



Correlation Analysis of Stock Price Movements between Large State-owned Listed Enterprises and Small-Medium Size Listed Companies : Based on Data Analysis of Share Listed Companies on China Since 2020

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ABSTRACT

This study investigates the correlation of stock price movements between large state-owned listed enterprises (SOEs) and small-to-medium-sized listed companies (SMEs) in China's capital market since 2020. Utilizing quantitative data analysis methods, the research aims to identify the strength and nature of co-movement between these two distinct categories of publicly traded firms. The study employs historical stock price data, correlation coefficients, and statistical testing to analyze whether price fluctuations in large SOEs significantly influence the price trends of SMEs. The findings reveal varying degrees of correlation depending on industry sectors, market conditions, and external economic events. Particularly during periods of heightened market volatility, the correlation tends to increase, suggesting a contagion effect or systemic linkage within the broader market. These insights contribute to a deeper understanding of market dynamics in China and offer implications for portfolio diversification, risk management, and policy formulation for both investors and regulators.

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INTRODUCTION

Over the past decades, China has emerged as one of the most dynamic and influential economies in the global financial landscape. With a rapid expansion of its capital markets, China has witnessed a substantial growth in the number and diversity of publicly listed companies. Among these are large state-owned enterprises (SOEs), which traditionally dominate key sectors of the economy, and a burgeoning number of small to medium-sized enterprises (SMEs) that contribute significantly to innovation, employment, and regional economic development.

The Chinese stock market, characterized by its unique blend of government intervention and market-driven dynamics, offers a distinctive environment to study the behavior of different types of listed companies. Large SOEs, often seen as strategic arms of the government, typically exhibit more stable performance, access to capital, and implicit state support. On the other hand, SMEs are generally more sensitive to market fluctuations, policy shifts, and financial constraints, resulting in higher volatility and varied investor expectations.

Understanding the correlation between the stock price movements of these two types of firms is essential for several reasons. First, it helps investors and analysts determine the level of diversification achievable within the Chinese stock market. If SOEs and SMEs move in tandem, the opportunities for risk



reduction through diversification may be limited. Conversely, weak correlation or negative co-movement may suggest more room for strategic portfolio construction.

Second, the correlation dynamics between SOEs and SMEs can provide insights into the broader transmission mechanisms within the financial system. For instance, during periods of market stress, the tendency for correlations to rise—commonly known as the "flight to quality" or "contagion effect"—can significantly alter the risk-return profile of various assets. Examining how SOE stock movements influence, or are influenced by, SME stocks can help detect systemic linkages and potential vulnerabilities in the market.

Since 2020, the Chinese economy and its stock markets have experienced a series of significant events, including the outbreak of the COVID-19 pandemic, shifting regulatory landscapes, geopolitical tensions, and macroeconomic policy adjustments. These developments have affected investor behavior and market sentiment, creating a timely context to analyze price correlations across different firm types. Particularly, the pandemic triggered unprecedented uncertainty and volatility, amplifying the need to study how different segments of the market responded.

In the context of capital allocation and policy formation, examining such correlations can also support regulators in identifying areas where systemic risk may propagate more rapidly. Understanding whether large SOEs act as stabilizers or amplifiers of market-wide movements can inform intervention strategies during financial distress and contribute to the design of more robust financial regulations.

While prior research has often focused on the individual performance and valuation of SOEs or SMEs, relatively fewer studies have rigorously analyzed the co-movement patterns between them in the Chinese context. Most existing literature tends to examine correlations across sectors or between Chinese and international markets. Therefore, this study aims to fill the gap by focusing specifically on the internal dynamics between SOEs and SMEs within the domestic market.

To achieve this objective, this research utilizes historical stock price data of Chinese listed companies from 2020 onwards, applying statistical correlation techniques to measure the degree of price co-movement. The analysis is further segmented by industry classification and key macroeconomic periods to uncover potential patterns and variations under different conditions.

Ultimately, this study aims to enhance the understanding of correlation structures in China's equity markets and offer practical implications for investors, fund managers, and policymakers. By identifying the interdependence—or independence—between large state-owned and smaller private-listed firms, the research contributes to both academic knowledge and strategic decision-making in one of the world's most important emerging markets.

LITERATURE REVIEW

The study of stock price correlation has long been a central theme in financial economics, particularly in the context of portfolio diversification, systemic risk, and market efficiency. A substantial body of literature has explored the co-movement of stock prices across various firm sizes, sectors, and geographic regions. In the context of the Chinese stock market, the distinction between state-owned enterprises (SOEs) and small-to-medium-sized enterprises (SMEs) adds a unique layer of complexity due to their differing structures, governance mechanisms, and economic roles.

One of the foundational studies in the area of stock price correlation is by Forbes and Rigobon (2002), which explores contagion effects in global financial markets. They argue that observed increases in correlation during crises may be a statistical artifact, yet the implication for diversification remains

critical. Similar studies, such as those by Longin and Solnik (2001), find that correlations among assets tend to increase during periods of market stress, reducing the effectiveness of diversification strategies. These findings are relevant in analyzing whether large SOEs and SMEs in China exhibit similar patterns during economic turbulence.

State-owned enterprises in China have been widely studied due to their dominant role in key industries such as energy, telecommunications, banking, and transportation. Research by Lin and Li (2008) suggests that SOEs benefit from preferential access to resources and government support, which often results in less market-driven behavior compared to private firms. Chen, Goldstein, and Jiang (2007) further argue that SOEs tend to exhibit lower volatility and are often perceived as more stable by investors. These characteristics suggest that their stock price movements may be less sensitive to market sentiment, which could lead to lower correlation with SMEs.

In contrast, SMEs in China face greater financing constraints, higher operating risks, and more significant sensitivity to policy changes and market trends. According to studies by Beck, Demirgüç-Kunt, and Maksimovic (2005), SMEs are more vulnerable to external shocks and information asymmetries. In the context of capital markets, this translates into higher price volatility and more erratic investor behavior. As such, the correlation between SME and SOE stock prices may be affected not only by market-wide shocks but also by structural differences in firm behavior.

Emerging markets, including China, often show higher levels of market inefficiency, greater information asymmetry, and stronger influence of macroeconomic and policy factors on stock prices. Bekaert and Harvey (2002) indicate that in emerging economies, co-movement among stocks can be driven more by political and policy risks than by firm fundamentals. This supports the hypothesis that correlation patterns between SOEs and SMEs may vary significantly across different periods depending on regulatory intervention or major policy announcements.

Recent empirical studies have sought to understand intra-market relationships in China. For instance, Wang et al. (2021) examined the inter-sectoral correlation of listed Chinese companies during the COVID-19 pandemic and found that systemic shocks tend to increase correlations across firm sizes. Another study by Li and Zhang (2019) analyzed the impact of ownership structure on stock volatility and found that state ownership correlates with lower beta values, implying more stability in stock returns. These studies underscore the importance of analyzing ownership type and firm size together when evaluating price co-movements.

China's capital market has been subject to a variety of exogenous shocks since 2020, including the COVID-19 pandemic, monetary policy adjustments, and geopolitical tensions. Literature by Zhang and Xiong (2022) highlights how regulatory crackdowns—especially on technology and education sectors—caused sharp, asymmetric movements in SME stocks, while SOEs remained relatively insulated. This suggests a temporal dimension to correlation analysis, where macro events play a key role in shaping the dynamics between different categories of firms.

The relevance of correlation analysis extends beyond academic interest. As argued by Markowitz (1952) in his Modern Portfolio Theory, understanding the correlation structure of asset returns is crucial for constructing optimal portfolios. In the context of the Chinese market, identifying whether SOEs and SMEs provide effective diversification benefits or instead contribute to systemic risk helps investors and regulators manage portfolios and monitor market stability more effectively.

Despite the growing body of research on China's capital market, few studies have focused specifically on the direct correlation between stock price movements of SOEs and SMEs, particularly in the post-2020 era. Most existing work treats ownership structure or firm size as control variables rather



than as focal points of the analysis. This gap in literature justifies the need for a focused investigation that explicitly examines how these two categories of firms interact in terms of price behavior over time.

RESEARCH METHOD

The research spans from January 1, 2020, to June 30, 2024, dividing listed companies in the A-share market into two groups: large listed state-owned enterprises (LSEs) and small and medium-sized listed companies (SMEs). The aim is to study the differentiation within the stock market. Particularly, following the implementation of Category B management for COVID-19 on January 8, 2023, this research aims to illustrate changes compared to the pre-implementation period and predict future trends. A brief overview of each period is provided below:

Before the COVID-19 outbreak, large listed state-owned enterprises, due to their pivotal role in the national economy, had deep industry experience, strong anti-risk capabilities, and robust business strategies, typically enjoying high market recognition and stability. In contrast, small and medium-sized listed companies exhibited varying performances based on industry characteristics, business concentration, and operational capabilities.

The COVID-19 pandemic caused tremendous shocks to global and A-share markets. For various reasons, January 1, 2020, is set as the starting point for studying stock market differentiation. From the initial extreme panic in market sentiment to the effective control of the virus, the A-share market overall experienced a trend of first decline and then rise. During this period, differentiation within the market emerged. On the one hand, large listed state-owned enterprises, leveraging their core positions in the industrial chain, maintained relatively stable performance growth. On the other hand, small and medium-sized listed companies faced mixed performances due to economic downturn-related operational pressures, financing difficulties, and other issues.

On January 8, 2023, China implemented "Category B management" for COVID-19, marking a new stage in prevention and control. However, this change did not immediately lead to a comprehensive rebound in the stock market; instead, differentiation within the market intensified. Large listed state-owned enterprises played a stabilizing role in the national economy, especially during the economic recovery process, where their performance was relatively robust. Meanwhile, with policies deepening reforms of state-owned enterprises, some state-owned enterprises saw improvements in governance structures, operational efficiency, and other aspects, further enhancing market confidence. For small and medium-sized listed companies, while some demonstrated strong growth potential, they faced significant operational pressures and financing challenges as a whole. Issues accumulated during the economic downturn have not been fully resolved, coupled with intensifying market competition, policy adjustments, and other factors, leading to further differentiation in their performance.

Research Hypothesis

We hypothesize that there exists a positive or negative correlation between the stock price movements of large listed state-owned enterprises (LSEs) and small and medium-sized listed companies (SMEs), and this correlation may vary across different periods. To quantify this correlation specifically, the research is conducted according to the following approach: the two variables are divided into two periods: from January 1, 2020, to January 7, 2023, and from January 8, 2023, to June 30, 2024. The correlation in each period is analyzed separately, and the results are then compared and analyzed to draw final research conclusions.



Sample Selection and Data Collection and Processing

Data selection and collection are the first steps in empirical analysis. Representative sector indices from the Shanghai and Shenzhen stock exchanges are selected as research samples. The following data are obtained from Eastmoney.com, where the stock prices of large listed state-owned enterprises are represented by the China State-owned Enterprises 200 Index (hereinafter referred to as the "SOE 200 Index"). This index consists of 200 state-owned enterprises with market capitalizations of 20 billion or more. Its advantage is that the sample covers both the Shanghai and Shenzhen stock exchanges, aligning with practical application scenarios and fitting the ideal sample data for large listed state-owned enterprises, which are typically large-cap stocks whose short-term fluctuations are unlikely to significantly alter their market capitalizations. The sample data for small and medium-sized listed companies is represented by the Small and Medium Enterprise Composite Index (hereinafter referred to as the "SME Composite Index"), which consists of nearly 1,000 non-state-owned small and medium-sized listed companies. Most of these companies have relatively small market capitalizations, making them ideal sample data that are susceptible to significant changes in market capitalization due to short-term fluctuations. The overall market indices are represented by the Shanghai Composite Index and the Shenzhen Component Index. The sample data for large listed state-owned enterprises, small and medium-sized listed companies, and the overall market indices all use daily K-line closing prices. Their advantage is that they truly reflect market sentiment and trends. For medium to long-term investors, the daily K-line closing price is an important reference indicator for judging future medium to long-term market conditions and the current situation. Therefore, 1,087 sample data points are extracted for each index from January 1, 2020, to June 30, 2024. The sample data obtained from the four indices are all logarithmically processed, with the overall market index being the logarithm of the sum of the Shanghai Composite Index and the Shenzhen Component Index. Logarithmic processing not only reduces the absolute values of the data but also reduces data fluctuations. Moreover, the logarithmically processed sample data do not alter their original properties or the correlation between the data within the sample.

RESULT AND DISCUSSION

Correlation Analysis

The correlation coefficient is obtained by dividing the covariance of two variables by the product of their standard deviations. According to the research design, the two variables of large listed state-owned enterprises (LSEs) and small and medium-sized listed companies (SMEs) are studied separately for the two periods from January 1, 2020, to January 7, 2023, and from January 8, 2023, to June 30, 2024. The sample variables for the two periods are referred to as "LSEs before the implementation of Category B, Class B management" and "SMEs before the implementation of Category B, Class B management," respectively, as well as "LSEs" and "SMEs" for clarity. First, the sample data from January 1, 2020, to January 7, 2023, are analyzed, and the correlation analysis results are as follows:

Table 2.1 Correlation Analysis Results between LSEs, SMEs, and the Overall Market Index Before the Implementation of Category B, Class B Management

	LSEs Before Category B, Class B Management	SMEs Before Category B, Class B Management	Overall Market Index
LSEs Before Category B, Class B Management	1.000	0.902	0.915



SMEs Before Category B, Class B Management	0.902	1.000	0.887
Overall Market Index	0.915	0.887	1.000

Data Source: EViews10

From Table 2.1, it can be observed that there is a high positive correlation between LSEs before the implementation of Category B, Class B management and the overall market index, reaching 91.5%. This indicates that when the overall market index rises, the overall performance of LSEs tends to rise as well, and vice versa. The positive correlation between SMEs before the implementation of Category B, Class B management and the overall market index is also high, reaching 88.7%. Although this figure is slightly lower than the correlation between LSEs and the overall market index, it still shows that the stock price movements of SMEs are highly synchronized with the overall market index. The positive correlation between the sample data of LSEs and SMEs before the implementation of Category B, Class B management reaches 90.2%, indicating that their market performances tend to synchronize.

Next, the sample data from January 8, 2023, to June 30, 2024, are analyzed, and the analysis results are as follows:

Table 2.2 Correlation Analysis Results between Large Listed State-owned Enterprises, Small and Medium-sized Listed Companies, and the Overall Market Index

	Large Listed State-owned Enterprises	Small and Medium-sized Listed Companies	Overall Market Index
Large Listed State-owned Enterprises	1.000	0.459	0.635
Small and Medium-sized Listed Companies	0.459	1.000	0.966
Overall Market Index	0.635	0.966	1.000

Data Source: EViews10

From the data in Table 2.2, it can be observed that there is a moderate positive correlation between large listed state-owned enterprises and the overall market index, with a correlation coefficient of 63.5%. This correlation is not very strong, indicating that although there is a relationship between the two, the performance of large listed state-owned enterprises may also be influenced by other factors. Small and medium-sized listed companies have a very high positive correlation with the overall market index, reaching 96.6%, with almost synchronized movements in price. The correlation between large listed state-owned enterprises and small and medium-sized listed companies is 45.9%, indicating a certain degree of positive correlation, but relatively weak.

(III) Analysis Results

During the period from January 1, 2020, to January 7, 2023, before the implementation of Category B, Class B management, large listed state-owned enterprises and small and medium-sized listed companies exhibited a high positive correlation in the fluctuations of A-share prices, with a correlation coefficient of 90.2%. However, after the implementation of Category B, Class B management, from January 8, 2023, to June 30, 2024, the two showed only a relatively weak positive correlation, with a



correlation coefficient of 45.9%. Correlation analysis summarizes past trends, and this result indicates that the stock price movements of these two groups diverged to some extent after the implementation of Category B, Class B management compared to before.

CONCLUSIONS

Through theoretical analysis and empirical research, it is found that in the A-share market, before the implementation of Category B, Class B management, the stock price movements of large listed state-owned enterprises and small and medium-sized listed companies generally exhibited a high correlation. However, after the implementation of Category B, Class B management, an analysis of market transaction data revealed that this correlation significantly weakened, and even showed a negative correlation in some periods. This indicates that structural changes within the A-share market in China have begun to emerge, with the overall stock price performance of large listed state-owned enterprises and small and medium-sized listed companies starting to diverge.

Research Recommendations

Based on the above research conclusions, the following three recommendations are made for value investors. Firstly, focus on the investment value of large state-owned enterprises. Under the socialist valuation system with Chinese characteristics, large listed state-owned enterprises may have medium- to long-term investment value due to their stable operations and policy support. Secondly, investors can consider increasing their investment proportion in large state-owned enterprises or related stock index funds. To flexibly respond to market differentiation, investors should adjust their investment strategies flexibly in the face of polarization in the A-share market. They should pay attention to the stable growth of state-owned enterprise sectors such as those with "China" in their names, while also keeping an eye on high-quality targets among small and medium-sized listed companies. Lastly, investors should rationally view market fluctuations. Short-term fluctuations in the stock market are difficult to predict, so investors should adhere to the concept of value investing, avoid blindly following trends or speculative behavior, and focus on long-term returns and risk control.

(III) Research Outlook

Future research can be refined to industry classifications, analyzing the differences in stock price movements between large state-owned enterprises and small and medium-sized listed companies in different industry contexts to reveal more specific market laws. More control variables can be introduced, considering the impact of multiple factors such as macroeconomics, policy environment, and market sentiment on stock prices, to build a comprehensive analysis model. Various analytical methods can be adopted to deeply explore the internal connections and dynamic evolution laws of stock price movements, providing investors with more precise investment decision support.



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