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A Decomposition Analysis of Wage Inequality in the Philippines

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Abstract: The data suggests that, in the Philippines, the wage gap between the 90th (high-income earners) and 50th percentile (middle-income) wage groups has been declining. As such, we aim to study this upper-tail wage inequality further by decomposing wage data using the October rounds of the Philippine Labor Force Survey (LFS) from 2007 to 2017 and by looking at trends in wages and employing two mutually exclusive methods. For the trend in relative wage changes, we observe that between the 90th and 50th percentiles of the wage distribution, the wage gap increased from 2007 to 2012 and decreased from 2012 to 2017. For the daily log wages for 2007 and 2017, we find that female workers belonging to the upper half of the wage distribution earn higher than males. In performing a simple regression, we find that 90-50 wage gap among each sub-group of gender, location and educational attainment is decreasing from 2011 to 2017. Furthermore, the 90-50 wage gap among non-NCR workers is greater than the 90-50 wage gap among NCR workers. A similar result is found between the wage gap among males and females, with a higher disparity for the former. For the standard variance decomposition method, the results show that overall variability in female wages explained by age, education and region is 48 to 55%. However, the overall and upper half variability in wages of males, NCR workers, non-NCR workers, high school graduates and college graduates are better explained by other factors (“within” variables) such as work experience or the worker’s type of job.

Key Words: wage inequality; decomposition; labor market; labor economics

1. INTRODUCTION

The existence, as well as the causes and consequences, of wage inequality are some of the most tackled issues in labor economics (Dacuycu, 2006). It is inevitable to have a moderate level of inequality specifically when it can improve efficiency through a reward mechanism (higher pay is awarded to the more productive or skilled worker) during periods when average incomes are increasing and poverty rates are dropping (Shaw and Stancil, 2011). However, inequality must not be ignored due to its unfavorable impact on the economy and society. For

instance, inequality can lead to large social costs and may significantly demoralize individuals’ educational and professional decisions (Stiglitz, 2012).

In the Philippines, a preliminary look at the data shows that wage inequality, while apparent between the 90th and 10th percentile wage groups, is also a trend between the 90th and the 50th percentile wage groups. From a policy perspective, this may be a cause for concern given that while the highest wage group is reaping higher wage gains in real terms, the middle wage group is not.

A closer look at the data shows us that from 2007 to 2017, the number of females enrolling and



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graduating in tertiary education has increased from 4,521 in 2007 to 4,903 in 2017. Furthermore, the number of female college graduates is 1.35 to 1.5 times the number of males. Also, based on the Global Gap Report (2018), a framework for determining gender-based disparities, by the World Economic Forum, men and women in the Philippines are more likely given equal opportunities compared to other countries. The Philippines ranks number one in terms of educational attainment and ranks eighth in the overall Gender Gap index. In this index, countries are ranked with a scale from 0 (disparity) to 1 (parity) across four thematic dimensions – economic participation and opportunity, educational attainment, health and survival, and political empowerment. This is due to the government's continuous promotion of wage and education equality through international agreements and local legislations.

Meanwhile, Dacuycuy (2006) focuses on understanding the roles of experiences and education in explaining the increase in wage inequality among Philippine workers between 1988 and 1995 using parametric and nonparametric approaches. According to his study, much of the inequality increase from 1988 to 1995 was caused by greater variability in returns to schooling and experience among 1995 male workers. In addition, Sauler and Tomaliwan (2015) find that returns to education are higher for workers belonging to the upper income quantiles.

Considering the location of workers, Sakellariou (2012) pointed out that education has negative effects on the wage structure on male workers of the Philippines, but a positive effect on male workers based only in Manila. Furthermore, there exists rural-urban income gaps and regional inequality in the Philippines and policies may have favored those working in Luzon; and in particular, NCR (Balisacan and Fuwa, 2004).

Hence, in this paper, we would like to further analyze wage inequality in the Philippines by decomposing the data on wages. In addition, we determine the role of education, gender and regional location in the changes in wage inequality. With these, we perform a simple regression and standard variance decomposition in analyzing the presence and behavior of wage inequality.

In Section 2, we present and describe the survey data and decomposition methodology; in Section 3, we present our results and analysis. We conclude the paper in Section 4.

2. METHODOLOGY

2.1 Data

We use the October rounds of the Philippine LFS conducted from 2007 to 2017. It is a representative multi-stage survey that uses the sampling frame of the Integrated Survey of Households (ISH) (Dacuycuy, 2006). We focus on non-agricultural workers in the government and private sectors, similar to Dacuycuy (2006), to eliminate from the estimation sample individuals who work for informal or household businesses. In addition, military personnel and domestic helpers are also excluded.

After filtering the dataset, we are left with 29,329 observations for 2007; 29,623 for 2008; 30,407 for 2009; 31,322 for 2010; 33,037 for 2011; 34,220 for 2012; 34,581 for 2013; 34,325 for 2014; 36,471 for 2015; 33,845 for 2016; and 34,871 for 2017. The total number of regular wage earners is 362,031.

We also classify the data according to region, gender and education for the purpose of determining their roles, if any, in the changes in wage inequality. Majority of the wage earners are from Non-NCR (296,176), males (217,545) and high school graduates (107,678).

To ensure comparability, we use the consumer price index for each region in the Philippines for the computation of real wages, with 2006 as the base year.

2.2 Trend Analysis

In analyzing the trend in the behavior of wages of workers included in the study, we look at the relative wage changes and the daily log wages across quantiles.

The three (3) wage percentiles are normalized to 100 in the base year to better illustrate the relative wage changes at different points of the distribution.

For the daily log wages across quantiles, we focus on the 10th, 25th, 50th, 75th and 90th percentiles for the overall workforce for years 2007, 2012 and 2017. Also, the same quantiles are derived for 2007 and 2017, categorized by gender, location and region separately.

2.3 Wage Gap Analysis

We perform a simple regression of log (real) wages on age and a set of education dummies, location and gender to obtain the wage gap between

two groups. The dependent variable is the natural logarithm of the daily real wage in Philippine pesos. The explanatory variables include age, gender dummy, education dummies and region dummies.

2.4 Variance Decomposition

The decomposition is performed by running a regression on age, gender dummy, education dummies, location dummy and a full set of interaction dummies (between gender and education; gender and location; location and education). This shows if between (identified) or within (unidentified) variables explain the variability in log (real) wages. To focus on the contribution of age, gender and education, we first partial out the effect of region/location.

3. RESULTS AND DISCUSSION

We first present the trends of the relative wage changes for the 10th, 50th and 90th percentiles of the distribution from 2007 to 2017 and the daily log wages between males and females for 2007 and 2017.

We then run the methods to different combinations of groups by quantiles to decompose the wages of the overall data. Secondly, we tried grouping them according to gender, region and education.

3.1 Trends

3.1.1. Relative Wage Changes

The three (3) wage percentiles are normalized to 100 in the base year to better illustrate the relative wage changes at different points of the distribution.

In Figure 1, it may be observed that the 90th percentile average wage has been increasing considerably since 2007 while the 50th percentile average wage has been dropping, with minimal increase. It is also noticeable how the 10th percentile dramatically increased after 2013.

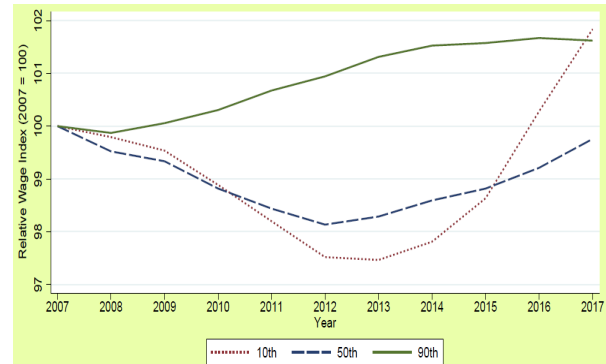


Fig. 1. Relative Wage Changes at 10th, 50th and 90th Percentiles (2006 CPI)

Overall, only the real wages of workers at the 90th percentile exhibit a consistent wage increase for the period covered. At the 10th percentile, real wages declined from 2007 to 2013 and increased from 2013 to 2017, going above the 2007 base year in 2016. At the 50th percentile, from 2007 to 2012, the real wage shows a decreasing trend. This trend reverses from 2012 to 2017 but the real wage for that period is still lower than that of the base year.

If analyzed according to gender, the data show that relative wage changes of male workers from 2007 to 2013 at the 10th, 50th and 90th percentiles decreased, with the last quantile at a slower pace. Within the covered period, there have been increases in real wages for the three wage percentiles but only the 50th did not exceed the real wage level of 2007 and with the 90th barely landing above the base year, as shown in Figure 2. Only the 10th shows a significant increase above the base year.

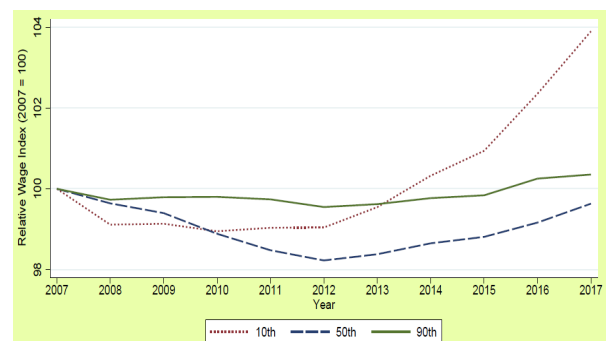


Fig. 2. Relative Wage Changes at 10th, 50th and 90th Percentiles for Male Workers (2006 CPI)

For female workers, relative wage changes in 2007 and 2017 increased at the 10th, 50th and 90th percentiles, as shown in Figure 3. The behavior of the relative wage changes for female workers is closer to the trend observed in Figure 1. Between male and female workers, real wages of the latter in all wage percentiles are greater than the former.

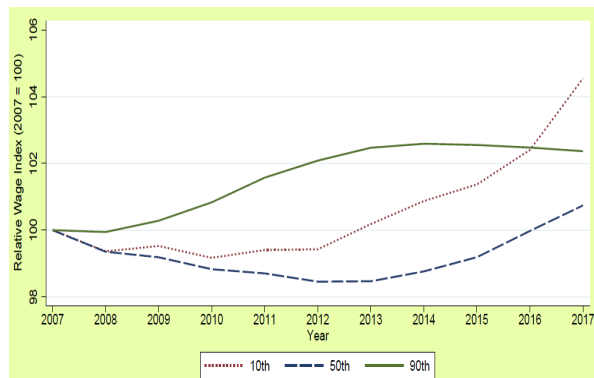


Fig. 3. Relative Wage Changes at 10th, 50th and 90th Percentiles for Female Workers (2006 CPI)

3.1.2. Daily Log Wages Across Quantiles

Overall, 2017 daily log wages at all percentiles are greater than those of 2007 and 2012 daily log wages. From Figure 4, we can observe that except for the 90th percentile, 2012 daily log wages are below than those of 2017.

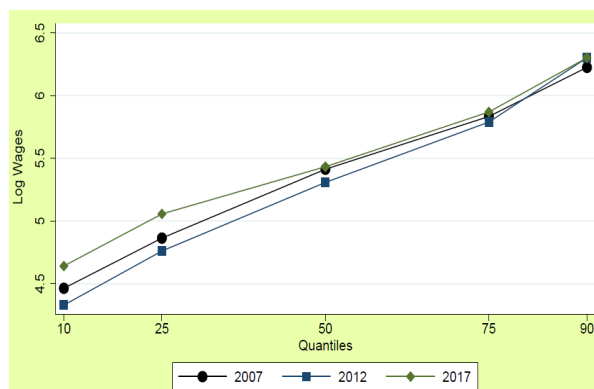


Fig. 4. Daily Log Wages Across Quantiles

In 2007 and 2017, as shown in Figures 5 and 6, respectively, it is noticeable that the daily log wage for male is greater than the female log wage at the lower half of the wage distribution while daily log wage for female is greater than the male log wage at

the upper half of the wage distribution. Furthermore, the gap in log wages between male and female is wider in 2017 than 2007.

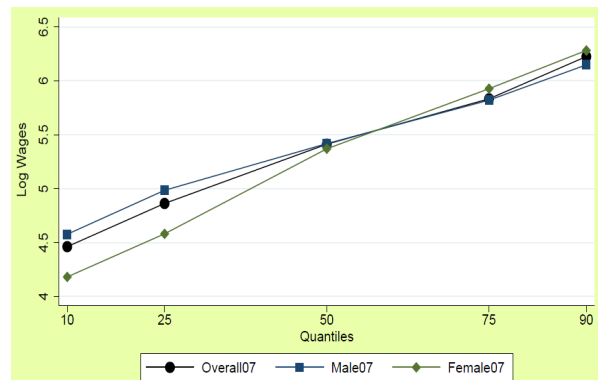


Fig. 5. Daily Wages Across Quantiles, Overall and by Gender 2007

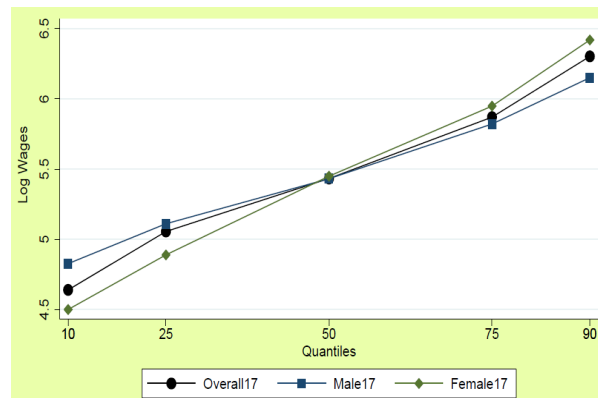


Fig. 6. Daily Wages Across Quantiles, Overall and by Gender 2017

3.2 Wage Gap Analysis

These results are found in the difference in log wages of the upper half of the wage distribution, which is between the 90th (high-income earners) and 50th percentiles (middle-income earners), in each sub-group for gender, location and education. From 2007 to 2017, the 90-50 wage gap has decreased overall and among: females, males, NCR workers, non-NCR workers, high school graduates and college graduates.

In Figure 7, the wage gap among males is greater than the wage gap among females. The wage

gap for both genders increased from 2007 to 2012 but steadily declined from 2012 to 2017.

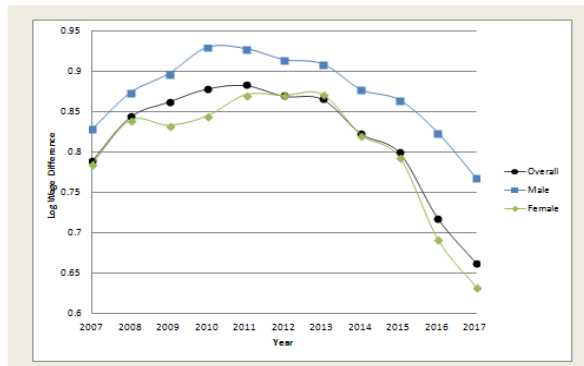


Fig. 7. 90-50 Wage Gap Among Females and Males

Furthermore, the wage gap among males, among Non-NCR (Figure 8) and among college graduates (Figure 9) is greater than the wage gap among their respective counterparts. We can say that for male workers, for Non-NCR workers and for college graduates that there must be an underlying cause such as experience or additional background as to why the wages between the 90th and 50th percentile vary greatly. For instance, we can also say that there might be a premium in education for workers in the Non-NCR region.

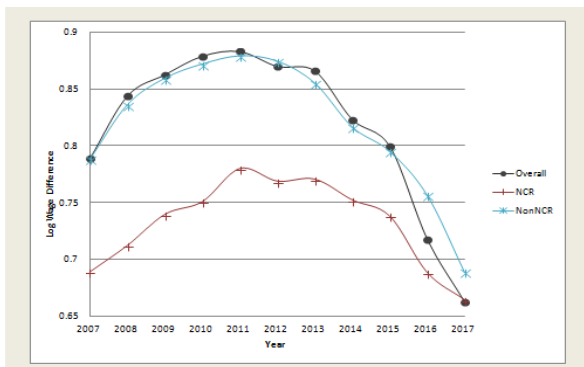


Fig. 8. 90-50 Wage Gap Among NCR and non-NCR workers.

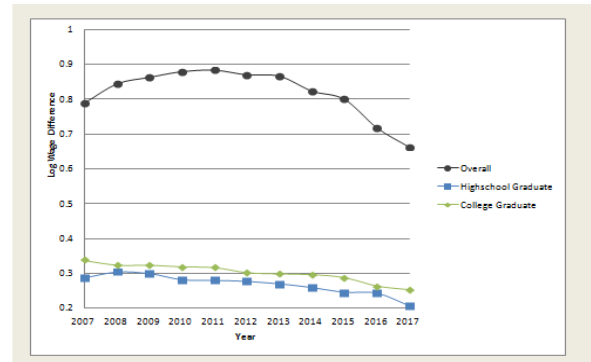


Fig.9. 90-50 Wage Gap Among College Graduates and High School Graduates

3.3 Variance Decomposition

Education, gender, region and age serve as the “between” variables while other factors we did not identify in this study serve as “within” variables. When the category is used for the dependent variable, it is disregarded as part of the “between” variables.

We note the results in the upper half of the wage distribution because of the trend in the influence of “between” variables to the variability of log wages. The upper half of the wage distribution includes workers whose wages belong to the 50th percentile and above.

Table 1. Variance Decomposition Results

Category	OVERALL		UPPER HALF	
	Between	Within	Between	Within
Pooled	48-41%	52-59%	37-39%	63-61%
Male	39-33%	61-67%	38-41%	62-59%
Female	55-48%	45-52%	31-31%	69-69%
College Graduate	10-4%	90-96%	9-8%	91-92%
HS Graduate	23-18%	77-82%	21-33%	79-67%
NCR	42-36%	58-64%	34-33%	66-67%
Non-NCR	49-42%	51-58%	37-39%	66-61%

For the overall, as seen in Table 1, it can be observed that the variation in log wages explained by the between variables for all categories has decreased, which implies that the influence of unaccounted factors have increased. In addition, 48 to 55% of the variability of log wages among females is explained by the between variables, which is highest compared to the other categories. Conversely,



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the college graduate category has the lowest percentage of the variability being explained by the between variables. This indicates that given a high level of education, other factors such as experience, other demographic and perhaps even work ethics, significantly influence the variability in log wages. In addition, for the male, HS graduate and Non-NCR categories in the upper half, there is an increase in the percentage of the variation that is explained by the between variables, which may also mean that the influence of within variables to the variability of log wages over the years has decreased.

4. CONCLUSIONS

Using the 2007 to 2017 October-rounds of the LFS, we set out to study trends in wage inequalities in the Philippines. We find that wage inequality exists between different wage percentiles considering gender, education and region as factors that can influence log wages. However, significant results are found in the upper half of the wage distribution.

For the trend in relative wage changes, we observe that between the 90th and 50th percentiles, the wage gap increased from 2007 to 2012 and decreased from 2012 to 2017. Furthermore, females earn higher than males in the upper half of the distribution as shown in the trend of daily log wages for 2007 and 2017.

According to the wage gap analysis, the 90-50 wage gap among females, males, NCR workers, non-NCR workers, high school graduates and college graduates shows a decreasing trend from 2012 to 2017. The wage gap among male workers is greater than the wage gap among their female counterpart, and a similar result can be observed for those workers who are located outside the National Capital Region (NCR) versus those working in NCR.

Based on the variance decomposition results, the variability in female wages explained by age, education and region is 48 to 55%. Also, at a high level of education, the roles of age, location and gender are minimal in explaining the wage gap, thus, there is a need to explore other factors not used in this paper.

For future research, since we find that other factors largely explain the changes in wage inequality, we would like to account for other factors that may affect wage inequality, such as work experience. Furthermore, we intend to use another

decomposition method in assessing wage inequality, namely the Oaxaca-Blinder decomposition method.

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