.000445	0.000057
Construction	0.002719	-0.003901	0.007830	-0.001210	0.002601	0.004336	-0.001501	-0.000232
Commerce	0.000651	3.47E-06	0.000287	0.00036	-0.000220	-0.000480	0.000978	-0.000718
Hostelry Services	0.001626	0.000425	0.001094	0.000107	0.002171	0.000636	0.001387	0.000148
Transports, communications, mail and storage	0.000950	0.000734	0.000085	0.000130	0.000328	0.000102	0.000211	0.000015
Professional, financial and corporative services	-0.005379	-0.000101	-0.005074	-0.000203	0.002559	0.000529	0.002175	-0.000145
Social services	-0.012375	-0.000367	-0.011884	-0.000123	-0.012318	0.000307	-0.012708	0.000082
Diverse services	0.013318	-0.000156	0.014738	-0.001262	0.005668	0.0001178	0.005507	0.000042
Government and government organizations	-0.0158811	-0.0016227	-0.0127861	-0.0014723	-0.0069874	0.001297	-0.0086591	0.0003747

Source: Own elaboration with data of ENOE. Third quarter 2005, 2009 & 2014

5. Conclusions

Wage inequality has been analyzed since classical economics; however, this subject lost relevance compared with others political, economic and social problems. In recent years, wage disparity has returned to be an important topic in economic science, due to the increase of inequality around the world. Economic science has worked in new techniques for analyze inequality, searching solid, objective and complete methodologies for addressing the problem. As described previously, it is necessary to go further in study of inequality, measuring the evolution and causes of wage gap, in this case between skilled and unskilled workers. The present paper gives interesting results:

Hypothesis is partially applied due to decreasing in wage gap during study period, however, the results are not exactly what was postulated in Stolper-Samuelson theorem, where wage of unskilled workers would be increased; results shows that unskilled worker's wages has been reduced during study period, so, the most important factor has been the significant decreasing of skilled worker's wages. The hypothesis also expected that it would be an increasing of skilled workers, at least in High-Exposure to international trade openness; contrary to the previous statement, skilled workers wages has decreased significantly. It can be observed that in all regions skilled-unskilled wage gap has been reduced, however, it exist a gap among regions, having the highest wage the High-Exposure region.

It can be concluded that wage inequality between skilled and unskilled workers in the recent period has been reduced, however, it must be noted that Stolper-Samuelson theorem is partially applied. It can be also observed that there is a wage difference among regions, with no important changes in this structure during the study period.

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