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Examining How Changes in NPV Affect Fluctuations in Fair Stock Value

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Abstract This study examined how changes in the Net Present Value (NPV) of a company's projects impact fluctuations in its fair stock value. An experiment utilized a simulated stock market with a virtual company (Ahoo Co.) and a group of 20 finance experts (Evaluators) who predicted Ahoo's stock prices to serve as a fair value benchmark. Robust regression analysis revealed a statistically significant positive relationship between changes in Ahoo's project NPVs and changes in the Evaluators' predicted stock values. The NPV coefficient was highly significant, and NPV explained 60% of the variance in predicted stock values. These findings support the hypothesis that a company's fair stock value fluctuations can be significantly explained by fluctuations in the expected NPV from its projects. The study concludes NPV is a crucial determinant of stock valuation, with implications for investment strategies, corporate decision-making, valuation modeling, and market efficiency. Key limitations include the small Evaluator sample size and generalizability issues. Further research with larger samples is recommended to strengthen reliability.

Keywords: *Net Present Value (NPV), Stock Valuation, Fair Value, Regression Analysis, Simulated Stock Market*

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1. Introduction

The central research question guiding this study is: How do fluctuations in Net Present Value (NPV) expected from the projects undertaken by a company impact the fluctuations in fair stock value of this company? To research this question, we have developed this hypothesis: The variation in stock value is explained by the variation in Net Present Value (NPV) expected from the projects. To put our hypothesis to the test, we set up a detailed study using a simulated stock market. We created a virtual company called Ahoo Co., basing it on Whirlpool Corporation, a leading company in the home appliances industry. We used Whirlpool's data, financial records, and achievements for Ahoo Co. to give our study participants a fair and realistic environment to work with. We included all the historical information up to the end of 2021, but then we got creative. We mapped out a hypothetical future for Ahoo Co., complete with new market trends, corporate announcements, unexpected twists, and developments tailored specifically for our virtual company. This approach lets participants engage with real corporate data while navigating scenarios that look like actual business situations. The importance of using a made-up company is that we can experiment with different strategies, regulations, and valuation methods without any real-world consequences.

To establish a benchmark for the correct stock price trend, we enlisted a group of 20 finance experts, whom we designated as Evaluators. These professionals were tasked with meticulously analyzing all new information about the company in our simulated stock market, while maintaining emotional detachment. In our experimental design, the Evaluators were expected to embody the characteristics of a "Homo-Economicus" investor, as described by Baltussen [1]. To facilitate this rational investor behavior, we provided the Evaluators with accurate, unambiguous information about the virtual company's stock, free from the noise of rumors or misinformation that often plagues real-world markets. Crucially, we adopted a controlled approach to information dissemination. Unlike the information deluge typical in actual markets, where investors grapple with a constant stream of diverse news and conflicting indicators, we presented information to our Evaluators in a measured, sequential manner. This methodical approach allowed for more deliberate analysis and decision-making. The primary responsibility of the Evaluators was to predict the correct trajectory of the stock price based on this reliable information. By doing so, they created a benchmark stock price trend that served as a point of comparison for our study. This approach enabled us to isolate the effects of rational analysis from the myriad factors that typically influence stock prices in real-world scenarios, thereby

providing a cleaner experimental environment for testing our hypotheses.

The virtual company's growth segment features a strategic expansion plan with six new projects, launched annually. We prepare separate financial statements (Income Statements, Balance Sheets, and Cash Flow Statements) for each project, enabling precise tracking of their economic value on a quarterly basis. To facilitate projects valuation, we provide all necessary data for net present value calculations, including key metrics like quarterly sales, profit margins, asset turnover, return on equity, dividend ratios, cost of capital, and capital structure weights. This approach allows for detailed financial analysis and accurate company valuation.

We use a regression analysis to examine how fluctuations in the net present values, generated from the expansion projects, impact the variations in fair stock value projected by the evaluators. This approach allows us to explore the relationship between these 2 variables in a controlled environment. This study's significance is threefold: it offers practical insights for investors and analysts, contributes to developing more information-efficient stock valuation models, and opens new avenues for academic research in finance and economics. Its potential impact spans both practical application and theoretical advancement in the field.

2. Literature Review

The field of stock valuation has seen significant developments over the years, with researchers exploring various models and their components. A notable study by Francis et al. [2] found that the Residual Income Model (RIM) outperformed both the Dividend Discount Model (DDM) and Free Cash Flow (FCF) models in terms of accuracy and explanatory power. They attributed this superiority to the significant role played by accounting book value, a key component of a stock's no-growth value. Building on this, Mayes and Shank [3] showed that the Earnings Model, which breaks down stock value into no-growth value and the present value of growth opportunities, is theoretically equivalent to the constant growth DDM. This line of inquiry was further advanced by Saad [4], who found that an upgraded version of the earnings model, called the Net Asset Present Value (NAPV) model, performed better than income-based models. Saad's work underscored the importance of separating stock value into its growth and no-growth components. Donnelly [5] made an interesting connection between project valuation and company valuation. He demonstrated that a project's net present value (NPV) is equal to the present value of its residual income (RI) over its lifetime. Donnelly argued that this principle extends to business valuation, as companies are essentially collections of projects. The interplay between growth opportunities, capital structure, and firm value was explored by Subagyo [6]. Their research suggested that for high-growth companies, debt has a negative impact on firm value. Moreover, they found that growth opportunities act as a moderating variable in the relationship between capital structure and firm value. In a related vein, Hossain [7] reported a significant positive relationship between net asset value per share and market value per share. This finding highlights the importance of net asset value as a primary component of no-growth value. Similarly, Zai et al. [8] found that the no-growth value of stock, as influenced by Return on Assets (ROA), had a significant impact on stock prices. Interestingly, they noted that growth value, as influenced by sales growth, didn't seem to have a significant effect on stock prices. Several researchers have delved into the relationship between growth, value, and stock returns. Blazenko and Fu [9], for instance, observed that growth firms tend to have lower returns compared to value firms. In a related study, Penman and Reggiani [10] found that the market pricing of earnings and book values aligns with the risk embedded in accounting. This provided a rationale for the book-to-price effect on stock returns as an indicator of the risk associated with purchasing earnings growth. Lyle [11] took a different approach, investigating how growth options relate to stock returns and information quality. His study revealed an intriguing pattern: firms with more growth options showed a negative association between future stock returns and information quality, while firms with less option-like equity displayed a positive association. Adding to this body of knowledge, Trigeorgis and Lambertides [12] reported a significant negative relationship between growth option variables and stock returns. They suggested that investors might be willing to accept lower average returns from growth stocks due to their more favorable risk-return profile. Finally, Callen et al. [13] made an important observation about the role of accounting quality in stock valuation. They found that lower accounting quality, which is crucial for distinguishing between no-growth and growth stock value, is associated with delayed price adjustment and higher future stock returns. This underscores the importance of high-quality accounting practices in facilitating timely and accurate stock price discovery.

3. Materials and Methods

3.1. Experiment: Samples and Data Collection

To investigate the impact of some regulatory measures on stock market information efficiency, we designed a comprehensive study using a simulated stock market environment. Our experiment centered around a virtual company, with multiple groups tasked with assessing its stock based on designed news and information. This approach allowed us to test the effects of various regulatory measures in a controlled setting. We compared the stock value predictions from these groups against a range of valuation models, aiming to determine the fair value of the stock across different time horizons.

A key component of our study was a group of 20 finance experts, whom we called the evaluators. These professionals were charged with analyzing every piece of market information objectively and rationally, free from emotional influences. Their predictions served as our benchmark for the "correct" stock price trend.

Our virtual company's design included a growth segment featuring a strategic expansion plan. This plan

involved launching six new projects, one each year. To maintain financial clarity, we prepared separate financial statements for each project, including Income Statements, Balance Sheets, and Cash Flow Statements. This approach provided all the necessary data to estimate each project's Net Present Value (NPV).

In this study, we aim to study the relationship between the fluctuations in NPV generated from these projects and the corresponding changes in the fair stock value of our virtual company as predicted by the group of evaluators.

3.1.1. The Virtual Corporation

In designing our research methodology, we developed a simulated company based on an existing firm in the home appliance industry. After obtaining necessary permissions, we chose to model our virtual entity on Whirlpool Corporation, a well-known global manufacturer. We created a fictional company called Ahoo Co., transferring Whirlpool's detailed financial records, core data, historical background, and business achievements to this new entity. The decision to rebrand the company as Ahoo Co. was strategic, aimed at preventing study participants from recognizing the original corporation, thus eliminating potential biases in their decision-making processes. We included all of Whirlpool's actual historical data up to the end of 2021, then constructed a hypothetical future path for Ahoo Co. The use of a virtual company allows us to investigate and assess different strategies, regulatory frameworks, and valuation techniques without affecting a real corporation or market.

Our research design features a virtual entity, Ahoo, which embodies the complete historical performance of Whirlpool Corporation. We've carefully modified Whirlpool's 2021 annual report to fit the specific criteria set for Ahoo. Study participants are granted access to Ahoo's financial records spanning the previous five-year period, allowing them to conduct comprehensive assessments of the company's financial evolution. The experimental framework equips evaluators with an extensive array of fundamental financial indicators for Ahoo. This dataset encompasses a wide range of crucial metrics, including but not limited to Dividend Per Share (DPS), Weighted Average Cost of Capital (WACC), Beta coefficient, Cost of Equity, and Free Cash Flow (FCF). By providing these essential financial measures, we aim to facilitate thorough analysis and precise valuation of the company.

In our experimental design, we've constructed Ahoo Company to reflect Whirlpool's geographical and business segments as they stood at the end of 2021. We've taken a novel approach by conceptually bifurcating Ahoo into two distinct components: a no-growth segment and a growth segment. The no-growth segment is characterized by its steady-state nature, featuring constant Earnings Per Share (EPS) that are fully distributed as dividends. This results in zero retained earnings and, consequently, no growth. In contrast, the growth segment is poised for future expansion through new profitable ventures. We've implemented a granular financial reporting structure, preparing separate financial statements for each segment. Within the growth segment, we've gone a step further by creating individual project statements. These are then consolidated to provide a comprehensive financial picture of Ahoo Company. To enable thorough company valuation, we've ensured that all necessary data for calculating each project's net present value is readily available. This approach allows us to dissect the company's value into its no-growth and growth components. From 2022 onwards, we've applied specific assumptions to Ahoo's financial model. These include quarterly sales of $5,502 for the no-growth segment, a Net Profit Margin (NPM) of 7.91%, and an annual Return on Equity (ROE) of 35.87% from ongoing projects. We've also adjusted the dividend policy. The Dividend Payout Ratio (DPR) for project earnings is set to zero in 2022 to facilitate funding for new projects, then increases to 25% from 2023 onwards. All projects are considered to carry average risk, allowing us to use the average Weighted Average Cost of Capital (WACC) for cash flow discounting. We've standardized project maturity at 5 years, with financing structured as 40% debt and 60% equity. Project-specific debt is repaid upon completion. Our model operates under the assumption that projects, once initiated, cannot be terminated even if they become unprofitable. This is based on the premise that closure costs would exceed those of continuing a negative NPV project. To add further realism and variability, each project is assigned unique estimates for initial annual sales, yearly growth rate, gross profit margin, Selling, General, and Administrative (SG&A) expenses as a percentage of sales, and total assets turnover. This intricate design allows us to simulate a complex corporate environment while maintaining control over key variables.

In our research, we employed an Earnings model to ascertain Ahoo Company's stock value, which we established at $400 as of December 31, 2021. This valuation is a composite figure, encompassing both the no-growth and growth value elements of the company. We designated this $400 figure as the starting point for our experimental period, serving as the initial stock value for our participating evaluators to work with. To maintain consistency with historical price trends, we devised an innovative adjustment method. This involved calculating the ratio between our derived $400 stock price and Whirlpool's actual stock price on the same date. We then applied this ratio to modify Ahoo's historical stock prices, thereby creating a coherent and adjusted price history that aligns with our experimental setup. In this carefully crafted scenario, we tasked our evaluators with stepping into the shoes of fully informed, rational investors. To facilitate this role, we provided them with unrestricted access to all pertinent information about Ahoo Company. This comprehensive dataset included crucial financial figures and detailed performance results.

Our research project involves a five-year simulation of Ahoo Company's hypothetical future, running from the start of 2022 through the end of 2026. To create a lifelike market scenario, we've developed a methodical strategy for distributing various types of information throughout this timeframe. We've carefully crafted a diverse mix of information, released at strategic intervals. This includes news reports, financial analyses, corporate announcements, market rumors, and accounts of unexpected events that could sway financial markets. The information we've created spans a spectrum from positive to negative, and from directly relevant to Ahoo's performance to seemingly unrelated market noise. Complementing this information

dissemination approach, we've constructed a detailed growth plan for Ahoo Company. This plan outlines potentially lucrative projects, identified through simulated capital budgeting processes and financial analyses. It provides in-depth specifications for each new project slated to launch annually over our five-year simulation period. According to our growth plan, Ahoo will initiate one new project at the beginning of each year. We've designed each of these projects with a five-year maturity, introducing a dynamic element to the company's simulated financial trajectory.

3.1.2. The Fair Stock Value Predicted by Evaluators

The study employs a group of evaluators tasked with meticulously examining all new information about the company in the simulated stock market, free from emotional bias. Their forecasts will be benchmarked against the net present values projected to be generated from the projects undertaken by the virtual company, with the assumption that their predictions form the correct stock price trend.

These evaluators are designed to represent the "Homo-Economicus" investor character, as outlined by Baltussen [1]. This model investor is characterized by rationality, unlimited information processing capacity, complex problem-solving abilities, high computational skills, and the ability to make consistent, emotion-free decisions. To replicate this investor type, the evaluators are provided with comprehensive, accurate information about the virtual company's stock, devoid of false data or rumors. Information is presented incrementally, rather than in the conflicting, diverse bundles typical of real stock markets. The group's objective is to forecast the correct stock price trend based on this accurate information, establishing a benchmark for comparison.

Each evaluator is expected to allocate adequate time to analyze all relevant information and submit their price range predictions via Google Forms, assessing how this information impacts the stock price. For each trading day (representing a quarter in the virtual company's timeline), individual growth rate predictions are consolidated to determine a collective daily growth rate estimation per evaluator. These daily estimations are then averaged across all evaluators to establish a final daily growth rate estimate for the stock price. This process yields the average daily percentage change in stock price, serving as a benchmark for accurate growth estimation and a fair representation of the information trend.

The decision to limit the number of evaluators was strategic, prioritizing the quality of estimation sources over quantity. It was recognized that a single, rational evaluator with complete information access could potentially outperform a larger, emotion-influenced group. Time constraints faced by participating lecturers and analysts further justified the use of a smaller evaluator sample, as these experts needed to focus intensively on the simulated stock market throughout the study duration. Future research could consider expanding the sample size to address this limitation.

The growth rates provided by this evaluator group are considered the benchmark for the correct and fair stock price trend. These rates will be compared and regressed against the variation in net present values expected to be generated by the virtual company's future projects.

3.1.3. Net Present Values Generated from Projects

In our design of the virtual company's growth segment, we've mapped out a strategic plan for future expansion through profitable projects. Specifically, we've scheduled the launch of six new projects, with one set to commence at the beginning of each year. The company releases things step by step, following its well-planned growth plan. To maintain a clear picture of each project's financial impact, we've taken the step of preparing separate financial statements - Income Statements, Balance Sheets, and Cash Flow Statements - for each individual project. This step-by-step approach allows us to pinpoint the added economic value generated by each project on a quarterly basis. It's worth noting that these individual statements are then consolidated with those of the no-growth segment, providing a comprehensive financial overview of the virtual company. To facilitate a thorough valuation of the company, we've ensured that all necessary data for calculating the net present value of each project is readily available. This includes a range of key financial metrics: quarterly sales figures, profit margins, total asset turnover, return on equity, dividend payout and retention ratios, cost of capital, and capital structure weights.

3.2. Statistical Analysis Methods

3.2.1. Regression Analysis: Variables and Hypothesis

Our research uses a regression model to study how changes in NPV affect Stock Value. The model focuses on the impact of one main factor: how the expected Net Present Values (NPV) from the virtual company's projects change over time. By looking at this, we want to understand how these NPV changes influence the Stock Value predictions made by our Evaluators.

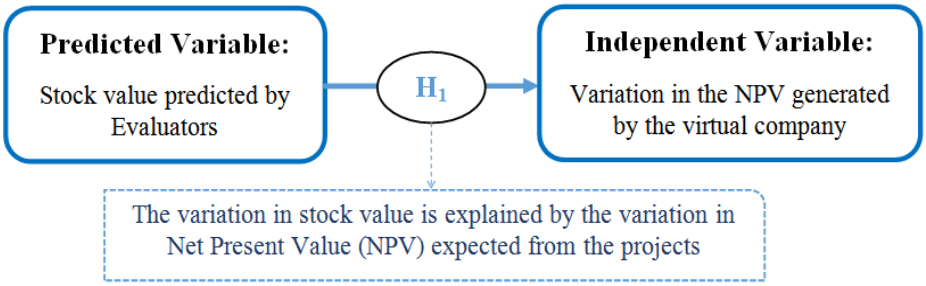

Figure 1. Variables and Hypothesis

Figure 1 illustrates the variables incorporated in the regression model, outlining the hypothesis that are set to be tested regarding the interrelationships among these variables.

Figure 2 illustrates the Evaluators' quarterly predictions for stock value. Figure 3 shows how the expected Net Present Values (NPV) of the virtual company's projects shift over time. Lastly, Figure 4 presents the quarterly growth rates for two key variables: Stock Values and NPV.

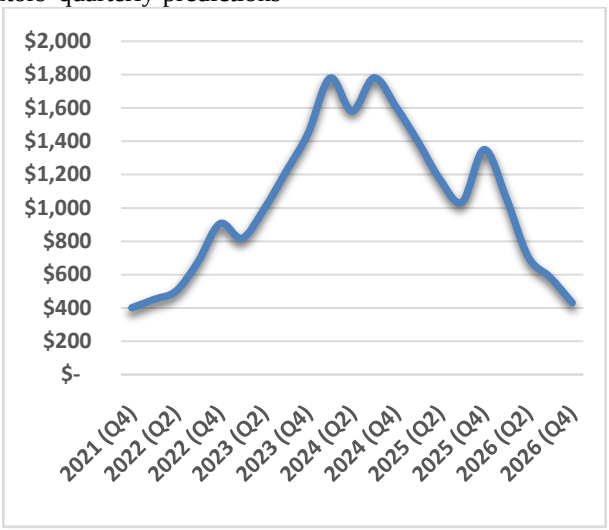

Figure 2. Fair Stock Values Predicted by Evaluators

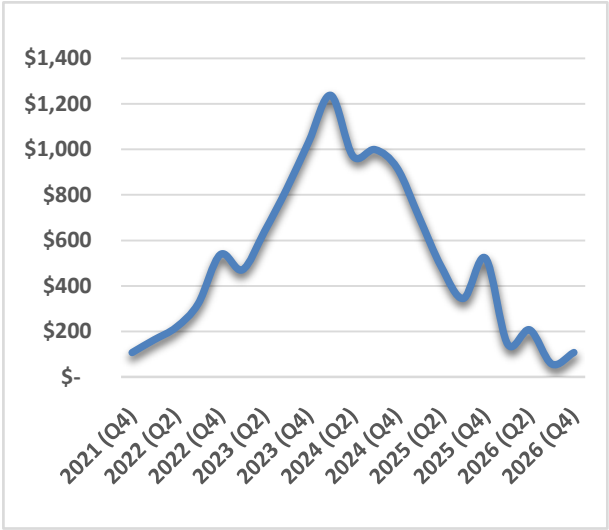

Figure 3. Net Present Values (NPV) Generated by Company

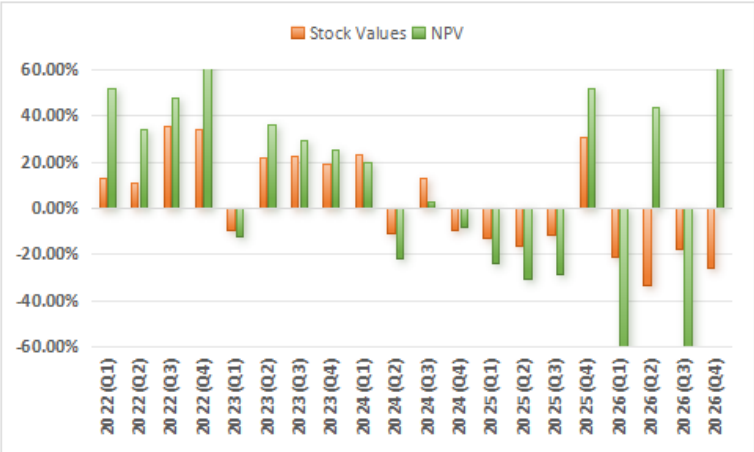

Figure 4. Quarterly Growth Rates of Each Variable

3.2.2. Unit Root Testing for Non-stationarity

Before constructing the regression model, it's crucial to test for unit roots when examining potentially non-stationary time series data, as this helps identify random walk patterns. Our analysis will employ the Augmented Dickey-Fuller Unit Root Test using EViews software, set at a 5% significance level. We'll apply this test to the quarterly growth rates of two key variables: Stock Values and NPV. For each time series, the null hypothesis posits the presence of a unit root.

3.2.3. Residual Analysis: Serial Correlation, Heteroscedasticity, and Normality

To validate our model, we conduct a comprehensive residual analysis, examining serial correlation, heteroscedasticity, and normality. We begin by evaluating residual term correlation within the regression model using the Durbin-Watson test, which assumes no serial correlation under its null hypothesis. Next, we test the constant variance assumption across observations using the Breusch-Pagan-Godfrey heteroskedasticity test. The null hypothesis here assumes homoskedasticity. Using EViews, we calculate the Breusch-Pagan chi-squared test statistic and compare it to the one-tailed critical value from a chi-squared distribution table (one degree of freedom, 5% significance level). Lastly, we assess the residuals' normal distribution assumption. We employ EViews' Jarque Bera probability test and consider the residuals' kurtosis and skewness. This thorough approach ensures a robust evaluation of our model's underlying assumptions.

4. Results

4.1. Nonstationarity Findings

Table 1 presents the results of the Augmented Dickey-Fuller Unit Root Test conducted on the quarterly growth rates of predicted stock values and Net Present Value (NPV). The null hypothesis assumes the existence of a unit root in each time series, using a significance level of 5%.

Table 1. Unit Root Test Results

Time series	Augmented Dickey-Fuller test statistic	MacKinnon (1996) one-sided p-values	Decision	Data to be used in regression
Stock Value	-4.71	0.0071	Reject the null: covariance stationary	Original time series
NPV	-7.74	0.0000	Reject the null: covariance stationary	Original time series

4.2. Autocorrelation, Heteroscedasticity, and Normality of Residuals

In our regression analysis, we conducted a Durbin-Watson (DW) test to examine the presence of positive serial correlation. The null hypothesis stated that the regression model does not exhibit positive serial correlation. We utilized the Durbin-Watson table and obtained critical values, specifically the upper critical value of 1.411 at a 5% significance level, considering one independent variable (k=1) and a sample size of 20 (n=20). Table 2 presents the DW statistic obtained from EViews, and based on the results, we did not find sufficient evidence to reject the null hypothesis. This suggests that there is an absence of positive serial correlation in the model used for analysis.

Table 2. Autocorrelation Test Results

Dependent variable	Independent variable	Upper Critical value	Durbin-Watson statistic	Decision
Predicted Stock Value	NPV	1.411	1.414	No positive serial correlation

To assess the presence of heteroscedasticity in our regression analysis, we performed a Breusch-Pagan-Godfrey test. The null hypothesis assumed that the regression demonstrates homoskedasticity. Table 3 shows the Breusch-Pagan chi-squared test statistic for the model, which was derived using EViews. We compared this test statistic to the one-tailed critical value of 3.84, which was obtained from the chi-squared distribution table, accounting for one degree of freedom and a significance level of 5%.

Table 3. Heteroscedasticity Test Results

Dependent variable	Independent variable	One-tailed critical value	Breusch Pagan statistic	Decision
Predicted Stock Value	NPV	3.84	6.4	Reject the null: Conclude Heteroscedasticity

The results of the Heteroscedasticity test suggest that the regression model's residuals have unequal variance across different observations. As a result, to ensure accurate interpretation of the regression analysis, we should use robust standard errors rather than the conventional standard errors.

To ensure the reliability of our conclusions from the regression analysis, it is essential to perform tests to assess the normality of the residual distribution. Table 4 presents the results of the Jarque-Bera probability tests conducted on the residuals of the regression model at a significance level of 5%.

Table 4. Normality Tests of The Residual

Model	P-test (Jarque Bera)	Kurtosis	Skewness	Are the residuals normally distributed?
Stock Value *c* NPV	0.0509	4.15	-1.21	No

Given the results of these normality tests we cannot assume a normal distribution for the residual of the regression model. For this reason, we will employ a Robust Least Squares regression model in the next section with the MM-estimation method that utilizes Huber Type I standard errors and covariance to obtain more reliable results given the presence of Heteroscedasticity.

4.3. Regression Analysis: Robust Least Squares

Table 5 presents statistical information for the constant and the NPV independent variable.

Table 5. Robust Least Squares with the MM-estimation method

Variable	Slope coefficient	p-value	95% CI		R-squared
			Low	*High*	
C	0.039	0.0614	-0.005	0.084	0.6046
NPV	0.436	0.0001	0.3365	0.5357	

Equation 1 depicts the statistical relationship between a company's stock return and the percentage change in its net present value (NPV%). This regression model aims to quantify how fluctuations in NPV% influence stock performance.

Equation 1 $Stock\ Return\ \% = 0.039 + 0.436(NPV\ \%)$

This regression analysis will evaluate how economic value creation, measured by Net Present Value (NPV), impacts stock performance. By examining the relationship between NPV and stock prices or returns, the study aims to quantify the market's response to a company's value-generating activities. The results could reveal whether investors prioritize companies that efficiently create economic value. This analysis may have significant implications for corporate strategy, investor decision-making, and financial communication practices. It could provide insights into the market's efficiency in incorporating value-creation information and guide future research on factors influencing stock performance.

5. Discussion and Conclusion

5.1. Analyzing the Findings

Our statistical analysis yielded several key findings. The Augmented Dickey-Fuller Unit Root Test confirmed the covariance stationarity of our stock value and NPV time series data, making them suitable for regression analysis. While the Durbin-Watson test showed no positive serial correlation in the residuals, the Breusch-Pagan-Godfrey test revealed heteroscedasticity in residual variances, and the Jarque-Bera test indicated non-normal distribution of residuals. Given these results, we implemented a Robust Least Squares regression model using the MM-estimation method with Huber Type I standard errors and covariance. This approach ensures more reliable results considering our data characteristics, and our comprehensive analyses support its application in this study.

This study examined the hypothesis that variations in a company's stock value can be explained by changes in the Net Present Value (NPV) of its projects. To test this, we employed a Robust Least Squares regression model, analyzing the correlation between stock values predicted by Evaluators and the NPV generated from the virtual company's projects. The results were compelling: the NPV coefficient's 95% confidence interval excluded zero, with a p-value below 0.05, indicating strong statistical significance. This suggests that changes in NPV are indeed a significant predictor of stock value variations. The model's R-squared value of 60% further reinforces this finding, indicating that NPV explains a substantial portion of the variance in stock values. These robust statistical indicators provide strong empirical support for our hypothesis, demonstrating that fluctuations in a company's stock value can be significantly explained by variations in the expected NPV of its projects. This finding has important implications for both investors and company managers, highlighting the importance of effective project management and value creation in driving stock performance.

5.2. Conclusion: Addressing the Research Question

In conclusion, this study provides a clear and compelling answer to our central research question: "How do fluctuations in Net Present Value (NPV) expected from the projects undertaken by a company impact the fluctuations in fair stock value of this company?" Our robust statistical analysis, employing a Robust Least Squares regression model, demonstrates a significant and positive relationship between changes in NPV and variations in stock value. The strong statistical significance of the NPV coefficient, coupled with an R-squared value of 60%, indicates that fluctuations in NPV explain a substantial portion of the variance in fair stock value. These findings underscore the importance of NPV as a key driver of stock valuation, suggesting that investors closely consider a company's ability to generate value through its projects when assessing fair stock value. This research not only confirms the theoretical link between NPV and stock value but also quantifies this relationship, providing valuable insights for both corporate financial management and investment decision-making. Ultimately, our study affirms that a company's capacity to create value through its projects, as measured by NPV, is a crucial determinant of its fair stock value.

5.3. Implications and Limitations

The implications of this study are far-reaching and significant for various stakeholders in the financial and corporate worlds. For investors, these findings underscore the importance of scrutinizing a company's project portfolio and its expected NPV when making investment decisions. This could lead to more informed and value-focused investment strategies, potentially improving overall market efficiency. For corporate managers, the strong link between NPV and stock value emphasizes the critical nature of effective project selection and management. It may encourage companies to prioritize value-creating projects and improve their capital allocation processes. Furthermore, this research could influence corporate communication strategies, prompting companies to provide more detailed and transparent information about their project NPVs to the market. For financial analysts and valuation experts, the study provides a quantifiable basis for incorporating NPV projections into stock valuation models, potentially enhancing the accuracy of fair value estimates. Lastly, these findings may have implications for corporate

governance, highlighting the importance of aligning management incentives with long-term value creation as measured by NPV, rather than short-term stock price fluctuations.

It's essential to consider the study's limitations when interpreting its results. A key constraint is the potentially small sample size of the evaluator group, which may not adequately represent the broader population, thus limiting the generalizability of our findings. Additionally, the fair value predicted by this group might not fully capture the actual fair value of the virtual company's stock, further restricting the study's applicability. To address these limitations and strengthen the reliability of the results, future research should focus on conducting simulations in the stock market with significantly larger sample sizes. This approach would likely produce more robust and generalizable outcomes, enhancing the overall validity and applicability of the findings in real-world scenarios.

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Data Availability Statement: The information pertaining to the simulation, including details about the company, evaluators, news and information, projects and simulated stock market, is available upon request. Mohamad Saad should be contacted for any inquiries regarding the data used in the study.

Conflicts of Interest: The author declares no conflict of interest.

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