Impact of Days to Receivable on the Profitability of Exporting Coal Companies in Indonesia

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Abstract: This study examines the effects of exchange rates, export intensity, and days to receivable on the profitability of Indonesian coal exporting companies, using panel data from 2015 to 2023. The objective is to find if export intensity and exchange rate impedes the effect of days to receivable on profitability. Interaction analyses reveal that the positive impact of receivables on profitability diminishes with increasing exchange rates. Conversely, the interaction between days to receivable and export intensity does not significantly affect profitability. Therefore, it might be beneficial for Indonesian coal companies should explore implementing more flexible trade credit policies to enhance customer relationships, particularly during periods of rupiah appreciation.

INTRODUCTION

Working capital management plays a crucial role in maintaining a company's financial health and operational efficiency. One key aspect of this is the management of the days to receivable (DTR) period, which measures how long it takes for receivables to be collected as it directly impacts cash flow and business liquidity. A shorter DTR allows a company to collect cash more quickly, enabling faster reinvestment in business activities and reducing reliance on external financing. However, extending the DTR can also be advantageous, as it offers customers more flexible payment terms, potentially strengthening relationships and enhancing the company's competitive advantage. Thus, the trade-off between a short and long DTR involves balancing immediate liquidity needs with customer retention and market positioning.

Previous researches (like Aldubhani et al., 2022, Jacob et al, 2021, Baysith et al, 2021) supports that shorter receivables collection period is associated with higher profitability. However, Indonesian coal company such as one studied by Ruslan and Nugroho (2022) finds positive relationship instead. It has been suggested that coal companies tend to adopt shorter trade credit policies during periods of economic growth and extend them during downturns (Sierpinska, 2020). As shown in Graph 1, the pattern can also be seen in the Indonesian coal industry, with the changes in average yearly DTR roughly opposes the growth of global coal

price, indicating the market demand. This is largely because the coal industry is capital-intensive, relying heavily on leverage to fund its investments, making efficient cash flow management critical in different economic conditions.
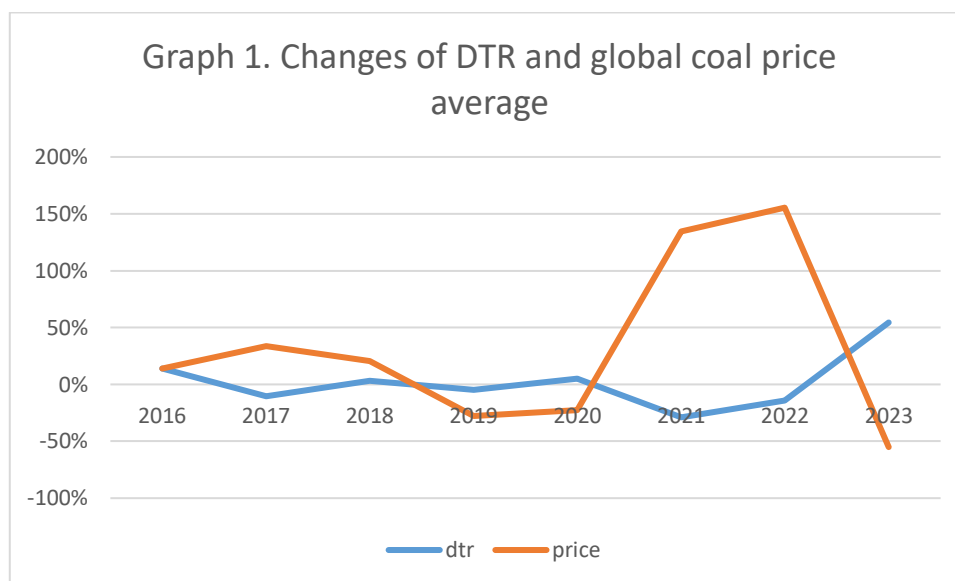
Source: Author's calculation and tradingeconomics.com

However there are factors that complicates exporting companies' receivable collectability since they usually face more collection risks than domestic ones. Because coal companies and their buyers are often based in different countries, the parties may not be as familiar with each other. This distance results in varying market and economic conditions, along with extended or more complex shipping processes (Ortakarpuz, 2019). Among these risks are currency risk where decrease in the country's foreign exchange devalues the receivables collected during the time--which by extension also creates transfer risk where, while the importer is willing to make payments, they might be delayed or costly due to navigating exchange rate fluctuations.

The coal industry in Indonesia is well-suited for analyzing the dynamic of exporting companies in the country since it is a major contributor to exports. Indonesia is one of the world's largest producers and exporters of coal, especially those used for power generation. The decision to export oftentimes depends on the heavily influenced by global market demand for coal and supply conditions. Therefore, the companies in this industry often have shifting export intensity from time to time. These factors make the sector a strong example for studying export dynamics.

The research gap in this study focuses on examining whether the collection period has a positive or negative relationship with profitability for profitable coal companies in Indonesia, while controlling for the actual cash received. This investigation aims to clarify how the timing of receivables collection affects profitability when the cash inflow rate is accounted for. Additionally, this study seeks to determine whether export intensity and currency fluctuations influence the relationship, as they subject firms to increased exposure to transfer and currency risks associated with export activities collectability.

LITERATURE REVIEW
Based on economic theory and various empirical studies, fluctuations in exchange rates, especially the depreciation of the domestic currency, can enhance a country's export

competitiveness and increase revenue from international sales. In this context, a decline in the value of the domestic currency tends to make export products more competitive in the global market, which can benefit companies operating in the export sector. For instance, a study on PT. Pupuk Sriwidjaja Palembang shows a positive relationship between the increase in the US dollar exchange rate against the Indonesian Rupiah and the company's profitability (Azmi et al, 2022). Similar phenomena are also observed in research on export companies in Bangladesh (Choi, 2020).

Furthermore, export intensity as an independent variable is also expected to positively influence profitability. The underlying theory for this hypothesis is that engagement in international trade expands markets, increases sales volumes, and improves operational efficiency. Empirical studies also show a positive relationship between export activities and company profitability, supported by favorable exchange rate conditions (Abor, 2011; Paiva, 2020).

However, there is also a negative impact of the number of days receivable on profitability, indicating that longer collection periods can pressurize a company's liquidity and reduce overall profitability. Studies on companies in Indonesia show that longer collection periods negatively impact profitability (Sierpińska-Sawicz, 2021; Basyith et al, 2021). Although coal industry's liquidity might not be utmost concern for investors since its current ratio doesn't necessarily affect its return (Rosdiana, 2021).

The problem formulation in this research includes the main question of how exchange rates, export intensity, and the number of days receivable, both independently and through variable interactions, affect company profitability in Indonesia. This research question seeks to identify causal relationships and verify whether patterns observed in other studies also apply in the context of Indonesian companies, particularly under different economic and regulatory conditions.

The hypothesis that exchange rate fluctuations, particularly a weaker domestic currency, enhance profitability by boosting a firm's competitive edge in international markets is substantiated by various studies. This correlation is evident in the increased profitability (ROA) of PT. Pupuk Sriwidjaja Palembang as the US dollar strengthened against the IDR from 2014 to 2020 (Azmi et al, 2022). Similarly, depreciation of the Bangladeshi currency favorably impacted Bangladeshi exporters (Choi, 2020). However, a contrary effect was observed in Vietnam's oil and gas sector, where exchange rate variations negatively influenced profitability (Bui and Nguyen, 2020).
H1: Exchange rate positively affects profitability.

The hypothesis that firms with high export intensity generally report better profitability due to expanded markets and increased sales is supported by evidence. For instance, PT. Pupuk Sriwidjaja Palembang benefited from favorable exchange rates (Abor, 2011), and depreciation of the domestic currency improved profitability for Bangladeshi exporters (Paiva, 2020). On the contrary, in Vietnam's oil and gas industry, adverse exchange rate changes reduced profitability (Vu and Holmes, 2014).
H2: Export intensity positively affects profitability.

The hypothesis that longer Days of Receivable (DtR) reduce profitability suggests that delayed payments can strain liquidity. Studies, including those by Sierpińska-Sawicz (2021) and Basyith et al. (2021), show that extended receivables periods correlate with reduced profitability. However, Ruslan and Nugroho found a potentially positive relationship between average collection periods and profitability (Ruslan and Nugroho, 2022).
H3: Days to receivable negatively affects profitability.

The hypothesis that efficient operating cash flow management boosts profitability is well-supported. Studies on companies listed on the Amman and Vietnamese stock exchanges illustrate that good cash flow management is essential for profitability (Ahmad et al, 2024; Huong, 2021). Additionally, effective debt and cash flow management contribute to profit persistence in coal mining companies (Wahyuni et al, 2022).

H4: Operating cash flow positively affects profitability.

The hypothesis that Days of Receivable (DtR), moderated by exchange rate fluctuations, negatively impacts profitability argues that firms with long receivables are vulnerable to losses when local currencies appreciate. Studies show that unhedged positions can lead to profitability declines during such fluctuations (Adams and Verdelhan, 2022; Claver, 2021).

H5: Days to receivable moderated by exchange rate negatively affects profitability.

Lastly, the hypothesis that high export intensity combined with inefficient receivables management reduces profitability highlights the importance of efficient working capital management. While export activities expand market reach, delays in receivables can negate these benefits (Talukder and Tripathi, 2021; Mahor and Banerji, 2023). Longer collection periods might sometimes benefit exporting SMEs, but generally, poor receivables management undermines profitability (Bellouma, 2011).

H6: Days to receivable moderated by export intensity negatively affects profitability.

METHOD

The population for this study comprises Indonesian coal exporting companies. The period under examination spans from 2015 to 2023. Financial report data were sourced from the respective companies' websites, while exchange rate data were obtained from Bank Indonesia. The criteria for sample selection were as follows: availability of annual reports from 2014 to 2023, absence of consecutive annual losses, availability of export revenue information, an export-to-domestic sales ratio of 50% or more in most of the years, and no years without exports during the study period. Based on these criteria, seven companies were selected for the study: PT. Adaro Energy Tbk, PT. Dian Swastika Sentosa Tbk, PT. Harum Energy Tbk, PT. Indo Tambangraya Megah Tbk, PT. Resource Alam Indonesia Tbk, PT. Mitrabara Adiperdana Tbk, and PT. Bukit Asam Tbk.

Definitions of Operational Variables:

1. **ROA (Return on Assets)**: This measure is used to assess a company's profitability relative to its total assets.
2. **Exchange Rate (Kurs)**: This is the average exchange rate between the Indonesian Rupiah (IDR) and the U.S. Dollar (USD), used to evaluate the impact of currency fluctuations on the company's financials. Previous research suggests that the significant effect of exchange rate fluctuations on changes in receivables diminishes when using the bilateral dollar rate instead of the broad dollar rate. However, since coal is typically traded in U.S. dollars, using the USD/IDR exchange rate should be sufficiently effective for this research.
3. **Export Intensity (Export)**: Calculated as the ratio of export revenue to total revenue, this variable quantifies the extent to which a company relies on exports for its sales.
4. **Days to Receivable (Receivable)**: This metric, computed as (Average Accounts Receivable/Revenue)×365, indicates the average number of days it takes for a company to collect payments from its customers.
5. **Cash Flow from Operations Ratio (CFO)**: This ratio, defined as operating cash flow divided by current liabilities, measures how well a company can cover its short-term obligations with the cash flow generated from its regular business operations.

6. **Interaction between Days to Receivable and Exchange Rate (Receivable*Kurs)**: This interaction term explores the combined effect of the average collection period and exchange rate fluctuations on the company's financial performance.
7. **Interaction between Days to Receivable and Export Intensity (Receivable*Export)**: This interaction term assesses how the relationship between the average collection period and the company's dependency on exports impacts its financial outcomes.

In the descriptive analysis of the variables used in the study, several statistical measures are assessed to provide a comprehensive understanding of the data distribution and variability. These measures include: mean, median, maximum, minimum, standard deviation, skewness, and kurtosis of the variables.

Several statistical tests are conducted to determine the most appropriate panel model for analyzing the data. These tests include the Lagrange Multiplier test, Chow test, and Hausman test. Each test helps in selecting between pooled, fixed, and random effects models based on their suitability for the data structure and the research question: Lagrange Multiplier Test is used to ascertain the necessity of using a random effects model over a simple pooled OLS model. If the test is significant, it suggests that the random effects model is more appropriate due to the presence of individual-specific variations that are not captured by the pooled OLS model. Chow Test determines whether fixed effects are significant and should be included in the model. This test compares the fit of the pooled OLS model against a model that allows for individual-specific intercepts (fixed effects). A significant result indicates that fixed effects should be incorporated, suggesting that ignoring these effects could lead to biased or inefficient estimates. Hausman Test compares the fixed effects and random effects models to identify which is more appropriate for the data. The Hausman test specifically checks whether the unique errors in the random effects model are correlated with the regressors. If the test is significant, the fixed effects model is preferred as it indicates that the random effects estimator may be biased.

Based on the regression equation adapted from Hussain et al. (2024), the following hypothesis testing scenarios apply:

$$ROA_{it} = \alpha_0 + \alpha_1 kurs_{it} + \alpha_2 export_{it} + \alpha_3 Receivable_{it} + \alpha_4 CFO_{it}$$
$$+ \alpha_5 Receivable * kurs_{it} + \alpha_6 Receivable * export_{it} + e_{it}$$

RESULT

Table 1. Descriptive Analysis

	ROA	KURS	EXPORT	RECEIVABLE	CFO
Mean	0.144728	13316.91	0.747306	33.53819	0.989568
Median	0.120582	14272.84	0.794773	32.69563	0.907338
Maximum	0.5852	15196.45	0.995825	71.50372	4.111266
Minimum	-0.07975	9984.004	0.21531	8.970513	-0.26259
Std. Dev.	0.121717	1912.602	0.203591	11.34393	0.68467
Skewness	1.085859	-0.88215	-0.8962	0.762655	1.597461
Kurtosis	4.723805	2.109992	2.887681	5.035114	8.140977

On average, the return on assets is about 14.47%. The median ROA is slightly lower than the mean, suggesting a slight right skew. Ranges from -0.07975 to 0.5852 and standard deviation of 0.121717, they indicate substantial variability in ROA among the observations. The average exchange rate over the period is 13316.91 with standard deviation of 1912.602 that indicates some variability but less extreme, also with kurtosis value that is quite close to a normal distribution. Meanwhile, Export mean of 0.747306 suggests moderate export intensity on average with standard deviation of 0.203591, which is moderate dispersion from the mean.

The average number of days to receivable is 33.53819 with median being close to the mean, indicating a roughly symmetric distribution. CFO ratio has the mean of almost one, indicating that operating cashflow ability to almost one times its current liabilities.

Table 2. Model Effect Tests Result

Langrange Multiplier test	Cross-section	Time	Both
Breusch-Pagan	5.650738	16.67245	22.32319
Probability	-0.0174	0	0
Hausman test	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0	6	1
Chow Test	Statistic	d.f.	Prob.
Cross-section F	5.593154	(6,50)	0.0002
Cross-section Chi-square	32.35233	6	0

Breusch-Pagan Test test checks for the presence of random effects in the panel data. The null hypothesis states that there are no random effects. With Statistic of 22.32319 and probability of 0 (or very close to 0), it suggests the rejection of the null hypothesis, indicating that random effects are present in the panel data. The Hausman test compares the random effects model and the fixed effects model to check if the individual-specific effects are correlated with the regressors. If they are, the fixed effects model is more appropriate. It has chi square statistic value of 0 with probability of 1, as expected since the variable kurs does not have cross sectional variance. Chow test compares whether fixed effects are more suitable than using just a simple pooled OLS model without considering any individual-specific or time-specific effects. It has F-Statistic of 5.593154 with probability of 0.0002, as well as Chi square statistic of 32.35233 with probability of 0. Both the F-statistic and Chi-squared test suggest a highly significant presence of fixed effects. Overall, the tests supports that the panel regression should use random effect model.

Table 3. Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.81099	0.277269	-2.92493	0.005
KURS	5.10E-05	1.64E-05	3.111229	0.0029
EXPORT	0.291824	0.17789	1.64047	0.1065
RECEIVABLE	0.019634	0.006703	2.929226	0.0049
CFO	0.102461	0.014854	6.897667	0
RECEIVABLE*KURS	-1.19E-06	4.44E-07	-2.68957	0.0094
RECEIVABLE*EXPORT	-0.00722	0.004083	-1.76769	0.0826
	Weighted Statistics			
Root MSE	0.060114	R-squared		0.642055
Mean dependent var	0.044702	Adjusted R-squared		0.603704
S.D. dependent var	0.101285	S.E. of regression		0.063761
Sum squared resid	0.227666	F-statistic		16.74144
Durbin-Watson stat	1.252705	Prob(F-statistic)		0

The constant coefficient of -0.81099 is significant at the 5% level (p=0.005), indicating a negative intercept when all independent variables are zero. Exchange Rate (KURS) coefficient of 5.10e-05 is significant at the 1% level (p=0.0029), suggesting a positive relationship between the exchange rate and ROA. Export Intensity (EXPORT) coefficient of 0.291824, although positive, is not statistically significant (p=0.1065). Days to Receivable (RECEIVABLE) variable shows a positive and significant effect on ROA with a coefficient of 0.019634 (p=0.0049). Operating Cash Flow (CFO) coefficient of 0.102461 is significantly positive (p=0.000), indicating a strong positive influence of operating cash flow on ROA. Interaction Term - Days to Receivable and Exchange Rate (RECEIVABLE*KURS) coefficient of -1.196e-06 is significant (p=0.0094), suggesting that the positive impact of receivables on ROA decreases as the exchange rate increases. Likewise, interaction Term - Days to Receivable and Export Intensity (RECEIVABLE*EXPORT) coefficient of -0.00722, though negative, is not statistically significant (p=0.0826), indicating that the interaction effect does not significantly alter the impact of receivables on ROA in relation to export intensity.

The model achieves an R-squared of 0.603704, indicating that approximately 60.37% of the variability in ROA is explained by the independent variables included in the model. The F-statistic is significant (p=0), affirming the model's overall fit.

DISCUSSION

Longer receivable days in the coal industry are common due to high transaction values, industry norms, long-term contracts, buyer profiles, supply chain complexities, and competitive dynamics. While extended credit terms can strengthen customer relationships and market competitiveness, coal companies must manage receivables efficiently to maintain liquidity.

The hypothesis of a positive relationship between the exchange rate and return on assets (ROA) in the coal industry, particularly through currency depreciation, suggests that a weaker domestic currency boosts profitability and asset efficiency. Depreciation makes coal exports cheaper and more attractive, increasing demand and sales volumes, which enhances profitability and ROA. Additionally, converting foreign revenues into higher domestic amounts, stable costs, and revaluing foreign assets contribute to operational margin improvements. Empirical studies, such as those on PT. Pupuk Sriwidjaja Palembang in Indonesia **(Azmi et al, 2022)** and Bangladeshi exporters (Choi, 2020), support this hypothesis, showing that currency depreciation boosts profitability.

While export intensity is theorized to enhance ROA by expanding markets, economies of scale, and currency benefits, empirical evidence in the coal industry indicates a weak but nearly significant effect (p-value = 0.1065). This suggests export intensity may contribute to profitability but isn't statistically robust at standard thresholds.

The hypothesis that DTR negatively affect profitability in the coal industry is not supported by the data, which instead shows a positive effect of DtR on return on assets (ROA). Contrary to conventional wisdom and prior research, such as Basyith et al.'s study on IDX-listed companies and Sierpińska-Sawicz's (Sierpińska-Sawicz, 2021) observations, which link longer DtR with lower profitability due to liquidity issues and bad debts, our analysis suggests the opposite. Longer DtR may indicate strong customer relationships, allowing companies to offer favorable payment terms without financial strain, potentially leading to higher sales and profitability. Companies might charge higher prices for longer payment terms or manage receivables effectively, thus improving profitability. This finding highlights that extended credit terms, typical in the coal industry, may enhance profitability under certain conditions.

The hypothesis that operating cash flow (CFO) positively affects ROA in the coal industry is accepted, with empirical evidence showing that efficient cash flow management drives profitability and asset efficiency. Strong CFO ensures liquidity, enabling better management

of receivables, payables, and inventory, reducing costs, and supporting smooth operations. Studies, such as those on the Amman Stock Exchange (Ahmad et al, 2024) and Vietnamese companies (Huong, 2021), confirm that higher CFO enhances ROA and financial performance by reducing dependency on external financing and supporting reinvestment.

The hypothesis that DTR moderated by the exchange rate negatively affects profitability is confirmed, highlighting that the combined effect of longer receivable periods and currency fluctuations can significantly impair return on assets (ROA) in the coal industry. Specifically, as the domestic currency depreciates (the exchange rate increases), the initially positive impact of longer DTR on ROA diminishes or turns negative. This adverse effect can be attributed to several factors: Currency depreciation, while potentially boosting sales by making exports more competitive, can result in delayed cash inflows when these are converted back to a weaker domestic currency, thus eroding profitability. Longer DTR periods also heighten exposure to foreign exchange risk, particularly when extended credit terms are permitted, which makes companies vulnerable to currency devaluations that can reduce the value of receivables. Moreover, the depreciation of the domestic currency raises the cost of servicing foreign-denominated debt and increases the price of imported goods and services, both of which can significantly affect companies reliant on such imports or financing, thus squeezing margins and reducing ROA. Additionally, during periods of domestic currency depreciation, customers may demand longer payment terms, which, if met, can further diminish the benefits of enhanced sales volumes due to the negative impacts on cash flow and profitability when receivables decrease in value owing to currency depreciation. These dynamics are corroborated by studies like Clavero (2021), which show that longer DtR combined with adverse exchange rate movements, such as local currency appreciation, can negatively impact profitability, particularly if exchange rate changes unfavorably during the collection period. Similarly, research on Turkish firms (Duman, 2017) indicates that while a weaker domestic currency can improve sales and receivables due to enhanced export competitiveness, these benefits can be offset by inefficient receivables management, especially if exchange rates fluctuate unfavorably during the collection period.

The hypothesis that DTR moderated by export intensity negatively affects profitability in the coal industry is somewhat supported, with results indicating a negative effect, although only significant at the 10% level (p-value = 0.0826). This suggests that as the percentage of export sales increases, the initially positive impact of lower DtR on return on assets (ROA) diminishes or becomes negative. The underlying reasons for this might include increased exposure to export market risks such as currency fluctuations, trade policies, and varying economic conditions. In scenarios where export customers demand longer payment terms, this leads to extended DtR, tying up more capital in receivables, reducing liquidity, and potentially impacting profitability and asset utilization. Additionally, the challenges of collecting receivables from foreign customers, which include legal system differences and currency conversion issues, elevate collection costs and compound the financial strain if DtR is prolonged. Furthermore, managing receivables across multiple currencies increases exposure to exchange rate risks, adversely affecting profitability when these receivables are converted back to domestic currency. Such inefficiencies in receivables management, especially in the context of high export intensity, can undermine the benefits typically associated with exporting, such as access to larger markets and higher sales volumes. Empirical evidence, such as the studies conducted on the Indian pharmaceutical industry (Talukder and Tripathi, 2021) and Tunisian export (Bellouma, 2011), corroborates that efficient receivables management is essential for maintaining liquidity and enhancing export competitiveness, which in turn bolsters profitability.

CONCLUSION AND SUGGESTION

Conclusion

The regression results show that exchange rates, receivables, and operating cash flow significantly affect the dependent variable. The interaction between receivables and exchange rates also has a significant negative effect. However, export intensity and the interaction between receivables and export are not statistically significant, although they approach significance at the 10% level. The model overall is a good fit, explaining about 64% of the variance in the dependent variable, and the model as a whole is statistically significant.

Based on the regression results, it appears that Indonesian coal companies can actually benefit from a more relaxed trade credit policy. In contrast to most industries where extended credit terms strain liquidity and reduce profitability, in the coal industry, offering longer payment terms seems to enhance profitability and asset efficiency. This could be due to strong customer relationships and the ability to charge higher prices in exchange for more favorable payment terms. However, the beneficial effect of extended credit terms is dampened when the Rupiah depreciates, as the negative impact of currency fluctuations moderates the positive relationship between receivables and profitability. Additionally, export intensity does not significantly affect profitability nor moderate the impact of receivables, indicating that fluctuations in the proportion of coal being exported do not have a major influence on profitability. This is reassuring for coal companies, particularly during periods when government policies impose export bans or restrictions.

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Suggestion

Indonesian coal companies should consider adopting more flexible trade credit policies to strengthen customer relationships and improve profitability. However, they should closely monitor exchange rate fluctuations, especially during periods of Rupiah depreciation, as this may reduce the benefits of extended credit terms. Additionally, coal companies can remain relatively indifferent to export intensity variations, as the proportion of exports does not significantly impact profitability. This flexibility can provide relief during times of export limitations or bans, allowing companies to focus on their domestic markets without fear of losing profitability. By strategically managing credit policies and exchange rate risks, coal companies can optimize their financial performance while navigating both domestic and international market challenges.

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