The Effect Of Economic Uncertainty And Monetary Policy News On Microblogging Sentiment Investor

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Abstract

The global economy has experienced growing uncertainty over the years, largely driven by geopolitical tensions and monetary policy adjustments. These conditions intensified volatility in financial markets, particularly the S&P 500 oil and gas sector. Microblogging Investor sentiment is analysed using 500 Twitter usernames from individual users, while monetary policy and economic uncertainty are assessed through accounts such as CNBC, WSJ, and Reuters. This research examines the impact of economic uncertainty and monetary policy updates on investor sentiment toward S&P 500 oil and gas stocks from 2022 to 2024. Using multiple linear regression and Naïve Bayes sentiment classification, data is collected from investor tweets mentioning specific stock ticker codes. The results show that monetary policy news significantly impact on microblogging investor sentiment, while economic uncertainty does not significant impact on microblogging investor sentiment. Investors tend to focus more strongly to monetary policy news than to economic uncertainty.

Keywords: Investor sentiment, monetary policy, economic uncertainty, microblogging, Naïve Bayes, oil and gas industry, S&P 500.

I. INTRODUCTION

In the past two years, the Economic Policy Uncertainty (EPU) index has effectively captured shifts in government policy unpredictability caused by significant events. These fluctuations influence economic decisions and investor behavior, making the EPU index a relevant measure of broader economic uncertainty. Figure 1 illustrates the variation of the EPU index from 2022 to 2024:

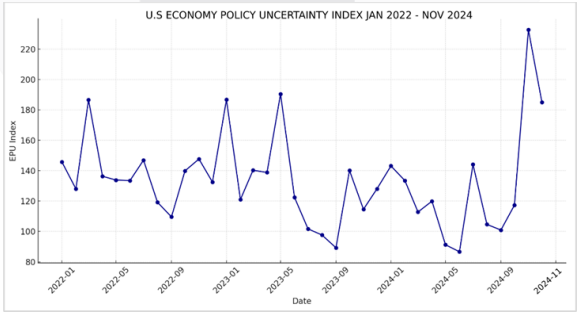


Figure 1 US Economy Policy Uncertainty Index

Research collectively from Maurya et al. (2023), Erer & Erer (2021), and Marschner (2021) underscores the profound impact of economic uncertainty on shaping investor sentiment, reinforcing its critical role in driving negative sentiment and influencing investment decisions during periods of high uncertainty. Conversely, (Anastasiou et al., 2025; Guenich et al., 2022; Nartea et al., 2020) suggest that during periods of low uncertainty, characterized by high investor optimism, economic policy uncertainty has an insignificant impact, as investors prioritize positive economic outlooks over potential risks.

While no research suggests that monetary policy news has an insignificant effect on shaping investor sentiment, the magnitude of its impact can vary depending on prevailing market conditions. When policy changes are influenced by broader macroeconomic factors, the immediate influence tends to be weaker. Nonetheless, the overall relationship between monetary policy and investor sentiment remains significant, as evidenced by the work of Benchimol (2023), Fariska et al. (2020), and Fariska (2021).

Benchimol (2023) emphasizes that, particularly during periods of low interest rates, monetary policy plays a significant

role in influencing investor sentiment by stimulating investment in the stock market, thereby driving increased market activity and higher stock prices, especially during times of heightened financial uncertainty. Fariska (2021) further contributes to this literature by examining the role of social media in shaping investor sentiment, illustrating how the dissemination of monetary policy news through platforms like microblogs significantly impacts investor sentiment. Similarly, Fariska et al. (2020) show that monetary policy adjustments in Indonesia lead to a sustained positive sentiment, while sentiment shocks tend to have only temporary effects.

However, limited research has been conducted on the impact of economic uncertainty and monetary policy news on investor sentiment in the context of the Oil and Energy sector stocks listed in the S&P 500 from 2022 to 2024. Thus, this study aims to examine how economic uncertainty and monetary policy news influence investor sentiment in microblogging platforms, specifically focusing on the oil & gas industry.

In addition, the rapid integration of social media into the dissemination of market information has reshaped how investor sentiment is formed, as a significant share of market-related narratives is now produced or amplified through online platforms. As a result, shifts in public sentiment can swiftly translate into market reactions. Az-Zahra et al. (2021) reveal a strong correlation between social media sentiment and major news coverage with stock price fluctuations, while sentiment transmitted through news and online discussions has a broader influence on overall market behavior (Alamsyah et al., 2022)

II. LITERATURE REVIEW

A. Behaviour Finance

Behavioral finance, introduced by Kahneman and Tversky (1974), explains how psychological biases affect financial decision-making. Unlike traditional finance, which assumes rational investors, behavioral finance emphasizes emotional and cognitive deviations, such as overconfidence or loss aversion. According to Shefrin (2007), cognitive biases such as overconfidence, anchoring, and mental accounting can lead investors to deviate from optimal choices. These biases cause investors to react differently to market information, particularly during periods of uncertainty or high volatility.

B. Social Dynamic

The social dynamics theory by Shiller (1984) asserts that investing behavior is not merely an individual act but a collective process influenced by social interactions. Market speculation, therefore, operates as a social phenomenon: investors imitate one another, propagate narratives, and collectively drive asset prices away from fundamentals. In the digital era, social media amplifies these dynamics by accelerating the diffusion of rumors and emotional contagion among investors. Fariska and Rohandi (2020) also highlight that the media environment has become a central factor shaping investor behavior in imperfect information markets.

C. Sentiment Investor

Investor sentiment represents the degree of optimism or pessimism investors hold regarding market prospects (Baker & Wurgler, 2006). It captures collective attitudes that may not align with economic fundamentals but nonetheless influence asset prices. Empirical studies (Lazzini et al., 2022; Fariska, 2021) show that investor sentiment derived from social media correlates strongly with stock market volatility, suggesting that digital emotions can serve as predictive signals for market direction.

D. Monetary Policy News

Monetary policy refers to the central bank's strategies for maintaining economic stability by controlling money supply, interest rates, and inflation (Marschner & Ceretta, 2021). Policy announcements often serve as catalysts for investor reactions. Baker and Wurgler (2007) argue that positive policy signals (e.g., rate cuts) boost investor sentiment, while restrictive signals (e.g., rate hikes) trigger pessimism. Data related to monetary policy news are commonly extracted from reputable media sources such as CNBC, Reuters, and WSJ. These announcements can be operationalized into variables reflecting positive or negative sentiment within financial communication streams.

E. Microblogging Sentiment Investor

Microblogging refers to brief posts or updates shared on platforms such as Twitter, where investors exchange views, predictions, and emotional reactions in real time (Jiang et al., 2015). In financial research, these posts are treated as behavioral data capturing investor mood. The sentiment can be classifie as positive, neutral, or negative, which can then be quantified and analyzed statistically (Antweiler & Frank, 2004). As Fariska (2021) notes, the integration of social media data provides a "bottom-up" perspective of financial psychology that complements traditional market models.

F. *Social Media Big Data*

The digitalization of financial communication generates enormous datasets, often referred to as *big data*. Gartner (2012) defines big data as large, complex, and rapidly growing information flows that exceed traditional analytical capacities. In financial markets, social media big data comprising millions of investor posts serves as a rich source for sentiment analysis and behavioral modeling.. Fariska (2021) emphasizes that social media big data provides a continuous behavioral trace of investor activity, allowing machine learning algorithms like Naïve Bayes to detect emotional shifts at scale. By integrating these computational tools, researchers can transform qualitative investor opinions into quantitative indicators that correlate with stock returns, volatility, and liquidity.

G. *Economic Policy Uncertainty (EPU)*

The *Economic Policy Uncertainty (EPU)* index, developed by Baker, Bloom, and Davis (2016), quantifies uncertainty in fiscal, monetary, and regulatory environments by analyzing the frequency of policy-related keywords in news media. High EPU levels indicate greater unpredictability in government actions, which can deter investment and reduce risk-taking (Caldara et al., 2022). In the context of behavioral finance, EPU serves as a macro-level driver of sentiment when policy uncertainty rises, investors tend to exhibit stronger fear responses and flight-to-safety behaviors. Studies by Maurya et al. (2023), Erer & Erer (2021), and Marschner (2021) confirm that heightened uncertainty correlates with declining investor optimism. Conversely, when uncertainty is low, investors focus more on positive macroeconomic expectations (Anastasiou et al., 2025; Guenich et al., 2022).

For this research, the EPU index is employed as an independent variable representing macroeconomic uncertainty that potentially influences microblogging investor sentiment toward oil and gas stocks in the S&P 500. From the background explanation above, the problem formulation or hypothesis of this research is as follows:

1. How does monetary policy news impact on microblogging investor sentiment on oil and gas sector stocks in the S&P 500 during the 2022-2024 period?
2. How does economic uncertainty impact on microblogging investor sentiment on oil and gas sector stocks in the S&P 500 during the 2022-2024 period?
3. How do monetary policy news and economic uncertainty simultaneously impact on the microblogging of investor sentiment oil and gas sector stocks in the S&P 500 during the 2022-2024 period?

III. RESEARCH METHODOLOGY

This study adopts a quantitative causal research design aimed at identifying and measuring the effect of monetary policy news and economic uncertainty on investor sentiment expressed through microblogging activity. The research uses secondary data obtained from social media and institutional sources.

The unit of analysis consists of individual investors who actively post about oil and gas stocks within the S&P 500 Energy Sector during the period January 2022 to November 2024. The five companies with the highest market capitalization (ExxonMobil (XOM), Chevron (CVX), ConocoPhillips (COP), Schlumberger (SLB), and EOG Resources) represent the research object, as they collectively account for 59.6% of the sector's market value.

The data was retrieved using Python 3.10 and Google Collab version 1.0.0, a cloud-based platform that enables users to write, execute, and share Python code collaboratively, without requiring local setup or installation.

The sentiment classification process generated a dataset of approximately 5,000 tweet entries from 500 active investor accounts. The Naïve Bayes model, trained on 80 percent of the data and tested on 20 percent, demonstrated exceptional accuracy with AUC, classification accuracy, and F1 scores all reaching 1.00. These metrics indicate that the sentiment labeling was highly reliable and consistent with manual categorization. Positive sentiments tended to appear during policy announcements suggesting monetary easing, while negative sentiments increased around interest rate hikes and inflation-related news.

IV. RESULT

A. *Naive Bayes Text Classification Analysis*

The sentiment classification process generated a dataset of approximately 5,000 tweet entries from 500 active investor accounts. The Naïve Bayes model, trained on 80 percent of the data and tested on 20 percent, demonstrated exceptional accuracy with AUC, classification accuracy, and F1 scores all reaching 1.00. These metrics indicate that the sentiment labeling was highly reliable and consistent with manual categorization. Positive sentiments tended to appear during policy announcements suggesting monetary easing, while negative sentiments increased around interest rate hikes and inflation-related news.

Table 1 Manual Tweet Classification Training Set

Comments	Classification Manual
ConocoPhillips achieved record production and strong financial performance in 2023, with a focus on sustainable growth, efficiency, and delivering value to shareholders #COP	Positive
@BlacklionCTA I'm surprised by the magnitude of the capital spending increases - for major public companies such as $XOM & $CVX the negative ESG pressure just keeps building	Negative
Exxon, Chevron Profits Disappoint on Weak Refining, Chemical Results $XOM $CVX	Negative
Oil prices rose slightly in Asian trade on Friday, and were set to snap a seven-week losing spree on optimism over interest rate cuts by the Federal Reserve and a positive outlook on demand from the International Energy Agency $XOM $OXY $CVX $COP	Positive

Table 2 Automatic Classification

Twitter's Post	Positive	Negative	Neutral	Classification
Dont jump on crude oil as it could get very volitile, Something more stable like (OXY) or (CVX) they will rise with the rise of crude oil plus get dividendsCorp, (XOM) reflects limited EPS from core operations	49,4%	0,6%	50%	Positive
WTI keeps going up yet $CVX can t even get to 160 , Big oil is DEAD! #OOTT	10%	42,8%	21,1%	Negative
$CVX's oil and gas production in the permian basin hit a record high but is the company pulling back? @chevron CEO mike Wirth tells @jimcrammer that it is the best company to invest	12,7%	0%	87,3%	Positive
$COP was this quarter's top loser, falling -17,26% #ConocoPhillips	0%	46,8%	54,9%	Negative

Table 3 Naive Bayes Classification Model

Model	AUC	CA	F1	Prec	Recall	MCC
Naïve Bayes	1,00	1,00	1,00	1,00	1,00	1,00

By using the orange application, the measurement of the Area Under the Curve (AUC) value is obtained as 1. The AUC matrix is used to measure the entire classification model where the closer to the maximum value (1), the better the performance of the model so that in this measurement the model can be said to have very good performance, meaning that the testing and training data used is said to be consistent.

The F1 Score measurement yielded a value of 1. This matrix combines Precision and Recall, providing an overall classification assessment. A high F1 score value indicates that the model has good and balanced precision and recall. Therefore in this test the model performed with good and balanced precision and recall. This suggests good consistency between the training and testing data, as can be seen in the following confusion matrix table:

Table 4 Matrix Confusion Results

		Predicted		
		Negatif	Positif	**Total**
Actual	Negatif	100%	0%	**185**
	Positif	0%	100%	**215**
	Total	**185**	**215**	**400**

In the "Negative" category, the model made accurate predictions with 100% precision for examples that belonged to that category. Out of a total of 185 examples that were actually "Negative," the model successfully predicted all of them as "Negative." In the "Positive" category, the model made accurate predictions with 100% precision for examples belonging to that category. Out of a total of 215 examples that were actually "Positive," the model successfully predicted all of them with 100% match rate.

B. *Descriptive Analysis*

Table 5 Descriptive Analysis Results

Variable	N	Minimum	Maximum	Mean	Std. Deviation
	statistic	statistic	statistic	statistic	statistic
Microblogging Sentiment investor	500	-1	1	0.08	0.845
Monetary Policy News	500	-1	1.5	0.036	0.841
Economic Uncertainty	500	-1	1.5	0.076	0.850

Based on table above, it can be concluded that the data obtained from 500 uploads based on the hashtag (#) code shares in 5 oil and gas companies listed on the NYSE for the period January 2022 - November 2024. The descriptive testing on the dependent variable (Y) or Microblogging sentiment Investor has a minimum value of -1, a maximum value of 1 and a mean value of 0.08, and a standard deviation value of 0.845. Descriptive statistical test testing has a smaller meaning value than the standard deviation. This means that the dependent variable data that has been collected does not have data distribution that is very far from the average.

For the independent variable (X1) or monetary policy news has a minimum value of -1, a maximum value of 1, and a mean value of 0.036, and a standard deviation value of 0.841. Descriptive statistical test testing has a smaller mean value than the standard deviation. This means that the dependent variable data that has been collected does not have a spread of data that is very far from the average.

As for the next independent variable (X2) or uncertainty economy has a minimum value of -1, a maximum value of 1.5, and a mean value of -0.076, and a standard deviation value of 0.850. Descriptive statistical test testing has a smaller mean value than the standard deviation. This means that the dependent variable data that has been

collected does not have a spread of data that is very far from the average.

C. *Multinomial Logistic Regression*

Table 6 Multinomial Logistic Regression Results

		B	S.E.	Wald	Df	Sig.	Exp(B)
0	Monetary policy	1.194	0.174	47.172	1	0.000	3.301
	Economic Uncertainty	0.042	0.153	0.075	1	0.784	1.043
	Intercept	0.205	0.138	2.219	1	0.136	
1	Monetary policy	1.788	0.181	98.003	1	0.000	5.979
	Economic Uncertainty	0.494	0.158	9.743	1	0.002	1.639
	Intercept	0.284	0.141	4.042	1	0.044	

From the data processing results above, for sentiment category 0, the intercept value is 0.205 with a significance level of 0.136, indicating that before considering the independent variable, the baseline probability of being in the neutral category compared to category -1 does not show a statistically significant difference. The monetary_policy variable has a coefficient of 1.194 with a significance value of 0.000, and an Exp(B) value of 3.301, which means that an increase in the monetary policy value increases the probability of investors being in the neutral sentiment category by 230.1% compared to the negative sentiment category (-1). This indicates that monetary policy has a positive and significant effect on the probability of neutral sentiment. Furthermore, the economic_uncertainty variable has a coefficient value of 0.042 with a significance of 0.784 and Exp(B) = 1.043, which means that changes in the level of economic uncertainty do not have a significant effect on the probability of investors being in the neutral sentiment category compared to the negative category. Thus, in this category, only the monetary policy variable is statistically significant in influencing changes in investor sentiment.

For sentiment category 1, the intercept value is 0.284 with a significance level of 0.044, so it can be concluded that before entering the independent variable, there is a statistically significant difference in the base probability between the positive sentiment category and the negative sentiment category. The monetary_policy variable shows a coefficient of 1.788 with a significance value of 0.000, and Exp(B) = 5.979, which means that an increase in the monetary policy value increases the probability of investors being in the positive sentiment category by 497.9% compared to category -1. Thus, monetary policy has been proven to have a positive and significant influence in encouraging positive sentiment. Meanwhile, the economic_uncertainty variable has a coefficient of 0.494 with a significance value of 0.002, and Exp(B) = 1.639, which indicates that an increase in economic uncertainty increases the likelihood of investors being in the positive sentiment category compared to category -1 by 63.9%. This shows that both monetary policy and economic uncertainty have a significant effect on the likelihood of investors being in the positive sentiment category.

D. *Multinomial Logistic Regression Analysis Test*

1. *Overall Model Fit*

Table 7 Overall Model Fit

-2Log likelihood awal (block number = 0)	317.841
-2Log likelihood akhir (block number = 1)	139.872

Based on the table above, the initial −2LL value was 317,841, while the final −2LL value decreased to 139,872. The decrease in −2LL of 177,969 indicates that the model with independent variables has a better fit than the model without predictors. The Chi-Square value of 177,969 with a significance of 0.000 < 0.05 also indicates that the simultaneous addition of monetary policy and economic uncertainty variables can improve the model's validity. Thus, the regression model used is declared fit and suitable for use in further analysis.

McFadden	*Cox & Snell R Square*	*Nagelkerke R Square*
0.164	*0.299*	*0.338*

2. *Goodness of Fit Test*

Table 8 Goodness of Fit Test

Based on the output, the Pearson Chi-Square value is 71.675 with a degree of freedom of 12 and a significance value of 0.000, while the Deviance value is 71.180 with a significance of 0.000. Both significance values are less than 0.05, indicating that there is a significant difference between the observed values and the values predicted by the model. Thus, these results indicate that the model does not fully describe the data perfectly. However, the model can still be used for interpreting the effects of variables, as such discrepancies are common in multinomial regression using categorical data with overlapping variations.

3. *Classification Matrix*

Table 9 Classification Matrix

Observed	Predicted			Percentage Correct
	-1	0	1	
-1	173	9	38	70.6%
0	24	17	100	12.1%
1	31	11	157	78.9%
Overall Percentage	33.6%	7.4%	59.0%	57.4%

Based on the classification results, the model was able to identify category -1 with an accuracy rate of 70.6%, category 0 with an accuracy rate of 12.1%, and category 1 with an accuracy rate of 78.9%. Overall, the model has an accuracy rate of 57.4%, which is higher than random guessing and indicates that the model is quite capable of distinguishing variations in microblogging sentiment categories. However, the ability to predict category 0 is still low, indicating that there are similarities in data patterns between neutral categories and other categories, making it difficult for the model to distinguish between them.

4. *Coefficient Determination (Pseudo's R Square)*

Table 10 Coefficient Determination Model Summary

McFadden	*Cox & Snell R Square*	*Nagelkerke R Square*
0.164	0.299	0.338

Based on the test results, the Cox and Snell value is 0.299, Nagelkerke is 0.338, and McFadden is 0.164. These values indicate that the monetary policy and economic uncertainty variables are able to explain approximately 29.9% to 33.8% of the variability in the microblogging sentiment category. Although not as high as linear regression, these values are considered adequate for data-based social research, where variability is often influenced by various

external factors outside the model. Thus, the model has moderate explanatory power and remains relevant for explaining the influence of both independent variables on investor sentiment.

E. *Hypothesis Test*

1. Wald Test

Based on the Parameter Estimates Table (table 6), in the reference category microblogging_sentiment = 1, the monetary policy variable shows a Wald value of 98.003 in category (-1) and 14.648 in category (0), with a significance level of 0.000 < 0.05. This result indicates that monetary policy has a significant effect in distinguishing the likelihood of investors being in the negative or neutral sentiment category compared to the positive sentiment category. The Exp(B) value of 0.167 for category (-1) and 0.552 for category (0) shows that an increase in monetary policy tends to reduce the likelihood of investors choosing sentiment categories other than positive.

Meanwhile, the economic uncertainty variable has a Wald value of 9.743 in category (-1) and 10.035 in category (0), with significance values of 0.002 < 0.05, respectively. Thus, economic uncertainty also has a significant effect on changes in investor sentiment categories. The Exp(B) value of 0.610 in category (-1) and 0.636 in category (0) indicates that increased economic uncertainty reduces the likelihood of investors being in the negative or neutral sentiment category compared to positive sentiment. Therefore, partially, both independent variables are proven to have a significant effect on investor sentiment microblogging.

2. Omnibus Test of Model Coefficients

Table 11 Coefficient Determination Model Summary

Chisquare	Df	Sig.
177.969	4	0.000

The omnibus test is used to assess the overall validity of the model, namely to determine whether the independent variables simultaneously have a significant effect on the dependent variable. Based on the Model Fitting Information Table, a Chi-Square value of 177.969 was obtained with degrees of freedom (df) = 4 and significance 0.000 < 0.05. These results indicate that the multinomial logistic regression model used in this study is statistically valid and significant. Thus, the alternative hypothesis (H1) is accepted, which means that monetary policy and economic uncertainty simultaneously affect investor sentiment microblogging in economic uncertainty simultaneously affects investor sentiment microblogging.

V. DISCUSSION

Based on the results of data processing, this study shows that monetary policy news has a significant effect on investor sentiment microblogging on energy sector stocks. This finding is in line with Kurov's (2010) research, which states that monetary policy news tends to create significant changes in financial markets, thereby triggering sentiment reactions from market participants. Furthermore, Baker & Wurgler (2007) explain that changes in investor sentiment can occur rapidly when there is macroeconomic information that is considered important, including interest rate announcements or other monetary policy announcements. The results of this study are also supported by Benchimol et al. (2023), who found that monetary policy shocks have a significant impact on market reactions.

The results of the analysis show that economic uncertainty also has a significant influence, although not as strong as the influence of monetary policy news on investor sentiment microblogging. These findings are in line with the research by Guenich et al. (2022) and Marschner & Ceretta (2021), which states that the level of economic policy uncertainty (EPU) can affect investor behavior, especially in the form of sentiment reactions. Thus, although economic uncertainty still contributes to sentiment movements, this factor is not the main determinant of investor sentiment microblogging, but serves as a supporting factor that reinforces the direction of sentiment when global economic conditions change.

Simultaneously, the results of the study show that monetary policy news and economic uncertainty have a significant effect on investor sentiment microblogging. These findings reinforce the results of Marschner & Ceretta's (2021) study, which revealed that the combination of monetary policy and economic uncertainty can create stronger sentiment dynamics among investors, especially in the financial and energy sectors. These findings also support the research by Fariska et al. (2020), which explains that monetary policy and economic uncertainty have a simultaneous effect on investor responses in volatile market conditions.

VI. CONCLUSION AND RECOMMENDATION

Based on the findings and discussion presented in the previous chapter, several important conclusions can be drawn regarding the relationship between monetary policy, economic uncertainty, and microblogging investor sentiment:

Monetary policy news demonstrated a significant partial effect on microblogging investor sentiment. The multinomial logistic regression results indicated that changes in monetary policy consistently influenced investor sentiment, particularly shifting sentiment toward more negative or neutral categories depending on the policy direction. This shows that monetary policy remains one of the primary macroeconomic signals interpreted by investors in online discussions.

Economic uncertainty showed a significant effect in the multinomial model, although the strength of the effect differed across sentiment categories. The testing results revealed that economic uncertainty contributed to explaining variations in investor sentiment, but the effect was weaker compared to monetary policy news. This suggests that while investors respond to uncertainty, their reactions may be shaped by more immediate or sector-specific information.

Simultaneously, monetary policy and economic uncertainty significantly influenced microblogging investor sentiment. The omnibus model test supported that the combination of both independent variables provided substantial explanatory power for predicting sentiment categories. This indicates that investor sentiment on microblogging platforms is shaped by a mix of macroeconomic conditions rather than a single dominant factor.

Overall, the results of this research indicate that monetary policy news and economic uncertainty jointly exert a meaningful influence on investor sentiment during the study period. These findings highlight the complexity of sentiment formation in digital financial discourse, where macroeconomic announcements and market uncertainty interact in shaping investor perspectives.

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