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THE EFFECT OF BUSINESS RISK, COST TO INCOME RATIO, AND EQUITY TO ASSETS RATIO ON FINANCIAL DISTRESS IN THE PROPERTY, REAL ESTATE, AND CONSTRUCTION SECTOR (A STUDY ON PT WIJAYA KARYA (PERSERO) TBK.)

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ABSTRACT. This study empirically examines the effect of business risk, the cost to income ratio (CIR), and the equity to assets ratio (EAR) on financial distress in the property, real estate, and construction sector, using PT Wijaya Karya (Persero) Tbk. as the unit of analysis. Financial distress is measured with the modified Altman Z-Score, while business risk, CIR, and EAR serve as independent variables. A quantitative approach is applied to secondary time-series data drawn from the company's audited annual financial statements for 2008–2024, obtained from the Indonesia Stock Exchange and the company's official website, and analyzed with multiple linear regression. Classical assumption tests confirm that the data are normally distributed and free of multicollinearity, heteroscedasticity, and autocorrelation. The results show that business risk, CIR, and EAR each exert a significant positive effect on financial distress, both partially and simultaneously, with the model explaining 97.1 percent of the variation in financial distress. The findings suggest that state-owned construction enterprises need to strengthen operational efficiency and capital structure to mitigate financial distress, a concern that also resonates with the Islamic economic principles of transparency (shiddiq) and the avoidance of wasteful spending (israf).

Keywords: Business Risk; Cost to Income Ratio; Equity to Assets Ratio; Financial Distress; Altman Z-Score

Introduction

Firms must continually strengthen their competitive position to survive increasingly intense rivalry in both domestic and international markets.[1] Under accelerating globalization, companies face highly dynamic competition compounded by unpredictable macroeconomic fluctuations; those that fail to adapt risk a steady erosion of financial performance.[2]

Intensifying competition tends to raise operating burdens and erode profitability. Once a firm's performance persistently falls short of expectations, losses accumulate, liquidity is

[1] Abdul Hadi, "Pengaruh Rasio-Rasio Keuangan Terhadap Financial Distress Pada Perusahaan Sektor Perdagangan, Jasa, Dan Investasi," *Jurnal Ilmu Manajemen* 10, no. 1 (2022): 1–10, https://doi.org/10.26740/jim.v10n1.p1-10.

[2] Reksa Anugrah, Dimas Nugroho, and Asher Nuche, "Pengaruh Sistem Informasi Manajemen Dalam Pembentukan Kinerja Organisasi Bisnis Di Indonesia," *Jurnal MENTARI: Manajemen, Pendidikan Dan Teknologi Informasi* 2, no. 2 (2024): 134–41, https://doi.org/10.33050/mentari.v2i2.480.

constrained, revenue generation weakens, and the existing capital structure is progressively undermined.[3] If left uncorrected, this trajectory culminates in financial distress — a condition in which a firm can no longer meet its short- or long-term obligations, eroding the confidence of investors and creditors and, at a broader level, threatening macroeconomic stability.[4]

Islamic economic teaching offers a complementary lens on this problem. Q.S. Al-Baqarah (2:282) instructs believers to record every transaction accurately and transparently; applied to corporate governance, this implies that a firm's financial reporting system should allow the early detection of financial difficulty and timely corrective action. Financial distress, viewed from this vantage point, is closely tied to lapses in transparency (*shiddiq*) and prudent stewardship (*amanah*) in managing a firm's assets and liabilities.

Property, real estate, and construction firms constitute a strategic pillar of the Indonesian economy: they drive infrastructure development and housing provision and generate multiplier effects for related industries such as building materials and finance.[5] Yet the sector is notoriously cyclical. Economic booms trigger aggressive expansion and, eventually, oversupply, while downturns translate quickly into falling demand and financial strain.

PT Wijaya Karya (Persero) Tbk. (WIKA), a state-owned construction enterprise listed on the Indonesia Stock Exchange since 2007, illustrates this vulnerability. In 2023 the company recorded a historic net loss; its expenses — including other expenses and financing costs — rose sharply, and its shares were subsequently suspended from trading by the Exchange. Although the Government of Indonesia injected State Capital Participation of Rp 6 trillion in 2024 and a further Rp2 trillion in 2025 to support recovery, the episode illustrates how quickly a large, strategically important firm can slide toward financial distress.

WIKA is a useful case precisely because its difficulties, while serious, had not yet become an irreversible crisis at the time of observation: it therefore allows the identification of early warning signals rather than a post-mortem analysis of failure. Three firm-specific factors are of particular interest. First, business risk — the inherent variability of operating income arising independently of financial leverage — intensifies when heavy reliance on debt exposes a firm to volatile interest and repayment burdens. Second, the cost to income ratio (CIR), which reflects the efficiency with which operating expenses are converted into revenue, is a direct barometer of managerial control: a rising CIR signals that an increasing share of revenue is being absorbed by operating costs, squeezing profitability. Third, the equity to assets ratio (EAR) captures the extent to which a firm finances its assets from equity rather than debt; a low or negative EAR indicates capital erosion and heavy reliance on external financing, both of which magnify vulnerability to financial distress.

Prior studies report mixed evidence on these relationships. Working capital and leverage have been found to significantly affect financial distress among Indonesian state-owned enterprises, while managerial compensation and operating cash flow do not.[6] Business risk has

[3] Firman Hidayat, Yono Maulana, and Mochammad Iqbal Arifin, "Analisis Potensi Kebangkrutan Perusahaan Dengan Menggunakan Model Taffler, Springate, Dan Zmijewski," *INOVASI: Jurnal Ekonomi, Keuangan Dan Manajemen* 4, no. 19 (2023): 1013–20.

[4] Muhammad Iqbal Surya Pratikto, Ariza Qanita, and Rahma Ulfa Maghfiroh, "Analisis Tingkat Kesehatan Dan Potensi Financial Distress Dengan Metode RGEC Pada BNI Syariah Tahun 2014-2018," *El-Qist: Journal of Islamic Economics and Business (JIEB)* 9, no. 1 (2019): 87–101, https://doi.org/10.15642/elqist.2019.9.1.87-101.

[5] M. A. N. Amin, A. Amirah, and L. A. Azis, "Pengaruh Growth Opportunity, Pertumbuhan Aset, Profitabilitas, Dan Risiko Bisnis Terhadap Struktur Modal Pada Perusahaan Properti Dan Real Estate," *Jurnal Valuasi: Jurnal Ilmiah Ilmu Manajemen Dan Kewirausahaan* 3, no. 1 (2023): 132–51.

[6] Aries Widya Gunawan et al., "Financial Distress Di BUMN Indonesia Dan Faktor-Faktor Yang Mempengaruhi," *Ekuitas: Jurnal Ekonomi Dan Keuangan* 3, no. 2 (2019): 226–43, https://doi.org/10.24034/j25485024.y2019.v3.i2.4135.

also been linked to firm value rather than to financial distress directly.[7] Findings on CIR are similarly inconsistent: a significant effect on financial distress has been reported in the national banking sector,[8] whereas no significant effect emerges from a separate study of the same sector.[9] EAR, in turn, has been found to significantly influence stock prices[10] but not always financial distress in banking-sector studies, in contrast to evidence from equity-based capital ratios elsewhere.[11]

These inconsistencies — which vary by sector, ratio definition, and estimation period — together with the scarcity of long-horizon, single-firm case studies in the construction sector, motivate a focused re-examination of business risk, CIR, and EAR as joint predictors of financial distress, using seventeen years (2008–2024) of WIKA's audited financial statements. Building on signalling theory and bankruptcy prediction theory, this study asks: (1) does business risk affect financial distress; (2) does the cost to income ratio affect financial distress; and (3) does the equity to assets ratio affect financial distress in PT Wijaya Karya (Persero) Tbk.? The findings are expected to contribute theoretically, by extending the literature on the determinants of financial distress in the construction sector, and practically, by helping state-owned enterprises and their stakeholders detect early warning signals of financial difficulty and design timely mitigation strategies.

Literature Review

Agency Theory

1. Signalling Theory

Signalling theory originates in the analysis of information asymmetry in markets where buyers cannot verify quality and therefore price all goods identically, disadvantaging sellers of genuinely high-quality goods.[12] This insight was later extended to labour markets, showing that credible signals allow better-informed parties to distinguish themselves from others, and that the cost of signalling unfavourable information is higher than that of signalling favourable information.[13]

Applied to corporate finance, signalling theory holds that managers — who possess more accurate information about a firm's condition than outside investors and creditors — use financial statements and related disclosures to communicate that condition to the market.[14] Positive signals, such as rising profitability, controlled costs, and a strong equity base, attract capital and lower financing costs. Negative signals, such as declining earnings, mounting debt, or an inability to meet obligations, erode external confidence and can trigger

[7]Tri Purwani and Harto Listijo, "Tri Purwani and Harto Listijo, "The Effect of Business Risk and Financial Distress on Firm Value in the Technology Sector," *Remittances Review* 8, no. 4 (2023): 3643–52, https://doi.org/10.33182/rr.v8i4.251. Value in the Technology Sector," Remittances Review 8, no. 4 (2023): 3645.

[8] Imam Ardiansyah, "Pengaruh Net Cash Flow, Cost Income Ratio, Loan to Deposit Ratio, Equity Capital to Total Asset, Total Asset Growth Terhadap Financial Distress Dengan Corporate Governance Sebagai Variabel Moderasi Pada Bank BUMN Dan Bank Umum Swasta Nasional Tahun 2014-2018," *Jurnal STEI Ekonomi* 4, no. 1 (2019): 75–84.

[9] Odilia Trisindy Beo and Ika Wulandari, "Pengaruh Financial Distress Pada Perusahaan Perbankan Yang Terdapat Di Indonesia," *Jurnal Akuntansi AKUNESA* 12, no. 3 (2024): 272–82, https://doi.org/10.26740/akunesa.v12n3.p272-282.

[10] Rauddina Alyani et al., "Pengaruh Equity to Total Asset Ratio (EAR), Inflasi Dan Suku Bunga Terhadap Harga Saham," *KINERJA: Jurnal Ekonomi Dan Manajemen* 19, no. 3 (2022): 567.

[11] Hendi and Kellys, "Prediksi Financial Distress Menggunakan Model Z-Score Pada Bank Yang Terdaftar Di Bursa Efek Indonesia," 1, no. 1 (2021): 987–98.

[12] George A. Akerlof, "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism," *The Quarterly Journal of Economics* 84, no. 3 (1970): 488–500, https://doi.org/10.2307/1879431.

[13] Michael Spence, "Job Market Signaling," *The Quarterly Journal of Economics* 87, no. 3 (1973): 355–74, https://doi.org/10.2307/1882010.

[14] Thomas Sumarsan Goh, *Monograf: Financial Distress*, 1st ed. (Sidoarjo: Indomedia Pustaka, 2023).

a self-reinforcing withdrawal of investor and creditor support, worsening the firm's financial position.[15]

2. Bankruptcy and Financial Distress Theory

The systematic study of corporate failure began with a discriminant-analysis model that combined several financial ratios into a single index — the Z-Score — to classify firms as distressed or healthy.[16] Later contributions refined this approach, including a logit-based probabilistic model of bankruptcy[17] and alternative estimation techniques for financial-distress prediction models.[18] Across these traditions, financial distress is understood as a continuum rather than a binary event: a firm's cash flow becomes progressively insufficient to service its short- and long-term obligations until, absent corrective action, insolvency and bankruptcy follow.[19]

This study operationalises financial distress using the modified Altman Z-Score for non-manufacturing/emerging-market firms, $Z = 6.56T1 + 3.26T2 + 6.72T3 + 1.05T4$, where T1 is working capital to total assets, T2 is retained earnings to total assets, T3 is earnings before interest and tax to total assets, and T4 is the book value of equity to the book value of total debt.[20] Under this classification, $Z \geq 2.6$ indicates a safe zone, $1.1 \leq Z < 2.6$ a grey zone, and $Z < 1.1$ a distress zone.

3. Business Risk

Business risk denotes the inherent variability of a firm's operating income, arising from its business model and operating environment independently of how the firm is financed. It is commonly proxied by the ratio of earnings before interest and tax to sales.[21] Business risk intensifies when a firm relies heavily on debt to meet its funding needs, since debt-service obligations compound the volatility already present in operating cash flows.[22] Firms exposed to high business risk face greater uncertainty in revenue generation and cost management, both of which are proximate drivers of financial distress.[23]

4. Cost to Income Ratio

The cost to income ratio (CIR) measures the proportion of operating income absorbed by operating expenses and is a direct gauge of managerial efficiency. A low CIR indicates that management converts revenue into profit while containing costs, strengthening the firm's financial resilience, whereas a persistently high or rising CIR signals waste, uncontrolled

[15] Melanny Methasari, *Analisis Nilai Perusahaan Perbankan Dengan Kebijakan Dividen Sebagai Variabel Moderasi Di Bursa Efek Indonesia* (Surabaya: Mitra Abisatya, 2021).

[16] Edward I. Altman, "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy," *The Journal of Finance* 23, no. 4 (1968): 589–609, https://doi.org/10.2307/2325319.

[17] James A. Ohlson, "Financial Ratios and the Probabilistic Prediction of Bankruptcy," *Journal of Accounting Research* 18, no. 1 (1980): 109–31, https://doi.org/10.2307/2490395.

[18] Mark E. Zmijewski, "Methodological Issues Related to the Estimation of Financial Distress Prediction Models," *Journal of Accounting Research* 22 (1984): 59–82, https://doi.org/10.2307/2490859.

[19] Harlan D. Platt and Marjorie B. Platt, "Predicting Corporate Financial Distress: Reflections on Choice-Based Sample Bias," *Journal of Economics and Finance* 26, no. 2 (2002): 184–99, https://doi.org/10.1007/BF02755985.

[20] Hadi, "Pengaruh Rasio-Rasio Keuangan Terhadap Financial Distress Pada Perusahaan Sektor Perdagangan, Jasa, Dan Investasi."

[21] Zuriyah Toyibah and Endang Ruhiyat, "Pengaruh Risiko Bisnis, Financial Distress, Dan Kebijakan Investasi Terhadap Nilai Perusahaan Dengan Peran Research and Development Sebagai Variabel Moderasi," *Account* 10, no. 1 (2023): 2000–2013, https://doi.org/10.32722/account.v10i1.5506.

[22] Raphael Amit and Birger Wernerfelt, "Why Do Firms Reduce Business Risk?," *Academy of Management Journal* 33, no. 3 (1990): 520–33, https://doi.org/10.5465/256579.

[23] Nenie Khoiria Nurwardani and Imam Hidayat, "Pengaruh Profitabilitas Dan Risiko Bisnis Terhadap Struktur Modal Perusahaan Food and Beverage," *Jurnal Ilmu Dan Riset Manajemen* 6, no. 6 (2017): 1–14.

spending, or revenue erosion — each of which strains liquidity and pushes the firm toward financial distress.[24]

5. Equity to Assets Ratio

The equity to assets ratio (EAR) expresses the share of a firm's assets financed by owners' equity rather than debt, and thus proxies capital-structure risk.[25] A higher EAR indicates lower reliance on external debt and, correspondingly, lower financial risk, while also reflecting owners' stronger commitment to the firm's continuity, since more of their own capital is at stake. A low or negative EAR — where liabilities exceed assets — signals capital erosion and, under bankruptcy theory, an elevated probability of insolvency.

6. Prior Research

Empirical findings on these relationships remain mixed. Working capital and leverage have been found to significantly affect financial distress among Indonesian state-owned enterprises that received government capital injections, while managerial compensation and operating cash flow do not.[26] Business risk and financial distress have jointly been shown to affect firm value in the technology sector, although their reciprocal relationship was not directly modelled.[27] Among internal ratios, leverage and liquidity are the strongest predictors of distress in property and real estate service firms, whereas profitability and activity ratios are not.[28] Business risk, financial distress, and investment policy have also been found to jointly shape firm value, although research and development does not moderate the relationship between business risk and firm value.[29]

EAR has been found to positively and significantly affect stock prices, while inflation and interest rates do not.[30] In the banking sector, the loan-to-deposit ratio has been found to negatively affect financial distress while CIR and equity-based capital ratios are not significant[31] — a finding that contrasts with evidence of a significant CIR effect on financial distress in state-owned and national private banks.[32] In the property and real estate sector specifically, leverage and firm-specific characteristics have been identified as salient determinants of distress.[33] These divergent findings, which vary by sector, ratio definition, and estimation period, justify a focused, long-horizon, single-firm test of business risk, CIR, and EAR in the construction sector.

[24] Ardiansyah, "Pengaruh Net Cash Flow, Cost Income Ratio, Loan to Deposit Ratio, Equity Capital to Total Asset, Total Asset Growth Terhadap Financial Distress Dengan Corporate Governance Sebagai Variabel Moderasi Pada Bank BUMN Dan Bank Umum Swasta Nasional Tahun 2014-2018."

[25] Vivin Indarwati and Edy Anan, "Pengaruh Rasio-Rasio Keuangan Terhadap Kinerja Bank Di Indonesia (Studi Kasus Pada Bank Pembangunan Daerah Di Indonesia Periode 2008-2012)," *EBBANK* 5, no. 2 (2014): 35–54.

[26] Gunawan et al., "Financial Distress Di BUMN Indonesia Dan Faktor-Faktor Yang Mempengaruhi."

[27] Purwani and Listijo, "The Effect of Business Risk and Financial Distress on Firm Value in the Technology Sector."

[28] Suryani Suryani and Desy Mariani, "Memprediksi Financial Distress Melalui Faktor Internal Pada Perusahaan Jasa Sub Sektor Property Dan Real Estate," *Jurnal Ilmiah Akuntansi Kesatuan* 10, no. 3 (2022): 443–54, https://doi.org/10.37641/jiakes.v10i3.1441.

[29] Toyibah and Ruhiyat, "Pengaruh Risiko Bisnis, Financial Distress, Dan Kebijakan Investasi Terhadap Nilai Perusahaan Dengan Peran Research and Development Sebagai Variabel Moderasi."

[30] Alyani et al., "Pengaruh Equity to Total Asset Ratio (EAR), Inflasi Dan Suku Bunga Terhadap Harga Saham."

[31] Beo and Wulandari, "Pengaruh Financial Distress Pada Perusahaan Perbankan Yang Terdapat Di Indonesia."

[32] Ardiansyah, "Pengaruh Net Cash Flow, Cost Income Ratio, Loan to Deposit Ratio, Equity Capital to Total Asset, Total Asset Growth Terhadap Financial Distress Dengan Corporate Governance Sebagai Variabel Moderasi Pada Bank BUMN Dan Bank Umum Swasta Nasional Tahun 2014-2018."

[33] Inggriyani Wilda Utami and Titis Puspitaningrum Dewi Kartika, "Determinants of Financial Distress in Property and Real Estate Companies," *The Indonesian Accounting Review* 9, no. 1 (2019): 109–20, https://doi.org/10.14414/tiar.v9i1.1705.

7. Hypothesis Development

Business Risk and Financial Distress.

High business risk directly threatens a firm's capacity to generate stable revenue and manage costs efficiently. Under signalling theory, a rising risk profile — manifest in falling profit, mounting debt, or an inability to meet short-term obligations — sends a negative signal that erodes external confidence and discourages the capital inflows a firm needs to sustain performance.[34] Higher business risk has been found to be associated with greater financial distress,[35] and although firms with lower business risk can more safely expand their use of debt, excessive leverage itself feeds back into higher business risk and, ultimately, a greater likelihood of distress or bankruptcy.[36]

H1: Business risk has a positive effect on financial distress.

Cost to Income Ratio and Financial Distress.

Under conditions of information asymmetry, CIR functions as a signal of operating efficiency: a low CIR signals disciplined cost management and solid profitability prospects, while a high CIR signals operational inefficiency and elevated financial risk. Consistent with bankruptcy-prediction theory, in which financial ratios serve as early-warning indicators, an unchecked rise in operating expenses relative to income squeezes cash flow and profitability, pushing the firm toward financial distress.[37] Contrasting evidence from the banking sector, however, finds no significant CIR effect on distress,[38] underscoring the value of testing the relationship in a non-financial, capital-intensive sector such as construction.

H2: Cost to income ratio has a positive effect on financial distress.

Equity to Assets Ratio and Financial Distress.

Signalling theory suggests that a high EAR — reflecting a solid capital structure with limited reliance on debt — sends a positive signal of financial stability and resilience to economic shocks, whereas a low or negative EAR signals the opposite. Within bankruptcy-prediction theory, EAR functions as a leverage indicator: the smaller the share of assets financed by equity, the greater the reliance on debt financing, and the higher the resulting interest burden and default risk. A positive relationship between equity-based capital ratios and financial distress has been reported elsewhere.[39]

H3: Equity to assets ratio has a positive effect on financial distress.

Together, these hypotheses form the conceptual framework of the study, summarised schematically as: Business Risk (X1) → Financial Distress (Y) ← Cost to Income Ratio (X2), Equity to Assets Ratio (X3). Business risk (X1), the cost to income ratio (X2), and the equity to assets ratio (X3) are thus posited as independent variables jointly and partially predicting financial distress (Y).

[34] Methasari, *Analisis Nilai Perusahaan Perbankan Dengan Kebijakan Dividen Sebagai Variabel Moderasi Di Bursa Efek Indonesia*.

[35] Nurwardani and Hidayat, "Pengaruh Profitabilitas Dan Risiko Bisnis Terhadap Struktur Modal Perusahaan Food and Beverage."

[36] Intan Dwi Cahyani and Yuyun Isbanah, "Pengaruh Struktur Kepemilikan, Tangibility, Firm Age, Business Risk, Kebijakan Dividen, Dan Sales Growth Terhadap Struktur Modal Perusahaan Sektor Properti Real Estate Yang Terdaftar Di BEI Tahun 2012-2016," *Jurnal Ilmu Manajemen (JIM)* 7, no. 1 (2018): 124–32.

[37] Ardiansyah, "Pengaruh Net Cash Flow, Cost Income Ratio, Loan to Deposit Ratio, Equity Capital to Total Asset, Total Asset Growth Terhadap Financial Distress Dengan Corporate Governance Sebagai Variabel Moderasi Pada Bank BUMN Dan Bank Umum Swasta Nasional Tahun 2014-2018."

[38] Beo and Wulandari, "Pengaruh Financial Distress Pada Perusahaan Perbankan Yang Terdapat Di Indonesia."

[39] Hendi and Kellys, "Prediksi Financial Distress Menggunakan Model Z-Score Pada Bank Yang Terdaftar Di Bursa Efek Indonesia."

Research methods

This study adopts a quantitative approach using secondary time-series data. The object of the study is PT Wijaya Karya (Persero) Tbk. (WIKA), a state-owned construction enterprise listed on the Indonesia Stock Exchange since 2007. The population comprises WIKA's complete audited annual financial statements, from which a purposive sample of seventeen annual observations covering the 2008–2024 period was drawn, selected on the basis of data completeness and consistency. Data were collected through documentation, using audited financial statements published on the official websites of the Indonesia Stock Exchange and PT Wijaya Karya (Persero) Tbk.

The dependent variable, financial distress, is measured with the modified Altman Z-Score ($Z = 6.56T1 + 3.26T2 + 6.72T3 + 1.05T4$). The independent variables are business risk (earnings before interest and tax divided by sales), the cost to income ratio (operating expenses divided by operating income), and the equity to assets ratio (total equity divided by total assets).

Data were analyzed using descriptive statistics followed by multiple linear regression, estimated with IBM SPSS Statistics version 27. Prior to estimation, classical assumption tests were conducted: normality (One-Sample Kolmogorov–Smirnov test), multicollinearity (tolerance and variance inflation factor), heteroscedasticity (Park test), and autocorrelation (Durbin–Watson statistic).[40] Hypotheses were tested partially with the t-test and simultaneously with the F-test, both at a 5 percent significance level, while the adjusted coefficient of determination (Adjusted R^2) was used to assess the overall explanatory power of the model.

Results and Discussion

Overview of the Research Object

PT Wijaya Karya (Persero) Tbk. (WIKA) was selected as the research object for three reasons. First, as a state-owned enterprise listed on the Indonesia Stock Exchange since 2007, its financial statements are both publicly accessible and independently audited. Second, its 2007 initial public offering allows uninterrupted observation of financial performance across seventeen years (2008–2024), a horizon long enough to capture cyclical dynamics in the construction sector. Third, WIKA is one of Indonesia's largest state-owned construction firms; although it has recorded a declining net-profit trend over the past five years, its condition had, at the point of observation, not yet reached an irreversible crisis, making it well suited to studying the early build-up of financial distress rather than its terminal stage.

Research Data

The annual values of business risk (X1), the cost to income ratio (X2), the equity to assets ratio (X3), and the Altman Z-Score (Y) for the 2008–2024 period are presented in Table 1.

Table 1. Business Risk, CIR, EAR, and Altman Z-Score of PT Wijaya Karya (Persero) Tbk., 2008–2024

Year	Business Risk (X1)	CIR (X2)	EAR (X3)	Z-Score (Y)
2008	0.0439	0.0236	0.2788	2.6417
2009	0.0736	0.0244	0.2679	2.9456
2010	0.0793	0.0325	0.2355	2.8041
2011	0.0844	-0.0273	0.0855	1.8053
2012	0.0861	-0.0271	0.0602	1.6337
2013	0.1023	-0.0309	0.0552	1.6840
2014	0.1124	-0.0316	0.0652	1.8086

[40] Imam Ghozali, *Aplikasi Analisis Multivariate Dengan Program IBM SPSS 25*, 9th ed. (Semarang: Badan Penerbit Universitas Diponegoro, 2018).

2015	0.1112	-0.0315	0.1001	1.9138
2016	0.1327	-0.0336	0.2234	2.8958
2017	0.0887	-0.0259	0.1956	2.4048
2018	0.1231	-0.0252	0.2584	2.8619
2019	0.1358	-0.0342	0.1930	2.5171
2020	0.0885	-0.0541	0.0560	1.0604
2021	0.0631	-0.0443	0.0031	0.6911
2022	0.0798	-0.0338	0.0466	0.9682
2023	-0.1699	-0.0437	-0.1173	-1.1285
2024	0.1032	-0.0646	0.1765	1.3440

Source: PT Wijaya Karya (Persero) Tbk. audited annual financial statements, 2008–2024 (processed).

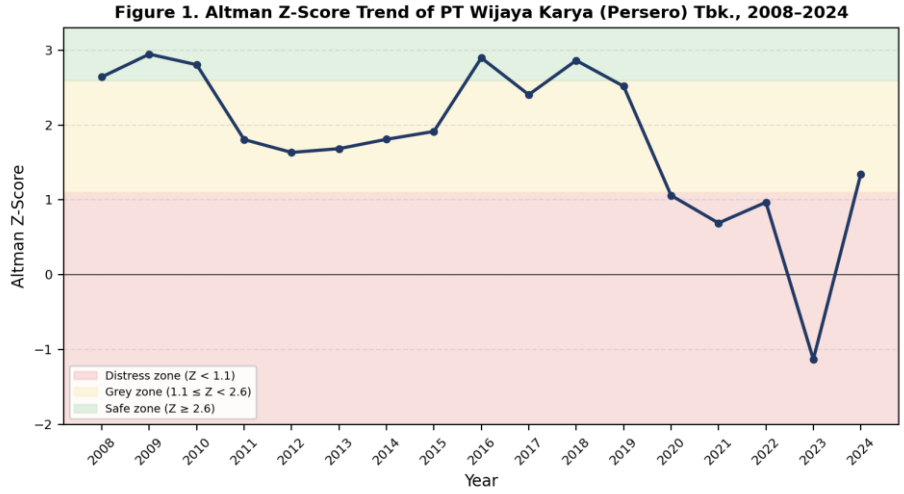

Figure 1. Altman Z-Score Trend of PT Wijaya Karya (Persero) Tbk., 2008–2024
Source: Author's construction based on Table 1.

The Z-Score trend in Figure 1 shows that WIKA remained in the grey or safe zone from 2008 through 2019, deteriorated sharply into the distress zone from 2020, and reached its lowest point in 2023 (Z = −1.13) before a partial recovery in 2024 following the injection of State Capital Participation — a pattern broadly consistent with the company's reported financial difficulties over the same period.

Descriptive Statistics

Table 2. Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Business Risk (X1)	17	-0.1699	0.1358	0.0787	0.0685
CIR (X2)	17	-0.0646	0.0325	-0.0251	0.0269
EAR (X3)	17	-0.1173	0.2789	0.1285	0.1104
Financial Distress (Y)	17	-1.1285	2.9456	1.8148	1.0470

Source: SPSS output, version 27, 2025.

Financial distress shows a mean of 1.8148, exceeding its standard deviation of 1.0470, indicating a relatively homogeneous spread of scores across the 17 observations, ranging from

−1.1285 to 2.9456. Business risk and EAR likewise show means that exceed their respective standard deviations, indicating homogeneous distributions, while CIR shows a small negative mean (−0.0251) with a standard deviation of 0.0269, reflecting the mixed cost-efficiency performance recorded across the observation period.

Classical Assumption Tests

Table 3. Normality Test

Test	Statistic	Result
One-Sample Kolmogorov–Smirnov	Asymp. Sig. (2-tailed) = 0.200	Residuals are normally distributed (p > 0.05)

Source: SPSS output, version 27, 2025.

Table 4. Multicollinearity Test

Variable	Tolerance	VIF	Conclusion
Business Risk (X1)	0.532	1.880	No multicollinearity
CIR (X2)	0.502	1.992	No multicollinearity
EAR (X3)	0.347	2.882	No multicollinearity

Source: SPSS output, version 27, 2025.

Table 5. Heteroscedasticity Test (Park Test)

Variable	Beta	Sig.	Conclusion
Business Risk (X1)	-4.631	0.441	No heteroscedasticity
CIR (X2)	-31.451	0.060	No heteroscedasticity
EAR (X3)	4.762	0.307	No heteroscedasticity

Source: SPSS output, version 27, 2025.

Table 6. Autocorrelation Test

Durbin–Watson	dL	dU	4 − dU	Conclusion
1.777	0.897	1.710	2.290	No autocorrelation (dU < d < 4 − dU)

Source: SPSS output, version 27, 2025.

All classical assumption tests are satisfied: the residuals are normally distributed, no independent variable exhibits multicollinearity (VIF well below 10; tolerance well above 0.10), no heteroscedasticity is detected under the Park test (all significance values exceed 0.05), and the Durbin–Watson statistic (1.777) falls between dU (1.710) and 4 − dU (2.290), indicating the residuals are free of positive autocorrelation.[41]

[41] Ghozali, *Aplikasi Analisis Multivariate Dengan Program IBM SPSS 25*.

Hypothesis Testing

Table 7. Partial Test (t-test)

Variable	Predicted Sign	B	t	Sig.	Conclusion
(Constant)		1.496	8.198	0.001	
Business Risk (X1)	+	5.229	6.677	0.001	H1 supported
CIR (X2)	+	24.866	5.799	0.003	H2 supported
EAR (X3)	+	5.977	11.614	0.001	H3 supported

Source: SPSS output, version 27, 2025.

Table 8. Simultaneous Test (F-test)

F	Sig.	Conclusion
179.881	0.001	X1, X2, and X3 jointly and significantly affect Y

Source: SPSS output, version 27, 2025.

Table 9. Coefficient of Determination

R Square	Adjusted R Square
0.976	0.971

Source: SPSS output, version 27, 2025.

The t-test results in Table 7 show that business risk (Sig. = 0.001), CIR (Sig. = 0.003), and EAR (Sig. = 0.001) each have a significance value below 0.05, with positive regression coefficients (B), indicating that all three variables partially and significantly increase financial distress, thereby supporting H1, H2, and H3. The F-test (Table 8) yields F = 179.881 with Sig. = 0.001, confirming that business risk, CIR, and EAR jointly and significantly affect financial distress. The Adjusted R Square of 0.971 (Table 9) indicates that the three independent variables jointly explain 97.1 percent of the variation in financial distress, with the remaining 2.9 percent attributable to factors outside the model.

Discussion

The finding that business risk has a significant positive effect on financial distress is consistent with bankruptcy theory, in which business risk reflects the volatility of a firm's revenue and cash flow. Firms with higher business risk face greater operational uncertainty, making them more vulnerable to sharp revenue declines or economic shocks, which directly raises the probability of financial failure. Under signalling theory, a high business-risk profile also transmits a negative signal to investors and creditors, who may respond by withdrawing capital or demanding higher returns and interest rates, further straining the firm's financial condition. This result is consistent with prior evidence linking business risk to financial distress and value destruction more broadly.[42]

CIR is likewise found to have a significant positive effect on financial distress: the higher the CIR, the greater the likelihood of financial distress. A rising CIR functions as a negative

[42] I. Gusti Agung Ayu Meilyani, Ni Made Suci, and Wayan Cipta, "Pengaruh Risiko Bisnis, Ukuran Perusahaan Dan Pertumbuhan Penjualan Terhadap Struktur Modal Pada Perusahaan Properti Dan Real Estate Yang Terdaftar Di Bursa Efek Indonesia," *Prospek: Jurnal Manajemen Dan Bisnis* 1, no. 2 (2019): 15–24, https://doi.org/10.23887/pjmb.v1i2.23150.

signal of operational inefficiency — an increasing share of revenue is absorbed by operating expenses, eroding profitability and, ultimately, undermining investor confidence and access to new financing. Within bankruptcy-prediction theory, CIR thus serves as an early-warning indicator: sustained cost inefficiency reduces the cash available to service obligations and can progressively push a firm toward insolvency. This finding aligns with evidence that CIR significantly increases the likelihood of financial distress in the banking sector.[43]

EAR is also found to have a significant positive effect on financial distress in this sample, indicating that a decline in the value of the firm's equity coincides with an increased risk of financial distress. This pattern is most pronounced when a firm's equity position turns negative — that is, when total liabilities exceed total assets, mathematically driving EAR toward very low or negative values. Such episodes typically reflect the accumulation of losses from stalled or failed projects and mounting uncollectible receivables, both common in capital-intensive construction operations financed heavily through bank and supplier debt. When projects are delayed, debt service becomes difficult while unpaid receivables continue to drain cash, jointly eroding assets, inflating liabilities, and compressing equity toward the threshold of financial distress. A near-zero or negative EAR signals that a firm has exhausted its capital buffer against future losses, a warning consistent with prior evidence that equity-based capital ratios positively predict financial distress.[44]

These findings — elevated business risk, a high CIR reflecting operational inefficiency, and a low or negative EAR reflecting equity erosion — can also be read through the lens of Islamic economic principles. Honesty (shiddiq) and transparency in mu‘amalah (dealings) are emphasized in Q.S. At-Taubah (9:119), which calls on believers to remain truthful, and in Q.S. Al-Baqarah (2:282), which commands the accurate and fair recording of debts and obligations — a principle that, applied to corporate reporting, requires honest rather than manipulated disclosure of a firm's financial health. Persistent operational inefficiency and uncontrolled business risk, in turn, resemble the concept of israf (wasteful extravagance), which Islamic teaching prohibits because it depletes wealth and threatens business continuity, contrary to the principles of professionalism (ihsan) and accountability (amanah) in the stewardship of resources, as reflected in Q.S. Al-Isra' (17:26–27). A depleted equity base, similarly, runs counter to the maqashid syariah objective of safeguarding wealth (hifzh al-mal). Viewed this way, the financial distress documented in this study can be understood as a consequence of departing from these principles of honest disclosure, disciplined resource use, and prudent capital stewardship.

Conclusion

This study examined the effect of business risk, the cost to income ratio, and the equity to assets ratio on financial distress in PT Wijaya Karya (Persero) Tbk. over the 2008–2024 period. Three conclusions follow. First, business risk has a significant positive effect on financial distress: firms with higher business risk face greater operational uncertainty and are correspondingly more vulnerable to financial failure. Second, the cost to income ratio has a significant positive effect on financial distress: the higher the CIR, the greater the likelihood of financial distress, reflecting weaker operational efficiency. Third, the equity to assets ratio has a significant positive effect on financial distress in this sample: the lower, or more negative, a firm's equity position, the greater its exposure to financial difficulty — a pattern in the construction sector often traced to uncontrolled debt accumulation and uncollectible

[43] Ardiansyah, “Pengaruh Net Cash Flow, Cost Income Ratio, Loan to Deposit Ratio, Equity Capital to Total Asset, Total Asset Growth Terhadap Financial Distress Dengan Corporate Governance Sebagai Variabel Moderasi Pada Bank BUMN Dan Bank Umum Swasta Nasional Tahun 2014-2018.”

[44] Hendi and Kellys, “Prediksi Financial Distress Menggunakan Model Z-Score Pada Bank Yang Terdaftar Di Bursa Efek Indonesia.”

receivables. Jointly, the three variables explain 97.1 percent of the variation in financial distress, underscoring their combined explanatory power for this case.

Suggestions

State-owned enterprises facing similar conditions are advised to implement comprehensive risk-mitigation strategies without delay, to contain adverse financial consequences and restore financial stability. Future research is encouraged to extend the model with additional predictors not examined here — such as activity ratios, growth ratios, firm size, macroeconomic growth, and exchange-rate movements — and to undertake comparative studies across other property, real estate, and construction firms to assess whether the effects of business risk, CIR, and EAR on financial distress documented here generalize beyond a single state-owned enterprise.

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