

UNIVERSIDAD SAN FRANCISCO DE QUITO USFQ

Colegio de Administración y Economía

**Determinants of labor income inequality in emerging markets: Evidence
from Ecuador**

Andrea De Los Ángeles Velasco García

Economía

Trabajo de titulación presentado como requisito

para la obtención del título de

Economista

Quito, 15 de mayo de 2021

UNIVERSIDAD SAN FRANCISCO DE QUITO USFQ
COLEGIO DE ADMINISTRACIÓN Y ECONOMÍA

**HOJA DE CALIFICACIÓN
DE TRABAJO DE FIN DE CARRERA**

**Determinants of labor income inequality in emerging
markets: Evidence from Ecuador**

Andrea De Los Ángeles Velasco García

Nombre del profesor, Título académico: Carlos Uribe-Terán, Ph.D.

Quito, 15 de mayo de 2021

Derechos de Autor

Por medio del presente documento certifico que he leído todas las Políticas y Manuales de la Universidad San Francisco de Quito USFQ, incluyendo la Política de Propiedad Intelectual USFQ, y estoy de acuerdo con su contenido, por lo que los derechos de propiedad intelectual del presente trabajo quedan sujetos a lo dispuesto en esas Políticas.

Asimismo, autorizo a la USFQ para que realice la digitalización y publicación de este trabajo en el repositorio virtual, de conformidad a lo dispuesto en el Art. 144 de la Ley Orgánica de Educación Superior.

Nombres y Apellidos: Andrea De Los Ángeles Velasco García

Código: 00201798

Cédula de Identidad : 0604577114

Lugar y fecha: Quito, 15 de mayo de 2021

ACLARACIÓN PARA PUBLICACIÓN

Nota: El presente trabajo, en su totalidad o cualquiera de sus partes, no debe ser considerado como una publicación, incluso a pesar de estar disponible sin restricciones a través de un repositorio institucional. Esta declaración se alinea con las prácticas y recomendaciones presentadas por el Committee on Publication Ethics COPE descritas por Barbour et al. (2017) Discussion document on best practice for issues around theses publishing, disponible en <http://bit.ly/COPETHeses>.

UNPUBLISHED DOCUMENT

Note: The following capstone project is available through Universidad San Francisco de Quito USFQ institutional repository. Nonetheless, this project – in whole or in part – should not be considered a publication. This statement follows the recommendations presented by the Committee on Publication Ethics COPE described by Barbour et al. (2017) Discussion document on best practice for issues around theses publishing available on <http://bit.ly/COPETHeses>.

AGRADECIMIENTOS

Quiero empezar agradeciendo a mis papis, que han sido un apoyo incondicional durante estos años. Por creer en mí y siempre impulsarme a ser mejor. A mis ñaños Vale y Alex, por estar a mi lado, motivarme y vivir conmigo cada etapa de mi vida universitaria.

Sin duda alguna, esta carrera no hubiese sido la misma sin el apoyo de todos mis amigos y compañeros de universidad. Gracias a mis profesores por hacer de estos 4 años un proceso de crecimiento académico y personal. Finalmente, gracias a Carlitos por su guía en este trabajo. Por enseñarme que una persona puede experimentar todas las emociones existentes con un solo trabajo de investigación.

Esta tesis es un agradecimiento a mi abuelita Leti. Por haber sido el ejemplo más grande de dedicación, esfuerzo y amor.

RESUMEN

En esta investigación analizo los determinantes de la desigualdad de ingreso en Ecuador. Con este fin, utilizo la información de ENEMDU de los años 2004 a 2017. Luego de aplicar un método de descomposición de la varianza en un componente de dispersión entre y dentro de grupos logro encontrar que, para el caso de Ecuador, el nivel de educación y la estructura del mercado laboral explican la desigualdad de ingreso más que las características demográficas de los individuos.

Palabras clave: Ecuador, ENEMDU, desigualdad de ingreso, varianza del ingreso, descomposición, determinantes, características demográficas, estructura del mercado laboral.

ABSTRACT

In this paper, I analyze the determinants of income inequality in Ecuador. To do this, I use the ENEMDU data set information from 2004 to 2017. After applying a variance decomposition method in a between and a within group dispersion component, I find that, for the case of Ecuador, education and labor market structure explain income dispersion between individuals more than demographic characteristics.

Keywords: Ecuador, ENEMDU, income inequality, variance of income, decomposition, determinants, demographic characteristics, labor market structure.

TABLE OF CONTENTS

LIST OF FIGURES	9
LIST OF TABLES	10
1 Introduction	11
2 Methodology	13
3 Data	14
3.1 Descriptive statistics	15
4 Results	20
4.1 Education level	22
4.2 Market structure	27
5 Conclusions	30
6 References	32

LIST OF FIGURES

1	Descriptive statistics of wages	16
2	Mean of wages by gender	16
3	Descriptive statistics of wages by age	17
4	Descriptive statistics by labor sector	19
5	Variance decomposition by gender	21
6	Variance decomposition by level of education	23
7	Descriptive statistics by education level	24
8	Variance decomposition by education level for each gender	25
9	Between group component by education level along the life cycle	25
10	Variance decomposition by education level for each labor status	26
11	Variance decomposition by labor status	27
12	Variance decomposition by labor status for each gender	28
13	Informality along the life cycle	30

LIST OF TABLES

1	Average wage and composition of the labor market by level of education	18
2	Variance decomposition by gender conditioning on other characteristics	22
3	Variance decomposition by labor status for each level of education	30

1 Introduction

Ecuador is an unequal country. Between 2004 and 2017, annual wages had an average variance of 0.444. While some individuals earned over \$100,000 per year, others had annual salaries of around \$5,000 or less. These numbers show not only that labor income is very dispersed, but also the importance of paying attention to possible causes of this dispersion. With this said, what are the main drivers of income inequality in Ecuador?

To address this question, I use the *Encuesta Nacional de Empleo, Desempleo y Subempleo* (ENEMDU) data set information from 2004 to 2017 in order to determine the demographic characteristics that explain labor income inequality in Ecuador. To study the percentage of inequality that results from being part of a group of specific characteristics, I decompose the total variance of income in a between and a within group dispersion component. After applying this decomposition method, I find that, for the case of Ecuador, education level and labor status of individuals are the ones that explain income dispersion the most.

With this paper, I contribute to the existent literature in two ways. First, I use a variance decomposition method that allows me to see the dynamics of each characteristic's contribution to inequality. Second, I contribute to inequality determinants literature in Ecuador. By decomposing the variance of income in demographic and labor market characteristics, I show that for the case of Ecuador, variables related to labor market structure have more weight in determining inequality than demographic characteristics.

A broad investigation on income inequality determinants has been carried out over the

years. Bourguignon (1979), Shorrocks (1982) and Cowell (1988) are some of the pioneers in this subject. By dividing the population in subgroups, they analyze the contributions of each of them to inequality measures, such as the Gini and Theil's coefficients, the relative mean deviation, and the variance of income. Regarding the latter, Song. et al. (2014) use a variance decomposition method to decompose income dispersion between and within firms. Using data from the US, they find that earnings inequality of individuals occurs due to wage dispersion between firms more than dispersion within them. This methodology is the one used in this paper.

By applying the analysis of inequality determinants to different countries, some of the findings suggest that the major determinants of wage dispersion are education level (Buscha & Dickson, 2015; Budría & Telhado, 2005; Gong et al., 2004) and labor status of individuals (Binelli & Attanasio, 2010; Amarant, Arim & Yapor, 2016; Chong & Gradstein, 2007) . Additionally, vast research on specific factors as determinants of income inequality has been done, regarding gender (Papps, 2004; Chevalier, 2006; Chantreuil & Lebon, 2015) and the role of the life cycle (Kaplan, 2012; Zhu, 2013)

In Ecuador, even though understanding the dynamics of income inequality has been the center of attention for many researchers (Sarmiento, 2017; Ponce, 2011), only a small amount of literature focuses on decomposing it. Some investigations decompose income inequality by income source (Ramírez y Díaz, 2016; Aristizábal-Ramírez, M. et al.,2015), region (Proaño, 2012), and gender (Aglante et al. 2017).

The remaining sections of the paper are organized as follows. In section 2, I explain the

methodology used to decompose the variance. Section 3, describes the data set and provides descriptive statistics. Section 4, presents the results, and Section 5 concludes and lists some implications for future analysis.

2 Methodology

Consider the equation that describes the annual wage of an individual i that belongs to a group j in a year t :

$$w_t^{i,j} = \bar{w}_t^A + [\bar{w}_t^j - \bar{w}_t^A] + [w_t^{i,j} - \bar{w}_t^j], \quad (1)$$

where \bar{w}_t^A is the average annual wage earned in the economy in a year t , and \bar{w}_t^j accounts for the average annual wage earned by a specific group or sector of the economy in the same year.

Reordering equation (1) I can write:

$$w_t^{i,j} - \bar{w}_t^A = [\bar{w}_t^j - \bar{w}_t^A] + [w_t^{i,j} - \bar{w}_t^j], \quad (2)$$

Now, I get the total sums of each difference in order to have information about dispersion for every individual i in a group j , and for every group j in the complete sample:

$$\sum_{j=1}^J \sum_i^{N_j} (w_t^{i,j} - \bar{w}_t^A)^2 = \sum_{j=1}^J \sum_i^{N_j} [\bar{w}_t^j - \bar{w}_t^A]^2 + \sum_{j=1}^J \sum_i^{N_j} [w_t^{i,j} - \bar{w}_t^j]^2 \quad (3)$$

Notice that by solving sums in equation (3) I can get the variance multiplied by the size of the sample as follows:

$$N\text{var}_i(w_i^{i,j}) = \sum_{j=1}^J N_j [\bar{w}_i^j - \bar{w}_i^A]^2 + \sum_{j=1}^J N_j \text{var}(w_i^{i,j} | i \in j). \quad (4)$$

where N_j accounts for the total individuals that belong to a specific group j .

Now, I divide both sides of equation (4) by N to get the final decomposition,

$$\text{var}_i(w_i^{i,j}) = \text{var}_j(\bar{w}_i^j) + \sum_{j=1}^J P_j * \text{var}_i(w_i^{i,j} | i \in j), \quad (5)$$

where $P_j = N_j/N$ denotes the weight of a group j compared to the total population N .

The first term in equation (5) accounts for the between group dispersion, while the second term shows the within group dispersion.

3 Data

I use the *Encuesta Nacional de Empleo, Desempleo y Subempleo* (ENEMDU) compiled by the National Institute of Census and Statistics INEC, for its acronym in Spanish. The main goal of the ENEMDU data base is to compile information about the labor market, labor status of the

economy, main income source and economic activity of the citizens that can be desegregated by demographic characteristics.

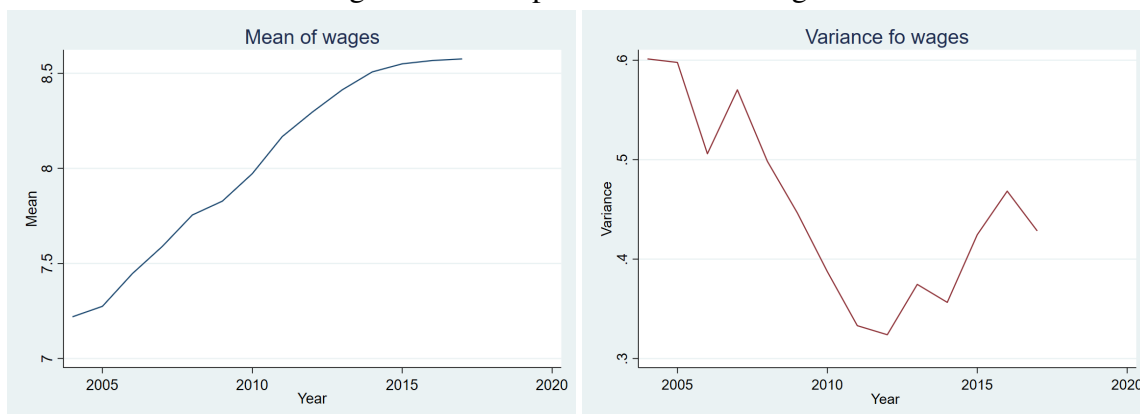
Even though ENEMDU provides quarterly information, in this paper I only use the December waves because those are the ones that contain more observations. In this specific work, I use the data from 2004 to 2017. This information accounts for people between 20 and 65 years old that live in urban areas and belong to the economically active population. This leaves me with a total of 71,744 observations.

3.1 Descriptive statistics

As a measure of earnings, I use the annual wage earned by dependent workers. Then, I adjust it by the annual inflation and obtain its logarithm. Figure 1 shows the descriptive statistics of the logarithm of annual wages. On the left, one can see the dynamics of the mean wage while on the right, I show the variance of income throughout the years. As it is shown, even though mean wages have increased over the years, the increase has become smaller since 2012. On the other hand, the total variance of income had started to decline around 2007, which is the year when the price of a barrel of crude oil had a peak. This increase in national income also led to considerable social spending and cash transfers to individuals. Afterwards, in 2012, income dispersion started to increase again. Within that year, the percentage of economic growth started to decrease.

Regarding demographic characteristics, one of my variables of interest is gender. As shown in the left panel of Figure 2, the curves of mean income for each gender have increased

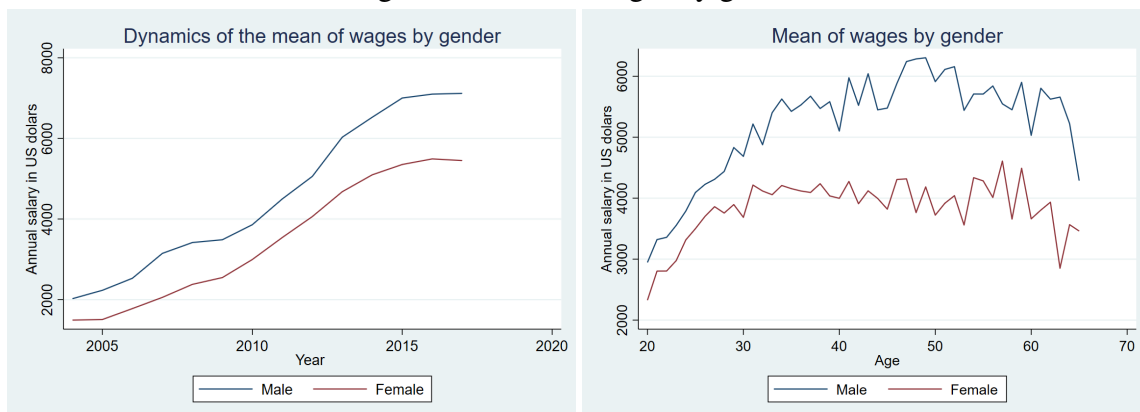
Figure 1: Descriptive statistics of wages



over the years; however, the gap has slightly fluctuated in some years. Now, when looking at how mean wages behave along the life cycle for each gender, one can see that the curves are different for men and women. For women, the maximum average wage is reached at the age of 30; at an average of 4000 US dollars per year. In contrast, mean wage for men increases until the age of 50; with an average annual salary of 6000 US dollars.

Another reason why gender is an interesting factor to analyze is the composition of the labor market. While 54% of the male labor force belongs to the private formal sector, only 46.9% of women have a formal job.

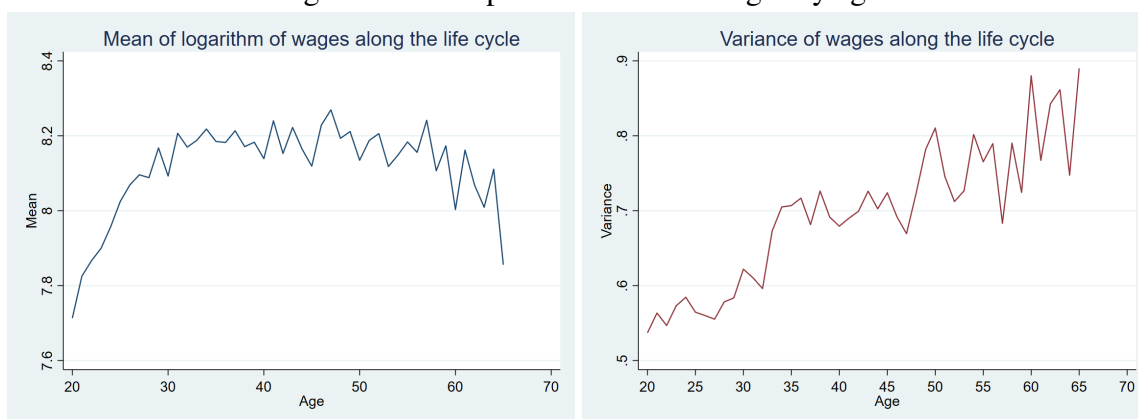
Figure 2: Mean of wages by gender



The next demographic variable I use in this analysis is age. In this case, I group agents

in 5 year intervals. Figure 3 shows both, the mean and the variance of wages along the life cycle. As one can see, even though the mean behaves similar for almost every age, the contrary happens when looking at the variance. As can be noted, income dispersion increases with age. Also, because I have information for individuals in different years, I divide them according to their year of birth. To do this, I define *cohort* which results from the difference between the year of the sample and the age of the individual. Then, I group individuals born every five years from 1936 to 2000. This last division allows me to compare people with the same age in different years.

Figure 3: Descriptive statistics of wages by age



Additionally, as previous literature has found, variables related to education and labor status of an individual are important determinants of wage inequality (Amarante, et al., 2016). I use two specific variables for this decomposition. To analyze the effects of schooling on the determination of income dispersion, I divide the population in 4 groups. The first group accounts for people who have reached basic education (10 years of formal education) or less. The second group accounts for individuals that have reached any year between basic education and high school (11 to 13 years of formal education). The third group includes people that have any kind of tertiary education which means, associates or bachelors degrees. The last group accounts for people who have reached eighteen years of schooling or more which includes

more than one bachelor degree, a masters degree or a Ph.D.

To understand the importance of using this variable, the first column of Table 1 shows the average logarithm of wages earned by each group of education level. Also, the second and third columns, show the education level composition of each sector of the labor market respectively. In this regard, it is important to notice how both sectors of the market are mostly composed by people with a secondary level degree or less.

Table 1: Average wage and composition of the labor market by level of education

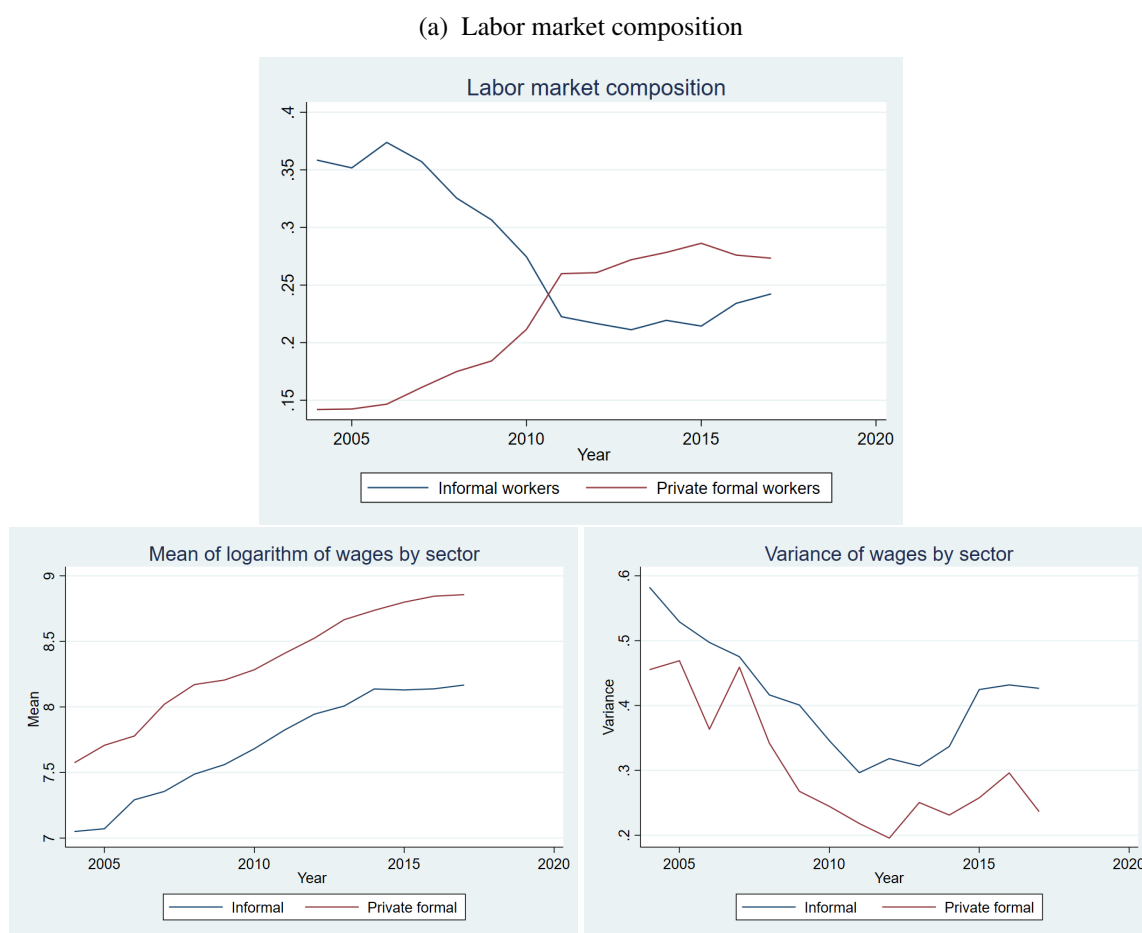
Level of education	Logwage	Formal private	Informal
Basic or less	7.792	0.206	0.425
High school or less	8.095	0.461	0.452
College or less	8.503	0.289	0.109
More than college	8.820	0.043	0.012

Another very important variable that I use to decompose the variance of income is the labor status of the worker. In Ecuador, it is well known that one of the biggest problem in the labor market is informality. To see how this has behaved over the years, panel A of Figure 4, shows the dynamics of the labor market composition. In this matter, it is important to mention that even though ENEMDU provides complete information about the labor market, the sample used in this paper includes informal and private formal workers only. As can be noted, even though the participation of informal workers in the labor market has decreased over the last years, it still represents a significant part of the labor market.

To analyze the wage gap between both sectors of the market, panels B and C of Figure 4 show the descriptive statistics of each sector. On the left, one can see the dynamics of the mean wage, while on the right, I show the wage dispersion of each sector. As can be noted, even though the mean wage has increased for informal and private formal workers, over the

last years, the gap has started to rise. In addition, the variance figure shows not only that wage dispersion is higher in the informal sector, but also that it began to increase around 2012, which as mentioned before, is the year when the percentage economic growth started to decrease.

Figure 4: Descriptive statistics by labor sector

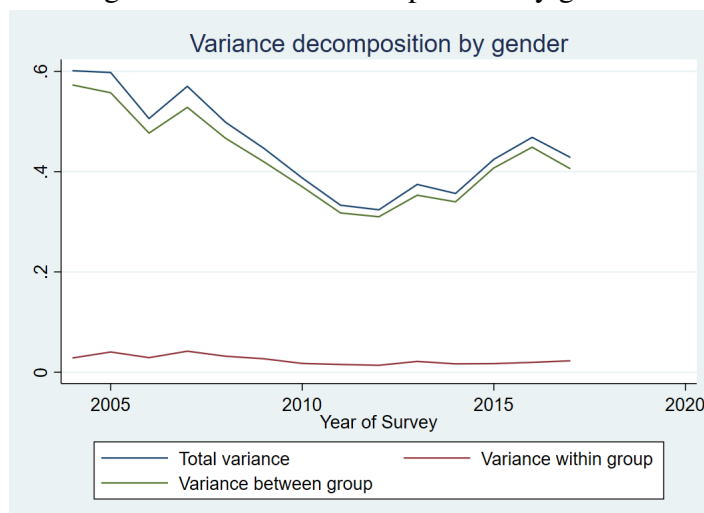


4 Results

Since the measure of inequality used in this paper is wage dispersion, I am interested in the portion of the variance that can be explained by the between group component. This means, I am interested in understanding the percentage of the total variance of income that is due to having a specific characteristic in the Ecuadorian economy.

First, I start by analyzing income dispersion caused by gender. Figure 5 shows the decomposition of the variance in a between group and a within group component regarding gender. As it is shown by the red line, on average, the between group part does not explain more than 10% of the total variance of income. This means, for the Ecuadorian economy, gender by itself is not a significant determinant of income inequality. As noted by previous researches (Papps, 2004), while income distribution between men and women is converging, the distribution within each group is becoming more dispersed. This can also be seen in the dynamics of the decomposition. By looking at the red line, one can see that even though it has almost maintained constant, since 2007, the between group component has lost more weight in the determination of inequality.

Figure 5: Variance decomposition by gender



A vast investigation on income inequality between men and women has been done over the years. Some of the most important findings show that a notorious part of wage inequality between genders is due to education and labor market characteristics (Papps, 2004).

To see how this happens in Ecuador, I condition the analysis of gender to subgroups of specific characteristics such as labor status and education level. As shown in Table 2, gender remains as a non determinant variable inside the informal and the private formal sector as it does not explain more than 10% of the total variance respectively. Also, when looking at gender inside each group of education level, one can see that the portion that can be explained by having an specific gender remains small. Having consistent results in each subgroup confirms that in Ecuador, wage inequality occurs within gender more than between men and women.

After analyzing wage dispersion among individuals of different gender, I focus on wages along the life cycle, specifically on the age of individuals. When talking about how age can explain income dispersion in the Ecuadorian economy, the results show that this variable is not

Table 2: Variance decomposition by gender conditioning on other characteristics

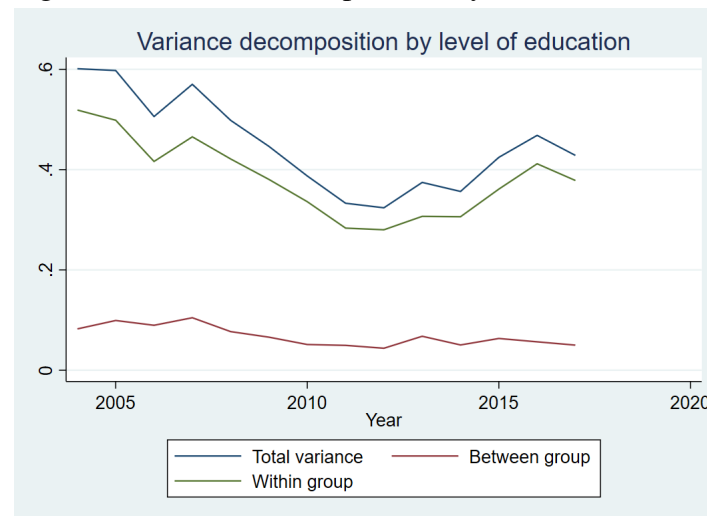
Labor status	Between group	Education level	Between group
Informal	7.906 %	Basic or less	10.765%
Formal private	1.975 %	High school or less	7.056%
		College or less	2.887%
		More than college	7.288%

a significant determinant. On average, being part of a specific group of age explains only 2% of the total variance of income. The same thing happens when decomposing by cohort where the between group component is, on average, 2.23%. This means not only that life cycle is not a determinant of income inequality, but also that the effects are controlled by the age of individuals and not by exogenous events that occurred in specific years.

4.1 Education level

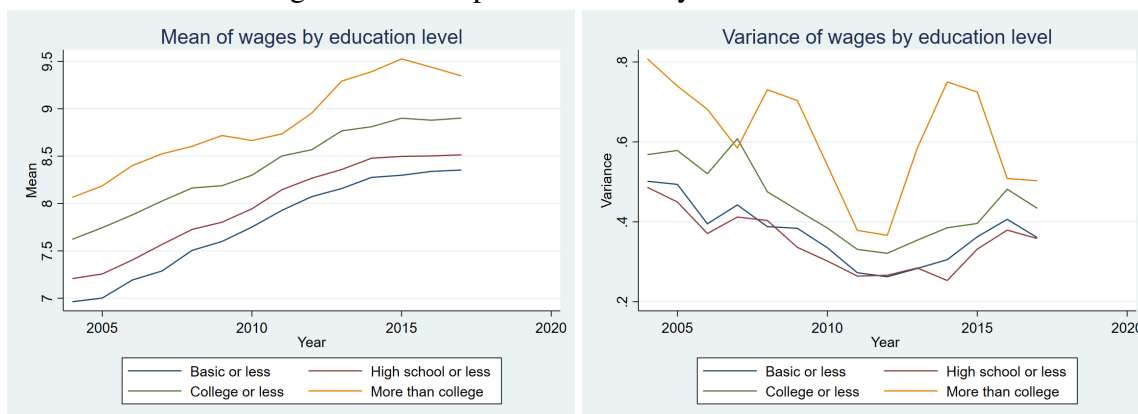
Consistent with the existent literature, results obtained from the variance decomposition by education level, show that in Ecuador, this characteristic is a considerable determinant of income inequality. As shown by the red line in Figure 6, the between group component accounts for an important part of the total variance. In percentage terms, education level explains on average 15.06% of the total wage dispersion. By looking at the dynamics of the decomposition, one can notice that around 2007, the between group component started to decrease. This means, since then, education level started to lose significance as an inequality determinant.

Figure 6: Variance decomposition by level of education



To confirm the effects of education on determining inequality, I examine how wages have behaved for each level of education. In this regard, Figure 7 shows the average logarithm and the variance of wages along the years. Here, we can see that even though both, the mean and the variance of wages have behaved almost similar for primary, secondary and tertiary education, the same does not happen for people with a fourth level degree. For this group, not only the mean has been more fluctuating, but also the variance has considerable changed over the years. Some investigations have shown that while returns to primary or secondary education behave equal for every quantile, the contrary happens for bachelor or master degrees (Budría & Telhado, 2005). Furthermore, one must consider the relation between high-skilled workers and individuals who have completed higher education programs.

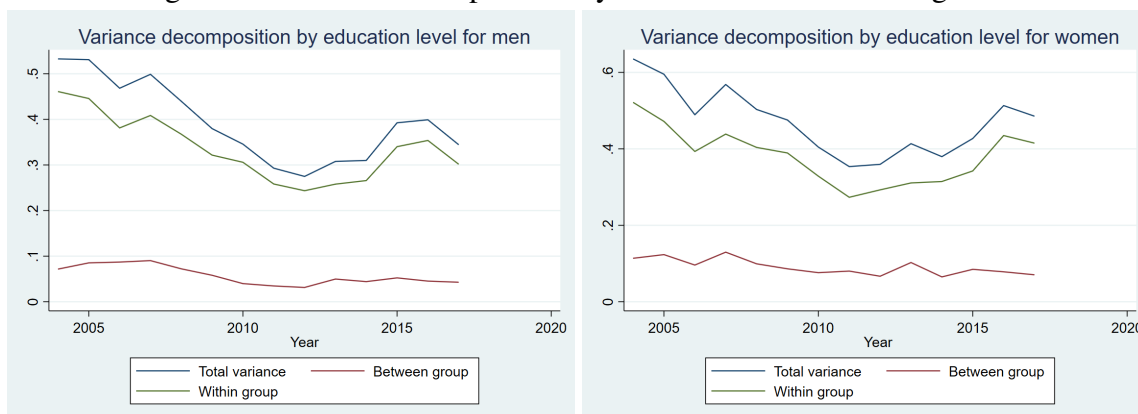
Figure 7: Descriptive statistics by education level



Given the importance of analyzing how education explains income dispersion among individuals of specific characteristics, I apply this analysis to each gender. Here, as shown in Figure 8, education as an inequality determinant behaves differently for men and women. On the left side, one can notice that not only total variance decreases when analyzing education among men, but also the between group component becomes smaller compared to the one obtained with all the labor market. On average, education level of individuals explains 14.58% of the total variance of income for men.

On the other side, when looking at education among women one can notice that, both, the total variance and the between group component increase. The latter explains, on average, 19.27% of the total wage dispersion. As has been shown by Papps (2004), returns to high levels of education are greater for women. In Ecuador, only 2.9% of the total female labor force has reached a fourth level degree and only 25% has gone to college. Furthermore, it is important to mention that even though the increase in schooling for women over the last year has helped to reduce the gap between men and women, it has acted as an important contributor to income inequality among women.

Figure 8: Variance decomposition by education level for each gender



Following the analysis of inequality explained by education level inside groups of specific characteristics, I now compute the variance decomposition for each group of age. As noted by Figure 9, the between group component increases along the life cycle. This means, the percentage of wage dispersion explained by education level is higher as individuals get older. This outcome shows that inequality due to education is not only a matter of schooling, but also a matter of the returns to experienced gained from education level.

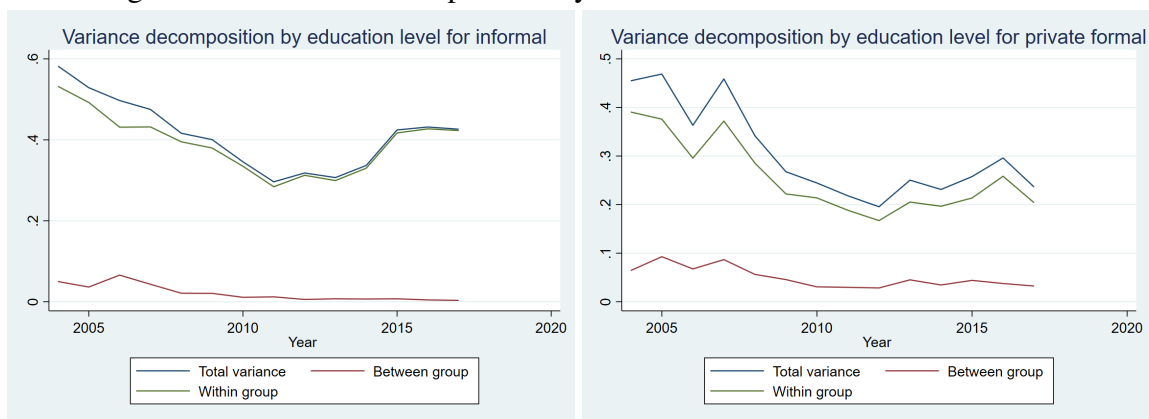
Figure 9: Between group component by education level along the life cycle



Now, when focusing on how education level explains wage inequality inside each sector of the economy, I obtain different results. Figure 10 shows that when applying the variance decomposition by education level inside the informal sector, the between group component explains on average only 5% of the total variance of income. This means, for the informal economy, education is not an important determinant of income inequality. In this sector, the demand of low skill jobs derives in returns for experience being more important than returns for education.

In contrast, when analyzing the decomposition inside the private formal market, education plays an important role on determining wage dispersion. On average, education explains 16.25% of the total variance of income. As mentioned by Gong et al. (2004), higher education levels, not only increase the probability of formal sector employment, but also increase returns to education attached to formal jobs.

Figure 10: Variance decomposition by education level for each labor status

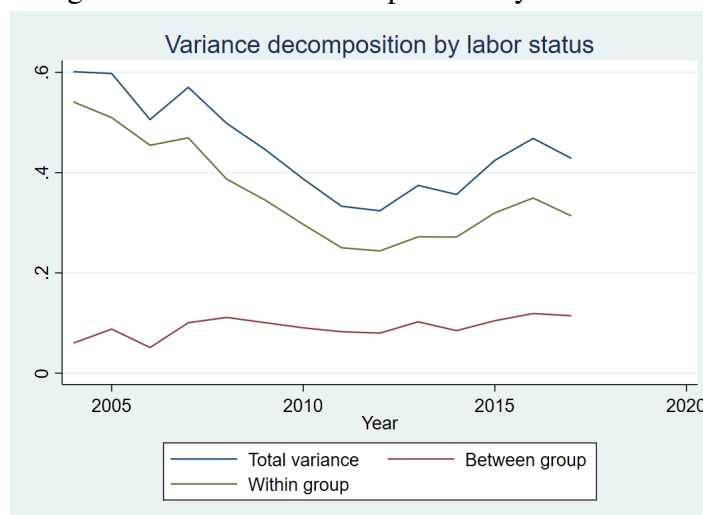


4.2 Market structure

In this subsection, I focus on the labor market structure. Informality as a driver of wages inequality is not something new. In Ecuador, it is well known that informality is an important problem, not only for the inequality that exists inside the sector, but also for the considerable amount of people that belong to it.

Figure 11 shows the decomposition of income variance by labor status. The red line accounts for the percentage of variance that can be explained by the labor sector to which the individual belongs to each year. On average, inequality due to belonging to the informal or private formal sector represents 20.04% of the total variance of income. From the variables that I have analyzed along this paper, labor status explains wage dispersion the most.

Figure 11: Variance decomposition by labor status



Becoming part of the formal sector implies incurring in many labor costs for both sides, the employer and the employee. For this reason, having a large informal sector might be under-

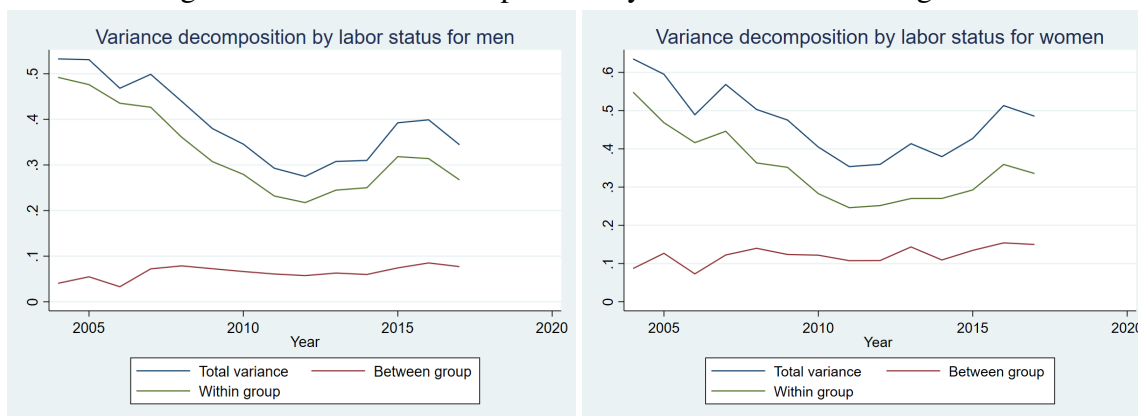
stood, not only as the result of a low formal labor demand due to the economic crisis, but also because many people decide to become informal workers after making a cost-benefit analysis.

Because labor status acts as a considerable determinant of income inequality when analyzing all the labor market, I now examine how labor status explains inequality inside groups of gender, age and education.

Figure 12 shows the same decomposition as before, but now separately for men and women. First, here is important to notice that total variance, represented by the blue line, is higher for women than for men. Also, the red line, that accounts for the between group component, remains as an important percentage of the total variance for both genders. For men, this means on average 16.22%, while for women it rises to 25.7% through out the years.

Regarding the latter, we should take into account that the presence of women in the Ecuadorian economy is higher in the informal sector where wages are, on average, lower and more dispersed. In addition, while the gap of the average logarithm of wages between sectors is 0.722 for men, it increases to 0.919 for women.

Figure 12: Variance decomposition by labor status for each gender

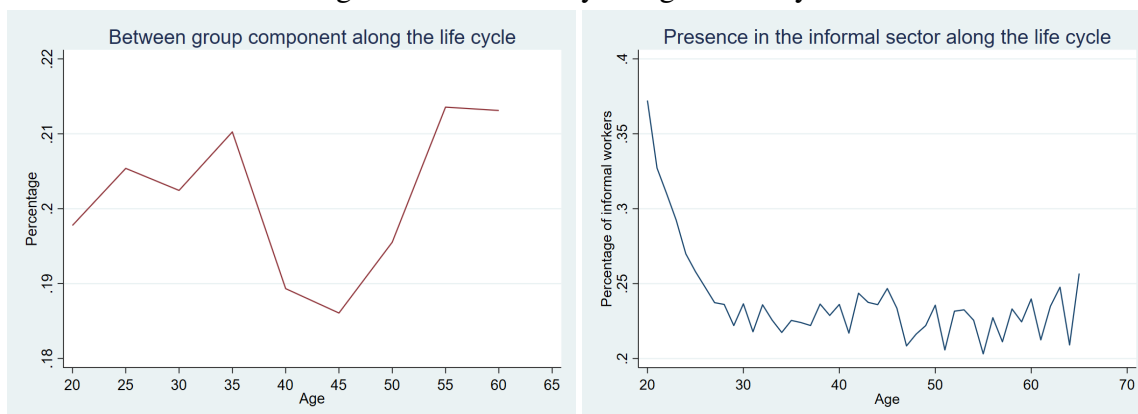


When focusing on the dynamics of this decomposition, one can see that the between group component has increased little over the years. It happens when considering all the labor market as well as when considering subgroups of gender. Clearly, even though the composition of the market is becoming more balanced between formal and informal workers, wages between and within each sector are becoming more dispersed.

With respect to the effect of labor status of individuals by conditioning to groups of age, I find that the between group component behaves differently along the life cycle. While for the first and last years of the working age labor status explains an important part of the total variance of income, it decreases for middle-aged people. To understand why this happens, Figure 13 shows the presence of individuals in the informal sector by age. As one can see, young individuals that are joining the labor force have a main presence in the informal economy. Also, even though the increase is very little, around the age of 60 years old one can notice that people start joining the informal sector again. Some reasons that explain this results are the lack of incentives to hire young people with no experience in the formal sector and the need of having an extra income after retirement. This results confirm what has been said by the existent literature about the positive relation between informality and income inequality (Chong & Gradstein,2007).

Finally, to conclude the analysis of labor sector as a determinant of inequality, I examine how it behaves in accordance to different groups of education level. As shown in Table 3, the between group component remains important for every level of education. However, the percentage of the variance explained by labor status conditioned on education level is lower than it is for the whole labor market. In this matter, we should take into account that by grouping

Figure 13: Informality along the life cycle



people by education level we are applying the analysis to more homogeneous samples. In addition, it is also important to notice that the between group component is higher for individuals with secondary education. This level of education has the biggest presence in both sectors of the market while the distributions of the others vary considerably between sectors.

Table 3: Variance decomposition by labor status for each level of education

Education level	Between group
Basic or less	14.79%
High school or less	17.27%
College or less	14.72%
More than college	9.57%

5 Conclusions

Along this paper, I analyzed income dispersion in Ecuador. By using the most complete data set of the country, ENEMDU, I was able to see how demographic characteristics such as gender, age, cohort, education level and labor status help to explain income dispersion among individuals. To do this, I stated an equation in which the annual wage of a person was a function of the average wage of the market and the average wage of the group which the individual belongs

to. This relation allowed me to decompose income variance in a between and a within group component, and look for the characteristics that have a larger percentage of between group dispersion.

After applying the decomposition to all the mentioned characteristics, I found that in Ecuador, education level and labor status of individuals are the ones that explain income dispersion between groups the most. By conditioning the analysis of these variables to groups of other demographic characteristics, I found that the importance of education as an inequality determinant increases along the life cycle, for private formal workers and when considering women only. Furthermore, the weight of labor status as a determinant of wage dispersion increases for young and female workers. In contrast, variables such as gender, age and cohort resulted to have a very low between group component. Thus, they do not explain income dispersion among individuals.

Even though this paper provides a basis to understand the main determinants of wage dispersion in Ecuador, a deeper research needs to be done in order to determine all the characteristics of individuals that explain income inequality between them. Some of the limitations of this paper have to do with the sample. As mentioned in Section 2, in this investigation, I use the information for urban informal and private formal workers only. By expanding the sample of analysis, one may be able to analyze income dispersion between living area and other categories of labor status. Additionally, another limitation of this methodology is that one cannot see the contribution of each category of a variable to the growth of the between group component.

6 References

Aaberge, R. & Mogstad, M. (2012). Inequality in current and lifetime income, Discussion Papers, No. 726, *Statistics Norway*.

Anglade, B. et al. (2017) Decomposing the Gender Wealth Gap in Ecuador. *World Development*
<http://dx.doi.org/10.1016/j.worlddev.2017.02.003>

Autor, D. et al. (2008). Trends in U.S. Wage Inequality: Revising the Revisionists. *Review of Economics and Statistics* 90 (2), 300–23.

Amarante, V., Arim, R. & Yapor, M. (2016). Decomposing inequality changes in Uruguay: the role of formalization in the labor market. *IZA J Labor Develop* 5(13).

Aristizábal-Ramírez, M. & Canavire, G. & Jetter, M. (2015). Income Inequality in Bolivia, Colombia, and Ecuador: Different Reasons. *IZA Discussion Papers no.9210*

Binelli, C. & Attanasio, O. (2010). Mexico in the 1990s: the Main Cross-Sectional Facts. *Review of Economic Dynamics*, 13(1), 238-264.

Bourguignon, F. (1979). Decomposable Income Inequality Measures. *Econometrica*, 47(4), 901. doi:10.2307/1914138.

Budría, S. & Telhado, P. (2005). Educational Qualifications and Wage Inequality: Evidence for

Europe. IZA Discussion Paper Series No: 1763, 16-32.

Buscha, F. & Dickson, M. (2015). The Wage Returns to Education over the Life-Cycle: Heterogeneity and the Role of Experience. *IZA Discussion Papers 9596*

Chantreuil, F. Lebon, I. (2015). Gender contribution to income inequality. *Economics Letters*, 133, 27–30. doi:10.1016/j.econlet.2015.05.009

Chevalier, A. (2006). Education, Occupation and Career Expectations: Determinant of the gender Pay Gap for UK Graduates. *Oxford Bulletin of Economics and Statistics*, 69, doi: 10.1111/j.1468-0084.2007.00483.x

Chong, A. & Gradstein, M. (2007). Inequality and informality. *Journal of Public Economics*, 91, 159-179.

Cowell, F. (1988). Inequality decomposition: Three bad measures. *Bulletin of Economic Research*, 40 309-312. doi.org/10.1111/j.1467-8586.1988.tb00274.x

Gong, X. et al. (2004): Mobility in the urban labor market: a panel data analysis for Mexico. *Economic Development and Cultural Change*.

Kaplan, G. (2012). Inequality and the life cycle. *Quantitative economics*, 3(3), 471-525.

Fortin, N., Lemieux, T., & Firpo, S. (2011). Decomposition methods in economics (working paper no.16045). *National Bureau of Economic Research*.

- Lerman, R. & Yitzhaki, S. (1985). Income inequality effects by income source: A new approach and applications to the United States. *The Review of Economics and Statistics*, 67(1), 151–156.
- Papps, K. (2004). Income Inequality and Gender in New Zealand, 1998-2003. *IZA Discussion Paper Series No: 1365*
- Ponce, J. (2011). Desigualdad del ingreso en Ecuador: un análisis de los años 1990s y 2000s. *Facultad Latinoamericana de Ciencias Sociales, Ecuador*
- Proaño, M. (2012). *Descomposición regional de la desigualdad en Ecuador*. (Tesis de maestría). Facultad Latinoamericana de Ciencias Sociales, Ecuador.
- Ramírez, J. & Díaz, J. (2017). Fuentes de la desigualdad económica en Ecuador. *Revista Economía Y Política*, (25), 9–28. <https://doi.org/10.25097/rep.n25.2017.01>
- Sarmiento, S. (2017). Evolución de la desigualdad de ingresos en Ecuador, período 2007-2015. *Revista de análisis estadístico*, 13(1), 49-79.
- Shorrocks, A. (1982). Inequality decomposition by factor components. *Econometrica*, 50(1), 193-211.
- Song, J. et al. (2015). Firming up inequality (working paper no.21199). *National Bureau of Economic Research*.

Zhu, G. (2013). Age-specific Rise of Income and Consumption Inequality. *Economics Discussion Papers*, no. 2013-21