




Market Concentration and Firm Performance of Manufacturing Companies

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Abstract. This research aims to analyze the impact of market concentration, financial risk, return on assets, debt policy, and company size on the performance of companies in the manufacturing industry. The study covered all manufacturing sector companies over an 11-year period from 2009 to 2020, encompassing a total of 195 companies that met the specified criteria. Using multiple regression analysis, the research shows that market concentration, measured by the Herfindahl-Hirschman Index, and other company-specific factors consistently influence profitability. However, the study yielded surprising results regarding company size, which was found to have a significant negative effect on performance. This negative impact is attributed to the increase in operational and administrative costs as the number and size of assets under management grow, ultimately leading to a decrease in company profits.

Keywords: Profitability, Market Concentration, Financial Performance.

1 Introduction

The manufacturing sector plays a crucial role in the economy, driving economic growth or gross domestic product (GDP), creating jobs, boosting exports, and attracting investment. The manufacturing industry is seen as highly productive and capable of generating extensive chain effects, which include increasing the added value of raw materials, expanding employment opportunities, producing significant foreign exchange, and being a major contributor to taxes and customs duties. The substantial growth of the manufacturing industry in Indonesia has intensified competition, especially among similar companies, making it important to study the development of their performance ¹.

Increasing competition among companies indicates a less concentrated market. According to the concentration-fragility hypothesis or competition-stability hypothesis proposed by Chan & Greenbaum ², lower concentration diminishes market power, enabling firms to lower prices, which in turn, reduces their risk exposure and lowers the overall risk profile of the market ³, which in turn can positively impact profitability. Conversely, the concentration-stability hypothesis or competition-fragility hypothesis, as proposed by Keeley ⁴, suggests that low concentration in an industry increases the incentives for firms to engage in excessive risk-taking. This is because declining market concentration lowers firms' market power, leading to lower profitability for the industry ³.

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Market concentration can have either a positive or negative impact on company profitability, depending on the specific circumstances and market dynamics. Several studies have explored how market concentration affects profitability. Kastratović et al.⁵ conducted research in the Serbian manufacturing industry and found a positive correlation between market concentration and profitability. Highly concentrated markets often provide opportunities for firms to engage in collusion and generate monopoly profits⁶. Similarly, Perera et al.⁷, in their research on South Asian banks, found that higher market concentration, indicated by higher values of the Herfindahl-Hirschman Index (HHI), correlates with increased profitability. This suggests that South Asian banks operating in more concentrated markets can extract economic rents and achieve greater profits. In industries with a high HHI, the market is dominated by a few large companies, which reduces competition and allows these companies to exert greater market power, charge higher prices, and enjoy higher profit margins. On the other hand, Kosmidou⁸ identified industry concentration as statistically significant but negatively associated with bank profits. This suggests that increased industry concentration may lead to decreased operational efficiency, thereby reducing profitability. Similarly, research by Alhassan et al.⁹; Mukhopadhyay & Chakraborty¹⁰; Zhang et al.¹¹ also shows a negative association among market concentration and company performance.

This research aims to examine the impact of market concentration and other specific factors on the dynamics of company profitability, focusing on the manufacturing industry sector listed on the Indonesia Stock Exchange from 2009 to 2020. This study introduces several advancements, including the use of the Herfindahl-Hirschman Index (HHI) on each sub-sector in the manufacturing industry to measure market concentration and an extended observation period to generalize findings beyond the typical 3 to 5 years. The results of this research are valuable for company managers to help them navigate market competition and consider strategies for enhancing profitability.

2

Literature Review

2.1 Managerial Efficiency Theory

Managerial efficiency theory explains that companies that manage their policies and resources efficiently and consistently over time will generate higher profits, enabling them to survive in competitive markets¹²⁻¹⁴. Company resources, both tangible and intangible, allow them to create valuable market offerings for specific segments. These offerings become benchmarks for observing industry behavior and performance, influencing the company's strategy and the profits achieved. In addition to resource management, a company's ability to manage its assets and capital significantly determines the dynamics of profitability. Profitability indicates a company's ability to earn profits over a given period. Companies are expected to continuously strive for high profits to remain competitive in the industry. Profitability or operating ratios are designed to help evaluate management performance and the company's overall success in achieving its financial goals.

2.2 Market Concentration Theory

The association among market concentration and firm performance has been the subject of significant academic investigation, particularly through the lenses of the concentration-fragility and concentration-stability hypotheses. These hypotheses offer different perspectives on how market concentration affects performance and company stability. The concentration-fragility hypothesis posits that higher market concentration leads to increased risk and fragility among firms. In highly concentrated markets, firms may engage in riskier behavior due to reduced competition, potentially leading to decreased stability and performance¹¹. A study by Kosmidou⁸ supports this hypothesis, identifying industry concentration as negatively associated with bank profits. This suggests that increased industry concentration may result in decreased operational efficiency, thereby reducing profitability.

In contrast, the concentration-stability hypothesis suggests that higher market concentration can enhance company stability and performance. This view holds that firms in concentrated markets can achieve economies of scale, stronger market power, and better access to resources, leading to increased financial stability and performance¹¹. For instance, Calice et al.³ found that declining market concentration reduces firms' market power, leading to lower profitability for the industry as a whole.

3 Methods

3.1 Population and Sample

The research population comprises 200 manufacturing companies listed on the Indonesia Stock Exchange (BEI) during the 2009-2020 period, resulting in a total of 1683 observations. Following the normalization process, 846 outlier observations were removed, resulting in a final sample size of 125 companies, and a total of 609 observations for analysis.

3.2 Variable Measurement

This research employs a return on equity (ROE) as a dependent variable. Meanwhile, Herfindahl-Hirschman Index, return on equity variance, return on assets, debt-to-equity ratio, and firm size act as influencing factors. Detailed descriptions of each variable measurement are provided in Table 1.

Table 1. Variabile measurement.

Variable	Measurement
Return on Equity (ROE)	"Earning after tax divided by total equity"
Herfindahl-Hirschman Index (HI)	"Sum of square of market share sub-sector i year t"
Varian Return on Equity (VROE)	"Variability of ROE firm i year t"
Return on Assets (ROA)	"Earning after tax divided by total asset"
Leverage Ratio (DER)	"Total debt divided by total equity"
Firm Size (SIZE)	"Natural logarithm of total asset"

3.3 Data Analysis

Panel regression analysis employing Partial Least Squares (PLS), Fixed Effects Model (FEM), and Random Effects Model (REM) methods is conducted to identify the most effective approach for uncovering how the independent variables influence the dependent variable (Gujarati, 2013). Regression testing is conducted after verifying that the data complies with all classical assumptions through assessments for normality, multicollinearity, heteroscedasticity, and autocorrelation. The regression equation utilized in this research is as follows:

$$ROE_{i,t} = \alpha + \beta_1 HI_{i,t} + \beta_2 VROE_{i,t} + \beta_3 ROA_{i,t} + \beta_4 DER_{i,t} + \beta_5 SIZE_{i,t} + \varepsilon \quad (1)$$

where, ROE = return on equity; HI = Herfindahl-Hirschman Index; VROE = variances of return on equity; ROA = return on asset; DER = debt equity ratio; SIZE: firm size.

4 Result and Discussion

4.1 Result

Table 2. Descriptive statistics.

Variable	Obs	Mean	Std. dev.	Min	Max
ROE	609	0.0820	0.0633	-0.0100	0.3071
HI	609	0.3415	0.1721	0.1182	1.0000
VROE	609	0.0005	0.0009	0.0000	0.0107
ROA	609	0.0513	0.0449	-0.0009	0.1994
DER	609	0.8200	0.5700	-0.2183	2.9949
SIZE	609	27.9773	0.9664	25.9744	29.9792

Table 2 shows that return on equity (ROE), which measures a firm's profitability relative to shareholders' equity, shows an average value of 8.20%, indicating that the company is able to provide a return on each invested capital of 0.08 times. The negative minimum value suggests that some firms are experiencing losses or experiencing capital deficiencies.

Herfindahl-hirschman index (HI) measures market concentration, with higher values indicating less competition. The mean value of 0.3415 suggests moderate concentration on average, but values range from low (0.1182) to a monopoly (1.0000). Variability of return on equity (VROE) captures the variability in a firm's ROE. A mean of 0.0005 indicates low average variability, with some firms showing no variability (minimum of 0) and others experiencing higher variability (maximum of 0.0107). Return on assets (ROA) measures profitability relative to total assets. The mean value of 0.0513 suggests a 5.13% return on assets on average. Similar to ROE, some firms are experiencing negative returns. Debt to equity ratio (DER) indicates the relative proportion of a firm's debt to shareholders' equity. The mean value of 0.8200 suggests that, on average, firms have 82% of debt compared to equity. The negative minimum indicates some firms mengalami defisiensi modal. SIZE is a measure of the firm's size in logarithmic scale. The average size is 27.9773, with a narrow range indicating relatively similar sizes among the firms in the dataset.

Table 3. Regression output.

Variables	PLS	FE	RE
	ROE	ROE	ROE
HI	0.009** (0.004)	-0.021* (0.012)	0.010* (0.005)
VROE	4.293*** (0.904)	4.510*** (1.641)	4.486*** (1.148)
ROA	1.467*** (0.019)	1.424*** (0.039)	1.454*** (0.029)
DER	0.029*** (0.002)	0.028*** (0.003)	0.029*** (0.002)
SIZE	-0.002*** (0.001)	-0.010*** (0.002)	-0.003*** (0.001)
Constant	0.041** (0.018)	0.284*** (0.070)	0.071*** (0.027)
Observations	609	609	609
R-squared	0.937	0.898	
N	125	125	125

Note: “***” significant at 1%, “**” significant at 5%, “*” significant at 10%.

Table 3 presents the results of multiple linear regression analysis. The findings indicate that market concentration (HI), variance of return on equity (VROE), return on assets (ROA), debt-to-equity ratio (DER), and company size (SIZE) significantly influence return on equity (ROE). Additionally, the R-squared value demonstrates that the independent variables HI, VROE, ROA, DER, and SIZE collectively explain over 89% of the variance in the dependent variable, using either the Partial Least Squares (PLS) method or the Fixed Effects Model.

Quite interesting results from the results of the regression analysis are that the Herfindahl-Hirschman Index (HI) as a proxy for market concentration has a significant effect on profitability (ROE) but has an inconsistent direction of relationship, exhibiting both negative and positive significance on ROE using various regression methods. Meanwhile, SIZE as a proxy for company size has a negative effect on ROE of manufacturing companies. This shows that the larger of a company, the lower the rate of return on capital invested by investors.

4.2 Discussion

The research results indicate that a higher Herfindahl-Hirschman Index (HI), representing companies in highly concentrated markets, can increase profitability and efficiency¹⁵. Positive outcomes suggest that company returns improve with the dominance of a few firms, fostering an oligopoly market structure. Greater market power allows firms to control prices, leading to high returns. This finding aligns with Degl’Innocenti et al.¹⁶, who found that in the Italian credit industry, factoring companies are more stable as competition decreases, bolster the competition-fragility hypothesis. However, considering the entity and time, HI negatively affects return on

equity (ROE), indicating that more concentrated manufacturing markets can decrease profitability. In highly concentrated markets, a few dominant firms may reduce competition, leading to complacency, less innovation, reduced efficiency, and higher costs . Zhang et al. ¹¹ also showed a negative association among market concentration and performance .

The research finds that the variance of return on equity positively affects ROE. Higher variance in ROE indicates poorer earnings quality and greater company risk. Companies with high profit variability face high risk ¹⁷, demonstrating that company risk positively affects profitability . This supports the high-risk high-return theory, which states that higher risk is associated with higher profits, and vice versa ¹⁸ . Moreover, earnings volatility can positively affect the cost of debt for borrowers ¹⁹, suggesting that firms with higher earnings volatility may attract higher returns from lenders, potentially enhancing profitability.

The study shows that return on assets (ROA) positively affects ROE. These results indicate that company assets influence company equity in achieving profitability. This finding aligns with the Dupont analysis, where asset efficiency is crucial for measuring and analyzing a company's ability to generate ROE. Therefore, ROA is a primary indicator of profitability, with higher ROA values indicating better financial performance. This is consistent with research by Gomes & Oliveira ²⁰, which found a positive association between ROA and ROE .

The research also proves that the debt-to-equity ratio (DER) positively affects ROE. Increasing the use of debt impacts profitability positively. However, financial managers are advised to use debt to the extent that tax savings from deductible loan interest are greater than or equal to the cost of financial distress. The optimal capital structure is achieved when the company uses a debt-to-equity ratio that is most appropriate. This finding is consistent with research by Gautam et al. ²¹, who found that DER significantly affects ROE, meaning that a greater proportion of debt in a company's capital structure can lead to higher profitability. This supports the balancing theory, which states that debt is acceptable as long as the profit level exceeds the debt cost .

Lastly, the research shows that firm size negatively affects ROE at a significant level of 1%. This means that higher assets in manufacturing companies lead to lower ROE values. Assets are the main source of company finances and are used for operational costs such as salaries, office administration, and promotions, which can impact profits. Therefore, larger assets can lead to higher operational and administrative costs, reducing profits. This finding aligns with Khadka ²², who revealed that company size negatively and significantly affects profitability, indicating that as company size increases, profitability decreases .

5 Conclusion

This research aims to reveal the impact of market concentration, measured using the Herfindahl-Hirschman Index (HI), on company profitability. HI has a significant positive effect on ROE, implying that companies in highly concentrated markets experience lower competition, which increases stability. This result supports concentration-stability hypothesis. Conversely, negative results indicate that greater market concentration in the manufacturing industry can lead to decreased profitability.

This result supports concentration-fragility hypothesis. The variance of return on equity positively affects return on equity, meaning that manufacturing companies with high profit variability tend to earn high profits. Return on assets affects profitability (ROE), indicating that successful asset utilization contributes to higher profits. The debt-to-equity ratio influences profitability, showing that increased debt usage can enhance the profitability of manufacturing companies. Company size negatively affects ROE, meaning that larger asset bases lead to higher operational and administrative costs, thereby reducing profits.

This research is limited to the manufacturing sector and employs only a multiple regression model. Suggestions for future research include developing interaction models and adding variables not used in this study that influence profitability, such as the impact of internationalization or the implementation of good corporate governance. This approach would broaden the financial knowledge base essential for business management. Additionally, future studies should consider different and more in-depth objects of study, such as comparisons across manufacturing sub-sectors.

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