

Relationship Between NIO Inc. Indebtedness and Stock Price Volatility

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Abstract: The burgeoning electric car market in China is revitalizing numerous enterprises, and the prospects for new energy vehicle companies are highly attractive. Debt is a substantial, non-negotiable expense that businesses utilize to fund their activities. Debt can facilitate the expansion of a corporation while simultaneously amplifying its dangers, which can occasionally escalate uncontrollably. Analyzing a company's debt is crucial in assessing its solvency and financial health. Using NIO as an example, this paper examines the company's stock price and liabilities, conducts a linear regression analysis, and evaluates the association. The analysis reveals a negative correlation between the stock price and liabilities. Effective risk management is essential for achieving corporate success, and debt represents a substantial expense in the course of conducting business. Gaining insight into the correlation between debt and share price can assist investors in assessing a company's financial soundness and investment risk. Elevated amounts of debt can lead to fluctuations in share prices, especially in bad circumstances. Consequently, organizations must diligently oversee obligations in order to maintain their financial well-being and promptly address any potential financial hazards.

Keywords: Stock price, Debt Risk, NIO Inc.

1. Introduction

NIO is a Chinese company that was established on November 25, 2014. It specializes on manufacturing high-end intelligent electric vehicles. Founded with a purpose of incorporating supercar DNA and presenting itself as a luxury brand, Li Bin quickly transformed it into a global strategic leader. NIO, a company that focuses on the investigation and production of high-performing electric cars, provides a range of advanced models and exceptional battery technology, as well as intelligent driving and user experience. NIO serves as a compelling example in the stock market, showcasing how innovative companies may gain a competitive edge worldwide while also reflecting industry patterns. NIO is a nascent company experiencing growth, and like other youthful enterprises, it entails a degree of risk. To gain a more comprehensive understanding of the hazards, the paper will focus the analysis on a specific element - debt [1].

NIO Corporation's debt levels are critical to analyzing its financial state and ability to repay debt, especially in the competitive electric car market. Checking share price volatility is crucial since it shows market sentiment. High debt can slow growth and lower share prices, while low debt might enhance risk. A company's debt levels affect its financial leverage, which affects its profitability and

financial shock vulnerability. High debt might reduce net income and raise interest rates. Debt levels and stock price volatility are complicated by financial soundness, leverage, market conditions, and investor mood. Therefore, investors should carefully evaluate this connection. [2]

Moreover, research indicates an intricate correlation between levels of debt and stock values. Initial research primarily examined the impact of corporate debt on stock prices, specifically the relationship between financial leverage and risk in the fields of finance and corporate management. Factors such as market circumstances and the state of the economy have an impact on both debt levels and stock values. Stock prices tend to increase when there is a robust economy and companies use financial leverage. However, during economic downturns, stock prices tend to decrease since companies have high levels of debt.

The paper seeks to investigate the possible correlation between NIO's debt level and its changes in stock price, and the resulting consequences for investors, market actors, and the firm. The degree of debt plays a crucial role in evaluating financial risk and investor confidence, which directly affects the performance of stocks. Comprehending NIO's debt situation is essential for forecasting its stock price patterns, since the company's financial well-being is also impacted by market mood and conditions.

2. Research method

To thoroughly investigate the relationship between NIO's liabilities and the volatility of its stock price, the author employed a wide array of data collection techniques. The initial data about liabilities, including the asset-liability ratio, current liabilities, and total liabilities, was obtained from NIO's official financial statements. Moreover, a study was undertaken by gathering historical stock price data for NIO to analyze the patterns of stock price variations. To enhance the comprehensiveness and accuracy of the data, the author cross-referenced it with sources such as financial news, industry publications, and third-party data providers.

Following the completion of data gathering, a variety of statistical and econometric analysis methods were utilized to gain a more thorough understanding of the relationship between stock prices and liabilities. Correlation analysis was used to examine any connections between liabilities and changes in stock prices. The author employed regression analysis to construct quantitative models capable of predicting variations in stock prices. In addition, a time series analysis was conducted to investigate trends and patterns in stock values, providing a broader perspective.

3. NIO's liabilities

3.1. Level of total liability

Table 1: NIO quarterly balance sheet [3]

	30/06/2023	31/03/2022	31/12/2022	30/09/2022
Total current assets	47941.88	51651.05	59149.75	63057.78
Cash and short-term investments	27851.53	32605.92	39408.24	44809.74
- Cash	-	-	-	-
Cash and cash equivalents	13723.95	14763.44	19887.58	18080.67
Short-term investments	14127.58	17842.48	19520.67	26729.06
Total net receivables	7588.32	7015.06	7074.73	6138.29
Total net trading receivables	5664.85	5464.54	5118.17	6138.29
Total inventory	8493.37	6376.31	8191.39	6671.57
Prepayment	-	-	-	-
Total other current assets	4008.65	5653.75	4475.39	5438.18
Total assets	87378.93	89327.37	96263.92	96877.22

Table 1: (continued).

	30/06/2023	31/03/2022	31/12/2022	30/09/2022
Total net property/plant/equipment	27927.95	25023.96	23082.33	20282.5
Total property/plant/equipment	36283.6	-	29983.56	-
Total accumulated depreciation	-8355.65	-	-6901.23	-
Net goodwill	-	-	-	-
Net intangible assets	29.65	29.65	212.6	213.93
Long-term investment	5273.96	5443.62	6356.41	5982.68
Long-term notes receivable	1923.47	1550.52	1956.56	-
Total other long-term assets	2177.88	6967.82	2740.58	7340.32
Total other assets	23068.9	23068.76	29834.97	32700.53
Total current liabilities	48103.61	40437.07	45852.05	39729.43
Accounts payable	19560.24	18873.75	25523.21	20367.42
Payable/Accrual	-	-	-	-
Accruals	5963.14	12284.2	6169.74	11036.41
Notes payable/short-term debt	4834.21	5294.21	4039.21	5039.21
Current receivable portion of long-term liabilities/capital leases	8595.91	3359.31	2294.49	2599.92
Total other current liabilities	9150.12	625.6	7825.4	686.46
Total liability	69018.4	65865.24	68617.16	64012.93
Total long-term debt	6555.91	11330.77	10900.26	12537.12
Long-term debt	6544.56	11330.77	10885.8	12537.12
Capital lease debt	11.34	-	14.46	-
Deferred income tax	216.16	216.4	218.19	216.6
Minority interests	3908.88	3842.69	3778.6	3730.64
Total other liabilities	-1734.9	-1088.89	-749.13	-2361.37
Total equity	18360.53	23462.14	27646.76	32864.28
Total redeemable preferred shares	-	-	-	-
Net non-redeemable preference shares	-	-	-	-
Total common shares	2.93	19619.45	2.92	29133.65
Capital reserve	95682	-	94593.06	-
Retained earnings (accumulated losses)	-80692.56	-	-69914.23	-
Common treasury stock	-1849.6	-	-1849.6	-
Employee Stock Ownership Plan Debt Guarantee	-	-	-	-
Unrealized gains (losses)	-	-	-	-
Total other interests	5217.75	3842.69	4814.61	3730.64
Total liabilities and shareholders' equity	87378.93	89327.37	96263.92	96877.22
Total common shares outstanding	1652.86	1649.31	1647.36	1640

* Millions of CNY (except items calculated per share)

According to the most recent available data, the total amount of money that NIO is responsible for is projected to be approximately \$6,901.84 billion USD. This includes both long-term debt and other obligations, as indicated in table 1. When assessing a firm's debt level, the total liability is a crucial indicator that represents the overall amount that the organization owes during a specific time frame. The data supplied provides a clear depiction of the magnitude of NIO's debt, which significantly impacts the organization's operations and financial condition. Various factors, including market

conditions, strategic decisions, and debt repayment plans, might influence the volatility of debt levels.[4]

3.2. Asset-liability ration

The data indicates that NIO has a total of 87,378 in assets, 69,018 in liabilities, and 18,360 in equity as of June 30th for the current quarter. The debt ratio is calculated by dividing the value of 69,018 by 87,378, resulting in a ratio of 0.79, as indicated in table 2. The asset-to-liability ratio is a crucial indicator that offers valuable insight into a company's financial structure. It is calculated by dividing the company's total liabilities by its total assets. A lower asset-to-liability ratio suggests that the organization relies more on its internal cash rather than taking on a significant amount of debt. When analyzing this data, it is crucial to consider both the standard practices in the industry and the specific conditions of the organization. The company's cautious handling of its debt, as indicated by a lower asset-to-liability ratio, implies a decreased financial risk. However, an extremely low ratio may suggest a lack of ability to effectively utilize debt financing options, thus limiting the company's ability to grow and make investments.

Table 2: Quarterly liability and asset [5]

Date	Liability(1000million)	Total asset(1000million)	Debt-asset ratio
2023-06-30	69.018	87.379	78.87%
2023-03-31	65.865	89.327	73.70%
2022-12-31	72.174	96.264	74.98%
2022-09-30	64.013	96.877	66.09%
2022-06-30	58.204	93.904	61.99%
2022-03-31	49.708	87.194	57.06%
2021-12-31	48.098	82.884	58.04%
2021-09-30	44.49	69.011	64.51%
2021-06-30	39.169	65.52	59.78%
2021-03-31	34.295	61.119	56.05%
2020-12-31	22.78	54.642	41.72%
2020-09-30	26.366	34.393	76.74%
2020-06-30	28.939	23.151	124.92%
2020-03-31	23.384	15.337	152.58%
2019-12-31	20.86	14.582	142.88%
2019-09-30	20.86	16.845	123.83%

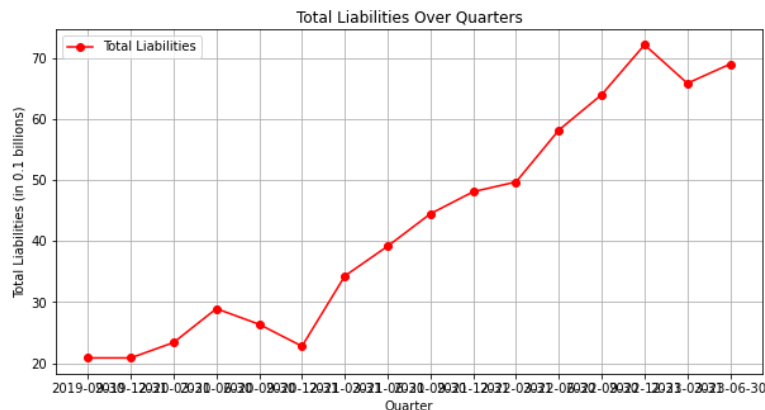


Figure 1: Quarterly total liability level

Figure 1 illustrates a decline in the overall debt level after June 30, 2020, reaching approximately 2.9 billion. However, it then saw a quick growth until it reached its highest point on December 31, 2022. One possibility is that the organization proactively pursued funding or raised its debt levels subsequent to June 30, 2020, in order to finance corporate expansion or other capital initiatives. The substantial expansion prior to December 31, 2022, could be attributed to the escalation of borrowing or the undertaking of supplementary financial obligations within this timeframe. Nevertheless, the presence of fluctuations and decreases may suggest that the company has initiated measures to decrease its debt or adjust its financial strategy in response to market fluctuations or to ensure financial stability.

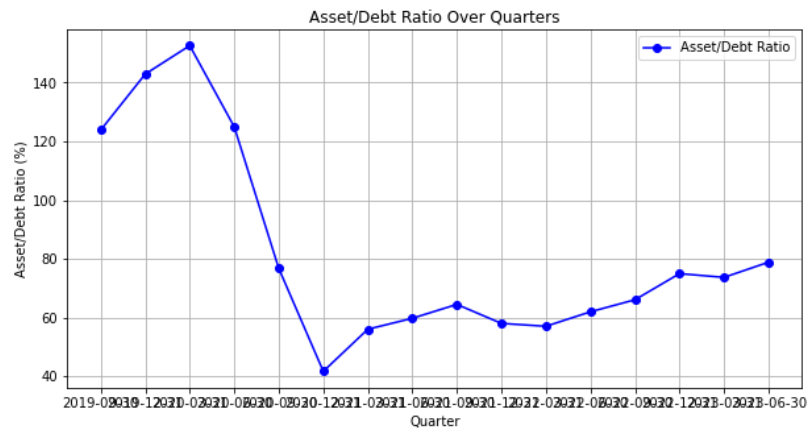


Figure 2: Quarterly Debt-asset ratio

Figure 2 shows that the asset-to-liability ratio started at a very high level and steadily increased in the first half of the year, reaching its highest point of 153% on March 31, 2020. Nevertheless, there was a rapid and significant decline, resulting in the asset-to-liability ratio plummeting to a mere 42% by December 31, 2020. Consequently, the ratio of assets to liabilities started to increase steadily and experienced fluctuations.

Upon careful examination of the data, it is clear that NIO saw a substantial decline in its asset-to-liability ratio between March and December 2020, although its liabilities only exhibited a slight reduction. Subsequent to December 31, 2020, there was a renewed upward trend in both the asset-to-liability ratio and the quantity of liabilities. NIO is relying more on debt financing rather than equity financing. The ability of the enterprise to control risks is gradually weakening. [6]

4. Fluctuations in NIO's share price

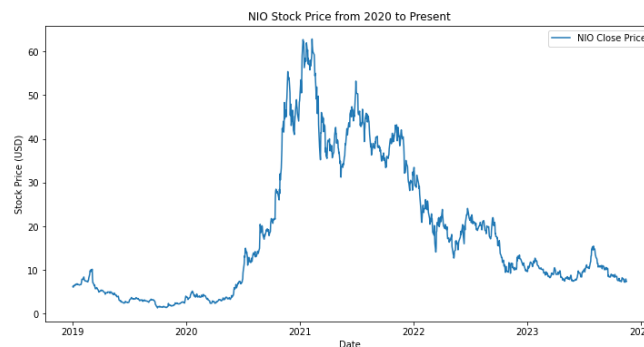


Figure 3: NIO stock price from 2020 to the present

The stock price reached its highest point in mid-2020 and maintained a consistent upward trend until early 2021 (figure 3). Nevertheless, the value of shares starts to decline in 2021. Seasonal trends indicate that prices reach their highest point at the beginning and end of the year. The COVID-19 pandemic has caused notable periods of volatility in early 2020, mid-2021, and mid-2022. Unusual events, such as the significant variations in November and December of 2020, justify the need for additional inquiry.

The stock price had a decline in early 2019, but subsequently exhibited a strong ascent, reaching a value of \$8 by 2020. The stock price surged to \$15 over the initial six months of 2020 and subsequently escalated to \$18 in August. The stock price experienced an upward trend, reaching a value of \$58 throughout the latter half of 2020 and the first quarter of 2021. The population of China, which is over 1.4 billion, presents a substantial potential market for NIO within its home market. China's electric car market is experiencing faster growth than that of the United States, and it has tremendous potential for further expansion[7]. Investors should take into account the valuations and the potential for greater competition that could limit the development prospects of industry leaders who have experienced substantial increases in stock prices. During the beginning of 2021, the stock price experiences a decline and steadily worsens throughout the year. The stock price rose to \$10 in 2022. The stock price fluctuates within the range of \$10 and \$20 over the initial six months of 2023. The stock price has declined to a range of \$7 to \$8 in the past few months.

5. Analysis of the relationship between debt and stock price volatility

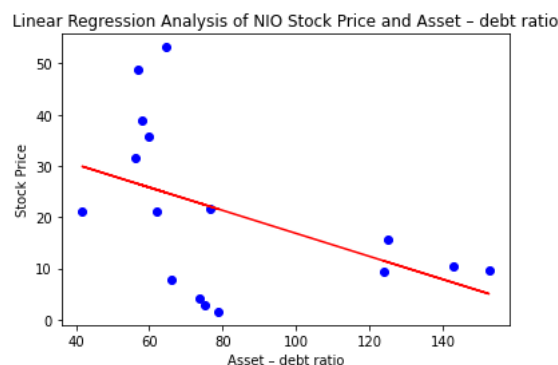


Figure 4: Linear Regression Analysis of NIO stock price and asset-debt ratio

The linear regression model forecasts a decrease of 0.22437966 units in a company's share price for each unit increase in the gearing ratio (figure 4). Investors may be cautious of companies with high gearing ratios since it could indicate increased financial risks, potentially leading to a decline in the share price. Investors may be deterred from purchasing a company's shares because of a high gearing ratio, as indicated by the Pearson's correlation coefficient (r) of -0.4658985024512028. This figure indicates a negative association between share price and gearing ratio.

Investors may have concerns over a company's financial stability if it possesses a high gearing ratio. A significantly high gearing ratio may indicate decreased solvency and the potential for insolvency if the company is unable to fulfill its financial obligations. An elevated gearing ratio may result in a decline in the company's equity value, so reducing investor trust and heightening risk and uncertainty for shareholders. A high gearing ratio can result in a decline in the firm's credit rating, which can impact how suppliers, customers, and partners perceive the organization. This could have a significant effect on the company's operations and increase risk levels even more. A disproportionately high gearing ratio can negatively impact the company's creditworthiness, leading to a decrease in its capacity to offer adequate security for loans and making it more challenging to

obtain funding from financial institutions. Any of these variables could influence the company's stock price and result in a decline.

The coefficient of determination (R-squared) is 0.2170614145862734, suggesting that gearing accounts for almost 21.7% of the stock price variation. Although the gearing ratio has an impact on stock price, about 78.3% of stock price fluctuations are influenced by other factors. These aspects encompass a company's profitability, market sentiment, industry developments, and the macroeconomic climate.

These are additional variables, with the initial factor being the significant increase in NIO stock value between 2020 and 2021. The stock price of NIO has experienced a remarkable increase of 277% during the previous four months, propelled by key factors. In October, two beneficial policy declarations were issued for the burgeoning energy sector: the New Energy Vehicle Industry Development Plan (2021–2035) and the Energy Saving and New Energy Vehicle Technology Roadmap 2.0. These techniques were advantageous for companies operating in the burgeoning electric vehicle industry, such as NIO. NIO implemented the NOP Pilot Assist function as the second feature. The introduction of this groundbreaking technology aroused investors' curiosity and elevated the stock price. The newly introduced EC6 model by NIO is expected to have significant order growth because to the high market demand for new energy automobiles. NIO is encountering difficulties despite the increase in its stock price.

Second one is that NIO stock plummets since 2021. Four main factors led to the 72% decrease in NIO's stock price during the past year. The market's interest in EV stocks has decreased, leading to a significant drop in the value of EV stocks like NIO. This year's significant rise in interest rates has led to an increase in the discount rate, impacting long-term assets such as NIO, which are not yet profitable. Thirdly, due to the escalating tensions between China and the United States, investors are growing increasingly cautious and hesitant about investing in Chinese stocks. Some investors are concerned about the U.S. government's implementation of the Chip Bill, which restricts the sale of specific semiconductors to China[8]. NIO's growth has fallen short of expectations in recent months, especially in September, with the business delivering 10,900 units, representing a just 2% increase from the previous year. NIO's third-quarter results lagged below the electric car market's overall growth rate. The stock price of NIO Motors has decreased due to a combination of these issues.

6. Conclusion

This study presents a comprehensive examination of NIO Corporation's debt, encompassing its overall debt amount, gearing ratio, and current obligations over multiple quarters. The analysis indicates that NIO's debt levels vary, offering valuable information on the company's financial state. Furthermore, NIO's historical stock price data exhibits numerous trends and patterns. The stock price peaked in mid-2020, had following gains at the start of 2021, and then began to decrease later in the same year. The paper underscores the need for additional inquiry through the examination of seasonal trends and identification of anomalous occurrences. This study examines the relationship between NIO's gearing ratio and stock price by employing a linear regression model. Elevated debt ratios can result in a decline in share values, as evidenced by the statistics demonstrating a negative correlation. The R-squared value, a statistical measure, indicates that debt accounts for around 21.7% of the variance in stock prices.

Due to financial and stock price data availability, data restrictions impair the paper's accuracy. The market's volatility means new information and changes may affect our results. Consider time-varying data when making decisions and interpreting information. This study acknowledges that market mood and geopolitical events affect stock performance. These unpredictable traits may cause stock value changes in short periods. Data interpretation should be done cautiously because every external aspect cannot be included, especially given the market's unpredictability. This study only covers NIO, thus

generalizations about the electric vehicle market or the company should be avoided. Studying one business may not adequately represent the sector because several factors affect market and industry developments. Readers should cautiously extend these conclusions to other relevant firms and macroeconomic data.

Investors might assess this filing's effects by considering NIO's debt and stock performance. Because debt ratios and company prices are adversely connected, debt monitoring is crucial for stock price prediction. Investors and market participants can adjust their strategies by analyzing risks from legislative changes, technological advances, regulatory scrutiny, and external funding, all of which threaten NIO stock performance and growth. These findings can help NIO and industry stakeholders enhance strategies. Stock performance aspects must be considered before investing.

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