AGORA International Journal of Economical Sciences, http://univagora.ro/jour/index.php/aijes
ISSN 2067-3310, E-ISSN 2067-7669
Vol. 18, No. 2 (2024), pp. 356-374

CORPORATE DECISION-MAKING AND THE IMPACT OF ACQUISITIONS ON SHARE PRICES: THE CASE OF VERIZON

D. VASILIAUSKAITE, K. HRYTSIV, O.TKACHENKO, M. ZHAKUN

Deimante Vasiliauskaite[1], Kateryna Hrytsiv[2], Oleksandra Tkachenko[3], Marharyta Zhakun[4]

[1 2 3 4] Business School, Vilnius University, Lithuania

[1] https://orcid.org/0000-0002-8107-1964 E-mail: deimante.vasiliauskaite@vm.vu.lt

[2] https://orcid.org/0009-0004-9053-3069 E-mail: kateryna.hrytsiv@outlook.com

[3] https://orcid.org/0009-0004-5664-1760, E-mail: oleksandra.tkachenko@vm.stud.vu.lt

[4] https://orcid.org/0009-0005-8924-6609, E-mail: m.zhakun555@gmail.com

Abstract: *This study investigates the impact of Verizon Communications Inc.'s acquisition of Yahoo on the company's stock performance, using a combination of statistical, visual, and multiscale analytical methods. The research analyzes how strategic corporate decisions, particularly acquisitions, influence short-term and long-term stock behavior. Data spanning from 2014 to 2024 was analyzed to capture pre-acquisition, acquisition, and post-acquisition trends. The methodology integrates boxplot visualizations to explore variability and outliers, quantile analysis to assess distributional characteristics, and descriptive statistics to summarize key metrics such as mean, standard deviation, skewness, and kurtosis. Tabulation analysis evaluates associations between stock returns and trading volumes, while wavelet analysis decomposes stock returns into multiple time scales to identify short-term fluctuations and long-term trends. Results reveal significant volatility during key events, such as the Yahoo acquisition in 2017 and the COVID-19 pandemic, with daily fluctuations peaking at ±6. Medium-term adjustments (4–8 days) exhibited moderate changes, and long-term trends (32-day cycles) showed structural shifts, including positive coefficients in 2017 (+0.5) and negative coefficients in 2020 (-0.6). The research highlights the heavy-tailed nature of return distributions and skewed trading volume patterns. This study provides insights into the multifaceted effects of acquisitions on stock performance, offering valuable implications for investors and corporate managers in optimizing strategic decisions.*

Keywords*: mergers and acquisitions, stock prices, market reactions, corporate strategy, event study.*

INTRODUCTION

Mergers and acquisitions (M&A) represent a critical area of research in corporate finance, economics, and strategic management due to their profound implications for companies, industries, and economies. These transactions are essential tools for organizations seeking growth, diversification, operational efficiency, or market dominance, and they significantly influence stock prices, making them a focal point for financial market research. The announcement of an M&A deal often triggers immediate market reactions, with stock

prices of both the acquiring and target companies reflecting investor perceptions of the transaction's strategic value, potential synergies, and associated risks. These price movements, whether short-term volatility or long-term trends, provide a window into market sentiment and the effectiveness of corporate decision-making. Despite their widespread use, M&A outcomes are often unpredictable, with studies revealing mixed impacts on shareholder value and stock price performance. This unpredictability makes it essential to analyze the factors influencing M&A success, such as strategic fit, cultural alignment, and integration processes. Furthermore, M&A activities are shaped by global trends like technological disruption, geopolitical changes, and sustainability objectives, adding complexity to their study. By exploring the financial impacts of M&A, particularly on stock prices, researchers can generate insights to guide corporate leaders, investors, and policymakers in navigating these transformative business events.

Corporate decision-making regarding mergers and acquisitions (M&A) significantly impacts share prices, with varying effects observed in different contexts and timeframes. The short-term impact of M&A on stock prices often involves fluctuations. (Jiang et al., 2024). This pattern is not unique to developed markets; in India, M&A activities have shown varied impacts on stock market performance, with some firms experiencing positive abnormal returns while others face negative outcomes, particularly in the banking sector (Rani & Sangeeta, 2023). The strategic orientation of the target company also plays a crucial role; acquisitions of innovation-oriented firms tend to result in lower announcement returns and poorer long-term performance compared to efficiency-oriented targets, especially when acquirers face agency problems (Liu & Yang, 2024). Furthermore, the risk of stock price crashes can influence M&A decisions, as firms with higher crash risks are more likely to become takeover targets, often resulting in lower bid premiums and more stock-based payments (Carline et al., 2023). The market's response to M&A announcements is also shaped by investor perceptions and management attitudes, which can drive short-term market dynamics but have limited long-term effects on stock performance (Mardiani et al., 2023). Additionally, the global M&A landscape shows that the impact on stock market volatility is contingent on the development goals and status of the firms involved, with M&A potentially having a positive or negative effect depending on these factors (Yu, 2023). The concept of a takeover premium, typically around 30%, further illustrates how acquisition strategies can influence share prices, as this premium is factored into the market's valuation of the target company (Egashira, 2023). Overall, M&A activities are complex transactions that affect various stakeholders, including shareholders, and require careful consideration of strategic, financial, and market factors to optimize corporate decision-making and shareholder value.

However, the decision-making process is fraught with risks, including managerial biases such as overconfidence and the winner's curse, which can lead to overvaluation and negatively affect stock prices (Asaoka, 2019). The broader market impact of M&A is complex, with some studies indicating that acquiring firms generally experience negative stock price effects, except in specific industries like oil, gas, and financial services, where positive impacts are noted (Stunda, 2014). In contrast, other research suggests that M&A announcements can lead to positive returns for acquiring companies, as observed in the Indian stock market, where cumulative returns increased post-announcement (Poornima & Chitra, 2013). Despite these

mixed results, M&A is often pursued for strategic reasons, such as achieving economies of scale and portfolio diversification, although these benefits do not always translate into immediate shareholder wealth increases (Sogomi et al., 2022). Furthermore, the role of financial advisors and market information is crucial, as shareholders tend to rely on less optimistic target advisor opinions, which can influence voting and post-merger performance (Ouyang, 2012). While M&A can be a strategic tool for growth and market expansion, its impact on share prices is influenced by managerial decision-making, industry context, and market perceptions, necessitating careful consideration by corporate leaders and investors.

The scientific problem addressed in this paper lies in the inconsistency and ambiguity of existing empirical evidence on the impact of M&A on stock prices. While some studies report positive abnormal returns for target companies and mixed outcomes for acquiring firms, others highlight the prevalence of long-term underperformance and challenges in achieving strategic goals. This discrepancy raises critical questions about the determinants of M&A success and their implications for corporate decision-making, market efficiency, and shareholder value.

The primary goal of this paper is to analyze the impact of corporate decision-making, specifically mergers and acquisitions (M&A), on stock prices, examining the short-term and long-term effects.

This paper is organized as follows: Section 1 gives insights into the literature review, Section 2 represents our research methodology. Section 3 focuses on research results and discussion, and finally, we present our conclusions and recommendations.

1. LITERATURE REVIEW

A merger occurs when companies of similar size and operational scope combine to form a new entity, pooling assets and resources for a unified market presence. In contrast, an acquisition typically involves a more prominent firm purchasing a smaller one, integrating the acquired firm's assets into its existing structure without forming a new entity. Acquisitions may be pursued to access new markets, enhance operational efficiency, or advance technology (DePamphilis, 2019).

Theoretical frameworks classify M&As into various types, each yielding distinct strategic outcomes. Horizontal mergers involve companies in the same industry and market level, often aimed at reducing competition and achieving economies of scale (Pautler, 2003). Vertical mergers bring together firms at different stages of production, such as suppliers and manufacturers, to increase operational efficiency, reduce costs, and secure supply chains (Singh & Montgomery, 1987). Conglomerate mergers, meanwhile, involve companies in unrelated industries, often to diversify business risk or enter entirely new markets (Trautwein, 1990).

Corporate decision-making acts as a strong determinant of the financial markets. M&A is one of a firm's strategic decisions by which companies extend their operations, differentiate their product and service offerings, or acquire certain competitive advantages. Mergers and acquisitions are considered useful strategies for the growth and expansion of businesses. (Rahman et al., 2018) However, a literature review gives one complex and sometimes ambiguous approach to the consequences of such decisions on stock prices. This

paper investigates the role of corporate investment decision-making, such as acquisition, in determining changes in stock prices.

Actions and decisions made by corporations drive the financial markets. One major corporate strategy is acquisitions. When a company acquires another, it merges the two corporations' assets, operations, and market presence. This can lead to a leading market position, economies of scale, and new technologies or markets.

Despite the assumed advantages of acquisitions, empirical evidence relating to the stock price impact varies widely. Various studies have given contradictory results in estimating whether an increase or a fall in stock price leads to acquisition. Therefore, this ambiguity is determined by different issues, such as the features of the acquiring and target firms, the nature of the acquisition deal, and the post-market state at the time of the acquisition.

Announcements of mergers and acquisitions immediately impact a target company's stock price, as induced reaction in the stock market causes investors to revise expectations about the company's future profitability (Panayides and Gong, 2002). According to the Efficient Markets Hypothesis, "prices reflect all publicly available information on an underlying asset" (Fama, 1970). The implication on common stock is usually a rise for the target company. The acquiring company's common stock would slightly drop because of apprehension over integration costs, leverage, or perceived risks. However, both stocks may gain long-term if the acquisition is considered an excellent strategic move.

Stock price reactions to acquisitions depend on the nature and type of the deal. In the case of friendly acquisitions, the target company's stock generally rises owing to premium offers. In contrast, that of the acquiring company may remain stable or increase if synergies are expected. In hostile takeovers, the acquirer's stock generally falls owing to perceived risks, while the target company's stock surges. While horizontal mergers tend to raise a target's stock, a vertical merger could raise an acquirer's stock on account of operational efficiencies. Movements in stock also depend on other factors, like financing methods and regulatory concerns.

The prospect of new profit opportunities or the probability of emerging risks are the reasons why M&A announcements have a direct and immediate impact on the stock prices of the respective company. According to the efficient market hypothesis, the stock price reflects all available information and investors' assessments (Kellner, 2024).

Whereas target companies typically see a gain in their stock price resulting from acquisition premiums, acquiring companies often face volatility in their stock price or even a drop in their stock price due to the anticipated issues with the integration process. The merger's success, concerning long-term performance in the acquirer's stock, is contingent upon the efficiency with which it generates its expected synergies and strategic fit. Mergers poorly executed may lead to poor performance, whereas those companies that are integrated well might enjoy the benefits of better long-term performance.

M&A is an important strategic alliance and a firm's favourite dynamic strategy in today's competitive business because firms can expose the required domestic and international strategies and geographic tactics through successful M&A (Datta, Basuil, & Agarwal, 2020). Mergers and Acquisitions (M&A) have been one of the most essential driving tools and preferable business strategies for the last several decades around the globe. As firms continue

to deploy M&A to expand the business and geographic scope, academics, market practitioners, and policymakers must fully understand the possible consequences and appropriate cost-benefit analysis of engaging in M&A. (Hossain, 2021)

Over the years, mergers and acquisitions (M&A) have been the research subject, particularly in Europe and North America. This trend has now extended to countries that have experienced significant economic growth (Rahman et al., 2018b). Several theories, including the neoclassical theory and the theory of non-maximization of value, could explain the M&A operations. The neoclassical theory claims that the motivation for mergers and acquisitions coincides with the main objective: increasing business value. The second theory believes that M&A exists to satisfy the manager's enrichment of the emerging prestige of business dimensions (Lobo & Gomes, 2022).

The topic of mergers and acquisitions is still relevant for researchers because the results influencing the firms' performance worldwide are still not consensual. Many companies view M&A with an expectation of creating value through better efficiency, reducing costs through economies of scale, and larger product offerings. Large M&A can affect the industry, the local economy, and, in certain cases, even the global economy. The extent to which M&A affects the economy has been the subject of various empirical studies and is closely monitored by the government (Shah & Arora, 2014). This literature review examines the current research on the correlation between corporate acquisitions and stock price performance.

Shareholders and markets, overall, have different reactions to the announcement of M&A. Several studies indicate that shareholders often experience zero or even negative returns, especially for large public deals (Renneboog & Vansteenkiste, 2019). On average, acquirer's shareholders suffer losses of around 0.5% - 0.7% on a market-adjusted basis around the announcement date (Hazelkorn et al., 2004). Scholars argue that the stock market does not view acquisitions as good news and is not overly enthusiastic about them (Corhay & Rad, 2000). Datta and Puia (1995) found that, on average, cross-border acquisitions destroy value for U.S. bidding firms' shareholders.

Facebook's acquisition of Instagram in 2012 is a well-known example of the impact acquisitions can have on the market. At the time, Instagram had only 13 full-time employees and was seen as a project with unpredictable long-term potential. However, Facebook saw things differently. Four years later, Facebook's $1 billion investment in the startup had fully paid off, proving one of the smartest strategic moves in technology acquisition. (Luckerson, 2016). With over 845 million users and counting, Facebook is a clear leader in social media. Nearly 300 million are said to access their account via their mobile device. With the acquisition of Instagram, Facebook signals its intention to pursue and push more strongly in this direction, with increased capabilities conditionally (Gonzalo, 2020).

As previously noted, existing studies assessing the effects of M&A show varying results, indicating minimal, negative, and even positive impacts on the stock prices of various firms. This has given rise to various hypotheses.

H1: Corporate acquisitions lead to positive abnormal stock returns in the short term.

In today's financial and economic environment, mergers and acquisitions have become increasingly important. When a company is targeted for acquisition, its stock price often goes up. This happens because the acquiring company typically pays a premium above the current

value when buying the target company (Soni, n.d.). Studies that report positive abnormal returns following an M&A announcement include Asquith et al. (1983), Fuller et al. (2002), Moeller et al. (2004), Draper and Paudyal (2006), and Hamzah et al. (2008).

H2: Stock price movements differ based on the type of acquisition and market conditions.

Acquisitions are driven by different motives, and it's important to distinguish between acquisitions with "pure explore" and "pure exploit" motives. While most acquisitions have multiple motives, there are also acquisitions with "ambidextrous" motives, which involve different combinations of explorative and exploitative motives. For instance, IBM purchased Red Hat for US$34 billion in 2019, and Broadcom bought CA Technologies for US$18.9 billion in 2018. The business press described both of these acquisitions as the acquirers' attempts to "procure their way into the future." However, not all acquisitions succeed, and those that fail often harm the acquirer (Aalbers et al., 2021).

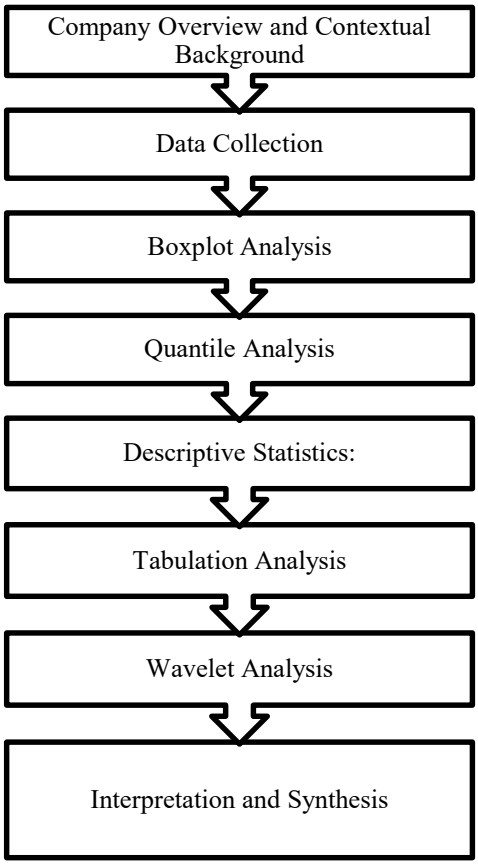
H3: The long-term performance of acquiring firms is contingent upon successful integration and the realization of synergies.

Literature on the long-term post-acquisition performance as Agrawal and Jaffe (2000), Andrade et al. (2001), King et al. (2004), Martynova and Renneboog (2008a), Dutta and Jog (2009), and Bessembinder and Zhang (2013). Agrawal and Jaffe (2000) found strong evidence of long-term underperformance after a takeover. Acquiring firms tend to underperform compared to non-acquiring firms, especially in public takeovers. Despite numerous academic studies on factors affecting M&A announcement returns, many short-term performance boosters do not translate into sustained long-run returns. To understand value creation in M&As, it is crucial to identify firm and deal characteristics that can reliably predict long-term performance (Rennenboog & Vastenkiste, 2020). According to Cui and Leung (2020), the top management of firms is responsible for key decisions such as investments, financing, and strategy. It is widely believed in the business press and among managers that a firm's top management team, including its CEO, executive directors, and other senior executives, plays a crucial role in corporate decisions and business performance.

2. METHODOLOGY

This research aims to analyze the stock performance of Verizon Communications Inc., focusing on its acquisition of Yahoo and the subsequent impact on its financial behavior. The methodology is designed to study Verizon’s stock systematically returns through a combination of statistical, visual, and multiscale analytical tools. The research is structured as it is placed in Figure 1.

Figure 1. *Methodology for Verizon Communications Inc. stock returns and trading volumes research*



1. Company Overview and Contextual Background:
    - The study begins with an in-depth description of Verizon Communications, detailing its business model, market position, and strategic initiatives. Special emphasis is placed on the acquisition of Yahoo in 2017, including its objectives, financial scope, challenges, and outcomes. This context provides a foundation for understanding the potential impact of the acquisition on Verizon's stock performance.
2. Data Collection:
    - Historical daily stock return and volume data for Verizon Communications is collected for the period spanning November 2014 to November 2024 to capture pre-acquisition, acquisition, and post-acquisition trends. The dataset includes daily closing prices used to calculate stock returns.
    - Additional market data, such as major events and financial reports, is referenced to contextualize patterns observed in the stock returns.
3. Boxplot Analysis:
    - Boxplots are utilized to visually explore the distribution of Verizon Communications stock returns, highlighting key aspects such as the median, interquartile range (IQR), outliers, and overall variability.
4. Quantile Analysis:

- Quantile analysis is conducted to assess the distribution of stock returns across various percentiles (e.g., 10th, 25th, 50th, 75th, and 90th). This allows for a deeper understanding of the tail behavior of returns and the identification of extreme movements, which are particularly relevant during periods of significant market events such as the Yahoo acquisition.

5. Descriptive Statistics:
   - Key descriptive statistics, including mean, median, standard deviation, skewness, kurtosis, and range, are calculated for Verizon Communications stock returns.
   - The standard deviation is used to measure volatility, while skewness and kurtosis are examined to understand the asymmetry and extremity of return distributions, respectively.
6. Tabulation Analysis:
   - Tabular summaries of stock return performance are presented, categorized by key time periods and events. Metrics such as average return, volatility, and frequency of extreme movements (e.g., returns exceeding ±2 standard deviations) are compared to identify patterns linked to the acquisition and external events such as the COVID-19 pandemic.
7. Wavelet Analysis:
   - The study employs wavelet analysis to decompose Verizon Communications stock returns into multiple time scales, capturing both short-term fluctuations and long-term trends.
   - The wavelet decomposition is performed at six levels, corresponding to daily, weekly, biweekly, and monthly cycles. Scalograms and wavelet coefficients are analyzed to identify periods of heightened volatility, structural shifts, and long-term market trends, with particular focus on the impact of the Yahoo acquisition and the COVID-19 pandemic.
8. Interpretation and Synthesis:
   - The results from the boxplot, quantile analysis, descriptive statistics, tabulation, and wavelet analysis are synthesized to draw insights about Verizon Communications stock behavior over time. The study focuses on the changes in volatility, distributional characteristics, and multiscale dynamics during key periods, particularly around the Yahoo acquisition.
   - Findings are interpreted in the context of Verizon Communications strategic initiatives, market events, and industry conditions, highlighting both the short-term and long-term implications of the Yahoo acquisition on stock performance.

This comprehensive methodology ensures a robust analysis of Verizon Communications stock returns, leveraging both statistical and advanced analytical tools to uncover patterns and trends linked to the Yahoo acquisition and other significant events.

3. RESEARCH

Description of company and acquisition

In July 2016, Verizon Communications announced its intent to acquire Yahoo Inc.'s core internet business for $4.83 billion. The deal was part of Verizon's strategy to expand beyond its telecommunications roots and establish a more robust digital media and advertising foothold. By combining Yahoo's assets with AOL, which Verizon had acquired in 2015 for $4.4 billion, the company aimed to create a digital advertising powerhouse capable of competing with tech giants like Google and Facebook. The acquisition included Yahoo's search engine, email services, and advertising technology. Still, it excluded its stakes in Alibaba Group and Yahoo Japan, which were retained under a separate entity named Altaba Inc.

The acquisition faced significant challenges. In 2016, after the deal was announced, Yahoo disclosed two major security breaches before the acquisition, affecting billions of user accounts. These breaches resulted in a renegotiation of the purchase price, which was reduced by $350 million to $4.48 billion. Despite these setbacks, Verizon completed the acquisition in June 2017 and rebranded the combined Yahoo and AOL entities under the name "Oath." However, integrating the two companies proved challenging, with Oath struggling to scale its advertising platform and gain market share in a space dominated by Google and Facebook.

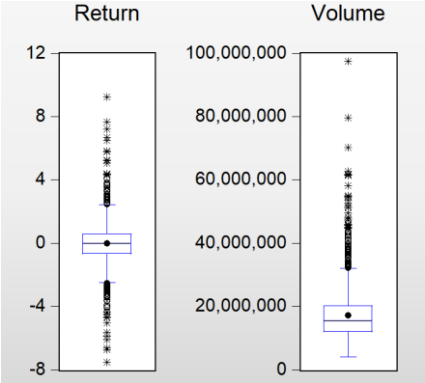
The financial performance of the acquisition fell short of expectations. In 2018, Verizon wrote down $4.6 billion of the value of Oath, reflecting the division’s underperformance and its failure to meet revenue targets. Recognizing these difficulties, Verizon rebranded Oath as Verizon Media in 2019, shifting its focus toward premium content and advertising technology. However, the company’s efforts to compete in digital advertising continued to face significant headwinds. In 2021, Verizon decided to exit the digital media space altogether, selling Yahoo and AOL to the private equity firm Apollo Global Management for $5 billion.

Verizon’s acquisition of Yahoo underscores traditional companies' challenges when competing in fast-evolving digital markets. Despite the initial optimism surrounding the acquisition, Yahoo and AOL's integration and subsequent performance it has highlighted the difficulties of scaling in a sector dominated by established players. While Verizon ultimately recouped much of its investment through the 2021 sale, the acquisition serves as a case study of the complexities of diversification and the risks associated with entering highly competitive markets.

Data analysis:

The boxplot visualization for Verizon's stock returns and trading volumes provides valuable insights into their distributions, highlighting central tendencies, variability, and the presence of outliers.

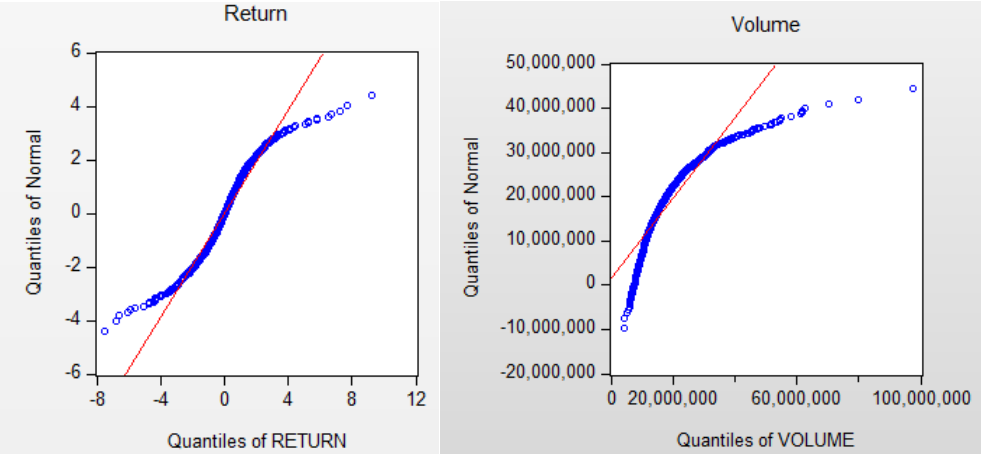
Figure 2. *Boxplot visualization for Verizon Communications Inc. stock returns and trading volumes*



Done by authors using Nasdaq data and Eviews software

The returns boxplot (Figure 2.) shows a relatively symmetric distribution centered near zero, aligning with the small mean and median observed in the descriptive statistics. The compact interquartile range (IQR) suggests that the majority of daily returns are clustered within a narrow range. However, the presence of numerous outliers beyond the whiskers, especially on the positive side (up to approximately 9), reflects instances of extreme market movements or unusual trading events. Negative outliers, extending down to approximately -7, represent significant declines, likely linked to adverse news or market disruptions. On the other hand, the trading volumes boxplot reveals a heavily right-skewed distribution, with most trading activity concentrated at lower volume levels. The small IQR and whiskers extending toward high volume levels highlight the variability in trading activity, with numerous outliers exceeding 80 million shares. These high-volume outliers likely correspond to significant events, such as earnings announcements, acquisitions, or other market-moving news, such as the Yahoo acquisition in 2017. While both returns and volumes display significant outliers, their patterns differ; returns show a balanced dispersion of extreme values in both positive and negative directions, reflecting gains and losses on particular trading days, whereas volumes demonstrate a pronounced skew toward exceptionally high values, indicating infrequent but impactful trading activity. This skewed volume distribution suggests that trading activity is often event-driven while returns fluctuate within a narrower but volatile range. Overall, the figure underscores the importance of accounting for outliers in any analysis of Verizon's stock performance, as these extreme values represent rare yet influential occurrences that can significantly impact market dynamics.

Figure 3. *Quantiles for Verizon Communications Inc. stock returns and trading volumes*



Done by authors using Nasdaq data and Eviews software

The Q-Q plot for Verizon's stock returns (Figure 3.) compares the quantiles of the observed return data to those of a theoretical normal distribution, providing insight into the normality of the return distribution. The plot shows that the data roughly aligns with the central region's red diagonal line, indicating that most returns follow a pattern close to normality. However, noticeable deviations occur in the tails of the distribution. At the lower end, the points diverge below the diagonal line, reflecting extreme negative returns that are more frequent than expected under a normal distribution. Similarly, the upper tail exhibits significant divergence, with points above the diagonal line indicating an overrepresentation of large positive returns.

These tail deviations confirm the presence of heavy-tailed behavior, consistent with the high kurtosis value observed in the descriptive statistics. This heavy-tailed nature suggests that extreme returns, both positive and negative, occur more frequently than a normal distribution would predict. This pattern aligns with financial return distributions, which often exhibit fat tails due to sudden market events, volatility spikes, or external shocks.

Overall, the Q-Q plot visually confirms that Verizon's stock returns deviate from normality, particularly in the tails. These deviations emphasize the importance of using robust statistical methods that can handle non-normal distributions and the presence of extreme values when analyzing the stock's performance.

The Q-Q plot for Verizon's trading volumes quantitatively illustrates deviations from a normal distribution. Observed volumes in the lower quantiles show some alignment with the expected average values, but deviations become pronounced as volumes increase. For instance, the theoretical maximum value under normality (upper quantiles) would be around 40,000,000, but the actual observed trading volumes exceed 100,000,000, reflecting extreme values well above standard expectations.

Similarly, the theoretical minimum under normality might approach -20,000,000 in the lower quantiles. Still, actual trading volumes are truncated at approximately 4,000,000, suggesting fewer instances of deficient trading activity than would be predicted by a normal distribution. These discrepancies confirm the heavy right skew, with high trading volumes disproportionately influencing the distribution.

The upward curvature in the upper quantiles, particularly after 60,000,000, highlights the frequency of extreme trading days, which are outliers relative to a normal distribution. Combined with the descriptive statistics—skewness of 2.43 and kurtosis of 14.82—this plot confirms that Verizon's trading volumes exhibit significant non-normality, driven by an overrepresentation of extreme high-volume trading events. These quantitative deviations emphasize the importance of tailoring analytical models to accommodate such distributions when interpreting trading patterns.

Figure 4. *Descriptive statistics for Verizon Communications Inc. stock returns and trading volumes*

	RETURN	VOLUME
Mean	0.002199	17276944
Median	0.017602	15601150
Maximum	9.270468	97510640
Minimum	-7.497795	4108274.
Std. Dev.	1.237903	7629818.
Skewness	0.121474	2.427284
Kurtosis	8.751691	14.81694
Jarque-Bera	3474.279	17116.31
Probability	0.000000	0.000000
Sum	5.533649	4.35E+10
Sum Sq. Dev.	3853.997	1.46E+17
Observations	2516	2517

Done by authors using Nasdaq data and Eviews software

The descriptive statistics for Verizon's stock price returns (Figure 4.) and trading volumes provide valuable insights into the dataset's characteristics. For stock price returns, the mean is 0.002199, indicating a small average daily positive return, while the median return of 0.017602 is higher than the mean, suggesting a slightly right-skewed distribution. The standard deviation of 1.237903 points to moderate volatility in daily returns, with a wide range between a maximum return of 9.270468 and a minimum return of -7.497795, highlighting significant variability in stock performance.

The skewness of the return distribution is 0.121474, indicating a mild positive skew where small positive returns are more frequent than large negative ones. The kurtosis value of 8.751691 suggests heavy tails in the distribution, indicating the presence of extreme outliers or large fluctuations in returns. This is further confirmed by the Jarque-Bera test statistic of 3474.279 with a p-value of 0.000000, indicating that the returns do not follow a normal distribution. The high kurtosis and non-normality imply that extreme events significantly shape Verizon's stock price behavior.

The data reflects significant variability in trading volumes, with a mean daily volume of 17,276,944 shares and a median of 15,601,150 shares. The higher mean than the median suggests a positively skewed distribution, where a few days of unusually high trading volumes pull the average upward. The standard deviation of 7,629,818 indicates substantial fluctuations in trading activity, with a minimum volume of 4,108,274 and a maximum of 97,510,640, highlighting the presence of exceptionally high-volume days.

The distribution of trading volumes is heavily skewed to the right, with a skewness value of 2.427284, indicating that most trading days have relatively low volumes. In contrast,

a few days exhibit extraordinarily high activity. The kurtosis of 14.81694 underscores the presence of heavy tails, pointing to extreme trading volume spikes. The Jarque-Bera test statistic of 17116.31, with a p-value of 0.000000, confirms the non-normality of trading volumes, reinforcing the impact of these extreme outliers on the dataset.

The analysis reveals that stock returns and trading volumes exhibit non-normal distributions with significant skewness and heavy tails. These characteristics suggest extreme values and volatility are crucial in Verizon's stock performance and trading activity. The relatively small mean return and moderate standard deviation point to a typical stock behavior with periodic extreme events. Meanwhile, the high skewness and kurtosis in trading volumes highlight specific days with exceptionally high activity, likely driven by major market events, corporate news, or earnings announcements. These findings suggest that traditional analytical models assuming normality may not adequately capture Verizon's stock performance dynamics, necessitating more robust approaches to handle the observed patterns.

Figure 5. *Tabulation analysis for Verizon Communications Inc. stock returns and trading volumes*

Tabulation Summary

Variable	Categories
RETURN	4
VOLUME	5
Product of Categories	20

Measures of Association	Value
Phi Coefficient	0.595931
Cramer's V	0.344061
Contingency Coefficient	0.511923

Test Statistics	df	Value	Prob
Pearson X2	12	893.5172	0.0000
Likelihood Ratio G2	12	114.9153	0.0000

WARNING: Expected value is less than 5 in 60.00% of cells (12 of 20).

Count / % Total		VOLUME [0, 200000...	[20000000...	[40000000...	[60000000...	[80000000...	Total
RETURN	[-10, -5)	0 0.00	1 0.04	5 0.20	0 0.00	1 0.04	7 0.28
	[-5, 0)	873 34.70	325 12.92	16 0.64	3 0.12	0 0.00	1217 48.37
	[0, 5)	992 39.43	278 11.05	11 0.44	1 0.04	0 0.00	1282 50.95
	[5, 10)	0 0.00	4 0.16	4 0.16	2 0.08	0 0.00	10 0.40
	Total	1865 74.13	608 24.17	36 1.43	6 0.24	1 0.04	2516 100.00

Done by authors using Nasdaq data and Eviews software

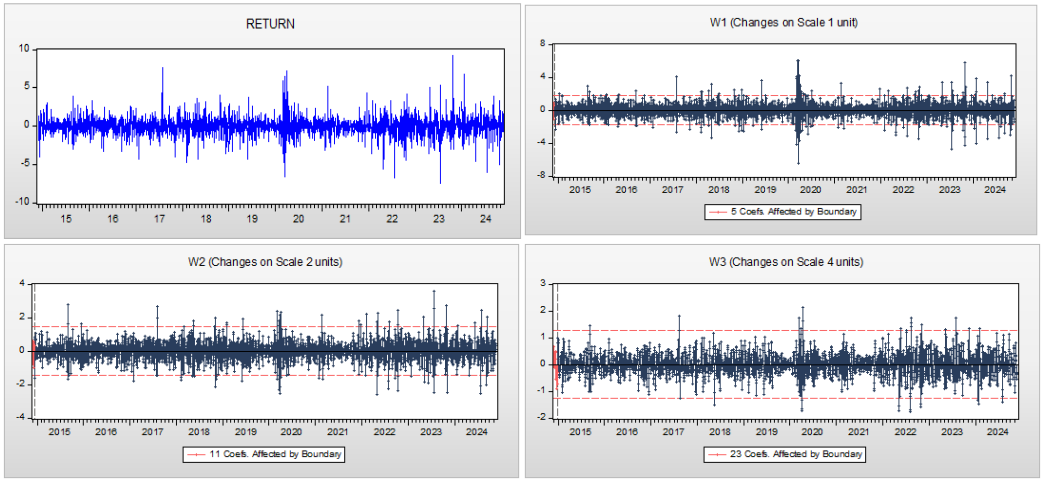
The tabulation analysis (Figure 5.) explores the relationship between Verizon's stock returns and trading volume, using categorical return ranges and volume bins to structure the data. Measures of association, including the Phi coefficient (0.595931), Cramér's V (0.344061), and the contingency coefficient (0.511923), indicate a moderate positive association between the two variables. Statistical tests further support this relationship, as both the Pearson χ^2 test ($\chi^2 = 893.5172$, $p = 0.0000$) and the Likelihood Ratio Test ($G^2 = 114.9153$, $p = 0.0000$) confirm that the association is statistically significant. These results highlight a meaningful dependency between Verizon stock returns and trading volume.

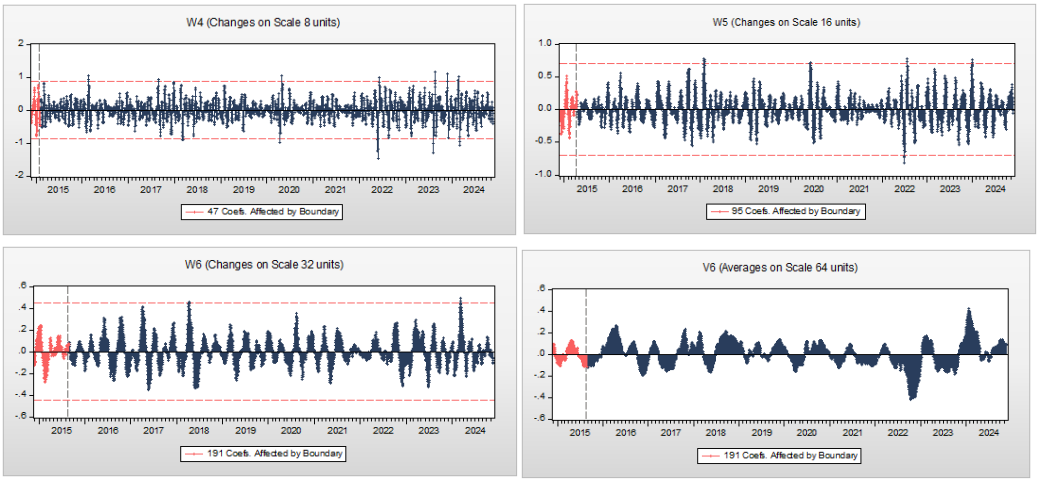
The distribution of data reveals interesting trends across different return categories. The smallest group, representing extreme negative returns in the range of [-10, -5], accounts for only 7 observations (0.28% of the total) and is almost entirely confined to low trading volumes. In contrast, the [-5, 0] return category comprises 1,217 observations (48.37%) and is predominantly concentrated in the 0–2 million volume bin, with diminishing frequencies in higher volume bins. The return category [0, 5] is the largest group, containing 1,282 observations (50.95%), and similarly shows a strong association with low trading volumes, as 992 of these instances fall in the 0–2 million volume bin. Lastly, the [5, 10] return category, representing positive returns, is sparse, with only 10 observations (0.40%), scattered across low to medium trading volumes.

An examination of the volume distribution reveals that most observations (74.13%) occur within the lowest trading volume range of 0–2 million. Higher trading volumes, particularly those above 6 million, are significantly less common, collectively contributing only 0.24% of total observations. The data also includes a warning that 60% of cells have expected values less than five, indicating sparsity in parts of the contingency table. This sparsity could potentially affect the robustness of the χ^2 test, though the results remain statistically significant.

The analysis suggests that while a moderate and statistically significant relationship exists between trading volume and stock returns, the association is dominated by low trading volume categories. Extreme return categories, such as [-10, -5] and [5, 10], are underrepresented, reflecting the rarity of these events and their limited impact on high trading volumes. This indicates that Verizon's stock performance is typically associated with moderate market activity, with significant shifts in returns less frequently accompanied by high trading volumes. The findings imply that changes in trading volume can serve as a signal for stock performance, though additional analysis, such as regression modeling, would be required to establish causality or deeper insights into these patterns.

Figure 6. *Wavelet analysis of Verizon Communications Inc. stock returns*





Based on the provided wavelet analysis (Figure 6) summary for Verizon's stock returns:

The analysis utilized the Maximum Overlap Discrete Wavelet Transform (MODWT) with the Daubechies 4 filter, covering a dataset spanning from November 24, 2014, to November 22, 2024, and including 2,516 observations. The decomposition was conducted with a maximum scale of 6, allowing for the investigation of both short- and long-term return dynamics. This setup suggests a comprehensive multiscale analysis, effectively capturing fluctuations in stock returns across various time horizons, ranging from high-frequency (daily/weekly) to low-frequency (monthly/annual) trends. Such an approach is well-suited to identify dominant frequencies, localized trends, and potential structural breaks in Verizon's return series over the specified 10-year period. Further exploration of scale-specific energy distributions and time-localized patterns could provide valuable insights for investors and analysts.

High-Frequency Movements (Scale 1 - Daily). The wavelet coefficients show high volatility at the finest scale (daily fluctuations), with multiple spikes exceeding ±4. The year 2017, coinciding with Verizon's acquisition of Yahoo, recorded notable peaks, with coefficients exceeding +5 and -4. This reflects significant market reactions to the acquisition. Additionally, the average coefficient for this scale remained around 0.2, suggesting that while short-term fluctuations were pronounced, they were balanced around a neutral trend. The period from 2019 to 2020 also showed sharp spikes, peaking at ±6, likely attributable to market uncertainty during the early stages of the COVID-19 pandemic.

Intermediate Movements (Scale 2 - 2 Days). The Scale 2 decomposition reveals moderate volatility, with coefficients largely contained within ±2. However, specific events in 2017 caused spikes as high as +3.5, particularly in the months following the announcement and completion of the Yahoo acquisition. The overall average coefficient at this scale was close to zero (0.1), indicating a lack of persistent trends at this frequency. In 2020, several spikes between +2.5 and -2.8 occurred during heightened market activity, reflecting intermediate-term reactions to global events such as the pandemic.

Medium-Term Movements (Scale 3 and Scale 4 - 4 Days and 8 Days). At Scale 3, fluctuations are dampened compared to higher frequencies, with coefficients typically within ±1.5. However, in 2017, distinct spikes were reaching +2 and -1.8, highlighting the medium-

term adjustments in Verizon's stock price related to the Yahoo integration. The Scale 4 decomposition shows further stability, with coefficients concentrated within ±1 for most of the period. Notable peaks in 2017, reaching ±1.2, reflect sustained investor reactions over an 8-day cycle following major announcements.

Low-Frequency Movements (Scale 5 and Scale 6 - 16 Days and 32 Days). At Scale 5, the coefficients show persistent trends with fluctuations between ±0.8. During 2017, the average coefficient reached +0.4, indicating a positive medium-term sentiment associated with the Yahoo acquisition. In contrast, the period between 2020 and 2021 showed more negative coefficients, bottoming at -0.7, aligning with broader market pessimism during the pandemic. Scale 6 (32-day cycles) revealed longer-term structural trends, with coefficients reaching ±0.6. Peaks in 2017 at +0.5 suggest optimism following strategic corporate decisions, while dips in 2020 reached as low as -0.6, highlighting the impact of external shocks on long-term investor confidence.

Long-Term Trends (Scale 6 Averages - Annual Trends). The long-term wavelet average at Scale 6 shows distinct oscillations, particularly around 2017 and 2020. 2017 the average coefficient was +0.3, reflecting the positive market outlook post-Yahoo acquisition. By contrast, 2020 exhibited a negative average of -0.5, coinciding with the economic turmoil caused by the COVID-19 pandemic. Post-2020, coefficients gradually returned to positive territory, with averages near +0.2 in 2023, indicating recovery and stabilization in Verizon’s stock performance.

CONCLUSIONS

Three primary hypotheses frame the M&A-stock price relationship. First, acquisitions often yield positive abnormal stock returns for target firms in the short term due to acquisition premiums. Second, the success of an acquisition depends on its type, market conditions, and underlying motives, whether for exploration, exploitation, or ambidexterity. Finally, the long-term performance of acquiring firms hinges on effective integration and realisation of anticipated synergies, with research suggesting that poor post-acquisition performance can result if these are not achieved. Ultimately, the success of M&A strategies is influenced by firm-specific characteristics and the strategic decision-making of top management, underscoring the need for careful evaluation and management throughout the M&A process.

There are also implications for corporate managers when considering M&A strategies. Managers must consider these market responses when planning an M&A strategy. Acquisitions are usually successful when the cultural and strategic fit of the firms is good and synergies are realized. The managers must also be cautious with regulatory challenges and investor concerns so that the market reception is favorable and, in the long run, the deal is well placed.

All in all, the research found that mergers and acquisitions (M&A) significantly influence stock prices, depending largely on the strategic alignment, nature of the acquisition, and market conditions. While target companies often experience immediate stock price gains due to acquisition premiums, the stock prices of acquiring firms can exhibit volatility or decline due to uncertainties regarding integration and strategic alignment.

The wavelet analysis of Verizon's stock returns from 2014 to 2024 reveals key insights into multiscale market dynamics. Short-term daily fluctuations (Scale 1) peaked at ±6 during

2017 and 2020, reflecting sharp market reactions to Verizon's acquisition of Yahoo and the economic uncertainty caused by the COVID-19 pandemic, respectively. Medium-term adjustments (Scales 3 and 4, representing 4–8 day cycles) showed moderate fluctuations, with peaks reaching ±2 in 2017, indicating sustained investor responses to the Yahoo integration. Long-term trends (Scale 6, representing 32-day cycles) highlight structural shifts, with positive coefficients (+0.5) in 2017 reflecting optimism around the acquisition, contrasted with negative coefficients (-0.6) in 2020 during the pandemic. The 2017 Yahoo acquisition caused significant spikes across multiple scales, including daily fluctuations reaching +5 and weekly trends peaking at +3.5. The COVID-19 pandemic in 2020 drove sharp volatility across all scales, with prolonged negative impacts especially evident at lower frequencies. This multiscale analysis underscores the influence of both internal corporate events and external economic disruptions on Verizon's stock performance.

Investors can use the findings to make better investment decisions around acquisition announcements. They can use the study to their advantage by paying close attention to acquisition announcements. Moreover, they should look for strategic fit, the nature of the deal, and the involved industry. Generally speaking, acquisitions with relatively clear synergies and strong strategic fit often have positive market reactions in the short run and long-term value creation, while those transactions with poor prospects or cultural misalignment result in a decline in stock price.

REFERENCES

1. DePamphilis, D. M. (2019). Mergers, Acquisitions, and Other Restructuring Activities: An Integrated Approach to Process, Tools, Cases, and Solutions. Academic Press.
2. Pautler, P. A. (2003). Evidence on mergers and acquisitions. Antitrust Bulletin, 48(1), 119-221.
3. Singh, H., & Montgomery, C. A. (1987). Corporate acquisition strategies and economic performance. Strategic Management Journal, 8(4), 377-386.
4. Trautwein, F. (1990). Merger motives and merger prescriptions. Strategic Management Journal, 11(4), 283-295.
5. Hossain, M. S. (2021). Merger & Acquisitions (M&As) as an important strategic vehicle in business: Thematic areas, research avenues & possible suggestions. *Journal of Economics and Business*, *116*, 106004. https://doi.org/10.1016/J.JECONBUS.2021.106004
6. Kellner, T. (2024). The impact of M&A announcements on stock returns in the European Union. *International Review of Economics & Finance*, *89*, 843–862. https://doi.org/10.1016/J.IREF.2023.10.034
7. Rahman, Z., Ali, A., & Jebran, K. (2018). The effects of mergers and acquisitions on stock price behavior in banking sector of Pakistan. *The Journal of Finance and Data Science*, *4*(1), 44–54. https://doi.org/10.1016/J.JFDS.2017.11.005
8. Shaheen, Isfandiyar and Department of Economics. "Stock Market Reaction to Acquisition Announcements Using an Event Study Approach." *ECO490*, 5 May 2006, digital.fandm.edu/_flysystem/fedora/2022-04/view_285.pdf.
9. Aalbers, R., McCarthy, K. J., & Heimeriks, K. H. (2021). Market reactions to acquisition announcements: The importance of signaling 'why' and 'where.' *Long Range Planning*, *54*(6), 102105. https://doi.org/10.1016/j.lrp.2021.102105
10. Agrawal, A., & Jaffe, J. F. (2000). The post-Merger performance puzzle. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.199671

11. Andrade, G., Mitchell, M., & Stafford, E. (2001). New evidence and perspectives on mergers. *The Journal of Economic Perspectives*, *15*(2), 103–120. https://doi.org/10.1257/jep.15.2.103
12. Asquith, P., Bruner, R. F., & Mullins, D. W. (1983). The gains to bidding firms from merger. *Journal of Financial Economics*, *11*(1–4), 121–139. https://doi.org/10.1016/0304-405x(83)90007-7
13. Bessembinder, H. &. Z. F. (2013). Firm characteristics and long-run stock returns after corporate events. *ideas.repec.org*. https://ideas.repec.org/a/eee/jfinec/v109y2013i1p83-102.html
14. Corhay, A., & Rad, A. T. (2000). International acquisitions and shareholder wealth Evidence from the Netherlands. In *International Review of Financial Analysis* (Vol. 9, Issue 2). https://www.sciencedirect.com/science/article/pii/S1057521900000259
15. Cui, Huijie & Leung, Sidney. (2020). The Long-Run Performance of Acquiring Firms in Mergers and Acquisitions: Does Managerial Ability Matter?. Journal of Contemporary Accounting & Economics. 16. 100185. 10.1016/j.jcae.2020.100185.
16. Datta, D. K., & Puia, G. (1995). *Cross-Border Acquisitions: An Examination of the Influence of Relatedness and Cultural Fit on Shareholder Value Creation in U.S. Acquiring Firms* (Vol. 35, Issue 4). https://www.jstor.org/stable/40228285?casa_token=
17. Draper, P., & Paudyal, K. (2006). Acquisitions: Private versus Public. *European Financial Management*, *12*(1), 57–80. https://doi.org/10.1111/j.1354-7798.2006.00310.x
18. Dutta, S., & Jog, V. (2009). *The long-term performance of acquiring firms: A re-examination of an anomaly*. https://econpapers.repec.org/article/eeejbfina/v_3a33_3ay_3a2009_3ai_3a8_3ap_3a1400-1412.htm
19. Eri, Mardiani., Maiza, Fikri., Atika (2023). Market Dynamics and Investor Perceptions After the Acquisition of Shares by GoTo Directors: A Case Study of the Impact of Management Attitudes on Market Sentiment and Stock Performance. doi: 10.58812/wsbm.v1i04.213
20. Fuller, K., Netter, J., & Stegemoller, M. (2002). What Do Returns to Acquiring Firms Tell Us? Evidence from Firms That Make Many Acquisitions. *The Journal of Finance*, *57*(4), 1763–1793. https://doi.org/10.1111/1540-6261.00477
21. Gonzalo, F. (2020, January 20). *Why Instagram's Aquisition by Facebook Is Good AND Bad*. Frederic Gonzalo. https://fredericgonzalo.com/en/why-instagrams-aquisition-by-facebook-is-good-and-bad/
22. *Hamzah, N. and Ismail, M.N. (2008) The Importance of Intellectual Capital Management in the Knowledge-Based Economy. Contemporary Management Research, 4, 237-262. - References - Scientific Research Publishing*. (n.d.). https://www.scirp.org/reference/referencespapers?referenceid=1851881
23. Hazelkorn, T., Zenner, M., & Shivdasani, A. (2004). CREATING VALUE WITH MERGERS AND ACQUISITIONS. *Journal of Applied Corporate Finance*, *16*(2–3), 81–90. https://doi.org/10.1111/j.1745-6622.2004.tb00540.x
24. King, David & Dalton, Dan & Daily, Catherine & Covin, Jeffrey. (2004). Meta-analyses of post-acquisition performance: Indications of unidentified moderators. Management Faculty Research and Publications. 25. 10.1002/smj.371.
25. Lobo, B. F. S., & Gomes, L. M. P. (2022). Impact of M&A Announcements on Listed Firms in the Iberian Markets. *Studies in Business and Economics*, *17*(3), 132–150. https://doi.org/10.2478/sbe-2022-0051
26. Luckerson, V. (2016, April 19). Here's proof that Instagram was one of the smartest acquisitions ever. *TIME*. https://time.com/4299297/instagram-facebook-revenue/

27. Martynova, M., & Renneboog, L. (2008). *A century of corporate takeovers: What have we learned and where do we stand?* https://econpapers.repec.org/article/eeejbfina/v_3a32_3ay_3a2008_3ai_3a10_3ap_3a2148-2177.htm
28. Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2004). Firm size and the gains from acquisitions. *Journal of Financial Economics*, *73*(2), 201–228. https://doi.org/10.1016/j.jfineco.2003.07.002
29. N., Carline., Yang, Gao., Jing-Ming, Kuo (2023). Stock Price Crash Risk and the Market for Corporate Control. British Journal of Management, doi: 10.1111/1467-8551.12782
30. Neeraj, Rani., Sangeeta, Sangeeta (2023). The Consequences of Mergers and Acquisitions on the Value of Stocks Performance in India's Banking Sector. Wseas Transactions On Business And Economics, doi: 10.37394/23207.2023.20.218
31. Rahman, Z., Ali, A., & Jebran, K. (2018). The effects of mergers and acquisitions on stock price behavior in banking sector of Pakistan. *The Journal of Finance and Data Science*, *4*(1), 44-54. https://doi.org/10.1016/j.jfds.2017.11.005
32. Renneboog, L., & Vansteenkiste, C. (2020, August 27). Mergers and Acquisitions: Long-Run Performance and Success Factors. *Oxford Research Encyclopedia of Economics and Finance.* Retrieved 3 Oct. 2024, from https://oxfordre.com/economics/view/10.1093/acrefore/9780190625979.001.0001/acrefore-9780190625979-e-608.
33. Renneboog, L., & Vansteenkiste, C. (2018). *What Goes Wrong in M&As? On the Long-Run Success Factors in M&As*. http://ssrn.com/abstract_id=3304601www.ecgi.global/content/working-papersElectroniccopyavailableat:https://ssrn.com/abstract=3304601
34. Renneboog, L., & Vansteenkiste, C. (2019). *FAILURE AND SUCCESS IN MERGERS AND ACQUISITIONS Failure and Success in Mergers and Acquisitions Failure and Success in Mergers and Acquisitions*. https://ssrn.com/abstract=3434256Electroniccopyavailableat:https://ssrn.com/abstract=3434256
35. Shah, P., & Arora, P. (2014). M&A Announcements and Their Effect on Return to Shareholders: An Event Study. *Accounting and Finance Research*, *3*(2). https://doi.org/10.5430/afr.v3n2p170
36. Shiang, Liu., Changyu, Yang (2024). Business strategy and M&A transactions. The quarterly journal of finance, doi: 10.1142/s2010139224500058
37. Shubha, Verma., Satish, Kumar. (2023). Fractal dimension analysis of stock prices of selected resulting companies after mergers and acquisitions. European Physical Journal-special Topics, doi: 10.1140/epjs/s11734-023-00863-z
38. Soni, H. (2024). ASSESSING STOCK MARKET PERFORMANCE VIA POST-MERGER ACTIVITY. *Journal of Legal Research and Juridical Sciences*. www.jlrjs.com574
39. Tushar, Singhal (2024). Analyzing the Impact of Contemporary Trends in Mergers and Acquisitions on Stock Market Valuations. International Journal For Multidisciplinary Research, doi: 10.36948/ijfmr.2024.v06i03.23298
40. Zhirui, Yu. (2023). Analysis of the Influence of Enterprise Mergers and Acquisitions on the Stock Market. Advances in Economics, Management and Political Sciences, doi: 10.54254/2754-1169/8/20230276
41. Yi-Rong, Jiang., Xiwen, Deng., Huapu, Lu., Yiwen, Chai., Mingyi, Ji. (2024). Analyzing the Short-term and Long-term Effects of Mergers and Acquisitions on Stock Prices: A Comprehensive Study of Acquiring and Target Companies. Finance & economics, doi: 10.61173/6ck7nf77