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Analyzing the Profitability's Impact on Firm Value During COVID-19

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Abstract: Amidst the COVID-19 epidemic, the specific impact of pharmaceutical companies' financial prowess on their overall worth remains uncertain. While many studies have explored the correlation between business value and various internal and external factors, the existing literature has not adequately focused on the precise influence of firm profitability on firm value, especially in the context of an epidemic. This article aims to fill a research gap by examining the relationship between profitability and corporate value during the COVID-19 pandemic, specifically focusing on Pfizer. This article utilizes a quantitative analysis technique. This research has developed a quantitative analytical approach to precisely measure the impact of profitability, which is an independent variable, on company value, which is a dependent variable. The investigation indicates a robust and favorable correlation between business value and sales growth. Due to the strong positive association between vaccine revenue and stock prices, it is advisable for corporate directors and strategic planners to emphasize vaccination production and sales.

Keywords: Quantitative Analysis, Firm Value, Profitability.

1. Introduction

The COVID-19 pandemic is an unavoidable stress test for all entities, from sole traders to large companies [1]. During the pandemic, the global economy stagnated, various industries suffered, and many companies suffered heavy losses. As a key force in the fight against the pandemic, the pharmaceutical sector contributed significantly to the quality of life for patients and society worldwide by carrying out a wide range of duties, including research and development, manufacture, distribution, and public health education [2]. From a financial performance management perspective, the pharmaceutical industry's market performance during the pandemic has garnered significant attention [3]. The substantial initial investment in research and development within the pharmaceutical industry can impact short-term profitability and subsequently influence investors' perceptions of the company. In the long term, however, these investments have helped to develop enterprises and improve shareholder welfare.

Pfizer, one of the biggest firms, became the first pharmaceutical company to exceed $100 billion in sales during a pandemic with two products: the coronavirus vaccine Comilunate and the oral medication Paxlovid. Pfizer's production of Comirnat, a coronavirus vaccine, exemplifies the importance of R&D investment and its enormous value to a company. Pfizer's COVID-19 vaccination not only saved many lives, but it also effectively launched a new innovation-driven corporate

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profitability model. Pfizer's cooperation with BioNTech, as well as its efforts in reaction to the pandemic, demonstrate the company's resilience and ability to use novel tools to produce major market outcomes.

Profitability is a company's ability to generate a profit over a specified period by maximizing the use of its numerous resources and opportunities, including capital, labor, sales, and other assets. The market price of a company's stock has a substantial impact on its profitability. This is because investors are generally willing to pay a premium for the stock of a company that is performing well. As a result, investors' optimism about a company's future prospects greatly influences its share price in the market [4]. Hamzah et al. conducted an analysis of data from 16 listed manufacturing companies in Indonesia and investigated the factors that influence firm value [5]. Sukmadilaga et al. conducted another study that focused on firm value and found that the adoption of environmental accounting, as measured by energy consumption, did not significantly impact the value of listed companies in ASEAN countries [6]. Additionally, Lee and Lee used nonlinear quantile regression to study the impact of CSR activities on corporate value as more and more businesses pay attention to social responsibility [7]. They discovered that CSR activities have a nonlinear rather than a linear effect on the valuation of Korean listed corporations [7].

The literature does not specifically address the influence of firm profitability on firm value, particularly during a pandemic, despite the substantial amount of research on the relationship between firm value and internal and external factors. Previous research has examined the relationship between profitability and firm value in the electronic communications and manufacturing industries during the pandemic. Nevertheless, the precise relationship between financial stability and firm value during a COVID-19 pandemic is still uncertain, despite the significant role that pharmaceutical companies play in a pandemic. The pharmaceutical sector has the attributes of a protracted cycle and substantial investment expenses. Does pharmaceutical businesses' profitability during the epidemic exhibit a positive correlation with corporate value, similar to other industries? Gaining a comprehensive understanding of the exact impact of COVID-19 on the pharmaceutical business can enable organizations to utilize this information in order to enhance their comprehension of their vulnerability to severe market circumstances and optimize their tactics for managing and reducing risks. This study can help analysts and investors make better-informed investing choices. Identifying the organizations that have the ability to sustain or enhance their profitability during a crisis might assist investors in selecting prospective investment opportunities.

Return on equity (ROE) and return on assets (ROA) are metrics employed to evaluate an organization's profitability. However, this study solely uses net profit as a metric to evaluate a company's profitability, with its share price determining its value. Therefore, this study incorporates Pfizer Inc. to examine the impact of profitability on firm value during the COVID-19 outbreak.

2. Literature Review

2.1. Definition

Company valuation is a critical component of financial theory that deals with determining an enterprise's economic value. The first serious debates and assessments of the influence of profitability on corporate finance began in 1968, with the suggestion that current earnings might forecast future profitability and change a company's value [7]. Damodaran defines it as calculating the present value of a company's projected capital flows [8]. It is an outgrowth of Damodaran's research into the principles of investment valuation and provides a solid foundation for the study of corporate finance [8]. Investors can also use business value to examine the link between a firm's performance and its share price [9]. Companies with higher share prices have a higher enterprise value, indicating that the market is confident in their present performance and supports future growth. Business valuation has

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a significant impact on mergers and acquisitions, investment choices, budgeting, and enhanced business control. Stock prices are a positive indicator for investors and management, creating an atmosphere for assessing the company's state and future development prospects [10].

Barriers to firm valuation are the elements that affect firm valuation and include aspects such as profitability, growth rate, and other internal and external factors such as market and industry forces. Globally, the need to identify profitability as a significant determinant of company value is well understood. The study by Sudiyatno et al. aimed to identify the correlation between profitability and firm value for manufacturers in Indonesia [11]. They discovered that profitability has a positive impact on a company's value [11].

2.2. Important Results

Expenditure on research and development has a significant impact, especially in the pharmaceutical industry. According to Diem, R&D intensity positively affects the firm's value for global pharmaceutical companies during the COVID-19 crisis [12]. This implies that investors appreciate firms that incur more costs for innovation, especially during a health threat [12]. Kunsu Park et al. employed a sample of 563 Chinese firms in a related research study by Woo Sung Kim to investigate the impact of R&D investment on firm value from 2005 to 2013 [13]. The study determined an inverted U-shaped relationship between firm value and R&D input in low-state-owned enterprises [13]. Furthermore, the findings show a distinct nonlinear relationship between R&D investment and firm value, which correlates with the expansion of development opportunities [13]. However, prospective variables such as import advertising intensity and technology intensity were not considered because it was difficult to obtain data from Chinese firms [13]. In 2017, Zhu Guilong et al. classified Chinese electronics manufacturing firms as emerging market firms [14]. Researchers determined that firms with more effective management significantly impact their performance through their R&D intensity [14].

Earnings quality is another component that goes into the company's valuation. High quality, sustainability, and predictability characteristics further predict the quality of earnings, often leading to higher valuation multiples. Investors prefer stocks from companies with higher earnings growth rates and lower risk. This is more so in industries that take longer to develop the products, such as the pharmaceutical industry, where earnings stability could point to efficiency and appropriate positioning in the market. In 2020, Hung et al. investigated the influence of earnings quality on corporate value in Vietnamese companies [15]. Through the use of GLS regression and linear structural models, the study demonstrated that earning quality positively influences corporate value [15]. Consequently, investors will experience increased levels of trust and concern when making investment decisions if companies provide additional information regarding the calculation of earning quality [15]. In a similar study, Dechow et al. examined various proxy variables for the quality of earnings, their factors, and their influence on corporate outcomes [16]. Dechow et al. typically linked high-quality earnings to increased company value and improved market performance [16].

Corporate governance is another factor that influences company valuation. Companies with suitable governance structures, accurate disclosures, and excellent boards of directors tend to command a market premium. Arpit Jain's study revealed that the relationship between firm value and corporate governance varies depending on the specific governance characteristics and firm value [17]. The research discovered that the concentration of ownership, institutional ownership, and board independence have a favorable and substantial impact on the value of a company [17]. In order to evaluate the correlation between firm value and two components of corporate governance (board of directors and ownership structure) in European financial institutions, Hanen and Jamil carried out a multivariate regression study [18]. The empirical analysis reveals a positive correlation between a

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firm's value, the gender diversity of the board, and the CEO's ownership [18]. In contrast, there is a negative correlation between firm value, ownership concentration, and board size [18].

2.3. Summary

Overall, these studies show that a variety of circumstances impact a company's worth. Although these studies provide extensive information, more research is necessary to comprehend the long-term impact of profitability on firm value across diverse economic scenarios, and the influence of industry-specific characteristics on this relationship. Pfizer, the corporation selected for this research, is a multinational conglomerate with a diverse portfolio of businesses. The Pfizer research improves the knowledge of the global pharmaceutical industry's governance dynamics and performance in various market settings. It will provide a comprehensive view for global investors and management.

3. Research Method

3.1. Research Design

The study employed the qualitative research method, which aims to determine the correlation between the independent variable "profitability" and the dependent variable "firm value." Correlation analysis is a general data analysis method that can be employed to investigate the relationship between variables and to acquire valuable information and insights. The analysis's results and reliability are dependent on data acquisition and processing, as well as the quality and quantity of the data. A low correlation indicates a feeble relationship between variables, while a high correlation indicates a significant relationship between two or more variables.

The key to the statistical analysis of this study lies in employing OLS regression, which is an easy-to-understand, widely used, and effective forecasting model that can accurately estimate the associations between many independent and dependent variables. OLS regression reduces the sum of squared differences between actual and expected values. It provides a clear and understandable way to figure out how changes in economic indicators, like sales revenue, affect stock prices.

3.2. Data Collection

The data utilized in this study are entirely quantitative, consisting solely of numerical values. Saunders pointed out that secondary data refers to data collected by some institutions for purposes other than the current research [15]. This investigation utilizes secondary data. All required information (business revenue, net profit, stock price, and sales revenue from vaccination companies) is sourced from Pfizer's quarterly financial reports, which are accessible to the public on Pfizer's official website, to guarantee the reliability and correctness of the analysis. This study chose Pfizer's financial data for nine quarters, from the fourth quarter of 2020 to the fourth quarter of 2022, because the vaccine's widespread distribution and sales began in the fourth quarter of 2020, marking the end of the global epidemic and the beginning of economic recovery.

3.3. Data Analysis

Based on the prior literature, this paper constructs the following hypotheses:

H0: There is a positive correlation between profitability and the firm value.

H1: There is no positive correlation between profitability and the firm value.

Each research variable operational definition is explained in Table1:

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Table 1: Definition of Variable Operations

Variable Name	Indicator	scale
Independent variable: Profitability	Sales revenue from vaccination Comirnaty	ratio
dependent variable: firm value	Stock price	ratio

(Data Source: Original)

To test the hypothesis, a simple regression equation model is used as follows (Formula 1):

$$\text{Stock Price } t=\beta 0+\beta 1\cdot \text{ Vaccine Revenue }_t+\epsilon_t \quad (1)$$

Where:

Stock Price tis the company's stock price at time t

Vaccine Revenue t is the company's vaccine revenue at time t.

β0 is the intercept term, representing the stock price when vaccine revenue is zero.

β1 is the regression coefficient, indicating the change in stock price per unit increase in vaccine revenue.

ϵt is the error term, representing additional variables influencing stock price that are not described by the model.

4. Result

The company studied is Pfizer, and the research period is Q4 2020 to Q4 2022. Figure 1 shows the change in Pfizer's vaccine sales revenue and company stock price from the fourth quarter of 2020 to the fourth quarter of 2022.

According to the Figure 1, vaccination revenue exhibited a substantial growth from Q4 2020 to Q3 2021, followed by changes in 2022. The overall trend initially ascended and subsequently descended. The general trajectory of the stock price closely mirrors the fluctuations in vaccine revenue. The surge in vaccination sales corresponded with a continuous upward trajectory of the stock price from Q4 2020 to Q4 2021, peaking at US$52. 69, followed by a modest fall in 2022.

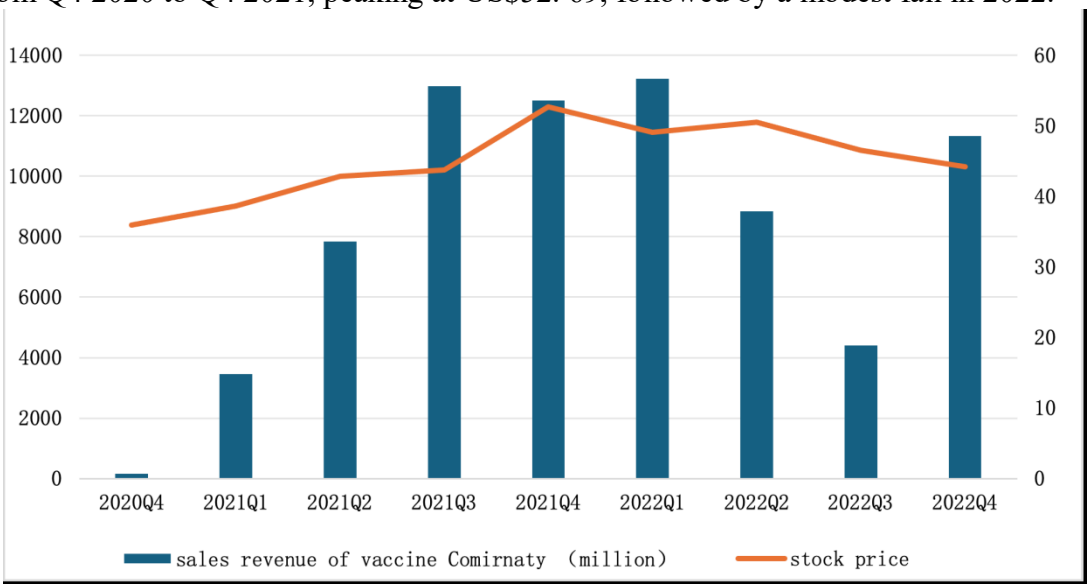

Figure 1: Pfizer vaccine sales revenue and stock price
(Data Source: Original)

Next, this paper tests the impact of vaccine profits on stock prices. The following Table 2 shows the results of the coefficient of determination. The independent variable accounted for 78.4% of the

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variation in the dependent variable, as shown by an R-square value of 0.784. The corrected R-square value of 0.762 suggests a strong model fit that can be applied to the full population.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0. 885[a]	0. 784	0. 762	2. 564

a. Predictors: (Constant), revenue(million)

(Data Source: Original)

The study's hypotheses were examined by chi-square regression analysis. The statistical hypotheses were assessed using t-tests and F-tests using the SPSS data processing programmed. The Table 3 below displays the outcomes of the t-test and F-test. The independent variable's t-statistic is 6.023, and the corresponding p-value is 0.000, which is less than the 0.05 level of significance. This implies that the correlation between earnings and stock price is not coincidental, as the regression coefficients of the independent variables are statistically significant.

Table 3: Regression Coefficients Table

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23. 760	2. 654		8. 951	0. 000
	revenue(million)	0. 001	0. 000	0. 885	6. 023	0. 000

a. Dependent Variable: stock price

(Data Source: Original)

The independent variable (Earnings in Millions of Dollars) is an important predictor of the dependent variable (stock price), as evidenced by the statistical significance of the regression model with an F-value of 36.271 and a p-value of 0.000 (Table 4). The independent variable's unstandardized regression coefficient (B) is 0.001, indicating that the stock price increases by 0.001 units for every unit increase in earnings (in millions of dollars), assuming all other variables remain constant. The independent variable has a substantial positive impact on the dependent variable, as evidenced by the standardized regression coefficient (β) of 0.885.

Table 4: ANOVA table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	238. 368	1	238. 368	36.271	0. 000[b]
	Residual	65. 718	10	6. 572		
	Total	304. 086	11			

a. Dependent Variable: stock price

b. Predictors: (Constant), revenue(million)

(Data Source: Original)

In general, the regression analysis results suggest that vaccine sales have a substantial predictive effect on stock price and that there is a strong positive correlation between these two variables.

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5. Discussion

It is evident that there are variations in Pfizer's vaccine sales revenue and stock price fluctuations when comparing the fourth quarters of 2020 and 2022. The overall trend of change in stock prices is similar to fluctuations in vaccine sales revenue. The increase in vaccination income has significantly impacted the corporation's stock price. However, in 2022, despite the fact that vaccine sales were strong, the stock price sank, perhaps as a result of other market problems. This demonstrates that Pfizer's performance during the COVID-19 pandemic has positively impacted the company's value. However, there are still some market factors outside profitability that need verification and improvement to improve the company's financial performance and raise investors' expectations for its future growth.

This study's results show a significant positive correlation between firm value and sales growth rate, aligning with the findings of Dewi and Sujana's 2020 study. This study, using multiple regression analysis, found that the sales growth rate positively influences the total firm value [8].

Enhancing profitability can positively impact Pfizer's value, as evidenced by the vaccine sales revenue's substantial positive impact on the share price.

Nevertheless, this finding implies that there is no direct correlation between vaccine revenue and stock prices. Vaccine revenues are a significant factor in determining the stock price, accounting for approximately 78.4% of the volatility. Factors not included in the model, such as macroeconomic variables, account for the remaining 21.6% of the volatility. The model significantly adjusts the corrected R-squared value of 0.762 to reflect the number of factors, further confirming the significant explanatory power of vaccine revenue on stock price. Overfitting does not significantly affect the model, as indicated by the difference between the two r-squares.

Given the significant positive correlation between vaccine revenue and stock price, company executives and strategic planners should pay more attention to vaccine production and sales. This is because increasing vaccine revenue is a smart way to raise stock prices, which in turn increases shareholder value. As a representation of the pharmaceutical business, Pfizer's conclusion is significant, and investors can utilize profitability data to guide their decisions when investing in high-input, long-term industries like the pharmaceutical sector.

6. Conclusion

This study examines the relationship between a company's value and profitability, using Pfizer Inc. as a specific example. The results suggest a significant positive correlation between vaccination sales and Pfizer, Inc.'s stock price. Research predicts that Pfizer's vaccine sales will initially increase and then fluctuate between the fourth quarter of 2020 and the fourth quarter of 2022. The company's stock price is expected to climb due to the surge in vaccination sales.

Nevertheless, the research was subject to specific constraints. Initially, the research exclusively focused on Pfizer, which has certain limitations in terms of sample size and hence cannot fully represent the whole pharmaceutical industry. Furthermore, the research only focuses on a single profitability parameter, namely vaccine sales revenue, which fails to adequately reflect the organization's overall profitability. Furthermore, the model presupposes that the data follows a normal distribution and that the residuals are independently and uniformly distributed. However, in reality, these assumptions may not be valid, which could undermine the model's confidence. Subsequent research endeavors may broaden the study cohort by investigating more pharmaceutical enterprises, thereby increasing the applicability of the results. Additional measures of profitability, such as return on net assets and return on assets, can be employed to provide a more comprehensive assessment of corporate profitability.

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In summary, the findings of this study align with those pervious' studies that an increase in sales positively impacts the company's total value. Pfizer believes that increasing vaccine sales is a viable strategy to improve its stock price and the value it provides to shareholders. These findings also offer guidance to investors who are investing in long-term, highly leveraged industries such as pharmaceuticals. The earnings data can help them make more informed choices.

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