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# Analysis of the Influence of Investment and Labor on Poverty Levels Through the Growth of the Indonesian Manufacturing Industry

**Riqah Balqis [1], Sofyan Syahnur [1,*] and Ernawati Ernawati [1]**

[1] Department of Economics, Faculty of Economics and Business, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia; riqahbalqis6@gmail.com; kabari_sofyan@usk.ac.id; minaraqi@usk.ac.id

* Correspondence: kabari_sofyan@usk.ac.id

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**Abstract**

This study aims to eradicate poverty by utilizing the manufacturing industrial sector, which cannot be separated from the influence of investment value and labor absorption. The analysis methods used are multiple linear regression and Vector Autoregression (VAR). The study employs quarterly secondary data from 1999 to 2022. The results of the analysis show that labor and investment partially have a significant and positive effect on the growth of the manufacturing industry. Moreover, by using a bivariate causality test, this study proves the existence of a two-way causal relationship between the economic growth of the manufacturing industry and poverty. Additionally, the study also analyzed the response of the independent variable to the dependent variable using Impulse Response Function (IRF) and Variance Decomposition (VD). It can be concluded that the economic growth of the manufacturing industry responds negatively to poverty, and poverty responds negatively to the economic growth of the manufacturing industry until both reach a balance. The contribution made by each variable in forming the value of that variable is different from one another. The implementation of good governance is highly expected in efforts to eradicate poverty in Indonesia, one of which is through increasing the economic growth of the manufacturing industry and then creating useful programs to increase investment and employment.



## 1. Introduction

Poverty is one of the main problems faced by almost all countries in the world, especially in developing countries [1–3]. Therefore, the UN has established Sustainable Development Goals (SDGs) consisting of 17 essential agendas that must be achieved by 2030. One of the objectives of this agenda is to eradicate poverty, aiming for a reduction of up to 50 percent in the proportion of the population living below the poverty line by 2030, compared to the conditions achieved by the Millennium Development Goals (MDGs) [4, 5].

The relationship between the growth of the manufacturing industry and poverty intertwines several economic theories. According to Nicholas Kaldor's neo-classical industrial theory, the manufacturing sector serves as an engine of growth, propelling economic development by catalyzing growth in other sectors [6, 7]. Francois Perroux's growth center theory further elucidates this relationship, suggesting that growth occurs asymmetrically across regions, with certain areas acting as growth centers characterized by leading industries. These closely interlinked industries drive regional development and influence the growth of other sectors. Concentrating industrial activity in specific regions creates distinct consumption patterns, fostering economic growth and poverty reduction [8, 9]. This conceptual framework highlights the pivotal role of the manufacturing industry in spurring economic development and alleviating poverty within society.

Furthermore, the influence of investment and labor on the growth of the manufacturing industry is elucidated through various economic theories. Harrod Domar's theory posits that capital formation, considered as expenditure, augments the economy's capacity to produce goods and services and enhances effective demand within the community [10–12]. Schumpeter's theory emphasizes the pivotal role of entrepreneurs in fostering economic growth through continuous innovation, market expansion, and organizational changes, necessitating additional investment [13–15]. Meanwhile, the Solow growth model, an extension of Harrod Domar's theory, delineates how capital stock, labor force growth, and technological progress influence a country's output. It asserts a constant relationship between capital and labor as fundamental inputs driving economic growth [16–18]. Synthesis of these theories gives a comprehensive understanding of the interplay between investment, labor, and industrial growth, offering insights into strategies for fostering economic development in the manufacturing sector.

Several direct and indirect poverty reduction policies, strategies, and activities have been implemented at both national and local levels in Indonesia. However, despite these efforts, the complete eradication of poverty remains elusive. Data from the BPS reveals fluctuating movements in Indonesia's poverty level, with both decreases and increases in the number and percentage of impoverished individuals observed from 2011 to 2021. In 2011, the number of poor people stood at 30.01 million. By 2014, it had decreased to 27.73 million, only to rise again to 28.51 million in 2015. Subsequently, it continued to decline, reaching 26.50 million by 2021 [19].

Developing countries believe that the industrial sector can address economic problems [20, 21]. Poverty alleviation through industrial development, also known as Poverty Alleviation by Industrial Development (PAID), is an essential component of the "Five Branches of the Poverty Alleviation Project," which aims to foster regional development and reduce the poverty population within the country [22, 23]. The performance of the manufacturing industry in the country is increasingly viewed as productive and competitive. A previous study conducted by Cazzuffi et al. [24] suggests that the manufacturing industrial sector significantly and negatively affects poverty. This implies that an increase in the manufacturing industrial sector will reduce poverty.

The comparison of the GDP growth rate of the manufacturing industry in Indonesia with the overall GDP growth rate has fluctuated throughout the years. In 2021, the GDP of the manufacturing industry experienced a fairly deep decline, reaching -2.93%. Similarly, Indonesia's overall GDP growth also declined by -2.07% after the previous growth of the manufacturing industry GDP, which was 3.8% in 2019, while Indonesia's GDP was 5.02% [19]. This decline was largely attributed to the impact of the Covid-19 pandemic on Indonesia.

The significant production value of the manufacturing industry cannot be separated from the influence of investment value, as higher investment can lead to greater output and an increased production scale, thereby facilitating industrial growth. This aligns with the Kaldorian industrial growth theory, which posits that investment is essential for expanding production capacity within an industry [25, 26]. By prioritizing investment in the manufacturing sector, the government can leverage it as a key driver of national income, potentially addressing funding needs and diversifying limited funding sources [27, 28].

Indonesia has a very large workforce. In this scenario, the manufacturing industrial sector became a medium for utilizing abundant natural resources, which could absorb this large workforce [29, 30]. The availability of quality labor led to increased output, thereby affecting per capita income. The availability of employment opportunities could reduce high levels of unemployment, leading to increased labor absorption and, consequently, a poverty reduction, which improved the economy. As per capita income rose, economic growth increased, leading to decreased poverty levels [31–33].

Maximizing the role of the manufacturing industry in Indonesia to effectively eradicate poverty necessitates active involvement from both labor and investment sectors. By optimizing the functions of these two pivotal factors within the manufacturing sector, tangible strides towards poverty reduction can be made. Therefore, the primary objective of this study is to delve into the intricate dynamics of investment presence and employment within the manufacturing sector and their direct influence on poverty reduction. Through a comprehensive analysis of these factors, we aim to elucidate their significance in driving sustainable economic growth and poverty alleviation in Indonesia. It is anticipated that by expanding the workforce engaged in industrial development, the insights gleaned from this study will not only inform policy-making but also foster

**Table 1.** Operational definition of variables.

| Variable | Definition | Unit |
|---|---|---|
| Investment (I) | Investment refers to domestic investment in the manufacturing industry sector. | Rupiah |
| Labor (TK) | Workers are residents of working age, namely 15 years and older, who are employed in the manufacturing industry. | Person |
| Manufacturing Industry Growth (PEI) | The manufacturing industry is an economic activity that involves the mechanical, chemical, or manual transformation of raw materials into finished or semi-finished goods, as well as the enhancement of goods from lower to higher value, bringing their properties closer to the final user. | Rupiah |
| Poverty (P) | Poverty refers to the number of people living in poverty. | Person |

important contributions to the attainment of long-term economic sustainability and poverty eradication in Indonesia.

## 2. Materials and Methods

### *2.1. Data and Variables*

The study utilized secondary data from Indonesia spanning from the first quarter (March) to the fourth quarter (December) of 1999 to 2022. The data, obtained from the Statistics Indonesia (BPS), encompassed information on the number of people living in poverty, investment in the manufacturing industry, total employment, and Gross Regional Domestic Product (GRDP) of the manufacturing industry in Indonesia. These four variables were employed in this study, with their operational definitions outlined in Table 1.

### *2.2. Econometric Model and Methods*

The first analytical method employed in this study is multiple linear regression to ascertain the impact of investment and labor on industrial economic growth. The relationship's function can be symbolized in Equation 1.

$$PEI = f(I, TK) \tag{1}$$

where $PEI$ represents industrial economic growth, $I$ denotes investment, and $TK$ signifies labor.

Therefore, the econometric model shown in Equation 2.

$$PEI_t = \beta_0 + \beta_1 I_t + \beta_2 TK_t + \varepsilon_t \tag{2}$$

Furthermore, the model is transformed into logarithmic form (log) to mitigate the potential problems with classical assumption tests. The final utilize model is depicted in Equation 3.

$$logPEI_t = \beta_0 + \beta_1 logI_t + \beta_2 logTK_t + \varepsilon_t \tag{3}$$

where $\beta_0$ is the intercept, $\beta_1$ and $\beta_2$ is the coefficients, and $\varepsilon$ is the error term.

Meanwhile, in analyzing the relationship between manufacturing industry growth and poverty, the Vector Autoregression (VAR) method is used. The VAR equation can be expressed in Equation 4.

$$\Delta \boldsymbol{Z_t} = \boldsymbol{a_0} + \boldsymbol{a_{ij}} + \boldsymbol{\Pi}\, \boldsymbol{ZP_{t-1}} + \boldsymbol{\Pi}\, \boldsymbol{ZPEI_{t-1}} + \sum_{i=1}^{p} \boldsymbol{\Gamma}\, \Delta \boldsymbol{Z_{t-1}} + \boldsymbol{\epsilon_{ti}} \tag{4}$$

where Zt is the endogenous variable, namely poverty (P) and economic growth in the manufacturing industry (PEI), Π = α. β (α is the error correction parameter vector, β is the cointegration vector), Γ = while it is the coefficient modification matrix in the short term and long term and p is the optimal lag length.

## 3. Results and Discussion

This section will explain two research methods. The first method involves analyzing the impact of investment and labor on the growth of the manufacturing economic industry using the multiple linear regression. The second method involves analyzing the relationship between the economic growth of the manufacturing industry and poverty using the Vector Autoregression (VAR).

### *3.1. Multiple Linear Regression*

#### *3.1.1. Classical Assumption Tests*

The classical assumption test is performed to verify that the multiple linear regression equation produces consistent, unbiased, and precise estimates. As presented in Table 2, the data are normally distributed, show no symptoms of heteroskedasticity, exhibit no autocorrelation in the period data, and demonstrate no indication of multicollinearity between variables.

#### *3.1.2. Results of Regression*

Table 3 presents the impact of labor and investment on the growth of the manufacturing economic industry using the multiple linear regression method. The results yield a constant value of -0.5053. This suggests that if all independent variables, including labor and investment variables, remain unchanged or constant, industrial economic growth would be -0.5053.

**Table 2.** Results of classical assumption test.

| Classical Assumption Test | | Prob. Obs* $R^2$ | VIF | Coeff. | Conclusion |
|---|---|---|---|---|---|
| Normality Test | J-B | 0.1087 | - | - | 0.1087 > 0.05 (normally distributed). |
| Heteroskedasticity Test | B-P-G | 0.0924 | - | - | 0.0924 > 0.05 (It can be concluded there are no symptoms of heteroskedasticity in the model). |
| Autocorrelation Test | B-G SC LM | 0.0687 | - | - | 0.0687 > 0.05 (autocorrelation test assumptions have been met or have passed the autocorrelation test). |
| Multicollinearity Test | VIF | - | 1.4720 | - | 1.4720 < 0.10 (do not show any symptoms of multicollinearity). |
| The coefficient of determination test | $R^2$<br>Adjusted $R^2$ | -<br>- | -<br>- | 0.9992<br>0.9992 | The model is well-fitted (Explaining nearly 99.92% of the variance in the dependent variable). |

Note: J-B: Jarque-Bera; B-P-G: Breusch-Pagan-Godfrey; B-G SC LM: Breusch-Godfrey Serial Correlation LM; VIF: Varians Inflation Factor.

**Table 3.** Results of multiple linear regression.

| Variable | Coeff. | Std. er. | t-stat. | Prob. |
|---|---|---|---|---|
| C | -0.5053* | 0.1249 | -4.0469 | 0.0001 |
| LOG(I) | 0.1948* | 0.0155 | 12.589 | 0.0000 |
| LOG(TK) | 1.0742* | 0.0037 | 286.62 | 0.0000 |
| R-squared | 0.9992 | | | |
| Adjusted R-squared | 0.9992 | | | |

Note: * indicates significance level at 1%.

The regression coefficient for the investment variable is 0.1948 with prob. value <0.01, indicating a significant and positive effect. This means that a 1% increase in investment will lead to a 0.1948% increase in manufacturing economic industry. This finding aligns with previous research by Peng et al. [34] and Ngepah et al. [35], which suggests that higher investment positively influences manufacturing industry economic growth.

Furthermore, the regression coefficient for the labor variable is 1.0742. This implies that a 1% increase in labor corresponds to a 1.0742% increase in manufacturing economic industry. This result supports the findings of previous studies by Zhu et al. [36] and Yu et al. [37], indicating that labor absorption has a significant and positive impact on the economic growth of the manufacturing industry, wherein an increase in labor leads to higher industrial economic growth.

### *3.2. Vector Autoregression (VAR)*

#### *3.2.1. Stationarity Test*

The stationarity test for a variable is crucial as it impacts the results of regression estimation. In this study, the Augmented Dickey Fuller (ADF) test was employed to assess the stationarity of the variables under investigation.

Based on the findings from Table 4, the Augmented Dickey Fuller test was utilized to conduct stationarity tests at both the level and first difference for manufacturing industry economic growth and poverty. The p-values obtained for industrial economic growth (0.0000) and poverty (0.0000) are both less than 0.05, suggesting that the data is free from unit root issues and stationary at the first difference level.

#### *3.2.2. Cointegration Test*

The cointegration test is conducted to explore the existence of a relationship between variables that are non-stationary but have a linear combination. Based on the results in Table 5 of the Johansen's cointegration test, it was found that the trace statistics value (0.7277) was smaller than the critical value (3.8415), and similarly, the maximum eigenvalue (0.7277) was smaller than the critical value (3.8415). These results indicate that the movement of the poverty variable and the industrial economic growth variable do not exhibit a stable or balanced relationship and do not have similar long-term movements. However, since all data are stationary at the first difference level, further analysis can be conducted using the VAR model.

#### *3.2.3. Determining Lag Length*

After testing for stationary data and cointegration, determining the optimal lag length is also crucial in VAR estimation. As shown in Table 6, lag 2 is selected using LR, FPE, AIC, SIC, and HQ criteria, indicating interrelation within the same and one previous period.

#### *3.2.4. VAR Model Analysis*

Following the completion of the stationary, cointegration, and lag optimum tests, the investigation advances to the

**Table 4.** Results of stationarity test.

| Variable | Levels | | First Difference | |
|---|---|---|---|---|
| | **t-stat.** | **Prob.** | **t-stat.** | **Prob.** |
| PEI | -0.9629 | 0.7637 | -5.7684* | 0.0004 |
| TK | -1.1359 | 0.6986 | -5.4395* | 0.0000 |

Note: * indicates significance level at 1%.

**Table 5.** Results of cointegration test.

| Trace | | | Maximum Eigenvalue | | |
|---|---|---|---|---|---|
| **Trace Stat.** | **Critical Value** | **Prob.** | **Max-Eig Stat.** | **Critical Value** | **Prob.** |
| 0.7277 | 3.8415 | 0.3936 | 0.7277 | 3.8415 | 0.3936 |

**Table 6.** Results of optimal lag length test.

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| 0 | -80.5144 | NA | 0.0206 | 1.7938 | 1.8486 | 1.8159 |
| 1 | 201.429 | 545.50 | 4.90e-05 | -4.2485 | -4.0840 | -4.1821 |
| 2 | 220.551 | 36.164* | 3.53e-05* | -4.5772* | -4.3031* | -4.4666* |
| 3 | 223.282 | 5.0453 | 3.63e-05 | -4.5496 | -4.1659 | -4.3947 |
| 4 | 228.396 | 9.2275 | 3.54e-05 | -4.5738 | -4.0804 | -4.3747 |

Note: * indicates the best lag optimum in the model.

**Table 7.** Results of VAR regression for manufacturing industry growth and poverty.

| Variable | Coeff. | Std. er. | t-stat. | Prob. |
|---|---|---|---|---|
| *Manufacturing Industry Growth* | | | | |
| C | 0.1996 | 0.1487 | 1.3421 | 0.1828 |
| LOG(PEI(-1)) | 0.9869* | 0.0140 | 70.335 | 0.0000 |
| *Poverty* | | | | |
| C | 0.1636 | 0.0859 | 1.9053 | 0.0599 |
| LOG(P(-1)) | 1.5680* | 0.0788 | 19.886 | 0.0000 |
| LOG(P(-2)) | -0.5864* | 0.0755 | -7.7641 | 0.0000 |

Note: * denotes significance at the 1% level.

presentation of the VAR regression model for manufacturing industry economic growth and poverty, presented in Table 7. For manufacturing industry growth, the coefficient for the lagged value of the PEI (LOG(PEI(-1))) is 0.9869, which implies that a 1% increase in the PEI in the previous period is associated with a 0.9869% increase in the PEI in the current period. The probability value associated with this coefficient is 0.0000, which is less than the typical significance level of 0.05, indicating that the lagged value of PEI is a significant predictor of the current PEI.

Regarding poverty, the coefficient for the lagged value of poverty (LOG(P(-1))) is 1.5680, suggesting that a 1% increase in poverty in the previous period is associated with a 1.5680% increase in poverty in the current period. The coefficient for the second lagged value of poverty (LOG(P(-2))) is -0.5864, indicating that a 1% increase in poverty in the two periods prior leads to a 0.5864% decrease in poverty in the current period. Both lagged values of poverty have probability values of 0.0000, meaning they are statistically significant predictors of the current period's poverty level, in line with research by Djeunankan et al. [38] that industrialization can encourage poverty.

In summary, the findings reveal that both the previous period's PEI and poverty levels significantly influence their respective current values. Specifically, the PEI demonstrates a direct relationship, indicating that higher values in the previous period correlate with increased values in the current period. Conversely, poverty levels exhibit both direct and inverse relationships with their past values, suggesting that previous levels of poverty can both positively and negatively impact current poverty rates.

*3.2.5. Impulse Response Function (IRF)*

The IRF test aims to observe the response of one variable to a shock given by another variable. Figure 1 illustrates the impact or response of changes in the economic growth of the manufacturing industry on changes in poverty over a period of 10 periods. Initially, during the first period, the economic growth of the manufacturing industry did not affect poverty or did not cause any shocks.

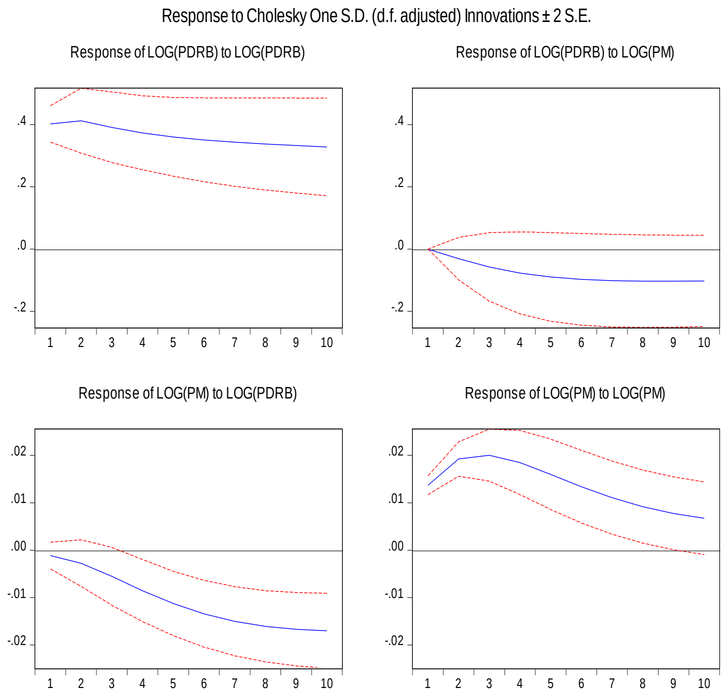


**Figure 1.** Results of Impulse Response Function (IRF).

**Table 8.** Results of Variance Decomposition (VD) for economic growth in the manufacturing industry and poverty.

| Variance Decomposition of D(LOGPEI) | | | |
|---|---|---|---|
| **Period** | **Std. er.** | **D(LOGPEI)** | **D(LOGP)** |
| 1 | 0.4026 | 100,00 | 0.0000 |
| 2 | 0.5771 | 99.709 | 0.2912 |
| 3 | 0.6997 | 99.121 | 0.8792 |
| 4 | 0.7969 | 98.389 | 1.6102 |
| 5 | 0.8793 | 97.636 | 2.3640 |
| 6 | 0.9517 | 96.933 | 3.0674 |
| 7 | 1.0169 | 96.314 | 3.6861 |
| 8 | 1.0765 | 95.789 | 4.2111 |
| 9 | 1.1316 | 95.352 | 4.6479 |
| 10 | 1.1827 | 94.992 | 5.0078 |
| Variance Decomposition of D(LOGP) | | | |
| **Period** | **Std. er.** | **D(LOGPEI)** | **D(LOGP)** |
| 1 | 0.0137 | 0.6919 | 99.308 |
| 2 | 0.0238 | 1.5677 | 98.432 |
| 3 | 0.0316 | 3.9393 | 96.061 |
| 4 | 0.0376 | 7.9479 | 92.052 |
| 5 | 0.0423 | 13.312 | 86.688 |
| 6 | 0.0464 | 19.454 | 80.546 |
| 7 | 0.0499 | 25.748 | 74.252 |
| 8 | 0.0533 | 31.718 | 68.282 |
| 9 | 0.0564 | 37.095 | 62.905 |
| 10 | 0.0593 | 41.790 | 58.209 |

Subsequently, from the second to the tenth period, the economic growth of the manufacturing industry exhibits a negative response to poverty until it reaches equilibrium. Moreover, the response of the poverty variable to the economic growth of the manufacturing industry indicates a consistent negative reaction to the shock provided by the growth variable, persisting from the beginning until the end of the period, or it could be described as consistently negative until equilibrium is achieved.

In the initial period, the application of a shock to the economic growth variable within the manufacturing industry triggers a response from the poverty variable, which in turn affects the trajectory of economic growth. As we progress from the second to the tenth period, poverty consistently demonstrates a negative response to the economic growth of the manufacturing sector. This

**Table 9.** Results of Granger causality test.

| Null Hypothesis | F-Stat. | Prob. |
|---|---|---|
| P does not Granger Cause PEI | 3.2067** | 0.0452 |
| PEI does not Granger Cause P | 5.1465* | 0.0077 |

Note: ** and * denote significance at the 5% and 1% levels, respectively.

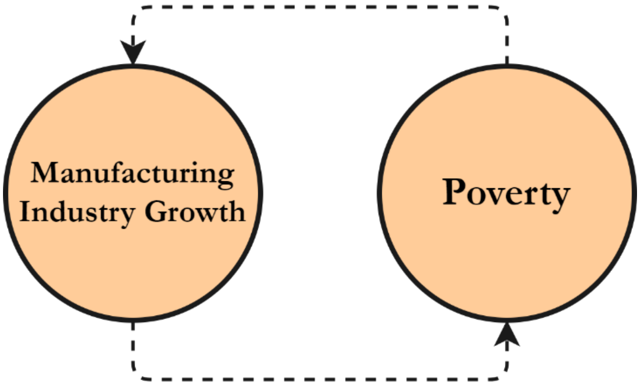


**Figure 2.** Overview of Granger causality.

sustained pattern suggests a persistent downward pressure exerted by poverty on the industry's growth dynamics, persisting until equilibrium is eventually reached.

*3.2.6. Variance Decomposition (VD)*

The aim of VD is to find out how much influence other variables have when a shock occurs in one of the variables. The results of the VAR analysis, presented in Table 8, provide insights into the relationship between the economic growth variable in the manufacturing industry and its impact on the poverty variable. These findings indicate that, in the first period, the economic growth of the manufacturing industry accounted for 100% of the variance at the variable's own level, while the poverty variable did not contribute.

However, in the second period, the poverty variable began to contribute to the economic growth variable of the manufacturing industry, with a contribution of 0.29%, steadily increasing until the 10th period, where it reached 5.00%. Next, let's examine the variance decomposition of the poverty variable and its relationship with the economic growth variable in the manufacturing industry.

These results show that, in the first period, the economic growth variable of the manufacturing industry contributed 0.69% to the variance of the poverty variable. This contribution increased to 1.56% in the second period and continued to fluctuate until the 10th period, where the economic growth variable contributed 41.79% to the variance of the poverty variable.

*3.2.7. Granger Causality Test*

In this phase of the analysis, the Granger causality test is conducted to investigate the potential for reciprocal relationships between variables. This particular test utilizes the VAR pairwise approach, applying a 5% level of significance to determine causality. The results of this causality test are compiled in Table 9, which presents the findings and facilitates the determination of whether the variables influence each other over time.

The test addresses two null hypotheses: first, that poverty does not Granger cause industrial economic growth (PEI), and second, that PEI does not Granger cause poverty. With 94 observations, the F-statistic for the influence of poverty on PEI stands at 3.2067, alongside a probability of 0.0452. In parallel, the influence of PEI on poverty yields an F-statistic of 5.1465 with a probability of 0.0077. Since both probability values fall below the 0.05 threshold, we reject both null hypotheses [39].

The rejection of these null hypotheses indicates a significant two-way causal relationship (bidirectional causality), consistent with previous studies [40, 41]. Poverty has a discernible impact on the economic growth of the manufacturing industry, and likewise, the industrial economic growth significantly affects poverty levels. The relationship is statistically significant in both directions, confirming a bidirectional causality between industrial economic growth and poverty. The overview of Granger causality is shown in Figure 2.

## 4. Conclusions and Policy Recommendations

The findings indicate a significant partial and simultaneous influence of labor and investment on the economic growth of the manufacturing industry. Together, the investment and labor variables account for 99.91% of the growth in the Indonesia's manufacturing industry. Furthermore, the study's analysis also identified a two-way causal relationship between the economic growth of the manufacturing industry and poverty. Additionally, the impulse response function analysis concluded that both variables exhibit a fluctuating response when a shock occurs. The economic growth variable of the manufacturing industry responds negatively to the shock caused by the poverty variable, and vice versa. Moreover, variance decomposition analysis is conducted to ascertain the contribution made by each variable in forming its value, which varies between the two.

Based on the findings, it is evident that policies aimed at promoting investment and enhancing labor force participation are crucial for fostering economic growth within Indonesia's manufacturing industry. As investment and labor collectively account for nearly 100% of the industry's growth, policymakers should prioritize initiatives that attract investment and facilitate the creation of employment opportunities. Additionally, efforts to alleviate poverty should be closely integrated with strategies for boosting manufacturing sector growth, considering the identified two-way causal relationship between economic growth and poverty. To mitigate the fluctuating response observed during shocks, policymakers should implement measures to enhance the resilience of both economic growth and poverty reduction efforts.

Furthermore, variance decomposition analysis highlights the varying contributions of investment and labor to the manufacturing sector's economic value, underscoring the need for targeted policies that maximize the positive impact of these factors. In conclusion, a comprehensive approach that addresses investment promotion, labor market dynamics, poverty alleviation, and resilience building is essential for fostering sustainable economic growth and development in Indonesia.

This study's primary limitation lies in its exclusive focus on phenomena within Indonesia, offering valuable insights into its manufacturing industry dynamics but limiting the generalizability of findings globally. Future research should replicate the study across diverse locations for a comprehensive understanding. Additionally, the absence of control variables in our analysis could impact result robustness and validity. Integrating relevant controls would enhance accuracy and provide a nuanced perspective on relationships investigated. Thus, we encourage future studies to include such variables, ensuring reliability and contributing to a deeper understanding of economic growth and poverty dynamics in manufacturing.

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