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Research on the Correlation Between Company Performance and Its Share Price

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Abstract: This paper mainly explores the correlation between corporate performance and stock price returns in the Chinese stock market. Theoretically, the stock value of a highly profitable company would also increase accordingly. But due to the structure of A-share investors, the extent of this correlation is yet to be proven. In this study, stock returns are set as explained variables, and market index returns, corporate earnings growth rates and momentum are used as explained variables. This article uses the financial statements and stock price information of Chinese listed companies as data for modeling. The selected companies are from the food and beverage industry, the medical industry and the home appliance industry. Multiple linear regression analysis was used as the method of this paper. From the regression results, it is concluded that the market index plays a leading role in stock returns. The study indicates that there is a certain positive correlation between company performance and stock price returns to a certain extent, and the degree of correlation varies with industries. The momentum factor has a positive or no correlation with returns, depending on the industry. This deviates from the theoretical assumption that momentum is a negative factor.

Keywords: stock price, company profitability, market factor, momentum factor

1. Introduction

A country's stock market plays a key role in its economic system. The Chinese stock market has a history of more than 30 years. However, it is still immature and in a period of high-speed development. Compared with other mature markets such as the US stock market, China’s market is characterized by greater volatility and higher speculation.

This project is expected to focus on the correlation between the performance of A-share listed companies and their stock prices for a period of time after the release of the quarterly statement. Because quarterly statements can better reflect the company's operating conditions over a period of time, they are more concerned by investors. Besides, the unexpected performance of listed companies also has a significant impact on the company's share price in the short term. As in China's stock market, there is a phenomenon that the stock price changes in advance. For example, a price drop due to bad news is actually a forward-looking reflection of future earnings damage. This illustrates the relationship between corporate performance and stock price from another perspective. In addition, this project is also willing to explore other factors that more or less affect

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stock price pricing, such as market trends, industry attributes, company size, etc. These factors provide alternative access to build a more efficient model for the A-share market.

2. Literature Review

The stock price is the most direct embodiment of market information. The performance of a listed company is a reflection of the intrinsic value of its stock price. The research of Akbas et al. showed that the impact of earnings trends on stock returns is positively correlated and cannot be explained by other factors [1]. The stock price of a company with good performance will be correspondingly higher. Changes of stock prices also reflect fluctuations in the company's earnings prospects [2]. Zhang's research showed that, according to the idea of the pricing model, the positive correlation and significance between corporate profitability and stock prices do not change with the addition of other accounting indicators as variables [3]. However, the movement of stock prices is also affected by other economic factors. In 1970, Fama proposed the Efficient Markets Hypothesis (EMH) to explore whether asset prices can reflect all available information [4]. Mature markets, such as the US stock market, are dominated by institutional investors, whose investments are often based on their own well-established pricing models. In the empirical study of Fama and French in 1993, the famous Fama-French three-factor model (FF3) was proposed [3]. FF3 is based on two accepted pricing phenomena: the first one is that usually stocks with smaller market capitalization would have better yields, and the second one is that shares with lower price-to-book ratios have higher returns [5]. Fama and French carried out regression analysis through the company's financial data and found that the excess return of a portfolio is affected by the market asset mix ($R_m - R_f$), the market capitalization factor (SMB), and the book-to-market ratio factor (HML).

Fama and French then added the profitability factor (RMW) and investment factor (CMA) to the model, forming a five-factor model with market excess return, market capitalization, B/M, profitability and investment as the factors [6]. Du research on the Chinese market and found that the five-factor model is more effective than FF3 [7]. Corporate performance has always been a key variable in mainstream multifactor models in academia.

In the past decade, the value anomaly seems to be gradually fading in the US securities market, and the market is closer to an efficient market [8]. However, the investor group in the A-share market is mainly composed of individual investors, who are relatively less sensitive to changes in company performance. The majority of investors may pay more attention to the valuation level of listed companies, so that some investors ignore their development prospects and growth space [5]. There are often cases where some companies are not well-managed but their stock prices remain high. Liu, Robert F. Stambaugh and Yuan in 2019 improved the Fama-French model according to the characteristics of China's stock market [9]. The model excludes the 30% of listed companies with the smallest market capitalization to avoid shell value affecting the validity of the model. Due to the structure of investors in the A-share market, the turnover rate affects the stock price to a considerable extent, so the new model has added pessimistic minus optimistic factor (PMO) to it. The improved model better fits the Chinese capital market.

There are still few widely recognized studies on the Chinese market. The macroeconomic cycle, policies and other factors have a significant impact on the A-share market [10]. The instability of China's stock market is also closely related to the herd behavior of investors [11]. According to the mispricing theory, investors' irrational factors and behavioral biases lead to differences in the company's operating performance that are not well reflected in the stock price. The stock price deviates from its true level. Yin et al. found that the reasons can be explained by the gambling effect, the priority of investors, the insensitivity to the information with low continuity, the uncertainty of the information, etc. [12]. Chen found that the correlation between company

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performance and stock price has industry characteristics [2]. In this case, studying the extent to which performance is reflected in stocks is useful for investment decisions.

3. Methods

The stock data and company statement data for this study come from the China Stock Market & Accounting Research Database (CSMAR). This article used a multiple regression model as the experimental model. Stock return R as explained variable, momentum factor M, index return IR and profit growth rate PGR as explanatory variables.

The stock and financial data sample range for this research is from the second quarter of 2018 to the first quarter of 2022, including 8 listed companies in the food and beverage industry (F&B), pharmaceutical industry (PH) and household appliance industry (HA). Several leading enterprises with the largest scale in the industry and medium-sized enterprises with a scale of 50% to 70% were selected respectively. Under the background of the approval system in the past, due to the existence of shell resources, small-cap stocks and problematic stocks will cause pricing distortion problems, which will affect the quality of data. The stocks that have been listed for less than five years, special treatment (ST), the smallest 30% of the industry, and long-term suspensions are excluded. A company's allotment of stock dividends will result in the stock ex-rights. Considering the issue of stock price ex-rights, this time the monthly market information after the previous re-entitlement is used.

The subscripts f, p, and h are used to represent the variable indicators of companies in the food and beverage industry, the pharmaceutical industry, and the household appliance industry. PGR represents the company's profit growth rate. The stock return is represented by R. VIX represents the volatility of the stock price, that is, the standard deviation of the stock price earnings ratio. The descriptive statistic of variables is shown in Table 1.

Table 1: Descriptive statistic of variables.

Variables	Obs	Min	Max	Mean	Std.Dev
PGR_f	128	-0.966	1.895	0.262	0.681
PGR_p	128	-4.295	4.532	0.299	1.014
PGR_h	128	-0.964	6.391	0.449	1.072
VIX_f	8	0.145	0.311	0.193	0.054
VIX_p	8	0.107	0.472	0.252	0.109
VIX_h	8	0.097	0.282	0.212	0.060

The momentum factor is represented by M, indicating the negative impact of historical gains on future stock prices. The first node on the time series uses the current quarter's R as the momentum factor. The formula for calculating M is as follows:

$$M_t = R_{t-1} \times 0.8 + M_{t-1} \times 0.2 \quad (1)$$

The market indices involved the CSI 300 Index and the Shanghai Composite index. The trend of the index is shown in Figure 1.

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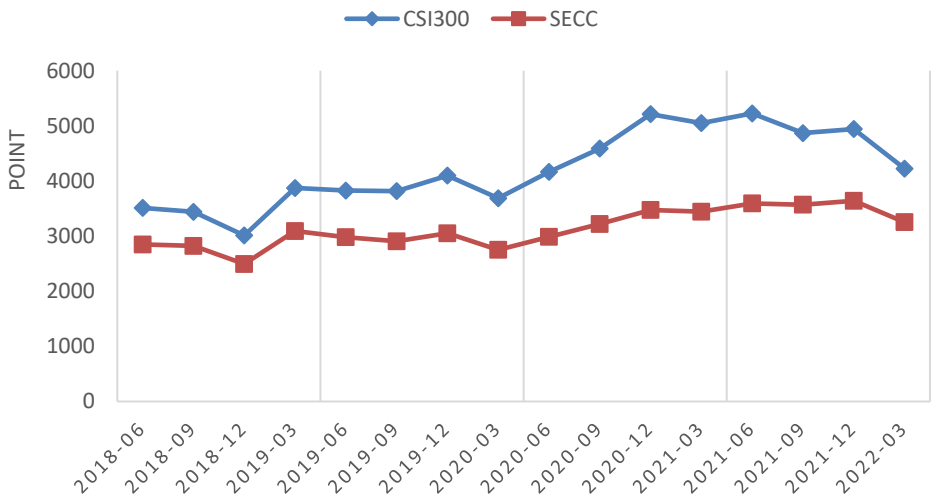

Figure 1: Monthly plots of CSI300 & SECC.

Finally, the company's sample data will be compared with the broader market to comprehensively analyze the impact of profitability on the company's stock price.

4. Results and Discussion

4.1. Analysis of Regression Results and Scatter Plots

The following table records the calculation results of the coefficients of each variable in the linear regression model. The sample size for each model is 128. The tables respectively list parameter values, standard errors, and P values. As can be seen from the following tables, these coefficients vary widely across the three industries.

To be more accurate and visualized, the scatter plot of each model was drawn. Scatter plots and univariate regression lines for these variables were combined as shown below.

Table 2: Regression coefficients of F&B.

Variables	Estimate	Std.Error	P value
M_f	0.241	0.102	0.020
IR_f	0.614	0.233	0.009
PGR_f	0.074	0.025	0.003

Table 2 shows the positive effect of M, a theoretical negative factor, in stock price trends. This means that investors are more willing to invest in a stock that has accumulated a high yield. The index plays a significant role in stock price movements. At the same time, the change of stock price can well reflect the operating conditions of the company in the quarter. The scatter plot of PGR and IR versus R and the univariate regression line are shown in Figure 2.

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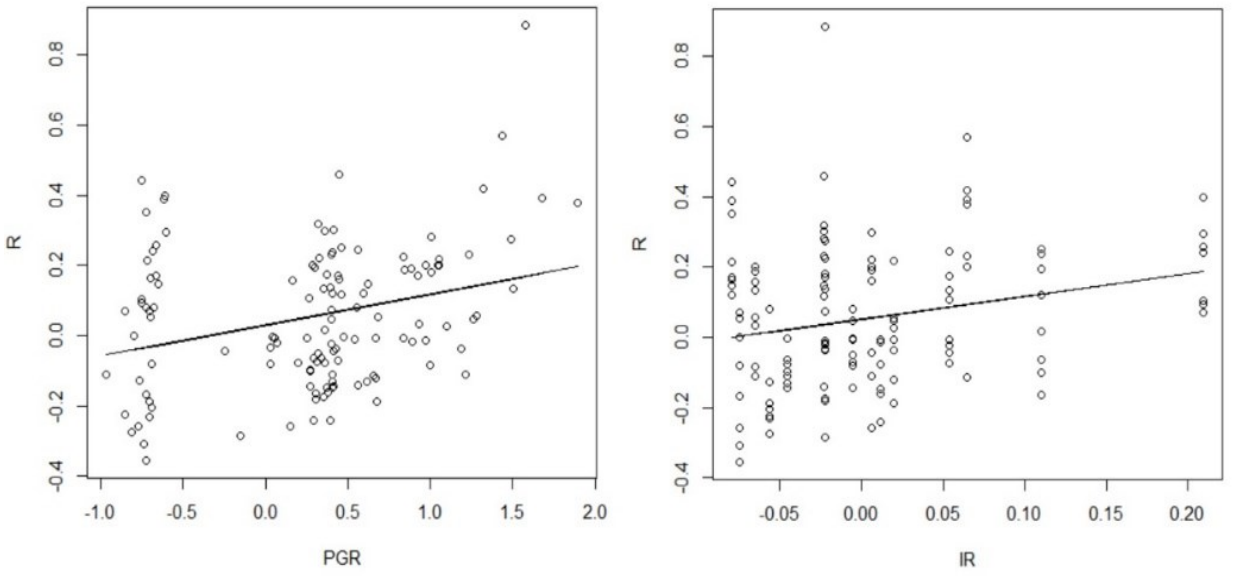

Figure 2: Scatter plot of PGR-R and IR-R (F&B).

Table 3: Regression coefficients of PH.

Variables	Estimate	Std.Error	P value
M_p	-0.155	0.112	0.168
IR_p	0.976	0.313	0.002
PGR_p	0.087	0.024	0.000

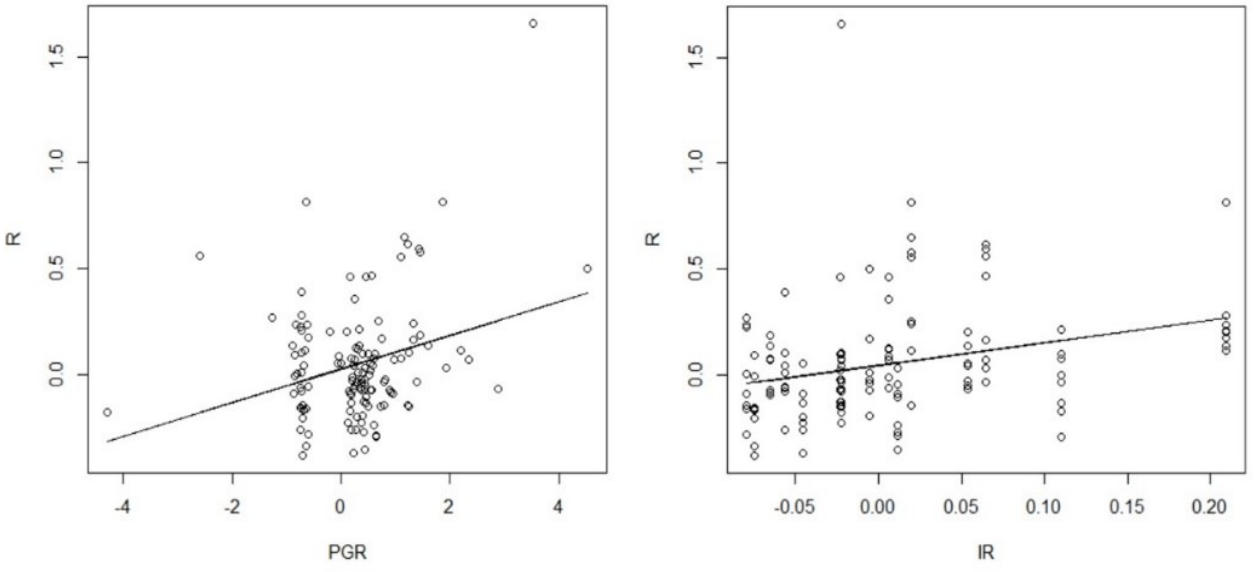

Figure 3: Scatter plot of PGR-R and IR-R (PH).

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Figure 3 shows that the scatter distribution of PGR-R is concentrated and fits well with the univariate regression line. Although there are individual samples that deviate far from the regression line, the number of such samples is small. In a multiple regression model for the pharmaceutical industry, the P value for PGR is close to 0 (0.0003 to be precise). This reveals a strong correlation. Also, from the graph of IR-R, it can be clearly found that the effect of stock index on returns. The momentum factor M is no longer a valid influencer in this model. The role of M is negligible compared to the above two.

Table 4: Regression coefficients of HA.

Variables	Estimate	Std.Error	P value
M_h	0.007	0.014	0.580
IR_h	1.805	0.202	0.000
PGR_h	0.024	0.014	0.008

The correlation between PGR and R of the model of HA in Table 4 is lower than that of the first two models. The entire stock prices are not sensitive to industry trends. The rise and fall of these stocks are almost completely at the mercy of the market index. The influence of market indices on stock prices dominates. While the significance level of the momentum factor is still low, revealing that the market is more random.

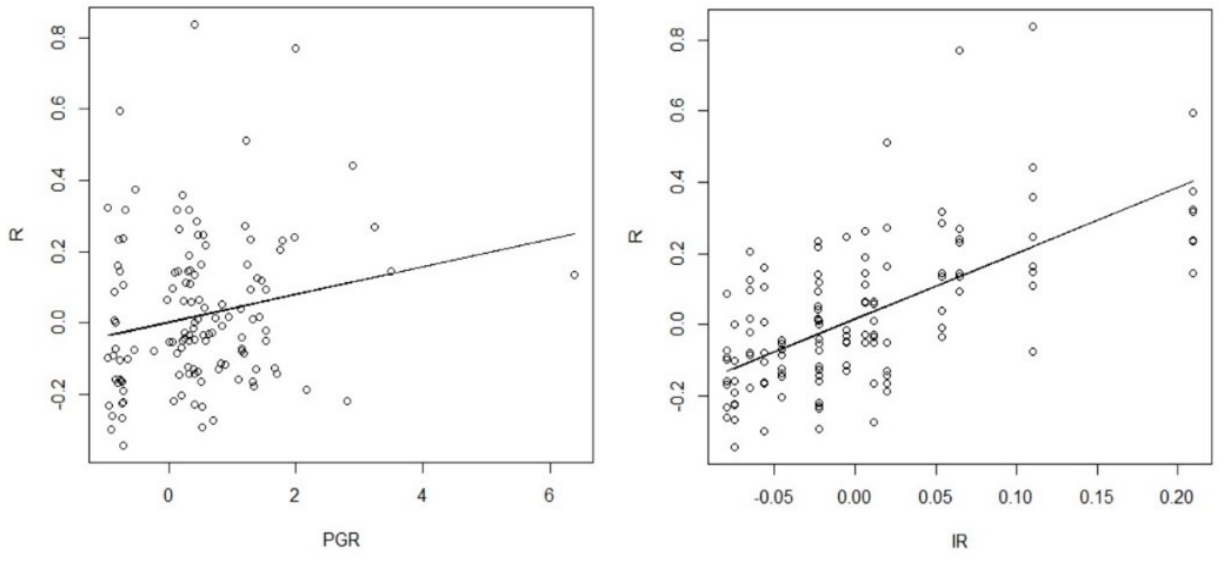

Figure 4: Scatter plot of PGR-R and IR-R (HA).

The results of regression modeling of market capitalization MC and volatility VIX. Variables without the table below represent the aggregate of all industry samples. The coefficient values of all VIX are close to 0, and the P value is greater than 0.1. It can be seen that there is no significant correlation between the market capitalization factor and volatility in the A-share market, and the FF3 model is not applicable in this category. The volatility of stocks is affected by other factors.

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4.2. Horizontal Comparative Analysis

Due to the observability of the monthly reports issued by most companies, the operating conditions will be reflected in the stock price in a forward-looking or real-time manner. Investors don't need to wait for quarterly reports to get a rough idea of the information. The experimental results demonstrate the positive correlation between corporate performance in the current quarter and stock prices. From the regression coefficients, there is a strong correlation between the stock price growth rate and profitability of pharmaceutical companies. The food and beverage industry has a similarly strong correlation. The household appliance industry is relatively less relevant with a significance level within [0.05, 0.1]. One possible reason is that during the new crown epidemic, investors paid more attention to the information of the pharmaceutical industry. As a result, they are more sensitive to the profitability of the medical company. Collectively, all models suggest that corporate performance has more or less impact on stock prices. The extent of this impact varies by industry.

The index's return has a significant impact on stock price returns in each model. Investors are more likely to focus on market indices. The stock prices of companies that are not concerned about the specific situation of the industry fluctuate with the market conditions. The phenomenon is especially evident when the market fluctuates sharply. This is in line with FF3 proposed by Fama and French, that the return of a stock has a linear relationship with the systematic risk of the whole market.

The momentum factor combines the stock price movement in the previous quarter and the previous accumulated returns. In the models of PH and HA, the P value of the momentum factor M is high, indicating that M has little effect on stock price returns. This shows a phenomenon that A-shares are less affected by the previous trend, and it is difficult for investors to grasp the future stock price trend through the cumulative return. It confirms the statement that China's stock market is highly speculative. The coefficient of M in the model of F&B is positive, which may be due to the herding effect in the Chinese stock market. It is more likely that there will be a phenomenon of chasing up and down.

5. Conclusion

To draw a conclusion, the stock return and the company's earnings growth rate in the three models established satisfy a certain degree of positive correlation, based on the industry in this paper. The return of the market index also plays a close positive correlation role in the model. The momentum factor was insignificant in some models, and showed a positive correlation in other models. In any industry, there is no significant correlation between stock price volatility and the company's total market capitalization.

In regard to practical application, the experimental results show that the company's profitability can provide a reference for investors. Both market indices and earnings growth rates have a certain degree of explanatory power for stock prices. Consistent with Chen's research, it shows that the degree of correlation between stock returns and corporate earnings is industry-dependent. A possible explanation is that with the occurrence of major international or domestic events, investors pay different attention to different industries. For example, in recent years, investors' attention to the pharmaceutical industry has increased due to the pandemic of COVID-19. In addition, the Chinese stock market does have the phenomenon that the performance of the momentum factor is not obvious. This phenomenon is consistent with the results obtained by Li et al. in 2010 with 25 strategies. Chan et al believe that the insignificant momentum may be caused by the underreaction of investors to information or the overreaction of positive feedback trading to information delay. The positive effect of momentum may also be related to the herding effect in the stock market.

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According to these diversified explanations, there is still a lot of potential space for the Chinese stock market to be explored in the future.

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