

Impact of Real-Time Data, Market Sentiment, and Economic Factors on Investment Profitability in Indonesia

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Article Info

Article history:

Received Nov, 2023

Revised Nov, 2023

Accepted Nov, 2023

Keywords:

Economic Indicators

Financial Markets

Investment Strategies

Risk Assessment

Stock Market

ABSTRACT

The study investigates the complex interplay of real-time data, market sentiment, and economic factors in shaping investment profitability in the context of Indonesia. Real-time data, including stock prices and trading volumes, market sentiment derived from sentiment analysis and expert interviews, and economic factors such as GDP growth, inflation rates, and interest rates are examined for their impact on investment outcomes. Quantitative methods, including correlation analysis, regression analysis, and time series analysis, are employed to analyze a comprehensive dataset spanning an extended period. The findings reveal that real-time data has a significant positive influence on investment profitability, underlining the importance of timely access to financial information. Market sentiment also exerts a notable impact, as more positive sentiment correlates with higher profitability. However, the relationship between economic factors and profitability is nuanced, with GDP growth exhibiting a positive influence and inflation rates and interest rates demonstrating weak negative effects. These results offer practical insights for investors and financial analysts, emphasizing the need to consider a holistic approach that incorporates real-time data, sentiment analysis, and macroeconomic indicators in investment decision-making. The study contributes to a deeper understanding of investment dynamics in the emerging market of Indonesia.

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1. INTRODUCTION

The realm of investing in financial markets is a dynamic and multi-faceted landscape influenced by various factors. Understanding how these variables affect the financial ecosystem is crucial for making informed investment decisions. The complexity of financial markets and the interplay of factors such as economic indicators, real-time data, and market

sentiment have significant implications for investors seeking to maximize returns [1]–[6]. Analyzing the complexity of the financial market and using methods like recurrence plots and recurrence networks can capture the nature of transitions in stock market dynamics [6]–[8]. Visualizing information through diagrams, graphs, and charts can aid in assessing the effectiveness of investment portfolios. Historical data of asset prices can be used to determine trading behavior and

optimize investment strategies [10]–[12]. Market ecology models can quantify endogenous interactions between investment styles and help optimize investment strategies. Understanding these dynamics and utilizing appropriate methods can assist investors in navigating the financial market landscape effectively.

Economic growth in Indonesia has been found to be significantly influenced by financial development indicators such as financial credit, financial asset, and third-party funding [13]. This suggests that the health of the financial sector can have a direct impact on the overall economic performance of the country, which in turn can affect the profitability of investments. Macroeconomic performances, such as Real Gross Domestic Product (RGDP), Foreign Exchange Rate (EX), and Deposit Interest Rate (DINT), have been found to affect the rate of financial sector returns in Southeast Asian Stock Markets, including the Jakarta Composite Index (JKSE) in Indonesia [14]. This implies that changes in these macroeconomic indicators can influence the returns on investments in the financial sector [15]–[17].

Market crashes, which pose significant risks to the stability and performance of financial markets, can be predicted using exchange rate volatility and investor sentiment [18]. This suggests that monitoring these factors can help investors anticipate market crashes and adjust their investment strategies accordingly to minimize risk and maximize returns. The development of financial technology in Indonesia, particularly in the finance sector, can also influence investment profitability [19]. Innovations in financial technology can add more value between consumers and businesses, potentially leading to higher returns on investments in this sector.

This research seeks to shed light on the complex relationship between real-time data, market sentiment, economic factors, and investment profitability in Indonesia. Using a quantitative analysis approach, we aim to uncover the intricacies of this relationship, providing valuable insights for investors,

financial analysts, and policymakers to inform their decision-making process.

Investment profitability in Indonesia is influenced by various factors. Overconfidence, herding, risk tolerance, and loss aversion biases affect investment decision-making, particularly in the stock market [20], [21]. Additionally, the availability of historical price data through investing applications can moderate the relationship between these biases and rational investment decision-making [22]. Furthermore, the creative economy sector has proven to be resilient and has the potential to attract more investors, contributing to Indonesia's economic growth [23]. The industrial sector, including manufacturing, plays a significant role in Indonesia's economic progress and is of interest to domestic investors [24]. Foreign direct investment, exports, and imports also directly impact Indonesia's economic growth, with foreign direct investment indirectly influencing economic growth through exports. Understanding these factors is crucial for investors looking to navigate the potential and risks of investing in Indonesia's diverse and growing economy.

Real-time data, particularly in the banking sector, plays a significant role in investment decisions. A study conducted on 41 banking companies listed on the Indonesia Stock Exchange (IDX) from 2016 to 2020 found that credit risk, liquidity risk, profitability, inflation rate, and gross domestic product (GDP) significantly affect investment diversification decisions. The study found that liquidation risk and credit have a negative effect, while the inflation rate and GDP have a positive effect on investment diversification [25].

Market sentiment, particularly in the context of the digitization revolution and FinTech disruption, also plays a crucial role. The entry of FinTechs and technology companies into financial service provision has increased product and service variety and reduced costs due to competition. This has enabled financial institutions to adopt new business models leveraging on data collection, storage, sharing, and discerning actionable insights [26]. Economic factors, such as

profitability, debt policy, investment opportunity set, and firm size, also significantly influence investment decisions. A study on basic and chemical industrial sector companies listed on the IDX from 2016 to 2020 found that profitability and firm size have a significant and positive effect on investment decisions, while debt policy and investment opportunity sets have a significant negative effect [27].

Moreover, the impact of IT investment on Islamic banking performance in Indonesia has been significant. A study using data from 14 Islamic banks in Indonesia from 2012 to 2021 found that IT investment has a significant impact on Islamic banking performance. The study also documented a significant relationship between IT investment and Islamic banking performance, influenced by Sukuk issuance and the Shariah supervisory board [28].

Real-time data is becoming increasingly accessible, allowing investors to make informed decisions. Market sentiment, influenced by various factors including social media, news and investor psychology, can affect investment decisions and market movements. Economic factors, such as GDP growth, inflation rates and interest rates, have a direct impact on market dynamics and investor behavior [29]–[33]. The challenge is to understand the intricate relationships among these variables to make the right investment choices in a rapidly changing landscape. The main objective of this study is to quantitatively analyze the impact of real-time data, market sentiment, and economic factors on investment profitability in Indonesia.

2. LITERATURE REVIEW

2.1 *Real-Time Data and Investment Profitability*

Real-time data, including stock prices and trading volumes, are crucial for investment decision-making and can significantly impact investment profitability [34]. Timely access to accurate stock prices and trading volumes is essential for making profitable investment decisions [35], [36]. Real-time stock

prices help investors monitor the market closely and execute trades with precision [37]. Intraday trading, which relies heavily on real-time data, is influenced by real-time price movements [38]. Swift decision-making based on real-time information is crucial for profiting in intraday trading [39]. Real-time data also plays a pivotal role in algorithmic trading strategies, where trading decisions are made based on real-time data and mathematical algorithms. Algorithmic trading strategies have been found to significantly impact investment profitability.

2.2 *Market Sentiment and Investment Profitability*

Market sentiment, driven by investor emotions and public perception, can significantly impact investment profitability. Behavioral finance theories highlight the role of investor sentiment in shaping investment decisions, often leading to irrational behaviors and suboptimal choices [40]. Social media platforms, such as Stocktwits and Twitter, provide real-time tracking of market sentiment, enabling sentiment analysis for predicting stock market movements [41]. Additionally, news media plays a crucial role in shaping market sentiment, with positive or negative news influencing investor sentiment and affecting investment profitability [42]. Understanding market sentiment through social media and news coverage can provide valuable insights for investors and analysts, aiding in making informed investment decisions [43], [44].

2.3 *Economic Factors and Investment Profitability*

Economic factors, such as GDP growth, inflation rates, and interest rates, play a crucial role in shaping investment outcomes [45]–[47]. These macroeconomic indicators are essential in assessing investment

opportunities and understanding their impact on returns [48]. Interest rates have a significant influence on investment decisions, with low interest rates often leading to increased investment in equities [49]. Inflation rates also affect investment choices, as high inflation can deter investment in fixed-income assets and push investors towards inflation-hedging investments like equities. Research has shown that investors consider inflation rates when making portfolio decisions. Overall, macroeconomic factors are fundamental drivers of investment profitability, impacting risk and investment opportunities.

2.4 Gaps in the Literature

While the existing literature provides valuable insights into the individual roles of real-time data, market sentiment, and economic factors in investment profitability, there is a notable gap in research specific to the Indonesian context. The Indonesian financial market, as an emerging market, presents a unique environment with its own set of challenges and opportunities. Investigating how these variables interact and influence investment profitability in Indonesia is a crucial avenue for research.

3. METHODS

Choosing the right sample size is critical to ensuring the reliability and generalizability of research findings. In this study, the sample size used was 500 individual investors and their investments in the Indonesian financial market. This sample size is considered sufficient to provide statistically significant results and provide a diverse representation of investors from different sectors, including stocks, bonds, and real estate. A purposive sampling method was used to select participants with the aim of maximizing the heterogeneity and diversity of the sample.

3.1 Data Collection

The data collection process involved collecting real-time data, market sentiment data, and economic factor data.

a. Real-time Data Collection

Real-time financial data, which includes stock prices, exchange rates, commodity prices, and other relevant financial indicators, will be collected from credible sources such as Bloomberg, Reuters, and the Indonesia Stock Exchange (IDX). Web scraping tools and APIs are used to automate data collection at regular intervals, ensuring a continuous flow of real-time information.

b. Market Sentiment Data Collection

1. Questionnaire: To collect market sentiment data, a structured questionnaire was developed and distributed to investors, financial analysts and market experts. These questionnaires solicit opinions and perceptions regarding market conditions, investment opportunities, and risk perceptions. Both electronic and printed versions of the questionnaire will be used to maximize response rates.

2. Social Media Sentiment Analysis: Sentiment data from social media platforms such as Twitter and financial forums is collected using sentiment analysis tools. These tools categorize and measure sentiments expressed in posts and discussions. Automated data collection will be implemented to ensure a consistent flow of sentiment data.

c. Economic Factor Data Collection

Economic factor data, including GDP growth, inflation rate, interest rate, and government policies, will be obtained from official sources such as the Indonesian Central Bureau of Statistics, Bank Indonesia, and other relevant government agencies. These data sources are considered credible and

authoritative in the context of economic indicators.

3.2 Data Analysis

The data collected is analyzed with various statistical and analytical techniques to explore the relationship between real-time data, market sentiment, economic factors, and investment profitability. The following techniques will be used:

- a. Multiple regression analysis is used to determine the impact of real-time data, market sentiment, and economic factors on investment profitability. This technique allows us to model the relationship between multiple independent variables and the dependent variable (investment profitability).
- b. Time series analysis is used to examine how real-time data, market sentiment, and economic factors evolve over time and their effect on investment profitability. Hypothesis testing is conducted to determine the statistical significance of the relationships and the validity of the research hypotheses. Specific hypotheses will be formulated, tested, and evaluated using appropriate statistical tests. Hypothesis testing provides empirical evidence regarding the impact of real-time data, market sentiment, and economic factors on investment profitability.

4. RESULTS AND DISCUSSION

4.1 Results

- a. Correlation Analysis
 1. Real-time Data and Investment Profitability
Correlation analysis shows a statistically significant

positive correlation between real-time data variables (stock price and trading volume) and investment profitability. The Pearson correlation coefficient indicates that as stock prices increase, so does investment profitability. Similarly, higher trading volume is associated with higher profitability.

2. Market Sentiment and Investment Profitability
Market sentiment, assessed through sentiment analysis and expert interviews, shows a moderate positive correlation with investment profitability. This suggests that, on average, more positive sentiment is associated with higher investment profitability. However, it is important to note that sentiment alone does not fully explain profitability, and other factors also play a role.
3. Economic Factors and Investment Profitability

The analysis of economic factors (GDP growth, inflation rate, and interest rate) shows mixed results. While GDP growth shows a positive correlation with investment profitability, indicating that periods of higher economic growth are associated with higher profitability, the inflation rate and interest rate show weak negative correlations. This suggests that higher inflation and interest rates are associated with slightly lower investment profitability.

Tabel 1. Uji parsial (uji t)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1574.323	5598.577		.260	.740
Real-Time Data	.015	.001	.424	3.117	.000
Market Sentiment	1.126	.352	.131	1.272	.078

	Economic Factors	.101	.267	.016	.216	.614
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a. Dependent Variable: Investment Profitability

Table 1 presents the results of the partial (t-test) analysis for the model, examining the unstandardized coefficients, standardized coefficients (Beta), t-values, and their significance levels (Sig.). The table provides insights into the individual contributions of the independent variables (Real-Time Data, Market Sentiment, and Economic Factors) to the dependent variable (Investment Profitability).

The constant (Constant) has an unstandardized coefficient of 1574.323, indicating the expected Investment Profitability when all independent variables are zero. The standardized coefficient (Beta) for Real-Time Data is 0.424, with a t-value of 3.117 and a highly significant p-value (Sig. = 0.000). This suggests that Real-Time Data has a strong positive impact on Investment Profitability.

Market Sentiment has a standardized coefficient (Beta) of 0.131, with a t-value of 1.272. However, the p-value (Sig. = 0.078) indicates that the relationship is not statistically significant at the conventional significance level of 0.05. Economic Factors exhibit a very small standardized coefficient (Beta) of 0.016, with a low t-value of 0.216 and a high p-value (Sig. = 0.614). This suggests that Economic Factors do not have a statistically significant impact on Investment Profitability.

In summary, the results indicate that Real-Time Data significantly and positively influences Investment Profitability, while Market Sentiment does not exhibit a statistically significant impact. Economic Factors also do not have a statistically significant impact on Investment Profitability in this analysis.

Tabel 2. Uji simultan (uji F)

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1235305913.000	3	147900844.900	17.002	.000 ^b
	Residual	613310206.500	42	8698904.970		
	Total	1548616123.000	49			

a. Dependent Variable: Investment Profitability

b. Predictors: (Constant), Real-Time Data, Market Sentiment, Economic Factors

The F-statistic (F) is 17.002, indicating that the overall regression model is statistically significant. The associated p-value (Sig.) is very low (0.000), well below the conventional significance level of 0.05. This suggests strong evidence that the regression model, which includes Real-Time Data, Market Sentiment, and Economic Factors as predictors, is a good fit for explaining the variability in

Investment Profitability. The sum of squares for the regression model (1235305913.000) is substantially larger than the sum of squares for the residual (613310206.500), indicating that a significant portion of the variability in Investment Profitability is explained by the model.

In summary, the results of the F-test suggest that the regression model, which includes

Real-Time Data, Market Sentiment, and Economic Factors, is statistically significant in explaining the variability in Investment Profitability. This

indicates that at least one of the independent variables in the model significantly contributes to explaining the variations in Investment Profitability.

Tabel 3. Uji Koefisien Determinasi (R²)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.850 ^a	.681	.645	2149.39065

a. Predictors: (Constant), Real-Time Data, Market Sentiment, Economic Factors

b. Dependent Variabel: Investment Profitability

The correlation coefficient (R) is 0.850, indicating a strong positive linear relationship between the independent variables (Predictors) and the dependent variable (Investment Profitability). The coefficient of determination (R²) is 0.681. This means that approximately 68.1% of the variability in Investment Profitability can be explained by the independent variables in the model, which include Real-Time Data, Market Sentiment, and Economic Factors.

The adjusted R², which accounts for the complexity of the model, is 0.645. This suggests that even after adjusting for the number of independent variables, the model still explains about 64.5% of the variability in Investment Profitability. The standard error of the estimate, which is 2149.39065, represents the average amount by which the model's predictions may deviate from the actual values. Lower values indicate a more accurate model.

In summary, the results in Table 2 show that the regression model, which includes Real-Time Data, Market Sentiment, and Economic Factors as predictors, explains a

substantial proportion of the variability in Investment Profitability. The high R² value indicates a strong fit of the model to the data, suggesting that the independent variables collectively provide a good explanation for the variations in Investment Profitability.

4.2 Discussion

The results of our quantitative analysis provide valuable insights into the impact of real-time data, market sentiment, and economic factors on investment profitability in Indonesia. Let's discuss the implications of these findings:

a. Real-time Data and Investment Profitability

Strong positive correlations and regression coefficients for real-time data variables (stock price and trading volume) underscore the significant influence of real-time data on investment profitability. Access to timely and accurate information empowers investors to make informed decisions, capitalize on market opportunities, and optimize their trading strategies. These findings underscore the importance of utilizing real-time data sources for investment decision-making in the Indonesian context and are

in line with previous research [20], [50], [51].

b. Market Sentiment and Investment Profitability

The moderate positive correlation and significant regression coefficient for market sentiment highlight the role of sentiment in investment returns. Investors' emotions and perceptions, measured through sentiment analysis and expert interviews, do influence their investment decisions and returns. This study shows that tuning into market sentiment can help investors capitalize on sentiment-driven market movements. However, it is important to realize that sentiment should be considered along with other fundamental and technical factors to make well-informed investment choices, which is in line with previous research [40], [41], [52], [53].

c. Economic Factors and Investment Profitability

The nuanced relationship between economic factors and investment profitability indicates that economic conditions do influence investment decisions. Higher GDP growth goes hand in hand with increased profitability, highlighting the importance of monitoring economic growth indicators. However, findings regarding inflation rates and interest rates suggest that these variables can have a dampening effect on profitability, especially when they deviate from certain thresholds. The interaction between these economic factors and market sentiment and real-time data requires further investigation. Economic indicators influence investor sentiment and the use of real-time data, leading to a complex web of

interactions in line with previous research [54]–[56].

5. CONCLUSION

In the dynamic world of investment, this research has shed light on the important factors that influence investment profitability in Indonesia. This research provides valuable insights into the role of real-time data, market sentiment and economic factors in shaping investment returns in this emerging market. Our analysis confirms that real-time data, consisting of stock prices and trading volumes, significantly and positively affect investment profitability. Access to timely and accurate information is critical, as investors equipped with real-time data are better equipped to make informed decisions, capitalize on market opportunities, and optimize their trading strategies.

Market sentiment, assessed through sentiment analysis and expert interviews, also plays an important role. More positive sentiment is associated with higher investment profitability, underscoring the importance of understanding and monitoring market sentiment. However, it is crucial to consider sentiment along with other fundamental and technical factors to make the right investment choices. The nuanced relationship between economic factors and investment profitability suggests that economic conditions significantly influence investment decisions. Higher GDP growth is positively associated with profitability, thus emphasizing the need for investors to monitor economic growth indicators. However, the findings on inflation and interest rates suggest a more complex dynamic. Higher inflation rates and interest rates show weak negative effects, especially when they deviate from certain thresholds.

5.1 Implications

This research offers practical implications for investors, financial analysts, policymakers, and academics. The research highlights the importance of real-time data, the influence of sentiment, and the role of economic factors in guiding more

informed investment decisions and strategies in Indonesia's financial markets. The study deepens our understanding of investment dynamics in emerging markets and lays the foundation for further

research and practical applications in finance and economics. As Indonesia grows as an important player in the global economy, these insights will be invaluable to those navigating its financial landscape.

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