The Impact of Entrepreneurship and Unemployment to Income Inequality in the Philippines

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Abstract: **The Philippines has one of the highest income inequality rates in Southeast Asia. Empirical studies suggest that entrepreneurial activity and high unemployment produce income inequality. 26.14 million Filipinos whose per capita income is inadequate to cover their basic food and non-food needs live below the poverty line. This study examines whether entrepreneurship will help decrease income inequality and whether unemployment is related to income inequality. Time-series multiple regression model using the Ordinary Least Square is used to determine the significance of the independent variables to the dependent variable. The results indicate that entrepreneurship positively affects income inequality, yet the unemployment rate was found insignificant to the dependent variable. Changes in the unemployment rates do not affect income inequality in the Philippines. However, entrepreneurial activities can aggravate income dispersion within the income distribution. In the Philippines, income is concentrated on entrepreneurs with capital, while the low-skilled and entrepreneurs without capital experience failure. Their business endeavors may not generate the expected return on investment and earn less than salary/wage workers. Despite this, the Philippines should still pursue entrepreneurship-enhancing policies because of its potential to create employment, its contribution of value to the economy, and its engagement prominently in export trade. The Philippine Government should keep supporting entrepreneurial activities and mitigate income inequality by bolstering low-skilled entrepreneurs by giving them access to credit, education, information, and training and easing the business process.**

Keywords: **Entrepreneurship, income inequality, Philippines, self-employed, unemployment.**

1. Introduction

The Philippines has one of the highest economic and social inequality rates in Southeast Asia. The inequality can indicate a loss of economic mobility and opportunity and represent long-term disadvantages for particular social groups (Norris et al., 2015). In 2017, the Philippines' potential growth rate hit 6.3 percent, the highest in 60 years, and much of the increase in potential growth has been driven by the increase in labor productivity growth (Felipe & Estrada, 2018). However, despite economic growth, the Philippines and other countries struggle to decrease income inequality. For example, the Philippines had a GDP of 3.698 trillion and a Gini Coefficient of 47.7 in 2000. Still, eighteen years later, in 2018, the GDP increased to 18.265 trillion, which is almost 400% change from the year 2000, and yet despite the increase, the Gini Coefficient has only decreased by 5.4 (World Bank, 2000, 2018). Kuznets (1963) argued that income is more unequal in underdeveloped countries, associated with lower levels of average income per capita. According to the World Bank (2018), the Philippines' latest Gini Coefficient was 42.3, higher than most ASEAN countries, such as Indonesia, 38.2 in 2019, Malaysia 41.1 in 2015, and Thailand 34.9 in 2019. We must note that the higher Gini Coefficient, the more inequality there is in the country. The researchers would then question what factors would increase the income of a developing country such as the Philippines while simultaneously decreasing income inequality.

The Philippine Statistical Authority (PSA) defined *entrepreneurial activity* as an economic activity, whether agricultural or non-agricultural, that is self-employed or operated by any member of the household. It comprises activities run by families, or those run as sole proprietorships or partnerships. Global Entrepreneurship Monitor (GEM) defines *entrepreneurship* as "any attempt at new business or venture creation, such as self-employment, a new business organization, or the expansion of an existing business by an individual, a team of individuals, or an established business." The 1987 Constitution of the Republic of the Philippines - Article XII section 1 states that private enterprises "shall be encouraged to broaden their ownership base" to achieve a more equitable distribution of opportunities, income, wealth, as well as to support the production of goods and services and to improve the overall productivity and efficiency of the economy. According to the Department of Economic and Social Affairs (DESA), Micro, Small, and Medium Enterprises (MSMEs) are an important engine of economic growth that can empower the poor, increase production, and stimulate innovation. MSMEs have an important role in achieving sustainable development goals (SDGs). They have remained steadfast in their efforts to create employment, contribute value to the economy, and engage prominently in export trade. The Philippine Statistics Authority (PSA) Preliminary Data from the Nationwide 2021 Updating of the List of Establishments Preliminary Results

found more than 1.08 million operating establishments, generating 8.57 million total jobs. There are 977,670 enterprises with total employment of 1 to 9 (Micro). In contrast, the number of establishments with total employment of 10 to 99 (Small), 100 to 199 (Medium), and 200 or more (Large) are only 102,968, accounting for 9.5 percent of all MSME establishments (PSA, 2022).

The International Labour Organization's global estimates recorded that, in 2018, 79 percent of all working people around the world did not live in poverty, whereas 13 percent were moderately poor and 8 percent were extremely poor, indicating that their employment-related incomes were insufficient to lift themselves and their families out of poverty and attain a good standard of living. Although the percentage of the world's poor workforce remains a serious concern, the percentage of working poverty has been declining since 2000 (ILO, 2019). Deyshappriya (2017) found that in countries in Asia, one of the factors that increase income inequality is unemployment. According to the Philippine Statistics Authority, the unemployment rate in the Philippines has improved from 11.2 percent in 2000 to 5.3 percent in 2018. Meanwhile, the Gini Coefficient continuously decreased from 42.9 in 2000 to 40.9 in 2018. Knowing the relationship between the unemployment rate and income inequality in the Philippines is important because, as mentioned earlier, not all working people are above the poverty line. In the Philippines, the average minimum wage is Php 366.41 (NWPC, 2022), or Php 10,992.3 if multiplied by 30 working days. The average minimum wage workers earn less than the Php 12,082 poverty threshold determined by Philippine Statistics Authority (PSA, 2021). During the first semester of 2021, according to the Philippine Statistics Authority, 23.7 percent of Filipinos whose per capita income is inadequate to cover their basic food and non-food needs. It means that 26.14 million Filipinos are living below the poverty line.

The purpose of this study is to (1) find the relationship between the number of entrepreneurs and the income inequality in the Philippines and (2) find the relationship between the unemployment rate and income inequality in the Philippines. The researchers want to determine whether creating more jobs will help decrease income inequality and if unemployment is related to income inequality.

2. Literature Review

A. Entrepreneurship and Income Inequality

Existing studies have attempted to identify factors that affect income inequality. Kuznets (1955) hypothesized that income inequality would initially increase at the early stages of economic development and eventually decline as per capita income increases. Ahluwalia (1976), Ragoubi & El Harbi (2017) study also showed strong evidence that relative income inequality increases at the early stage of development and declines at the later stages. Lewis (1954) explained that limited employment and high wages in the industrial sector at the early stages of economic development increased income inequality between the agricultural and industrial sectors. Auguste (2020)

found that the relationship between entrepreneurship and inequality is weak at low levels of development but increases as development progress from low to intermediate levels and then reduces again at advanced development. Muryani et al. (2021) also supported the Kuznets hypothesis. Their findings revealed that increasing per capita income levels in Indonesia increase income inequality in the short run but improve income inequality over time.

Polacko (2021) proposed that some of the causes of income inequality are executive pay and union pay. Union decline is also one of the factors of income inequality. Based on the United States data from 1947 to 2015, the decline of union organizations and structural change corresponded with significant growth in income inequality (Kollmeyer, 2018). In 2016, the wage gap between Chief Executive Officers (CEOs) and their employees at the 500 leading US companies was 335 times higher than in 1980. The existing income inequality is increasingly viewed as unfair by the majority of employees, and increasing income inequality is identified as a significant threat to the global economy (Przychodzen & Gómez-Bezares, 2021).

Some studies have found entrepreneurship associated with increasing income inequality. Lecuna (2014) empirical results found that entrepreneurial activity produces greater income inequality. Registration of new business by approximately one new firm for every 1,000 working-age adults will increase the Gini Index by approximately six units. Atems & Shand (2018) also provide strong evidence of a significant positive relationship between entrepreneurship and income inequality. According to the findings, increasing entrepreneurship would increase income inequality and may be detrimental to economic growth. Halvarsson et al. (2018) study also mentioned that entrepreneurs (self-employed and incorporated self-employed) increase income inequality, significantly affecting the income of the bottom and top of the income distribution. In the study of Valenzuela et al. (2017), the poverty rate was higher in families where the main source of income was entrepreneurial activities than in households where the main source of income was salaries. In the Philippines, from 2000 to 2012, the overall result of their study shows that wage and salary earner households experience higher welfare compared to entrepreneurs. In the earnings analysis of Lofstrom (2013) between self-employed and wage/salary employed, it was revealed that the earnings of most low-skilled workers are higher in wage/salary employment than in self-employment. However, earnings from self-employment will surpass the wage/salary of employment overtime after 11-12 years in the business.

Entrepreneurship can be an option for workers that experience income inequality. Sorensen & Sharkey (2013) study stated that employees exposed to high-income inequality in their workplaces are more eager to transition to entrepreneurship. Hamilton (2000) also stated that the workers are willing to sacrifice substantial earnings in self-employment in exchange for the nonpecuniary benefits of owning a business. Some studies concluded that income inequality improves with entrepreneurship. Rakhmatullayeva (2020) stated that the self-employed will actively "integrate into the production chain regardless of the type of activity." They will increase the

number of startups and innovation, as well as the overall level of income and living standards by creating additional employment in the economy and stimulating private domestic investment. In the US, between 1980 to 2010, about one-sixth of 2.9 million jobs per year were created by new firms brought by entrepreneurship (Decker et al., 2014). According to Perotti & Volpin (2004), income inequality may worsen over time under the limited entry of entrepreneurs. Therefore, easing the entry of entrepreneurs into the market will improve income distribution. Lecuna (2019) said that the total entrepreneurial activity of both formal and informal entrepreneurs correlates to improving the Gini coefficient. Having entrepreneurship-related policies that focus on the informal sectors of the economy shall significantly reduce income inequality. Informal entrepreneurship has the potential to create wealth among the poor by making them become small business owners or waged and salaried workers. Kimhi (2009) study found that entrepreneurship helps reduce income inequality in Southern Ethiopia. Rural entrepreneurship decreases income inequality by stimulating growth in that sector. The decrease in income inequality occurs because it may give entrepreneurs and their families additional income, increasing income from less profitable sectors such as informal agriculture and part-time work.

It was also proven in Mohamad et al. (2021) research that entrepreneurship is vital and effective in reducing income inequality. Income inequality can be reduced if entrepreneurship is aggressively promoted and opportunities are offered for low-income earners. According to Riswanto (2016), the involvement of entrepreneurship can be a solution to the high unemployment, slow economic growth, and economic development of developing countries. Increasing the number of productive businesses established by entrepreneurs may raise labor demand, the number of outputs, innovations, and income per capita. Furthermore, although the contribution of entrepreneurship is small, it is said that it could be an important engine in the long run if it is correctly developed and promoted. The study suggested that one possible solution is for governments to offer various programs such as policies promoting entrepreneurship opportunities, education, and other important activities to bring the poor out of poverty and help them become entrepreneurs. Increased involvement and participation of important parties are needed to promote entrepreneurship opportunities. Wai et al. (2020) said that self-employment generally does decrease the Gini coefficient but noted that pursuing only a self-employment policy is insufficient to address income inequality. Ragoubi & El Harbi (2017) suggested that it is necessary to address the responsibility that entrepreneurship may take in overcoming structured and durable types of income inequality. Rakhmatullayeva et al. (2020) suggested that policies such as a preferential tax regime and more business opportunities in the economy will help the self-employed create more employment in the economy and stimulate private domestic investment. Not only will the country's startup and innovation initiatives grow, but so will the country's overall population income and standard of living. In addition, governments could use other measures such as investment in training and education programs, labor market regulations such as minimum wages and job protections, and competition policies aimed at migration, trade, and market power (Heathcote et al., 2020).

B. Unemployment and Income Inequality

There are numerous studies focusing on the relationship of unemployment to income inequality. Whiteford (2017) proposed two leading causes of income inequality in Australia: unemployment and income inequality. Earnings from employment take a large part of the population's income distribution. Being unemployed also means losing their primary source of income. The high increase in real wages in the top-earning distribution compared to the modest increase in the bottom of the distribution also increases income inequality. Deyshappriya (2017) found that in countries in Asia, one of the factors that increase income inequality is unemployment and that this effect is statistically significant even after accounting for political and demographic factors. Similarly, compared to higher-income groups, unemployment effectively limits access to income sources for lower-income groups with little to no acquired wealth. Unemployment also reduces the income share of all quartiles except the wealthiest group, and unemployment negatively impacts the second, third, and first quartiles. Diamond (1982) argued that the wage, which is a component of income, is dependent on the unemployment rate and job vacancy rate because these rates are taken into account when determining the wage. Thus, a high unemployment rate decreases wages, widening the gap between the low and the high-income earners.

Existing studies have investigated rising unemployment as one of the causes of rising income inequality. Quintana & Royuela (2012) revealed that the increased inequalities are likely related to the high and lasting unemployment rate. While initial high unemployment rates do not appear to be important for the eventual long-run growth, they have a considerable negative influence when interacting with increases in income inequality. To summarize, unemployment may hurt the economy not simply because it wastes resources but also because it has significant distributional consequences: it generates redistributive pressures and subsequent distortions; it depreciates existing human capital and deters its accumulation; it leads individuals into poverty and results in liquidity constraints that limit labor mobility. Seputiene (2011) found a strong negative relationship between employment and wages. An increase in the unemployment rate corresponds to a negative decrease in wages.

However, some studies have found that unemployment has a negative relationship with income inequality. Fawaz et al. (2012) stated that the unemployment rate has a negative relationship with income inequality in low-income developing countries but has a positive relationship in high-income developing countries. Huber & Stephens (2014) mentioned that the rise in unemployment in advanced industrial democracies' labor markets had been the most significant development over time. The higher levels of unemployment result in higher levels of pre-tax and transfer inequality. Greater total employment

levels have reduced the tendency toward growing family income inequality across several countries. Muryani et al. (2021) study concluded that unemployment significantly and negatively affects income inequality in Indonesia. Decreasing unemployment does not guarantee better distribution of income. They suggest that promoting job creation alone will not reduce income inequality; instead, improvements in jobs, labor skills, and productivity are needed as a more effective technique to obtain positive effects on income inequality.

High unemployment rates have forced workers to accept lower wages, promoting income inequality. Blanchard (2010) argued that higher unemployment rates forced workers to accept lower wages. A higher unemployment rate allows firms to pay their workers lower wages, but, despite the low wage, workers are still willing to work due to limited job opportunities. According to Schnabel (2021), one main argument favoring low-paying jobs is that it enables workers to escape the "scarring effects" of unemployment. Workers lessen their unemployment period and thus the scarring effects by accepting a low-paying job rather than hoping for a better wage offer. Brunner & Kuhn (2014) argued that an increase of 1% in the unemployment rate is associated with a 1.3% decrease in lifetime wages. It is because workers can only secure jobs that are low paying when there is high unemployment. Due to low wages, workers enter self-employment rather than staying in paid employment. According to Szczepanik (2019), an increase in job vacancy and a decrease in the unemployment rate will increase the wage of workers. Hence, the higher the unemployment rate, the lower the wage share, and the more unequal the distribution of income (Sheng, 2011).

C. Synthesis

Kuznets (1955) stated that inequality rises at the early stage of economic development. Entrepreneurship, which has a vital part in the economy's growth, is associated with income inequality. On the other hand, Deyshappriya (2017) stated that a high unemployment rate also increases income inequality.

D. Theoretical Framework

The researchers used the Kuznets curve as a theoretical basis for income inequality. Kuznets (1955) theory tells us that income inequality is related to the increase of per capita income in an economy, forming a bell-shaped curve as seen in Figure 1. It shows that income inequality will initially increase at the early stages of economic development. After reaching the turning point, the income inequality falls as per capita income rises further.

According to Kuznets (1955), there are mainly two factors contributing to income inequality. First is the transition of the economy towards industrialization and urbanization. Initially, income inequality grew because of the migration of agricultural workers to the non-agricultural sector. Eventually, income inequality will decline when the majority of the poor agricultural workers migrate to the non-agricultural sector. It can be attributed to the nature of structural change. His evidence suggests that all economies will experience income inequality at the start of economic development but will eventually improve as economic development prosper under industrialization. The second factor contributing to income inequality is the concentration of savings in the upper-income bracket. Kuznets (1955) found that when the income is divided between consumption and savings, the upper-income brackets are the only ones saving, whereas those lower-income brackets are saving nearly nothing. The concentration of savings will result in income-yielding assets being concentrated in the hands of the upper groups and their descendants, increasing income inequality.
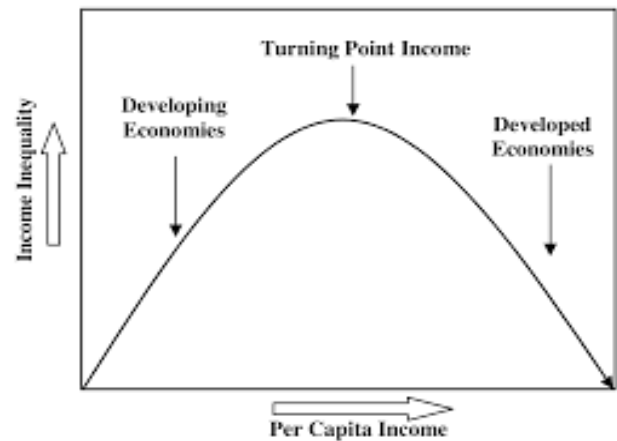

Fig. 1. Kuznets' Inverted U-Curve

In this study, instead of using the same variables used by Kuznets, the researchers will use the number of entrepreneurs and the Gini Coefficient to test if it will also show a rise in income inequality as the number of entrepreneurs increases in the Philippines seen in Figure 2.
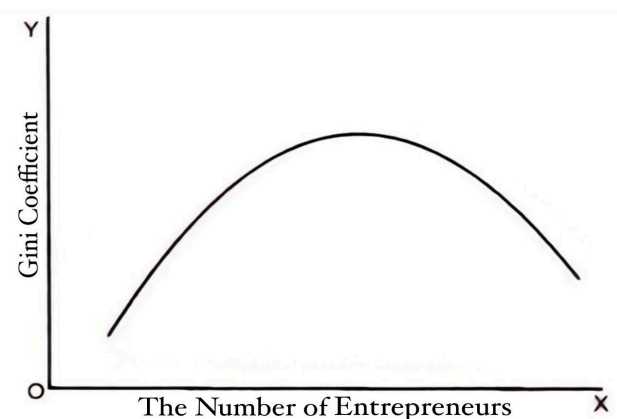

Fig. 2. No. of Entrepreneurs to Gini Coefficient

The researchers also used the unemployment rate as another variable that increases income inequality. Unemployment reduces the income share of all the quantiles except the wealthiest group (Deyshappriya, 2017). A negative relationship exists between the unemployment rate and wages, and a high unemployment rate will result in lower wages. The limited employment disables people in the labor force from having access to wages, which is a large part of the population's income, thus increasing income inequality (Whiteford, 2017).

It can be explained in the Classical Theory of Employment corresponds to the labor market equilibrium seen in Figure 3. The equilibrium assumes that wages adjust to satisfy firms and workers who participate in labor demand and labor supply simultaneously, ceteris paribus.
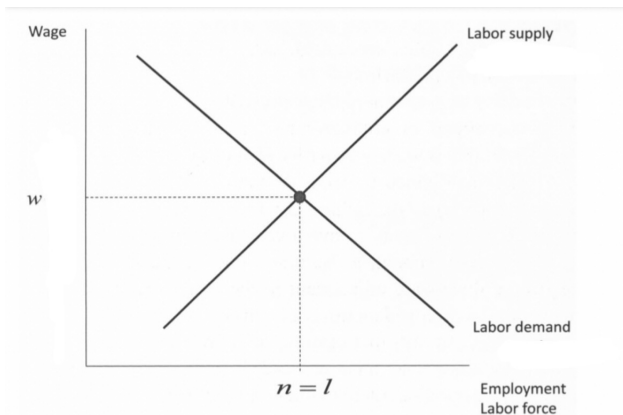

Fig. 3. Classical theory of employment

n= the amount of labor the firms want to employ given the prevailing wage.
l = the size of the labor force
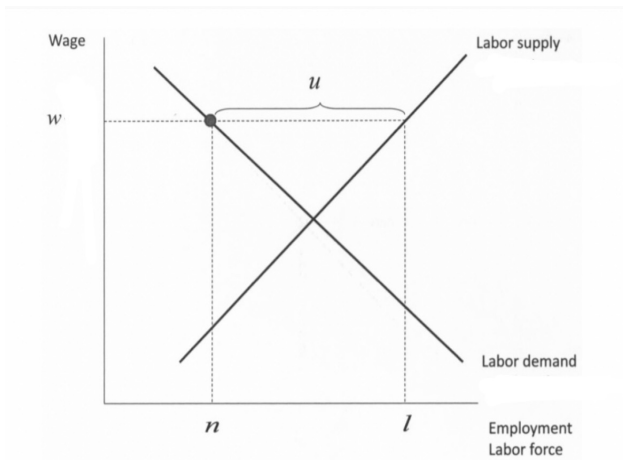*w* = wage

Fig. 4. Upward Pressure on Wages

u = unemployment

According to Keynes, upward pressure on wages will produce unemployment, as seen in Figure 4. Unemployment will only be solved when workers are willing to work at a lower wage as illustrated in Figure 5.

The model above shows that nominal wages decreased because of unemployment which will increase income inequality (Deyshappriya, 2017; Whiteford, 2017).
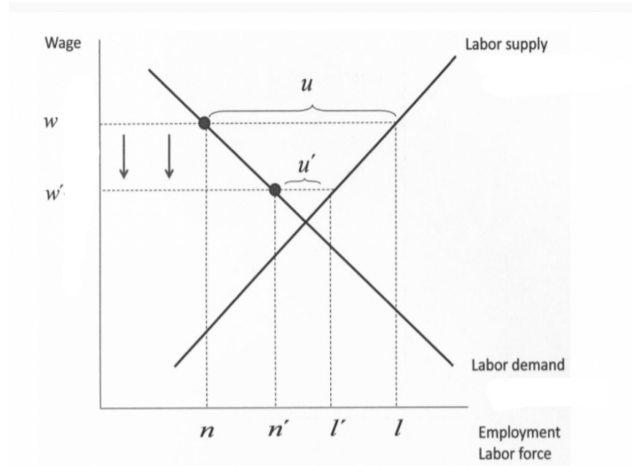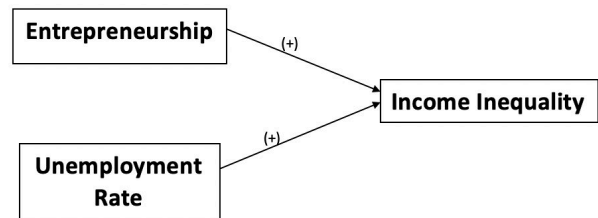

Fig. 5. Weak pressure on wages

E. Simulacrum

F. Hypothesis

Ho: Entrepreneurship has no significant effect on income inequality in the Philippines.

Ha: Entrepreneurship has a significant effect on income inequality in the Philippines.

Ho: Unemployment Rate has no significant effect on income inequality in the Philippines.

Ha: Unemployment Rate has a significant effect on income inequality in the Philippines.

3. Method

A. Research Design

This study used a quantitative time-series regression model to determine if the Lecuna (2014) and Deyshappriya (2017) hypothesis exists in the Philippines. We will be using the Ordinary Least Squares (OLS) to determine the significance of the number of entrepreneurs and the unemployment to income inequality in the Philippines. The researchers wanted to establish the significance of the independent variable on income inequality. This research method was used by different authors (Hamilton, 2000; Kollmeyer, 2018).

This study was conducted in the Philippines and had a scope of 48 years ranging from 1968 to 2015 (48 observations), to run a multiple regression.

B. Data and Source Specification

This study has gathered secondary data from various reliable sources. We used the number of self-employed people obtained from the Philippine Statistics Authority (PSA) as our independent variable to measure entrepreneurship. Lecuna

(2014, 2019) and Decker et al. (2014) used the newly registered firms to measure Entrepreneurship. However, due to the limited availability of this data in the Philippines, our study used the annual number of self-employed in the Philippines as an alternative measure used by Hamilton (2000) and Halvarsson et al. (2018). The researchers also used the annual average unemployment rate in the Philippines obtained from the Philippine Statistics Authority as another independent variable to measure unemployment. This was also used by Deyshappriya (2017).

The dependent variable used in this study is Income Inequality. To measure the dependent variable, the researchers used the Gini Coefficient obtained from Standardized World Income Inequality Database (SWIID). The most common measure of income inequality is the Gini coefficient or Gini index. Due to every three-year release of GINI data for income inequality in the Philippines, the researchers used the data from SWIID to obtain significant observations and more accurately depict income inequality. Frederick Solt developed the SWIID to standardize the Gini data from various sources. The SWIID used a Bayesian approach to standardizing observations collected from several databases such as the "Luxembourg Income Study, OECD Income Distribution Database, the Socio-Economic Database for Latin America and the Caribbean generated by CEDLAS and the World Bank, Eurostat, the World Bank's PovcalNet, the UN Economic Commission for Latin America and the Caribbean, national statistical offices around the world, and many other sources." Solt (2019). The SWIID was also used in the study of Polacko (2021) and Auguste (2020).

C. Economic Tool and Model

To evaluate the relationship of entrepreneurship and unemployment to income inequality, the researchers regressed the following equation:

$$IE = \beta 0 + \beta 1 ENT + \beta 2 UER + e$$

Where:
IE = Income Inequality
β0 = constant
β1 = Entrepreneurship (number of self-employed)
β2 = Unemployment Rate
e = Error Term

D. Test for Unit Root

Unit root tests test whether a time series variable is non-stationary. To test the unit root, the researchers will use the Augmented Dickey Fuller Test. Accepting the null hypothesis means that the series possesses a unit root and hence is not stationary and accepts the alternative hypothesis when the p-value is less than alpha, showing that it is stationary. This test is necessary for model with long time series data.

E. Test for Multicollinearity

Multicollinearity reduces the precision of the estimated coefficients. We will use the Variance Inflation Factor (VIF) to identify if there is a collinearity problem between the variables.

F. Test for Heteroskedastic Disturbances

When the variance of the regression residuals of the model is time-varying, the parameters and their standard errors are said to be biased and inefficient. If it is not corrected, this could lead to wrong decisions and conclusions. To detect the presence of Heteroskedastic Disturbances in the residuals, the white Heteroskedasticity and Breusch-Pagan test will be used.

G. Test for Normality of Residuals

It is the assumption that the residuals are normally distributed. When the p-value is less than the level of significance, the null hypothesis will be rejected, and the residuals are not from a normal distribution. When the p-value is greater than the level of significance, the null hypothesis will be accepted. Hence there is no non-normality error.

H. Test for Autocorrelation

The Durbin-Watson test is the most common approach for detecting autocorrelation in a regression analysis.

I. Test for Misspecification Error

Misspecification error manipulates the model by including irrelevant variables and omitting the model's functional form or relevant variables. This test creates bias or inconsistency in regression estimators, which can continue even as the sample size increases. The researchers will use the Ramsey Regression Specification Error Test (RESET) as this test is commonly used for linear regression models.

J. Test for Cointegration

It identifies scenarios where two or more non-stationary time series are integrated so that they cannot deviate from equilibrium in the long term. The researchers will use the Johansen test, an improvement from the Engle-Granger Test as a way to determine if three or more time series are cointegrated.

4. Results and Discussion

Evidence from related literature supports that both entrepreneurship and unemployment affect income inequality (Lecuna, 2014; Deyshappriya, 2017). The study aims to develop a model that can describe the relationship between the number of entrepreneurs and the unemployment rate to income inequality in the Philippines. The Ordinary Least Squares (OLS) model is used to determine the relationship between the variables.

To evaluate the relationship of entrepreneurship and unemployment to income inequality, the researchers regressed the following equation:

$$IE = \beta 0 + \beta 1 ENT + \beta 2 UER + e$$

Where:
IE = Income Inequality
β0 = constant
β1 = Entrepreneurship (number of self-employed)
β2 = Unemployment Rate
e = Error Term

We sourced secondary data from the Philippine Statistics Authority (PSA) to gather historical data on the self-employment rate and unemployment rate in the Philippines. To measure the dependent variable, the researchers used the Gini Coefficient obtained from Standardized World Income Inequality Database (SWIID). This study will run a time series regression with a scope of 48 years ranging from 1968 to 2015 (48 observations).

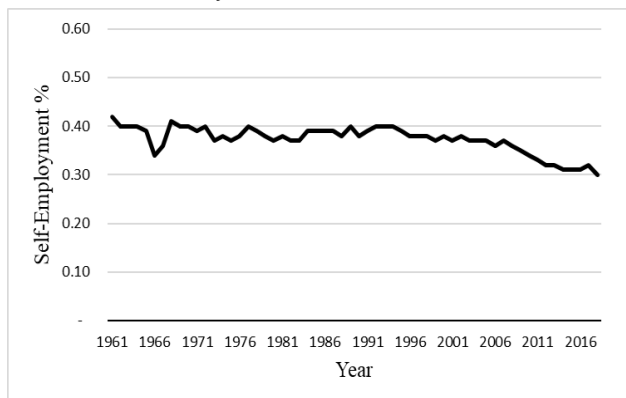*A. Historical Trends of Variables*

Fig. 6. Annual Average Self-Employment Rate (1968-2015)

The share of the self-employment rate has been stable for over 40 years from 1960 to 2000. However, there was a steady decline in the share of the self-employment rate starting in the early 2000s. According to a study from Asian Development Bank, this is due to the expansion of wage employment. Wage employees tend to earn more than self-employed workers, which explains the gradual decline in self-employment. Additionally, the decrease was also caused by the increase in the share of other sources of income, such as reliance on remittances (Valenzuela et al., 2017).
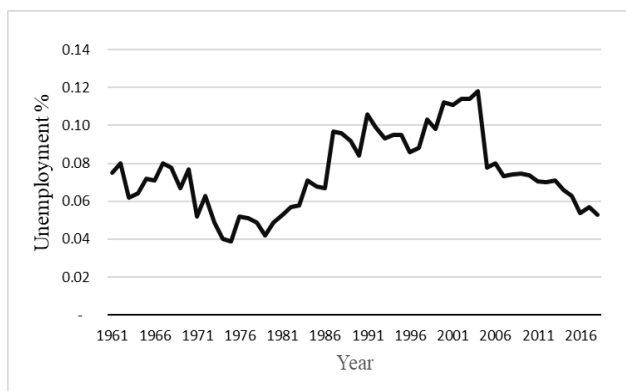

Fig. 7. Annual Average Unemployment Rate (1968-2015)

From 1968 to 1975, the unemployment rate trended downward until it increased in the 1980s, reaching 7% in 1984. The unemployment rate was greatly affected by the growth in the population, the lack of access to land, and inadequate job creation and economic policies (Dolan, 1993). According to Brooks (2002), employment growth had not been able to reduce the unemployment rate since it was not sufficient to offset the labor force growth in light of the rising labor force participation

rate and population growth. The Philippines invested heavily in capital-intensive industrial industries such as nuclear power, steel, aluminum, etc. which did not produce enough work compared to labor-intensive industries (Overholt, 1986). This backfired after these factories closed down and laid off workers (De Dios et al., 2021). Self-employment activities or small-scale enterprises, which are referred to as part of the informal economy due to the lack of records and tracking from the government, quickly replaced the jobs that were lost. A relatively high proportion of the labor force was transferred to low-productivity service-sector jobs (Dolan, 1993).

In the early 1990s, the unemployment rate soared as a result of the recession. It started to climb to 11% in 1991 due to mild recession and remained at around 9-10% from 1992 to 1999. Despite an increase in employment, most of these are in the economy's low-productivity service sector. In the 2000s, due to inclement weather and a decline in production, the Agriculture, Fisheries, and Forestry (AFF) sector experienced the most significant decrease in employment (Rubio, 2004). Agriculture employed 36.4% of the labor force in 2003, a significant decline from the 44% employed a decade earlier (Habito & Briones, 2005).

The major fall that occurred in 2005 was brought about by the revisions of unemployment's definition. The revision states that unemployment will only cover persons 15 years old higher than the previous 10 years old and above. It also only covers persons (i) without work (ii) currently available for work, i.e., were available and willing to take up work during the reference period and/or would be available and willing to take up work; and (iii) seeking work (Felipe & Estrada, 2018). From 2010 - 2018, unemployment continued to decline due to job creation & expansion in various sectors, according to the Banko Sentral ng Pilipinas. Based on the study of Resurreccion (2014), it was discovered that the relationship between unemployment, inflation, and economic growth is adversely related.
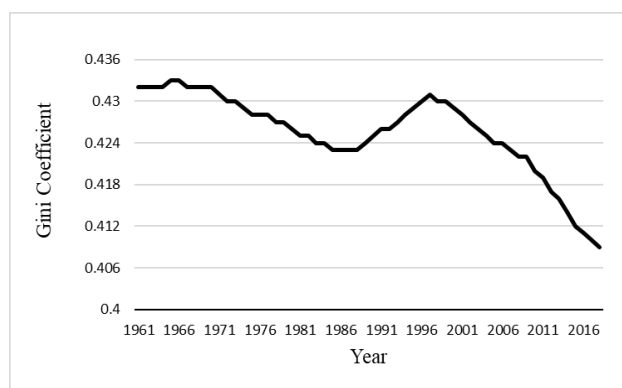

Fig. 8. Gini Coefficient (1968-2015)

The Gini coefficient, which measures income inequality, declined from 1971 to 1985 and increased between 1988 to 1999. Since then, it has continuously declined. Income inequality is usually attributed to income disparity among regions in the Philippines (Valenzuela et al., 2017). There is also a concentration of economic growth in the Greater Manila region compared to the slow growth in rural areas which

mirrored the Gini Coefficient in the Philippines. The weak growth of agricultural employment in rural areas is also to be blamed for the rise of income inequality between 1991 and 2000 (Tuaño & Cruz, 2019).

B. Statistical Results

Table 1
Ordinary Least Squares

	dGINI	
Variable	Coefficient	P-value
C	-0.00898357	7.00e-07
SE	0.0215288	5.43e-06
UR	0.00656096	0.1654

Table 1 shows that the self-employment rate has a p-value less than 0.05 alpha (p < 0.05); therefore, we reject the null and accept the alternative hypothesis that entrepreneurship has a significant effect on income inequality in the Philippines. Evidence from the result shows that the unemployment rate has no significant effect on income inequality in the Philippines with a p-value greater than 0.05 alpha (p > 0.05); therefore, we accept the null hypothesis.

The coefficient of determination (R-squared) of the model is 0.41, indicating that the independent variables can explain 41% of the dependent variable. The results imply that the self-employment rate has a positive effect on the Gini coefficient and that the unemployment rate is insignificant to the Gini-Coefficient.

Table 2
Correlation Coefficients, using the observations 1968-2015

SE	UR	d_GINI	
1.0000	0.1362	0.6188	SE
	1.000	0.2444	UR
		1.000	d_GINI

5% critical value (two-tailed) = 0.2845 for n = 48

The value of the correlation is at 0.2845, indicating that there is a positive correlation and significant since the value is greater than alpha. It also indicates that correlation is low among variables, decreasing the possibility of an error.

The diagnostic test results indicate that there are no errors in the model. The multicollinearity test, heteroskedasticity test, normality of residual, autocorrelation test, and specification test reveal that all of their p-values are higher than 0.05 alpha ($p > 0.05$), therefore accept the null hypothesis that there is no error in the model. Results from Augmented Dickey-Fuller & Johansen Test indicate that the time series model is non-stationary and cointegrated, rejecting the null hypothesis at stage 3 as k>2. This means the variables are integrated and will not depart in the long run.

C. Discussion

The results revealed that the self-employment rate has a positive significant effect on the Gini coefficient. As entrepreneurship increases, the Gini Coefficient rises correspondingly.

Table 3
Diagnostic test result

VIF Multicollinearity Test	Null hypothesis: no multicollinearity Values > 10 may indicate a collinearity error SE = 1.019 UR = 1.019
White's Test for heteroskedasticity	Null hypothesis: heteroskedasticity not present Test statistic: TR^2 = 9.247092, p-value = P(Chi-square(5) > 9.247092) = 0.099605
Breusch-Pagan Test for heteroskedasticity	Null hypothesis: heteroskedasticity not present Test statistic: LM = 2.791264, p-value = P(Chi-square(2) > 2.791264) = 0.247676
Test for normality of residual	Null hypothesis: error is normally distributed Test statistic: hi-square(2) = 5.711 with p-value 0.05754
LM test for autocorrelation up to order 1	Null hypothesis: no autocorrelation Test statistic: LMF = 1.046449, with p-value = P(F(1,44) > 1.04645) = 0.312 Alternative statistic: TR^2 = 1.115062, with p-value = P(Chi-square(1) > 1.115062) = 0.291 Ljung-Box Q' = 1.16902, with p-value = P(Chi-square(1) > 1.16902) = 0.28
Durbin Watson	Null hypothesis: no autocorrelation Durbin Watson = 1.690899 With p-value = 0.085032
RESET test for specification (Square and cubes)	Null hypothesis: specification is adequate Test statistic: F = 0.628594, with p-value = P(F(2,43) > 0.628594) = 0.538
Augmented Dickey-Fuller	Null hypothesis: time series is non-stationary p-value d_d_GINI = 7.318e-30 p-value d_d_UR = 8.156e-13 p-value d_d_SE = 2.416e-09
Johansen Cointegration Test	Null hypothesis: Stage 1: k>0, Stage 2: k>1, Stage 3: k>2 Reject null hypothesis at stage 3 since k<2

This result is similar to the findings of Lecuna (2014) and Halvarsson et al. (2018), whom both suggest that the registration and encouragement of entrepreneurial activities aggravate income inequality. Halvarsson et al. (2018) study stated that entrepreneurship could affect the bottom and top of the income distribution. There are two main arguments from the existing literature that may explain the result. First, entrepreneurs at the top of the income distribution and with capital will likely succeed in pursuing entrepreneurship (Lecuna, 2014; Hasan & Jandoc, 2009). More importantly, they will also have higher incomes compared to their counterparts (i.e., wage & salaried workers) and to those who do not have the capital. This is aligned with the study of Kuznets (1955), which stated that income inequality increases when income is accumulated in the top bracket of the income distribution.

Second, despite entrepreneurs' possibility of higher earnings, not every entrepreneur earns more than their counterparts. Self-employed who are in the bottom and middle of the income distribution, wage, and salaried workers have higher earnings compared to those who are self-employed. Factors such as lack of access to credit, market information, and government regulation are constraints that affect the self-employed from having a higher income (Hasan & Jandoc, 2009). The study of Lofstrom (2013), Atems & Shand (2018), and Rani & Furrer (2016) all suggest that skills and education are determinants of the earnings of a self-employed worker. It was identified that low-skilled self-employed have lower earnings and will switch to a wage or salaried work if they can. Furthermore, a higher level of education will increase the probability of workers securing a wage/salaried work. The study by Valenzuela et al. (2017) revealed that from 2000 to 2012, households that drew their income from entrepreneurial activity had the highest poverty compared to households earning from wages and salaries.

The low income of the bottom and middle self-employed and the high income of the top self-employed explains the direct relationship between entrepreneurship to income inequality.

On the other hand, contrary to the hypothesis of Deyshappriya's (2017) study and from substantial evidence in the literature, the result indicates that the unemployment rate is insignificant to the Gini coefficient in the Philippines. According to Jantti & Jenkins' (2001) and Muryani et al. (2021), improvement in unemployment does not guarantee better distribution of income and thus has an insignificant impact on income inequality. Instead, improvements in the quality of jobs, labor skills, and productivity are needed as a more effective technique to obtain positive effects on income inequality. Similarly, having a job does not guarantee that workers will be better off. A significant number of workers may overcome poverty, but per capita income will not improve significantly as the formal sector requires more skills and knowledge. The lack of quality jobs and slow growth in real wages may be better determinants of income inequality in the Philippines. The study by Rutkowski (2015) stated that although the Philippines can create jobs and employ most of its working population due to economic growth, as seen in Figure 7, it still failed to improve the quality of jobs resulting in low-paying jobs. Real wages remain stagnant due to the weak bargaining power of low-skilled workers.

Inequality in educational attainment has been recognized as the root cause of vulnerable workers in the Philippines. Inequities in education impede empowerment, capabilities, skills, and level of engagement in social and economic growth processes. Improving the quality of education for the poor is an approach to reducing income inequality, allowing everyone to have a higher wage return (Albert et al., 2015). Consequently, investment in education reduces unemployment opportunity costs. Higher educational levels help reduce the risk of unemployment because educated workers are more efficient in finding new employment opportunities and obtaining higher salaries (Gokhool et al., 2021).

5. Conclusion

The study aims to find the relationship and significance of entrepreneurship and unemployment to income inequality in the Philippines. The researchers used a time-series regression model using the Ordinary Least Square procedure to determine the significance of the independent variables to the dependent variable. The self-employment and unemployment rates data were obtained from PSA, while the Gini Coefficient was obtained from SWIID. The study covered 48 years from 1968 to 2015 to perform the time-series regression. Diagnostic tests were also performed to determine any errors ensuring that the model was valid and reliable before using it to forecast. The results indicate that entrepreneurship has a positive effect on income inequality, yet the unemployment rate was found insignificant to the dependent variable. It appears that changes in the unemployment rates do not affect income inequality in the Philippines. On the other hand, the result showed the significance of the self-employment rate to the Gini coefficient, which was consistent with the empirical evidence that an increase in entrepreneurial activities would increase income inequality in the Philippines. It appears that entrepreneurial activities can aggravate the dispersion of income within the income distribution. Income is concentrated on entrepreneurs with capital, while the low-skilled and entrepreneurs without capital experience failure where their business endeavors may not generate the expected return on investment and earn less compared to salary/wage workers.

A. Policy Implications

This study can be used to determine factors that aggravate income inequality in the Philippines. The Philippines can create policies that may influence those determinants to decrease income inequality.

The statistical results supported the significance of the direct relationship between entrepreneurship and income inequality. The income concentration of self-employed who have capital and the low income of the low-skilled self-employed may explain this relationship. The study by Atems & Shand (2018) suggests that growth-enhancing policies are more effective than entrepreneurship-enhancing policies in reducing the income in quality. Despite entrepreneurship increasing income inequality, the Philippines should still pursue entrepreneurship-enhancing

policies because of its potential to create jobs, its contribution of value to the economy, and its engagement in export trade. The Philippines can keep supporting entrepreneurial activities and mitigate income inequality altogether by bolstering low-skilled entrepreneurs by giving them access to credit, education, and information and easing the process of doing business in the Philippines, which was pointed out by Valenzuela et al. (2017), Rani & Furrer (2016), Hasan & Jandoc (2009).

The Republic Act No. 11032, also known as the Ease of Doing Business and Efficient Government Service Delivery Act of 2018, is an act aimed at increasing the efficiency and effectiveness of doing business operations in the country. All government agencies are required to simplify business processes, reduce red tape, and expedite business permits and licenses. This standardizes the processing timetable for businesses, making transactions and processes easier to comply with. This also allows businesses to reduce their costs and expenses spent on government regulation that can constrain their capital (Hasan & Jandoc, 2009). The Republic Act No. 9501, which is better known as the Magna Carta for Micro, Small, and Medium Enterprises (MSMEs) law, is an act to promote entrepreneurship in the Philippines. They give training that could enhance the skills of entrepreneurs and give access to sources of funds.

Both of these policies increase the probability of MSMEs earning higher incomes. However, micro-enterprises that have a capital of not more than Php 3,000,000 should be prioritized since they are the most vulnerable to having weak earnings that can lead to the failure of their business. Moreover, since they are characterized as having little capital, they do not also benefit from economies of scale compared to companies with larger capital (Lecuna, 2014; Hasan & Jandoc, 2009). Governments should therefore focus more on offering the poor the appropriate intervention policies that can give them credit access, education, and other relevant activities. Governments should offer various schemes targeting the poor. Entrepreneurship-supporting policies can be particularly beneficial in reducing inequality if they are targeted at the low-income, low-wealth, and uneducated segments of society (Lecuna, 2019).

The statistical results suggest the insignificance of the relationship between the unemployment rate and income inequality. In the study of Rani & Furrer (2016), different factors that may contribute to income inequality were analyzed from 13 G20 countries, and have found that labor income inequality significantly explains the income inequality in all of the countries except South Africa and the United Kingdom. In the Philippines, there is an increase in job creation that employed workers, but real wages remained stagnant. The lack of quality and low-paying jobs may be the factors that could explain income inequality in the Philippines and not the unemployment rates.

The Republic Act 10869, otherwise known as the Job start Philippines Act, is a law that institutionalizes the country-wide implementation of the Job start Philippines Program and provides funds thereof. With the creation of the Public Employment Service Office (PESO), it would become the main establishment that serves as the provider of active labor programs such as job search assistance, training, and arrangement for the unemployed (specifically the young job applicants).

This project would help improve the knowledge and skills attained from their education and train them to become equipped with employability abilities fit for the demands of the labor market. The youth will benefit from this as they will be given a head start on their future, and employment opportunities will arise from it. Thus, this can produce job-ready and skillful employees that can help reduce unemployment on a small scale.

Other than this act, there are an inadequate amount of existing policies that focus specifically on creating high-quality and well-paying jobs. Therefore, the government should also create a policy that can produce high-quality jobs that pay higher.

B. Economic Theory

Kuznets' Curve hypothesis suggests that all economies will experience income inequality at the start of economic development but will eventually improve as economic development prospers under industrialization. Contrary to the Kuznets Curve, results from this study suggest that entrepreneurship can still increase income inequality despite being able to help create jobs, increase the country's productivity, and increase economic growth in the Philippines. There are two reasons for this finding.

First, in Kuznets's curve hypothesis, the initial increase in income inequality was brought about by industrialization mainly due to the migration of agricultural workers to higher-paying non-agricultural jobs. Early industrialization in the Philippines was mainly on commodity processing, such as rice mills, sugar centrals, and hemp factories, located among many commodity-producing provinces. (Williamson, 2017). This means that agricultural workers in the Philippines did not seek non-agricultural jobs since the jobs being created were in the provinces. Thus, the Kuznets curve is not evident in the Philippines even during the twentieth century. There was no increase in income inequality during the industrial development from the early 1950s to the mid-1970s.

Second, even though the Philippine economy is growing, growth is centralized in urban areas. Tuaño (2019) stated in his study that income inequality in rural areas remained high in the Philippines from 1991 to 2015. This is brought about by weak employment opportunities in the agriculture sector that resulted in low levels of output and productivity. Rural areas have high vulnerability and poverty rates because economic development primarily focuses on urban areas. (Parel, 2014). As a result, the poor have acquired just a portion of the advantages of economic progress. This could prevent low-skilled workers from accessing resources that invest in human capital.

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