Predicting financial distress in property and real estate companies: moderation of company size

Wiwik Saraswati
Universitas Balikpapan, Kalimantan Timur, Indonesia
wiwiksaraswati@uniba-bpn.ac.id

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Abstract
Purpose – This study analyses the effect of intellectual capital, return on assets (ROA), and debt-to-equity ratio (DER) on financial distress moderated by company size. **Method** – This study uses a quantitative method using secondary data from publications obtained through the Indonesia Stock Exchange (IDX) official website. The research population comprises real estate and property companies listed on the IDX 2018–2023. The sampling technique uses the purposive sampling method so that 90 observation data are obtained from 15 property and real estate companies as samples. The data analysis techniques utilized are panel data regressions and moderated regression analysis (MRA) using EViews 12. As a result of Chow and Hausman's tests, the random effect model is the selected model. **Findings** – The study findings indicate that DER, ROA, intellectual capital and company size positively affect financial distress. Company size can strengthen the influence of ROA and intellectual capital on financial distress. However, it cannot moderate DER and financial distress. **Implications** – The research findings contribute to the scientific understanding of financial distress determinants in property and real estate companies. The practical implication of these findings is that the company must sustainably increase investor trust by maintaining the company's good performance in the stock exchange.
Keywords: DER, ROA, intellectual capital, company size, financial distress.

Introduction

Indonesian government maintained low interest rates to support the property and real estate industry during the pandemic, where only until 2022 did the BI rate increase to 3.75 percent. The performance of Indonesian property sectors in 2023 has not been very strong. This is evident from the growth in related economic sectors like construction and real estate (Sunarsip 2024). In the third quarter of 2022, a quarterly increase of 1 percent in the property price index, 5.1 per cent in the supply index and 10.5 percent in the demand index (Jariah, Irdiana, and Lukiana 2024). In recent decades, Indonesia's real estate market has grown. Approximately 2.4 percent of Indonesia's GDP came from the real estate industry in 2023; the real estate market is currently among the strongest in the region (Siahaan 2025). Low profitability in the property and real estate sector, and there is concern that it may indicate financial distress that could impact the company's bankruptcy. According to Choi, Son, and Kim (2018), financial distress is one of the early warning signs for a company's management to prevent bankruptcy.

As of July 2024, the Indonesia Stock Exchange (IDX) found that there are still 53 companies whose financial statements still need to be submitted to date and paid fines by December 2023, including 10 real estate companies (Binekasri 2024). In addition, the IDX will impose penalties on companies that have filed financial information but have not yet paid the

fines for the delays. In the real estate industry, delayed financial reports increased to 24 companies between 2019 and 2022. In 2023, there were only 20 companies with late reports indicating that businesses were making progress in adjusting to the challenges posed by the pandemic (Agustin and Hapsari 2024). Financial reporting is still something that many businesses need to improve, even though the deadline has been extended. Companies must plan and be aware of the elements contributing to financial reporting delays because it will negatively affect public perception of the company and investors' perceptions of its performance (Saraswati, Ratnawati, and Irawan 2024).

A company's debt-to-equity ratio (DER) is one measure of its financial health. This study used DER as a proxy for leverage. A leverage ratio shows how much debt has been used to finance an organization's assets (Hermiyetti et al. 2024). The risk of bankruptcy increases with the amount of debt a company has. A company with more current wealth will face fewer financial difficulties than those with current debt (Muliadi et al. 2023). A greater DER signifies a larger composition of the company's long-term liabilities, which increases the default risk. DER serves as an indicator of the level of business risk. To generate substantial returns, the business will improve operations management and choose low-risk funding sources to raise capital (Tanjung 2023). Growing debt can also lead to unsustainable business growth and upset the company's financial situation, as shown by a decline in the activity ratio. An organization is more susceptible to financial distress when its debt load is growing and excessive because it will also lower its liquidity ratio and raise its leverage ratio (Bukhori, Kusumawati, and Meilani 2022).

Another factor influencing financial distress is the return on assets (ROA). This study used ROA as a proxy for profitability to compare a company's rate of return on its assets by tying net income to the entire quantity of assets that the business owns (Kurniasih et al. 2020). The ROA level describes the company's performance as seen from its capacity to make a profit, regardless of whether the business has promising prospects (Dance and Made 2019). The ability of a business to make money by using its assets is referred to as ROA. A company is said to be financially liquid if it can manage its assets as efficiently as possible to produce the most revenue. Conversely, a business that cannot manage its assets to maximize revenue is likely going through financial difficulties. ROA can be considered a signal of a company's operational performance. A high ROA is a positive sign, so operational efficiency and potential ability to overcome debt burdens. The better a company does, the higher its ROA value and the less likely financial distress will occur (Hananiyah and Jaya 2023).

Apart from DER and ROA, another factor that influences financial distress is intellectual capital (IC). Intellectual capital is the term used to describe a company's intangible resources, such as knowledge, experience, invention, and also technology (Sari et al. 2023). Organizational capital is resource efficiency, which refers to capital assets that are suitable for optimal management and will increase firm value. Intellectual capital is essential for property and real estate firms since it includes organizational and physical frameworks that uphold human capital (Ardiansari et al. 2021). Furthermore, there is no longer a strong correlation between an organization's value and the information gleaned from financial reports that follow conventional accounting methods. The company developed the VAIC (value-added intellectual coefficient) method, which is designed to give details regarding the efficiency of creating value for the company's tangible and intangible assets (Lisda and Anthony 2023). The organization's intellectual capital management is improving; its performance will be evaluated favorably. If intellectual capital performance can be maximized, then the company will add value, which can provide its own characteristics (Ozkan, Cakan, and Kayacan 2017).

Previous research on factors influencing financial distress has produced inconsistent results. Research by Bukhori, Kusumawati, and Meilani (2022); Naibaho and Natasya (2023) found that financial distress is significantly affected by debt to equity ratio (DER). In contrast,

in research by Edi and Eilyn (2023); Elfriandi and Sudjono (2023); Sitompul and Syarif (2023) found that DER has no impact on financial distress. Research by Ferdiansyah and Widyarti (2022); Rachman (2022); Sitompul and Syarif (2023); Setowening and Djuminah (2023) found that return on assets significantly influences financial distress. Meanwhile, research by Sariroh (2021); Pebriani, Syafitri, and Meiriasari (2024) found that return on assets has an insignificant effect on financial distress. Research by Jati, Kholmi, and Jannah (2023); Pradana and Chalid (2023) found that intellectual capital significantly affects financial distress. Meanwhile, Maulana et al. (2012) found that intellectual capital negatively impacts financial distress. However Setowening and Djuminah (2023) found that intellectual capital do not affects financial distress. Research conducted by Hakim et al. (2020); Miradji et al. (2024) found that company size significantly affects financial distress. In contrast, according to research by Utama and Setiawati (2022); Asmi, Suryadi, and Zerrin (2024) found that the company's size does not affect financial distress. This inconsistency opens a research gap, so further research must be conducted.

Company size can signal the quality of financial management in a company, and the use of company size as a moderate variable is new; previous studies are still limited to examining this. Several previous studies have examined company size as a moderation variable towards debt to equity ratio (DER) on financial distress but did not discuss ROA and intellectual capital, as in the study by Ariqoh and Yuniningsih (2022); Bimantio and Nur (2023). Several studies have also discussed company size as a moderation variable toward return on asset (ROA) in financial distress but have not discussed DER and intellectual capital, such as the study by Erdi et al. (2022). Several studies have examined company size as a moderation variable towards intellectual capital in financial distress but not discuss DER and ROA, as in the study by Bayraktaroglu, Calisir, and Baskak (2019); Purwaningrat and Oktarini (2020). Previously limited research only examines company size as partial moderation. However, discussing the relationship between variables comprehensively is a novelty compared to previous research.

Property and real estate companies were chosen as research samples because they played a significant role in the Indonesian economy. It has been demonstrated that there are still discrepancies in the outcomes of every variable based on multiple earlier investigations. This discrepancy might result from varied samples used in previous studies. Therefore, context-specific research is needed to find more accurate empirical data. This study aims to find empirical evidence on the effect of debt-to-equity ratio (DER), return on assets (ROA), and intellectual capital on financial distress moderated by company size in property and real estate companies listed on the IDX for the 2018-2023 period. This study can provide literacy and knowledge about company valuation, especially in the property and real estate sector. This study can also provide input to property and real estate companies regarding the importance of policies to increase profitability and reduce debt to maximize profits. Bankruptcy theory analysis helps companies be more prepared and identify potential financial problems faster.

Literature review

Signaling theory

According to signaling theory, a business's strong financial statements indicate to its users that business operations are proceeding satisfactorily (Bini et al. 2011). The responder will respond well if the signal is in good condition. An informational announcement is given to investors to help them decide what to buy. The primary argument of this study, signaling theory asserts that it is inevitable that management will intentionally communicate with the market (Abdallah and Bahloul 2023). Disclosure and financial reporting may be essential for

management to convey the company's performance and oversight to external investors. Full disclosure and improved market value are attributes of the company with the highest profitability. Outsiders shield themselves from information they do not receive, which drives down prices for a company. Consequently, to lessen this, the organization sends accurate, accurate, and complete signals matching the manager's information (Budiman, Kristanti, and Wardhana 2016).

Financial distress

Lestari and Erdiana (2024) state that a company experiencing a financial decline for several years is believed to be experiencing financial difficulties, which may result in bankruptcy. Financial distress is the chance that a business cannot pay bills on time. It causes operating and net losses for the company's current fiscal year. Awwaliyah et al. (2024) said that when unusual operational losses occur in a business, like deteriorating performance or years of consecutive losses and failure to carry out dividend payments, it is in financial distress. When a company has large, fixed costs and is highly susceptible to economic downturns, there is a greater likelihood of financial distress. Due to this requirement, businesses must incur significant costs which will compel management to lend money to third parties. The reduced retained earnings values used to pay dividends due to the losses will cause a capital shortage (Pamungkas et al. 2022).

Debt to equity ratio (DER)

Leverage is a metric used to quantify the proportion of a company's assets under debt financing (Arhinful and Radmehr 2023). It demonstrates the companies' ability to settle all of their debts, whether they are short-term or long-term (Ugur, Solomon, and Zeynalov 2022). Abdullah et al. (2023) state that most assets are financed by debt when the debt-to-asset ratio is high. The greater the amount the business must pay off its debts and interest, the more likely financial distress will result. With a high debt-to-asset ratio, most assets are financed by debt. The more the company must pay off its debts and interest, the greater the likelihood of financial distress. This brings on financial distress because it puts more of a strain on the business to pay its debts and accrue interest. The DER calculation shows the utilization rate of debt relative to equity. Businesses with a higher debt-to-equity ratio do so because they finance their operations with a higher debt ratio than their capital (Arifuddin et al. 2023).

Return on assets (ROA)

Profitability is measured by the difference between the income received and the costs incurred by the company. Profitability demonstrates the business's capacity to profit from all its assets (Kalbuana et al. 2022). Profitability is important for property and real estate companies because it measures success and becomes the basis for assessing property and real estate sector health to compete and survive as a business organization (Ahkam, Nahar, and Shorna 2021). ROA is chosen to measure how well businesses generate profits from their assets and the financial health of the property and real estate industries. The possibility of financial distress decreases as a company's profits increase. Companies with high ROA generally have relatively little debt; ROA can evaluate how effectively companies use their resources to turn a profit. This suggests that as business profits rise, the probability of financial hardship falls (Saraswati, Ratnawati, and Irawan 2024).

Intellectual capital (IC)

Intellectual capital is considered an element driving company value, so it becomes an interesting issue (Ozkan, Cakan, and Kayacan 2017). The VAIC method assesses the effectiveness of intellectual capital (Nurrahmawati et al. 2024). This model considers the

assessment of employed, structural, and human capital, and many previous studies have used the VAIC model, a metric for evaluating intellectual capital. Intellectual capital consists of three types of organizational capital: human capital, structural capital in terms of knowledge, and technology, which can bring value to the company (Dalwai and Mohammadi 2020). Both material and immaterial assets can be considered resources. Intellectual capital is crucial for boosting business performance and creating environment-friendly conditions for long-term competitive advantage (Mansoor, Jahan, and Riaz 2021). Intellectual property assets are intangible resources that can provide a long-term competitive advantage by defending property rights through the legal system. Organizations with outstanding human ingenuity, talent, and capabilities can gain and maintain a competitive edge (Alqarni et al. 2023).

Company size

A company's stock market value, total sales, and total assets are some factors that can determine the size of a company (Putra, Wahyuni, and Fitrijanti 2022). When a company has a high total asset value, it is considered mature, meaning that its cash flow is already positive and has good prospects for a relatively long time. Additionally, total net sales can be used to determine company size. Businesses with a high total asset value can be classified and are less likely to go bankrupt. That company's size and stability are correlated with its sales, which also lowers the probability of the company experiencing financial difficulties (Wangsih et al. 2021). Larger companies will have more access to the phenomenon in competition, while smaller companies will also have less access, depending on the circumstances (Hermiyetti et al. 2024). The company size will benefit interested parties like creditors and investors, who will not be reluctant to lend money and make investments to keep the business out of financial distress.

Hypothesis development

Financial distress can serve as a problem early warning system. Businesses with greater debt levels will face financial difficulties sooner than those with lower debt levels. Based on the signaling theory, increasing the total amount of debt indicates a high probability of financial difficulties for the entity. Bankruptcy could result from the company's failure to manage financial difficulties carefully and with the proper steps. The company's financial distress cannot be accurately predicted by looking at the size of the DER value. It is not always the case that businesses with higher DER values are labelled as being in financial distress, and vice versa for businesses with lower DER values. According to Studies by Bukhori, Kusumawati, and Meilani (2022); Naibaho and Natasya (2023), debt to equity ratio significantly affects financial distress. Considering the previous explanation, the following:
H_1: DER positively affects financial distress.

A business with a high ROA (return on assets) can generate revenue from sales and investments. The company's assets are being managed more efficiently and effectively, which can eventually reduce the company's expenses and offer enough cash flow and savings to operate the firm. According to the signaling theory, the company may encounter financial difficulties because of several net losses that rise annually due to cost increases and declining revenues. Better profits and more economic use of funds can result from more effective and efficient asset management for the business. Companies that generate hefty profits can manage a lot of money available to pay costs and operate their companies well to avoid financial distress. The findings of studies by Ferdiansyah and Widyarti (2022); Rachman (2022), return on asset negatively influences financial distress. Considering the previous explanation, the following:
H_2: ROA negatively affects financial distress.

Good management can strengthen the company's value through the quality of its human resources so that the latest innovation emerges in the industrial sector. Intellectual capital is crucial to generating value for the enterprise and enhancing performance to provide a competitive edge over rivals. According to signaling theory, the value of financial hardship will decrease due to the intellectual capital's ability to support the significance of sound corporate governance. The company's intangible asset is the intellectual capital necessary to enhance its competitive advantage, boost financial performance and prevent bankruptcy or financial distress. A study by Maulana et al. (2012); Widhiadnyana and Ratnadi (2019); Shahwan and Habib (2020) found that intellectual capital negatively affects financial distress. Considering the previous explanation, the following:

H_3: intellectual capital negatively affects financial distress.

In addition to allowing a company with the capital to fulfil its immediate obligations, the larger companies encourage market bargaining power, which, in turn, helps to bolster investor confidence and lessen the possibility of financial difficulties. In signaling theory, smaller companies typically find it simpler to fulfil their immediate obligations because they do not have enough resources or money. An established business, despite its small size, the company has many partners, financial institutions have a high degree of trust in it, and clients and other parties recommend it. As an organization grows, its ability to generate revenue increases, which can reduce financial distress by reducing the organization's need to borrow funds to operate. According to the study by Wangsih et al. (2021); Meiliana, Muslimin, and Dalimunthe (2024), company size negatively affects financial distress. Considering the previous explanation, the following:

H_4: company size negatively affects financial distress.

According to signaling theory, the business will be dealing with higher debt risk. A low ratio of DER means the business will be smaller because it will have more debt. A strong foundation and larger companies are better able to handle outside obstacles like erratic economic conditions. The size of the company can support funding for corporate debt. Large businesses have more options when raising capital and can access the capital market more readily. The smaller a company, the greater the chance that it will experience financial difficulties. A conflict of interest between agent and principal is common in small businesses, which also have more room to grow. For this reason, small businesses are heavily dependent on external loans to fund their daily operation. According to research from Ariqoh and Yuniningsih (2022); Bimantio and Nur (2023), company size can moderate the connection between financial distress and DER. Considering the previous explanation, the following:

H_5: company size can moderate the effect of DER on financial distress.

A high return on assets demonstrates the company's quality of use of its current assets. The assets of a business can be managed more effectively and efficiently to maximize profits and make the best use of available funds. In signaling theory, some businesses can make large profits. However, they cannot manage whether the money they have on hand is sufficient to pay their expenses and operate their business, which leads to financial difficulties. Although the firm's size does not directly affect profitability in financial distress, it typically affects operational scale, financial market accessibility, and resource management effectiveness more. The magnitude of an organization's financial crisis has no impact on its level of profitability. Financial distress is a problem that every business can face, regardless of its size or profitability. According to the research by Suharti et al. (2021); Rahayuningtyas and Yanti (2023), company size can moderate the relationship between ROA and financial distress. Considering the previously provided explanation, the following:

H_6: company size can moderate the effect of ROA on financial distress.

Intellectual capital is the term for knowledge-based resource management that can help a large company achieve better financial results by supporting the resource management

process, which leads to obtaining profits. According to signaling theory, a larger company can aid in resource management and facilitate the acquisition of outside funding if it is deemed favorable by investors. Bigger businesses can facilitate easier resource management and funding acquisition. This statement suggests that factors related to company size can enhance its intellectual capital and help it achieve the desired profit. Improving the evaluation of business financial health can minimize financial resource misallocation, which can lessen economic value and employment loss. The financial resources can be allocated to companies that can efficiently invest in and manage their intellectual property. Research by Kurniawati, Rasyid, and Setiawan (2020); Fitriani, Suriyanti, and Ramashar (2022) state that the company's size can moderate intellectual capital in financial distress. Considering the previous explanation, the following:

H_7: company size can moderate the effect of intellectual capital on financial distress.

Referring to the development of the hypothesis, a research model can be described as illustrated in Figure 1.

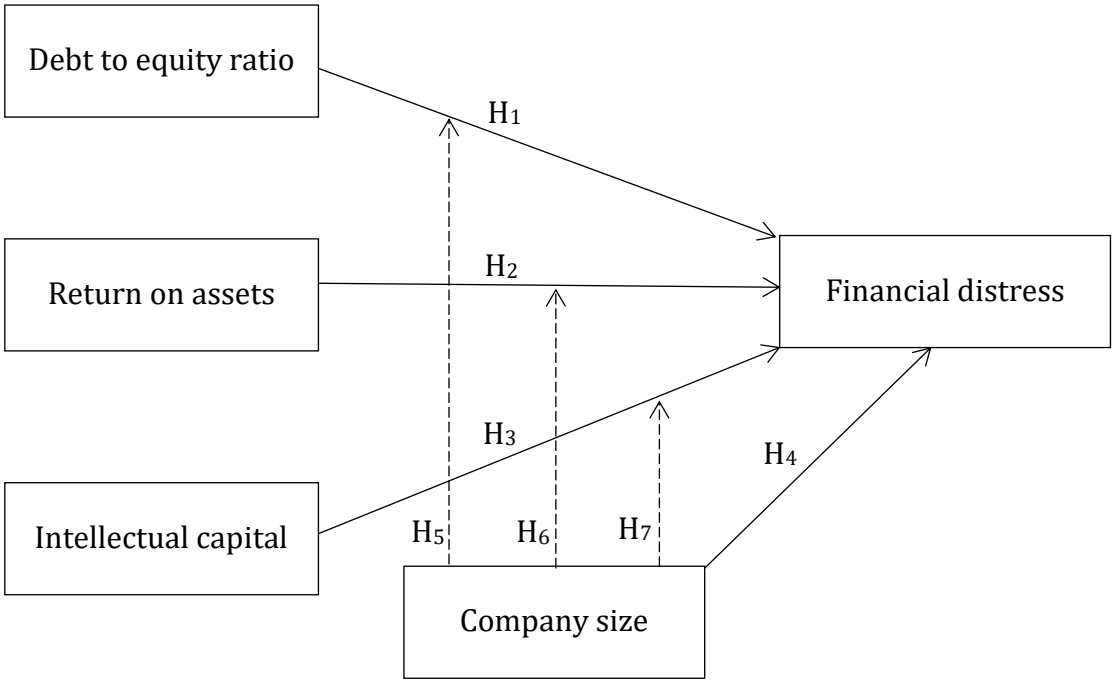

Figure 1 research model

Method

This research uses quantitative methods within an explanatory framework to investigate the effect of various financial ratios on financial distress among businesses. The information used in this study was derived from secondary data found in financial reports and was acquired from the Indonesia Stock Exchange (IDX). Data was gathered by documenting and observing Indonesian real estate and property firms. In this study, the 51 property and real estate subsector enterprises listed on the IDX comprise the population between 2018 and 2023; purposive sampling was used as a sampling technique with predetermined criteria (Table 1). Observation data was obtained from 90 of 15 property and real estate companies that met the existing sample criteria; these are AMAN, APLN, BCIP, BIKA, BKSL, BSDE, CSIS, GWSA, KBAG, LAND, LPCK, LPKR, MMLP, MTLA, and also PWON through the release of annual reports in 2018–2023, maintained accurate, and also consistent financial records.

Table 1 sample criteria

No	Criteria	Amount
1	Property and real estate in Indonesia listed on the Indonesia Stock Exchange (IDX)	51
2	Property and real estate sector companies in the main IDX listing board during the 2018-2023 period	(33)
3	Property and real estate sector company incomplete financial reports for the 2018-2023 period	(3)
4	Sample of property and real estate companies	15
5	Observations data for 2018-2023 study period = 15 x 6	90

Source: secondary data (processed, 2025)

This study has several variables, namely DER, ROA and intellectual capital as independent variables, financial distress as an independent variable and company size as a moderating variable. At the same time, the measurements can be seen in Table 2. The data analysis technique uses panel data regression, which consists of multiple linear regression and moderated regression analysis (MRA), with statistical tools in the form of EViews 12 software. Panel data regression analysis of the research model uses a random effect model (REM). Several stages of data analysis used in this study are as follows: descriptive statistics, model selection, classical assumption tests, t-statistics tests, and determination coefficient.

Table 2 variable measurements

Variables	Measurements	Scale
Financial distress (Z_ALTMAN)	Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5 cut-off value: Z > 2.99 = safe zone 1.81 < Z < 2.99 = grey zone Z > 1.81 = distress zone (Utomo, Achsani, and Aruddy 2025)	Ratio
Debt to equity ratio (DER)	$DER = \frac{\text{Total Liabilities}}{\text{Total Equity}}$ (Agustin and Hapsari 2024)	Ratio
Return on assets (ROA)	$ROA = \frac{\text{Earnings After Tax}}{\text{Total Assets}}$ (Kalbuana et al. 2022)	Ratio
Intellectual capital (IC)	iB-VAIC™ = iB-VACA + iB-VAHU + iB-STVA (Lisda and Anthony 2023)	Ratio
Company size (SIZE)	SIZE = Ln (Total Assets) (Sunaryo 2021)	Ratio

Results and discussion

The study's descriptive analysis goal was to summarize each variable's research characteristics, including mean, standard deviation, minimum, and maximum values. Table 3 shows that the minimum Altman Z-Score value is -1.310471, the maximum value is 15.42896, and the average value is 4.755277. The Altman Z-Score model is the basis for the property and real estate companies, which are healthy and have a lower chance of going bankrupt. DER ranges from a minimum of 1.103802 to a maximum of 5.884799, with an average of 0.590846, indicating relatively low variation in the debt to total assets ratio. On the other hand, ROA

shows moderate variances in the company efficiency for earning income using all the owned assets, with an average of 0.458330, a minimum of 0.1885119, and a maximum of 1.608440. With an average of 5.500230, a minimum of -4.399724, and a maximum of 46.88384, the company's intellectual capital shows that it is more capable of generating added value if it has a higher intellectual capital value. The minimum value of company size is 13.42220, with a maximum value of 19.88000 and an average value of 16.14855, which indicates that the company is in the large category based on the total assets it owns.

Table 3 descriptive statistics

Variables	N	Minimum	Maximum	Mean	Std. deviation
Z_ALTMAN	90	-1.310471	15.42896	4.755277	2.402214
DER	90	1.103802	5.884799	1.790846	1.568286
ROA	90	0.188519	1.608440	0.458330	0.298019
VAIC	90	-4.399724	46.88384	5.500230	2.295568
SIZE	90	13.42220	19.88000	16.14855	1.941903

Source: secondary data (processed, 2025)

Many tests are conducted on model specification to ensure the optimal model is utilized in panel data analysis to approximate panel data regression. The Chow test aims to identify the fixed effect and standard effect model that most closely matches the data. The common effect model is approved if the probability cross-section value is greater than 0.05 (5%). The fixed effect model is approved if the probability cross-section value is less than 0.05 (5%).

Table 4 the Chow-test results

Effects test	Statistic	d.f	Prob.
Cross-Section F	2.995034	(14.52)	0.0010
Cross-Section Chi-Square	44.338050	14	0.0000

Source: secondary data (processed, 2025)

Table 4 shows that the Chow test results obtain prob. 0.0010 is less than 0.05, leading to the fixed effect model selection. The Hausman test can identify the best fixed effect or random effect model. The model is considered acceptable if the random probability cross-section value for the fixed effect models is less than 5% (0.05). The random probability cross-section value must be higher than 5% (0.05) for approval of the random effect model.

Table 5 Hausman-test results

Test summary	Chi-sq. statistic	Chi-sq. d. f	Prob.
Cross-section random	22.074435	5	0.0755

Source: secondary data (processed, 2025)

Table 5 shows that the probability value of 0.0755 is higher than 0.05, and the Hausman test, the random effect model, was accepted.

To ascertain whether the data utilized in the investigation are typical and absent of autocorrelation, heteroscedasticity, and multicollinearity symptoms. The data distribution's expectedness can be ascertained using a normality test. The Jarque-Bera profitability value must be higher than 0.05 for the data to be deemed normal. The normality test results show a probability of 0.446225 greater than 0.05, so data in this study can be considered normally distributed.

The multicollinearity test is one possible test to determine whether independent variables are correlated. If the VIF score is less than 10, the data has no multicollinearity.

Table 6 shows that the probability value of the centered variance inflation factor (VIF) is less than 10.00, so there are no multicollinearity symptoms.

Table 6 the multicollinearity test results

Variables	Coefficient variance	Uncentered VIF	Centered VIF
C	1.066150	18.52035	NA
DER	-0.420437	-0.543886	0.502955
ROA	2.000000	4.255775	2.466676
VAIC	0.058830	3.558051	1.064388
SIZE	1.332485	3.225700	1.805992

Source: secondary data (processed, 2025)

One can employ heteroscedasticity tests to ascertain whether variables from observations or residuals are not comparable to other regression model observations. If the profitability value is higher than 0.05, Heteroscedasticity may not be present in the data. Table 8 shows that the probability value is greater than 0.05. It can be stated that Heteroscedasticity is not present.

Table 7 the heteroscedasticity test results

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	2.334384	10.05994	1.334055	0.5085
DER	-5.690220	2.640557	-1.866242	0.1872
ROA	0.854883	1.075355	0.618009	0.3044
VAIC	-0.104485	0.339558	-1.118085	0.3280
SIZE	0.744507	0.955908	0.553066	0.5335

Source: secondary data (processed, 2025)

The LM test and the Durbin-Watson test are two methods for detecting autocorrelation. An autocorrelation is not formed by a signifier when the F-count exceeds 0.05. Autocorrelation is absent when D-W is less than (4-dU) and greater than (dU). Considering the outcomes of autocorrelation test, DW = 2.203755, dL= 1.6345, dU = 1.6794, 4-dU = 2.3206, 4-dL = 2.3655 and Prob. 0.513352 higher than 0.05, it is possible that autocorrelation does not form.

The t-test results can be used to ascertain how the exogenous variable affects the endogenous variable. If the probability value is sig < 0.05, then the effect of an exogenous variable on the endogenous variable is significant. Meanwhile, if the probability value is sig > 0.05, endogenous variables are unaffected by exogenous variables.

Table 8 estimation of panel data regression results

Variables	Coefficient	Std. error	t-Statistic	Prob.
DER	1.038054	0.552590	3.528216	0.0009
ROA	2.484265	1.244577	5.820437	0.0000
VAIC	0.043446	0.026130	5.250507	0.0001
SIZE	1.448866	0.158140	3.418298	0.0010
DER*SIZE	-0.153253	0.641450	-4.968986	0.1410
ROA*SIZE	4.488052	0.798764	4.705084	0.0004
VAIC*SIZE	0.373558	0.068225	2.308767	0.0017
C	30.33192	8.558265	2.245085	0.0033

Source: secondary data (processed, 2025)

Table 8 shows that the constant (α) is a positive value (30.33192); this indicates that the financial distress is 30.33192 if the DER, ROA, VAIC, and company size are 0% or

unchanged. With a positive coefficient of 1.038054 and a probability value of 0.0009 < 0.05, the DER positively and significantly affects financial distress, so H_1 is accepted. A rapid increase in financial distress will occur if the DER rises, and vice versa. ROA positively and significantly affects financial distress, achieving a positive coefficient of 2.484265 and a probability value of 0.0000 < 0.05, so H_2 is rejected. Intellectual capital positively and significantly affects financial distress, with a positive coefficient of 0.043446 and a probability of 0.0001 < 0.05, so H_3 is rejected. Company size positively and significantly affects financial distress, with a positive coefficient of 1.448866 and a probability of 0.0010 < 0.05, so H_4 is rejected.

The probability of 0.1410 > 0.05 and coefficient value of -0.153253 show that the association between DER and financial difficulty cannot be moderated by company size, so H_5 is rejected. With a coefficient value of 4.488052 and a probability of 0.0004 < 0.05, it indicates that company size can strengthen the relationship between ROA and financial distress, so H_6 is accepted. A coefficient value of 0.373558 and a probability value of 0.0017 < 0.05 indicate that company size can strengthen the relationship between financial distress and intellectual capital, so H_7 is accepted.

Table 9 the determination coefficient test results

	R-square (R^2)	Adjusted R-squared
Financial distress (Y)	0.525767	0.506044
Company size (M)	0.419950	0.407745

Source: secondary data (processed, 2025)

The coefficient of determination test (R2) results can be used to calculate the exogenous variable percentage influence on the endogenous variable. Table 9 shows that the R-square value of 0.525767 or 52.5% means simultaneous debt to equity ratio, return on asset, intellectual capital, and company size affect financial distress. However, 47.5% may be impacted by other factors not considered. The company's R-square value was 0.419950, indicating that DER, ROA, and intellectual capital impacted 41.9% of the company size. The remaining 58.1% were impacted by factors not considered in this study.

The effect of debt-to-equity ratio on financial distress

Data analysis indicates that the debt-to-equity ratio positively affects financial distress in real estate and property companies. This indicates that the more exposed the company is to risk, its debt-to-equity ratio value is higher. It indicates that the more financial leverage a company has, the more financial distress it will face because it will lower its value and send negative signals to the capital market and investors. The findings align with the signaling theory, which states that increasing the total amount of debt indicates a high probability of financial difficulties for the entity. A company will face financial difficulties if it cannot produce additional assets to offset its substantial debts (Arhinful and Radmehr 2023). Bankruptcy could result from the company's failure to manage financial difficulties carefully with the proper steps. The company's financial distress cannot be accurately predicted by looking at the size of DER value. The findings of this study are consistent with those of earlier studies by Bukhori, Kusumawati, and Meilani (2022); Naibaho and Natasya (2023), debt to equity ratio affects financial distress significantly. These findings suggest that companies with higher DER values are not always classified as being in financial distress, just as companies with lower DER values are not always classified as not in financial distress. Then, property and real estate companies must be cautious when managing their debt. High DER can boost growth (through leverage) but also increase vulnerability to financial distress. Therefore, balance in capital structure is crucial.

The effect of return on assets on financial distress

Data analysis indicates that return on assets positively affects financial distress. This indicates that the higher the company's ROA, the higher the possibility of financial distress. This finding is unusual and contradicts common logic and the view of signaling theory. Generally, a high ROA indicates a company's efficiency in generating profits from its assets, which usually reduces the risk of financial distress. However, if high ROA is positively correlated with financial distress, it means that companies that appear "healthy" in profitability are more vulnerable to financial distress (Isayas 2021). Signaling theory assumes that high ROA may come from unsustainable income, then investors or creditors catch the wrong signal, so they judge the company too optimistically. Management may polish financial reports to show high ROA to appear healthy when, in fact, the actual financial condition is deteriorating "window dressing"; in this context, ROA becomes an unreliable signal. ROA can be high because the project margin is large, but cash inflows are delayed, or short-term debt burdens are significant, causing liquidity distress even though ROA looks good. Property and real estate companies with high ROA may become too expansive or aggressive in investing, increasing debt burdens or risks and ultimately increasing financial distress. If a high ROA increases financial distress, ROA fails to function as a positive signal. This could be due to imperfect information, false signals, or industry conditions that make profitability signals irrelevant to financial risk. This study's findings do not align with a study conducted by Ferdiansyah and Widyarti (2022); Rachman (2022) that the return on assets negatively influences financial distress. This finding suggests that a high ROA does not always guarantee a company is in a healthy financial condition, especially in the property and real estate companies. Accounting profitability should be analyzed with other risk factors, such as leverage, liquidity, and funding structure. ROA can be a misleading signal if not analyzed comprehensively.

The effect of intellectual capital on financial distress

Data analysis indicates that intellectual capital positively affects financial distress. This indicates that the higher the intellectual capital a company has, the greater the likelihood that the company will experience financial difficulties. In the view of signal theory, intellectual capital is a positive signal. Investment in human resources, innovation, systems, and customer relations are indicators of long-term competitive advantage. It should signal that the company has bright prospects, is more efficient, and is less financially risky. With this finding, the market does not capture high intellectual capital as added value, especially in the property industry, which relies more on physical assets and funding. Investors and creditors consider intellectual capital irrelevant or do not contribute directly to profitability or solvency (D'Amato 2021). Companies can announce large investments in intellectual capital as a positive signal but without real results (only for images). The market then sees it as "window dressing," not a signal of real ability. Investors and creditors cannot correctly assess the benefits of intellectual capital because it is not directly visible on the balance sheet, unlike physical assets. As a result, intellectual capital is considered "empty" or not credible. The findings of this study align with those of previous research projects by Jati, Kholmi, and Jannah (2023); Pradana and Chalid (2023); intellectual capital significantly impacts financial distress. However, these findings contradict the study conducted by Widhiadnyana and Ratnadi (2019); Shahwan and Habib (2020) found that intellectual capital negatively affects financial distress. The finding that intellectual capital positively affects financial distress means that investment in intangible assets does not necessarily reduce financial risk, especially in the property and real estate sectors. This emphasizes that intellectual capital must be managed efficiently and adjusted to the characteristics of the industry so that it does not become a burden.

The effect of company size on financial distress

Data analysis indicates that a company's size positively affects financial distress. This indicates that the larger the company's size, the greater the potential or risk of the company experiencing financial distress. This can happen because of the unique characteristics of property companies and how large companies operate in this industry. Large size does not guarantee financial strength in the property sector. On the contrary, large companies are more at risk of distress under certain conditions due to high debt levels, large operational costs, delayed long-term projects and high dependence on market conditions and regulations. Signaling theory states that company management gives signals to the market through specific actions or characteristics (such as company size, capital structure, and financial performance) to indicate the actual internal conditions of the company. Large company size should be a positive signal because it is assumed to reflect stability, asset capacity, and market strength (Roosmawarni, Fatihudin, and Mauliddah 2023). However, if it positively affects financial distress, it means that large size fails to function as a signal of confidence and can even be a negative signal. Instead of reflecting strength and stability, large size signals latent financial problems, managerial risk, and high-risk expansion. The results of this research are consistent with an earlier study by Hakim et al. (2020); Miradji et al. (2024); the company's size significantly impacts financial distress. However, in contrast to research conducted by Wangsih et al. (2021); Meiliana, Muslimin, and Dalimunthe (2024), company size negatively affects financial distress. These findings indicate that larger property companies are potentially more financially risky. The implications are the need for tighter risk management, more careful supervision, and a change in market perception of company size as an indicator of strength.

The effect of debt-to-equity ratio on financial distress moderated by company size

Data analysis indicates that the company size cannot moderate the relationship between the debt-to-equity ratio and financial distress. This indicates that property and real estate companies, both large and small, remain vulnerable to financial pressure if they rely on a high-debt capital structure. This underscores the importance of leverage management, regardless of the company's operational scale. This indicates that property and real estate companies, both large and small, remain vulnerable to financial distress if they rely on a high-debt capital structure. This emphasizes the importance of leverage management, regardless of the company's operational scale. This finding occurs because the financial distress caused by large debts remains dominant in determining the company's financial condition. In property and real estate companies, where working capital is high and income is long-term, high debt levels directly impact the potential for financial distress, regardless of the company's scale (Muigai and Nasieku 2021). Signaling theory states that a company's actions and characteristics provide signals to outsiders about the company's internal conditions and prospects. The absence of moderation of company size in the relationship between DER and financial distress indicates that company size fails to provide an effective positive signal to the market. Investors and creditors pay more attention to DER as the primary risk signal because the use of large debts reflects the potential for a liquidity crisis rather than the company size. The results of this study are consistent with earlier studies by Mulatsih et al. (2024); company size is unable to moderate debt the to-equity ratio towards financial distress. This finding confirms that the company's capital structure is more important than the scale of operations in determining the financial resilience of property and real estate companies.

The effect of return on assets on financial distress moderated by company size

Data analysis indicates that company size can strengthen the relationship between ROA and financial distress. This indicates that large companies are more affected by changes

in profitability in terms of financial distress risk. This measure emphasizes how asset performance impacts financial stability, especially in the property and real estate sector with large capital and risk. This is because large companies are more sensitive to declining asset efficiency (Jiang, Zhang, and Jin 2021). High fixed costs, market pressures, profitability expectations, and managerial complexity cause low ROA to have a more significant impact on financial distress risk in large companies than in small companies. Signaling theory views this as indicating that company size strengthens the signal sent by profitability to the company's financial condition. Large companies make ROA signals more reliable, strong, and impactful. Investors, creditors, and financial analysts will take profitability signals from large companies more seriously because they are assumed to be more informative and credible. Findings from this study are consistent with earlier research by Suharti et al. (2021); Rahayuningtyas and Yanti (2023), found that the company size can moderate ROA and financial distress. This finding implies that large companies are more vulnerable to declining asset performance. Therefore, profitability becomes a key factor in maintaining the financial stability of large companies in the property and real estate sector. Investors, managers, and regulators should be more careful about low ROA signals in large companies because it has greater consequences for the potential for financial crises.

The effect of intellectual capital on financial distress moderated by company size

Data analysis indicates that company size can strengthen the effect of intellectual capital on financial distress. This indicates that intellectual capital is more effective in preventing financial distress in large companies. Large companies can utilize their intellectual resources optimally in terms of management, economic value, and market perception. Large companies have higher managerial, technological, and reputational capacities to utilize IC optimally (Le et al. 2024). The large scale allows IC to be converted into real economic value that maintains financial stability and reduces the potential for financial distress. Signaling theory views that company size strengthens and moderates positive signals from intellectual capital regarding the company's financial condition. Due to better reputation, management capacity, and transparency, intellectual capital in large companies becomes a more credible and effective signal in reducing the perception of financial distress risk. The findings of the study are consistent with research by Kurniawati, Rasyid, and Setiawan (2020); Fitriani, Suriyanti, and Ramashar (2022), the company size can moderate the effects of financial distress on intellectual capital. The findings suggest that financial resources can be allocated to companies that can effectively oversee and invest in their intellectual property. Company size plays an important role in increasing the effectiveness of intellectual capital as a tool to reduce the risk of financial distress. Thus, intellectual capital is intrinsically important and depends on the company's capacity to manage it, which is usually greater in large companies.

Conclusions

Based on the discussion, the study findings indicate that DER, ROA, intellectual capital and company size positively and significantly affect financial difficulties in real estate and property firms. On the other hand, company size can strengthen the effect of ROA and intellectual capital on financial distress. Meanwhile, a company size does not moderate DER and financial distress. Enhancements in leverage management and profitability can be essential for reducing the likelihood of financial difficulties property and real estate companies may face. A more thorough understanding of how these elements interact with financial distress offers industry decision-makers important information that paves the way for better financial management practices in real estate companies.

The theoretical implication of this research is that it can increase literacy and insight into the state of financial distress so it can be considered when investors interested in funding

property and real estate subsector businesses make investment decisions. This study gives furthermore researchers a starting point for investigating signaling theory in IDX markets, which advances our understanding of these intricate financial dynamics on a global scale. As a measure of the company's financial health, factors like profitability and leverage ratios must be considered to allow investors to make more intelligent investment choices.

One of the study's limitations is that it solely examines Indonesian real estate and property companies. As a result, further study is suggested to broaden the industries the study sample covers. It is recommended that more research be done to look at other factors affecting the company's capacity to predict financial difficulties. Future studies are encouraged to broaden the scope of the current study by adding additional years and factors, like audit committees, managerial ownership, and alternative indicators of financial distress.

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