UJoST
e-ISSN: 2962-9179
Universal Journal of Science and Technology

Philippine MSMEs - Impact on Sustainable Economic Development in Employment Generation, Income Inequality, and Poverty

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Abstract — *In the Philippines, the MSME sector is considered to be a significant driving force in boosting economic productivity addressing poverty, income inequality, and high unemployment rates. This study aims to answer, "How impactful are the role of MSMEs on employment generation, income inequality, and poverty in the Philippines?". Most studies show that MSMEs (regressor) positively impact employment generation, income inequality, and poverty alleviation (regressands) however, some studies show that MSME negatively impacts labor productivity which affects employment generation; MSME and poverty alleviation has a negative association, whereas as MSME industries flourish, poverty incidence also increases; and MSME negatively affect income inequality wherein as MSMEs flourish, the income gap between the rich and the poor is also growing. The researchers collected regional secondary data from the Philippine Statistics Authority and published academic journal online, determined using panel least squares regression analysis to evaluate the relationship between the controlled and observed variables. The study proved that there is a negative correlation between MSMEs and employment generation, income inequality, and poverty alleviation, which means that the dependent variables have an impact on the MSMEs.*

Keywords — *MSMEs, employment generation, income inequality, poverty*

I. INTRODUCTION

The Philippines has been facing various economic problems, specifically poverty, inequality, and unemployment. On top of that, Prasetyo (2021) acknowledged that poverty, inequality, and unemployment are the three main problems in economic development. Currently, the estimated population in the Philippines is about 110 million people because the world population has grown significantly then the

number of poor people in the world is constantly increasing (Chui & Cabanda, 2005). With the increasing population in the country yearly, does it affect the reduction of poverty, income inequality, and unemployment? Poverty is considered to be one of the many social problems within the Philippines and needs to be eradicated with the help of the local government, organizations, and people in the business sector to provide employment opportunities for society and its residents (Quingco & Leonoras, 2019). It is still a major challenge in achieving sustainable development, environmental security, global stability, and a global market (Sharma, 2015). As stated by the Philippine Statistics Authority (PSA) that during the first semester of 2021, the poverty rate of the country stood at 23.7 percent which is equivalent to 26.1 million Filipinos. Based on the data, there is an increase in poverty incidence among the population during the first half of 2021 compared to the first half of 2018. With poverty, income inequality is also present in the country since both income growth and rising inequality have opposite effects on poverty. According to Luo (2020), there is a high probability that income growth reduces poverty incidence, whereas rising inequality worsens it. Moreover, Kouadio and Gakpa (2021) mentioned that as long as there is an unfair distribution of growth exists, then poverty alleviation mechanisms will not be effective. Another problem that is connected to poverty is unemployment, where the higher the number of the workplace, if it is not followed by an increase in the availability of employment thereby, will result in unemployment (Prasetyo, 2021). If there is high unemployment, it may then reflect the low economic growth hence resulting in low entrepreneurial opportunities (Baumol, 2009; Audretsch & Keilbach, 2011). Because of these economic difficulties that were felt by many Filipinos, the Micro, Small, and Medium Enterprises (MSMEs) are considered to be one of the many solutions that can help alleviate poverty and, at the same time, lessen both inequality and unemployment. The researchers led to a question, “What is the Role of Micro, Small, and Medium Enterprises (MSMEs) towards sustainable economic development in terms of employment generation, income inequality, and poverty?”.

On the contrary, the narrative of MSMEs based on past studies is not uniform. Countries such as India, Ghana, Nigeria, and many African nations experience positive effects of MSMEs where it does generate employment, reduce income inequality, and alleviate poverty. However, places like Pakistan, West Virginia, and China do not experience the positive narrative of MSMEs. For instance, in Pakistan, it is found that the growth of MSMEs leads to more income inequality resulting in increased levels of poverty. In the case of West Virginia, it rejected the narrative of MSMEs reducing poverty thus, it was found that MSMEs do not alleviate poverty. In China, MSMEs did alleviate poverty however income inequality grew as the incidence of MSMEs flourish. Income inequality will still lead back to poverty if it’s not addressed properly since the gap will continue to expand bringing citizens back to poverty (Agpayong, 2010; Ali & Ali, 2013; Nursini, 2020; Yadav & Suthar, 2021).

Micro, Small, and Medium Enterprises (MSMEs) are considered to be one of the great driving forces in the Philippine economy hence, their role in the economy’s growth is very vital (Miranda, 2018). Khatibi (2021) concluded that these enterprises which engage in the wholesale or retail trade, manufacturing, hotels and restaurants, real estate, and other community, and social service businesses help reduce poverty in the country by providing jobs to the growing labor force of the country. In line with this, Adebayo and Nassar (2014) also mentioned that these enterprises are essential instruments for poverty reduction, especially in developing economies. Given that the MSMEs account for the 99 percent of businesses registered in the country thus, they provide employment opportunities to the Filipinos workers by 60 percent. Likewise, it contributes to the economy by 35.7 percent value. As well as that, the lessening of barriers to entry allows enterprises that are suffering to be stabilized hence, it opened more opportunities for the Filipinos (Khatibi, 2021).

In terms of the number of establishments, MSMEs were able to dominate the Philippine economy and accounted for 99.6 percent of the total number of establishments in 2006. In terms of employment and

value-added contribution, MSMEs accounted for 61.2 percent of the country's total employment and 35.7 percent of total value-added. In terms of employment contribution, microenterprises contributed 31.2 percent while SMEs contributed 32 percent. On the other hand, the value-added contribution of microenterprises accounted for a share of 4.9 percent, and SMEs accounted for 30.3 percent. As a result, the growth of the MSME sector has not been vigorous enough to propel the economy. In terms of labor productivity measured by value-added per worker, microenterprises registered the lowest with labor productivity of only about 10 percent of that of large enterprises. The labor productivity of small enterprises was 52 percent of large enterprises' labor productivity while for medium enterprises, the ratio was 82 percent (Aldaba, 2012).

Table 1. MSMEs: Structure and Economic Contribution

	Total	Micro	Small	Medium	Large	MSMEs
2008 number of enterprises	761, 409	697,077	58,292	3,067	2,973	758,436
Percent distribution		91.6	7.7	0.4	0.4	99.6
2008 employment	5,544,590	1,663,382	1,314,065	418,058	2,149,085	3,395,505
Percent distribution		30	23.7	7.5	38.8	61.2
2006 value added (in million pesos)	2,108,546	103,918	431,340	216,685	1,356,603	751,943
Percent distribution	100	4.9	20.5	10.3	64.3	35.7
2006 value added per worker (in pesos)	380,289	62,474	328,248	518,313	631,247	221,452
Percent of large enterprises		9.9	52	82.1		

Table 1 - Source: MSMED Plan 2010 - 2016

Based on the data of the Philippine Statistics Authority (PSA) during 2018, in terms of sectoral classification, the wholesale and retail trade; repair of motor vehicles and motorcycles sector with 461,765 enterprises accounted for the bulk or 46.4 percent of the total MSMEs in 2018. This was followed by accommodation and food service activities and manufacturing with 144,535 and 116,335 with a share of 14.5 percent and 11.7 percent of the total, respectively. These three industries jointly accounted for 72.4 percent of total MSMEs in 2018. Based on the estimates of the Department of Trade and Industry (DTI), the manufacturing sector contributed the largest share to the country's total value added at 6.9 percent. In terms of regional distribution, almost half of the MSMEs in 2018 were located in three regions, namely NCR (20.4 percent with 203,312 establishments), CALABARZON (14.8 percent with 148,196), and Central Luzon (11.6 percent with 116,073). Furthermore, Central Visayas, Western Visayas, and Davao are the other regions that hosted a significant number of MSMEs.

With the issues observed, such as the trend of MSMEs generating employment, alleviating income inequality, and reducing poverty, the researchers examine the role of MSMEs in the Philippines since it is one of the developing countries that experience high poverty rates that also results in increasing inequality and unemployment or underemployment. Additionally, the Philippines is one of the countries that is dedicated to achieving the Sustainable Development Goals (SDGs) of the United Nations by the year 2030. To measure the impact of MSMEs in achieving the SDG goals specifically in the economic sector, SDG

Goal # 1: No poverty, SDG Goal # 8: Decent work and economic growth, and SDG Goal # 10: Reduced inequalities are being targeted in this study.

This study aims to answer the question, "How impactful are the role of MSMEs on employment, income inequality, and poverty alleviation in the Philippines?". To achieve this, the study has four objectives: (1) to identify the key role of MSMEs in the Philippines, which stimulate employment, income inequality, and poverty overall, impacting its sustainable economic growth and development; (2) to determine the employment rate, income inequality, and poverty in the MSMEs industry of the regions in the Philippines; (3) to evaluate the relationship between MSMEs and employment generation, income inequality, and poverty alleviation and; (4) to measure the impact of MSME in achieving SDG 1, 8, and 10.

The purpose of this paper is to contribute to existing related literature on the role of MSMEs in terms of employment generation, income inequality, and poverty. The findings of the study would be a great contribution to the various MSMEs and society. This study is not expected to lobby policymakers; however, if the findings intrigued future economists, researchers, and policymakers, then further mechanisms may be performed. Moreover, the researchers conducted this study to benefit the following:

For Micro, Small, and Medium Enterprises (MSMEs). The study will provide further information and a deeper understanding of how they are contributing to society through employment opportunities, reduction of income inequality, and poverty alleviation.

For Policy and Regulatory Institutions for Development Plan. The study may be used as a reference for the policymakers on their decision-making process and drafting of policy choices regarding strategies for the economic development of the Philippines. The institutions that may benefit from the study are Department of Trade and Industry (DTI), Department of Labor and Employment (DOLE), and National Economic and Development Authority (NEDA).

For Future Researchers. The study can be used as a reference in conducting new research related to the MSMEs sector.

For Development Economists/Researchers. Through this study, the economists or researchers will gain insights into the role of MSMEs and provide empirical evidence concerning the following dependent variables: employment generation, income inequality, and poverty in the Philippines. The findings of the study may aid them with their related studies, which are in the field of economic development.

II. LITERATURE REVIEW

2.1 Micro, Small, and Medium Enterprises (MSMEs)

In the Philippines, the Republic Act No. 9501, or Magna Carta for Micro, Small, and Medium Enterprises was enacted by the Philippine Congress in 2008 to promote, support, strengthen, and encourage the growth and development of the MSME industry of the country. Ajuwon et al. (2017) defined MSMEs as the level of investment capitalization, sales turnover, and the total number of employees in an establishment. MSMEs are any business activity that is engaged in industry, agribusiness, trade, and services based on total assets and number of employees as follows:

Table 2. Micro, Small, and Medium Enterprises classification based on total assets and the number of employees

Size	Total Assets	Number of Employees
Micro	not more than PHP 3,000,000	1 - 9
Small	PHP 3,000,001 - 15,000,000	10 - 99
Medium	PHP 15,000,001 - 100,000,00	100 - 199
Large	above PHP 100,000,000	200 and above

Table 2 - Source: RA No. 9501: Magna Carta for Micro, Small and Medium Enterprises section 3 and Micro, Small, and Medium Enterprise Development Council (MSMED Council)

In the paper of Aldaba (2011), the Philippine government from the seventies up to the present has devoted considerable effort on supporting and promoting SMEs development since the overall policies and programs have evolved with the focus on shifting from an inward-looking approach toward a more externally-oriented approach. As discussed by Leano (2006), the Philippine government decided on a comprehensive and integrated strategy for both sustainable growth and the development of SMEs that are affecting the economy. Concerning that, proponents of policies and programs that assist small businesses asserted that they tend to be labor-intensive, effective, fair in how they distribute the money they generate, geographically spread, and supportive of entrepreneurs (Nichter & Goldmark, 2005).

Quingco and Leonoras (2020) stated that MSMEs are considered to be the lifeblood of the economy. It is the engine for a globally competitive Philippine economy because microeconomic businesses are more noticeable flagships to a nation's development and progress (Chui & Cabanda, 2005). As the MSME sector has a vital role in the country's economy, researchers like Pradhan and Munda (2010), Aldaba (2011), Naser (2013), Zanjurne (2018), Srivastava (2020), and Yadav and Suthar (2021), acknowledged that it is crucial for the country's sustainable economic growth and promotion of economic development as it contributes to the country's overall innovation, industrial production output, export, and industrial management. In developing countries, specifically in Asia, Africa, and Latin America, the MSME sector plays an important role in the perspective of employment opportunities and sources of income for the poor to be distributed properly, poverty reduction, and rural economic development (Rahmana, 2008; Tambuna, 2012). As supported by other researchers such as Prasetyo (2008), Kiss and Zagyi (2014), Sarkar (2016), Yahaya et al. (2016), Singh and Paliwal (2017), Zafar and Mustafa (2017), Tambunan (2019), Weldeslassie et al. (2019), Erdin and Ozkaya (2020), Shelly et al. (2020), Bhat and Singh (2020), Prasetyo and Dzaki (2020) and Kyal et al. (2021), the contributions of the MSME sector as the driving force of income generation, employment generation, entrepreneurship development, local competitiveness, and poverty reduction and/or alleviation. It is evident that entrepreneurship brings both labor and capital together thus, it is the pathway toward employment and economic growth (Mahadea & Kaseeram, 2018).

Additionally, the MSME sector ensures the creation and growth of money supply both in urban and rural areas, thereby improving the peoples' purchasing power and per capita income (Baral, 2013). The development of the MSME sector is for the betterment of one's economy for the reason that, Geremewe (2018) and Manzoor et al. (2019) concluded that it can result in absorbing more labor, improvement of

one's income, and pushing economic growth to further reduce poverty incidence hence improving their socio-economic condition. However, a study by Subhan et al. (2014) in Pakistan highlighted that there are also some hidden and apparent obstacles in the path of the growth of SMEs such as political instability, law and order situation, financial constraints, energy crisis, taxation problems, labor issues, regulatory reforms, lack of coordination, and regular information exchange mechanism among institutions.

2.2 Sustainable Development

In the study of Shelly et al. (2020), the authors mentioned that the concept of sustainable development covers a wide range of aspects because it includes economic, social, and environmental issues with consideration of the environmental aspect. It aims at creating a society wherein both nature and individuals live in harmony with one another and not at the expense of the deterioration of the environment (Verma & Nema, 2019). According to Khan (2011), sustainable development means achieving a balance between the development and protection of the environment (employment, shelter, basic services, social infrastructure, transportation, etc.).

One well-known organization that is engaged to meet the Sustainable Development Goals (SDGs) by the year 2030 is the United Nations Development Programme (UNDP) and through this, the related SDGs in our study are goals: #1 No Poverty, #8 Decent work and economic growth, and #10 Reduced inequalities; the SDG Goal # 1 poverty eradication is the main focus of governments and stakeholders (Nursini, 2020). Poverty alleviation must deal with any effective program that is related to sustainable development (Quingco & Leonoras, 2020). Shelly et al. (2020) viewed the MSME sector as a critical pillar in accomplishing the SDGs because it can contribute directly or indirectly. Sustainable development should be a precondition for a competitive MSME sector especially in developing or emerging countries since it generates massive employment opportunities; helps diversify economic activity; and contributes to local development (Roxas, 2007).

2.3 MSMEs and Employment Generation

According to Suhaili and Sugiharsono (2019), employment is directly linked to job opportunities, specifically the ability of available jobs to absorb the current workforce. Through employment generation, income availability would increase, which may boost the social standard (Subhan et al., 2014). As mentioned in the study by Kumar (2020), MSME contributes a major impact on increasing the nation's employment among genders, regions, sectors, and skills; concurrently, it also allows people to develop entrepreneurial skills that serve as an instrument to promote women's employment and reduce poverty in the country. Furthermore, Almeda and Baysic (2013) mention that the policy environment in which MSMEs operate was the focus of research in the Philippine MSMEs; the manufacturing sector has received particular attention in increasing productivity value creation. Thus, according to Philippine Statistics Authority (PSA), MSME generated 63.2 percent of the total employment in the country which is equivalent to 5.7 million jobs in 2018.

In addition, Almeda and Baysic-Pobre (2013) stated that small enterprises generate more employment because they can integrate manpower and job creation due to their labor intensiveness rather than large enterprises. On the other hand, MSME also promotes self-employment in rural areas; Tambunan (2019) stated that within a developing country, a higher proportion of self-employment units are located in rural areas because it depends on family labor such as livestock sales, crop sales, and other self-sustaining sources of income.

Governments have been supporting MSMEs extensively with various programs because it plays a significant role in developing countries which improve employment creation, income distribution, poverty reduction, industrial and rural development, and export (Tambunan, 2019). In line with this, Castillo et al. (2014) mentioned that Argentina's economy confirmed that implementing an effective innovation policy for SMEs can increase employment and a higher wage; the authors used a quasi-experimental strategy and found that programs that support process and product innovation could create five additional jobs per firm. In the Indian economy, Yadav and Suthar (2021) stated that growth is achievable through increasing labor productivity and capital investment, if policies are correctly designed, labor market flexibility will make the quality of employment better which would help the MSME's impact in the long run. Nandeeswaraiah and Ramana (2019) also recognized the contribution of MSMEs to the Employment Generation in India, stating that it generates a large number of job opportunities for the country's younger generations due to the increasing number of units year on year and the existing amount of untapped human potential.

In contrast, the findings of the study by Apaydin (2018) show that there is an inverse relationship between entrepreneurship and unemployment in Turkey. The regression model of growth rates of both labor and capital by Yadav and Suthar (2021) yields significant results where labor and capital do not have a positive impact on the growth of production in the Indian MSME sector hence, a decreasing trend in the growth in productivity of labor and capital and the important factors behind the low productivity are sub-optimal scale of operation, technological backwardness, supply chain inefficiency, increasing domestic and global competition, shortage of funds, uncertain market scenario, lack of infrastructure facilities at the workplace, poor job quality, low wages, and poor working conditions.

Ho: There is no significant relationship between the number of MSMEs and employment generation.

2.4 MSMEs and Income Inequality

In the paper by Dollar and Kraay (2002), the authors defined the poor as those in the bottom fifth of the income distribution of a country. MSME can significantly affect a country's income inequality, it helps lower unequal income distribution by creating more job opportunities and industrialization in the Indian economy (Syal, 2015). Researchers like Thorbecke (2013), Basu (2013), Ncube et al. (2014), Fosu (2016), and Ostry et al. (2018) confirmed that high inequality inhibits the positive effect of the economy in terms of diminishing poverty. Furthermore, Wahiba and Weriemmi (2014) confirmed that the unequal distribution of income is endogenous to the process of development; there is an increase in inequality when there is development but beyond a certain threshold, balanced inequality, then declining until it reaches the lowest level that can be in industrialized economies. In addition, Lippmann et al. (2005) found that higher rates of entrepreneurial activity through enterprises would result in greater income inequality for the reason that those at the upper end of the income distribution have extra capital to invest in other businesses.

Winklemann and Winklemann (2010) highlighted that analyzing a country's income inequality is essential because increasing inequality could harm the poor, which can negatively impact the middle class. Rivera (2021) mentioned that in the Philippines, NCR obtained the highest level of inequality while improvements were evident in the survey periods, with metropolitan regions such as Central Visayas and Davao, NCR demonstrated steep improvements toward more equality. In the international setting, Barros and Gupta (2017) mentioned that the measure of inequality (Gini indicator) in South Africa is found to increase poverty showing that inequality and poverty affect each other, the findings proved that in South Africa, poverty is growing at a decreasing rate. Furthermore, economic variables such as income per capita, GDP growth, and employment minimize poverty. In addition, in the study by Wahiba and Weriemmi (2014), the decrease in the rate of economic growth due to income inequality is explained by the increased poverty that involves

the implementation of policies regarding income redistribution that will significantly increase taxes and then distortions.

According to Hyder et al. (2015), to estimate the magnitude of impact, there are determinants of income inequality such as food prices, per capita income, manufacturing-to-agriculture terms of trade, investment/GDP ratio, direct/indirect tax ratio, the ratio of development expenditure on social services to GDP, and the ratio of manufacturing and agricultural wages. The researchers also concluded that inflation, sectoral wage gap, and trade in favor of manufacturing have a significant positive correlation toward inequality while investment expenditure on social services harms inequality. On the other hand, in the paper of Atems and Shand (2018), the empirical results show evidence of a strong positive relationship between entrepreneurship and income inequality. Additionally, in businesses with little compensation dispersion, Carnahan et al. (2012) found a positive relationship between high-performance workers and their propensity to become entrepreneurs. Furthermore, Bonito et al. (2017) showed that regional gross domestic product was a significant determinant of income inequality and the variables were negatively related to income inequality; the regression result of the relationship between the regional gross domestic product was a significant determinant of income inequality at a 10 percent level of significance; thus, the MSME was an insignificant determinant of income inequality at a 10 percent level of significance.

Ho: There is no significant relationship between the number of MSMEs and income inequality.

2.5 MSMEs and Poverty

Lecuna (2020) mentioned that the percentage of the population who live in families where the average annual consumption or income is less than the poverty level is known as the poverty ($1.90 a day). As stated by Ali and Ali (2013), the concept of poverty is not a simple task because it is multi-dimensional; it covers not only the levels of both income and consumption but as well as health, education, vulnerability, risk, marginalization, and exclusion of the poor from the mainstream of society (Mahendra Dev, 2000). Furthermore, one of the most important goals of the SDGs is poverty eradication which is a key objective of policymakers (Cheema & Sial, 2012). In the study by Rivera (2021), the author mentioned that through the years in the Philippines, the urban regions of Central Luzon, NCR, and CALABARZON and rural regions of Ilocos and CAR have poverty thresholds that are larger than the other regions while ARMM has the lowest poverty threshold. In addition to that, the author also concluded that for anti-poverty policies to be impactful, especially to the poorest, they should focus on a region or specific province-based considering that appropriate policy with collaborative governance supported by a robust and data-driven understanding of the situation of both poverty and inequality can be formulated for the regions of the country.

Cheema and Sial (2012) stated that poverty depends on inequality and growth however the relationship between poverty, income inequality, and growth is not simple. Theoretically, investigating the relationship between MSMEs and poverty reduction through economic growth trends and labor absorption (Nursini, 2020). It is also stated in the study of Dowers and Masci (2013) and Ali et al. (2014) that the SMEs sector is important since it is the most effective instrument for poverty alleviation because they are the emerging private sector that constitutes large share firms, generation of employment opportunities, and a contributor of livelihood for the poor. Through SMEs, there is an increase in the economy's productivity growth, meaning it plays an important role in public welfare and poverty reduction (Ali et al., 2014). Through (1) income generation and diversified livelihood opportunities, (2) more secure employment opportunities, and (3) provision of other social benefits to the poor, such as skill enhancement, increased self-confidence, increased participation of women, empowerment, and security against income loss, the growth of MSMEs directly contributes to the alleviation of poverty (Duncombe & Heeks, 2005). Verma et al. (2020) stated that MSMEs not only alleviate poverty but also can improve both the economic and socio-economic

condition of the underprivileged population hence boosting the rural development; as more MSMEs flourish, it lays the foundation for both poverty alleviation and rural development in a country. Therefore, it must be given importance and attention by the state to the development of MSMEs since they give efforts of reducing the poverty rate within a country (Salim, 2020).

A study by Nursini (2020) mentioned that many empirical studies analyzed the correlation between MSMEs and poverty reduction, the researchers that argue the relationship have a strong connection are Harvie (2003), Mukras (2003), Beck et al. (2005), Koshy and Prasad (2007), Asikhia (2010), Adeyemi and Lanrewaju (2014), Ali et al. (2014), Hussain et al. (2017), Geremewe (2018), and Manzoor et al. (2019) while other researchers that reject the argument due to the research methodology and empirical research findings are Katua (2014), Abdullahi and Sulaiman (2015), and Bank Indonesia (2016). In comparison, Tambunan (2019) investigated the theoretical implication between poverty and the importance of MSMEs in which it is positively correlated, meaning the economic share of MSMEs increases as the poverty rate also increases. Ali et al. (2014) found a strong negative relationship and significant impact in West Virginia between small-scale businesses and the incidence of poverty, whereas poverty has an increasing trend in the years of decline in small-scale industries' output since small-scale enterprises utilize more labor compared to large-scale firms.

Ho: There is no significant relationship between the number of MSMEs and poverty alleviation.

2.6 Synthesis

Generally, the related literature shows contrasting findings on the relationship between MSMEs, employment generation, income inequality, and poverty. The researchers summarized past studies based on the findings of MSME's relationship with the three dependent variables.

1. In terms of employment generation, studies show that MSMEs positively contribute to employment generation both in the international and local setting since it provides job opportunities. Thus, in the Philippines, it was empirically proven that the employment rate continues to grow as the MSMEs flourish. In contrast, some studies, like the study of Apaydin (2018) show that MSMEs negatively impact labor productivity affecting employment generation, and show a decreasing trend in the growth in productivity of both labor and capital and the important factors behind the low productivity leading to inefficiency.
2. In terms of income inequality, MSMEs can also help reduce wage inequality by increasing their productivity. As stated above, MSMEs generate income through employment, making the income distribution fairer and minimizing wage inequalities. In other words, productivity is essential in minimizing the gap in income inequality. At the same time, the MSME was also found an insignificant determinant of income inequality and has a negative impact on inequality.
3. In terms of poverty alleviation, MSMEs contribute directly to poverty alleviation through income generation, diversified livelihood opportunities, providing more secure employment opportunities, and provision of other social benefits to the poor. Nevertheless, there are still studies that show a negative association and no significant impact between poverty and MSME output, whereas poverty has an increasing trend in the years of decline in small-scale industries.

Furthermore, in the Philippines, the role of MSMEs in terms of the three dependent variables affecting sustainable growth and development in the national economy has not been further explored despite outweighing the benefits it gives to Filipino workers.

2.7.1 Theoretical Framework

A. Social Economic Development by Dudley Seers

Dudley Seers (1969) emphasizes the meaning of social development. The theory states that development is related to the level of poverty, unemployment, and inequality in a nation; if one or two of the said variables deteriorate or worsen, then development can be considered not successful even though per capita income increases (Prasetyo, 2021). In connection with the theory of Seers, the study's dependent variables are poverty, income inequality, and employment, as it is a difficulty that was felt by Filipinos in the country. With this, the researchers will determine whether MSMEs, in relation to three variables, contribute to the sustainable growth and development of the Philippine economy.

B. Theory of Economic Development by Joseph Schumpeter

Based on the theory of economic development by Schumpeter, the MSME and unemployment is related to the theory of the Schumpeter Effect vs. Refugee Effect. The Theory of the Schumpeter Effect (TSE) or also known as the attractiveness effect, explains that entrepreneurship and unemployment are negatively or inversely related, which means that the emergence of new entrepreneurship will have an impact on reducing unemployment, while the Theory of the Refugee Effect (TRE) or also known as the push effect states that if there is a positive unemployment phenomenon then it will encourage the creation of new businesses in the community thus, unemployment will help stimulate entrepreneurial activities in the economy (Prasetyo, 2021). Through this theory of Schumpeter, the researchers can focus on the solutions to the unemployment problems in the country with the help of the MSME sector.

C. Trickledown Theory by W.H Locke Anderson

According to the Trickledown Theory propounded by Anderson (1964) emphasized that growth in the short run will substantially promote quality in the long run. The six propositions depicted under this theory include (1) business can be encouraged as long as there are direct profits to the entrepreneurs or investors; (2) such encouragement will hearten the growth of the enterprise; (3) profits realized from the growth will be either invested or reinvested; (4) new jobs will then be created from investment; (5) jobs will assist in satisfying the total needs of poor persons employed; and (6) through earnings, savings, and fresh opportunities in the society consequently, inequality may be reduced eventually. Through wealth distribution, the wealth created by entrepreneurs will trickle down to low-income family members and society as well (Mohammed et al., 2019). The Trickledown theory captures the relationship between SMEs, employment, innovation, human capital development, income, and poverty reduction, thereby applicable to the researchers' study.

2.7.2 Research Simulacrum

Figure 1. Research Simulacrum of the study

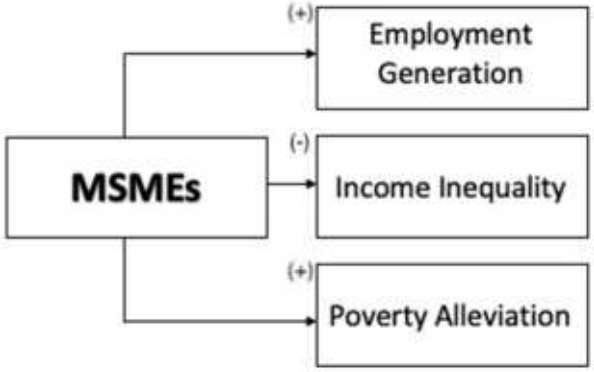


Figure 1

The research simulacrum shows graphically how MSMEs impact employment generation, income inequality, and poverty alleviation in the Philippine context thus, the independent variable is the total number of establishments of the MSMEs.

III. RESEARCH METHOD

3.1 Research Design

In conducting this study, the researchers used a descriptive-quantitative approach to exploring the relationship between MSMEs, employment generation, income inequality, and poverty alleviation. The panel least-squares regression, along with diagnostic tests such as normality of residuals, specification error, autocorrelation of residuals, homoscedasticity of residuals, and hausman test was used as the researchers aimed to determine the relationship between the variables.

3.2 Study Site

The researchers chose panel least-squares data for the Philippines from the year 2000 to 2015 as there was insufficient data representing the periods before 2000 and after 2015. Moreover, due to the three-year release of data for poverty and income inequality, the researchers used regional data every three years to obtain a sufficient number of observations (more than 30 observations), wherein in this study, there are 102 observations.

3.3 Data Collection Procedure

The study utilized secondary data and was collected electronically from online sources such as the Philippine Statistics Authority (PSA) and related literature. MSMEs, Employment generation, and Income inequality are collected from the PSA, while poverty is withdrawn in a study by Rivera (2021). The following would be the variables and their respective measurements: (1) MSMEs were measured by the total number of establishments, (2) Employment generation was measured by employment rate, (3) Income inequality was measured by Gini coefficient, and (4) Poverty was measured by Sen poverty index.

3.4 Data Analysis

The study used panel least-squares regression per region with MSMEs as the independent variable and Employment generation, Income inequality, and Poverty as the dependent variables. Panel least-data regression analysis is a type of data structure. In general, parameter estimation in regression analysis with cross-section data is accomplished by using the least-squares approach known as Ordinary Least Squares (OLS). The Data Panel for Regression Method will provide the Best Linear Unbiased Estimate (BLUE), which is the estimation outcome. Moreover, it is a mix of cross-section and time-series data, in which the same unit cross-section is assessed at multiple periods. In other words, panel data is information from regions where it has been observed at the same time periods (Zulfikar, 2018). The method of ordinary least squares (OLS) is ascribed to Carl Friedrich Gauss, a German mathematician, whereas the objective under particular assumptions, such as having a two-variable model, is to estimate the parameters of the two-variable regression model. It is widely used in regression analysis because it is more intuitive and theoretically straightforward than the maximum likelihood technique (Gujarati, 2003).

3.4.1 Econometric Model

3.4.1.1 To evaluate the relationship between MSME and employment generation, the following econometric model represented in an equation is

$$log\ (d(\ EG_{rt})) = \beta_o + \beta_1 MSME_{rt} + \varepsilon$$

wherein:
EG = Employment Generation
MSME = Micro, Small, and Medium Enterprises
β_o = Constant term or intercept
β_1= Beta Coefficient of Micro, Small, and Medium Enterprises
r = Region
t = Time
ε = Error term
log = logarithm
d = first difference

3.4.1.2 To evaluate the relationship between MSME and income inequality, the following econometric model represented in an equation is:

$$log\ (d(IE_{rt})) = \alpha_o - \alpha_1 MSME_{rt} + \varepsilon$$

wherein:
IE = Income Inequality
MSME = Micro, Small, and Medium Enterprises
α_o = Constant term or intercept
α_1= Alpha Coefficient of Micro, Small, and Medium Enterprises
r = Region
t = Time
ε = Error term
log = logarithm
d = first difference

3.4.1.3 To evaluate the relationship between MSME and poverty alleviation, the following econometric model represented in an equation is:

$$POV_{rt} = \delta_0 + log(d(\delta_1 MSME_{rt})) + \varepsilon$$

wherein:
POV = Poverty
MSME = Micro, Small, and Medium Enterprises
δ_o = Constant term or intercept
δ_1= Derivative Coefficient of Micro, Small, and Medium Enterprises
r = Region
t = Time
ε = Error term
log = logarithm
d = first difference

3.5 Diagnostic Tests of Panel Least Squares regression assumptions

Panel least squares regression assumption that needs to be satisfied:

3.5.1 Test for Normality of residuals in R

To test the assumption that the residual errors are normally distributed, the researchers used the Jarque - Bera (JB) test of normality. This test is often the best one to test for symmetric distributions with medium to long tails and slightly skewed distributions with long tails (Thadewald & Bunin, 2004). If the p-value is less than the significance level, then the data is not normally distributed. But, if the p-value is greater than the significance level, then there is a conclusion that the data is normally distributed (De Jesus, n.d.).

3.5.2 Test for Specification Error

To test the specification error, the researchers used Ramsey's (1969) regression specification error test (RESET). This test has proven to be useful in detecting general functional form misspecification (Wooldridge, 2013). The RESET test is used to examine different specification errors in the linear regression models, such as wrong functional form, and redundant and omitted variables (Gujarati, 2004). If the p-value is greater than the significance level, then there is no Ramsey RESET Error, but if the p-value is less than the significance level, there is Ramsey RESET Error (R. Cabauatan, personal communication, n.d. 2021).

3.5.3 Test for Autocorrelation of residuals in R

To test the assumption that all residuals are independent or uncorrelated with each other, the researchers used Wooldridge Test to examine the autocorrelation. This test was proposed by Jeff Wooldridge (2002) for panel data and has a method that uses the residuals from a regression in first differences. If the p-value is less than the level of significance, the null hypothesis will be rejected therefore, there is autocorrelation error. On the other hand, if the p-value is greater than the level of significance, the null hypothesis will be accepted that there is no autocorrelation error (Drukker, 2003).

3.5.4 Test for Homoscedasticity of residuals in R

In OLS, there cannot be any systematic pattern in the distribution of the residuals, to test the homoscedasticity of residual errors, the researchers used the Breusch-Pagan (BP) test. This test is intended to discover any linear type of heteroskedasticity and evaluates the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more

variables (Williams, 2020). If the p-value of the test is greater than the significance level, then we accept that there is homoscedasticity. However, if the p-value is lower than the significance level, we reject the null hypothesis and conclude that homoscedasticity is inexistent in the regression model (R. Cabauatan, personal communication, n.d. 2021).

3.5.5 Hausman Test

The Hausman test is a statistical test that determines whether the best Fixed Effect or Random Effect model is applied. If the result is Ho: choose RE ($p > 0.05$), and H1: choose FE ($p < 0.05$) (Zulfikar, 2018).

IV. RESULTS AND DISCUSSION

4.1.1 Descriptive Results

Figure 2. Correlation Matrix of Employment Generation

```
corr(IVMSME, l_d_DVEG) = -0.45499134
Under the null hypothesis of no correlation:
 t(30) = -2.79854, with two-tailed p-value 0.0089
```

Figure 2

Figure 2 shows the results from 2003 to 2015, with 32 observations. The results portray that MSME and employment generation have a negative moderate correlation.

4.1.2 Numerical Results

Figure 3. Ordinary Least Squares (OLS) Regression Procedure Result of Employment Generation

```
Model 1: Pooled OLS, using 32 observations
Included 17 cross-sectional units
Time-series length: minimum 1, maximum 3
Dependent variable: l_d_DVEG

              coefficient    std. error    t-ratio   p-value
  ---------------------------------------------------------
  const        1.27363       0.329006      3.871    0.0005  ***
  IVMSME      -2.47981e-05   8.86109e-06   -2.799    0.0089  ***

Mean dependent var   0.558123   S.D. dependent var   1.294006
Sum squared resid    41.16217   S.E. of regression   1.171355
R-squared            0.207017   Adjusted R-squared   0.180584
F(1, 30)             7.831838   P-value(F)           0.008885
Log-likelihood      -49.43457   Akaike criterion     102.8691
Schwarz criterion    105.8006   Hannan-Quinn         103.8408
rho                 -0.101296   Durbin-Watson        0.614355
```

Figure 3

Figure 3 presents the panel least squares regression results of the variables affecting employment generation from 2003 to 2015 with a total of 32 observations. The researcher opted to use the data ranging from 2003

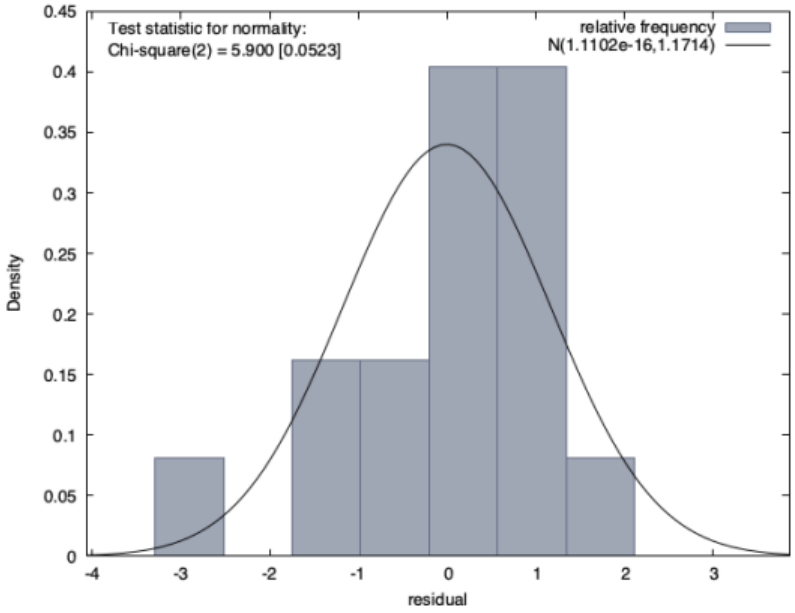
to 2015 to statistically comply with all the diagnostic tests. The OLS output indicates the p-value of constant (0.0005) and IV MSME (0.0089) is significant. The value of the R-squared is 0.207017, while the value of Durbin - Watson is 0.614355.

Based on the statistical result of the panel least squares regression, the econometric model equation was specified as

$$log\ (d(\ EG_{rt})) = \ 1.27363 + \ -2.47981e^{-05}\ MSME_{rt} + \varepsilon$$

Table 3. Diagnostic Tests of Employment Generation

Indicated below are the diagnostic tests and results for employment generation (2003 to 2015):

DIAGNOSTIC TESTS	RESULTS
Normality of Residuals (Jarque - Bera)	
Specification Error (Ramsey's RESET)	Auxiliary regression for RESET specification test OLS, using 32 observations Dependent variable: l_d_DVEG coefficient std. error t-ratio p-value const 2.32702 1.87779 1.239 0.2255 IVMSME -5.09863e-05 4.77917e-05 -1.067 0.2952 yhat^2 -0.460253 0.862594 -0.5336 0.5979 yhat^3 -0.422055 0.739463 -0.5708 0.5727 Test statistic: F = 0.162980, with p-value = P(F(2,28) > 0.16298) = 0.85

Autocorrelation of Residuals (Wooldridge test)	Auxiliary regression including lagged residual: coefficient std. error t-ratio p-value const -0.100764 0.817160 -0.1233 0.9059 IVMSME 1.97062e-05 3.72599e-05 0.5289 0.6159 uhat(-1) 0.0886448 0.191217 0.4636 0.6593 n = 7, R-squared = 0.0666 Wooldridge test for autocorrelation in panel data - Null hypothesis: No first-order autocorrelation (rho = 0) Test statistic: t(6) = 0.463583 with p-value = P(|t| > 0.463583) = 0.659287
Homoscedasticity of Residuals (Breusch-Pagan) and Hausman Test	Diagnostics: using n = 17 cross-sectional units Fixed effects estimator allows for differing intercepts by cross-sectional unit coefficient std. error t-ratio p-value const 1.28150 0.387361 3.308 0.0052 *** IVMSME -2.50709e-05 1.18277e-05 -2.120 0.0524 * Residual variance: 15.0468/(32 - 18) = 1.07477 Joint significance of differing group means: F(16, 14) = 1.51865 with p-value 0.218888 (A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the fixed effects alternative.) Variance estimators: between = 0.499804 within = 1.07477 Panel is unbalanced: theta varies across units Random effects estimator allows for a unit-specific component to the error term coefficient std. error t-ratio p-value const 1.27389 0.351587 3.623 0.0011 *** IVMSME -2.46632e-05 8.80644e-06 -2.801 0.0088 *** Breusch-Pagan test statistic: LM = 0.499903 with p-value = prob(chi-square(1) > 0.499903) = 0.479543 (A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the random effects alternative.) Hausman test statistic: H = 0.00348411 with p-value = prob(chi-square(1) > 0.00348411) = 0.952931 (A low p-value counts against the null hypothesis that the random effects model is consistent, in favor of the fixed effects model.)

Table 3

1. Test for Normality of Residuals
   The Jarque-Bera test determines the goodness of fit that indicates whether the sample data is normally distributed. The statistic for normality has a p-value of 0.0523, which is greater than alpha (0.05 level of significance), and the result is normally distributed.

2. Test for Specification Error
   The p-value in Ramsey Reset is 0.85, which is greater than the significance level of 5%. There is no Ramsey Reset error; therefore, accept the null hypothesis, which indicates that residuals are normally distributed.

3. Test for Autocorrelation of Residuals
   The result of the Wooldridge test for autocorrelation of residuals has a p-value of 0.659287, which is greater than the alpha, this indicates that there is no autocorrelation.

4. Test for Homoscedasticity of Residuals
   The Breusch-pagan is applied to test the estimated variance from the regression. Based on the result, the p-value is 0.479543, which is above the appropriate threshold of 0.05 level of significance then, the homoscedasticity is accepted, and the presence of heteroskedasticity is rejected.

5. Hausman Test
   The p-value is 0.952931, which is greater than alpha; therefore, this indicates that the null hypothesis is accepted.

Based on the results of the correlation matrix from 2003 to 2015, EG and MSMEs have a negative moderate correlation. The researchers proved that as MSMEs increase then EG decreases hence resulting in unemployment, and this is similar to other studies that also stated that labor and capital do not have a positive impact on the growth of production in the Indian MSME sector. MSMEs also have a negative impact on employment generation if there is poor job quality, low pay, and unfavorable working conditions. Additionally, there is a negative relationship between entrepreneurship and unemployment in Turkey (Apaydin, 2018; Yadav & Suthar 2021).

4.1.3 Descriptive Results

Figure 4. Correlation Matrix of Income Inequality

```
corr(IVMSME, l_d_DVIEG) = -0.02800813
Under the null hypothesis of no correlation:
 t(39) = -0.174979, with two-tailed p-value 0.8620
```

Figure 4

Figure 4 shows the results from 2000 to 2012, with 41 observations. The results portray that MSME and income inequality have a negative negligible correlation.

4.1.4 Numerical Results

Figure 5. Ordinary Least Squares (OLS) Regression Procedure Result of Income Inequality

```
Model 1: Pooled OLS, using 41 observations
Included 17 cross-sectional units
Time-series length: minimum 1, maximum 4
Dependent variable: l_d_DVIEG

             coefficient    std. error    t-ratio    p-value
  ---------------------------------------------------------
  const      -3.59983       0.188189      -19.13     2.03e-21 ***
  IVMSME     -5.51054e-07   3.14925e-06    -0.1750   0.8620

Mean dependent var  -3.624195   S.D. dependent var   0.800823
Sum squared resid    25.63256   S.E. of regression   0.810707
R-squared            0.000784   Adjusted R-squared  -0.024836
F(1, 39)             0.030618   P-value(F)           0.862001
Log-likelihood      -48.54745   Akaike criterion     101.0949
Schwarz criterion    104.5221   Hannan-Quinn         102.3429
rho                  0.298050   Durbin-Watson        0.894693
```

Figure 5

Figure 5 presents the panel least squares regression results of the variables affecting the income inequality - gini index from 2000 to 2012 with a total of 41 observations. The researcher opted to use the data ranging from 2000 to 2012 in order to statistically comply with all the diagnostic tests. The OLS output indicates the p-value of constant (2.03e-21) and IV MSME (0.8620) is insignificant. The value of the R-squared is 0.000784, while the value of Durbin - Watson is 0.894693.

Based on the statistical result of the panel least squares regression, the econometric model equation was specified as

$$log\ (d(IE_{rt})) = -3.59983 - 5.51054e^{-07} MSME_{rt} + \varepsilon$$

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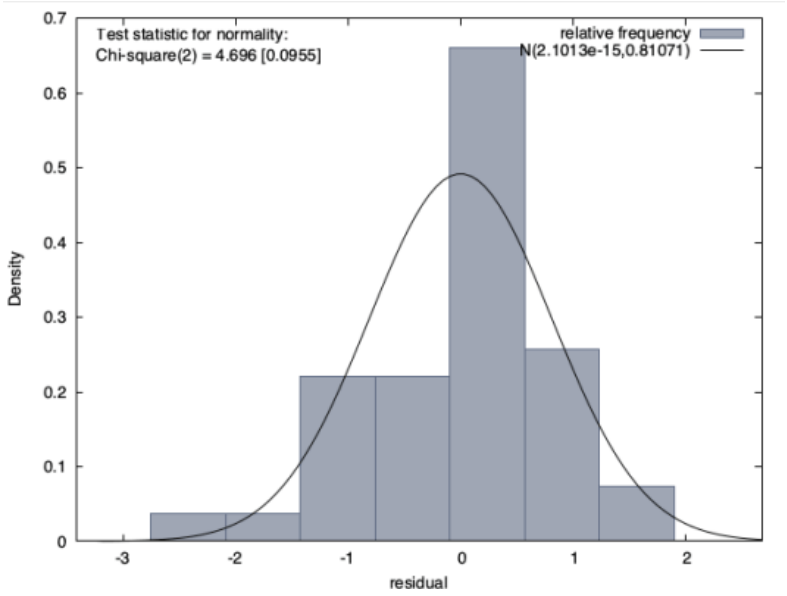
e-ISSN: 2962-9179
Universal Journal of Science and Technology

Table 4. Diagnostic Tests of Income Inequality

Indicated below are the diagnostic tests and results for income inequality (2000 to 2012):

DIAGNOSTIC TESTS	RESULTS
Normality of Residuals (Jarque - Bera)	
Specification Error (Ramsey's RESET)	Auxiliary regression for RESET specification test OLS, using 41 observations Dependent variable: l_d_DVIEG coefficient std. error t-ratio p-value const 303299 622683 0.4871 0.6291 IVMSME 0.0701140 0.144048 0.4867 0.6293 yhat^2 -34874.9 71549.8 -0.4874 0.6288 yhat^3 -3186.18 6527.79 -0.4881 0.6284 Test statistic: F = 0.143616, with p-value = P(F(2,37) > 0.143616) = 0.867
Autocorrelation of Residuals (Wooldridge test)	Auxiliary regression including lagged residual: coefficient std. error t-ratio p-value const -3.52348 0.424941 -8.292 3.37e-05 *** IVMSME -1.28040e-05 1.27918e-05 -1.001 0.3462 uhat(-1) 0.158256 0.176371 0.8973 0.3958 n = 14, R-squared = 0.0791 Wooldridge test for autocorrelation in panel data - Null hypothesis: No first-order autocorrelation (rho = 0) Test statistic: t(8) = 0.897292 with p-value = P(|t| > 0.897292) = 0.395763

Homoscedasticity of Residuals (Breusch-Pagan) and Hausman test	Diagnostics: using n = 17 cross-sectional units Fixed effects estimator allows for differing intercepts by cross-sectional unit coefficient std. error t-ratio p-value const −3.61919 0.182867 −19.79 6.08e-16 *** IVMSME −1.13142e-07 3.33504e-06 −0.03393 0.9732 Residual variance: 11.0342/(41 − 18) = 0.479747 Joint significance of differing group means: F(16, 23) = 1.90184 with p-value 0.0776691 (A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the fixed effects alternative.) Variance estimators: between = 0.181984 within = 0.479747 Panel is unbalanced: theta varies across units Random effects estimator allows for a unit-specific component to the error term coefficient std. error t-ratio p-value const −3.56076 0.197574 −18.02 1.64e-20 *** IVMSME −5.30007e-07 2.91633e-06 −0.1817 0.8567 Breusch-Pagan test statistic: LM = 2.83155 with p-value = prob(chi-square(1) > 2.83155) = 0.092429 (A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the random effects alternative.) Hausman test statistic: H = 0.0731732 with p-value = prob(chi-square(1) > 0.0731732) = 0.786771 (A low p-value counts against the null hypothesis that the random effects model is consistent, in favor of the fixed effects model.)

Table 4

1. Test for Normality of Residuals
   The statistic for normality has a p-value of 0.0955, which is greater than alpha (0.05 level of significance), and the result is normally distributed.

2. Test for Specification Error
   The p-value in Ramsey Reset is 0.867, which is greater than the significance level of 5%. There is no Ramsey Reset error; therefore, accept the null hypothesis, which indicates that residuals are normally distributed.

3. Test for Autocorrelation of Residuals
   The result of the Wooldridge test for autocorrelation of residuals has a p-value of 0.395763, which is greater than the alpha, this indicates that there is no autocorrelation.

4. Test for Homoscedasticity of Residuals
   Based on the result, the p-value is 0.092429 and above the appropriate threshold of 0.05 level of significance, then the homoscedasticity is accepted and the presence of heteroskedasticity is rejected.

5. Hausman Test
   The p-value is 0.786771, which is greater than alpha; therefore, this indicates that the null hypothesis is accepted.

Based on the results of the correlation matrix from 2000 to 2012, IEG and MSMEs have a negative negligible correlation. The researchers confirmed that as MSMEs increases then the gap between the high income earners and the low income earners lessens, which is evident in other studies as well. In contrast, previous studies stated that there is a positive relationship between entrepreneurship and income inequality. Moreover, the OLS results in this study showed that MSMEs is insignificant to IEG which is also supported by another study which showed MSMEs as an insignificant determinant of income inequality at a 10 percent level of significance (Carnahan et al., 2012; Bonito et al., 2017; Atems & Shand, 2018).

4.1.5 Descriptive Results

Figure 6. Correlation Matrix of Poverty

```
corr(DVP, l_d_IVMSME) = -0.42057992
Under the null hypothesis of no correlation:
 t(45) = -3.10975, with two-tailed p-value 0.0032
```

Figure 6

Figure 6 shows the results from 2000 to 2015, with 47 observations. The results portray that MSME and poverty have a negative moderate correlation.

4.1.6 Numerical Results

Figure 7. Ordinary Least Squares (OLS) Regression Procedure Result of Poverty

```
Model 1: Pooled OLS, using 47 observations
Included 17 cross-sectional units
Time-series length: minimum 1, maximum 4
Dependent variable: DVP

              coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------
  const         6.62447     0.835007     7.933    4.31e-10 ***
  l_d_IVMSME   -0.265422    0.0853516   -3.110    0.0032   ***

Mean dependent var   4.061511   S.D. dependent var   1.002182
Sum squared resid    38.02858   S.E. of regression   0.919282
R-squared            0.176887   Adjusted R-squared   0.158596
F(1, 45)             9.670532   P-value(F)           0.003245
Log-likelihood      -61.71259   Akaike criterion     127.4252
Schwarz criterion    131.1255   Hannan-Quinn         128.8176
rho                 -0.115857   Durbin-Watson        1.002314
```

Figure 7

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e-ISSN: 2962-9179
Universal Journal of Science and Technology

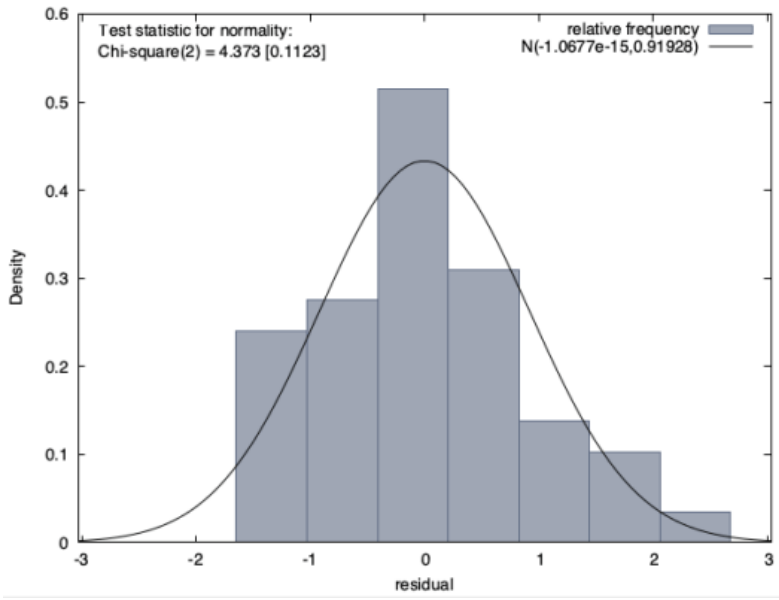
Figure 7 presents the panel least squares regression results of the variables affecting poverty from 2000 to 2015 with a total of 47 observations. The researcher opted to use the data ranging from 2000 to 2015 to statistically comply with all the diagnostic tests. The OLS output indicates the p-value of constant (4.31e-10), and the log of the first difference IV MSME (0.0032) is significant. The value of the R-squared is 0.176887, while the value of Durbin - Watson is 1.002314.

Based on the statistical result of the panel least squares regression, the econometric model equation was specified as

$$POV_{rt} = 6.62447 + log\,(d(-0.265422\,MSME_{rt})) + \varepsilon$$

Table 5. Diagnostic Tests of Poverty

Indicated below are the diagnostic tests and results for poverty (2000 to 2015):

DIAGNOSTIC TESTS	RESULTS
Normality of Residuals (Jarque - Bera)	
Specification Error (Ramsey's RESET)	Auxiliary regression for RESET specification test OLS, using 47 observations Dependent variable: DVP coefficient std. error t-ratio p-value const 416.657 216.931 1.921 0.0614 * l_d_IVMSME -21.2220 11.0977 -1.912 0.0625 * yhat^2 -18.1221 9.56848 -1.894 0.0650 * yhat^3 1.36482 0.719654 1.896 0.0646 * Test statistic: F = 1.798542, with p-value = P(F(2,43) > 1.79854) = 0.178

Autocorrelation of Residuals (Wooldridge test)	Auxiliary regression including lagged residual: coefficient std. error t-ratio p-value const 6.09903 1.36648 4.463 0.0012 *** l_d_IVMSME -0.153217 0.154692 -0.9905 0.3453 uhat(-1) 0.223637 0.434959 0.5142 0.6183 n = 17, R-squared = 0.1167 Wooldridge test for autocorrelation in panel data - Null hypothesis: No first-order autocorrelation (rho = 0) Test statistic: t(10) = 0.514156 with p-value = P(|t| > 0.514156) = 0.618313
Hausman Test	Diagnostics: using n = 17 cross-sectional units Fixed effects estimator allows for differing intercepts by cross-sectional unit coefficient std. error t-ratio p-value const 5.78281 1.39142 4.156 0.0003 *** l_d_IVMSME -0.178259 0.143287 -1.244 0.2234 Residual variance: 29.544/(47 - 18) = 1.01876 Joint significance of differing group means: F(16, 29) = 0.520522 with p-value 0.914363 (A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the fixed effects alternative.) Variance estimators: between = 0 within = 1.01876 theta used for quasi-demeaning = 0 Random effects estimator allows for a unit-specific component to the error term coefficient std. error t-ratio p-value const 6.62447 0.835007 7.933 4.31e-10 *** l_d_IVMSME -0.265422 0.0853516 -3.110 0.0032 *** Hausman test statistic: H = 0.828525 with p-value = prob(chi-square(1) > 0.828525) = 0.362699 (A low p-value counts against the null hypothesis that the random effects model is consistent, in favor of the fixed effects model.)

Table 5

1. Test for Normality of Residuals
   The test statistic for normality has a p-value of 0.1123, which is greater than alpha (0.05 level of significance), and the result is normally distributed.

2. Test for Specification Error
   The p-value in Ramsey Reset is 0.178, which is greater than the significance level of 5%. There is no Ramsey Reset error; therefore, accept the null hypothesis, which indicates that residuals are normally distributed.

3. Test for Autocorrelation of Residuals
   The result of the Wooldridge test for autocorrelation of residuals has a p-value of 0.618313, which is greater than the alpha, this indicates that there is no autocorrelation.

4. Hausman Test
   The p-value is 0.362699, which is greater than the alpha; therefore, this indicates that the null hypothesis is accepted

Based on the results of the correlation matrix from 2000 to 2015, POV and MSMEs have a negative moderate correlation. The researchers confirmed that as MSMEs increase then poverty decreases. This is supported by other studies which also reject the positive correlation between MSMEs and poverty due to the research methodology and empirical research findings.Similar with a study in West Virginia, there is a strong negative relationship between small-scale businesses and poverty incidence, which means that poverty increased over the years of the decline of in small - scale industries' output for the reason that these enterprises utilize more labor. The result is in contrast with previous studies that showed that poverty and MSMEs are positively correlated, meaning that when the economic share of MSMEs increases, then the poverty rate also increases. (Ali et al., 2014; Katua, 2014; Abdullahi & Sulaiman, 2015; Bank Indonesia, 2016).

4.2 Hypothesis Testing and Results of the Objective

- Hypothesis Testing

Hypothesis 1:
Ho: There is no significant relationship between the number of MSMEs and employment generation.
Ha: There is a significant relationship between the number of MSMEs and employment generation.
Conclusion: Accept alternative hypothesis

Hypothesis 2:
Ho: There is no significant relationship between the number of MSMEs and income inequality.
Ha: There is a significant relationship between the number of MSMEs and income inequality.
Conclusion: Accept null hypothesis

Hypothesis 3:
Ho: There is no significant relationship between the number of MSMEs and poverty alleviation.
Ha: There is a significant relationship between the number of MSMEs and poverty alleviation.
Conclusion: Accept alternative hypothesis

- Results of the Objective

As mentioned in Chapter 1, the objective of this study aimed to identify the impact of the dependent variables on the role of MSME in the Philippines. Based on the regression result, the researchers concluded that:

1. MSME and employment generation have a negative moderate correlation

2. MSME and income inequality have a negative negligible correlation
3. MSME and poverty alleviation have a negative moderate correlation

V. CONCLUSIONS AND RECOMMENDATION

This study focused on determining the impact of MSME on employment generation, income inequality, and poverty alleviation in the Philippines. Specifically, exploring the relationship between the independent variable, MSMEs, and dependent variables, EG, IEG, and POV. In order to fulfill the aim and objective of this study , the researchers applied a descriptive-quantitative approach. The researchers used a panel least squares regression model using the Ordinary Least Squares (OLS) procedure and diagnostic tests such as normality of residuals, specification error, autocorrelation of residuals, homoscedasticity of residuals, and hausman tests were performed to determine the impact of MSMEs to EG, IEG, and POV. The regional data of MSMEs, employment rate, and gini coefficient was obtained from the Philippine Statistics Authority (PSA) while Sen poverty index was obtained from a study by Rivera (2021). The study covered the years 2000-2015 with a gap of 3 years. The researchers have drawn 32 observations from employment generation (2003 to 2015); 41 observations from income inequality (2000 to 2012); and 47 observations from poverty (2000 to 2015).

Based on the study's statistical results, the researchers concluded that employment generation has a negative moderate correlation with MSME; income inequality has a negative negligible correlation with MSME; and poverty has a negative moderate correlation with MSME which revealed that the dependent variable has an impact on MSMEs. Moreover, EG and POV diagnostic tests are statistically significant hence, there are no errors present in the regression model, while IEG diagnostic tests are statistically insignificant hence, the researchers do not have statistical evidence to reject the null hypothesis and accept the alternative hypothesis. Therefore, the study accepts the null hypothesis of H2 and accepts the alternative hypothesis of H1 and H3.

5.1 Policy Implication

Based on the results, the researchers will be recommending policies that the government should consider to lessen the adverse effects of the following social dilemmas such as high unemployment rate, high income inequality, and high poverty rate through MSMEs; wherein it is empirically proven that MSMEs plays a role in mitigating the adverse effects of the said problems. The researchers recommended one policy per variable.

Firstly, in terms of MSMEs and employment generation, the researchers recommend that the government should promote skills-based educational programs like Technical Education and Skills Development Authority (TESDA). The goal of this policy is to improve the employability of the labor force, increasing the employment rate. Based on the results, the relationship between MSME and employment generation is negative, which is not the ideal result. Furthermore, promoting skills-based educational programs means that a senior high school graduate may not need to go to college just for him to be employed. Blue-collar jobs are as important as white-collar jobs; therefore, it must be promoted by the government more to break the mentality of “only college graduates” can be employed easily. For instance, this policy looks like a

senior high school graduate went to TESDA and took bread and pastry production and is being employed in a local pastry shop (MSME) by not needing a diploma in culinary arts, which is taken for 4 years and in expensive universities. TESDA graduates will be as employable as UST graduates.

Secondly, in terms of MSMEs and income inequality, the researchers recommend that MSMEs should have more tax breaks from the government. The goal of this policy is to lessen income inequality by MSMEs allocating the should be tax funds to directly affect the income of the lower class employees. Based on the results, MSMEs have a negative relationship with income inequality but on a lower scale level. To have more direct impacts and visible results, MSMEs should have more tax breaks from the government so that the funds that will be used to pay taxes will directly go to their employees' wages belonging to the lower class making the income gap less. For instance, this looks like an enterprise that has the capacity to pay the minimum wage only for their employees, given the taxes. With tax breaks, they can directly increase their employees' wages above the minimum rate, making the gap in income inequality less. For example, the net profit of an enterprise is PHP 500,000, including a total of PHP 100,000 business tax, and the wage expense is PHP 100,000 (assuming there are 10 employees and all are lower income earners and each has PHP 10,000 income). With tax breaks, it is possible that the income of these employees will be PHP 20,000.

Lastly, in terms of MSMEs and poverty, the researchers recommend that MSMEs should be more stimulated by the government through sustaining and advocating the Philippine Trade Training Center – Global MSME Academy (PTTC-GMEA). The goal of this policy is to further increase the number of MSMEs to help alleviate poverty. Based on the results, MSMEs have a negative relationship with poverty. It was empirically proven that MSMEs help decrease poverty rates but on a very low scale. Furthermore, the PTTC-GMEA has always been in the forefront of providing growth-oriented MSMEs with the necessary skills and expertise to enable them to reach global entrepreneurial excellence. They offer programs such as Food Connect where it eases the entry of food business in the market. For instance, this policy looks like; as the government advocated PTTC-GMEA, a person is aware of its programs and was able to attend a session in PTTC-GMEA's talk. After the talk, he was able to stimulate entrepreneurship ideas. With those ideas, he was able to receive proper mentorship, access to ease of doing his business (i.e. loans and licenses). Through that, he was able to establish a small food business and hire laborers. If this will happen on a dominant scale, the number of MSMEs will continue to rise alleviating poverty in the Philippines.

VI. APPENDIX

Appendix A

	Total	Micro	Small	Medium	Large	MSMEs
2008 number of enterprises	761, 409	697,077	58,292	3,067	2,973	758,436
Percent distribution		91.6	7.7	0.4	0.4	99.6
2008 employment	5,544,590	1,663,382	1,314,065	418,058	2,149,085	3,395,505
Percent distribution		30	23.7	7.5	38.8	61.2
2006 value added (in million pesos)	2,108,546	103,918	431,340	216,685	1,356,603	751,943
Percent distribution	100	4.9	20.5	10.3	64.3	35.7
2006 value added per worker (in pesos)	380,289	62,474	328,248	518,313	631,247	221,452
Percent of large enterprises		9.9	52	82.1		

Table A. MSMEs: Structure and Economic Contribution (MSMED Plan 2010 - 2016)

Appendix B

Size	Total Assets	Number of Employees
Micro	not more than PHP 3,000,000	1 - 9
Small	PHP 3,000,001 - 15,000,000	10 - 99
Medium	PHP 15,000,001 - 100,000,00	100 - 199
Large	above PHP 100,000,000	200 and above

Table B. Micro, Small, and Medium Enterprises classification based on total assets and the number of employees (RA No. 9501: Magna Carta for Micro, Small and Medium Enterprises section 3 and Micro, Small, and Medium Enterprise Development Council)

Appendix C

```
corr(IVMSME, l_d_DVEG) = -0.45499134
Under the null hypothesis of no correlation:
 t(30) = -2.79854, with two-tailed p-value 0.0089
```

Figure C. Correlation Matrix of Employment Generation

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Appendix D

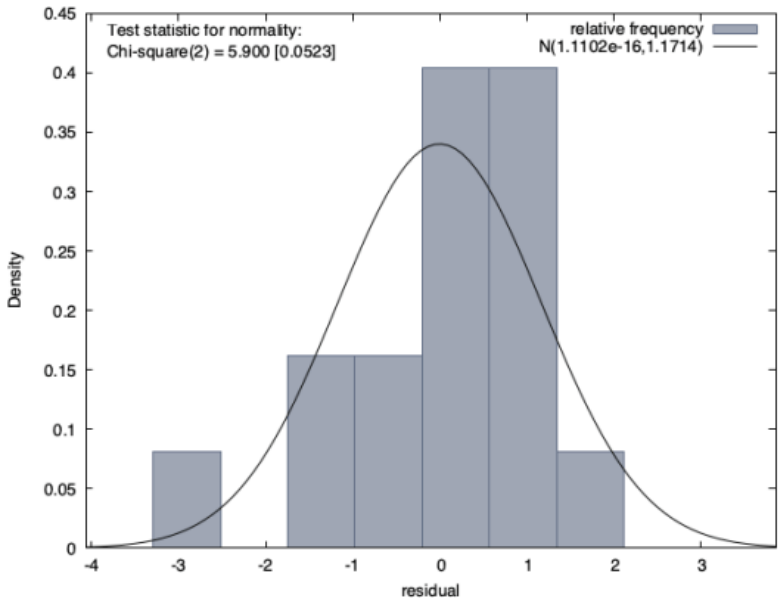
```
Model 1: Pooled OLS, using 32 observations
Included 17 cross-sectional units
Time-series length: minimum 1, maximum 3
Dependent variable: l_d_DVEG

              coefficient    std. error    t-ratio   p-value
  ---------------------------------------------------------
  const        1.27363       0.329006      3.871    0.0005  ***
  IVMSME      -2.47981e-05   8.86109e-06   -2.799    0.0089  ***

Mean dependent var   0.558123   S.D. dependent var   1.294006
Sum squared resid    41.16217   S.E. of regression   1.171355
R-squared            0.207017   Adjusted R-squared   0.180584
F(1, 30)             7.831838   P-value(F)           0.008885
Log-likelihood      -49.43457   Akaike criterion     102.8691
Schwarz criterion    105.8006   Hannan-Quinn         103.8408
rho                 -0.101296   Durbin-Watson        0.614355
```

Figure D. Ordinary Least Squares (OLS) Regression Procedure Result of Employment Generation

Appendix E

DIAGNOSTIC TESTS	RESULTS
Normality of Residuals (Jarque - Bera)	

Specification Error (Ramsey's RESET)	Auxiliary regression for RESET specification test OLS, using 32 observations Dependent variable: l_d_DVEG coefficient std. error t-ratio p-value const 2.32702 1.87779 1.239 0.2255 IVMSME -5.09863e-05 4.77917e-05 -1.067 0.2952 yhat^2 -0.460253 0.862594 -0.5336 0.5979 yhat^3 -0.422055 0.739463 -0.5708 0.5727 Test statistic: F = 0.162980, with p-value = P(F(2,28) > 0.16298) = 0.85
Autocorrelation of Residuals (Wooldridge test)	Auxiliary regression including lagged residual: coefficient std. error t-ratio p-value const -0.100764 0.817160 -0.1233 0.9059 IVMSME 1.97062e-05 3.72599e-05 0.5289 0.6159 uhat(-1) 0.0886448 0.191217 0.4636 0.6593 n = 7, R-squared = 0.0666 Wooldridge test for autocorrelation in panel data - Null hypothesis: No first-order autocorrelation (rho = 0) Test statistic: t(6) = 0.463583 with p-value = P(|t| > 0.463583) = 0.659287
Homoscedasticity of Residuals (Breusch-Pagan) and Hausman Test	Diagnostics: using n = 17 cross-sectional units Fixed effects estimator allows for differing intercepts by cross-sectional unit coefficient std. error t-ratio p-value const 1.28150 0.387361 3.308 0.0052 *** IVMSME -2.50709e-05 1.18277e-05 -2.120 0.0524 * Residual variance: 15.0468/(32 - 18) = 1.07477 Joint significance of differing group means: F(16, 14) = 1.51865 with p-value 0.218888 (A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the fixed effects alternative.) Variance estimators: between = 0.499804 within = 1.07477 Panel is unbalanced: theta varies across units Random effects estimator allows for a unit-specific component to the error term coefficient std. error t-ratio p-value const 1.27389 0.351587 3.623 0.0011 *** IVMSME -2.46632e-05 8.80644e-06 -2.801 0.0088 *** Breusch-Pagan test statistic: LM = 0.499903 with p-value = prob(chi-square(1) > 0.499903) = 0.479543 (A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the random effects alternative.) Hausman test statistic: H = 0.00348411 with p-value = prob(chi-square(1) > 0.00348411) = 0.952931 (A low p-value counts against the null hypothesis that the random effects model is consistent, in favor of the fixed effects model.)

Table E. Diagnostic Tests of Employment Generation

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Appendix F

```
corr(IVMSME, l_d_DVIEG) = -0.02800813
Under the null hypothesis of no correlation:
 t(39) = -0.174979, with two-tailed p-value 0.8620
```

Figure F. Correlation matrix of Income Inequality

Appendix G

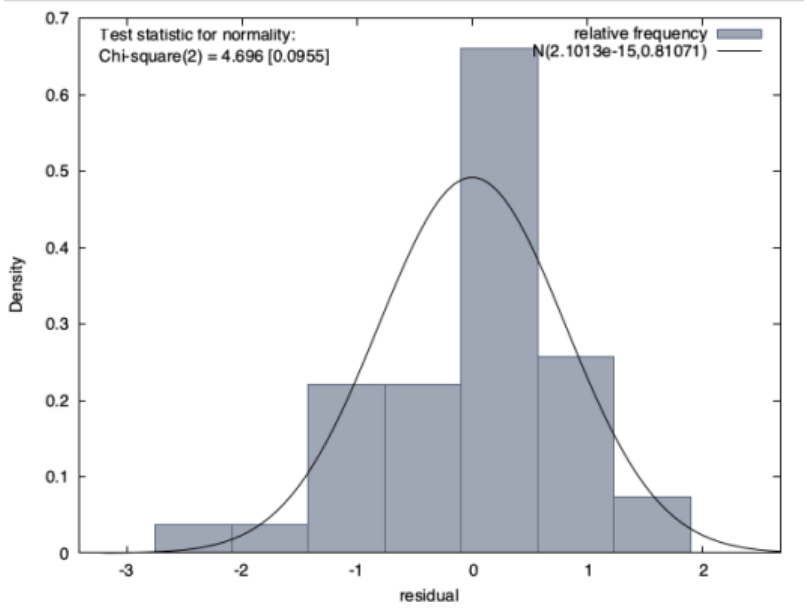
```
Model 1: Pooled OLS, using 41 observations
Included 17 cross-sectional units
Time-series length: minimum 1, maximum 4
Dependent variable: l_d_DVIEG

             coefficient    std. error    t-ratio    p-value
  ---------------------------------------------------------------
  const      -3.59983       0.188189      -19.13     2.03e-21 ***
  IVMSME     -5.51054e-07   3.14925e-06    -0.1750   0.8620

Mean dependent var  -3.624195   S.D. dependent var   0.800823
Sum squared resid    25.63256   S.E. of regression   0.810707
R-squared            0.000784   Adjusted R-squared  -0.024836
F(1, 39)             0.030618   P-value(F)           0.862001
Log-likelihood      -48.54745   Akaike criterion     101.0949
Schwarz criterion    104.5221   Hannan-Quinn         102.3429
rho                  0.298050   Durbin-Watson        0.894693
```

Figure G. Ordinary Least Squares (OLS) Regression Procedure Result of Income Inequality

Appendix H

DIAGNOSTIC TESTS	RESULTS
Normality of Residuals (Jarque - Bera)	

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Specification Error (Ramsey's RESET)	Auxiliary regression for RESET specification test OLS, using 41 observations Dependent variable: l_d_DVIEG coefficient std. error t-ratio p-value const 303299 622683 0.4871 0.6291 IVMSME 0.0701140 0.144048 0.4867 0.6293 yhat^2 -34874.9 71549.8 -0.4874 0.6288 yhat^3 -3186.18 6527.79 -0.4881 0.6284 Test statistic: F = 0.143616, with p-value = P(F(2,37) > 0.143616) = 0.867
Autocorrelation of Residuals (Wooldridge test)	Auxiliary regression including lagged residual: coefficient std. error t-ratio p-value const -3.52348 0.424941 -8.292 3.37e-05 *** IVMSME -1.28040e-05 1.27918e-05 -1.001 0.3462 uhat(-1) 0.158256 0.176371 0.8973 0.3958 n = 14, R-squared = 0.0791 Wooldridge test for autocorrelation in panel data - Null hypothesis: No first-order autocorrelation (rho = 0) Test statistic: t(8) = 0.897292 with p-value = P(|t| > 0.897292) = 0.395763
Homoscedasticity of Residuals (Breusch-Pagan) and Hausman test	Diagnostics: using n = 17 cross-sectional units Fixed effects estimator allows for differing intercepts by cross-sectional unit coefficient std. error t-ratio p-value const -3.61919 0.182867 -19.79 6.08e-16 *** IVMSME -1.13142e-07 3.33504e-06 -0.03393 0.9732 Residual variance: 11.0342/(41 - 18) = 0.479747 Joint significance of differing group means: F(16, 23) = 1.90184 with p-value 0.0776691 (A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the fixed effects alternative.) Variance estimators: between = 0.181984 within = 0.479747 Panel is unbalanced: theta varies across units Random effects estimator allows for a unit-specific component to the error term coefficient std. error t-ratio p-value const -3.56076 0.197574 -18.02 1.64e-20 *** IVMSME -5.30007e-07 2.91633e-06 -0.1817 0.8567 Breusch-Pagan test statistic: LM = 2.83155 with p-value = prob(chi-square(1) > 2.83155) = 0.092429 (A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the random effects alternative.) Hausman test statistic: H = 0.0731732 with p-value = prob(chi-square(1) > 0.0731732) = 0.786771 (A low p-value counts against the null hypothesis that the random effects model is consistent, in favor of the fixed effects model.)

Table H. Diagnostic Tests of Income Inequality

Appendix I

```
corr(DVP, l_d_IVMSME) = -0.42057992
Under the null hypothesis of no correlation:
 t(45) = -3.10975, with two-tailed p-value 0.0032
```

Figure I. Correlation Matrix of Poverty

Appendix J

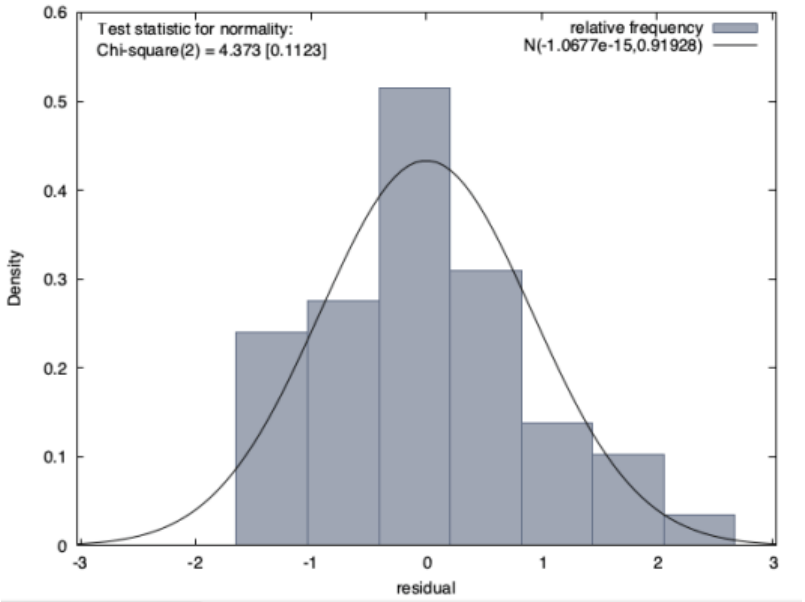
```
Model 1: Pooled OLS, using 47 observations
Included 17 cross-sectional units
Time-series length: minimum 1, maximum 4
Dependent variable: DVP

              coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------
  const          6.62447     0.835007     7.933    4.31e-10 ***
  l_d_IVMSME    -0.265422    0.0853516   -3.110    0.0032   ***

Mean dependent var   4.061511   S.D. dependent var   1.002182
Sum squared resid    38.02858   S.E. of regression   0.919282
R-squared            0.176887   Adjusted R-squared   0.158596
F(1, 45)             9.670532   P-value(F)           0.003245
Log-likelihood      -61.71259   Akaike criterion     127.4252
Schwarz criterion    131.1255   Hannan-Quinn         128.8176
rho                 -0.115857   Durbin-Watson        1.002314
```

Figure J. Ordinary Least Squares (OLS) Regression Procedure Result of Poverty

Appendix K

DIAGNOSTIC TESTS	RESULTS
Normality of Residuals (Jarque - Bera)	
Specification Error (Ramsey's RESET)	Auxiliary regression for RESET specification test OLS, using 47 observations Dependent variable: DVP coefficient std. error t-ratio p-value const 416.657 216.931 1.921 0.0614 * l_d_IVMSME -21.2220 11.0977 -1.912 0.0625 * yhat^2 -18.1221 9.56848 -1.894 0.0650 * yhat^3 1.36482 0.719654 1.896 0.0646 * Test statistic: F = 1.798542, with p-value = P(F(2,43) > 1.79854) = 0.178
Autocorrelation of Residuals (Wooldridge test)	Auxiliary regression including lagged residual: coefficient std. error t-ratio p-value const 6.09903 1.36648 4.463 0.0012 *** l_d_IVMSME -0.153217 0.154692 -0.9905 0.3453 uhat(-1) 0.223637 0.434959 0.5142 0.6183 n = 17, R-squared = 0.1167 Wooldridge test for autocorrelation in panel data - Null hypothesis: No first-order autocorrelation (rho = 0) Test statistic: t(10) = 0.514156 with p-value = P(|t| > 0.514156) = 0.618313

Hausman Test	Diagnostics: using n = 17 cross-sectional units Fixed effects estimator allows for differing intercepts by cross-sectional unit coefficient std. error t-ratio p-value const 5.78281 1.39142 4.156 0.0003 *** l_d_IVMSME -0.178259 0.143287 -1.244 0.2234 Residual variance: 29.544/(47 - 18) = 1.01876 Joint significance of differing group means: F(16, 29) = 0.520522 with p-value 0.914363 (A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the fixed effects alternative.) Variance estimators: between = 0 within = 1.01876 theta used for quasi-demeaning = 0 Random effects estimator allows for a unit-specific component to the error term coefficient std. error t-ratio p-value const 6.62447 0.835007 7.933 4.31e-10 *** l_d_IVMSME -0.265422 0.0853516 -3.110 0.0032 *** Hausman test statistic: H = 0.828525 with p-value = prob(chi-square(1) > 0.828525) = 0.362699 (A low p-value counts against the null hypothesis that the random effects model is consistent, in favor of the fixed effects model.)

Table K. Diagnostic Tests of Poverty

ACKNOWLEDGEMENT

First and foremost, we express our profound gratitude to the Almighty Father for giving us the strength and knowledge to complete this research paper successfully.

Second, we would like to express our sincere gratitude to our research adviser, Mr. Peter Jeff Camaro, M.A., for providing us with invaluable guidance throughout the research. It was a privilege to work under his guidance.

We are also thankful to our research professor, Ms. Marie Antonette Rosete, and our panelists, Mrs. Clarissa Ruth Sabugo and Mr. Kevin Jamir Pigao, for their patience, encouragement, and comments/suggestions to making our research a better one.

Lastly, we are extremely grateful to our family and friends for their continuous love and support throughout this research paper.

REFERENCES

[1] Agyapong, D. (2010). Micro, Small, and Medium Enterprises' Activities, Income Level and Poverty Reduction in Ghana - A Synthesis of Related Literature. *International Journal of Business and Management, 5*(12), 196-205. doi: 10.5539/ijbm.v5n12p196

[2] Ajuwon, O. S., Ikhide, S., & Akotey, J. O. (2017). MSMEs and Employment Generation in Nigeria. *The Journal of Developing Areas, 51*(3), 229-249. https://www.jstor.org/stable/26416942

[3] Aldaba, R. (2012). SME Development: Narrowing the Development Gap in the ASEAN Economic Community. *Philippine Journal of Development, 19*(1&2). https://dirp4.pids.gov.ph/webportal/CDN/PUBLICATIONS/pidspjd12-sme%20development.pdf

[4] Aldaba, R. M. (2011). 'SMEs Access to Finance: Philippines', in Harvie, C., S. Oum, and D. Narjoko (eds.), *Small and Medium Enterprises (SMEs) Access to Finance in Selected East Asian Economies*. ERIA Research Project Report 2010-14, Jakarta: ERIA. pp. 291-350.

[5] Ali, A. Y. S., & Ali, A. H. (2013). Entrepreneurship Development and Poverty Reduction: Empirical Survey from Somalia. *American International Journal of Social Science, 2*(3), 108-113. https://www.researchgate.net/publication/295854825_Entrepreneurship_Development_and_Poverty_Reduction_Empirical_Survey_from_Somalia

[6] Ali, M. (1987). Durbin-Watson and Generalized Durbin-Watson Tests for Autocorrelations and Randomness. Journal of Business & Economic Statistics, 5(2), 195-203. https://doi.org/10.2307/1391900

[7] Ali, S., Rashid, H., & Khan, M. A. (2014). The Role of Small and Medium Enterprises and Poverty in Pakistan: An Empirical Analysis. *Theoretical and Applied Economics, 21*(4), 67-80. http://store.ectap.ro/articole/972.pdf

[8] Almeda, S., & Baysic, I. (2012). Micro, Small and Medium Enterprises (MSMEs) in the Philippines: What We Know and What We Don't Know. Asian Institute of Management Working Paper No. 13 — 022. http://dx.doi.org/10.2139/ssrn.2316569

[9] Asif Khan, M. (2011). MSME's and Their Role in Ensuring Sustainable Economic Development in India Characterized By LPG. *International Journal of Management Research and Development (IJMRD), 1*(1). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3536159

[10] Atems, B., & Shand, G. (2018). An empirical analysis of the relationship between entrepreneurship and income inequality. *Small Business Economics, 51*(4), 905-922. https://doi.org/10.1007/sl1187-017-9984-1

[11] Banerjee, A.V., & Duflo, E. (2003). Inequality and Growth: What Can the Data Say?. *Journal of Economic Growth 8*, 267–299. https://doi.org/10.1023/A:1026205114860

[12] Baral, S. (2013). An Empirical Study on Changing Face of MSME Towards Emerging Economies in India. *Radix International Journal of Research in Social Science*, *2*(1). http://dx.doi.org/10.2139/ssrn.3375260

[13] Barros, C. P., & Gupta, R. (2017). Development, Poverty, and Inequality: A Spatial Analysis of South African Provinces. *The Journal of Developing Areas, 51*(1), 19-32. https://www.jstor.org/stable/26415693

[14] Beck, T., Demirguc-Kunt, A., & Levine, R. (2005). SMEs, Growth, and Poverty: Cross-Country Evidence. *Journal of Economic Growth, 10*(3), 199-229. https://doi.org/10.1007/s10887-005-3533-5

[15] Behera, M., Mishra, S., Mohapatra, N., & Behera, A. R. (2021). COVID-19 Pandemic and Micro, Small and Medium Enterprises (MSMEs): Policy Response for Revival. *Small Enterprises Development, Management & Extension Journal, 47*(3), 213-228. https://doi.org/10.1177/09708464211037485

[16] Bhat, S. A., & Singh, S. (2020). Role of MSMEs in Social and Economic Development in India. *UGC Care Journal, 40*(50), 813-822. https://www.researchgate.net/profile/Suhail-Ahmad-Bhat/publication/347936773_Role_of_MSMEs_in_Social_and_Economic_Development_in_India/links/6062eb82299bf1736779853e/Role-of-MSMEs-in-Social-and-Economic-Development-in-India.pdf

[17] Bonito, J. D., Daantos, F. J., Mateo, J. C., & Rosete, M. A. (2017). Do Entrepreneurship and Economic Growth Affect Poverty, Income Inequality, and Economic Development?. *Review of Integrative Business and Economics Research, 6*(1), 33-43. https://www.sibresearch.org/uploads/3/4/0/9/34097180/riber_h16-020_33-43.pdf

[18] Castillo, V., Maffioli, A., Rojo, S., & Stucchi, R. (2014). The Effect of Innovation Policy on SMEs' Employment and Wages in Argentina. *Small Business Economics, 42*(2), 387-406. https://doi.org/10.1007/s11187-013-9485-9

[19] Cheema, A. R., & Sial, M. (2012). Poverty, Income Inequality, and Growth in Pakistan: A Pooled Regression Analysis. *The Lahore Journal of Economics, 17*(2), 137-157. http://lahoreschoolofeconomics.edu.pk/EconomicsJournal/Journals/Volume%2017/Issue%202/06%20Cheema%20.pdf

[20] Chiu, C. L., & Cabanda, E. (2005). The Role of Entrepreneurship in Developing Countries in Recognition of the Philippine MSME Sector. *Silicon Valley Review of Global Entrepreneurship Research, 1*. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.462.6303&rep=rep1&type=pdf#page=34

[21] Department of Economic and Social Affairs. (n.d.). Micro, Small, and Medium-sized Enterprises (MSMEs) and their role achieving the Sustainable Development Goals. https://sustainabledevelopment.un.org/content/documents/25851MSMEs_and_SDGs_Final3120.pdf

[22] Department of Trade and Industry. (n.d.). MSME Laws. https://www.dti.gov.ph/negosyo/msme-resources/msme-laws/

[23] De Jesus, J. (n.d.). Jarque-Bera Test with Python. https://towardsdatascience.com/jarque-bera-test-with-python-98677c073de3

[24] De Robles, C. J., De Leon, J. R., & Manapat, C. (2021). Economic Growth at the Expense of Environmental Degradation: Evidence from the Philippines. *Journal of Economics, Finance and Accounting Studies, 3*(2), 269–287. https://doi.org/10.32996/jefas.2021.3.2.25

[25] Dollar, D., & Kraay, A. (2002). Growth is Good for the Poor. *Journal of Economic Growth, 7*(3), 195-225. http://www.jsty aor.org/stable/40216063

[26] Drukker, D. (2003). Testing for serial correlation in linear panel-data models. *The Stata Journal, 3*(2), 168 - 177. https://journals.sagepub.com/doi/pdf/10.1177/1536867X0300300206

[27] Duncombe, R., & Heels, R. (2005). Information & Communication Technologies (ICTs), Poverty Reduction and Micro, Small & Medium-scale Enterprises (MSMEs). http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.489.4483&rep=rep1&type=pdf

[28] Erdin, C., & Ozkaya, G. (2020). Contribution of Small and Medium Enterprises to Economic Development and Quality of Life in Turkey. *Heliyon, 6*(2). https://doi.org/10.1016/j.heliyon.2020.e03215

[29] Gujarati, D. (2003). Basic Econometrics, Fourth Edition. http://zalamsyah.staff.unja.ac.id/wp-content/uploads/sites/286/2019/11/7-Basic-Econometrics-4th-Ed.-Gujarati.pdf

[30] Haider, K., Khanna, M., Kotei, M., Kushnir, K., Singh, S., & Sridhar, T. (2019). Micro, Small, and Medium Enterprises - Economic Indicators (MSME - EI) Analysis Note. https://www.smefinanceforum.org/sites/default/files/MSME-EI%20Report_FINAL.pdf

[31] Hyder, S. K., Ahmed, Q. M., & Jamal, H. (2015). Simulating the Impact of Income Distribution on Poverty Reduction. *The Pakistan Development Review, 54*(4), 931-944. http://www.jstor.org/stable/43831375

[32] Khatibi, Z. (2021). Pandemic Unemployment Levels in the Micro, Small, and Medium Enterprises: Evidence from the Philippines. *International Journal of Progressive Research in Science and Engineering, 2*(4), 13-15. https://www.journals.grdpublications.com/index.php/ijprse/article/view/253/248

[33] Kiss, K., & Zagyi, N. (2014). Principal Characteristics of the Indian Micro, Small & Medium Enterprises (MSME) Sector and Its Importance in Rural Development. *Geographical Locality Studies, 4*(2), 438-460. http://www.frugeo.science/GLS2_Paper-9.pdf

[34] Kouadio, H. K., & Gakpa, L-L. (2021). Do economic growth and institutional quality reduce poverty and inequality in West Africa?. *Journal of Policy Model, 44*(1), 41-63. https://doi.org/10.1016/j.jpolmod.2021.09.010

[35] Kumar, A. (2020). Role of MSMEs in Employment Generation in India. *UGC Care Journal, 3*(4). https://www.researchgate.net/publication/342490888_Purakala_UGC_Care_Journal_ROLE_OF_MSME'S_IN_EMPLOYMENT_GENERATION_IN_INDIA

[36] Kyal, H., Mandal, A., Kujur, F., & Guha, S. (2022). Individual Entrepreneurial Orientation on MSME's Performance: The Mediating Effect of Employee Motivation and the Moderating Effect of Government Intervention. *IIM Ranchi Journal of Management, 1*(1), 21-37. https://doi.org/10.1108/IRJMS-07-2021-0041

[37] Lecuna, A. (2020). Income inequality and entrepreneurship. *Economic Research - Ekonomska Istraživanja, 33*(1), 2269-2285. doi: 10.1080/1331677X.2019.1663545

[38] Lippmann, S., Davis, A., & Aldrich, H. E. (2005). Entrepreneurship and Inequality. *Entrepreneurship (Research in the Sociology of Work, 15*, 3-31*)*. https://doi.org/10.1016/S0277-2833(05)15002-X

[39] Luo, C., Li, S., & Sicular, T. (2020). The long-term evolution of national income inequality and rural poverty in China. *China Economic Review, 62.* https://doi.org/10.1016/j.chieco.2020.101465

[40] Mahadea, D., & Kaseeram, I. (2018). Impact of unemployment and income on entrepreneurship in post-apartheid South Africa: 1994–2015, *Southern African Journal of Entrepreneurship and Small Business Management, 10*(1), a115. https://doi.org/10.1007/sl1187-017-9984-1

[41] Mahendra Dev, S. (2000). Economic Reforms, Poverty, Income Distribution and Employment. *Economic and Political Weekly, 35*(10), 823-835. http://www.jstor.org/stable/4408994

[42] Miranda, A. T., & Miranda, J. L. F. (2018). Status and conditions of small- and medium-sized enterprises as predictors in empowering rural communities in Samar Island, Philippines. *Asia Pacific Journal of Innovation and Entrepreneurship*, *12*(1), 105-119. http://dx.doi.org/10.1108/APJIE-12-2017-0045

[43] Mohammed, M., Ab-Rahim, R., & Shah, S-U-M. (2019). Small and Medium Size Enterprises (SMEs) and Multidimensional Poverty. *International Journal Academic Research Business and Social Sciences, 9*(3), 1080-1095. http://dx.doi.org/10.6007/IJARBSS/v9-i3/5765

[44]*MSMEs in the Philippines.* (2020). https://cpbrd.congress.gov.ph/images/PDF%20Attachments/Facts%20in%20Figures/FF2020-19_MSMEs.pdf

[45] Nandeeswaraiah, K., & Ramana, A. V. (2019). Role and Performance of Micro, Small and Medium Enterprises. *Journal of Management (JOM), 6*(5), 10-17. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3525265

[46] Nursini, N. (2020). Micro, small, and medium enterprises (MSMEs) and poverty reduction: empirical evidence from Indonesia. *Development Studies Research*, *7*(1), 153-166. https://doi.org/10.1080/21665095.2020.1823238

[47] *Philippines Population 2022 (Live)*. (n.d.). World Population Review. https://worldpopulationreview.com/countries/philippines-population

[48] Philippine Statistics Authority. (2021). Proportion of Poor Filipinos Registered at 23.7 percent in the First Semester of 2021. https://psa.gov.ph/content/proportion-poor-filipinos-registered-237-percent-first-semester-2021

[49] Pradhan, K., & Santosh, K. M. (2010). Micro, Small, and Medium Enterprises (MSME) and Economic Development of Odisha. https://digitalrepository.unm.edu/nsc_research/46

[50] Prasetyo, P. E. (2020). The Role of Government Expenditure and Investment for MSME Growth: Empirical Study in Indonesia. *Journal of Asian Finance, Economics, and Business, 7*(10), 471-480. https://doi.org/10.13106/jafeb.2020.vol7.no10.471

[51] Prasetyo, P. E. (2021). The Role of MSME on Unemployment in Indonesia. *Turkish Journal of Computer and Mathematics Education, 12*(13), 2519-2525. https://doi.org/10.4102/sajesbm.v10i1.115

[52] Quingco, J. G., & Leonoras, C. S. (2020). The Economic Impact, Contribution, and Challenges of Micro Business Enterprises to the Local Development. *Philippine Social Science Journal*, *2*(2), 107-122. https://doi.org/10.52006/main.v2i2.8

[53] Quintana, A. A., Chong, M., Cordova, M. L., & Camaro, M.A., P. J. (2022). The Impact of Logistics on Marketing Margin in the Philippine Agricultural Sector. *Journal of Economics, Finance and Accounting Studies, 3*(2), 300–318. https://doi.org/10.32996/jefas.2021.3.2.27

[54] Rivera, J. P. (2021). Winning the War on Poverty: Tracking Living Standards in the Philippines Using a Class of Axiomatic Indices. *DLSU Business & Economics Review, 31*(2), 14-41. https://www.dlsu.edu.ph/wp-content/uploads/2021/04/2Rivera-041121.pdf

[55] Riveros, J. (n.d.). Wooldridge Serial Correlation Test for Panel Data using Stata. https://blog.ms-researchhub.com/2021/02/24/wooldridge-serial-correlation-test-for-panel-data-using-stata/

[56] Salim, M. N., Susilastuti, D., & Rafiqah, I.W. (2020). Determinant of MSMEs Performance and Its Impact on Province GRDP in Indonesia. *International Journal of Economics and Financial Issues, 7*(1), 1-13. https://doi.org/10.18488/journal.62.2020.71.1.13

[57] Samar, E. (2009). Revisiting the SMEs in the Philippines: Challenges and Issues, 179-193. https://www.apec.org/docs/default-source/Publications/2010/12/The-Role-of-SMEs-on-Poor-Power-Empowerment-Lessons-learned-and-sharing-experiences-Proceedings/210_atc_SME-role.pdf#page=193

[58] Sarkar, B. (2016). Socio-Economic Impact of MSMEs on its Employees in Lakhimpur (Assam). *International Research Journal of Management Science & Technology, 7*(12), 471-481. https://www.academia.edu/36309634/Socio-Economic_Impact_of_MSMEs_on_its_Employees_in_Lakhimpur_Assam

[59] Schober, P., Boer, C., & Schwarte, L. (2018). Correlation Coefficients: Appropriate Use and Interpretation. *Anesthesia & Analgesia, 126* (5), 1763 - 1768. doi: 10.1213/ANE.0000000000002864

[60] Sharma, N. (2015). Constructs and Constraints of MSME in India for Sustainable Development. *Asian Journal of Research in Business Economics and Management, 5*(4). doi: 8-24.10.10.5958/2249-7307.2015.00084.5

[61] Shelly, R., Sharma, T., & Bawa, S. S. (2020). Role of Micro, Small, and Medium Enterprises in Indian Economy. *International Journal of Economics and Financial Issues, 10*(5), 84-91. https://doi.org/10.32479/ijefi.10459

[62] Singh, S., & Paliwal, M. (2017). Unleashing the growth potential of Indian MSME sector. *Comparative Economic Research*, *20*(2), 35-52. http://dx.doi.org/10.1515/cer-2017-0011

[63] Srivastava, S. (2020). Role of MSME Sector in Indian Economy: A Study With Special Reference to Gujarat. P*acific Business Review International, 13*(3). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3755792

[64] Subhan, Q. A., Mahmood, T., & Sattar, A. (2014). Innovation and Economic Development A Case of Small and Medium Enterprises in Pakistan. *Pakistan Economic and Social Review, 52*(2), 159-174.

https://www.semanticscholar.org/paper/INNOVATION-AND-ECONOMIC-DEVELOPMENT-A-Case-of-Small-Subhan-Mahmood/9dfc0502e6c6669f470a9dd73a15a71a65efb91c

[65] Suhaili, M., & Sugiharsono, S. (2019). Role of MSME in Absorbing Labor and Contribution to GDP. *Economics Development Analysis Journal*, *8*(3), 301-315. https://doi.org/10.15294/edaj.v8i3.35229

[66] Sumner, A., Ortiz - Juarez, E., & Hoy, C. (2020). Precarity and the pandemic: COVID-19 and poverty incidence, intensity, and severity in developing countries. WIDER Working Paper 2020/77. Helsinki: UNU-WIDER. https://doi.org/10.35188/UNU-WIDER/2020/834-4

[67] Tambunan, T. T. H. (2019). *Development of MSMEs in Developing Countries*. https://books.google.com.ph/books?hl=en&lr=&id=oEWlDwAAQBAJ&oi=fnd&pg=PA1&dq=msme+rural+philippines&ots=TC0KprwJh_&sig=Ypebm3tkpe3ywbtsznLjlG1yQSg&redir_esc=y#v=onepage&q=msme%20rural%20philippines&f=false

[68] Thadewald, T., & Büning, H. (2004). Jarque-Bera test and its competitors for testing normality: A power comparison. https://www.econstor.eu/bitstream/10419/49919/1/668828234.pdf

[69] Verma, T. L., Nema, D., & Pandagre, R. (2020). Role of MSMEs in poverty alleviation and rural development in India. *International Journal of Multidisciplinary Research and Development, 7*(9), 61-65. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3701314

[70] Wahiba, N. F., & Weriemmie, M. E. (2014). The Relationship Between Economic Growth and Income Inequality. *International Journal of Economics and Financial Issues, 4*(1), 135-143. https://www.econjournals.com/index.php/ijefi/article/view/657/pdf

[71] Weldeslassie, H. A., Vermaack, C., Gebrekirstos, K., Minwuyelet, L., Tsegay, M., Tekola, N. H., & Gidey, Y. (2019). Contributions of Micro, Small and Medium Enterprises (MSMEs) to Income Generation, Employment and GDP: Case Study Ethiopia. *Journal of Sustainable Development*, *12*(3), 46-81. https://doi.org/10.5539/jsd.v12n3p46

[72] Williams, R. (2020). Heteroskedasticity. https://www3.nd.edu/~rwilliam/stats2/l25.pdf

[73] Wooldridge, J. (2013). Introductory Econometrics A Modern Approach, Fifth Edition. https://economics.ut.ac.ir/documents/3030266/14100645/Jeffrey_M._Wooldridge_Introductory_Econometrics_A_Modern_Approach__2012.pdf

[74] Xu, K., & Osberg, L. (2002). On Sen's Approach to Poverty Measures and Recent Developments. https://www.mathstat.dal.ca/~kuan/sensw.pdf

[75] Yadav, S., & Suthar, M. (2021). Employment and Productivity: The Role of Labor Market Flexibility in the Indian Micro, Small and Medium Enterprises (MSMEs). *Zeichen Journal, 7*(4), 50-65. https://www.researchgate.net/profile/Sonal-Yadav-6/publication/350768811_Employment_and_Productivity_The_Role_of_Labor_Market_Flexibility_in_the_Indian_Micro_Small_and_Medium_Enterprises_MSMEs_BY/links/6070899ca6fdcc5f77949825/Employment-and-Productivity-The-Role-of-Labor-Market-Flexibility-in-the-Indian-Micro-Small-and-Medium-Enterprises-MSMEs-BY.pdf

[76] Zafar, A., & Mustafa, S. (2017). SMEs and Its Role in Economic and Socio-Economic Development of Pakistan. *International Journal of Academic Research in Accounting, Finance and Management Sciences, 6*(4). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3085425

[77] Zanjurne, P. (2018). Growth and Future Prospects of MSME in India. *International Journal of Advanced Engineering, Management, and Science (IJAEMS)*, *4*(8), 608-614. https://dx.doi.org/10.22161/ijaems.4.8.5

[78] Zulfikar, R. (2018). Estimation Model And Selection Method Of Panel Data Regression: An Overview Of Common Effect, Fixed Effect, And Random Effect Model. doi:10.31227/osf.io/9qe2b