Digital Innovation : International Journal of Management

E-ISSN: 3047-9053
P-ISSN: 3047-9681

Research Article

The Effect of Financial Ratios and Macroeconomic Factors on Financial Distress in Technology Companies Listed on the Indonesia Stock Exchange

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Abstract: Financial distress refers to a condition where a company experiences financial difficulties and if it is not resolved immediately, it will lead to bankruptcy. Several models can be used to measure financial distress, one of which is the Zmijewski model. This study aims to analyze the influence of financial ratios and macroeconomic factors on financial distress among technology companies listed on the Indonesia Stock Exchange. The research was conducted at technology companies listed on the IDX for the 2020–2024 period, with a sample size of 44 companies selected using a purposive sampling method. The study employed secondary data derived from company financial statements obtained through the official IDX website and analyzed using SPSS version 27. The findings reveal that financial ratios specifically, profitability (ROE) have a significant negative effect on financial distress, while leverage (DER) has a significant positive effect. Meanwhile, macroeconomic factors such as inflation and interest rates have no effect on financial distress.

Keywords: Financial Distress; Financial Ratios; Indonesia Stock Exchange; Macroeconomic Factors; Technology Companies.

Received: August 30, 2025
Revised: September 13, 2025
Accepted: September 27, 2025
Online Available: September 29, 2025
Curr. Ver.: September 29, 2025

1. Introduction

The cyclical dynamics of industry fluctuations are often exemplified by conditions of financial distress. This phenomenon has particularly impacted technology firms during 2022–2023, a period commonly referred to as the "tech winter," reflecting the adverse effects of economic uncertainty, policy shifts, and intensifying competition. This downturn was triggered by several factors, including tightened global monetary policies, rising inflation, and lingering economic disparities following the COVID-19 pandemic. According to Sapulette & Muchtar (2023), the tech winter refers to the slowdown and even potential bankruptcies faced by startup companies. Moreover, Jumiyati (2024) noted that several Indonesian technology sub-sector companies listed on the Indonesia Stock Exchange (IDX) received warnings due to unprofitable performance.

The Indonesian Fintech Association reports that the tech winter pushed companies and startup players to shift their focus from aggressive growth-driven strategies to resilient business models and innovation geared toward profitability. The "growth at all cost" mindset that once fueled rapid expansion has given way to a "path to profitability" approach. The combined impact of COVID-19, inflation, and elevated interest rates has slowed down the fintech industry's growth, prompting strategic realignments, including workforce reductions. Yusnaini (2023) highlights that the tech winter led to a 60% drop in funding trends for digital startups in Asia, resulting in cash flow challenges due to reduced investor support. Such diminished investor interest may lead venture capital to withdraw funding, thereby increasing the risk of financial distress.

Financial distress is characterized by financial hardship or liquidity challenges faced by companies prior to bankruptcy (Mahaningrum & Merkusiwati, 2020). It occurs when a firm's financial condition threatens its viability due to deteriorating performance, difficulty meeting obligations, cash flow disruptions, and liquidity constraints. As Wijaya & Suhendah (2023) explain, financial distress can emerge when a company fails to generate sufficient profit or funds to service its liabilities.

Financial statements of technology firms listed on the IDX reveal that net income saw modest fluctuations during 2020–2021. However, in 2022, the average net result plunged to near a 1 trillion IDR loss, followed by a sharp decline in 2023, with average losses exceeding 2 trillion IDR. This steep downturn is likely attributable to a combination of external and internal factors, including shifting market dynamics and suboptimal strategic responses. In 2024, however, the net results show signs of recovery, with average losses around 115 billion IDR, reflecting the ongoing challenges that technology firms face in adapting to a volatile market.

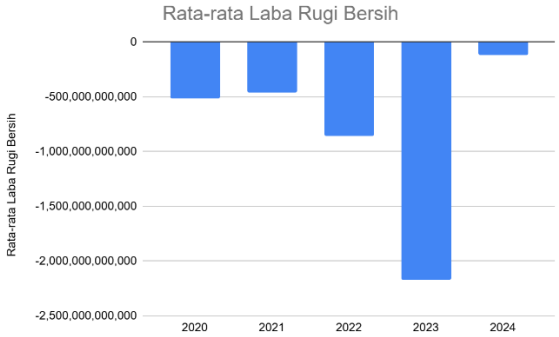

Figure 1. Average Net Income of Technology Companies from 2020 to 2024.
Source: Indonesia Stock Exchange, 2020-2024 (Data Processed)

One illustrative case is GOTO (Goto Gojek Tokopedia Tbk), which, despite achieving a 134.07% increase in net revenue (IDR 7.79 trillion) in Q3 2022, still reported a net loss of IDR 20.91 trillion. This was due to soaring operational expenses sales and marketing costs doubled to IDR 11.27 trillion, while administrative expenses rose 67.45% to IDR 8.62 trillion (Nuryanti & Ramdhani, 2023).

The GoTo case and financial statements of tech firms underscore that these companies face dual challenges: generating revenue and controlling operational expenditures. When expenses exceed income, financial imbalance ensues, heightening the risk of financial distress. According to Harahap et al. (2022), declining financial performance—inherent in financial statements often signals early stages of distress, underscoring the need for early detection through financial ratios. Nuryanti & Ramdhani (2023) support this, indicating that financial ratios derived from financial reports can serve as predictors of financial distress. Various financial ratios can serve as indicators of financial distress. Profitability ratios assess a firm's ability to generate profit, indicating effective asset management that reduces costs and ensures sufficient capital for operations (Agustini & Wirawati, 2019). Leverage ratios, on the other hand, show the extent to which assets are financed by debt; high leverage implies a heavy debt burden, escalating financial distress risk, especially in volatile markets.

Macroeconomic factors also play a role in financial distress. Adiputra & Ruslim (2023) state that adverse macroeconomic conditions can elevate financial distress risk, such as inflation reducing consumer purchasing power. Rahayu et al. (2025) explain that high inflation reflects macroeconomic instability and may trigger financial difficulty. Additionally, as a monetary policy instrument, interest rates aim to stabilize the economy. Natasa et al. (2023) suggest that high interest rates increase companies' financial burden, potentially leading to financial distress.

Natasa et al. (2023) also found that profitability and leverage significantly affect financial distress, while interest rates and inflation do not. Hanafi & Supriyadi (2018) similarly report a positive significant effect of leverage on distress, with no significant impact from inflation and interest rates. Conversely, Ulaya & Nurfauziah (2022) found a significant impact of inflation on distress but not interest rates, while Beno & Masripah (2024) found that interest rates significantly positively affected distress, whereas inflation did not.

Based on this context, the present study aims to examine the influence of financial ratios and macroeconomic factors on financial distress in technology companies. Firstly, this

approach aligns with the recommendation by Hendiansyah & Natita (2025) to extend research periods, incorporate macroeconomic variables, and use the Zmijewski model due to its high accuracy in predicting distress in the technology sector. Therefore, this study extends the timeline through 2024 and adopts the Zmijewski X Score instead of the Altman Z Score, as the latter focuses more on market values whereas the former emphasizes solvency (Cintyarani & Indrawati, 2024; Sudharyati et al., 2022). Secondly, following Nuryanti & Ramdhani (2023), this study examines profitability, liquidity, and leverage as determinants of financial distress. The study is also grounded in agency theory, which posits that conflicts between agents and principals can influence financial decisions (Jensen & Meckling, 1976). Profitability reflects managerial efficiency in resource utilization, which may decline if agents act suboptimally. Leverage represents management's debt-financing choices, serving as a disciplinary mechanism. Meanwhile, inflation and interest rates—external macroeconomic stressors—can exacerbate agency conflicts by incentivizing short-term, high-risk decisions and compromising strategic financial planning. Thus, this study aims to analyze the effects of financial ratios and macroeconomic factors on financial distress among technology companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period.

2. Methodology

This study employs a quantitative approach to examine the influence of financial ratios and macroeconomic variables on financial distress among technology sector companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. Research data were obtained from annual financial statements available on the official IDX website, as well as macroeconomic data namely inflation and interest rates—sourced from Bank Indonesia. The dependent variable, financial distress, is measured using the Zmijewski model, while the independent variables include profitability (Return on Equity/ROE), leverage (Debt-to-Equity Ratio/DER), inflation, and interest rate (BI Rate) (Sugiyono, 2022; Kasmir, 2019; Cintyarani & Indrawati, 2024).

The research population consists of 47 technology companies listed on the IDX. A purposive sampling technique was employed to select a final sample based on specific criteria, including companies that were consistently listed from 2020 to 2024 and provided complete annual financial reports. Purposive sampling was deemed appropriate as it allows for selecting samples that align closely with the study objectives, thereby enhancing the representativeness and relevance of the findings (Etikan & Bala, 2017; Fauzy, 2019).

The data utilized in this study are quantitative and secondary in nature, comprising numerical data from financial reports and macroeconomic indicators. Data collection was conducted through non-participant observation by examining and recording official company documents and macroeconomic statistics. Data analysis involved several stages: descriptive statistics, classical assumption tests (normality, multicollinearity, autocorrelation, and heteroscedasticity), and multiple linear regression to assess the influence of independent variables on financial distress. Hypothesis testing was performed using the t-test (partial), F-test (simultaneous), and coefficient of determination (R^2), with SPSS version 27 as the analytical tool (Ghozali, 2016; Sudariana & Yoedani, 2021).

3. Results and Discussion

Descriptive Statistics of Research Variables

This study employs descriptive statistics to provide a general overview of the research data, including the minimum, maximum, mean, and standard deviation of each variable: profitability (X1), leverage (X2), inflation (X3), interest rate (X4), and financial distress (Y). The descriptive statistical results are presented in Table 1.

Table 1. Descriptive Statistics Results.

	N	Minimum	Maximum	Mean	Std. Deviation
ROE	173	-92,97%	70,06%	4,1348%	22,52085%
DER	173	2,33%	238,41%	55,4024%	52,85346%
Inflasi	173	1,57%	5,51%	2,7185%	1,50878%
SB	173	0,02%	6,10%	2,7510%	2,45798%
FD	173	-6,16%	0,22%	-2,6408%	1,09728%
Valid N (listwise)	173				

Source: Processed Data, 2025

The total number of technology company samples used in this study is 173 observations over the 2020–2024 period. This number is reduced from the initial 225 observations due to several reasons: (1) some companies only went public in 2022–2024; (2) data outliers were excluded; and (3) certain companies were suspended starting in 2023, limiting usable data to 2020–2022 only.

Financial Distress (Y)

The financial distress variable ranges from a minimum of -6.16% to a maximum of 0.22%. Negative values indicate that several companies are in a financially healthy condition. The average financial distress score of -2.6408% suggests that most companies were not in a state of financial distress. The standard deviation of 1.09728% indicates that most technology companies are facing a relatively stable financial situation.

Profitability (X1)

Profitability (ROE) values range from -92.97% to 70.06%. The extremely low minimum reflects significant losses in companies, while the high maximum indicates exceptional performance in others. The average ROE is 4.1348%, suggesting that, on average, technology companies on the IDX experienced modest profitability or slight losses during the period. The large standard deviation (22.52085%) highlights a high degree of variation, implying instability in company performance, with outliers on both extremes.

Leverage (X2)

Leverage (DER) ranges from 2.33% to 238.41%. The low minimum reflects firms with minimal debt dependency, suggesting reliance on internal financing. The high maximum indicates firms whose debt exceeds their equity base, pointing to aggressive external financing strategies. The average DER of 55.4024% implies that most companies use external financing to support growth while maintaining a relatively balanced capital structure. However, the high standard deviation (52.85346%) suggests considerable variation in financial strategies and risk tolerance across companies.

Inflation (X3)

Inflation data ranges from a minimum of 1.57%—indicative of stable price levels—to a maximum of 5.51%, reflecting periods of heightened price pressures potentially caused by commodity price hikes, supply chain disruptions, or demand-side pressures. The average inflation rate during 2020–2024 is 2.7185%, reflecting a relatively stable macroeconomic environment. The standard deviation of 1.50878% suggests moderate fluctuations driven by seasonal factors, government policy, or global economic dynamics.

Interest Rate (X4)

The interest rate ranges from a minimum of 0.02%, indicating an accommodative monetary policy aimed at stimulating economic growth, to a maximum of 6.10%, reflecting tighter monetary conditions in response to inflationary or currency volatility. The average interest rate of 2.7510% implies a balanced approach to growth and stability. The relatively high standard deviation (2.45798%) indicates notable fluctuations during the study period, highlighting monetary policy adjustments in response to evolving domestic and global economic conditions.

Results of Data Analysis

Classical Assumption Tests

Normality Test

The normality test aims to determine whether the residuals in the regression model are normally distributed. In this study, the One-Sample Kolmogorov-Smirnov (K-S) test was used. Prior to testing, outliers were handled using the boxplot method to ensure the quality of the analyzed data. The results are shown in Table 2.

Table 2. Normality Test Results.

			Unstandardized Residual
N			173
Normal Parameters[a,b]	Mean		0,0000000
	Std. Deviation		0,28007718
Most Extreme Differences	Absolute		0,066
	Positive		0,044
	Negative		-0,066
Test Statistic			0,066
Asymp. Sig. (2-tailed)[c]			0,062
Monte Carlo Sig. (2-tailed)[d]	Sig.		0,066
	99% Confidence Interval	Lower Bound	0,059
		Upper Bound	0,072

Source: Processed Data, 2025

The Asymp. Sig. (2-tailed) value of 0.062 exceeds the significance threshold of 0.05, indicating that the residuals are normally distributed.

Multicollinearity Test

This test is conducted to assess whether high correlations exist among independent variables. The evaluation is based on tolerance and the Variance Inflation Factor (VIF). If the tolerance value is > 0.1 and the VIF < 10, multicollinearity is not a concern.

Table 3. Multicollinearity Test Results.

		Collinearity Statistics	
Model		Tolerance	VIF
1	ROE	0,812	1,232
	DER	0,825	1,212
	Inflasi	0,978	1,023
	SB	0,971	1,030

Source: Processed Data, 2025

All independent variables meet the acceptable thresholds, indicating no significant multicollinearity in the regression model.

Autocorrelation Test

The Durbin-Watson test was used to detect autocorrelation in the residuals. Initial analysis suggested the presence of autocorrelation. To address this, the Cochrane-Orcutt method was applied, reducing the sample size to 172 observations.

Table 4. Autocorrelation Test Results.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0,964	0,929	0,927	0,24678	1,820

Source: Processed Data, 2025

With a DW value of 1.820 and reference to the critical values (dL = 1.7033, dU = 1.7983), the result satisfies the condition dU < DW < 4 - dU (i.e., 1.7983 < 1.820 < 2.2017), confirming the absence of autocorrelation.

Heteroscedasticity Test

This test evaluates whether the variance of residuals is constant across observations. The White test was employed. With an R^2 of 0.229 and N = 172, the test statistic is 39.388 (172 × 0.229). This is less than the chi-square table value of 203.602, indicating no heteroscedasticity.

Table 5. Heteroscedasticity Test Results.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,479	0,229	0,160	0,09668

Source: Processed Data, 2025

Multiple Linear Regression Analysis

Following the confirmation that classical assumptions are met, multiple linear regression analysis was conducted to examine the effect of the independent variables on financial distress. The results are shown in Table 6.

Table 6. Multiple Linear Regression Results.

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1,872	0,033		-57,374	0,001
	ROE	-0,033	0,001	-0,710	-30,657	0,001
	DER	0,021	0,000	0,997	43,661	0,001
	INFLASI	-0,013	0,011	-0,026	-1,222	0,223
	SB	0,016	0,013	0,026	1,218	0,225

Source: Processed Data, 2025

Regression Equation:

$$Y = -1{,}872 - 0{,}033\ X1 + 0{,}021\ X2 - 0{,}013\ X3 + 0{,}016\ X4 + e$$

Interpretation:

a. The constant value of -1.872 indicates that when all independent variables are zero, financial distress would be at -1.872 units.

b. ROE has a negative regression coefficient (-0.033), suggesting that an increase in ROE by one unit leads to a decrease in financial distress by 0.033 units, assuming other variables remain constant.

c. DER has a positive coefficient (0.021), indicating that higher leverage increases financial distress

d. Inflation has coefficient (-0.013), indicating that increase in inflation by one unit leads to a decrease in financial distress by 0.013 units, assuming other variables remain constant.

e. Interest rate shows a small positive effect (0.016) on financial distress, indicating that increase in interest rates by one unit leads to an increase in financial distress by 0.016 units, assuming other variables remain constant.

Coefficient of Determination (R^2)

This test evaluates the proportion of variance in the dependent variable explained by the independent variables.

Table 7. Coefficient of Determination.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0,964	0,929	0,927	0,24678	1,820

Source: Processed Data, 2025

An Adjusted R^2 of 0.927 means that 92.7% of the variation in financial distress is explained by ROE, DER, inflation, and interest rate. The remaining 7.3% is attributed to other factors outside the model. This suggests the regression model has a high explanatory power for financial distress among IDX-listed tech firms.

Model Feasibility Test (F-Test)

The F-test assesses whether the independent variables jointly have a significant effect on the dependent variable.

Table 8. F-Test Result.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	132,383	4	33,096	543,453	0,001
	Residual	10,170	167	0,061		
	Total	142,553	171			

Source: Processed Data, 2025

The F-statistic of 543.453 with a significance level of 0.001 ($p < 0.05$) confirms that the independent variables collectively have a significant impact on financial distress.

Hypothesis Testing (t-Test)

The t-test examines the individual impact of each independent variable on the dependent variable.

Table 9. t-Test Results.

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1,872	0,033		-57,374	0,001
	ROE	-0,033	0,001	-0,710	-30,657	0,001
	DER	0,021	0,000	0,997	43,661	0,001
	INFLASI	-0,013	0,011	-0,026	-1,222	0,223
	SB	0,016	0,013	0,026	1,218	0,225

Source: Processed Data, 2025

Based on the results of the t-test presented in Table 9, the effects of each independent variable on financial distress can be interpreted as follows:

a. The ROE variable shows a regression coefficient of -0.033 with a significance value of 0.001 ($p < 0.05$). This indicates that ROE has a significant negative effect on financial distress.
b. The DER variable has a regression coefficient of 0.021 with a significance value of 0.001 ($p < 0.05$), demonstrating that DER has a significant positive effect on financial distress
c. The inflation variable has a regression coefficient of -0.013 with a significance value of 0.223 ($p > 0.05$), indicating that inflation does not have a statistically significant effect on financial distress, despite the negative sign of the coefficient.
d. The interest rate variable has a regression coefficient of 0.016 with a significance value of 0.225 ($p > 0.05$), suggesting that the interest rate also does not significantly affect financial distress, although its coefficient is positive.

Discussion of Research Findings

The Effect of Profitability on Financial Distress

a. Based on the results of the first hypothesis test, profitability measured by Return on Equity (ROE) has a significant negative effect on financial distress in technology companies. The analysis shows that the higher the profitability generated by the company, the lower the risk of experiencing financial distress. This finding supports the first hypothesis (H1), which states that profitability negatively influences financial distress. A high ROE reflects efficient use of equity, reducing the risk of bankruptcy because the company is able to generate sufficient profits to meet its obligations.

b. This result is grounded in agency theory, where a high ROE indicates the company's ability to generate returns on the capital invested by shareholders. This condition reduces the risk of financial distress, as high profitability demonstrates that managers (agents) have effectively optimized company resources for the benefit of shareholders (principals). Additionally, a strong ROE may decrease the company's reliance on external financing, potentially minimizing agency conflicts related to debt between shareholders and creditors. These findings align with studies by Agustini & Wirawati (2019), Effendi et al. (2021), Umam & Yusuf (2024), Waqas & Md-Rus (2018), Nadia et al. (2022), Nugrahanti et al. (2020), Arifin et al. (2021), and Kalbuana et al. (2022), which reported a significant negative relationship between profitability and financial distress.

The Effect of Leverage on Financial Distress

a) The results of the second hypothesis test indicate that leverage, measured by the Debt to Equity Ratio (DER), has a significant positive effect on financial distress in technology companies. The analysis shows that the higher the company's leverage, the greater the risk of financial distress. This supports the second hypothesis (H2), which states that leverage positively affects financial distress. DER reflects the extent to which a company's capital is financed by debt. Excessively high DER can lead to financial difficulties due to insufficient assets to cover liabilities.

b) This finding is also consistent with agency theory, which explains that increasing debt levels can trigger conflicts of interest between creditors and shareholders, as well as increase fixed interest expenses that may lead to financial distress. This result is supported by research from Agustini & Wirawati (2019), Nugrahanti et al. (2020), Umam & Yusuf (2024), Wangsih et al. (2021), Waqas & Md-Rus (2018), Dwiantari & Artini (2021), Safitri & Yuliana (2021), and Mahaningrum & Merkusiwati (2020).

The Effect of Inflation on Financial Distress

1) The third hypothesis test reveals that inflation does not have a significant effect on financial distress among technology companies listed on the Indonesia Stock Exchange (BEI). The regression coefficient for inflation is -0.013 with a significance level of 0.223 ($p > 0.05$), indicating that although inflation has a negative coefficient, it does not significantly affect financial distress. This result rejects the third hypothesis (H3), which predicted a positive effect of inflation on financial distress. The financial distress condition of companies cannot be solely assessed through inflation, as many companies tend to withstand periods of high inflation (Sandi & Amanah, 2019).

2) This finding contrasts with agency theory, which suggests that information asymmetry between management (agents) and shareholders (principals) can trigger conflicts, particularly in uncertain economic conditions such as inflation. The study's findings suggest that technology firms listed on the BEI effectively manage inflation risk, minimizing its impact on financial distress. This may be attributed to more flexible financial structures or effective risk management policies, which reduce potential agency conflicts related to inflation. This is consistent with findings from Adiputra & Ruslim (2023), Hendrawan et al. (2022), Tyas & Sari (2021), Wafi et al. (2021), Sandi & Amanah (2019), and Priyatnasari & Hartono (2019), which concluded that inflation does not significantly affect financial distress.

The Effect of Interest Rates on Financial Distress

i. The fourth hypothesis test shows that interest rates do not significantly affect financial distress in technology companies listed on the BEI. The regression coefficient for interest rates is 0.016 with a significance value of 0.225 ($p > 0.05$), indicating a positive

but statistically insignificant effect. This result rejects the fourth hypothesis (H4), which proposed a positive effect of interest rates on financial distress.

ii. Interest rates do not significantly influence the assessment of financial distress in technology firms because interest expenses remain stable even if interest rates rise, as the loan interest is typically fixed at the time of contract agreement (Natasa et al., 2023). Therefore, fluctuations in interest rates do not impact the financial stability of these companies. This finding diverges from agency theory, which posits that higher financial costs, including interest expenses, can escalate agency conflicts between management and shareholders. However, the insignificant effect of interest rates in BEI-listed technology firms can be explained by flexible funding structures or the companies' ability to optimize interest expense management.

iii. This result aligns with previous studies by Adiputra & Ruslim (2023), Tyas & Sari (2021), Ulaya & Nurfauziah (2022), Lestari & Nelmida (2018), and Sandi & Amanah (2019), which found that interest rates do not significantly influence financial distress.

4. Conclusion

Based on the analysis and discussion, several conclusions are drawn as follows:

a. Profitability has a negative effect on financial distress in technology companies listed on the BEI. This suggests that companies with higher profitability are better equipped to avoid financial distress due to sufficient internal resources to meet financial obligations. This result is based in agency theory, where high profitability will redusce the risk of financial distress because a high profitability value indicates that the agent has carried out his role effectively in optimizing company resources.

b. Leverage has a significant positive effect on financial distress. This finding is consistent with agency theory, which states that high levels of debt can increase conflicts between management and creditors, as well as raise the risk of default leading to financial distress.

c. Inflation and interest rates do not have a significant effect on financial distress. This implies that technology companies on the BEI have anticipated the impact of macroeconomic factors effectively, such that fluctuations in inflation and interest rates do not directly affect financial distress conditions.

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