DEVELOPMENT OF INNOVATION CAPABILITIES IN THE COVID-19 PANDEMIC ERA AND ITS EFFECT ON FINANCIAL PERFORMANCE

Andi Wijayanto[*)1], Nila Firdausi Nuzula[**)]

[*)]Department of Business Administration, Diponegoro University
Antonius Suroyo St., Semarang 50275, Indonesia
[**)]Department of Business Administration, Brawijaya University
MT. Haryono St. 163, Malang 65145, Indonesia

Abstract:

Background: The COVID-19 pandemic has profoundly affected multiple aspects of life, particularly the business sector, which has struggled with the challenges posed by decreasing consumer spending. Globally, an economic crisis has occurred in many countries, including Indonesia, which experienced a recession in the third quarter of 2020 with a GDP decline of 3.49%. As the country with the highest number of COVID-19 cases in Southeast Asia and a high mortality rate, Indonesia faces major challenges in economic recovery. The government has implemented various measures to support people affected by the pandemic. In this situation, companies must develop adaptive strategies not only to survive but also to seize opportunities to improve their performance, even surpassing pre-pandemic conditions.

Purpose: To explain how manufacturing companies in Indonesia invest in R&D to develop their innovation capabilities and financial performance during the crisis caused by the COVID-19 pandemic, to prove the differences between the innovation capabilities of Indonesian manufacturing companies before and during the crisis and its effect on financial performance.

Design/methodology/approach: The research was conducted on 37 Indonesian manufacturing companies that disclosed expenditures for research and development (R&D) activities. Observational data are financial reports from 2018 to 2021. Data analysis techniques use the Wilcoxon Signed-Rank Test and Linear Regression.

Findings/Result: The R&D intensity and ROA before and during the crisis did not differ significantly, whereas ROE showed a significant difference. Innovation capabilities show a significant effect on financial performance, both in ROA and ROE.

Conclusion: Only 22% of Indonesian manufacturing companies allocate funds for R&D activities. Nevertheless, the Indonesian manufacturing companies under study demonstrated greater efforts to innovate during the COVID-19 pandemic. Investment in R&D increased from an average of 0.67% before the pandemic to 1.06% during the pandemic. The company's financial performance showed a decline during the pandemic.

Originality/value (State of the art): This research has the novelty of revealing the development of innovation capabilities of Indonesian manufacturing companies during the COVID-19 pandemic and using a financial approach to prove the influence of innovation capabilities on company financial performance.

Keywords: financial performance, innovation capabilities, manufacturing companies, pandemic era; research and development (r&d)

How to Cite:

Wijayanto, A., & Nuzula, N. F. (2025). Development of innovation capabilities in the COVID-19 pandemic era and its effect on financial performance. Jurnal Aplikasi Bisnis dan Manajemen (JABM), 11(3), 778. https://doi.org/10.17358/jabm.11.3.778

[1] Corresponding author:
  Email: andibilt@gmail.com

INTRODUCTION

The global COVID-19 pandemic has significantly affected many aspects of human life, particularly the business sector. Various business sectors have experienced strong pressure due to the decline in people's consumption levels. The global economy is experiencing strain until a number of nations enter crisis conditions, as seen by negative economic growth (Arianto, 2020; Soava et al. 2021; Wei, Li, & Zhang, 2021).

Since the first COVID-19 case was found on March 2, 2020, there has been a two-year COVID-19 pandemic in Indonesia. Indonesia has the greatest number of positive COVID-19 cases in all Southeast Asia. Indonesia also ranks second in Asia with the highest number of deaths (Khan et al. 2023). Having experienced a significant decrease in the number of positive COVID-19 cases, Indonesia is again threatened by a new COVID-19 variant, Omicron, which has a faster transmission risk than previous variants.

The COVID-19 pandemic has greatly influenced various sectors in Indonesia, most notably the country's economy, which is now officially in a recession because of continuing to decline economic growth in the third quarter of 2020. Indonesian GDP growth declined from the Q1 to the Q4 of 2020 due to the impact of the COVID-19 pandemic (Nursjanti & Amaliawiati, 2021). The Indonesian government has undertaken several initiatives to develop legislation that will assist those Indonesians who are having difficulty during the pandemic.

The decline in national economic indicators during the crisis caused by COVID-19 can affect company performance. Therefore, every company must find a strategy not only to survive the COVID-19 pandemic crisis era but be able to take advantage of existing opportunities to encourage better performance improvement even compared to normal conditions.

One of the main strategies that companies can do to survive and win competition in the current era of uncertainty is to continue to innovate. Innovation is a key word that is widely mentioned regarding how companies can go through crisis situations caused by the COVID-19 pandemic. The changes that occur in terms of how humans live their lives prove that innovation has become the main weapon to rule the world, including the business world. Innovation changes old ways with new ways that are easier, cheaper and more fun. Innovation causes *creative destruction.* This pattern is consistent with Joseph E. Schumpeter's 1934 theory that innovation is the key to growth. He contends that ingenuity, not resources, determines a country's growth (Schumpeter, 2017).

Innovation is "the process of turning opportunities into ideas" (Drucker, 2012; Tidd & Bessant, 2018; YuSheng & Ibrahim, 2020). Since the 1990s, innovation has been extensively researched in connection with achieving a company's sustained competitive advantage (Kleiner, 2013; Teece, 2007; Teece, Pisano, & Shuen, 1997). Companies that have superior innovation capabilities will have a competitive advantage. If the company excels in competition, then the company will have good performance.

To increase innovation power, the company must increase its innovation capability. Innovation can only occur if the company has innovation capability (Laforet, 2011; Saunila & Ukko, 2012). The capability for innovation is a determinant of performance, competitive advantage, and success (Amit & Schoemaker, 1993). Lawson & Samson (2001) describe innovation capability as "the capacity to consistently convert ideas and knowledge into new systems, procedures, and products that are advantageous to the company and its stakeholders". According to Rangone (1999), an organization's capability for innovation is its ability to create novel goods and procedures as well as to outperform competitors in terms of technology and management.

The Dynamic Capabilities View (DCV) theory places innovation capability as one of the main components that make up dynamic capabilities (Teece & Pisano, 1994). Dynamic Capabilities are "a firm's ability to integrate, build and reconfigure its internal and external competencies in the face of rapid environmental change". There are various components that make up dynamic capabilities include "sensing opportunities and threats, seizing opportunities, and reconfiguration, adaptive capability, absorptive capability, and innovative capability" (Pisano, 2000, 2015; Teece, 2007).

Innovation serves as a critical driver of competitive advantage. Companies that innovate will be able to meet customer needs and even create new needs and markets. Companies that do not innovate will be eliminated due to innovations from competitors that can change consumer behavior. Calantone et al. (2002) stated that innovation is the most important determinant of organizational performance.

The relationship between company's capability for innovation and firm financial performance is suggested by Kleinknecht & Mohnen (2002); Hsu & Wang (2012); Protogerou et al. (2012); Wang & Hsu (2010b) which states that Innovation capabilities are proxied by dynamic capabilities in R&D, which contribute to a firm's competitive advantage. Firms that invest in innovation capabilities, such as research and development, tend to see improvements in financial metrics like profitability and growth (Ali, Hao, & Aijuan, 2020). Earlier research has attempted to empirically examine the impact of innovation capability on a company's financial performance. The significance of the effect of innovation capability on the company's financial performance is shown through the research of YuSheng & Ibrahim (2020) who conducted research in Ghana; Rajapathirana & Hui (2018) in Sri Lanka; Camisón & Villar-López (2014) on industrial companies in Spain; Yasin et al. (2014) in Pakistan; Saunila et al. (2014); Maldonado-Guzmán et al. (2019) in Mexico; and research by Ali et al. (2020) in China.

The financial performance of companies in Indonesia during the crisis caused by COVID-19 shows a decline. According to research by Wijayanto & Seno (2021), during the COVID-19 pandemic, manufacturing enterprises in the consumer goods industry saw a decline in their Return on Asset (ROA), a measure of financial performance from 8.10 percent in 2019 to 4.57 percent in 2020. Meanwhile, return on equity (ROE) decreased from 13.84 percent in 2019 to 7.47 percent in 2020. On the other hand, manufacturing firms in Indonesia have shown relatively low attention to the development of innovation capabilities up to the year 2018. A study by Wijayanto et al. (2020) revealed that only 35 out of 166 companies reported investing in R&D to build their innovation capabilities.

Previous studies have measured innovation capability and financial performance using perceptual approaches.

These studies typically collected data through questionnaires completed by respondents based on their perceptions of their respective firms' innovation capabilities. Based on the author's literature review, no prior research has investigated the relationship between innovation capability and financial performance using financial statement-based measures.

The novelty of this study lies in two key aspects: (1) it investigates the development of innovation capabilities by manufacturing firms in Indonesia during the COVID-19 pandemic, an area that has received limited attention in prior research; and (2) it adopts a financial-based approach to empirically assess the impact of innovation capability on firm financial performance, offering a perspective beyond the commonly used perceptual measures.

To investigate whether manufacturing companies in Indonesia improved their innovation capabilities during the COVID-19 Pandemic, we conducted a comparison of the intensity of research and development before and during the COVID-19 Pandemic. The intensity of research and development is a proxy for a company's efforts to improve innovation capabilities (Carvache-Franco et al. 2020; Karbowski, 2016; Wang & Hsu, 2010a; Zawislak et al. 2018). The Wilcoxon Signed-Rank Test or The Paired Sample T-test is used to conduct the difference test by looking at the assumption of data normality. Furthermore, we will test whether the innovation capabilities developed by companies before and during the COVID-19 Pandemic have an impact on the company's financial performance as measured by Return on Asset (ROA) and Return on Equity (ROE). Regression analysis is used to test this causal relationship with the SPSS software tool.

This study seeks to address this research gap by providing empirical evidence on the relationship between innovation capability and financial performance from a financial reporting perspective. This study aims to: (1) explore how innovation capability and financial performance have evolved in Indonesian manufacturing companies during a time of crisis, by comparing conditions before and during the COVID-19 pandemic; and (2) examine how innovation capability influences the financial performance of these companies.

METHODS

This research adopts both comparative and associative approaches. The comparative level can be seen in the comparison or average difference between several sample groups. The explanatory level is shown in testing the effect of innovation capability variables on financial performance in manufacturing companies that go public on the Indonesia Stock Exchange (IDX).

This study uses secondary data. Secondary data refers to data that has been previously gathered for another objective and is already available in an existing format (Saunders, Lewis, & Thornhill, 2019). Research data is obtained from company financial reports, IDX Facts Book, summaries of listed companies, and annual reports. Data sources were obtained from the Indonesian Stock Exchange (IDX).

All manufacturing enterprises that list on the IDX are the study's population. There are 171 manufacturing businesses in Indonesia that went public, according to the IDX Facts Book (IDX, 2019). The sample was selected using a purposive sampling technique. The following criteria must be met to be included in a research sample: (a) manufacturing firms that are registered on the IDX consecutively from 2018-2021; (b) The company publishes the company's financial statements consecutively from 2018-2021; and (c) Companies must disclose R&D costs in their financial statements.

Innovation capability was measured using the ratio of R&D intensity (Carvache-Franco et al. 2020; Karbowski, 2016; Wang & Hsu, 2010a; Zawislak et al. 2018). Financial performance was measured using the ratio of ROA and ROE (Pujiastuti, 2024).

Documentation approaches are included in the data collection method. The documentation technique involves gathering data by examining existing materials such as documents, records, or written texts that are closely related to the research topic. This technique involves gathering information from sources such as reports, books, journals, letters, meeting minutes, official records, or digital archives (Creswell & Creswell, 2018). It allows researchers to draw insights from sources that already contain valuable information.

Descriptive and inferential analysis are two methods of data analysis. The process of descriptive analysis is used to characterize the data, including descriptive information on sample firms, research variable descriptions, and research findings descriptions. The Wilcoxon Signed-Rank Test and linear regression analysis were used to conduct inferential analysis. SPSS for Windows, a statistical analysis tool, was used to assist with the data analysis process for hypothesis testing. The following formulation of the research hypothesis is based on the theoretical study:

H_1: "There is a significant difference between the innovation capabilities of Indonesian manufacturing companies between before and during the crisis"

H_2: "There is a significant difference between the financial performance of Indonesian manufacturing companies between before and during the crisis"

H_3: "Innovation capability has a significant effect on Return on Asset (ROA) of Indonesian manufacturing companies both before and during the crisis"

H_4: "Innovation capability has a significant effect on Return on Equity (ROE) of Indonesian manufacturing companies both before and during the crisis"

The research framework is presented in Figure 1. This framework outlines the timeline of the study, which is divided into two distinct periods: before and during the COVID-19 pandemic. The researcher compares how innovation capability varied across these two phases, reflecting how companies adapted and strengthened their innovation efforts in response to the crisis. Furthermore, the study examines how this innovation capabilities impact firm financial performance, as measured by ROA and ROE.
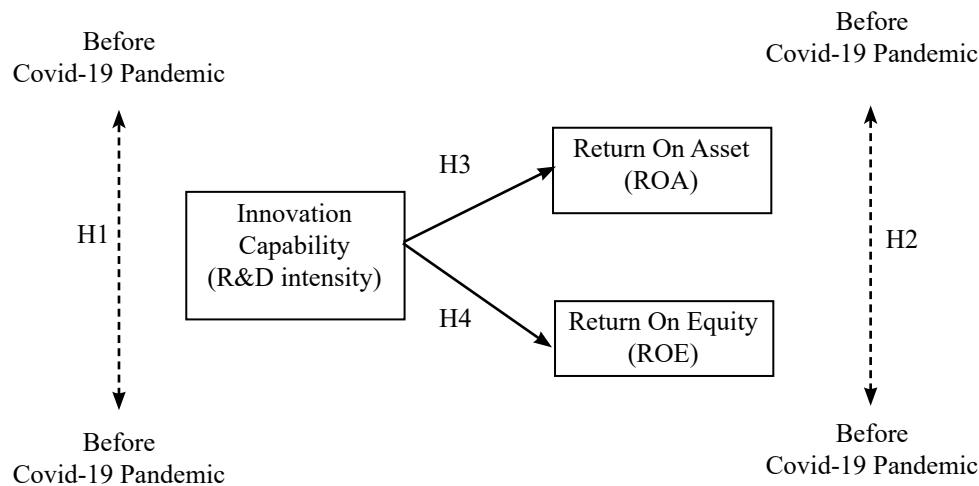
Figure 1. Hypothesis Model

RESULTS

Innovation capability Development of Indonesian Manufacturing Companies Before and during the Crisis

Data analysis was conducted to answer the problem formulation and prove the research hypothesis. Efforts to improve the company's innovation capability are reflected in the high intensity of activities in research and development (R&D). The differential test of innovation capability (R&D intensity) in this study was conducted using the Wilcoxon S-R Test. The data was not normally distributed, as seen by the data normality test findings, which led to the implementation of this test approach. Table 1 displays the data normality test results.

The data normality test, conducted using the Kolmogorov-Smirnov (K-S) and Shapiro-Wilk (S-W) methods, produced a significant value of 0.000. Since this value is below the alpha threshold of 0.05, it indicates that the data is not normally distributed. As a result, the Wilcoxon S-R Test was employed to perform the difference test.

The following test, the Wilcoxon S-R Test, compares the R&D intensity of Indonesian manufacturing enterprises before and during the crisis based on the results of the data normality test. The Wilcoxon Signed-Rank Test results are shown in Table 2.

The Wilcoxon Signed-Rank Test yielded a significant value of 0.588, which exceeds the alpha threshold of 0.05. Thus, the null hypothesis is accepted. It is found that there was no significant difference in the R&D intensity of Indonesian manufacturing enterprises before and during the crisis.

ROA Ratio of Indonesian Manufacturing Companies Before and during the crisis

The Wilcoxon S-R Test was used in this study to assess financial performance in manufacturing enterprises in Indonesia prior to and during the COVID-19 pandemic using the Return on Asset ratio. The data was not normally distributed, according to the findings of the data normality test, which is why this test approach was employed. The results of the data normality test are shown in Table 3.

The data normality test using both K-S and S-W shows that the significance value obtained is 0.000. Given that this value is below the threshold of 0.05, it indicates a deviation from normality, meaning the data are not normally distributed. This outcome highlights the need to consider non-parametric methods or data transformation in the subsequent analysis.

The next stage is to use the Wilcoxon S-R Test to compare the financial performance of Indonesian manufacturing enterprises before and during the crisis using the Return on Asset ratio, based on the findings of the data normality test. The Wilcoxon S-R Test results are shown in Table 4.

Table 1. Test of data normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Stat.	df	Sig.	Stat.	df	Sig.
Innovation Capability Before PCov	0.373	74	0.000	0.348	74	0.000
Innovation Capability During PCov	0.378	74	0.000	0.329	74	0.000

[a]Lilliefors Significance Correction

Table 2. Comparison of R&D Intensity before and during the Pandemic

Comparison	Ranks	N	Mean	Sum of Ranks
RnD Intensity During PCov - RnD Intensity Before PCov	Negative Ranks	43a	34,60	1488,00
	Positive Ranks	31b	41,52	1287,00
Ho=The median of differences between Innovation Capability Over Pcov equals 0	Related-Samples W-S Rank Test	Asymp. Sig. (2-tailed) = 0.588		Decision: Retain the null hypothesis

Table 3. Test of Data Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Stat.	df	Sig.	Stat.	df	Sig.
ROA Before PCov	0.240	74	0.000	0.568	74	0.000
ROA During PCov	0.196	74	0.000	0.775	74	0.000

[a]Lilliefors Significance Correction

Table 4. Comparison of ROA before and during the Pandemic

Comparison	Ranks	N	Mean	Sum of Ranks
ROA During PCov – ROA Before PCov	Negative Ranks	38	40,05	1522,00
	Positive Ranks	36	34,81	1253,00
Ho=The median of differences between ROA Before PCov and ROA During PCov equals 0	Related-Samples Wilcoxon Signed Rank Test	Asymp. Sig. (2-tailed) = 0.469		Decision: Retain the null hypothesis

The Wilcoxon S-R Test results show that the sig. value is 0.469. This value is greater than alpha 0.05, so Ho is accepted. It can be concluded that the financial performance of Indonesian manufacturing companies using the Return on Asset ratio between before and during the crisis is not significantly different.

ROE Ratio of Indonesian Manufacturing Companies Before and during the crisis

The different test of financial performance using the Return on Equity ratio in Indonesian manufacturing companies between before and during the crisis in this study was carried out using the Wilcoxon S-R Test. The data was not normally distributed, according to the findings of the data normality test, which is why this test approach was employed. Table 5 displays the data normality test results.

The significance value, as determined by the data normalcy test employing Kolmogorov-Smirnov and Shapiro-Wilk, is 0.000. This value is smaller than alpha 0.05 so it can be concluded that the data is not normally distributed.

The Wilcoxon S-R Test is applied to assess the financial performance of Indonesian manufacturing companies before and during the crisis using the Return on Equity ratio, following the results of the data normality test. The outcomes of the Wilcoxon S-R Test are presented in Table 6.

The results of the Wilcoxon S-R Test indicate a significant value of 0.033, which is lower than the alpha threshold of 0.05. Consequently, Ho is rejected, and Ha is accepted. This suggests that there is a significant difference in the financial performance of Indonesian manufacturing companies, measured by the Return on Equity ratio, between the period before and during the crisis.

The Effect of Innovation capability on Return on Asset

The test of the effect of R&D Intensity on financial performance using the Return on Asset ratio in Indonesian manufacturing companies in this study was carried out using the Simple Linear Regression test. The first stage in the regression test is to ensure that the data distribution is normal. The data normality test uses a visual test, namely using a histogram of test results. Data is normally distributed if the normal curve formed is symmetrical, not extending too much to the left or right side. The results of the data normality test with a histogram are as shown in Figure 2. The test results show that the data is normally distributed.

Furthermore, linear regression analysis can be done. The results of simple linear regression analysis to test the effect of R&D Intensity on financial performance using the Return on Asset ratio in Indonesian manufacturing companies are shown in the Table 7.

The correlation value (r) of the test results is 0.368. This indicates that the relationship between Innovation Capability shown by R&D intensity and Return on Asset is weak. The r-square of 0.135 indicates that the contribution of the effect of Innovation Capability shown by R&D intensity on Return on Asset is small at 13.5 percent, while 86.5 percent of ROA variability is influenced by other variables.

Referring to Table 7, the regression equation can be expressed as follows: $Y = 4.838 + 0.877(X)$. The regression coefficient is positive at 0.877, indicating that an increase in intensity in R&D by one unit will cause an increase in ROA by 0.877 percent.

The t value from the test results is 4.631 with a significance of 0.000. Ho is rejected while Ha is accepted because this significance value is less than alpha 0.05. The conclusion is that innovation capability proxied by intensity in R&D has a significant effect on financial performance with ROA ratio.

The Effect of Innovation Capability on Return on Equity

Data normality testing on the influence of the Innovation Capability on Return on Equity shows that the data distribution is normal (Figure 3). Furthermore, linear regression analysis can be performed.

Table 5. Test of Data Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Stat.	df	Sig.	Stat.	df	Sig.
ROE Before PCov	0.288	74	0.000	0.483	74	0.000
ROE During PCov	0.302	74	0.000	0.599	74	0.000

[a]Lilliefors Significance Correction

Table 6. Comparison of ROE before and during the Pandemic

Comparison	Ranks	N	Mean	Sum of Ranks
ROE During PCov – ROE Before PCov	Negative Ranks	44	40,55	1784,00
	Positive Ranks	30	33,03	991,00
Ho=The median of differences between ROE Before PCov and ROE During PCov equals 0	Related-Samples Wilcoxon S-R Test	Asymp. Sig. (2-tailed) = 0.033		Decision: Reject the null hypothesis

Table 7. The Effect of R&D Intensity on Return on Asset

Model	Variable	Coefficients	Std. Error	Beta	t-statistics	Sig.
1	(Constant)	4.838	0.568		8.511	0.000
	Innovation Capability	0.877	0.189	0.368	4.631	0.000
R = 0.368	$R^2 = 0.135$					

Figure 2. Normality Test

Figure 3. Test 1 Histogram
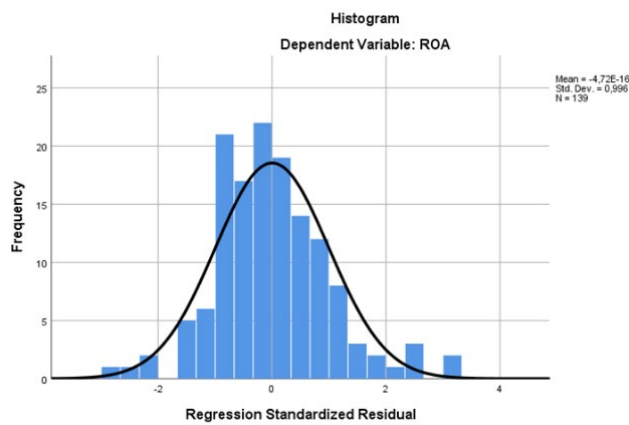
The results of simple linear regression analysis to test the effect of R&D Intensity on financial performance using the Return on Equity ratio are shown in Table 8. The correlation value (r) of the test results is 0.551. This indicates that the relationship between Innovation Capability shown by R&D intensity and Return on Equity is moderate. The r-square of 0.304 indicates that the contribution of the effect of Innovation Capability shown by R&D intensity on Return on Equity is 30.4 percent, while 69.6 percent of ROE variability is influenced by other variables.

Referring to Table 8, the regression equation can be expressed as follows: Y=7.798+4.808 (X). The regression coefficient is positive at 4.808, indicating that an increase in intensity in R&D by one unit will cause an increase in ROE by 4.808 percent.

The t value from the test results is 7.906 with a significance of 0.000. Ho is rejected while Ha is accepted because this significance value is less than alpha 0.05. The conclusion is that innovation capability proxied by intensity in R&D has a significant effect on financial performance with ROE ratio. The results of this research support the dynamic capability theory (Teece, 2007) where "innovation capability enables companies to be able to develop new products and processes, and to achieve superior performance" (Rangone, 1999). The findings of this study align with Calantone et al. (2002), who emphasized that innovation plays a crucial role as the primary factor influencing organizational performance.

This study produces several findings. First, the Wilcoxon Signed-Rank Test results show that the R&D intensity of Indonesian manufacturing companies between before and during the crisis is not significantly different. This ind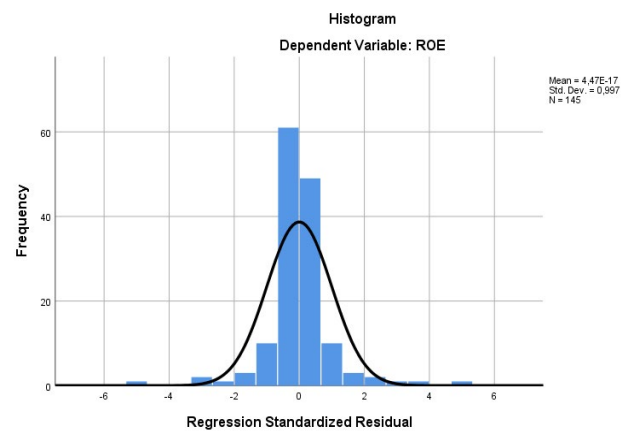icates that Indonesian manufacturing companies have not changed their strategies in the face of uncertainty because of the COVID-19 pandemic. In an era where innovation is one of the determinants of competitive advantage for companies, continuous efforts to improve innovation capabilities are very important to do.

Second, the financial performance of Indonesian manufacturing companies using the ROA ratio is not significantly different between before and during the crisis. Indonesian manufacturing companies are considered capable of maintaining their performance in a crisis because of COVID-19. On the other hand, the company's assets also did not change much which caused this ratio not to be affected much.

Third, the financial performance of Indonesian manufacturing companies using the Return on Equity ratio is significantly different between before and during the crisis. The company's ROE decreased during the COVID-19 pandemic, from 18.63 percent in 2018 to 9.91 percent in 2021. This decline is mostly due to the downward trend in the company's net profit from IDR 841,100,034,212.18 to IDR 725,978,374,795.39 in 2021.

Furthermore, innovation capability proxied by intensity in R&D shows a significant influence on financial performance as measured by ROA and ROE ratios. This finding underscores the importance of R&D in strengthening innovation capability, thereby enhancing firm financial performance. The results of this study confirm the research conclusions of Ali et al. (2020; Camisón & Villar-López (2014); Maldonado-Guzmán et al. (2019); Rajapathirana & Hui (2018); Saunila et al. (2014); Yasin et al. (2014); dan YuSheng & Ibrahim (2020).

Table 8. The Effect of R&D Intensity on Return on Equity

Model	Variable	Coefficients	Std. Error	Beta	t-statistics	Sig.
1	(Constant)	7.798	1.786		4.365	0.000
	Innovation Capability	4.808	0.608	0.551	7.906	0.000
R = 0.551	R^2 = 0.304					

Managerial Implications

The findings of this study provide important insights for managers in Indonesian manufacturing firms. First, the increase in R&D investment, particularly in 2020, highlights the strategic importance of innovation capability in times of crisis. Managers are encouraged to consistently allocate and even increase resources for R&D activities, as the data suggest that such investments contribute positively to financial performance, particularly ROE, as observed in the recovery phase of 2021. Furthermore, despite the overall decline in financial performance during the early stages of the pandemic, companies that maintained consistent R&D spending, such as PT Unilever Indonesia Tbk, demonstrated greater resilience. This underscores the need for long-term commitment to innovation as a driver of sustainable performance. The significant relationship between R&D intensity and both ROA and ROE suggest that innovation capability should be positioned as a core component of strategic planning, especially in navigating future uncertainties. Therefore, managerial focus should shift from viewing R&D as a discretionary expense to recognizing it as a critical investment for long-term competitiveness and financial stability.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Several conclusions can be drawn from the data analysis. During the COVID-19 pandemic, manufacturing firms in Indonesia have made more significant strides in innovation. Their investment in research and development rose from an average of 0.67% before the pandemic to 1.06% amid the pandemic. A significant increase in the company's budget for R&D occurred in 2020. The largest expenditure for R&D activities is shown by PT Pyridam Farma Tbk, while the consistent expenditure for R&D activities is shown by PT Unilever Indonesia Tbk, which is 11 percent each year.

The company's financial performance shows a decline, especially at the beginning of the pandemic. In line with the increased spending in R&D, the results can be seen in 2021 where ROE has increased. The company's financial performance showed a decline from the beginning of the pandemic, from 18.63 percent in 2018 to 9.91 percent in 2020. The lowest ROE was experienced by PT Bentoel International Investama Tbk, while Merck Tbk recorded itself as having the highest ROE.

R&D intensity and ROA of Indonesian manufacturing companies between before and during the crisis is not significantly different. Meanwhile, the financial performance of Indonesian manufacturing companies using the ROE is significantly different between before and during the crisis. Also, innovation capability proxied by intensity in R&D shows a significant influence on financial performance as measured by ROA and ROE ratios.

Recommendations

Based on these conclusions, several suggestions are proposed. The commitment of Indonesian manufacturing companies in developing their innovation capabilities needs to be improved. Only about 25 percent of companies allocate funds for R&D activities. Then, in a situation full of uncertainty, companies must continue to innovate to have a competitive advantage. R&D efforts play an important role in improving innovation capabilities for firms. Further research needs to be done, especially the impact of other capabilities in the dynamic capability view framework both on firm performance and firm value.

CONFLICTS OF INTEREST: The author declares no conflict of interest.

REFERENCES

Ali, H., Hao, Y., & Aijuan, C. (2020). Innovation Capabilities and Small and Medium Enterprises' Performance: An Exploratory Study. The Journal of Asian Finance, Economics and Business, 7(10), 959–968. https://doi.org/10.13106/jafeb.2020.vol7.no10.959

Amit, R., & Schoemaker, P. J. H. (1993). Strategic Assets and Organizational Rent. Strategic Management Journal, 14(1), 33–46. https://doi.org/10.2307/2486548

Arianto, B. (2020). Dampak Pandemi COVID-19 terhadap Perekonomian Dunia. Jurnal Ekonomi Perjuangan, 2(2), 106–126. https://doi.org/10.36423/jumper.v2i2.665

Bowman, C., & Ambrosini, V. (2003). How the Resource based and the Dynamic Capability Views of the Firm Inform Corporate level Strategy. British Journal of Management, 14(4), 289–303. https://doi.org/10.1111/j.1467-8551.2003.00380.x

Calantone, R. J., Cavusgil, S. T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. Industrial Marketing Management, 31(6), 515–524.

Camisón, C., & Villar-López, A. (2014). Organizational innovation as an enabler of technological innovation capabilities and firm performance. Journal of Business Research, 67(1). https://doi.org/10.1016/j.jbusres.2012.06.004

Carvache-Franco, O., Gutiérrez-Candela, G., Guim-Bustos, P., Carvache-Franco, M., & Carvache-Franco, W. (2020). Effect of R&D intensity on the innovative performance of manufacturing companies. Evidence from Ecuador, Peru and Chile. International Journal of Innovation Science, 12(5). https://doi.org/10.1108/IJIS-04-2020-0046

Creswell, J. W., & Creswell, D. J. (2018). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. In Sage (Vol. 53).

Drucker, P. F. (2012). Managing in turbulent times. In Managing in Turbulent Times. https://doi.org/10.4324/9780080938158

Hsu, L.-C., & Wang, C.-H. (2012). Clarifying the Effect of Intellectual Capital on Performance: The Mediating Role of Dynamic Capability. British Journal of Management, 23(2), 179–205. https://doi.org/10.1111/j.1467-8551.2010.00718.x

IDX. (2019). IDX Factbook 2019. In www.IDX.co.id. Jakarta. Retrieved from https://www.idx.co.id/media/7717/fb2019-halaman.pdf

Karbowski, A. (2016). The Elasticity-Based Approach to Enterprise Innovation. International Journal of Management and Economics, 49(1). https://doi.org/10.1515/ijme-2016-0004

Khan, W., Khan, A. A., Khan, J., Khatoon, N., Arshad, S., & De los Ríos Escalante, P. (2023). Death caused by COVID-19 in top ten countries in asia affected by COVID-19 pandemic with special reference to Pakistan. Brazilian Journal of Biology, 83. https://doi.org/10.1590/1519-6984.248281

Kleiner, A. (2013). The Dynamic Capabilities of David Teece. Strategy Business, 2013(November 11), 1–4.

Kleinknecht, A., & Mohnen, P. (2002). Innovation and Firm Performance. New York: Palgrave Macmillan.

Laforet, S. (2011). A framework of organisational innovation and outcomes in SMEs. International Journal of Entrepreneurial Behavior & Research, 17(4), 380–408. https://doi.org/10.1108/13552551111139638

Lawson, B., & Samson, D. A. (2001). Developing Innovation Capability in Organisations : A Dynamic Capabilities Approach. International Journal of Innovation Management, 5(3), 377–400. https://doi.org/10.1142/S1363919601000427

Maldonado-Guzmán, G., Garza-Reyes, J. A., Pinzón-Castro, S. Y., & Kumar, V. (2019). Innovation capabilities and performance: are they truly linked in SMEs? International Journal of Innovation Science, 11(1). https://doi.org/10.1108/IJIS-12-2017-0139

Nursjanti, F., & Amaliawiati, L. (2021). COVID-19 in Indonesia: socio-economic impact and policy response. Turkish Journal of Computer and Mathematics Education, 12(8).

Pisano, G. P. (2000). In Search of Dynamic Capabilities: The Origins of R&D Competence in Biopharmaceuticals. In Nature & Dynamics of Organizational Capabilities. https://doi.org/10.1093/0199248540.001.0001

Pisano, G. P. (2015). A Normative Theory of Dynamic Capabilities: Connecting Strategy, Know-How, and Competition. In Harvard Business School Working Paper (No. 16–036). https://doi.org/10.2139/ssrn.2667018

Protogerou, A., Caloghirou, Y., & Lioukas, S. (2012). Dynamic capabilities and their indirect impact

on firm performance. Industrial and Corporate Change, 21(3), 615–647. https://doi.org/https://doi.org/10.1093/icc/dtr049

Pujiastuti, H. (2024). Accounting conservatism, intellectual capital, capital structure in the financial performance of consumer good companies. Jurnal Aplikasi Bisnis Dan Manajemen (JABM), 10(2), 374–374. https://doi.org/http://dx.doi.org/10.17358/jabm.10.2.374

Rajapathirana, R. P. J., & Hui, Y. (2018). Relationship between innovation capability, innovation type, and firm performance. Journal of Innovation and Knowledge, 3(1). https://doi.org/10.1016/j.jik.2017.06.002

Rangone, A. (1999). A Resource-Based Approach to Strategy Analysis in Small-Medium Sized Enterprises. Small Business Economics, 12(3). https://doi.org/10.1023/A:1008046917465

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2019). Research Methods for Business Students. In Oxford English Dictionary (Eighth Edi). New York: Pearson. https://doi.org/10.1093/oed/7394538181

Saunila, M., Pekkola, S., & Ukko, J. (2014). The relationship between innovation capability and performance: The moderating effect of measurement. International Journal of Productivity and Performance Management, 63(2011), 234–249. https://doi.org/10.1108/IJPPM-04-2013-0065

Saunila, M., & Ukko, J. (2012). A conceptual framework for the measurement of innovation capability and its effects. Baltic Journal of Management, 7(4), 355–375. https://doi.org/10.1108/17465261211272139

Schumpeter, J. A. (2017). Essays: on entrepreneurs, innovations, business cycles and the evolution of capitalism (R. V. Clemence, Ed.). Oxon: Routledge.

Soava, G., Mehedintu, A., Sterpu, M., & Grecu, E. (2021). The Impact of the COVID-19 Pandemic on Electricity Consumption and Economic Growth in Romania. Energies, 14(9), 2394. https://doi.org/10.3390/en14092394

Teece, D. (2007). Explicating Dynamic Capabilities: The Nature and Microfoundations of (Long-Run) Enterprise Performance. Strategic Management Journal, 28(13), 1319–1350.

Teece, D. J. (2007). Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance. Strategic Management Journal, 28(13), 1319–1350. https://doi.org/10.1002/smj.64()

Teece, D. J., & Pisano, G. (1994). The Dynamic Capabilities of Firms: An Introduction (No. WP-94-103). Laxenburg. https://doi.org/10.1093/icc/3.3.537-a

Tidd, J., & Bessant, J. (2018). Managing Innovation Integrating Technological, Market and Organizational Change Sixth Edition. WILEY.

Wang, C., & Hsu, L. (2010a). The influence of dynamic capability on performance in the high technology industry : The moderating roles of governance and competitive posture. African Journal of Business Management, 4(May), 562–577.

Wang, C., & Hsu, L. (2010b). The influence of dynamic capability on performance in the high technology industry: The moderating roles of governance and competitive posture. African Journal of Business Management, 4(May), 562–577.

Wei, X., Li, L., & Zhang, F. (2021). The impact of the COVID-19 pandemic on socio-economic and sustainability. Environmental Science and Pollution Research, 28(48), 68251–68260. https://doi.org/10.1007/s11356-021-14986-0

Wijayanto, A., Suhadak, Dzulkirom, M., & Nuzula, N. F. (2020). Innovation capability and barriers to entry-based competitive advantage in Indonesian manufacturing companies. International Journal of Innovation, Creativity and Change, 12(12).

Yasin, G., Nawab, S., Bhatti, K., & Nazir, T. (2014). Relationship of Intellectual Stimulation, Innovations and Smes Performance: Transformational Leadership a Source of Competitive Advantage in Smes. Middle-East Journal of Scientific Research, 19(1), 74–81. https://doi.org/10.5829/idosi.mejsr.2014.19.1.12458

YuSheng, K., & Ibrahim, M. (2020). Innovation Capabilities, Innovation Types, and Firm Performance: Evidence From the Banking Sector of Ghana. SAGE Open, 10(2), 215824402092089. https://doi.org/10.1177/2158244020920892

Zawislak, P. A., Fracasso, E. M., & Tello-Gamarra, J. (2018). Technological intensity and innovation capability in industrial firms. Innovation and Management Review, 15(2). https://doi.org/10.1108/INMR-04-2018-012