Jurnal Mantik, 9 (2) (2025), ISSN 2685-4236 (Online)

Published by:Institute of Computer Science (IOCS)

Jurnal Mantik

Journal homepage: www.iocscience.org/ejournal/index.php/mantik

Building effective hedging strategies through financial variable analysis

Ramadhan Khoerul Mukromiin[1], Wida Purwidianti[2], Erny Rachmawati[3], Ika Yustina Rahmawati[4]

[1,2,3,4]Faculty of Economics and Business, Universitas Muhammadiyah Purwokerto, Indonesia

A R T I C L E I N F O

Article history:

Received Jul 03, 2025
Revised Jul 25, 2025
Accepted Jul 31, 2025

Keywords:

Leverage
Growth Opportunity,
Firm Size,
Profitability,
Liquidity.

ABSTRACT

As international trade increases, so too does the risk involved. Therefore, good risk management is necessary to minimize the risks that arise. One way to do this is through hedging. This study aims to examine the impact of leverage, growth opportunity, firm size, profitability, and liquidity on hedging decisions in processing industry companies, which include two sectors: consumer cyclical and non-cyclical. The sample of this study was 30 companies listed on the IDX (idx.co.id) for the period 2020-2024. This study utilizes panel data comprising 150 observations, employing the binary logit estimation method, where the dependent variable is a dummy variable. This study provides an empirical contribution that reveals the relationship between financial factors (leverage, growth opportunity, firm size, liquidity, and profitability) on hedging decisions. The findings provide evidence that firm size and liquidity are dominant predictors of hedging decisions, with negative results, while other factors such as leverage, growth opportunity, and profitability do not affect hedging decisions, so that the results of this study can provide a new picture for companies in designing a more measurable hedging strategy and with this companies should focus more on managing their firm size and liquidity.

Corresponding Author:

Wida Purwidianti,
Department of Management, Faculty of Economics and Business
University of Muhammadiyah Purwokerto,
Street KH. Akhmad Dahlan, Dukuhwaluh, Banyumas, Central Java, 53114, Indonesia
Email: widapurwidianti@ump.ac.id

1. INTRODUCTION

Many businesses develop by conducting international trade, this causes the exchange of foreign currencies during the transaction. The value of the currency designated in the exchange rate over time will experience currency fluctuations (Anniyati et al., 2020). Fluctuating currencies make businesses often at risk of loss when conducting international trade (Haryanto, 2020). Of course, this makes many companies in Indonesia that carry out international transactions potentially experience losses on foreign exchange differences, because the rupiah has an unstable exchange rate. Companies can carry out hedging activities as an effort to prevent foreign exchange

losses (Xing et al., 2022). One of the activities that cause weak domestic exchange rates is exports and imports.

The processing industry is a sector that is quite active in exporting, importing, and seeking external financing, from which companies will be affected by fluctuations in the results of changes in the value of the rupiah against other currencies and tend to have high foreign exchange exposure due to frequent exporting, importing, and seeking external financing, therefore, a company needs to hedge to avoid the impact of frequent risk fluctuations, such as interest rates, exchange rates, and even commodity prices. This is done to reduce the possibility of default (bankruptcy) and reduce the cost of financial distress (Pangestuti., 2020). Supported by Bank Indonesia data (2025), in April 2025, the position of private external debt (ULN) was recorded at 194.8 billion US dollars, one of the largest contributors to private external debt is the manufacturing sector, in addition there were 2,372 companies or 93% of the 2,540 companies with private external debt. Reporting from (IDN Times; CNBC Indonesia; 2024) many companies engaged in the processing industry have experienced bankruptcy such as PT Sri Rejeki Isman Tbk, PT Sariwangi Agricultural Estate Agency and PT Sanken Indonesia which are caused by large debt burdens and less than optimal internal management, so according to Marhaenis & Artini. (2020) to protect their assets, companies need Hedging.

Hedging, Also referred to as hedging, this tactic lowers unforeseen business risks while preserving investment returns, therefore hedging can be considered an investment to minimize or eliminate investment risk (Pangestuti et al., 2020). One element that may affect investing choices is risk. Investors that are risk averse frequently perceive risks and unclear circumstances as threats. High-risk investors will take the potential for loss into account. (Purwidianti et al., 2024). Because hedging involves using derivative products like futures contracts, forward contracts, option contracts, and swaps, it is therefore essential. (Hadini & Desmiza, 2024). According to Ostana et al. (2023)before hedging, a company must pay attention to existing internal and external factors, internal factors include leverage, growth opportunity, firm size, profitability and liquidity, in this case companies in the processing industry sector often require a lot of commodities, which makes this company quite sensitive to rising commodity prices, so internal factors such as Leverage, Growth opportunity, firm size, Profitability and Liquidity are factors that need to be considered and considered.

Previous research that has been conducted still finds many differences in results between one another. Leverage the debt ratio, also known as the solvency ratio, indicates how effectively a firm can meet its short- and long-term financial obligations. It also indicates how much of the company's funding comes from its debt. (Ayu et al., 2020). Previous research by (Ayu et al, 2020;Anggyantari & Purbawangsa, 2020; Nurfiyanti et al., 2025)states that leverage has an impact on hedging decisions, inversely proportional to research (Limbong & Hutabarat,2020 Herawati & Abidin, 2020; and Mahasari & Rahyuda, 2020) claims that judgments about hedging are unaffected by leverage.

Growth opportunity refers to the level of investment opportunities or opportunities available to companies (Mahasari & Rahyuda, 2020). The greater the growth potential of a corporation, the more chances it might present for expansion, which, of course, need substantial financial resources to finance (Pangestuti et al., 2020). Research by (Larasati & Wijaya, 2022; Ratnaningsih et al., 2021)found the results that Growth opportunity affects hedging decisions, but contradicts research (Nur Habibah et al., 2020; Nanda et al., 2022) which discovered that judgments about hedging are unaffected by growth opportunities.

Firm Size indicates a company's perceived size based on its total sales. (Mudjiyanti et al., 2021),a large company has more operational activities (Anniyati et al., 2020). Previous research by (Heri Purwanto & Putra, 2022; Rusadi et al., 2023; Mauliana et al., 2024) discovered that judgments about hedging are influenced by business size,

but in contrast to the study conducted by Karlinda & Manunggal. (2023) discovered that business size had a detrimental influence on hedging decisions.

Liquidity is among the internal indicators that demonstrate the company's capacity to meet short-term financial obligations on a predetermined timeline. (Mahasari & Rahyuda, 2020). Because the risk of the cost of financial difficulties that may arise tends to be low and the company has enough reserve funds to overcome these risks, a higher level of liquidity will make the company use less derivative instruments. (Ayu et al., 2020).Studies conducted by (Marhaenis & Artini, 2020; Heri Purwanto & Putra, 2022) discovered that judgments about hedging are unaffected by liquidity, different results were shown by research conducted by Apriliani et al., (2024)that Liquidity has an impact on hedging decisions.

Profitability is the capacity of business management to produce efficiency and profits. One of the elements that adds value in the future and draws in new investors is the return that the business generates. (Anggyantari & Purbawangsa, 2020). Previous research by (Ostana et al., 2023; Anggyantari & Purbawangsa, 2020)found that Profitability has no impact on hedging decisions, while according to (Mauliana et al., 2024; Safitri et al., 2023)Profitability has an impact on hedging decisions.

The theory used in this study is Shareholder Value Maximization, according to Friedman. (1970)this theory focuses on companies that have the main responsibility to increase profits for their shareholders. This theory is used to optimize the value of shareholders by reducing foreign exchange exposure by implementing Hedging (Nanda et al., 2022). Taking into account the background information and variations in the findings of studies on variables that affect hedging, researchers are interested in developing research that has been conducted by (Pangestuti et al., 2020)with the title "Logistic Regression Analysis: Factors Affecting Hedging Decisions Using Derivative Instruments" by adding Profitability variables so that the coverage is broader, as well as the use of a newer research period, namely in 2020-2024 in companies in the processing industry, and with conditions that fluctuate quite sharply, of course it is a consideration for companies to hedge without forgetting consideration of internal factors.

2. RESEARCH METHOD

2.1. Research Design

This study employs secondary data, also referred to as panel data, and a quantitative methodology. According to Mukhid (2021), quantitative research employs numerical data to forecast population conditions. The data is gathered from the Indonesia Stock Exchange and the company's official website, which are both accessible on www.idx.co.id. The study's population consists of 288 manufacturing industry sector enterprises that are listed on the Indonesia Stock Exchange (IDX) for the 2020–2024 timeframe. The number of samples in this study is determined by purposeful sampling, with the following criteria applied: (1) Processing Industry Companies listed on the "IDX" (2) Companies that submit their financial and annual reports consecutively from 2020 to 2024 (3) Businesses that generate a profit; (4) Businesses that employ derivatives. The selection criteria for research samples are displayed in the following table.

Table 1. Sample Selection

No	Description	Number
1	Manufacturing industry companies listed on the "IDX"	288
2	Companies that do not use derivative instruments	(150)
3	Companies that experienced losses from 2020-2024	(108)
4	Number of selected companies	30
	Number of research samples that meet the criteria	150

The binary logistic regression test, a statistical technique that shows the interactions between independent and binary dependent variables, with stages (1) Regression model feasibility (Goodness of Fit) untuk menentukan bahwa model regresi yang digunakan memang layak (2) Coefficient of Determination Test (Nagelkerke R square) to see the extent to which variables affect the dependent variable (Faisal et al., 2024), was used in this study's analysis using SPSS 27. In general, the model can be expressed as follows:

$$P = \frac{1}{1+ln(\beta 0+\beta 1X1+\beta 2X2+\beta 3X3+\cdots+\beta nXn} \quad (1)$$

$$\ln\frac{p}{1-p} = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \cdots + \beta nXn \quad (2)$$

2.2. Variables and Operation Definition of Variables

Table 2. Operational Definition of Variables

Variables	*Basic Concept*	*Operation*
Hedging	Investments made to minimize risk (Pangestuti et al., 2020)	0=No Hedging 1=Hedging
Leverage	Debt ratio that shows the ability to meet financial obligations (Gewar et al., 2020)	DER = $\frac{Total\ Debt}{Total\ Equity}$
Growth Opportunity	Company growth opportunities in the future (Amaliyah, 2020)	$\frac{Total\ Asset\ t1 - Total\ Asset\ t0}{Total\ Asset\ t1}$
Firm Size	A method for evaluating businesses using the natural logarithm of their total assets (Mahasari & Rahyuda, 2020)	Firm Size = $Ln_{totalasset}$
Profitability	The capacity of the business to make money (Safitri et al., 2023)	ROA = $\frac{Net\ Profit}{Total\ Asset}$
Liquidity	Demonstrates the company's ability to meet short-term commitments. (Safitri et al., 2023)	CR = $\frac{Current\ assets}{current\ liabilities}$

2.3. Hypothesized Variables and Conceptual Framework

Leverage can show how well a company can use capital to fulfill its obligations (Nanda et al., 2022). Referring to the theory of shareholder value maximization, companies in doing business will choose diversification due to losses due to exchange rate fluctuations. A high level of leverage is vulnerable to default and bankruptcy, so companies tend to hedge. According to studies carried by by (Nurfiyanti et al., 2017). 2025; Anggyantari & Purbawangsa. 2020; Ayu et al. 2020)which explains that Decisions about hedging are positively impacted by leverage. H1 : Hedging decisions are positively and significantly influenced by leverage

One approach to gauge a company's potential for commercial development is to look at its growth possibility. (Amaliyah, 2020). According to the theory of shareholder value maximization, businesses with significant growth prospects are more likely to keep their profits as retained earnings and to increase their funding in order to maximize profits. Since funding is typically acquired through debt or financing from outside sources, there is a greater chance that businesses will use hedging.Supported by research (Larasati & Wijaya. 2022; Ratnaningsih et al. 2021; Wijayani & Harsanti. 2020) It claims that judgments about hedging are positively impacted by growth opportunities. H2 : The decision to hedge is positively and significantly influenced by growth opportunities

Firm Size is characterized as a classification or grouping of businesses according to the total recorded assets. (Heri Purwanto & Putra, 2022). It is explained by the theory of shareholder value maximization that companies will tend to choose firm size diversification as part of risk management, with a high probability of companies conducting domestic and foreign trade so that hedging will be used more often.. Previous

research conducted by (Hadini & Desmiza 2024; Rusadi et al. 2023; Nurfiyanti et al. 2025) discovered that hedging decisions are positively impacted by business size. H3 : Decisions on hedging are positively and significantly by firm size

Liquidity is the organization's capacity to use its resources to satisfy any immediate responsibilities.. (Safitri et al., 2023). The shareholder value maximization theory explains that the company's choice to use hedging is negatively correlated with the value of liquidity. Previous findings by (Marhaenis & Artini 2020; Mahasari & Rahyuda 2020; Karlinda & Manunggal. 2023) assert that judgments about hedging are negatively impacted by liquidity. H4 : Decisions on hedging are negatively and significantly impacted by liquidity.

Profitability is a ratio that assesses the company's capacity to turn a profit within a specific time frame. (Mauliana et al., 2024). shareholder value maximization theory in the form of Profitability or the level of profit obtained from the assets used, with this if the profit of a company is high it will show high transactions as well, In order to reduce the risk associated with the exchange rate, the business will decide to hedge. Earlier studies carried performed by (Mauliana et al. 2024; Limbong & Hutabarat. 2020; Herawati & Abidin. 2020) assert that hedging benefits from profitability. H5 : Decisions on hedging are positively and significantly impacted by profitability.

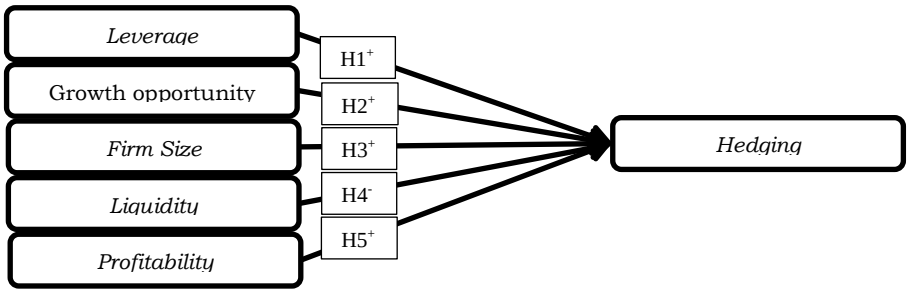

Figure 1. *Conceptual Framework*

3. RESULTS AND DISCUSSIONS

The data utilized in the study is described via descriptive statistical analysis. 150 data observations on hedging were used, leverage, growth opportunity, firm size, Liquidity and Profitability, the following descriptive statistics are presented.

Table 3. *Descriptive Statistic*

Variables	N	Min	Max	Mean	Std. Deviation
Hedging	150	0	1	0.4966	0.4202
Leverage	150	0.0670	12.0500	0.7119	1.3022
Growth opportunity	150	-0.8977	9.9078	0.2370	1.6675
Firm size	150	27.3746	33.7899	30.5417	0.1248
Liquidity	150	1.0746	11.4760	2.5924	1.7275
Profitability	150	0.0026	1.3088	0.0784	0.5016

With a standard deviation of 0.4202 and a mean value of 0.4966 for the dependent variable, hedging, the above table indicates that around 49.66% of all enterprises currently in operation are hedging. The mean value of the leverage level is 0.7119. To put it another way, the average company has debt of 0.7119 times equity with a standard deviation of 1.3022, the mean value of the firm size variable is 30.5417, and the growth opportunity variable has a mean value of 0.2370, indicating that the average company will grow at a rate of 0.2370 for the upcoming years with a standard deviation of 1.6675. The liquidity variable has a mean value of 2.5924, indicating that the firm can, on average, meet its short-term commitments of 2.5924, with a standard deviation of

1.7275. This indicates that the average size of the company has increased by 30.5417, with a standard deviation value of 0.1248. Last but not least, the profitability variable has a mean value of 0.0784, meaning that the business makes 0.0784 annually, with a standard deviation of 0.5016.

Table 4. Goodnes of Fit

Step	Chi-square	df	Sig.
1	5.978	8	0.650

According to the test criteria, Table 4 displays the chi-square value of 5.978 with a significance of 0.650 > 0.05, where if the sig. > 0.05 then the model can be said to be good. Because the variables studied are not significantly different from one another, it is said that the model is suitable for use.

Table 5. Omnibus Test

		Chi Square	df	Sig.
Step 1	Step	15.861	5	0.007
	Block	15.861	5	0.007
	Model	15.861	5	0.007

The sig. value, as indicated in Table 5, is 0.007 <0.05. This finding indicates that examining the independent factors at the same time has an impact on the dependent variable.

Table 6. Coefficient of Determination

Step 1	-2Log likelihood	Cox & Snell R square	Nagelkerke R square
	190.690	0.101	0.135

Table 6's results indicate that leverage, growth opportunity, firm size, profitability, and liquidity can affect 13.5% of hedging decisions, with the remaining 86.5% being explained by other factors. The Nagelkerke R square value is 0.135.

Table 7. *Partial Test*

ariable	B	S.E	Wald	Sig.	Conclusion
Leverage	0.505	0.521	0.940	0.332	H1 Rejected
Growth opportunity	-0.098	0.136	0.516	0.473	H2 Rejected
Firm size	-0.258	0.111	5.350	0.021	H3 Rejected
Liquidity	-0.303	0.141	4.641	0.031	H5 Accepted
Profitability	5.996	3.340	3.222	0.073	H4 Rejected
Constant	7.844	3.479	5.031	0.025	

Table 7 shows that the leverage variable has a sig. value of 0.332> 0.05 (insignificant) and a positive regression coefficient of 0.505, indicating that H1 is rejected. H2 is rejected because the Growth Opportunity variable has a negative regression coefficient of -0.098 and a sig value of 0.473 > 0.05 (not significant). H3, which claims a positive influence, is rejected since the Firm Size variable has a negative coefficient value of -0.258 and a sig value of 0.021 <0.05 (significant). H4 is acceptable because the liquidity variable has a negative coefficient value of -0.303 and a sig value of 0.031 <0.05 (significant). The final variable is profitability, which has a sig value of 0.073 > 0.05 (not significant) and a positive coefficient value of 5.996.

a. How Leverage Affects Hedging Choices

The findings of the logistic regression test indicate that the majority of low hedging decisions of manufacturing sector companies are influenced by the level of corporate leverage. With this insignificant positive result, it shows that the increase in corporate debt cannot be used as the main factor in hedging assets that become contract collateral.

Because transaction risks can arise if the liabilities are not proportional (Heri Purwanto & Putra, 2022). However, this may also be due to the company's debt obtained from local financial institutions, so the company no longer needs to protect itself from foreign exchange rates. This conclusion is corroborated by earlier studies showing that leverage has little bearing on hedging choices, according to ((Limbong & Hutabarat, 2020; Utomo & Hartanti, 2020; Mahasari & Rahyuda, 2020).

b. Growth opportunities' effects on hedging choices

The logistic regression test's findings indicate that businesses' decisions to hedge are not much impacted by growth opportunity's high value., this makes Growth opportunity not a consideration in Hedging, with a negative insignificant direction further proving that the decline in hedging decisions by companies is due to increased investment opportunities (Nanda et al., 2022). This can be caused by companies that prefer to use internal financing rather than external financing which is more risky when there are foreign currency fluctuations. This finding is consistent with research by (Nur Habibah et al., 2020; Nanda et al., 2022) This demonstrates that judgments about hedging are unaffected by growth opportunities.

c. The effect of firm size on decisions on hedging

The findings of the logistic regression test indicate that the firm's decision to hedge decreases as the size of the business increases. The significant negative result reinforces that large-scale firms tend to have more diverse sources of capital to avoid possible bankruptcy. This is also related to the additional cost of debt and equity capital. (Karlinda & Manunggal, 2023)This result is in line with research (Karlinda & Manunggal, 2023) which claims that decisions about hedging are negatively impacted by firm size.

d. The influence of liquidity on decisions about hedging

The findings of the experiments indicate that low hedging decisions will be influenced by a company's liquidity value, thus strengthening the significant negative results which show that companies with high liquidity levels tend to limit their derivatives because the risk of financial difficulties is usually low (Ayu et al., 2020) and they have sufficient reserves to deal with potential risks, so they do not need a Hedging policy (Marhaenis & Artini, 2020). In line with the results of research (Marhaenis & Artini, 2020; Heri Purwanto & Putra, 2022) which demonstrates that decisions about hedging are negatively impacted by liquidity.

e. Profitability's influence on hedging choices

The experiments' findings indicate that a company's hedging decision will be less effective the lower its profitability value. These results reinforce that a decrease in return on assets does not have a significant influence on businesses' hedging choices. This speaks to the business's capacity to cut expenses and manage assets in an effective and efficient manner. (Mustafa & Ariani, 2024). This result is in accordance with research (Anggyantari & Purbawangsa, 2020; Mustofa & Ariani, 2024; Ostana et al., 2023) which states that profitability has no impact on Hedging decisions.

4. CONCLUSION

The results of this study state that company size and liquidity can be used as important factors in hedging decision making because they have a significant influence on corporate hedging decisions. Overall, based on the results obtained, the best advice is for companies to hedge to reduce cash flow volatility because cash receipts and expenditures will not fluctuate as much as currency fluctuations. By hedging, companies can reduce the possibility of bankruptcy, enable manufacturing companies to obtain credit from

creditors more easily, establish better cooperation with suppliers, and enable companies to obtain more credit. Hedging can also provide manufacturing companies with more accurate forecasting of future cash expenditures and receipts. The research certainly still has limitations, so that further research can expand the variables used, use new sectors and more company periods.

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