

## The Effect of Workforce Education Level on Profitability (ROA) in Indonesia's Defense Industry for the 2017–2023 Period

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### ARTICLE INFO

*Keywords:* Workforce Education Level, Profitability, ROA, Defense Industry

*Received :* 04, March  
*Revised :* 18, March  
*Accepted:* 19, April

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### ABSTRACT

This study aims to analyze the effect of workforce education levels on the profitability (Return on Assets/ROA) of the defense industry in Indonesia during the 2017–2023 period. The independent variables tested include workforce education levels: secondary school, diploma, bachelor's (S1), master's (S2), and doctoral (S3) degrees. This research employs a quantitative method using panel data regression with the Panel Least Squares approach. The sample consists of five defense industry companies with 35 observations. The findings reveal that workforce education at the bachelor's, master's, and doctoral levels positively impacts ROA, whereas secondary school and diploma levels are not significant. These results highlight the importance of improving workforce education quality to enhance the profitability of the defense industry.

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## **INTRODUCTION**

National defense is a crucial aspect of safeguarding Indonesia's sovereignty, territorial integrity, and national security. This is regulated under Law No. 3 of 2002 and further supported by the 2015 Defense White Paper. Threats to national security can be categorized into three main types: military threats originating from armed forces, non-military threats affecting economic, social, political, ideological, and technological sectors, and hybrid threats that combine both aspects. These threats are further classified into actual threats (those that have occurred) and potential threats (those that have not yet occurred).

Indonesia adopts a total defense strategy, engaging all elements of society to maintain national security. In the coming years, actual threats such as terrorism, separatism, cyberattacks, and natural disasters require special attention, while the potential for conventional conflict remains a concern despite its low probability. Addressing these challenges demands strengthening defense capabilities through adequate budget allocations and modernizing military equipment (Alutsista). Additionally, developing the domestic defense industry is essential to reduce dependence on imported products and enhance national self-reliance. This industry not only supports national security but also drives economic growth through increased use of local components.

The effectiveness of the defense industry can be evaluated using financial indicators such as Return on Assets (ROA), which measures a company's operational efficiency. Sustained investment in the local sector can help Indonesia build a robust and innovative defense industry ecosystem, strengthening both economic stability and national security.

A company's financial performance can be assessed through the ratio of net profit to total assets. A higher ratio indicates better company performance. ROA serves as a key indicator for evaluating a company's operational efficiency. According to Zinn (2024) and Cornett, Adair Jr., and Nofsinger (2012), an ROA of 9.30% or higher signifies strong company performance. Meanwhile, Sujarweni (2017) provides a more detailed classification:

1. ROA > 5% : Very good
2. ROA 3% - 5%: Good
3. ROA 1% - 3%: Fair
4. ROA ≤ 1% : Poor

This classification serves as a guideline for assessing a company's effectiveness in generating profit from its assets.

An analysis of the annual reports of state-owned defense companies from 2017 to 2023 (Table 1) reveals variations in Return on Assets (ROA). Companies such as PT PAL Indonesia, PT Pindad, and PT LEN consistently recorded ROA below 5%, indicating a modest performance level. PT Dahana showed fluctuating performance, with unsatisfactory ROA in certain years. In contrast, PT INTI generally reported positive ROA, though it experienced a performance decline in recent years. Referring to the standards set by Cornett, Adair Jr., and Nofsinger (2012), where an ROA of 9.30% or higher signifies strong performance, the defense industry overall has not yet demonstrated

optimal efficiency in utilizing assets to generate profit. However, certain companies, such as PT INTI in 2019 and 2020 and PT Dahana in 2023, achieved favorable ROA levels.

**Table 1. Analysis of ROA in Indonesia’s Defense Industry**

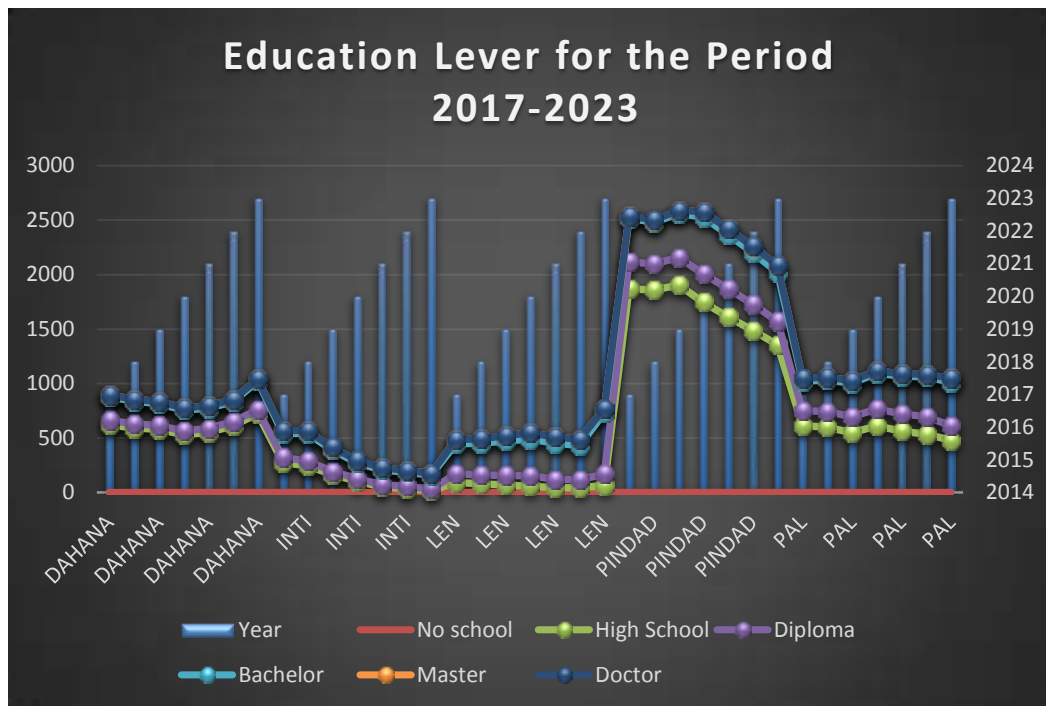
No.	Company Name	Year of the ROA (%)							Average (%)
		2017	2018	2019	2020	2021	2022	2023	
1	PT. Dahana (Persero)	8,39	7,45	3,99	6,33	1,09	6,69	10,55	6,366
2	PT. INTI (Persero)	0,33	5,82	31,2	12,81	9,08	7,3	7,68	10,603
3	PT. LEN Industri (Persero)	2,24	3,99	1,47	1,73	0,16	1,29	4,98	2,266
4	PT. Pindad (Persero)	1,54	1,56	1,48	0,09	0,86	0,75	0,74	1,003
5	PT. PAL Indonesia (Persero)	1,51	1,78	1,47	0,24	0,01	0,25	0,26	0,789

Source: Company Annual Report (2025)

The defense industry plays a strategic role in supporting national self-reliance and economic resilience. In Indonesia, the sector continues to develop, driven by government policies aimed at strengthening national defense. One crucial factor influencing the industry’s profitability is the workforce’s education level, which contributes to increased efficiency and innovation in company operations.

Previous studies have shown a positive correlation between workforce education and company productivity and financial performance. However, research specifically examining the relationship between workforce education levels and Return on Assets (ROA) in Indonesia’s defense industry remains limited. This study seeks to bridge this gap and provide deeper insights into the role of education in industry profitability.

According to data (Figure 1), most employees in Indonesia’s state-owned defense industry are educated at the secondary school and bachelor's (S1) levels. The proportion of diploma, master's (S2), and doctoral (S3) graduates is relatively small, with some companies having almost no doctoral-degree employees, except for PT INTI (Persero). A correlation exists between education level and ROA, as PT INTI (Persero), which employs a higher percentage of bachelor's graduates, also recorded an ROA above 5%, indicating strong company performance.



**Figure 1. Workforce Education Level in Indonesia’s Defense Industry**  
 Source: Company Annual Report (2025)

Higher education plays a vital role in the defense industry, which requires specialized expertise in engineering, manufacturing, and military technology. A well-educated workforce enhances the industry’s ability to adopt new technologies, manage complex defense systems, and innovate in military equipment development. With the integration of these three factors, the defense industry can achieve self-reliance, improve competitiveness, and contribute significantly to national security and economic growth.

This study explores the extent to which workforce education levels impact the profitability of Indonesia’s defense industry from 2017 to 2023. The findings indicate that employees with higher education levels, specifically at the bachelor's, master's, and doctoral levels, contribute positively to ROA, while secondary school and diploma education levels show no significant effect. These results highlight the importance of workforce education in enhancing company efficiency and profitability within the defense industry.

## **THEORETICAL REVIEW**

### ***Financial Performance Theory***

The success of a company can be assessed based on its financial performance, particularly its ability to generate profits (Hutabarat, 2020). Financial performance reflects the efficiency of resource management in achieving financial objectives. Evaluating financial performance is crucial for all stakeholders involved. A company’s quality can be assessed through both financial and non-financial performance (Fahmi, 2015 in Hutabarat, 2020). Financial statements represent financial performance (Ermaini et al., 2021) and can be measured using indicators such as profitability, liquidity, solvency, and operational efficiency (Horne and Wachowicz, 2008). In the context of this

study, profitability is the main indicator used to assess a company's effectiveness in generating profits.

A company's effectiveness in generating profits is often measured by its profitability. Financial ratio analysis can be used to evaluate company performance (Salsabila, 2024). A good profitability ratio indicates effective management (Sari, Susanti, & Fitriano, 2023). Ratios such as ROA, ROE, ROI, NPM, and EPS help assess a company's operational efficiency. Return on Assets (ROA) has a significant impact on profitability (Rosyada et al., 2022; Pratama, Prapanca, & Sriyono, 2024). ROA is a measure used to evaluate how effectively a business generates profits from its assets.

A company's ability to generate profits from its business operations is referred to as profitability (Weston and Brigham, 2019). It measures how effectively a company utilizes its resources to generate earnings. Kasmir (2018) stated that profitability reflects management's ability to generate profits from sales, capital, and assets. According to Hanafi and Halim (2018), profitability serves as an indicator of a company's long-term financial strength. Thus, profitability reflects management's success in achieving long-term financial objectives. In the defense industry, high profitability indicates effective management and company capacity.

Return on Assets (ROA) is used to measure how effectively a company generates net income from its total assets. Kasmir (2018) emphasized that the higher the ROA, the better the company's performance in utilizing its assets to generate profits. The DuPont Theory (Soliman, 2008) focuses profitability analysis on profit margins and asset turnover. Therefore, ROA provides a clear indication of how much assets contribute to a company's profits. In this study, ROA is used as a key ratio to identify factors contributing to low profitability in the defense industry.

A company is considered to have good performance if the ratio between net income and total assets is sufficiently high (Hasanah & Enggariyanto, 2018). Zinn (2024) suggested that an ideal ROA is 5% or higher. Sujarweni (2017) classified ROA as follows:

1. ROA > 5%: Very good
2. ROA 3% - 5%: Good
3. ROA 1% - 3%: Fair
4. ROA ≤ 1%: Poor

A low ROA indicates that a company faces challenges in generating profits from its assets. Therefore, measuring ROA is essential for comprehensively evaluating a company's financial performance.

ROA is calculated using the following formula:

$$ROA = \frac{\text{Net Income}}{\text{Total Assets}} \times 100\% \dots \dots \dots (1)$$

Description:

- a. Net Income = Total Revenue – Total Expenses.
- b. Total Assets = All company-owned resources (both current and fixed assets).

Net income, which represents profits after deducting all operational costs, interest, taxes, and other expenses, reflects the profit available to shareholders and management effectiveness. In the context of Return on Assets (ROA), net income serves as a benchmark for how well a company generates value from its assets. Total assets include all resources owned by the company, both current and fixed, used in operational and investment activities, such as cash, receivables, inventory, property, and equipment. The total asset value provides an overview of a company's resource scale and, in ROA calculations, serves as the denominator to indicate the amount of resources invested in generating profits.

### ***Human Capital Theory***

The human capital theory states that investment in employee education and training enhances productivity and organizational performance. Schultz (1961) and Becker (1993) explained that more educated employees tend to have higher skills, which contribute to increased operational efficiency and company profitability.

Previous studies have shown a positive relationship between workforce education levels and company profitability across various industries (Autor, 2014; Hanushek & Woessmann, 2012). However, some studies suggest that higher education levels do not always directly correlate with increased profitability, as this depends on the specific industry sector (Mincer, 1974).

Education level indicates the formal academic qualifications an individual has completed and is officially recognized. As mandated in Law No. 20 of 2003, education is a structured effort to optimize individual potential in various aspects. Education levels encompass not only academic achievements but also skills and behaviors acquired through learning processes (Ministry of Education and Culture of Indonesia). Sulistiani and Masrukan (2016) emphasized that higher education plays a role in developing critical and innovative thinking abilities. Furthermore, the national education system (Sisdiknas) in Law No. 20 of 2003 highlights that education prepares individuals to contribute positively to society and the workforce. Psacharopoulos and Patrinos (2004) underlined that education is an essential human capital investment, positively impacting individual productivity (Usman, 2011; Lestari, 2011).

Evaluating workforce education levels involves several key indicators, including the highest education attained (Tirtarahardja & Sulo, 2005), the relevance of the field of study to the job (Tirtarahardja & Sulo, 2005), graduation rates (Lestari in Astuti, 2015), and work experience. Education levels include primary and secondary education (Tirtarahardja & Sulo, 2005) as well as higher education (Law No. 20 of 2003 on National Education System). The measurement of education levels in this study follows the weighted average method (Jin et al., 2023), which assigns weights to different education levels.

The formula used for calculating the weighted average education level, adapted from Jin et al. (2023), is as follows:

$$\text{Weighted Average Education Level} = \frac{\sum n_i \times E_i}{N} \dots\dots\dots(2)$$

Description:

- $n_i$  = Number of employees at education level  $i$
- $E_i$  = Value or scale assigned to each education level  $i$
- $N$  = Total number of employees

The educational level scale is determined by assigning scores to each level of education. The average score calculated from the formula can then be mapped to this scale for meaningful interpretation. The following scale is established:

**Table 2. Scale of the Education Level**

No.	Education Level	Scale
1	No formal Education	0
2	Secondary School	1
3	Diploma	2
4	Bachelor’s Degree (S1)	3
5	Master’s Degree (S2)	4
6	Doctoral Degree (S3)	5

Source: Processed by researcher (2025)

**Hypotheses**

A hypothesis is a temporary assumption made by researchers before they conduct research or after discovering a research problem and finding a relevant theory that can be thought of as being able to solve the research problem (Surjaatmadja & Recky, 2024). Hypothesis in this study include:

- H<sub>1</sub> : Secondary school education level positively affects the ROA of the defense industry in Indonesia.
- H<sub>2</sub> : Diploma education level positively affects the ROA of the defense industry in Indonesia.
- H<sub>3</sub> : Bachelor's degree (S1) education level positively affects the ROA of the defense industry in Indonesia.
- H<sub>4</sub> : Master's degree (S2) education level positively affects the ROA of the defense industry in Indonesia.
- H<sub>5</sub> : Doctoral degree (S3) education level positively affects the ROA of the defense industry in Indonesia.
- H<sub>6</sub> : Workforce education levels simultaneously have a positive effect on the ROA of the defense industry in Indonesia.

**Contextual Framework**

In the defense industry, a workforce with a higher level of education is expected to have better technical and managerial capabilities in managing resources and advanced technology. Therefore, the hypotheses in this study are tested within the context of defense industry companies in Indonesia, considering macroeconomic variables that may influence the outcomes.

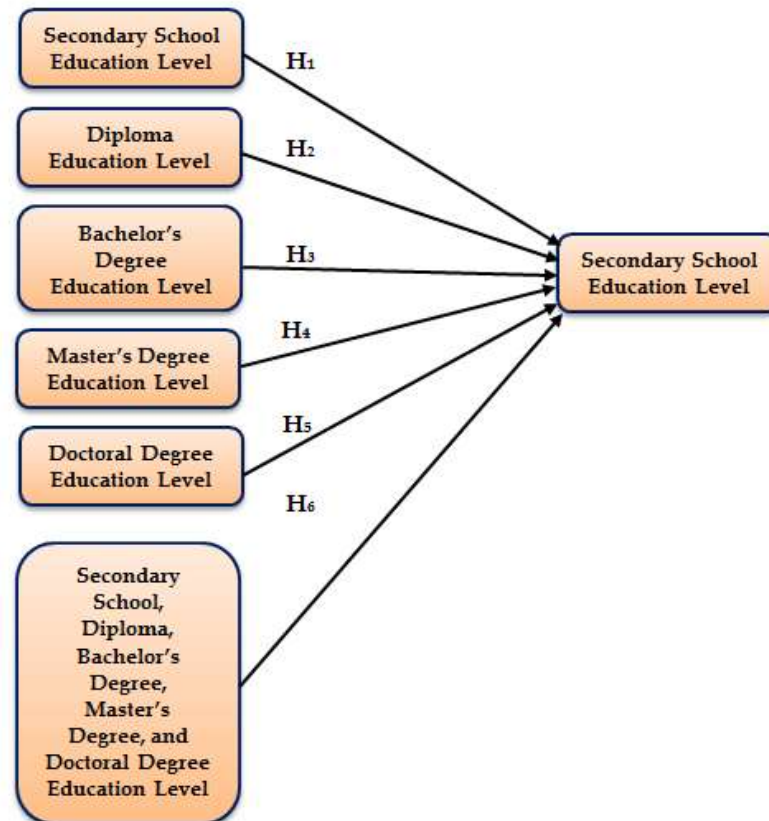


Figure 1. Conceptual Framework

## METHODOLOGY

This study employs a quantitative approach using multiple linear regression methods to analyze the effect of workforce education levels on ROA. The data population is collected from seven state-owned enterprises (SOEs) in Indonesia's defense industry, registered under the Defense Industry Policy Committee.

This study includes the following seven SOEs in the defense industry as the research population:

1. PT LEN Industri (Persero): Develops electronics for defense and infrastructure needs.
2. PT Pindad (Persero): Manufactures weapons, ammunition, combat vehicles, and heavy equipment.
3. PT PAL Indonesia (Persero): Operates shipyards for both military and civilian purposes.
4. PT Dirgantara Indonesia (Persero): Focuses on aircraft manufacturing and aerospace components.
5. PT Dahana (Persero): Provides explosives for the defense sector and other industries.
6. PT INTI (Persero): Offers telecommunications and information technology solutions for defense needs.
7. PT Dok & Perkapalan Kodja Bahari (Persero): Provides shipyard services and ship repairs.

These companies were selected due to their relevant characteristics concerning the research objective, which is to analyze the impact of education levels on Return on Assets (ROA) during the 2017–2023 period. The sampling technique applied in this study is probability sampling, with the simple random sampling method, where each company in the population has an equal chance of being selected as a research sample. This study includes five companies chosen based on specific criteria. The data sources include annual company reports, workforce education data, and financial data from 2017–2023. The data analysis tool used in this study is Eviews 12.

The data analysis process involves the following steps:

1. Collection of secondary data from company annual reports.
2. Classical assumption testing (multicollinearity and heteroscedasticity).

In panel data regression, not all classical assumption tests are necessary. Normality and autocorrelation tests are not mandatory (Basuki & Yuliadi, 2015). This is supported by Gujarati (2012), who states that classical assumption testing is not always required in panel data analysis because panel data can minimize bias, provide more information, variation, and degrees of freedom. Furthermore, Basuki and Prawoto (2016) argue that autocorrelation tests are not required in panel data because panel data is cross-sectional, whereas autocorrelation only occurs in time-series data. Therefore, the classical assumption tests used in this study include multicollinearity and heteroscedasticity tests.

Before conducting the classical assumption tests, it is essential to determine the most appropriate panel data regression model using the following tests: Chow test, Hausman test, and Lagrange Multiplier test.

3. Regression analysis to examine the relationship between workforce education levels and ROA.

This study employs multiple linear regression analysis after completing the classical assumption tests. The analyzed data covers the period from 2019 to 2023, using a time-series approach. Multiple linear regression is a statistical method that uses more than one independent variable to explain the relationship with a dependent variable. This analysis aims to determine the direction of influence and measure how much the independent variables affect the dependent variable (Ghozali, 2021). The resulting regression model provides insights into the pattern of relationships between variables based on historical data.

The regression equation used in this study is:

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} \varepsilon \quad \dots\dots\dots(3)$$

Description:

- $Y_t$  = ROA in year t
- $X_{1t}$  = Workforce education level (High School) in year t
- $X_{2t}$  = Workforce education level (Diploma) in year t
- $X_{3t}$  = Workforce education level (Bachelor's Degree/S1) in year t
- $X_{4t}$  = Workforce education level (Master's Degree/S2) in year t
- $X_{5t}$  = Workforce education level (Doctorate/S3) in year t

$\varepsilon$  = Error term

**RESULTS**

This study aims to analyze the effect of workforce education levels on the profitability (Return on Assets/ROA) of the defense industry in Indonesia during the 2017–2023 period. In this study, education levels are categorized into five tiers, namely:

- a. High School ( $X_1$ )
- b. Diploma ( $X_2$ )
- c. Bachelor’s Degree (S1) ( $X_3$ )
- d. Master’s Degree (S2) ( $X_4$ )
- e. Doctorate (S3) ( $X_5$ )

The data used consists of 35 observations, analyzed using the panel least squares regression method.

The research findings indicate that:

*Panel data regression model selection test*

**Table 3. Model Selection Test Provisions**

Test Type	Results	Decision
Chow Test	Prob > 0,05	CEM
	Prob < 0,05	FEM
Hausman Test	Prob > 0,05	REM
	Prob < 0,05	FEM
Lagrange Multiplier Test	Prob > 0,05	CEM
	Prob < 0,05	REM

Source: Savitri., et al (2021)

*Chow Test Results*

**Table 4. Chow Test Result**

Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.927110	(4,25)	0.4640
Cross-section Chi-square	4.841038	4	0.3040

Source: Processed by researcher (2025)

Prob value 0.3040 > 0.05, then the selected model is the CEM model.

*Hausman Test Results*

The Hausman test was not carried out because this test was to determine the REM and FEM models, even though the Chow test had determined that the selected model was the CEM model, so go straight to the Lagrange Multiplier test.

*Lagrange Multiplier Test Results*

**Table 5. Lagrange Multiplier Test Result**

Lagrange Multiplier Tests for Random Effects			
Null hypotheses: No effects			
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives			
	Cross-section	Test Hypothesis Time	Both
Breusch-Pagan	1.612663 (0.2041)	0.097630 (0.7547)	1.710293 (0.1909)
Honda	-1.269907 (0.8979)	-0.312458 (0.6227)	-1.118901 (0.8684)
King-Wu	-1.269907 (0.8979)	-0.312458 (0.6227)	-1.181281 (0.8813)
Standardized Honda	-0.269688 (0.6063)	-0.145836 (0.5580)	-3.817082 (0.9999)
Standardized King-Wu	-0.269688 (0.6063)	-0.145836 (0.5580)	-3.989701 (1.0000)
Gourieroux, et al.	--	--	0.000000 (1.0000)

Source: Processed by researcher (2025)

Prob value 0.2041 > 0.05, then the selected model is the CEM model.

*Multicollinearity and heteroscedasticity tests show no significant multicollinearity and heteroscedasticity*

**Table 6. Multicollinearity and Heteroscedasticity Test Terms**

Test Type	Result	Decision
Multicollinearity Test	Prob > 0,85	Multicollinearity has occurred
	Prob < 0,85	There is no multicollinearity
Heteroscedasticity Test	Prob > 0,05	There is no heteroscedasticity
	Prob < 0,05	Heteroscedasticity has occurred

Source: Basuki dan Yuliadi (2014) & Napitupulu, et al (2021)

**Table 7. Multikolinieritas Test Result**

	X1	X2	X3	X4	X5
X1	1.000000	-0.598913	-0.986029	-0.917240	-0.235090
X2	-0.598913	1.000000	0.468908	0.441906	-0.103024
X3	-0.986029	0.468908	1.000000	0.899544	0.268751
X4	-0.917240	0.441906	0.899544	1.000000	0.248171
X5	-0.235090	-0.103024	0.268751	0.248171	1.000000

Source: Processed by researcher (2025)

The multicollinearity test is a method in regression analysis used to detect the presence of a high linear relationship between independent variables in the regression model (Gujarati, 2004). Multicollinearity can lead to unstable parameter estimations, affecting the interpretation of regression results.

The correlation test table between independent variables indicates several strong relationships between certain variables, such as:

- a.  $X_1$  and  $X_3$  (-0.986)
- b.  $X_1$  and  $X_4$  (-0.917)
- c.  $X_3$  and  $X_4$  (0.899)

A correlation value close to 1 or -1 indicates a high level of multicollinearity. The very strong correlation between  $X_1$  and  $X_3$  as well as  $X_1$  and  $X_4$  can cause problems in regression estimation, such as increasing the standard error and reducing the accuracy of parameter estimation.

**Table 8. Heteroscedasticity Test Result**

Dependent Variable: ABS(RESID)				
Method: Panel Least Squares				
Date: 03/15/25 Time: 15:21				
Sample: 2017 2023				
Periods included: 7				
Cross-sections included: 5				
Total panel (balanced) observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-712.8821	1160.650	-0.614209	0.5439
X1	716.4165	1160.592	0.617285	0.5419
X2	344.2957	579.3401	0.594289	0.5569
X3	240.0765	387.1400	0.620128	0.5400
X4	177.7506	290.4282	0.612029	0.5453
X5	240.1921	233.5406	1.028481	0.3122

Source: Processed by researcher (2025)

The probability values for each variable in the heteroscedasticity test are as follows:

1. Prob  $X_1 = 0.5419 > 0.05 \rightarrow X_1$  passes the heteroscedasticity test
2. Prob  $X_2 = 0.5569 > 0.05 \rightarrow X_2$  passes the heteroscedasticity test
3. Prob  $X_3 = 0.5400 > 0.05 \rightarrow X_3$  passes the heteroscedasticity test
4. Prob  $X_4 = 0.5453 > 0.05 \rightarrow X_4$  passes the heteroscedasticity test
5. Prob  $X_5 = 0.3122 > 0.05 \rightarrow X_5$  passes the heteroscedasticity test

Based on the test results, there is no heteroscedasticity issue in the model, as all variables have p-values greater than 0.05. This indicates that the regression model used is relatively stable.

**Hypothesis Testing and Regression Analysis**

**Table 9. Partial Significance Test Results (t-Test)**

Dependent Variable: Y				
Method: Panel Least Squares				
Date: 03/15/25 Time: 15:30				
Sample: 2017 2023				
Periods included: 7				
Cross-sections included: 5				
Total panel (balanced) observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3737.965	2035.687	-1.836218	0.0766
X1	3743.980	2035.586	1.839264	0.0761
X2	1829.482	1016.116	1.800465	0.0822
X3	1254.485	679.0126	1.847513	0.0749
X4	927.7673	509.3878	1.821338	0.0789
X5	939.1067	409.6115	2.292677	0.0293

Source: Processed by researcher (2025)

In the significance test, the X<sub>5</sub> variable (Doctoral level education) has a significant influence on ROA with a p-value of 0.0293 (below the 5% significance level). Meanwhile, other variables have p-values between 0.0749 and 0.0822, which approach the 10% significance threshold, indicating that education level has an impact on profitability, although not strongly significant.

Overall, the regression model has an R-squared value of 0.59, meaning that 59% of the variation in ROA can be explained by workforce education levels. Additionally, the F-test results show that the regression model is statistically significant with a p-value of 0.000054.

**Table 10. Simultaneous Significance Test Results (F Test)**

<i>F-statistic</i>	8,370898
<i>Prob (F-statistic)</i>	0,000054

Source: Processed by researcher (2025)

### **Regression Results**

The regression analysis results indicate that workforce education levels have a positive and significant influence on the ROA of Indonesia's defense industry. The regression equation is:

$$Y = -3737,9650873 + 3743,98 X_1 + 1829,48 X_2 + 1254,48 X_3 + 927,76 X_4 + 939,11 X_5$$

The regression results show that all education level variables positively influence the profitability of the defense industry. The regression coefficients for each variable indicate that the higher the workforce education level, the greater its contribution to increasing ROA. The highest coefficient is found in X<sub>1</sub> (High School) with 3743.98, followed by X<sub>2</sub> (Diploma) with 1829.48, X<sub>3</sub> (Bachelor's Degree) with 1254.48, X<sub>4</sub> (Master's Degree) with 927.76, and X<sub>5</sub> (Doctorate) with 939.11.

### **DISCUSSION**

These findings align with human capital theory, which suggests that a more educated workforce possesses better skills in managing resources and improving company efficiency. Furthermore, the results are consistent with previous studies indicating a positive relationship between workforce education and company profitability.

However, several other factors may influence the results, such as government policies, technological advancements, and investment levels in research and development within the defense sector.

### **CONCLUSIONS AND RECOMMENDATIONS**

This study concludes that workforce education levels positively affect the ROA of Indonesia's defense industry. The research findings suggest that Doctoral (S3) education has a significant impact, while lower education levels show a positive but statistically insignificant relationship. The model used is adequate, with an R-squared of 59%, indicating that most of the variation in ROA can be explained by workforce education levels.

Therefore, companies in this industry are advised to increase investment in workforce training and education to enhance competitiveness and profitability.

### **FURTHER STUDY**

This study has limitations in terms of sample size and time frame. Future research could consider additional variables such as work experience, technical skills, government policies, macroeconomic conditions, and additional training programs that may affect profitability.

### **ACKNOWLEDGMENT**

The author expresses gratitude to academic colleagues and defense industry professionals who have provided valuable insights and suggestions in the preparation of this journal.

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