

“Does innovation efficiency affect financial performance? The role of ownership concentration”

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DOES INNOVATION EFFICIENCY AFFECT FINANCIAL PERFORMANCE? THE ROLE OF OWNERSHIP CONCENTRATION

Abstract

The company that is synonymous with the application of science and technology is the manufacturing industry (Krmela et al., 2022). Manufacturing companies in Indonesia have been accustomed to the use of technology in their production activities so far, because technology really helps the company's production to be more effective (Muchran, 2020). This study examines the effect of innovation efficiency on firm performance and the moderating role of ownership concentration on this effect. This study examines innovation efficiency as the optimal combination of innovation input and innovation output. The inputs used are research and development expenses, machine repair expenses, and information technology purchases. Meanwhile, the output of innovation. This study used 616 annual reports of manufacturing companies from 2013 to 2018. The analytical technique used is a moderated regression analysis. The results show that efficiency is positively and significantly correlated with company performance. In addition, the results of the study provide evidence of concentrated ownership, encouraging managers to be more intensive in carrying out innovation efficiency so that it affects increasing company performance. These findings show that there is efficiency in innovation projects that can improve company performance, and companies with concentrated ownership find it easier to carry out innovation efficiency because of the active involvement of shareholders in the management process when innovation projects are implemented aimed at improving company performance.

Keywords

industry management, firm strategy, market
performance, corporate financial management,
sustainable development financing

JEL Classification

F63, L16, M11, M21, O11

INTRODUCTION

Changes in the manufacturing environment today are becoming more dynamic and, in the future, will force all manufacturing companies to use technology to support their manufacturing activities. (Yeung, 2021). Innovation provides space for companies to seize new opportunities and improve company competitiveness (Lestari et al., 2020). Companies that fail to innovate affect the rejection of the company's products, the reduction of the production cycle and the loss of the company's position in the market environment (Jensen, 2021).

Innovation drives companies to discover and create new ideas, take risks, and encourage new business approaches (Sanchez-Henriquez & Pavez, 2021). Companies are also required to produce quality products or services at low costs, improvise products with new attributes and produce products that differ from the previous ones from the innovation activities carried out (Jensen, 2021). Therefore, innovation is an important effort that must be carried out by every company in the modern era in order to win the competition, maintain sustainabili-

ty, and improve company performance. Innovation efficiency reduces unnecessary burdens to defend themselves in a competitive environment, so that the innovations carried out do not have a significant impact on the decline in company performance (Grabowska & Saniuk, 2022). Management's ability to properly calculate the efficiency of innovation can provide benefits to efforts to meet consumer preferences without placing an excessive burden on company resources (Adomah Worae & Ngwakwe, 2017). Innovation efficiency is defined as a company's ability to translate innovation inputs into innovation outputs (Türkeş et al., 2021). Although innovation is not a linear process of changing innovation inputs into innovation outputs, the study how the resources used as innovation inputs provide optimal output explains the concept of innovation efficiency (Türkeş et al., 2021).

Good corporate governance can design innovation effectively, so that efficiency can be built properly in the innovation process (Yin & Sheng, 2019). Ownership is the foundation of corporate governance because a company cannot exist without owners, and share ownership rights are allocated to owners (Aguilera & Crespi-Cladera, 2016). Ownership contributes to value creation, builds a long-term company vision, and takes a part in allocating company resources (Ma et al., 2022). Regarding innovation, ownership structure encourages management to increase innovation activities, especially concentrated ownership structure (Shehadeh et al., 2022). Innovation investments that involve high costs and high risks are a hard choice for companies with dispersed ownership structures (Khan et al., 2021). The dispersed ownership structure creates enormous differences in views between each owner so that it becomes an obstacle for companies to invest in innovation (Ma et al., 2022). In addition, companies with a concentrated ownership structure more easily absorb organizational culture that leads to innovation activities (Shehadeh et al., 2022).

Concentrated ownership encourages managers to increase innovation activities for the growth and sustainability of a company in the future (Ma et al., 2022). Innovation can be well received by managers if efficiency can be carried out in innovation activities (Jensen, 2021). Managers do not miss the opportunity to maximize non-corporate value that benefits their position and interests. The effectiveness of resource allocation when innovation efficiency is carried out results in lower innovation input costs than the resulting output. Innovation is aimed at improving a company's performance in the long term (Yin & Sheng, 2019). A company's performance improvement is carried out by seeking a better market position through product and process innovation (Kurniawati et al., 2022). New products and services resulting from the innovation process generate new market share, the ability to create prices, to encourage increased company profitability (Tarigan et al., 2019).

There is a lack of models to track the effect of various types of innovations on firm performance over time, so future research is recommended to validate the findings of previous studies and present an integrative research framework that simultaneously covers the influence of innovation and firm performance (Agostini et al., 2017). This study looks at this opportunity and examines the efficiency of innovation as an integrative framework for innovation. Efficiency is an important concept in innovation, because investing in innovation is not an activity that company management wants (Türkeş et al., 2021).

1. LITERATURE REVIEW

Principal-agent problems usually arise in a firm's innovation activities (Hang et al., 2018). Innovation is very important to maintain a company's competitive advantage, but it requires a lot of time and investment of resources that contributes to the decline in the company's short-term operational performance (Ali & Anwar, 2021).

Managers will choose not to invest heavily in innovation activities and prefer steady performance improvements. Managers have an interest in increasing their wealth, so they have a tendency to reject innovation activities that require large financing. Innovation efficiency gives managers the opportunity to increase their wealth, because the enormous cost of innovation can be offset by a much greater increase in revenue (Grabowska &

Saniuk, 2022; Zandi et al., 2019). This results in a company's short-term performance being maintained and having the hope of increasing when innovation efficiency is carried out. Shareholders' expectations that managers increase innovation activities can be realized if the efficiency of innovation can be fulfilled properly (Zandi et al., 2019). This shows that innovation efficiency is a strategy to bridge the interests of principals and agents when a company has the intention of increasing innovation activities.

Innovative companies are more flexible and more adaptable to the business environment, increasing opportunities better than competitors (Almulhim, 2020). Without continuous development and innovation, it will disrupt a company's internal conditions and impact on the imbalance between supply and demand in the market (Ruiter et al., 2022). This makes managers have no desire to carry out innovation projects to maintain the company's short-term performance growth. Innovation must consider efficiency factors in order to reduce the excessive burden on the use of company resources (Grabowska & Saniuk, 2022). Innovation efficiency plays an important role in an increasingly complex business environment where innovation efficiency can reduce unnecessary burdens to defend themselves in a competitive environment so that the innovations carried out do not have a significant impact on improving the company's performance (Kafetzopouloset al., 2019).

Innovation comes from the company's desire to develop products that differ from competitors, create new products according to consumer preferences, and shorten the production cycle (Tavassoli & Karlsson, 2015). Products and processes resulting from innovation activities create and develop market share, increasing sales volume. To achieve this, R&D is needed for customers, competitors, and company resources (Haryati et al., 2021). R&D causes a company's cash expenditure to increase, so efficiency is needed so as not to disrupt the company's cash flow. The efficiency of innovation optimally combines the use of innovation inputs to produce greater output (Zandi et al., 2019). Innovation efficiency makes it easy for companies to expand their market share without placing an enormous burden on the company's operational activities, so that companies have the convenience

of increasing sales volume, as well as improving performance (DC Chen & Chen, 2021). In addition, new products resulting from innovation activities make the company a market leader, so that it is easy to determine prices for these new products (De et al., 2020). This resulted in the company's revenue increasing from the addition of market share and the ability to shape prices. This shows that innovation efficiency is a strategy to improve company performance while remaining actively involved in the competitive environment (Qiao & Fung, 2016; Yan et al., 2019).

Companies with a concentrated ownership structure encourage managers to be more active in exploring forms of innovation that the company can develop (Mustafa et al., 2020). Concentrated ownership provides an injection of funding to finance investments in innovation to meet its expectations for future growth in the company's performance and increasing their prosperity (Gamariel et al., 2022). Large investment costs create the possibility for managers to get a smaller return from the performance they have done (Jensen, 2021). Agency problems that arise between principals and agents when innovating must be minimized as best as possible, so that companies can survive in a competitive environment and obtain better sustainability in the future.

Active involvement of shareholders in the management process to influence managers' innovative efforts is a form of effort to resolve problems that arise among actors in innovation activities (Xie et al., 2019). Shareholders can use their ownership position to actively influence operations or management when they are not satisfied with the implementation of the innovation strategy (Dilla et al., 2019). Shareholders help improve the risk-taking process by managers, so managers are motivated to increase the company's innovation activities (Eroglu & Sanders, 2021). Shareholders have the expectation that their profits will increase if they can influence the actions of managers to innovate (Xie et al., 2019). Companies with concentrated ownership will be more aggressive in increasing innovation due to the active involvement of shareholders in the management process. Shareholders seek to encourage managers to support their initiatives to create innovations in business processes through efforts to increase innovation activities.

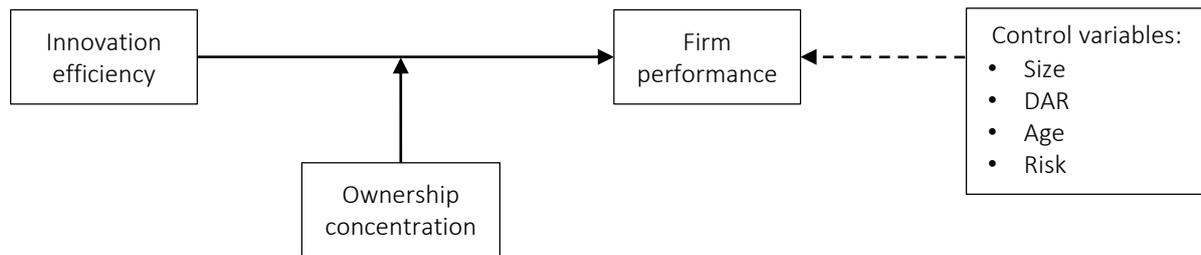


Figure 1. Conceptual framework

Companies with a concentrated ownership structure encourage management to increase the company's innovation activities by considering cost efficiency when innovation is carried out (Gamariel et al., 2022). Innovation efficiency increases when the company's ownership structure is more concentrated due to the active involvement of shareholders in the management process (Yuan et al., 2020). Concentrated ownership roles to be actively involved in innovation activities provide tighter supervision to managers, so managers are more motivated to innovate and maintain cost efficiency (Yuan et al., 2020). The cost efficiency created during the innovation process has an impact on increasing market share, increasing sales volume, and minimizing operational costs (Exposito & Sanchis-Llopis, 2018). This makes it easy for com-

pany managers to improve company performance (Muthuveloo et al., 2017). In addition, concentrated ownership encourages company management to carry out innovation efficiency in order to minimize the current use of cash, so that cash disbursements can be maintained (Gamariel et al., 2022). This gives hope to managers to keep getting higher returns when innovation activity increases. Therefore, this study formulates the following hypotheses:

H1: Innovation efficiency has a positive effect on company performance.

H2: Concentrated ownership increases the effect of innovation efficiency on company performance.

Table 1. Definition and measurement of research variables

Source: Data tabulation, 2022.

No.	Variable	Indicators/measurements	Scale
1.	Firm performance, The measurement of a company's performance in question is only those that are directly related to innovation, which is difficult to determine (Wang & Wang, 2012)	$Ro_a = \frac{Net\ Income}{Total\ Assets}$	Ratio
2.	Innovation Efficiency, provides a basic explanation of how the use of resources as input for innovation provides optimal results (Qiao & Fung, 2016)	Innovation efficiency is obtained by operationalizing the input and output of innovation in the non-parametric mathematical method of Data Envelopment Analysis (DEA). To estimate the efficiency of innovation by using three inputs, namely: research and development expenses, engine repair expenses, and technology purchases and one output (Erkan et al., 2019). $hs = \frac{\sum_{i=1}^m U_i \cdot Y_{is}}{\sum_{j=1}^n V_j \cdot X_{js}}$	Ratio
3.	Ownership Concentration, has an important function in innovation projects (Belloc, 2012). Ownership concentration used in this study is concentrated ownership, because the dispersed ownership structure creates large differences in views between each owner so that it becomes an obstacle for companies to invest in innovation	Ownership concentration is calculated based on the difference of the controlling shareholder (Shehadeh et al., 2022). This study uses the three largest controlling shareholders, so that ownership concentration is formulated: $OC = (Equity_1 - Equity_2)^2 + (Equity_2 - Equity_3)^2$	Ratio
4.	Firm Size (control), is used to estimate company size because companies with large assets have the opportunity to explore and exploit innovation activities. Therefore, companies with large assets have a high opportunity to increase innovation projects and make projects efficient (Cruz-Cázares et al., 2013)	Ln total assets (proxied by total assets)	Ratio

Table 1 (cont.). Definition and measurement of research variables

No.	Variable	Indicators/measurements	Scale
5.	Capital structure (control), is used to measure capital structure because companies with large capital structures have the possibility to fund innovation activities (Lin, 2017)	$Debt\ to\ Equity = \frac{Total\ Liabilities}{Total\ Equity} \cdot 100\%$	Ratio
6.	Firm age (control), The age of a company indicates the maturity of the company in a competitive environment, where companies with a large age have more experience in business operations, making it easier to win the competition (Cruz-Cázares et al., 2013)	Calculated from the year of establishment to the present	Nominal
7.	Firm risk (control) shows the consequences of actions taken by company managers. Innovation is an activity that has a large risk, so the risk that the company currently has is a consideration for innovation efficiency in order to improve company performance	<p>Company risk is calculated using the standard deviation of EBITDA (Earnings Before Interest, Tax, Depreciation and Amortization) divided by a company's total assets. The formula for the standard deviation of EBITDA is as follows:</p> $CR = \sqrt{\frac{n \sum_{i=1}^n x_i^2 - (\sum_{i=1}^n x_i)^2}{n(n-1)}}$ <p>where n is the number of data and 1 is EBITDA. So, the formula for calculating company risk is: Risk = EBITDA Standard Deviation / Total Assets. A greater company risk indicates that the company's executives are risk taking, a smaller company risk indicates that the company's executives are risk averse</p>	Ratio

2. METHOD

The study uses quantitative methods. The research data used in this study are secondary data. The population are manufacturing companies listed on the Indonesia Stock Exchange. A sample of 616 Indonesian manufacturing company data was used.

This study conducted data analysis and statistical testing using SPSS 24.0 to analyze descriptive statistics, correlation analysis, multiple linear regression and moderated regression analysis. Multiple linear regression was used to test hypothesis 1, while moderated regression analysis was used to test hypothesis 2. The model developed to measure the effect of innovation efficiency on company performance (hypothesis 1) is as follows:

$$ROA = \alpha + \beta_1 EFF + \beta_2 SIZE + \beta_3 DER + \beta_4 AGE + \beta_5 RISK + \varepsilon,$$

while the model developed to measure ownership concentration moderation on the effect of innovation efficiency on company performance (hypothesis 2) is as follows:

$$ROA = \alpha + \beta_1 EFF + \beta_2 OC + \beta_3 EFF \cdot OC + \varepsilon,$$

where ROA : Financial Performance; EFF : Innovation efficiency; OC : Ownership concentration;

$SIZE$: Size firm; DAR : Capital structure; AGE : Firm age; and $RISK$: Firm risk.

3. RESULTS

Table 2 provides information on the number of companies that carry out product innovation efficiency during the period 2013 to 2019.

Table 2. Manufacturing companies that carry out product efficiency for the period 2013–2019

Source: Research data, 2019.

Year	Number of Companies	Number of Efficient Companies	%
2013	86	2	2.33
2014	90	2	2.22
2015	89	2	2.25
2016	81	2	2.47
2017	85	3	3.52
2018	94	3	3.19
2019	91	3	3.29

Table 2 shows that the efficiency of innovation is still minimal by manufacturing companies in Indonesia. This indicates that manufacturing companies in Indonesia have not been able to optimize the use of their resources for innovation activities.

Table 3. Descriptive statistics

Source: Research data, 2019.

Variable	N	Minimum	Maximum	mean	Std. Deviation
ROA	616	-0.401425	4.446758	0.044370	0.084450
EFF	616	0	1	0.044126	0.175878
OC	616	0.000000	0.992813	0.282687	0.2893058
DER	616	1,267	23.201	9.0281	11.2034
SIZE	616	10,392	24,918	22.9281	25,9291
AGE	616	5	7	3.4029	5,7261
RISK	616	-1.750198	2,64381	0.115318	0.547381
Valid N (listwise)					

Table 3 provides descriptive statistical results of the variables in this study. Here are the results of the test data.

From a sample of 616 manufacturing company data for the period 2013 to 2019, a company's performance shows a range of values of -0.401425 to 4.446758 with an average of 0.044370 and a standard deviation of 0.084450. This shows that the sampled companies have different abilities in improving their performance. Innovation efficiency shows that it has a value range of 0 to 1 with an average of 0,044126 and standard deviation 0,175878. These results indicate that there are still companies that have not been able to carry out innovation efficiency, and companies that have the ability to carry out innovation efficiency are still very low. Ownership concentration shows a range of values from 0 to 0,992813 with an average of 0,282687 and standard deviation of 0,2893058. These results indicate that in general manufacturing companies in Indonesia have a concentrated ownership structure, but there are companies that have scattered shareholdings. The average debt to equity ratio obtained is 9.0281 and the standard deviation is 11.2034. While the minimum value is 1,267 and the maximum is 23,201. This result means that manufacturing companies in Indonesia, which have a higher Debt to Equity Ratio value, have a higher amount of debt that must be paid off by the company within a certain period of time. The firm risk value that has been tested produces a minimum value of -1.750198, and the maximum value is 2.64381. Meanwhile, the average value is 0.115318 and the standard deviation value is 0.547381. This result means that the higher the risk of a company, which includes a high risk of uncertainty demand, the more it poses a risk. The company's income is uncertain, where, with the uncertainty of the company's income, this causes the company's profitability to decrease.

Table 4. Hypothesis testing

Source: Research data, 2019.

Variable	Model 1		Model 2	
	Coef	Sig	Coef	Sig
Constant	-1,247**	0.000	-1,212***	0.000
OC	0.277***	0.001	0.276***	0.001
EFF	0.124**	0.000	-0.021	0.861
ROA	0.213**	0.001	-0.005***	0.000
SIZE	0.482**	0.000	0.483***	0.000
DAR	0.046***	0.000	0.045***	0.000
AGE	0.910**	0.000	-0.032***	0.001
RISK	0.230**	0.001	-0.098***	0.000
EFF*OC	0.402**	0.000	-0.192***	0.000

Note: *** = positive and significant; ** = negative and significant.

The results from Table 4 show that company size, age, and company risk have a positive and significant effect on company performance. In addition, the capital structure has a negative and significant effect on the company's performance. The first hypothesis states that there is a positive effect of innovation efficiency on company performance.

The results of the research on model 1 show that innovation efficiency has a positive and significant effect on company performance with a Beta (β) value of 0.041 and p-value of 0.021. This result means that the higher the efficiency of innovation by the company, the higher its performance will be. Companies with a high level of efficiency when carrying out innovation projects have the advantage of improving their short-term performance (Peñarroya-Farell & Miralles, 2022).

The results of the research on model 2 show that the interaction of innovation efficiency with ownership concentration has a positive and significant effect on company performance. Based on the existing phenomenon, innovation efficiency makes it easy for companies to increase sales volume, in-

crease sales growth, increase net profit, and minimize investment costs for innovation (Qiao & Fung, 2016). This shows that innovation efficiency is a form of strategy that companies can develop to improve their performance (short or long term) and maintain their sustainability.

4. DISCUSSION

The findings of this study are in line with previous researchers who stated that innovation efficiency is a form of strategy to improve company performance by remaining actively involved in the competitive environment and there are several spaces that companies can develop to improve their innovation efficiency (Trinugroho et al., 2022). The innovations made provide a better opportunity to become market leaders, so they are able to determine the price level for the new products they create (Chen et al., 2019). The amount of costs incurred by a company to fund innovation projects can be minimized by managers when efficiency is carried out properly. Managers will choose the optimal use of resources, so that the resulting innovation is in accordance with market needs.

The results of this study mean that the more concentrated shareholder ownership, this will encourage managers to be more active in making efficiency in innovation projects, so that it has an impact on increasing company performance. Concentrated ownership also encourages management to increase innovation projects to improve the company's position in the competitive environment. Concentrated ownership expects the company to be able to maintain a competitive advantage and increase the company's competitiveness with the company's innovations. The drive for concentrated ownership of managers is manifested by the direct involvement of shareholders in innovation projects. Concentrated

ownership will monitor and supervise managers regarding the success of the company's innovation projects. The direct involvement of concentrated ownership makes innovation projects more efficient in their financing. Concentrated ownership expects that innovation projects run by managers do not require large injections of funding, so they do not burden the owners. Companies with concentrated ownership will be more active to innovate and make efficiency in project financing, so that companies are able to improve their performance from the efficiency of innovations carried out by company managers. Concentrated ownership will monitor and supervise managers regarding the success of the company's innovation projects. The direct involvement of concentrated ownership makes innovation projects more efficient in their financing.

Concentrated ownership expects that innovation projects run by managers do not require large injections of funding, so they do not burden the owners. Companies with concentrated ownership will be more active to innovate and make efficiency in project financing, so that companies are able to improve their performance from the efficiency of innovations carried out by company managers. Concentrated ownership will monitor and supervise managers regarding the success of the company's innovation projects. The direct involvement of concentrated ownership makes innovation projects more efficient in their financing (Shehadeh et al., 2022). The direct involvement of concentrated ownership in innovation projects provides opportunities for companies to maintain competitive advantage and improve company performance. The findings of this study are in line with previous findings, which state that concentrated ownership plays an important role in innovation projects, so that it makes it easier for companies to improve their performance (Chatterjee & Bhattacharjee, 2020).

CONCLUSION

This study finds that manufacturing companies in Indonesia are still lacking in innovation efficiency, so they have vulnerabilities in facing global competition. Indonesia has a goal to become one of the developed countries in the world economy. Therefore, it is important for every company in Indonesia to continuously develop innovations in their products or production processes to support these goals. Innovation is a strategy for every company in Indonesia to be able to compete with the global compet-

itive environment. Therefore, when developing an innovative strategy, it is necessary to consider efficiency in the project financing process. Innovation efficiency provides an opportunity for each company to develop its business processes without placing great pressure on company resources (Grabowska & Saniuk, 2022). In Indonesia, the corporate ownership structure is dominated by concentrated ownership. This condition makes it easier for each company to carry out innovation projects and make efficiencies due to the strong encouragement of the company owners. Concentrated ownership can encourage managers to improve the company's innovation projects to maintain performance growth, maintain competitive advantage, and maintain company viability (Shehadeh et al., 2022).

The limitation of this study is that this finding has not technically explained the steps that need to be taken by entrepreneurs to carry out the efficiency of product innovation they produce. Thus, this limitation can be covered by the existence of further research in the future that will examine the strategic steps that need to be taken by entrepreneurs to carry out product innovation efficiency, so that their business performance can continue to develop and be competitive and have a competitive advantage in the future. This finding provides a signal for several stakeholders to start controlling the innovation work carried out by a company's management, the aim is to form budget efficiency and the effectiveness of innovation products in the future.

AUTHOR CONTRIBUTIONS

Conceptualization: Triyonowati, Rizki Amalia Elfita, Suwitho, Titik Mildawati.

Data curation: Triyonowati, Suwitho, Titik Mildawati.

Formal analysis: Triyonowati, Suwitho, Titik Mildawati.

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Investigation: Triyonowati, Rizki Amalia Elfita, Suwitho, Titik Mildawati.

Methodology: Triyonowati, Suwitho, Titik Mildawati.

Project administration: Triyonowati, Suwitho, Titik Mildawati.

Resources: Triyonowati, Suwitho, Titik Mildawati.

Software: Triyonowati, Suwitho, Titik Mildawati.

Supervision: Triyonowati, Suwitho, Titik Mildawati.

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Writing – original draft: Triyonowati, Rizki Amalia Elfita, Suwitho, Titik Mildawati.

Writing – review & editing: Triyonowati, Rizki Amalia Elfita, Suwitho, Titik Mildawati.

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