




# “Impact of investment efficiency on financial distress risk: Listed firms in ASEAN-6”

<b>AUTHORS</b>	Thuy Duong Phan  Thi Thanh Hoang 
<b>ARTICLE INFO</b>	Thuy Duong Phan and Thi Thanh Hoang (2026). Impact of investment efficiency on financial distress risk: Listed firms in ASEAN-6. <i>Investment Management and Financial Innovations</i> , 23(3), 1-15. doi: <a href="https://doi.org/10.21511/imfi.23(3).2026.01">10.21511/imfi.23(3).2026.01</a>
<b>DOI</b>	<a href="http://dx.doi.org/10.21511/imfi.23(3).2026.01">http://dx.doi.org/10.21511/imfi.23(3).2026.01</a>
<b>RELEASED ON</b>	Wednesday, 01 July 2026
<b>RECEIVED ON</b>	Thursday, 29 January 2026
<b>ACCEPTED ON</b>	Tuesday, 23 June 2026
<b>LICENSE</b>	 This work is licensed under a <a href="https://creativecommons.org/licenses/by/4.0/">Creative Commons Attribution 4.0 International License</a>
<b>JOURNAL</b>	"Investment Management and Financial Innovations"
<b>ISSN PRINT</b>	1810-4967
<b>ISSN ONLINE</b>	1812-9358
<b>PUBLISHER</b>	LLC “Consulting Publishing Company “Business Perspectives”
<b>FOUNDER</b>	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

**41**



NUMBER OF FIGURES

**3**



NUMBER OF TABLES

**9**

© The author(s) 2026. This publication is an open access article.



## BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"  
Hryhorii Skovoroda lane, 10,  
Sumy, 40022, Ukraine  
[www.businessperspectives.org](http://www.businessperspectives.org)

**Type of the article:** Research Article

**Received on:** 29<sup>th</sup> of January, 2026

**Accepted on:** 23<sup>rd</sup> of June, 2026

**Published on:** 1<sup>st</sup> of July, 2026

© Thuy Duong Phan, Thi Thanh Hoang, 2026

Thuy Duong Phan, Assoc. Prof.,  
Finance – Accounting and Sustainable  
Management Research Group,  
University of Transport Technology,  
Vietnam.

Thi Thanh Hoang, Ph.D., Finance  
– Accounting and Sustainable  
Management Research Group,  
University of Transport Technology,  
Vietnam. (Corresponding author)



This is an Open Access article,  
distributed under the terms of the  
[Creative Commons Attribution 4.0  
International license](https://creativecommons.org/licenses/by/4.0/), which permits  
unrestricted re-use, distribution, and  
reproduction in any medium, provided  
the original work is properly cited.

**Conflict of interest statement:**

Author(s) reported no conflict of interest

Thuy Duong Phan (Vietnam), Thi Thanh Hoang (Vietnam)

# IMPACT OF INVESTMENT EFFICIENCY ON FINANCIAL DISTRESS RISK: LISTED FIRMS IN ASEAN-6

## Abstract

This study examines the impact of investment efficiency on firms' financial distress risk in ASEAN. Using 30,440 firm-year observations from listed firms in Vietnam, Malaysia, Thailand, Indonesia, Singapore, and the Philippines during 2015–2024, financial distress risk is measured by the O-score and Z-score. Listed firms are classified into overinvestment and underinvestment groups based on the model residuals. Control variables are return on total assets, leverage, firm size, and growth rate. The results obtained using the FGLS estimation method indicate that overinvestment and underinvestment increase financial distress risks for ASEAN firms as measured by the O-score. Overinvestment increases financial risk (coefficient 0.3-0.63), with the most severe impact in Thailand and Malaysia (coefficient 0.95-0.99) and Vietnam (coefficient 0.39). High debt is consistently the biggest risk factor (coefficient >7.1), while profitability is the strongest risk mitigation factor (coefficient <-6.6). By contrast, Z-score results show higher safety for overinvestment and insignificant underinvestment. However, the impact of investment efficiency on financial distress risk, whether linear or non-linear, differs across countries. The results indicate an inverted U-shaped relationship in Indonesia, the Philippines, Thailand, and Vietnam, while no statistically significant evidence of a non-linear relationship is found for Malaysia and Singapore. In the Philippines and Thailand, the non-linear effect is strong, with investment-deficit coefficients of 1.9416 and 1.6463, respectively, indicating a sharp increase in financial risk in the early stages of investment cuts. These findings provide valuable empirical evidence for firms in mitigating financial distress risk and enhancing sustainable value.

## Keywords

investment efficiency, financial distress, risk, ASEAN, O-score, Z-score, overinvestment, underinvestment

## JEL Classification

G30, G31, G32

## INTRODUCTION

In the current economic instability, identifying factors that can increase the risk of financial distress is a crucial issue in corporate finance research. Companies at risk of financial difficulties will have to restrict investment, even in projects with positive net present value, leading to reduced operational efficiency, increased bankruptcy risk, and financial insecurity. It shows that the risk of financial distress is not only a result of declining financial capacity but can also stem from the business's own important economic decisions, with investment decisions being a particularly important aspect to consider.

Investment plays a vital role in maintaining a business's operations and growth. However, investment also carries inherent risks. When a business uses external capital to finance investments, it puts pressure on cash flow, and profits may become negative due to significant delays. During the setup phase, operating costs increase due to the installation of new production equipment and investment in new technology, leading to financial difficulties for the business. Decisions to overinvest or underinvest can increase the risk of financial distress for the business by reducing profits.

In ASEAN countries, cooperation agreements have been signed to create a stable financial environment for the region's overall development. Simultaneously, internal competition within the ASEAN Economic Community, along with global competition, forces businesses to maintain financial efficiency and enhance risk control during development. In this context, the relationship between investment efficiency and financial distress risk needs careful consideration, especially given that businesses in ASEAN economies often face high growth demands, limited financial resources, and varying market conditions. Therefore, the scientific questions arise: whether overinvestment and underinvestment significantly increase the financial distress risk of listed companies in the ASEAN-6 countries, and whether the magnitude and form of this relationship differ across markets with varying institutional environments.

## 1. LITERATURE REVIEW AND HYPOTHESES

Financial distress risk occurs when a business faces a significant probability of being unable to meet its financial obligations in full (Gordon, 1971; Baldwin & Mason, 1983). It reflects a business's vulnerability to shocks from the business environment, debt pressure, and operational capacity constraints. Financial distress prediction has developed from Beaver's (1966) ratio-based approach to Altman's (1968) Z-score and Ohlson's (1980) O-score models. Because these models capture different aspects of financial fragility, this study uses both the Z-score and O-score to assess financial distress risk more comprehensively. Previous studies have shown that financial distress risk can arise from a shortage of financial resources or a high leverage ratio (Whitaker, 1999), poor governance quality (Younas et al., 2021), and adverse economic fluctuations, such as recessions (Yousaf et al., 2024). These factors not only impair solvency but also negatively affect the business's operational efficiency and financial sustainability. That makes investment performance a distinct predictor of financial distress risk, both theoretically and empirically, and one that has been studied separately.

From a theoretical perspective, the relationship between inefficient investment and financial distress risk can be explained by several key theoretical foundations. The business life cycle theory (Mueller, 1972) suggests that leaders' decisions regarding scaling and investment strategies change across different stages of a business's development. During the Startup and Rapid Growth phases, businesses are often willing to take risks to expand, leading to overinvestment. Conversely, due to lower growth opportunities during the Mature

and Diversification phases, businesses tend to be more cautious in their investments, resulting in underinvestment. Inefficient investment puts financial pressure on the business. Agency theory (Jensen & Meckling, 1976), based on agency, ownership, and finance theory, defines the conflict of interest between shareholders and managers as leading to erroneous investment decisions due to potential agency costs. Overinvestment to pursue managerial interests or underinvestment to avoid risk both reduce capital efficiency, thereby increasing the risk of financial distress. Furthermore, the pecking order theory (Myers, 1984) explains the impact of prioritizing internal capital (retained earnings) over external capital (debt or equity). When a business lacks sufficient internal capital, the use of external capital, with its high costs and information asymmetry, restricts the business's investment. Low investment efficiency and debt repayment pressure will lead to financial difficulties. Overall, these theoretical approaches suggest that deviations from optimal investment levels, whether overinvestment or underinvestment, can impair capital efficiency, put pressure on cash flow, and increase the risk of financial distress for the business.

Empirical studies have measured the impact of overinvestment and underinvestment on companies' financial distress risk across countries (Cleary, 1999; Vosoughi et al., 2016). Overinvestment and diversification of investments to drive growth can lead to financial distress risk. Empirical studies by Männasoo et al. (2018) and Geng et al. (2025) show that overinvestment increases financial distress risk. Overinvestment reduces a company's cash reserves and subsequent cash flow, thus increasing the need for external financing (Chen et al., 2016). Harris and Raviv (1991) indicated that when companies opt for external financing, they face higher

cost pressures due to increased financial distress risk and higher debt-related costs. Geng et al. (2025) clarify the impact of inefficient investment on financial distress risk, examining it across specific company characteristics and market conditions. However, the evidence is not uniformly negative. The distress consequences of overinvestment diminish significantly in firms with strong governance and low information asymmetry, suggesting that institutional context moderates the relationship in European firms (Morgado & Pindado, 2003). Not all excess investment is value-destroying – firms in high-growth industries may rationally invest above the baseline implied by current fundamentals, and classifying such investment as overinvestment may overstate the risk implications. Conversely, underinvestment can also create equally adverse consequences. When a business does not invest enough to maintain its assets and operations, its cash flow capacity is reduced, thereby affecting its ability to meet its debt obligations (Richardson, 2006). At the same time, underinvestment not only reflects the avoidance of projects with negative net present value but can also cause businesses to miss projects with positive net present value, weakening growth potential and operational continuity (Kaplan & Zingales, 2000; Geng et al., 2025).

The relationship between the degree of underinvestment and financial distress risk may not be strictly linear. The relationship between financing constraints and investment outcomes is non-monotonic (Kaplan & Zingales, 2000). Firms facing moderate liquidity pressure may cut investment and temporarily improve short-term cash flow, partially stabilizing distress indicators. This threshold dynamic provides a theoretical rationale for an inverted U-shaped relationship between the degree of underinvestment and financial distress risk. At moderate levels, firms forgo productive projects, erode their competitive position, and weaken their future cash flow capacity, increasing distress risk. At extreme levels, however, firms have typically already shifted to cash preservation and debt restructuring strategies, which can partially offset further risk escalation (Geng et al., 2025). The examination of Tehran Stock Exchange firms finds that the relationship between investment inefficiency and financial distress intensifies at higher levels of inefficiency but at a decreasing

rate – consistent with this inverted U-shaped prediction (Vosoughi et al., 2016). Thus, both overinvestment and underinvestment can exacerbate a company's financial fragility and thereby increase the risk of financial distress.

Several studies have used both measures of investment efficiency to provide a more complete picture than relying on a single measure. Richardson (2006) proposed a regression-based expected investment model that decomposes actual capital expenditure into an expected component – predicted by growth opportunities (Tobin's Q) and prior-year investment – and an unexplained residual that serves as a measure of investment bias. A positive residual indicates overinvestment – spending exceeding the level justified by fundamental factors – while a negative residual signals underinvestment. That theoretical framework has been validated (Biddle et al., 2009; Chen et al., 2011) and is applied in this study due to its simplicity and cross-border applicability. Both the magnitude and sign of the residual carry different implications for financial risk, which prompts examining the two groups separately within the same study. The financial distress risk is expressed through two indicators: the Z-score (Altman, 1968; Altman et al., 1995), which weights asset productivity and capital structure, and the O-score (Ohlson, 1980; Campbell et al., 2008), which emphasizes the probability of insolvency through cash flow and leverage dynamics.

The institutional heterogeneity of the ASEAN-6 markets has spurred multinational empirical studies. La Porta et al. (1998) showed that legal traditions and creditor rights shape companies' access to external financing and their vulnerability to suboptimal investments. In some ASEAN countries, family and state ownership are prevalent (Faccio & Lang, 2002), increasing agency conflict and the potential for overinvestment that benefits controlling shareholders. In contrast, Singapore operates under a legal framework with high information transparency, conditions that theory predicts would mitigate the financial consequences of underinvestment (Jedda et al., 2021). These structural differences imply that the impact of overinvestment and underinvestment on financial distress risk is unlikely to be uniform across ASEAN markets.

Although some studies have examined and predicted the risk of financial distress in ASEAN countries, the available evidence remains limited and uneven. Previous studies have primarily focused on analyzing determinants or financial characteristics related to financial distress risk within the ASEAN-5 or ASEAN-6 context, rather than comprehensively assessing the impact of investment behavior on this risk (Alfiyanah & Kurniawanti, 2025; Masripah & Ariefiara, 2025). Therefore, a research gap arises from the lack of empirical evidence simultaneously testing both suboptimal investment states within a unified analytical framework for listed companies in the ASEAN-6 region. This study aims to analyze the impact of overinvestment and underinvestment on the financial distress risk of listed firms in the ASEAN-6 countries.

The proposed hypotheses are as follows:

H1: *Overinvestment increases financial distress risk.*

H2: *Underinvestment increases financial distress risk.*

## 2. RESEARCH METHODS

This study measures the impact of investment efficiency on financial distress risk using a quantitative method, specifically examining how over- and underinvestment affect this risk among listed firms on stock exchanges in ASEAN countries. Six ASEAN countries form the regional market-production-services pillar, including Vietnam (VNX), Malaysia (MYX), Thailand (SET), Indonesia (IDX), Singapore (SGX), and the Philippines (PSE). The research data for 2015–2024 include 30,440 observations, of which 21,864 belong to overinvested companies, and 8,576 belong to underinvested companies. The sample comprises 3,805 unique listed firms across six markets, yielding an unbalanced panel with an average of approximately eight observations per firm. The predominance of over-invested firms (71%) reflects agency-theoretic predictions that managers in high-growth emerging markets with imperfect monitoring tend to over-deploy capital (Jensen, 1986), consistent with prior applications of the Richardson (2006) model

in Asian contexts (Chen et al., 2011; Geng et al., 2025). Financial sector firms are excluded due to their distinct capital structures. All continuous variables are winsorized at the 1st and 99th percentiles.

**Table 1.** Sample

Country	Frequency	Number of enterprises	Percent (%)
IDN	3328	416	10.93
MYS	6568	821	21.58
PHL	1600	200	5.26
THA	5648	706	18.55
SGP	2912	364	9.57
VNM	10384	1298	34.11
Total	30440	3805	100

The study uses the FGLS estimation method to examine the impact of overinvestment and underinvestment on the risk of financial distress from panel data during the period.

The empirical model is specified as follows:

$$FRISK_{it} = \beta_0 + \beta_1 INV\_EFF_{it} + \gamma X_{it} + \mu_i + \epsilon_{it} \quad (1)$$

The dependent variable is financial distress risk ( $FRISK_{it}$ ) measured by the Financial Distress Risk O-score (Ohlson, 1980; Campbell et al., 2008), the Financial Distress Risk Z-score (Altman, 1968; Altman et al., 1995).

The independent variable investment efficiency ( $INV\_EFF_{it}$ ) determines the enterprise's investment spending level. Overinvestment and underinvestment are determined according to Richardson's model (2006). Specifically, investment efficiency is measured using the residual from the following expected investment regression estimated by OLS with year fixed effects:

$$inv\_rate_{i,t} = a_0 + a_1 inv\_rate_{i,t-1} + a_2 TobinQ_{i,t-1} + YearFE + e_{i,t}, \quad (2)$$

where  $inv\_rate_{i,t}$  – purchases of fixed assets scaled by lagged total assets;  $TobinQ_{i,t-1}$  – market capitalisation divided by total assets (lagged), capturing growth opportunities; and  $inv\_rate_{i,t-1}$  is lagged investment to control for mean reversion in capital expenditure. Year fixed effects are included to absorb common time-varying shocks. The residual  $e_{i,t}$  from Equation (2) is the invest-

ment efficiency deviation: a positive residual ( $e_{i,t} > 0$ ) indicates overinvestment and is coded  $Cat = 1$ ; a negative residual ( $e_{i,t} < 0$ ) indicates underinvestment and is coded  $Cat = 0$ . The absolute value of the residual is used as the investment deviation variable (*over\_inv* or *under\_inv*) in the main regression (Equation 1).

Firms with positive residuals, where actual investment exceeds expected investment, are classified as overinvesting firms ( $Cat = 1$ ). Firms with negative residuals, where actual investment is lower than expected investment, are classified as underinvesting firms ( $Cat = 0$ ).

Control variables (leverage, enterprise size, revenue growth, etc.) used in the analysis represent firm-specific characteristics (Desta et al., 2024; Abdul et al., 2021). The use of financial leverage leads to investment constraints, causing firms to miss profit growth opportunities, increasing financial distress risk (Campbell et al., 2008; D'Mello & Miranda, 2010; Dirman, 2020). Firm size controls for differences in available resources and capabilities to cope with competition (Al-Hadi et al., 2019; Aurelia & Leon, 2023; Chen & Merville, 1999; ElBannan, 2021). Revenue growth meets businesses' financing and investment needs (Love & Zicchino, 2006; Wangsih et al., 2021). In this study, control variables include return on total assets (roa) measured as net profit after tax/total assets at year end, leverage (lev) measured as total liabilities at year end/total assets at year end,

firm size (size) measured as natural logarithm of total assets at year end, growth rate (growth) measured as (net sales current year-net sales previous year)/net sales of the previous year.

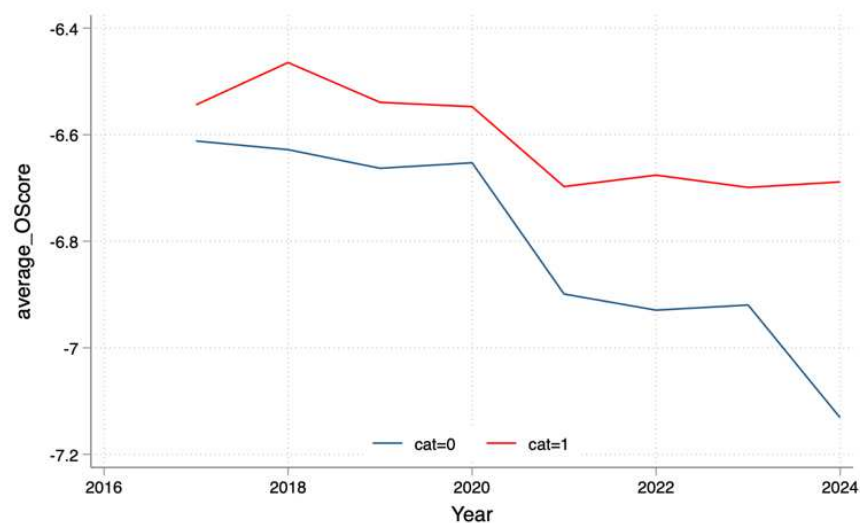
### 3. RESULTS AND DISCUSSION

#### 3.1. Descriptive statistics

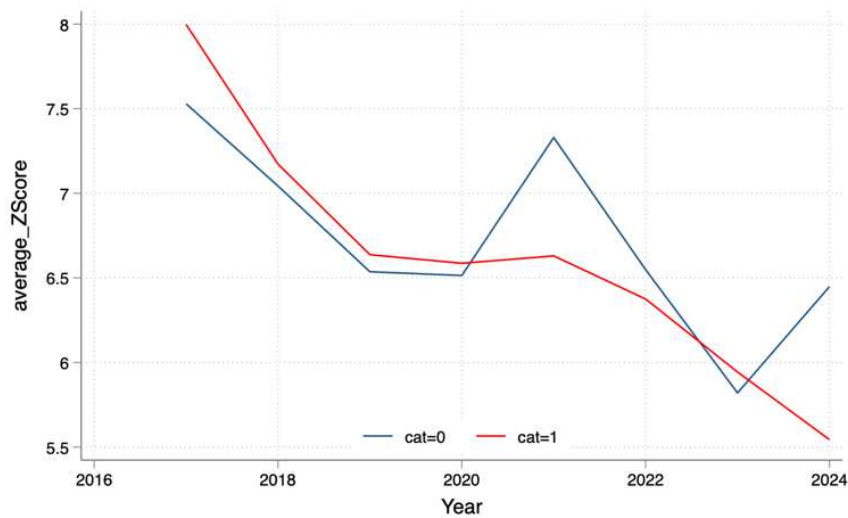
Figure 1 shows the trend of O-score index fluctuations in 2015–2024 according to 2 groups: overinvesting firms ( $Cat = 1$ ) and underinvesting firms ( $Cat = 0$ ). The O-score index of both groups generally decreased over time, suggesting that the risk of financial distress tended to decline. However, the underinvestment group recorded a higher O-score than the overinvestment group, indicating a relatively higher level of financial distress risk.

Figure 2 shows the fluctuations in the Z-score of firms from 2015 to 2024. The general decline in the Z-score suggests that financial distress risk tends to increase. Firms that under-invest show a sharper decrease, indicating greater exposure to financial distress risk in later years. Meanwhile, overinvesting firms maintain relatively higher Z-scores in recent years, suggesting better financial stability than underinvesting firms.

Descriptive statistics of variables in Table 2 show the differences in variable values in the research model.



**Figure 1.** Average O-score over time: Overinvestment vs. underinvestment



**Figure 2.** Average Z-score over time: Overinvestment vs. underinvestment

**Table 2.** Descriptive statistics

Variable	Overinvestment					Underinvestment				
	Obs	Mean	Std. dev.	Min	Max	Obs	Mean	Std. dev.	Min	Max
oscore	21,864	-6.608	2.262	-19.282	4.792	8,576	-6.803	2.145	-19.502	3.950
zscore	21,864	6.611	11.631	-46.525	195.188	8,576	6.714	9.969	-28.866	179.699
Investment deviation	21,864	0.022	0.049	0.000	6.201	8,576	0.057	0.167	0.000	12.704
roa	21,864	0.029	0.090	-0.680	0.689	8,576	0.051	0.088	-0.689	0.678
lev	21,864	0.448	0.230	0.002	0.999	8,576	0.451	0.209	0.015	0.988
size	21,864	18.233	1.814	12.776	24.810	8,576	18.300	1.932	12.952	25.333
growth	21,864	0.082	0.543	-2.752	8.972	8,576	0.139	0.522	-0.996	8.538

The average O-score of both groups is negative (-6.608 for overinvestment firms and -6.803 for underinvestment firms), reflecting relatively low estimated distress probability. The Z-score of the firms varies widely, from -46.525 to 195.188 for overinvestment firms and -28.866 to 179.699 for underinvestment firms.

The capital investment allocations between the two groups of firms differ significantly. The average investment level of the overinvestment group (Mean 0.022, standard deviation 0.049) is lower than that of the underinvestment group (Mean 0.057, standard deviation 0.167), indicating that underinvesting firms show a larger deviation from expected investment.

Comparing the two groups, underinvestment firms have higher ROA than overinvestment firms (0.051 versus 0.029), while leverage is nearly iden-

tical between the two groups (0.448 versus 0.451). Their growth rates also differ substantially, with underinvestment firms recording higher growth (0.139 versus 0.082). Although underinvestment firms may be limited in investment scale, they maintain higher profitability and growth, reflecting a prudent capital allocation strategy that can contribute to improving financial efficiency and minimizing risks.

### 3.2. Correlation analysis

The results of the correlation analysis between variables in the model are shown in Tables 3 and 4.

Table 3 shows that O-score has a negative correlation with Z-score (-0.426) and ROA, and a positive correlation with financial leverage (0.779). This indicates that high financial leverage and low profitability increase the risk of financial distress

**Table 3.** Correlation matrix: Overinvestment

Variable	oscore	zscore	over_inv	roa	lev	size	growth
oscore	1.000						
zscore	-0.426	1.000					
over_inv	0.007	0.054	1.000				
roa	-0.485	0.356	0.030	1.000			
lev	0.779	-0.431	-0.002	-0.212	1.000		
size	-0.194	-0.148	-0.055	0.024	0.147	1.000	
growth	-0.032	0.017	0.072	0.126	0.026	0.028	1.000

**Table 4.** Correlation matrix: Underinvestment

	oscore	zscore	Under_inv	roa	lev	size	growth
oscore	1.000						
zscore	-0.498	1.000					
Under_inv	0.028	0.016	1.000				
roa	-0.526	0.378	0.016	1.000			
lev	0.777	-0.472	0.003	-0.230	1.000		
size	-0.194	-0.102	-0.082	0.018	0.220	1.000	
growth	-0.011	0.025	0.157	0.103	0.041	-0.003	1.000

of overinvesting firms. Z-score has a positive relationship with ROA. Thus, the profitability of overinvestment is associated with the financial safety of ASEAN firms. The correlation values of over\_inv and roa, lev, size, and growth show that these variables have the necessary independence to play the role of explanatory variables in the model. There is no serious multicollinearity problem in the subsequent regression analysis.

The coefficients in Table 4 also give similar conclusions about the correlation between the O-score, Z-score variables, and the variables in the model. However, the correlation between the financial risk variables and operating efficiency is larger. Financial leverage increases risk in both groups of firms, but the negative impact is more pronounced in the underinvestment group.

### 3.3. Model diagnostic testing

Table 5 shows the results of the Model diagnostics. For the overinvestment model, all tests are statistically significant at the 1% level (LM test =  $3.3e+03$ , Hausman = 252.0128, Modified Wald =  $1.2e+35$ , Wooldridge = 9.0194). This result implies

heteroscedasticity, autocorrelation, and fixed/random difference. For the underinvestment model, the first three tests (LM, Hausman, and Modified Wald) are statistically significant. In contrast, the Wooldridge test is insignificant, indicating that the model has heteroscedasticity and fixed/random difference, but no significant first-order autocorrelation.

### 3.4. Regression results and discussion

The full-sample regression results (Table 6) show that overinvestment has a positive and statistically significant impact on the risk of financial distress (measured by the O-score). Specifically, the coefficient of the overinvestment variable is positive and significant at the 1% level in all models, implying that the more a firm invests beyond the optimal level, the higher the probability of falling into financial distress. This pattern aligns with agency theory, which suggests that when firms have excess free cash flow, managers are inclined to pursue inefficient projects that exceed the optimal investment threshold (Jensen, 1986). This behavior can undermine financial stability. From a static trade-off perspective, overinvestment tends

**Table 5.** Model diagnostics

Model with	LM_test	Hausman	Modified Wald	Wooldridge
over_inv	3.3e+03***	252.0128***	1.2e+35***	9.0194***
under_inv	678.6820***	22.6565***	6.5e+34***	1.6560

**Table 6.** Relationship between overinvestment and FDR (O-score)

Variables	(1)	(2)	(3)	(4)
	OLS	FEM	REM	FGLS
L.over_inv	0.4650*** (0.142)	0.2949** (0.144)	0.3822*** (0.134)	0.6298*** (0.075)
roa	-8.1831*** (0.084)	-6.6489*** (0.115)	-7.5952*** (0.092)	-8.0121*** (0.035)
lev	7.4219*** (0.033)	7.5658*** (0.084)	7.5234*** (0.043)	7.4000*** (0.009)
size	-0.3683*** (0.004)	-0.2149*** (0.027)	-0.3691*** (0.006)	-0.3691*** (0.001)
growth	-0.0444*** (0.013)	-0.1236*** (0.013)	-0.0814*** (0.012)	-0.0711*** (0.006)
Constant	-2.9008*** (0.076)	-5.7926*** (0.487)	-2.9548*** (0.102)	-2.8929*** (0.015)
Year FE	yes	yes	yes	yes
Observations	19,135	19,135	19,135	19,135
Number of ID		3,747	3,747	3,747

Note: Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

to increase leverage and cost burdens, disrupting the balance between the tax benefits of debt and the costs associated with financial distress. This relationship is particularly evident in the context of the ASEAN-6, where imperfections in capital markets may exacerbate the negative effects of inefficient investment. This finding supports and extends the research of Männasoo et al. (2018) and Geng et al. (2025) from the region.

Looking at the control variables, ROA has a statistically significant negative coefficient in all models, suggesting that profitable firms are less likely

to fall into financial crisis (consistent with both pecking order and signaling theories, as high profits send a positive signal about financial health). Conversely, financial leverage (LEV) significantly positively affects O-score, strongly supporting the trade-off theory warning that high debt increases the risk of bankruptcy. The significant negative sign of the Size variable suggests that larger firms (with more assets and resources) are generally safer from financial distress, consistent with the expectations of diversification and reputational advantages of large firms. The Growth variable also appears negative and significant at the 1% level

**Table 7.** Relationship between overinvestment and FDR (O-score), by stock exchange

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	IDX	MYX	PSE	SET	SGX	VNX
L.over_inv	-0.0316 (0.316)	0.9481*** (0.140)	0.0757 (0.391)	0.9918*** (0.201)	0.5564 (0.375)	0.3884*** (0.110)
roa	-7.8828*** (0.113)	-8.5671*** (0.074)	-6.7415*** (0.169)	-8.2626*** (0.095)	-7.5153*** (0.112)	-7.8781*** (0.077)
lev	7.1422*** (0.038)	7.2932*** (0.026)	7.2621*** (0.058)	7.7902*** (0.034)	7.2408*** (0.043)	7.2828*** (0.023)
size	-0.3904*** (0.005)	-0.3685*** (0.003)	-0.4190*** (0.005)	-0.3587*** (0.003)	-0.3374*** (0.004)	-0.3613*** (0.002)
growth	-0.1031*** (0.021)	-0.0169 (0.013)	-0.0996*** (0.030)	-0.0675*** (0.014)	-0.1212*** (0.024)	-0.0834*** (0.009)
Constant	-2.3282*** (0.095)	-2.8159*** (0.058)	-1.8464*** (0.089)	-3.3517*** (0.065)	-3.5504*** (0.086)	-2.9080*** (0.030)
Year FE	yes	yes	yes	yes	yes	yes
Observations	1,933	4,308	1,038	3,479	1,985	6,392
Number of ID	404	814	195	695	361	1,278

Note: Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

across all models, suggesting that revenue growth helps mitigate financial risk - perhaps through improved cash flow and prospects. In summary, the analysis of corporate data from six ASEAN countries supports the hypothesis that overinvestment, especially when coupled with poor performance or high debt, significantly increases the probability of a firm falling into financial distress.

Table 7 presents the results of estimating the impact of overinvestment on financial risk (O-score) in each major stock market in ASEAN. The results show significant differences between countries. In Malaysia and Thailand, the regression coefficient of the overinvestment variable is approximately 0.948 and 0.992 (both significant at the 1% level), implying that overinvestment significantly increases the risk of financial distress in these two markets. In Vietnam, the overinvestment coefficient is also positive and statistically significant, with a regression coefficient of approximately 0.39, indicating that the impact of overinvestment on financial risk exists but at a moderate level. In contrast, in Indonesia, the Philippines, and Singapore, the overinvestment variable does not show a significant impact (the coefficient is not statistically significant). This suggests that the link between overinvestment and financial risk is context-specific: in some countries, overinvestment is a strong “catalyst” that increases the risk of financial distress, while in others, the relation-

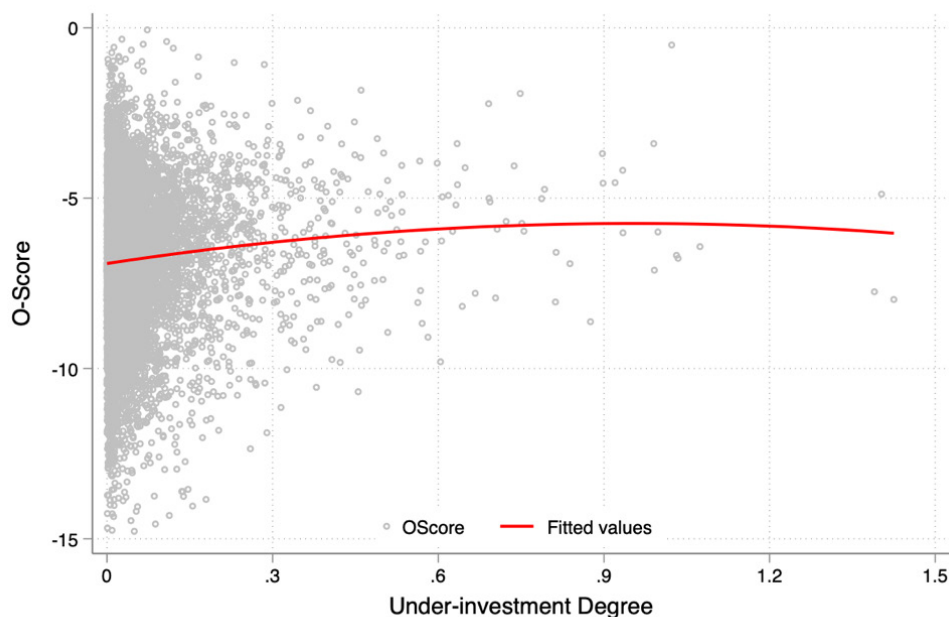
ship is weaker. The institutional and governance environment can explain this difference: markets such as Malaysia, Thailand, and Vietnam may face more pronounced agency problems, and corporate governance and investor protection mechanisms may be weak, leading to managers being more likely to invest in inefficient projects, increasing financial risk. Singapore, with its strong governance framework, high market discipline, and information transparency, can contain the negative effects of overinvestment. Indonesia and the Philippines may reflect different corporate structures (family-owned or state-owned firms) or financing conditions that produce inconsistent effects.

Regarding control variables, results are largely consistent across markets: ROA is always negatively and significantly related (ranging from approximately -7 to -9), confirming profitability as a financial buffer; LEV is always positively significant, indicating higher debt raises risk in all markets; Size has a negative and significant effect, confirming large firms face lower bankruptcy risk; and Growth is mostly negative and significant (except Malaysia), suggesting sustained revenue growth enhances financial resilience. Overall, the market-level analysis supports a link between overinvestment and financial risk, with the magnitude varying across countries depending on their governance quality and investment climate.

**Table 8.** Relationship between underinvestment and FDR (O-score), by stock exchange

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ASEAN6	IDX	MYX	PSE	SET	SGX	VNX
L.under_inv	0.3675*** (0.017)	1.9881*** (0.215)	0.5420*** (0.136)	1.9416*** (0.425)	1.6463*** (0.148)	0.8994*** (0.245)	0.1720*** (0.035)
L.under_inv2	-0.0400*** (0.008)	-2.1923*** (0.401)	-0.4779 (0.329)	-3.8131*** (1.100)	-1.2575*** (0.167)	-0.5337 (0.499)	-0.0242*** (0.008)
roa	-7.8760*** (0.036)	-6.6416*** (0.114)	-8.0624*** (0.073)	-8.1908*** (0.225)	-9.0156*** (0.127)	-7.1040*** (0.107)	-8.9798*** (0.059)
lev	7.9683*** (0.008)	8.2243*** (0.057)	8.1394*** (0.029)	7.4879*** (0.070)	8.0082*** (0.035)	7.6052*** (0.040)	7.6126*** (0.009)
size	-0.3918*** (0.001)	-0.3888*** (0.005)	-0.3957*** (0.004)	-0.3709*** (0.007)	-0.3915*** (0.003)	-0.3548*** (0.004)	-0.3625*** (0.003)
growth	-0.0238*** (0.002)	-0.2841*** (0.036)	-0.0279* (0.017)	-0.2845*** (0.033)	-0.0110 (0.021)	0.0143 (0.038)	-0.0108 (0.010)
Constant	-2.7111*** (0.013)	-3.0681*** (0.098)	-2.7146*** (0.067)	-2.8997*** (0.132)	-2.7452*** (0.058)	-3.4118*** (0.091)	-2.9727*** (0.045)
Year FE	yes	yes	yes	yes	yes	yes	yes
Observations	7,500	979	1,439	362	1,463	563	2,694
Number of ID	2,595	300	547	113	490	211	934

Note: Standard errors in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.



**Figure 3.** Scatter plot of underinvestment degree and O-score

Table 8 examines the impact of underinvestment on financial risk in ASEAN markets and finds a notable nonlinear relationship. Across the ASEAN sample, the positive coefficient of underinvestment and the negative coefficient of its squared term indicate an inverted U-shaped relationship between underinvestment and financial distress risk. This confirms the existence of an inverted U-shaped relationship between the level of underinvestment and financial risk: as firms begin to cut investment below the optimal level, financial risk increases, but if the cutback becomes too large, the rate of increase in risk slows or even reverses to a small decrease. In other words, moderate levels of underinvestment can be most detrimental to financial health (because firms miss out on important growth opportunities, which reduces competitiveness and operating cash flow). However, when underinvestment becomes extreme (because firms are too undercapitalized or too conservative), the marginal impact on risk tends to decrease. This result is similar to the conclusion of Kaplan and Zingales (2000) and recent findings from Geng et al. (2025), which report a nonlinear or threshold effect in the relationship between investment and financial health. This finding is in line with prior studies showing that underinvestment may affect financial distress risk through a non-linear or threshold mechanism. However, the shape of this relationship may differ depending on the sample

characteristics, market conditions, and the measure of financial distress risk used.

Table 8 shows that Indonesia, the Philippines, Thailand, and Vietnam exhibit a clear nonlinear relationship between underinvestment and financial risk (significant positive first-order and negative second-order coefficients): financial risk rises initially as investment is curtailed, peaks, and then declines beyond a certain threshold. In Malaysia and Singapore, the square term is insignificant, indicating a linear relationship – the more underinvested, the higher the risk, with no reversal. This difference may reflect capital access: in more developed or financially stable markets (such as Singapore and Malaysia), firms can more easily mobilize external funds, reducing the likelihood of extreme underinvestment. In contrast, in Vietnam and the Philippines, severely underinvested firms focus on maintaining core activities, so bankruptcy risk does not continue to rise proportionally.

Control variable results are consistent with prior findings: ROA is strongly negative and significant across all markets, confirming profitability as a key buffer against financial risk. LEV is significantly positive, particularly in high-debt markets such as Thailand. Size remains significantly negative, indicating larger firms are more resilient even in the face of underinvestment. Growth mostly shows

negative or ambiguous coefficients, suggesting that low revenue growth compounds the adverse effects of underinvestment in several markets.

Figure 3 shows the relationship between the degree of underinvestment and financial risk as measured by the O-score. The inverted parabolic regression line shows that as the degree of underinvestment increases from low to medium, the O-score tends to increase (financial risk increases). However, when underinvestment exceeds a certain threshold, the O-score decreases slightly (financial risk decreases). This result reinforces the empirical evidence that the relationship between underinvestment and financial risk is nonlinear: moderate underinvestment can be detrimental to a firm because of missed profit opportunities. However, at very high levels of underinvestment, the marginal association between underinvestment and O-score becomes weaker. This pattern may reflect firms' defensive adjustment, liquidity preservation, or restructuring behavior rather than a direct beneficial effect of severe underinvestment.

**Table 9.** Relationship between overinvestment, underinvestment, and FDR (Z-Score)

Variables	(1)	(2)
	zscore	zscore
L.over_inv	13.9275*** (0.672)	
L.under_inv		0.0419 (0.092)
L.under_inv2		-0.0176 (0.032)
roa	31.9301*** (0.269)	28.6019*** (0.166)
lev	-16.9188*** (0.065)	-17.9310*** (0.067)
size	-0.4985*** (0.006)	-0.0245*** (0.006)
growth	0.1673*** (0.032)	0.0318 (0.033)
Constant	21.7178*** (0.130)	13.6279*** (0.103)
Year FE	yes	yes
Observations	19,135	7,500
Number of ID	3,747	2,595

Note: Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 9 measures financial risk using the Z-score as the inverse measure of financial risk. The results show some interesting differences from the

O-score model. For the full sample (model 1), overinvestment has a very large and significant positive coefficient ( $\approx 13.93$ ), meaning that overinvestment significantly increases the Z-score. Since the Z-score is an inverse measure of distress risk – higher values indicate greater financial security, not greater distress – this result implies that overinvestment is associated with lower financial distress risk as measured by the Z-score. This is the opposite directional finding from the O-score model, and it requires careful interpretation rather than being treated as confirmation of H1. This divergence is not a contradiction between the two models; rather, it reflects the structurally different constructions of the two distress measures. The Z-score is a composite of asset productivity, earnings, and market capitalisation ratios, all of which may be temporarily elevated in overinvesting firms as capital expenditure expands the asset base and can, in the short run, sustain or increase revenue and retained earnings. Consequently, a firm that over-invests may register a higher Z-score in the near term even while its underlying insolvency risk – as captured by the O-score's emphasis on cash flow adequacy and the probability of negative net income – is increasing. The two measures, therefore, capture different temporal horizons and risk dimensions: the O-score is more sensitive to short-to-medium-term cash flow fragility, while the Z-score may be temporarily buffered by the accumulated asset position of overinvesting firms. This interpretation is consistent with Altman (1984) and Ohlson (1980), who document that different weighting schemes can yield non-convergent distress signals for the same firm, and supports the use of multiple distress proxies in this study. The underinvestment model (Model 2 using Z-score) shows that the Underinvestment variable and its square are both statistically insignificant. In other words, when measuring financial risk using Z-score, we did not find clear evidence of a relationship between underinvestment and financial safety. This is different from the O-score result, but it can be explained that the Z-score (with components of profit, liquidity, and leverage) may have reflected the impact of underinvestment indirectly (underinvestment reduces revenue growth but at the same time can improve liquidity ratios or accumulate short-term retained earnings, making the overall impact on Z unclear).

Regarding other variables, the Z-score model yields results consistent with expectations. ROA has a large and significant positive impact (coefficients from 31.93 to 28.60), confirming that profitability substantially improves financial health. LEV shows a clearly negative coefficient (−16.9 to −17.9), indicating that higher debt reduces the Z-score – consistent with trade-off theory and O-score results. Size has a significant negative coefficient in both models, indicating that large firms (typically mature, traditional industries) tend to grow more slowly and carry higher fixed asset burdens, thereby compressing the Z-score through its revenue/total assets component. Growth in model (1) is slightly positive and significant at the 1% level, suggesting a modest contribution to financial security, though the effect is insignificant in model (2).

Overall, the findings provide measure-dependent support for the proposed hypotheses. Overinvestment increases financial distress risk (O-score) through a mechanism consistent with agency theory: excess capital expenditure depletes internal reserves, raises dependence on costly external financing, and amplifies leverage-driven fragility (Jensen, 1986; Männasoo et al., 2018; Geng et al., 2025). The effect is most pronounced in Malaysia,

Thailand, and Vietnam – markets with comparatively weaker governance oversight – but is statistically negligible in Singapore, the Philippines and Indonesia, consistent with Morgado and Pindado (2003) and Jedda et al. (2021) on the moderating role of institutional quality. For underinvestment, an inverted U-shaped relationship emerges in O-score models across most markets: moderate shortfalls below the investment optimum are most harmful, as firms forgo positive-NPV projects and erode future cash-flow capacity (Kaplan & Zingales, 2000), whereas extreme underinvestment coincides with defensive liquidity preservation that partially offsets further risk accumulation. This non-linear pattern does not appear in Z-score models, reflecting the two indicators' different emphases: O-score captures insolvency probability while Z-score weights current profitability and asset productivity, whose short-term dynamics can partially mask the consequences of investment cuts (Altman, 1984; Ohlson, 1980). Across all specifications, leverage is the dominant risk amplifier (coefficient over 7.1 in O-score models), while profitability is the strongest mitigant (coefficient under −6.6), underscoring that the financial consequences of suboptimal investment are substantially conditioned by a firm's capital structure and earnings capacity.

---

## CONCLUSION

This study investigates whether overinvestment and underinvestment drive financial distress risk for listed companies in ASEAN-6, and whether this relationship differs across markets with varying institutional environments. FGLS estimates were performed on 30,440 company observations from 2015 to 2024. Overinvestment increased financial distress risk based on O-score, most significantly in Malaysia, Thailand, and Vietnam, while this effect was statistically negligible in Singapore, the Philippines, and Indonesia. Underinvestment followed an inverted U-shaped pattern in O-score models for Indonesia, the Philippines, Thailand, and Vietnam. Meanwhile, Malaysia and Singapore exhibit only a linear relationship, with no evidence of a threshold effect. When risk is measured by the Z-score – an inverse measure where higher values indicate greater financial security – overinvestment is positively and significantly associated with the Z-score, implying lower distress risk under this measure. This diverges from the O-score finding and reflects the two indicators' structurally different constructions: the Z-score captures short-term asset productivity gains that may temporarily buffer overinvesting firms, while the O-score captures the underlying cash flow fragility that accumulates over time. Underinvestment and its squared term are statistically insignificant in the Z-score model.

These findings suggest that the financial consequences of suboptimal investment in ASEAN depend simultaneously on the misalignment, the quality of the institutional environment, and the scale of financial vulnerability being measured. Governance reforms, disciplined capital structure management, and the adoption of two early warning indicators (O-score and Z-score) are mutually supportive priorities for both businesses and regulators seeking to contain crisis risks across the region.

This study has several limitations. First, there may be an inverse causal relationship, as financially distressed companies could also reduce their investment levels. To address this concern, the main investment performance variables are lagged by 1 period, and fixed-year effects are included to account for general shocks. Therefore, the results should be interpreted as associations rather than definitive causal effects. Second, the study relies on accounting-based measures of hardship and a simplistic expected investment model, which may limit the accuracy of the measurements. Lastly, the sample is restricted to listed companies. Future research could explore alternative measures of hardship, employ more robust causal methods, or include a broader sample that consists of both listed and unlisted companies.

## CONFLICT OF INTEREST STATEMENT

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## FUNDING STATEMENT

The authors received no financial support for the research, authorship, and/or publication of this article.

## AUTHOR CONTRIBUTIONS

Conceptualization: Thuy Duong Phan.

Data curation: Thuy Duong Phan.

Formal analysis: Thuy Duong Phan.

Funding acquisition: Thuy Duong Phan, Thi Thanh Hoang.

Investigation: Thuy Duong Phan, Thi Thanh Hoang.

Methodology: Thuy Duong Phan.

Project administration: Thuy Duong Phan.

Resources: Thuy Duong Phan, Thi Thanh Hoang.

Software: Thuy Duong Phan, Thi Thanh Hoang.

Supervision: Thuy Duong Phan.

Validation: Thuy Duong Phan, Thi Thanh Hoang.

Visualization: Thuy Duong Phan, Thi Thanh Hoang.

Writing – original draft: Thuy Duong Phan, Thi Thanh Hoang.

Writing – review & editing: Thuy Duong Phan, Thi Thanh Hoang.

## REFERENCES

1. Abdul Manaf, S. M., Amzah, N. F. H., & Salleh, W. A. (2021). An investigation of factors affecting financial distress: analysis among PN17 companies in Bursa Malaysia. *Insight Journal (IJ)*, 8, 182-198. Retrieved from [https://www.researchgate.net/publication/350862226\\_An\\_Investigation\\_of\\_Factors\\_Affecting\\_Financial\\_Distress\\_Analysis\\_Among\\_PN17\\_Companies\\_in\\_Bursa\\_Malaysia](https://www.researchgate.net/publication/350862226_An_Investigation_of_Factors_Affecting_Financial_Distress_Analysis_Among_PN17_Companies_in_Bursa_Malaysia)
2. Alfianah, D., & Kurniawanti, I. A. (2025). Exploring the Determinants of Financial Distress in ASEAN-5 Firms During the COVID-19 Pandemic. *Journal of Enterprise & Development (JED)*, 7(3). <https://doi.org/10.20414/jed.v7i3.14346>
3. Al-Hadi, A., Chatterjee, B., Yaftian, A., Taylor, G., & Monzur Hasan, M. (2019). Corporate social responsibility performance, financial distress and firm life cycle: evidence from Australia. *Accounting & Finance*, 59(2), 961-989. <https://doi.org/10.1111/acfi.12277>
4. Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *The Journal of Finance*, 23(4), 589-609. <https://doi.org/10.1111/j.1540-6261.1968.tb00843.x>
5. Altman, E. I. (1984). The success of business failure prediction models: An international survey. *Journal of Banking & Finance*, 8(2), 171-198. [https://doi.org/10.1016/0378-4266\(84\)90003-7](https://doi.org/10.1016/0378-4266(84)90003-7)
6. Altman, E. I., Eom, Y. H., & Kim, D. W. (1995). Failure prediction: evidence from Korea. *Journal of*

- International Financial Management & Accounting*, 6(3), 230-249. <https://doi.org/10.1111/j.1467-646X.1995.tb00058.x>
7. Aurelia, V., & Leon, F. M. (2023). Factors Affecting Financial Distress in Small and Medium Enterprises (SMEs) in Indonesia: An Empirical Study. *Journal of Economics, Management and Trade*, 29(4), 33-46. <http://dx.doi.org/10.9734/jemt/2023/v29i41088>
  8. Baldwin, C. Y., & Mason, S. P. (1983). The resolution of claims in financial distress the case of Massey Ferguson. *The Journal of Finance*, 38(2), 505-516. <https://doi.org/10.1111/j.1540-6261.1983.tb02258.x>
  9. Beaver, W. H. (1966). Financial ratios as predictors of failure. *Journal of Accounting Research*, 4, 71-111. Retrieved from <https://ideas.repec.org/a/bla/joares/v4y1966ip71-111.html>
  10. Biddle, G. C., Hilary, G., & Verdi, R. S. (2009). How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics*, 48(2-3), 112-131. <https://doi.org/10.1016/j.jacceco.2009.09.001>
  11. Campbell, J. Y., Hilscher, J., & Szilagyi, J. (2008). In search of distress risk. *The Journal of Finance*, 63(6), 2899-2939. <https://doi.org/10.1111/j.1540-6261.2008.01416.x>
  12. Chen, F., Hope, O. K., Li, Q., & Wang, X. (2011). Financial reporting quality and investment efficiency of private firms in emerging markets. *The Accounting Review*, 86(4), 1255-1288. Retrieved from [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1722804](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1722804)
  13. Chen, G. M., & Merville, L. J. (1999). An analysis of the underreported magnitude of the total indirect costs of financial distress. *Review of Quantitative Finance and Accounting*, 13(3), 277-293. <https://doi.org/10.1023/A:1008370531669>
  14. Chen, X., Sun, Y., & Xu, X. (2016). Free cash flow, overinvestment and corporate governance in China. *Pacific-Basin Finance Journal*, 37, 81-103. <https://doi.org/10.1016/j.pacfin.2015.06.003>
  15. Cleary, S. (1999). The relationship between firm investment and financial status. *The Journal of Finance*, 54(2), 673-692. <https://doi.org/10.1111/0022-1082.00121>
  16. D'Mello, R., & Miranda, M. (2010). Long-term debt and overinvestment agency problem. *Journal of Banking & Finance*, 34(2), 324-335. <https://doi.org/10.1016/j.jbankfin.2009.07.021>
  17. Desta Wijaya, F., Andy Lasmana, & Magdalena Melani, M. (2024). The Effect of Liquidity, Profitability, Leverage and Activity on Financial Distress. *Jurnal Ilmiah Manajemen Kesatuan*, 12(4), 1377-1388. <https://doi.org/10.37641/jimkes.v12i4.2550>
  18. Dirman, A. (2020). Financial distress: the impacts of profitability, liquidity, leverage, firm size, and free cash flow. *International Journal of Business, Economics and Law*, 22(1), 17-25. Retrieved from [https://ijbel.com/wp-content/uploads/2020/08/IJBEL22\\_205.pdf](https://ijbel.com/wp-content/uploads/2020/08/IJBEL22_205.pdf)
  19. ElBannan, M. A. (2021). On the prediction of financial distress in emerging markets: What matters more? Empirical evidence from Arab spring countries. *Emerging Markets Review*, 47, 100806. <https://doi.org/10.1016/j.ememar.2021.100806>
  20. Faccio, M., & Lang, L. H. P. (2002). The ultimate ownership of Western European corporations. *Journal of Financial Economics*, 65(3), 365-395. [https://doi.org/10.1016/S0304-405X\(02\)00146-0](https://doi.org/10.1016/S0304-405X(02)00146-0)
  21. Geng, H., Zhu, H., Lau, W. T., Nor, N. M., & Ab Razak, N. H. (2025). How does investment efficiency affect financial distress risk? Evidence from China. *Journal of Behavioral and Experimental Finance*, 45, 101024. <https://doi.org/10.1016/j.jbef.2025.101024>
  22. Gordon, M. J. (1971). Towards a theory of financial distress. *The Journal of Finance*, 26(2), 347-356. <https://doi.org/10.1111/j.1540-6261.1971.tb00902.x>
  23. Harris, M., & Raviv, A. (1991). The theory of capital structure. *The Journal of Finance*, 46(1), 297-355. <https://doi.org/10.1111/j.1540-6261.1991.tb03753.x>
  24. Jedda, N. E., Lakhal, F., & Ghenima, R. (2021). Family Control and Investment Efficiency: Does Financial Analyst Coverage Matter? *Management International*, 25(3), 91-114. <https://doi.org/10.7202/1079215ar>
  25. Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, 76(2), 323-329. Retrieved from [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=99580](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=99580)
  26. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
  27. Kaplan, S. N., & Zingales, L. (2000). Investment-cash flow sensitivities are not valid measures of financing constraints. *The Quarterly Journal of Economics*, 115(2), 707-712. <https://doi.org/10.1162/003355300554782>
  28. La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy*, 106(6), 1113-1155. <https://doi.org/10.1086/250042>
  29. Love, I., & Zicchino, L. (2006). Financial development and dynamic investment behavior: Evidence from panel VAR. *The Quarterly Review of Economics and Finance*, 46(2), 190-210. <https://doi.org/10.1016/j.qref.2005.11.007>
  30. Männasoo, K., Maripuu, P., & Hazak, A. (2018). Investments, credit, and corporate financial distress: Evidence from Central and Eastern Europe. *Emerging Markets Finance and Trade*, 54(3), 677-689. <https://doi.org/10.1080/1540496X.2017.1300092>
  31. Masripah, & Ariefiara, D. (2025). Financial Performance Analysis on Financial Distress in ASEAN

- Six. *Jurnal Ilmiah Akuntansi Kesatuan*, 13(4), 741-750. <https://doi.org/10.37641/jiakes.v13i4.3537>
32. Morgado, A., & Pindado, J. (2003). The underinvestment and overinvestment hypotheses: An analysis using panel data. *European Financial Management*, 9(2), 163-177. Retrieved from [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=294871](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=294871)
  33. Mueller, D. C. (1972). A life cycle theory of the firm. *The Journal of Industrial Economics*, 199-219. <https://doi.org/10.2307/2098055>
  34. Myers, S. C. (1984). The capital structure puzzle. *Journal of Finance*, 39, 575-592. <https://doi.org/10.1111/j.1540-6261.1984.tb03646.x>
  35. Ohlson, J. A. (1980). Financial ratios and the probabilistic prediction of bankruptcy. *Journal of Accounting Research*, 109-131. <https://doi.org/10.2307/2490395>
  36. Richardson, S. (2006). Over-investment of free cash flow. *Review of accounting studies*, 11(2), 159-189. <http://dx.doi.org/10.1007/s11142-006-9012-1>
  37. Vosoughi, M., Derakhshan, H., & Alipour, M. (2016). Investigating the relationship between financial distress and investment efficiency of companies listed on the Tehran Stock Exchange. *Accounting*, 2(4), 167-176. <http://dx.doi.org/10.5267/j.ac.2016.3.003>
  38. Wangsih, I. C., Yanti, D. R., Yohana, Y., Kalbuana, N., & Cahyadi, C. I. (2021). Influence of leverage, firm size, and sales growth on financial distress. *International Journal of Economics, Business and Accounting Research (IJEBAR)*, 5(4). <https://www.jurnal.stie-aas.ac.id/index.php/IJEBAR/article/view/3563>
  39. Whitaker, R. B. (1999). The early stages of financial distress. *Journal of economics and finance*, 23(2), 123-132. <https://doi.org/10.1007/BF02745946>
  40. Younas, N., UdDin, S., Awan, T., & Khan, M. Y. (2021). Corporate governance and financial distress: Asian emerging market perspective. *Corporate Governance*, 21(4), 702-715. <https://doi.org/10.1108/CG-04-2020-0119>
  41. Yousaf, U. B., Jebran, K., & Ullah, I. (2024). Corporate governance and financial distress: A review of the theoretical and empirical literature. *International Journal of Finance & Economics*, 29(2), 1627-1679. <https://doi.org/10.1002/ijfe.2752>