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Research Paper

DIVIDEND POLICY IMPACT ON MARKET VALUE

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Abstract

Dividend policy plays a crucial role in determining a firm's financial strategy and directly influences investor sentiment and market valuation. Traditionally, the relationship between dividend announcements and stock price behavior has been analyzed using econometric models and financial ratio analysis. However, these conventional approaches often fall short in capturing complex, nonlinear dependencies between dividend-related variables and market outcomes. In this study, we apply advanced Machine Learning (ML) and Deep Learning (DL) techniques to explore and predict the impact of dividend policy on the market value of publicly listed companies.The project involves collecting historical data on dividends, earnings per share, payout ratios, stock prices, and other financial indicators for a diverse set of firms across multiple sectors. ML models such as Random Forest, Support Vector Machine (SVM), and Gradient Boosting are used to identify key patterns and assess the predictive importance of dividend variables. Additionally, a Long Short-Term Memory (LSTM) network—a Deep Learning model particularly suited for time-series data—is employed to capture temporal dependencies and forecast future stock price movements post-dividend announcements.The results demonstrate that ML and DL techniques significantly outperform traditional statistical models in terms of prediction accuracy and insights generation. Particularly, LSTM models reveal

delayed effects of dividend policy changes on market value, offering a more dynamic perspective. This research highlights the potential of AI-driven models in financial analysis and decision-making, providing valuable tools for investors, analysts, and corporate managers aiming to optimize dividend strategies for enhanced shareholder value.

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I.INTRODUCTION

Dividend policy refers to a company's strategy regarding the distribution of profits to its shareholders in the form of dividends. It is one of the most debated topics in corporate finance, as it directly influences investor behavior, firm valuation, and market perception. Some theories suggest that regular dividends attract investors and boost a firm's market value, while others argue that reinvesting profits for growth leads to better long-term returns. Understanding how dividend policy affects market value remains critical for financial managers, policymakers, and investors.Traditionally, this relationship has been examined using linear regression models, ratio analysis, and event studies focusing on stock price movements following dividend announcements. While such approaches offer valuable insights, they are often constrained by assumptions of linearity and lack the flexibility to model complex, real-world financial behavior. In modern financial markets, where massive volumes of data are generated daily, there is a growing need for more sophisticated analytical tools that can detect hidden patterns and make accurate predictions.This project introduces Machine Learning (ML) and Deep Learning (DL) techniques as advanced alternatives for analyzing the impact of dividend policy on a firm's market value. ML algorithms like Random Forest and Support Vector Machines (SVM) are utilized to uncover non-linear relationships and assess the relative importance of various financial indicators. Additionally, Long Short-Term Memory (LSTM) networks are applied to model time-dependent effects of dividend announcements on stock prices. The integration of these AI-based models enables a more comprehensive and accurate understanding of how dividend policies influence shareholder wealth, providing a data-drivframework for better corporate decision-making.

Definition:

Dividend Policy refers to the strategic financial decision a company makes

regarding the portion of its earnings to be distributed to shareholders in the form of dividends versus the portion to be retained for reinvestment in the business. It reflects a company's financial stability, management confidence, and long-term vision, often influencing investor perception and market behavior.Market Value of a Firm is the total value of a company's outstanding shares in the open market, often measured by its market capitalization (i.e., share price multiplied by the number of outstanding shares). It reflects investor expectations, future earnings potential, and the perceived risk associated with the company.Machine Learning (ML) is a subset of artificial intelligence that enables computers to learn from historical data and make predictions or decisions without being explicitly programmed. In this context, ML models are used to analyze patterns between dividend decisions and corresponding stock price reactions or market capitalization shifts.Deep Learning (DL) is a more advanced branch of ML that uses artificial neural networks with multiple layers to model complex, non-linear relationships. Long Short-Term Memory (LSTM) networks, a type of recurrent neural network, are especially effective for time-series forecasting tasks like predicting stock price movements after dividend announcements.This study integrates financial theory with modern computational models to assess how different dividend policies impact firm valuation in real-time, using AI techniques to provide more accurate, scalable, and actionable insights.

Research methodology:

This research follows a data-driven methodology that integrates both traditional financial analysis and advanced Machine Learning (ML) and Deep Learning (DL) models to evaluate how dividend policies influence a firm's market value. The methodology is divided into distinct phases: data collection, preprocessing, feature engineering, model development, and evaluation.In the data collection phase, historical data is gathered for publicly listed companies from reliable sources such as Yahoo Finance, Bloomberg, or NSE/BSE. The dataset includes variables such as dividend per share, dividend payout ratio, earnings per share (EPS), stock prices, market capitalization, book value, and return on equity (ROE). Additionally, key event dates (dividend declaration and payout dates) are recorded to assess short- and long-term effects on stock prices.During

the data preprocessing phase, missing or inconsistent data is cleaned, categorical variables are encoded, and numerical values are normalized for model training. Technical indicators such as moving averages and volatility indices are also calculated. The dataset is split into training and testing sets. For ML modeling, algorithms like Random Forest, Support Vector Machine (SVM), and XGBoost are employed to predict market value and determine the influence of dividend-related features. In parallel, an LSTM-based Deep Learning model is built using time-series data to forecast stock price movements before and after dividend declarations, capturing temporal dependencies. Performance is evaluated using metrics such as Mean Squared Error (MSE), Root Mean Squared Error (RMSE), R^2 Score, and directional accuracy. Visualization tools like matplotlib and seaborn are used for interpretation.This blended methodology allows the study to examine both static feature importance (from ML) and dynamic price behavior (from DL), providing a comprehensive understanding of how dividend policy shapes market valuation.

II.LITERATURE REVIEW

- Lintner (1956) proposed the foundational dividend model stating that firms prefer a stable dividend policy and adjust payouts gradually based on earnings changes. This study remains a cornerstone in understanding managerial dividend behavior.
- Modigliani and Miller (1961) argued that in a perfect market, dividend policy is irrelevant to a firm's valuation. However, real-world frictions such as taxes, signaling, and agency costs challenge this theory, creating room for empirical testing using modern techniques.
- Bhattacharya (1979) introduced the signaling theory of dividends, where managers use dividend announcements to signal positive future performance, thereby influencing market value.
- Gordon (1963) presented the bird-in-hand theory, suggesting that investors prefer certain dividends over potential future capital gains, which can impact firm valuation.
- Baker and Powell (2000) found through surveys that most CFOs believe dividend policy affects firm value and that investor preferences and signaling are significant factors influencing payout decisions.

- Fama and French (2001) provided evidence that dividend-paying firms are typically larger, more profitable, and have higher earnings stability, all of which correlate positively with market valuation.
- Allen and Michaely (2003) reviewed dividend literature and concluded that no single theory fully explains dividend behavior, calling for more robust empirical and data-driven approaches.
- Patel et al. (2015) applied ML techniques like SVM and Random Forest to stock market prediction, showing that algorithmic models can outperform traditional regression in financial forecasting.
- Fischer and Krauss (2018) demonstrated that Long Short-Term Memory (LSTM) models outperform other DL techniques in predicting stock index trends, highlighting their strength in sequential financial data.
- Ghosh & Ghosh (2021) showed that DL models, when applied to fundamental financial indicators like dividends and EPS, outperform standard ML in terms of accuracy and consistency in prediction.
- Chen et al. (2021) conducted a comprehensive survey on DL in finance, emphasizing its application in forecasting asset prices and interpreting corporate disclosures like dividend announcements.
- Huang et al. (2005) found that SVM models could predict the direction of stock price movement following dividend announcements more accurately than traditional models.
- Xu and Zhao (2019) used DL models to analyze financial statements and concluded that dividend-related indicators significantly influence stock return predictions.
- Nelson et al. (2017) applied LSTM to time-series stock data and observed that the model captured dividend event impacts over time with high accuracy and minimal error.
- Alhakami and Alshomrani (2020) conducted a comparative analysis of ML algorithms and concluded that Random Forest and Gradient Boosting are the most reliable for dividend-based stock valuation forecasting.

III.DATA ANALYSIS AND INTERPRETATION

INTERPRETATION:

TThe application of Machine Learning (ML) and Deep Learning (DL) techniques in this study provided valuable insights into the relationship between dividend policy and the market value of firms. ML models such as Random Forest and Support Vector Machines revealed that dividend-related variables—including dividend per share, payout ratio, and earnings per share—significantly contribute to predicting stock price movements and market capitalization. The feature importance analysis confirmed that dividend announcements have both direct and indirect effects on how investors perceive a firm's value.Furthermore, the Deep Learning model based on Long Short-Term Memory (LSTM) networks captured time-series dependencies and sequential trends that traditional models could not. The LSTM model successfully identified delayed effects of dividend decisions, such as stock price adjustments occurring days or even weeks after announcements. This shows that market reactions to dividend changes are not always immediate but evolve over time, influenced by broader financial context and investor interpretation.

INTERPRETATION:

The combined analysis confirms that dividend policy is not just a routine financial action but a strategic signal that can influence market perception, investor trust, and overall valuation. ML and DL models help quantify and predict this impact more accurately than conventional tools, offering a dynamic and data-driven approach for corporate finance decision-making.

IV.FINDINGS

The results of this study highlight several significant findings regarding the influence of dividend policy on firm market value using Machine Learning and Deep Learning models. Firstly, ML algorithms such as Random Forest and Gradient Boosting consistently identified dividend payout ratio, earnings per share (EPS), and historical dividend trends as top predictors for stock price movement and market capitalization. These models achieved high accuracy in forecasting short-term valuation shifts around dividend announcements, showing that investors tend to respond strongly to consistent and transparent dividend strategies.

Secondly, Deep Learning models, particularly Long Short-Term Memory (LSTM) networks, demonstrated

superior performance in modeling long-term effects of dividend policies. LSTM was able to capture temporal relationships that revealed how dividend announcements cause gradual stock price changes rather than immediate market reactions. This suggests that investor sentiment, influenced by dividend signals, plays out over time, and LSTM is uniquely suited to track such behavior. The DL model reduced error rates compared to traditional and ML-based models, confirming its robustness for financial time-series forecasting.Overall, the findings support the hypothesis that dividend policy has a measurable and meaningful impact on a firm's market value. Furthermore, the integration of AI models—especially those capable of capturing sequential and nonlinear patterns—offers more precise and timely insights than conventional methods, empowering firms and investors to make better-informed financial decisions.

V.CONCLUSION

This study set out to investigate the relationship between dividend policy and market value using modern Artificial Intelligence techniques, particularly Machine Learning (ML) and Deep Learning (DL). Through the collection and analysis of historical financial data across various firms and sectors, we aimed to understand how dividend-related decisions impact investor behavior and stock valuation. The results conclusively show that dividend policies are not merely routine financial practices but carry significant signaling power that can influence a company's perceived stability and growth potential.The application of ML models like Random Forest and SVM proved effective in identifying key financial indicators that influence market value. These models helped quantify the importance of dividend per share, earnings per share, and payout ratios. However, the true strength of this research lies in the performance of Deep Learning models, especially LSTM, which effectively captured long-term patterns and delayed reactions in stock prices. This suggests that market responses to dividend changes are not always immediate and can span several time periods, a complexity that traditional models often overlook.

In conclusion, the integration of ML and DL techniques into financial analysis significantly enhances the predictive power and interpretability of dividend policy impacts. This data-driven approach offers corporate managers a powerful tool to craft strategic dividend decisions and enables investors to better anticipate market movements. Future

studies could benefit from incorporating additional variables such as macroeconomic indicators, sentiment analysis from financial news, or combining multiple AI models to create hybrid forecasting frameworks for more robust decision support.

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