




# Identification and Ranking of Financial, Non-Financial, and Behavioral Components Influencing Earnings Response Coefficient in the Iranian Capital Market (Data Mining Approach)

Mansour. Moghadasi<sup>1</sup>, Alireza. Ghiasvand<sup>2\*</sup>, Farid. Sefati<sup>2</sup>

<sup>1</sup> Ph.D. Student, Department of Accounting, Borujerd Branch, Islamic Azad University, Borujerd, Iran

<sup>2</sup> Assistant Professor, Department of Accounting, Borujerd Branch, Islamic Azad University, Borujerd, Iran

\* Corresponding author email address: Ghiasvand\_alireza@yahoo.com

### Article Info

#### Article type:

Original Research

#### How to cite this article:

Moghadasi, M., Ghiasvand, A., & Sefati, F. (2024). Identification and Ranking of Financial, Non-Financial, and Behavioral Components Influencing Earnings Response Coefficient in the Iranian Capital Market (Data Mining Approach). *International Journal of Innovation Management and Organizational Behavior*, 4(4), 121-129. <https://doi.org/10.61838/kman.ijimob.4.4.14>



© 2024 the authors. Published by KMAN Publication Inc. (KMANPUB), Ontario, Canada. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

### ABSTRACT

**Objective:** The aim of this study is to identify and rank the financial, non-financial, and behavioral components affecting companies' ERC.

**Methodology:** Using data from 153 companies listed on the Tehran Stock Exchange over the period 2013 to 2022, and employing data mining techniques and two methods: stepwise forward regression and regression decision tree, the influential components on ERC were identified and ranked.

**Findings:** The results of the stepwise forward regression method indicated that the components of auditor's opinion type, earnings per share (EPS), stock liquidity, growth opportunities, earnings stability, inflation rate, sales growth, operating profit ratio, relative strength index per share, and market index return respectively influence ERC. The regression decision tree method results also showed that the components of earnings stability, stock liquidity, EPS, stock price synchronicity, stock trading imbalance, adjusted trading volume, psychological line index, relative strength index per share, earnings conservatism, and financial statement restatements respectively influence ERC. The Wilcoxon test results also showed that the ranking of components influencing ERC is not the same in the two methods. Additionally, comparing the mean absolute error of the two methods indicated that the regression decision tree method identifies and ranks the influential components on ERC more accurately.

**Conclusion:** The results of both methods confirm the high impact of EPS, stock liquidity, earnings stability, and relative strength index per share on the ERC of companies.

**Keywords:** Efficient Market Hypothesis, Accounting Profit, Unexpected Earnings, Stock Price, Investor Sentiment

## 1 Introduction

Investment decisions in financial markets are influenced by information sources. According to stock market theorists, one of the valuable sources of data is financial statements, whose main objective is to assist users and facilitate their decision-making process. One of the most critical factors in financial reporting is the announcement of profit-related information, which likely attracts the most investor attention. At the time of profit announcement, the market has certain expectations based on available information about the company's declared profit, and the difference between market expectations and the company's declared profit is called unexpected earnings (Widiatmoko & Indarti, 2018).

Any event in the capital market elicits reactions from market participants, one of which is the profit announcement, to which the market reacts with stock price movements. The studies by Ball and Brown (1968) showed a significant relationship between a company's profit announcement and stock price changes. For instance, if the declared profit increases (positive unexpected earnings), there is a positive trend in stock price changes, and conversely, if the declared profit decreases (negative unexpected earnings), negative changes in stock prices occur. The Earnings Response Coefficient (ERC) is used to measure investors' reactions or the stock price response to accounting profit information (Sandy & Mulya). The ERC, originating from Ball and Brown's seminal work in 1968, plays a crucial role in measuring the correlation between unexpected earnings and stock returns, providing valuable insights into the complex relationship between reported profits and stock price movements (Riyani et al., 2023).

The ERC related to accounting profit indicates the sensitivity of stock price fluctuations to accounting profit and shows how market analysis of reported profit information can be inferred from stock price volatility around the financial statement disclosure date. Each company has a unique ERC based on how reported information influences investor reactions and stock prices (Fatmawati et al., 2023). The ERC is defined as the impact of each unit of unexpected earnings on stock returns and is typically measured by the regression coefficient between abnormal stock returns and unexpected earnings. The ERC

measures the stock price reaction or the company's market value to the information contained in the company's accounting profit. A low ERC indicates that the profit provides less information for investors to make economic decisions (Riyani et al., 2023). In other words, a high ERC suggests that the reported profit information is of good quality, causing a strong market reaction. Conversely, a low ERC indicates that the reported profit information is of low quality, causing a weak market reaction.

The importance of research on ERC primarily stems from the need to increase stakeholder trust in the disclosure of accounting information, allowing them to make informed stock decisions (Alang et al., 2023). Additionally, research on ERC is useful for investors in fundamental analysis to determine the market's reaction to a company's profit information. It is expected that if investors understand the factors affecting the ERC, they can better predict stock pricing based on profit information (Widiatmoko & Indarti, 2018). Considering that, in addition to the quality of the declared profit, other financial factors as well as non-financial and behavioral factors can influence the ERC, this study attempts to identify and rank the financial, non-financial, and behavioral components affecting the ERC using a data mining approach.

## 2 Methods and Materials

This study is "applied" in terms of its objective and "descriptive-correlational" in terms of data collection and execution method. It is a "retrospective" study in terms of its temporal nature and a "quantitative" study due to the use of quantitative data. Furthermore, because the study reaches a general conclusion through analysis and inference from observations, it is "inductive." The theoretical foundations and research background were compiled using the "library" method, and data collection for the research variables was done using the "documentary" method. The theoretical foundations and the financial and non-financial data required for the statistical tests in this study were recorded and collected through the "card" tool. By studying the theoretical foundations and research background, the potential financial, non-financial, and behavioral components affecting the ERC (independent variables) were collected and classified into six groups as shown in Table 1:

**Table 1***Potential Financial, Non-Financial, and Behavioral Components Affecting the Earnings Response Coefficient*

Group of Factors	Variable Name	Measurement Method	Abbreviation
Company Financial Status and Performance Characteristics	Earnings per Share (EPS)	Net profit after tax divided by the number of shares adjusted for end-of-period stock price	EPS
	Growth Opportunities	Market value of assets divided by book value of assets	GO
	Return on Assets	Net profit after tax divided by book value of assets	ROA
	Operating Cash Flows	Operating cash flow divided by book value of assets	CFO
	Financial Leverage	Book value of liabilities divided by book value of assets	LEV
	Sales Growth	Logarithm of current year sales relative to the previous year	SG
	Operating Profit Ratio	Operating profit divided by sales	OP
Investment Environment Factors	Information Asymmetry	Venkatesh and Chiang model (1986); average daily bid-ask spread during the year	ASY
	Systematic Risk	Covariance of company stock returns and market index returns divided by the variance of market index returns	BETA
	Stock Price Synchronicity	Piotroski and Roulstone market model (2004); R-squared from the extended market model regression (regression of stock returns and market and industry returns)	SYNCH
	Delayed Stock Price Response	Hou and Moskowitz model (2005); ratio of R-squared from the restricted to the unrestricted market regression model	DELAY
	Market Index Return	Geometric return of daily market index changes	MR
Capital Market Status and Performance	Inflation Rate	Annual inflation index announced by the central bank	IF
	Free Float	The portion of a company's shares that are readily available for sale and calculated by the stock exchange organization	FF
	Stock Turnover Rate	Number of shares traded during the fiscal year relative to total shares	STV
	Stock Liquidity	Inverse of Amihud's (2002) illiquidity measure; sum of absolute daily stock returns divided by the monetary volume of stock trades	LIQ
Corporate Governance Characteristics	Number of Stock Trades	Logarithm of the number of stock trades during the year	STT
	Government Ownership	Percentage of shares held by the government or quasi-governmental institutions	GOW
	Institutional Ownership	Number of shares held by institutional shareholders relative to total common shares	IS
	Financial Expertise of Audit Committee	Ratio of audit committee members with financial expertise (accounting or finance) to the total number of audit committee members	ACFEX
	Audit Quality	If the company's auditor is the Audit Organization or Moafidrahbar Auditing Firm, assigned a value of 1, otherwise 0	AQ
	Board Independence	Ratio of non-executive (independent) board members to total board members	BI
Financial Reporting Characteristics	CEO Duality	If the CEO is also the chairman or vice-chairman of the board, duality exists	DUAL
	Earnings Quality	Abnormal accruals based on the modified Jones model (1995)	PQ
	Timeliness of Reporting	Inverse of the time difference between the fiscal year-end and the date of the audited financial statement release	FRT
	Auditor's Opinion Type	Unqualified opinion assigned a value of 0, and qualified, adverse, or disclaimer of opinion assigned a value of 1	AO
	Earnings Stability	Dechow and Dichev model (2002); regression coefficient of prior period profit with current period profit	ES
	Financial Statement Restatements	Companies that have restated their income statement or balance sheet are assigned a value of 1, otherwise 0	RS
	Earnings Conservatism	Conditional conservatism (post-event or asymmetric earnings timeliness) based on the Khan and Watts model (2009)	CC
Financial and Behavioral Factors of Investors	Relative Strength Index per Share	Ratio of positive to negative monthly stock return changes for each company	RSI
	Psychological Line Index	Ratio of the number of days the stock closing price is higher than the previous day's to the total number of trading days	PSY
	Adjusted Trading Volume	Stock trading volume to total issued shares adjusted by daily return	ATR
	Trading Imbalance	Ratio of the difference between buy and sell trade volumes to the total buy and sell trade volumes	BSI

The statistical population of this study comprises companies listed on the Tehran Stock Exchange from 2013 to 2022. Due to the heterogeneity of some members of the statistical population, sampling was performed using a screening or systematic elimination method. The following restrictions were considered for selecting the sample companies: 1) Listed on the Tehran Stock Exchange from the beginning of 2008 and continuously present until the end of 2022; 2) Fiscal year ending in March of each year; 3) No change in activity or fiscal year during the research period; 4) Not part of investment, holding, financial intermediary, banking, or insurance companies; 5) No trading halt longer than three months in any of the research years. After applying these restrictions, 153 companies were selected as the sample. Since the data is collected over 10 years for 153 companies, the sample size consists of 1,530 company-years. To prepare the data and perform calculations related to research variables, Excel 2016 was used. For statistical analysis of the impact of financial, non-financial, and behavioral variables on the ERC, data mining approaches

using two methods—stepwise forward regression and regression decision tree—along with Clementine 12 software were employed.

### 3 Findings and Results

Table 2 shows the descriptive statistics of the research variables. For example, the mean of the Earnings per Share (EPS) variable in the research sample is 0.051, which ranges from a maximum of 1.568 to a minimum of -1.171. The median value is also 0.05, indicating that the distribution of this variable is close to a normal distribution given the small difference between the median and the mean. Furthermore, dispersion parameters are a measure to determine the extent of data dispersion from each other or relative to the mean. One of the most important dispersion parameters is the standard deviation. Among the research variables, Earnings Stability (ES) has the highest standard deviation, and Information Asymmetry (ASY) has the lowest standard deviation.

**Table 2**

*Descriptive Statistics of Research Variables*

N o.	Variab le	Scale	Minimu m	Maxim um	Sum	Range	Mea n	Standar d Error Mean	Standar d Deviat ion	Varian ce	Skewne ss	Kurtosi s	Medi an	Mode
1	ERC	Continuo us	-12.876	13.264	-1325.141	26.140	-0.866	0.076	2.963	8.782	0.187	2.063	-0.820	0.000
2	EPS	Continuo us	-1.171	1.568	78.078	2.739	0.051	0.003	0.101	0.010	-0.905	69.631	0.050	0.000
3	GO	Continuo us	0.682	76.022	4443.330	75.340	2.904	0.086	3.380	11.425	9.319	158.203	1.912	0.682
4	ROA	Continuo us	-0.563	0.830	232.021	1.393	0.152	0.004	0.151	0.023	0.524	1.079	0.128	-0.105
5	CFO	Continuo us	-1.311	0.727	185.601	2.038	0.121	0.004	0.145	0.021	-0.142	7.112	0.101	-0.111
6	LEV	Continuo us	0.031	1.505	820.520	1.474	0.536	0.005	0.207	0.043	0.146	0.173	0.537	0.267
7	SG	Continuo us	-3.195	2.953	401.103	6.148	0.262	0.009	0.360	0.129	-0.528	10.911	0.269	0.000
8	OP	Continuo us	-1.393	36.698	365.668	38.091	0.239	0.024	0.958	0.918	36.060	1372.543	0.187	0.045
9	ASY	Continuo us	0.000	0.122	56.037	0.122	0.037	0.000	0.011	0.000	-0.136	3.468	0.038	0.000
10	BETA	Continuo us	-3.430	7.304	1151.515	10.734	0.753	0.024	0.930	0.865	0.546	3.595	0.722	-3.430
11	SYNC H	Continuo us	-7.935	5.887	-814.329	13.822	-0.532	0.043	1.672	2.796	-0.271	1.238	-0.433	4.595
12	DELA Y	Continuo us	0.009	1.000	1036.699	0.991	0.678	0.007	0.267	0.071	-0.595	-0.732	0.720	0.009

13	MR	Continuous	-0.019	0.092	51.348	0.111	0.034	0.001	0.035	0.001	0.236	-1.159	0.025	-0.0191
14	IF	Continuous	0.083	0.652	466.865	0.569	0.305	0.005	0.213	0.045	0.616	-1.222	0.238	0.0831
15	FF	Continuous	0.000	1.000	390.690	1.000	0.255	0.004	0.167	0.028	1.047	1.380	0.229	0.498
16	STV	Continuous	0.000	5.202	936.485	5.202	0.612	0.018	0.717	0.514	2.145	5.865	0.362	0.0001
17	Liq	Continuous	0.089	0.710	287.943	0.621	0.188	0.001	0.050	0.002	2.137	11.611	0.179	0.0891
18	STT	Continuous	2.833	16.013	16281.393	13.180	10.641	0.046	1.815	3.295	-0.563	0.625	10.884	3.2961
19	GOW	Continuous	0.000	72.800	1243.790	72.800	0.813	0.142	5.551	30.811	9.181	92.377	0.000	0.000
20	IS	Continuous	0.000	0.987	1084.156	0.987	0.709	0.005	0.210	0.044	-1.402	1.930	0.751	0.000
21	ACFX	Continuous	0.000	1.000	721.783	1.000	0.472	0.009	0.366	0.134	-0.054	-1.352	0.667	0.667
22	AQ	Nominal	0.000	1.000	--	--	--	--	--	--	--	--	--	0.000
23	BI	Continuous	0.000	1.000	947.605	1.000	0.619	0.006	0.251	0.063	-0.788	0.526	0.600	0.600
24	DUAL	Nominal	0.000	1.000	--	--	--	--	--	--	--	--	--	0.000
25	PQ	Continuous	0.431	2.128	1549.317	1.697	1.013	0.003	0.127	0.016	1.717	9.578	0.990	0.990
26	FRT	Continuous	-0.500	0.050	11.127	0.550	0.007	0.001	0.026	0.001	-14.221	241.050	0.009	0.008
27	AO	Nominal	0.000	1.000	--	--	--	--	--	--	--	--	--	0.000
28	ES	Continuous	-98.140	698.244	2441.692	796.384	1.596	0.539	21.070	443.958	25.136	797.142	0.253	0.000
29	RS	Nominal	0.000	1.000	--	--	--	--	--	--	--	--	--	0.000
30	CC	Continuous	-45.110	34.370	100.587	79.480	0.066	0.041	1.620	2.623	-8.065	528.421	0.049	-45.1101
31	RSI	Continuous	0.000	300.157	5346.892	300.157	3.495	0.342	13.379	178.994	15.617	292.243	1.239	0.000
32	PSY	Continuous	0.000	1.000	715.385	1.000	0.468	0.003	0.137	0.019	0.097	4.308	0.473	0.500
33	ATR	Continuous	-81.274	74.020	725.876	155.294	0.474	0.167	6.541	42.784	0.145	58.838	0.478	0.000
34	BSI	Continuous	-1.000	1.000	247.571	2.000	0.162	0.006	0.240	0.058	-0.650	5.257	0.178	1.000

The results of calculating the Pearson correlation coefficients between the independent variables and the dependent variable (Earnings Response Coefficient (ERC)) and their intensity based on the output from Clementine 12

software are presented in Table 3. In Clementine 12 software, correlation coefficients are classified into three groups: weak, moderate, and strong.

**Table 3**  
*Correlation Coefficients Between Research Variables*

Variable	Symbol	Pearson Correlation Coefficient	Correlation Strength
Earnings per Share	EPS	-0.202	Strong
Growth Opportunities	GO	0.074	Strong
Return on Assets	ROA	-0.100	Strong
Operating Cash Flows	CFO	-0.156	Strong
Financial Leverage	LEV	0.056	Strong
Sales Growth	SG	0.157	Strong
Operating Profit Ratio	OP	-0.022	Weak
Information Asymmetry	ASY	0.142	Strong
Systematic Risk	BETA	0.052	Strong
Stock Price Synchronicity	SYNCH	0.020	Weak

Delayed Stock Price Response	DELAY	-0.005	Weak
Market Index Return	MR	0.145	Strong
Inflation Rate	IF	0.116	Strong
Free Float	FF	0.162	Strong
Stock Turnover Rate	STV	0.208	Strong
Stock Liquidity	Liq	0.217	Strong
Number of Stock Trades	STT	0.151	Strong
Government Ownership	GOW	0.050	Moderate
Institutional Ownership	IS	-0.123	Strong
Audit Committee Financial Expertise	ACFEX	-0.047	Moderate
Audit Quality	AQ	-0.018	Weak
Board Independence	BI	-0.049	Moderate
CEO Duality	DUAL	-0.010	Weak
Earnings Quality	PQ	-0.082	Strong
Timeliness of Reporting	FRT	-0.005	Weak
Auditor's Opinion Type	AO	0.166	Strong
Earnings Stability	ES	0.094	Strong
Financial Statement Restatements	RS	-0.042	Weak
Earnings Conservatism	CC	-0.009	Weak
Relative Strength Index per Share	RSI	0.085	Strong
Psychological Line Index	PSY	0.039	Weak
Adjusted Trading Volume	ATR	-0.029	Weak
Trading Imbalance	BSI	0.018	Weak

Given that the objective of the research is to identify and rank the financial, non-financial, and behavioral variables affecting the Earnings Response Coefficient (ERC), and considering that 1530 data points were collected for 153 companies over a 10-year period (2013-2022), the data are considered big data, and data mining techniques can be utilized. Data mining is the process of extracting useful information from large datasets. It involves using statistical techniques and algorithms to discover patterns, relationships, and trends in the data. Data mining can also be used to uncover hidden insights and predict future events. Data mining uses various algorithms and statistical models to identify hidden patterns and relationships that may not be immediately apparent. It is often used to discover valuable information and make predictions based on historical data. In this research, two data mining methods, "stepwise forward regression" and "regression decision tree," were used to predict the impact of financial, non-financial, and behavioral variables on the Earnings Response Coefficient. Therefore, the mentioned models were first modeled in the

Clementine 12 software environment. As observed, the data were first loaded from the Excel environment into the software, and the functions related to the descriptive statistics outputs and research variables charts were defined. Then, uninterpretable variables such as company name and fiscal year were filtered out using the Filter function, and the variables were defined based on the type of dependent and independent variables in the Type function. Subsequently, the data were randomly divided into training, testing, and evaluation groups in the Partition function at ratios of 55%, 35%, and 10%, respectively, and entered into the machine learning algorithm. Finally, the data of the three groups were entered into the "stepwise forward regression" and "regression decision tree" algorithms.

After running the data mining model using the stepwise forward regression method, the financial, non-financial, and behavioral factors affecting the Earnings Response Coefficient were ranked by importance, as shown in [Table 4](#).

**Table 4**

*Ranking of Factors Affecting the Earnings Response Coefficient Based on the Stepwise Forward Regression Method*

Factor Name	Symbol	Importance	Impact Rank
Auditor's Opinion Type	AO	0.202	1
Earnings per Share	EPS	0.133	2
Stock Liquidity	Liq	0.115	3
Growth Opportunities	GO	0.107	4
Earnings Stability	ES	0.103	5

Inflation Rate	IF	0.099	6
Sales Growth	SG	0.062	7
Operating Profit Ratio	OP	0.052	8
Relative Strength Index per Share	RSI	0.047	9
Market Index Return	MR	0.038	10

After running the data mining model using the regression decision tree method, the financial, non-financial, and behavioral factors affecting the Earnings Response

Coefficient were ranked by importance, as shown in Table 5.

**Table 5**

*Ranking of Factors Affecting the Earnings Response Coefficient Based on the Regression Decision Tree Method*

Factor Name	Symbol	Importance	Impact Rank
Earnings Stability	ES	0.7443	1
Stock Liquidity	Liq	0.1432	2
Earnings per Share	EPS	0.0595	3
Stock Price Synchronicity	SYNCH	0.0038	4
Trading Imbalance	BSI	0.0017	5
Adjusted Trading Volume	ATR	0.0017	6
Psychological Line Index	PSY	0.0017	7
Relative Strength Index per Share	RSI	0.0017	8
Earnings Conservatism	CC	0.0017	9
Financial Statement Restatements	RS	0.0017	10

Subsequently, the ranks of the factors identified as influential on the Earnings Response Coefficient in at least one of the two methods (stepwise forward regression and regression decision tree) were statistically compared. Given that the ranks of two dependent samples (factors in the two methods) were compared, the non-parametric Wilcoxon signed-rank test and SPSS software were used. In the Wilcoxon test, the null hypothesis claims that the ranking of factors by the two methods is equal. Therefore, if the test's significance level is less than 0.05, the null hypothesis is rejected at a 95% confidence level, indicating that the ranking of factors by the two methods is significantly different. In 9 out of 10 cases, the ranking of factors is greater based on the stepwise forward regression method than the regression decision tree method, and in one case, it is smaller, with a mean rank of 5.83 for the larger and 2.50 for the smaller. The Wilcoxon test statistic is -2.567, and its significance level is less than the error level of 0.05. Therefore, at a 95% confidence level, the null hypothesis of the Wilcoxon test is rejected, leading to the conclusion that the rankings of the stepwise forward regression and regression decision tree methods for the factors affecting the Earnings Response Coefficient are not the same.

Moreover, the mean absolute error (MAE) of the stepwise forward regression method model in the evaluation stage is 1.798, and based on Table 6, the mean absolute error (MAE)

of the regression decision tree method model in the evaluation stage is 1.57. Therefore, it can be concluded that the regression decision tree method identifies and ranks the factors affecting the Earnings Response Coefficient more accurately.

#### 4 Discussion and Conclusion

The response of stock prices to the disclosure of profit changes at the time of profit announcements by companies is a finding that has long been widely claimed regarding the relevance of profits for stock pricing based on positive accounting theory. There is significant consensus in the theoretical foundations that profit increases lead to stock price increases and profit decreases lead to stock price decreases.

One of the tools that can be used to measure investor reactions to accounting profit information is the Earnings Response Coefficient (ERC). The ERC estimates changes in a company's stock price as a result of the company's profit information announced to the market. The ERC is another measure for abnormal returns observed in response to unexpected elements of the company's reported profit. In other words, the ERC measures the sensitivity of stock markets to profit reports through the regression slope coefficient between abnormal returns and unexpected earnings. The ERC is very useful in fundamental analysis for

calculating the intrinsic value of stocks using the company's financial data, which can serve as the basis for investor evaluations to determine market reactions to profit information in the company's stock price. Each company has a unique ERC based on how reported information affects investor reactions and stock prices. In other words, company stock prices show different reactions to one unit of unexpected earnings because the ERC is influenced by various factors related to the company's characteristics. Company characteristics are private or specific information that distinguishes the company from others, impacting the ERC.

Research on the ERC aims to identify and explain different market reactions to profit information from various companies. Various factors, including earnings quality and financial reporting, company status and performance, capital market performance, investment environment, corporate governance framework, and investor behavioral factors, cause different market reactions to profits. In this research, we attempted to identify and rank the financial, non-financial, and behavioral factors affecting the ERC of companies using data mining techniques, employing two data mining methods: stepwise forward regression and regression decision tree.

The analysis results based on the data mining technique using the stepwise forward regression method showed that among the factors related to the company's financial status and performance, the variables "Earnings per Share," "Sales Growth," "Growth Opportunities," and "Operating Profit Ratio" and among the factors related to the company's capital market status and performance, the variable "Stock Liquidity" influence the ERC. Additionally, among the factors related to the company's financial reporting characteristics, the variables "Auditor's Opinion Type" and "Earnings Stability" influence the ERC. Among the factors related to the company's investment environment, the variables "Market Index Return" and "Inflation Rate" and among the financial and behavioral factors of investors, the variable "Relative Strength Index per Share" influence the ERC. Based on the data mining technique using the stepwise forward regression method, the Auditor's Opinion Type variable has the greatest impact, and the Market Index Return variable has the least impact on the ERC.

The analysis results based on the data mining technique using the regression decision tree method showed that among the factors related to the company's financial status and performance, the variable "Earnings per Share" and among the factors related to the company's capital market

status and performance, the variable "Stock Liquidity" influence the ERC. Additionally, among the factors related to the company's financial reporting characteristics, the variables "Earnings Stability," "Earnings Conservatism," and "Financial Statement Restatements" influence the ERC. Among the factors related to the company's investment environment, the variable "Stock Price Synchronicity" and among the financial and behavioral factors of investors, the variables "Trading Imbalance," "Adjusted Trading Volume," "Psychological Line Index," and "Relative Strength Index per Share" influence the ERC. Based on the data mining technique using the regression decision tree method, the variable Earnings Stability has the greatest impact, and the variable Financial Statement Restatements has the least impact on the ERC.

The results of the Wilcoxon test also showed that the rankings of the factors affecting the ERC using the stepwise forward regression method and the regression decision tree method are not the same. Furthermore, comparing the mean absolute error of the two methods indicated that the regression decision tree method identifies and ranks the factors affecting the ERC more accurately. However, the results of both methods confirm the impact of the variables Earnings per Share, Stock Liquidity, Earnings Stability, and Relative Strength Index per Share on the ERC of companies.

Therefore, in general, it can be concluded that in their reactions to the pricing of stocks based on the unexpected earnings announced by the company, investors consider Earnings per Share as an indicator of investment returns in stocks and the stability of earnings as a predictor of future earnings, making decisions based on the relevance and reliability of profits. On the other hand, stock liquidity also acts as a criterion of relevance in buy and sell decisions and the balance between supply and demand in the stock, affecting investor reactions to unexpected earnings. Additionally, positive investor sentiment towards the monthly return trend of stock prices, measured by the Relative Strength Index per Share, impacts investor reactions to unexpected earnings.

Therefore, current and potential investors are advised to pay attention to Earnings per Share and its stability, stock liquidity, and market sentiment towards the stock based on monthly returns when predicting stock pricing for buy and sell decisions at the time of profit announcements. Managers are also advised to manage real profits and smooth out Earnings per Share and create earnings stability to prevent fluctuations in Earnings per Share that lead to a high ERC for the company and increase its risk.



## Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

## Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

## Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

## Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

## Declaration of Interest

The authors report no conflict of interest.

## Funding

According to the authors, this article has no financial support.

## Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

## References

- Alang, T., Saraswati, E., & Andayani, W. (2023). Determination Of Earnings Response Coefficient with Corporate Social Responsibility Disclosure as a Moderating Variable. *Jurnal Keuangan dan Perbankan*, 27(3), 409-423. <https://jurnal.unmer.ac.id/index.php/jkdp/article/view/11771>
- Fatmawati, M., Nugroho, D., Novesar, M. R., Nurhayati, T., Rizkiyah, T. F., & Pratama, A. (2023). PROFITABILITY, COMPANY SIZE, AND PROFIT PERSISTENCE INFLUENCE EARNING RESPONSE COEFFICIENT. *GOVERNANCE: Jurnal Ilmiah Kajian Politik Lokal dan Pembangunan*, 10(1). <http://governance.lkispol.or.id/index.php/description/article/download/98/93>
- Riyani, Y., Mardiah, K., Kusmana, E., Andriana, S., Nengzih, N., Soepriyadi, I., & Endri, E. (2023). Determinants of Indonesian capital market reaction. <http://repository.polnep.ac.id/xmlui/handle/123456789/2225>
- Sandy, R. M., & Mulya, A. S. The Effect of Earnings Persistence and Capital Structure on Earnings Response Coefficient in Indonesia Stock Exchange. <https://ijefm.co.in/v7i3/Doc/4.pdf>

- Widiatmoko, J., & Indarti, M. K. (2018). The determinans of earnings response coefficient: An empirical study for the real estate and property companies listed on the Indonesia Stock Exchange. *Accounting Analysis Journal*, 7(2), 135-143. <https://journal.unnes.ac.id/sju/aaj/article/view/27321>