



Impact of Financial Indicators on Stock Price Based on Chinese Baijiu Listed Companies

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Abstract. How to determine the trend of stock prices is the most concerning topic for stock investors. This paper takes the stocks of Kweichow Moutai, Jiannanchun and Jiugui Liquor as the research objects, selects financial indicators in the quarterly financial statements of these companies from 2005 to 2023 and quarterly stock closing prices as data samples, uses SPSS to conduct factor analysis and regression analysis, and studies the relationship between financial indicator and stock price. The results show that quick ratio, equity ratio, diluted earnings per share and net asset value per share of Kweichow Moutai have a greater positive impact on the stock price; Jiannanchun's current ratio, quick ratio, year-on-year growth rate of net profit, year-on-year growth rate of total operating revenue, and net asset value per share positively influences stock prices. on the stock price; The current ratio, quick ratio, equity ratio, net profit margin, year-on-year growth rate of net profit, year-on-year growth rate of total operating revenue, diluted earnings per share, and net asset value per share of Jiugui liquor have a significant positive impact on the stock price. Different financial indicators have different impacts on the stock prices of Baijiu companies of different grades, so investors should consider carefully when investing.

Keywords: Correlation analysis, Stock price, Financial indicator, Factor analysis, Regression analysis.

1 Introduction

As a crucial tool in investment and finance, identifying the primary drivers of stock price changes through fundamental analysis has become a focal point for investors. Stock price fluctuations are influenced not only by macroeconomic factors but also by internal aspects of the company. Among these, financial indicators are readily accessible through public channels and studying their relationship with stock prices is imperative. At present, Baijiu market has always been an important part of the capital market of China, the highest price of A-share was set by a Baijiu company. Baijiu plays a very important role in Chinese traditional liquor culture. We can understand China's economic situation from the analysis of Baijiu companies.

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Previous studies focused on the different financial indicators, including profitability, total asset turnover rate, dividends, cash flow, earnings, book value per share etc. Besides, most articles use regression modeling methods for research, other people use regression models combined with other models to conduct research.

Parab et al. employed Panel Data Analysis and Correlation Analysis to investigate the influence of financial performance indicators on stock returns. The findings indicated a weak negative association between EVA, ROA, ROE, and ROIC with Stock Returns. REM believed that modern performance indicators have a greater impact on stock returns compared to traditional indicators [1]. Li et al. employed the Pearson correlation coefficient to examine the relationship between financial indicators of listed companies and their stock prices. Their findings suggested that the explanatory power of financial indicators of listed companies on stock prices is diminishing, with the profitability of a company emerging as the primary factor influencing the stock price of listed companies [2]. Jiang et al. constructed a regression model by combining literature research with empirical data statistical analysis to investigate the connection between quarterly financial indicators and stock price movements in China's financial industry. Their findings revealed that the total asset turnover rate exerts the most substantial influence on the increase in stock prices for companies in the financial industry [3]. O'Hara et al. discovered that companies demonstrating consistent growth in dividends, cash flow, and earnings over a 17-year period tended to outperform the market consistently in both up and down markets over the long term [4].

Shu Chen et al. developed an innovative neural network model to examine the relationship between financial indicators and stock price fluctuations, aiming to achieve precise short-term predictions of stock market prices [5]. Aayale et al. applied multiple linear regression in a panel data analysis to examine the relationship between stock prices and returns of listed banks, alongside indicators of solvency, liquidity, asset quality, and profitability. They concluded that stock prices are not influenced by the level of liquidity, asset quality, and profitability indicators. Conversely, additional tests indicated that the profitability level of banks, as measured by ROA, is associated with the aforementioned indicators [6].

Pešík and Procházková employed a panel regression model and a machine learning approach as their primary methods to assess the extent of financial indicators' influence on stock prices. Their research indicated that companies across various industries receive distinct valuations on both the New York Stock Exchange and Nasdaq. Additionally, they affirmed that financial indicators do play a role in determining a company's valuation [7]. Oliveira et al. utilized panel data methodology from 2009 to 2013 to examine the correlation between the stock prices of companies listed on the BM&FBovespa and key metrics including earnings per share, book value per share, and total assets. Their findings suggest that such information plays a significant role in determining stock prices [8].

This paper explores what are the main factors that affect the stock prices of Baijiu companies of different grades, which also studies the difference and the reasons. The content includes building models with financial factors, and the calculated results will be analyzed in the discussion parts.

2 Method

This article focuses on Kweichow Moutai, Jiannanchun, and Jiugui Liquor, all listed on the Shenzhen Stock Exchange, as the subjects of research. After eliminating some missing quarterly data, it selects quarterly financial information disclosed from 2005 to 2023, organizes various financial indicators from the quarterly statements, and defines them as X_i ($i=1-10$) as the independent variables X , as depicted in Table 1. Simultaneously, it records the closing price Y of the company's quarterly K-line chart from 2005 to 2023 as the dependent variable and employs SPSS to investigate the influence of financial indicators on the stock prices of these three distinct companies. All relevant data comes from Sina Finance.

Table 1. Financial Indicators

Category	Indicator
Short-term Liquidity	Current ratio (X_1)
	Quick ratio (X_2)
Long-term Liquidity	Equity ratio (X_3)
Operational capability	Inventory turnover days (X_4)
	Receivable turnover days (X_5)
Profitability	Net profit margin (X_6)
Development capability	Year-on-year growth rate of net profit (X_7)
	Year-on-year growth rate of total operating revenue (X_8)
Company performance	Diluted earnings per share (X_9)
	Net asset value per share (X_{10})

2.1 Modeling

The variability of stock prices isn't dictated by a single factor; rather, there exist strengths and weaknesses among numerous influencing factors. This article employs multivariate statistical analysis techniques to scrutinize the statistical patterns among multiple indicators when they are interrelated. The fundamental framework of multiple regression is outlined as follows:

$$\begin{aligned}
 Y \\
 &= \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \dots + \alpha_n X_n \\
 &+ \varepsilon
 \end{aligned}
 \tag{1}$$

In Equation (1), Y represents the dependent variable, X_i ($i=1,2,\dots,n$) signifies the independent variables, α_i ($i=1,2,\dots,n$) denotes the coefficients of the independent variables, α_0 represents the constant term, and ε is the random perturbation term. Considering the possible correlation between variables, factor analysis is necessary. Factor analysis is the process of analyzing a large amount of data to identify the most general factors, which is to achieve dimensionality reduction while minimizing information loss. Therefore, the factor model that can be constructed based on the research content is as follows:

$$X_i = \beta_1 F_1 + \beta_2 F_2 + \beta_3 F_3 + \dots + \beta_m F_m + \sigma \tag{2}$$

In Equation (2), X_i ($i=1,2,\dots,n$) represents the selected financial indicator, F_i ($i=1,2,\dots,m$) signifies the common factor, β_i ($i=1,2,\dots,n$) denotes the coefficient and σ represents the special factor.

To make each factor variable interpretable, factor rotation is required to obtain the factor score matrix, which forms the following expression:

$$\begin{aligned}
 F_i \\
 &= \gamma_1 X_1 + \gamma_2 X_2 + \gamma_3 X_3 + \dots \\
 &+ \gamma_j X_i
 \end{aligned}
 \tag{3}$$

In Equation (3), γ_j ($j=1,2,\dots,n$) represents the component score coefficient.

Finally, perform regression analysis on Y and F_i to obtain the final regression equation:

$$\begin{aligned}
 Y \\
 &= C_0 + C_1 F_1 + C_2 F_2 + \dots + C_k F_m \\
 &+ \theta
 \end{aligned}
 \tag{4}$$

In the formula, Y represents the stock price, C_k ($k=1,2,\dots,n$) signifies the coefficient of the regression equation and θ denotes the random perturbation term.

2.2 Descriptive Analysis

To characterize the concentration and dispersion of the sample data, an initial descriptive statistical analysis should be performed on the sample, and the findings are presented in Table 2. From Table 2, it is evident that the data distribution of financial indicators in Kweichow Moutai is relatively centralized, with small standard deviations for each indicator indicating low dispersion and no discernible abnormalities.

Table 2. Descriptive Analysis.

Variable name	N	Minimum	Maximum	Average	Standard deviation
Current ratio	50	1.762	6.943	3.725	1.290
Quick ratio	50	1.259	5.668	2.723	1.002
Equity ratio	50	0.136	0.678	0.315	0.146
Receivable turnover days	50	0.002	5.084	1.181	1.651
Net profit margin	50	0.285	0.555	0.478	0.078
Year-on-year growth rate of net profit	50	-0.025	1.631	0.313	0.301
Year-on-year growth rate of total operating revenue	50	-0.010	0.757	0.239	0.157
Diluted earnings per share	50	0.595	61.711	8.901	12.491
Net asset value per share	50	5.300	173.759	39.578	45.727

2.3 Factor Analysis

This section is conducted by SPSS statistical software, and the specific process is as follows.

(1) Determine if factor analysis is suitable: KMO&Bartlett sphericity test is a commonly used method, while the KOM test is used to determine whether the research object is suitable for factor analysis, with a value range of 0-1. A value above 0.6 indicates that it can be performed, and the larger the value, the better; Factor analysis cannot be performed below 0.5. The Bartlett test is employed to assess whether the data adheres to a multivariate normal distribution. The outcomes reveal a KMO value of 0.569 for the sample data, suggesting that factor analysis can be conducted. Additionally, the Sig. value of Bartlett's sphericity test is 0.000, which is below the significance threshold of 0.05, indicating that the data originates from a normally distributed population and is apt for further analysis.

(2) Construct factor variables: The principal component analysis method can be used to obtain the factor loading matrix of the sample data, and the factor components can be determined based on the cumulative contribution rate of each factor. The results are shown in Table 3.

According to Table 3, only the initial eigenvalues of the first three factors surpass 1 among all the components. Additionally, the cumulative sum of the eigenvalues of these first three factor components amounts to 87.511% of the total eigenvalues. Consequently, the first three factors have been extracted as common factors for subsequent analysis.

Table 3. Total Variance explanation.

Com ponent	Initial eigenvalue			Extraction sums of squared loadings			Rotation Sums of Squared Loadings		
	T otal	Var iance (%)	Cum ulative (%)	T otal	Var iance (%)	Cum ulative (%)	T otal	Var iance (%)	Cum ulative (%)
1	5.30	53.02	53.02	5.30	53.02	53.02	4.10	40.95	40.95
2	2.06	20.63	73.65	2.06	20.63	73.65	2.35	23.52	64.47
3	1.39	13.86	87.51	1.39	13.86	87.51	2.30	23.04	87.51
...	...	...	...						
10	0.00	0.02	100.00						

(1) Make factor variables interpretable: Using Kaiser's standardized maximum variance method to perform orthogonal rotation on the factor loading matrix, the rotated factor loading matrix is obtained, making the common factor variables interpretable. Based on the analysis results, the first common factor exhibits substantial loadings on X1, X4, and X6, thus it is designated as F1. The second common factor demonstrates significant loadings on X7 and X8, denoting it as F2. Lastly, the third common factor displays noteworthy loadings on X2, X3, X5, X9, and X10, leading to its designation as F3.

(2) Calculate the score of factor variables: The specific values of each common factor on each sample are shown in Table 4. According to Table 4, the coefficients of X1, X4, and X6 in the F1 factor equation are relatively large, and F1 can be used as a component factor reflecting current ratio, profitability, and inventory turnover days; The coefficients of X7 and X8 in the F2 factor equation are relatively large, and F2 can be used as a component factor reflecting development ability; The coefficients of X2, X3, X5, X9, and X10 in the F3 factor equation are relatively large, and F3 can be used as a component factor to reflect the company's quick ratio, long-term liquidity, receivable turnover days, and company performance.

Table 4. Component Score Coefficient Matrix.

Variable name	Component		
	F ₁	F ₂	F ₃
Current ratio (X ₁)	0.179	0.082	0.089
Quick ratio (X ₂)	0.142	0.092	0.163
Equity ratio (X ₃)	-0.251	-0.071	0.048
Inventory turnover days (X ₄)	0.196	-0.268	-0.266
Receivable turnover days (X ₅)	-0.248	0.048	0.130
Net profit margin (X ₆)	0.279	0.034	-0.123
Year-on-year growth rate of net profit (X ₇)	0.103	0.429	-0.059
Year-on-year growth rate of total operating revenue (X ₈)	0.093	0.422	-0.045
Diluted earnings per share (X ₉)	-0.146	-0.001	0.489
Net asset value per share (X ₁₀)	-0.104	-0.021	0.457

2.4 Regression Analysis

(1) The goodness of fit of regression equations: The regression model, utilizing the primary factors obtained previously (F1, F2, and F3) as independent variables and stock price Y as the dependent variable, yields an adjusted R-squared value of 0.975. This result suggests an excellent fit of the sample data to the regression model, indicating its efficacy in explaining variations in stock prices.

(2) Significance test of regression equation: The ANOVA analysis of variance result shows that the F-value is 638.334, and the corresponding P-value is 0.00, which is less than the significance level of 0.05. Therefore, the result indicates a significant correlation between Y and F, which has passed the significance test.

(3) The regression results and conclusions are shown in Table 5.

Table 5. Regression analysis results of Kweichow Moutai.

Name	Unstandardized coefficient		Standardization coefficient	t	Significance
	B	Standard error	Beta		
constant	205.581	52.070	-	3.948	<0.01
F ₁	-1.099	0.133	-0.225	-8.242	<0.01
F ₂	41.470	70.608	0.016	0.587	0.560
F ₃	18.409	0.431	1.004	42.735	<0.01

3 Results and Discussion

In order to compare the specific relationship between high, middle and low-end Chinese Baijiu listed companies and financial indicators, the paper first calculated Moutai, and the results are shown in Table 7. The results of F₁ and F₃ are significant, indicating that the stock price of a company is negatively correlated with current ratio, inventory turnover days, and net profit margin, and positively correlated with quick ratio, long-term liquidity, receivable turnover days, and company performance.

The coefficient of F₁ is -1.099, which means that a small change in F₁ will drive a small change in the stock price. The coefficient of F₃ is 18.409, which means that a small increase in F₃ will cause a nearly 18 fold increase in stock price, indicating that quick ratio, long-term liquidity, receivable turnover days, and company performance have a positive impact on stock price. However, the larger the receivable turnover days, the higher the stock price, which is contrary to the reality, because excessive receivable turnover days may indicate difficulties in fund operation, reduced operational capacity, and unfavorable for stock price rise. Therefore, the stock price of Moutai Company is more related to its quick ratio, long-term liquidity, and company performance. The higher the value of this type of indicator, the better it indicates the company's operating condition, which is conducive to the rise of stock prices.

$$F_1=0.179X_1+0.196X_4+0.279X_6 \quad (5)$$

$$F_2=0.429X_7+0.422X_8 \quad (6)$$

$$F_3=0.163X_2+0.048X_3+0.13X_5+0.489X_9+0.457X_{10} \quad (7)$$

Besides, the calculation results of Jiannanchun, a mid-end Baijiu company, are shown in Table 6. The three factors are significant. However, it is worth noting that due to different companies, there are also differences in the financial indicators corresponding to F_1 , F_2 , and F_3 . The coefficient of F_1 is 22.184. The coefficient of F_2 is 208.704. The increase of F_1 and F_2 can both bring significant growth to stock prices. Similar to Moutai, after excluding the receivable turnover days, the main factors affecting the stock price of Jiannanchun are the company's short-term liquidity, net asset value per share, and development ability.

Table 6. Regression analysis results of Jiannanchun.

Name	Unstandardized coefficient		Standardization coefficient	t	Significance
	B	Standard error	Beta		
constant	-72.435	18.341	-	-3.949	<0.01
F_1	22.184	3.346	0.657	6.629	<0.01
F_2	208.704	25.840	0.881	8.077	<0.01
F_3	0.257	0.073	0.432	3.522	<0.01

$$F_1=0.283X_1+0.269X_2+0.171X_{10} \quad (8)$$

$$F_2=0.143X_5+0.332X_7+0.325X_8 \quad (9)$$

$$F_3=0.22X_3+0.38X_4+0.714X_9 \quad (10)$$

The calculation results of low-end Baijiu Jiugui Liquor are shown in Table 7, both F_1 and F_2 are significant. The coefficient of F_1 is 8.413. The coefficient of F_2 is 28.202. Therefore, the increase of F_1 and F_2 can drive a significant increase in stock prices. The main factors affecting the stock price of Jiugui liquor include the company's short-term liquidity, development ability, performance, long-term liquidity, and profitability.

Table 7. Analysis of regression results of Jiugui liquor.

Name	Unstandardized coefficient		Standardization coefficient	t	Significance
	B	Standard error	Beta		
constant	-0.759	4.023		-0.189	0.851
F_1	8.413	1.806	0.493	4.659	<0.01
F_2	28.202	5.087	0.587	5.544	<0.01

$$F_1=0.215X_1+0.203X_2+0.019X_7+0.2X_{10} \quad (11)$$

$$F_2=0.084X_3+0.292X_6+0.302X_8+0.295X_9 \quad (12)$$

As the representative of high-end Baijiu field, Kweichow Moutai is not only a symbol of the brand, but also a leader in the industry. Its mature operating system makes it almost immune to the impact of non-systematic risks, and this stability brings confidence to investors. However, in the Chinese Baijiu market, Kweichow Moutai's position is not isolated, but gradually consolidated in the competition with other high-end Baijiu brands. This market competition urges investors to pay more attention to the analysis of the solvency, profitability and net asset level of Kweichow Moutai and its competitors. These data directly affect their investment decisions.

In comparison, the competition in the middle end Baijiu market is more intense. Although the mid end Baijiu companies represented by Jiannanchun are large, there is still a gap between them and high-end Baijiu companies. This gap not only manifests in brand awareness and market share, but also involves the company's decision-making and management level. In the Chinese Baijiu market, the competition between middle end Baijiu brands is extremely fierce, and various brands often launch different marketing strategies and product innovation in order to compete for market share. Therefore, investors will pay more attention to their capital strength and financial status when evaluating the mid end Baijiu Company, so as to fully understand the company's operating status and investment value. In addition, it is also necessary to focus on the development capabilities of each brand. In the market competition, the mid end Baijiu companies represented by Jiannanchun not only need to compete with high-end brands, but also need to face challenges from emerging competitors. These challenges may come from product innovation, marketing strategies, channel expansion, and other aspects. Therefore, the development ability of mid end Baijiu companies is also one of the important indicators to evaluate whether they are worth investing.

As for the low-end Baijiu market, although the overall competitiveness is relatively weak compared with the mid end and high-end Baijiu companies, the market is extremely active. Jiugui Liquor and other low-end Baijiu brands occupy a certain market share in the Chinese Baijiu market, and their product prices and quality are different, forming a diversified competitive situation. Due to fierce market competition, investors will be more cautious when considering buying low-end Baijiu company shares, and conduct in-depth research on all aspects of the company to comprehensively assess risks and opportunities.

4 Conclusion

This paper studies the relationship between stock prices and financial indicators of Baijiu companies of different grades. The research shows that the higher the grade of Baijiu companies, the more stable their share prices are, and the fewer major factors that affect their share prices. In general, when choosing Baijiu Company as the investment object, investors should not only pay attention to the trend of the K line chart, but also pay attention to the changes in financial indicators of the company's current ratio, quick ratio, equity ratio, diluted earnings per share, net asset value per

share, and year-on-year growth rate of total operating revenue, and make reasonable investment decisions by combining fundamental analysis with technical analysis. On the other hand, for the management personnel of Baijiu Company, they should not only pay attention to the production quality of products, but also pay attention to the disclosure of financial statements, make targeted information disclosure, and more effectively convey the company's favorable information to investors.

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