The Impact of M&A Events of Chinese Listed Companies on Stock Prices and Long-Term Performance

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The Impact of M&A Events of Chinese Listed Companies on Stock Prices and Long-Term Performance

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Abstract

Using the event study methodology, this thesis analyses the impact of mergers and acquisitions (M&A) on Chinese listed companies. The thesis evaluates the long- and short-term performance of the firms from 2000 to 2019. It then focuses on the form of acquirers' long-term market performance after acquisitions.

When studying short-term stock market performance, this thesis evaluates the cumulative abnormal returns (CAR) around the merger events focusing on market performance within an event window of ten days before to thirty days after the merger announcement (-10,30]). The analysis then splits the sample according to industry, years and organizational form of the firm. When studying the long-term market performance, this study examines the buy-and-hold abnormal return (BHAR) of mergers and acquisitions within a 36-month period after the merger event. When studying the impact of organizational form on long-term performance of M&A transactions, the thesis examines whether acquisitions initiated by state-owned holding companies have differential long-term performance. The thesis also examines if the long-term performance of acquisitions involving state-owned acquirers has changed since 2015.

The empirical results show that for most companies, M&A events will bring good market performance in the short- and long-term. Furthermore, the long-term market performance of state-owned enterprises is inferior to that of non-state-owned enterprises. Additionally, with the progression of market-oriented reform, the long-term performance of state-owned enterprises M&A is in turn improving.

Key words: M&A; Event Research Method; Market Performance; Synergistic Effect; State-Owned Enterprise

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1. Introduction

1.1. Background

The capital market management has been developing for the last 30 years in China. Thus, in turn the merger and acquisition business has become standardized and has expanded further. From 2009 to 2018, there were nearly 18,000 mergers and acquisitions, with a total transaction value of about 8.5 trillion yuan. From a microscopic point of view, mergers and acquisitions can not only make a company bigger and stronger, but also improve its management efficiency and core competitiveness. From a macro point of view, promoting corporate mergers and acquisitions can concentrate on high-quality assets, to achieve rational allocation of resources and upgrade of industrial structure. Therefore, the M&A performance of enterprises has always attracted the attention of academia and industry. Common questions that gained attention are, for instance, 'Can M&A create value?', 'Whether M&A can improve corporate performance?', and 'What factors will affect M&A performance?'. These are important questions in domestic and foreign M&A research. Domestic and foreign studies on corporate M&A performance have found that although M&A benefits the shareholders of the target company in the short-term, in the long-term the benefits are still unclear. (Li 2022) Additionally, in the long-term perspective it is not clear whether any value is added for the acquirer's company. The conclusions are contradictory on the subject matter and there is not any definitive answer.

China's capital market has obvious Chinese characteristics, and with the continuous deepening of financial reform, the effectiveness of China's capital market has been continuously improved. The study of mergers and acquisitions in the Chinese market cannot copy the routines of mature western capital markets, and a route with Chinese characteristics should also be developed academically. This is due to the fact that the Chinese economy is still growing and the trends within the market are still varying. There is no tangible accurate data which illustrates the long-lasting benefits of mergers and acquisitions within China.

The M&A activities of listed companies will cause a reaction of the capital market. In the process of mergers and acquisitions, the stock prices of the acquiring company and the target company will fluctuate wildly before and after the announcement. However, there is disagreement between academia and industry on whether mergers and acquisitions can improve corporate performance. There is no unified conclusion on whether they have a

positive or negative impact on corporate performance. China's securities market is not yet perfect, and there are agency problems of listed companies. It is doubtful whether the mergers and acquisitions of listed companies in China can improve performance. Can corporate mergers and acquisitions become a feasible path for the rapid development of Chinese enterprises? Can listed companies optimize resource allocation and improve the operating performance of listed companies through mergers and acquisitions? Can paying attention to the mergers and acquisitions of listed companies bring benefits to investors? What kinds of companies can create positive benefits in M&A activities? With the deepening of financial reforms, are capital markets more effective in M&A events? These questions need to be answered urgently to make the subject matter clear and concise. Therefore, it is very important and urgent to study the stock price and long-term performance brought about by the mergers and acquisitions of listed companies within the Chinese market. In order to clarify the impact of M&A on the market performance of enterprises, this paper analyzes the changes in market performance after the occurrence of M&A events from both short-term and long-term perspectives. At the same time, it studies whether the market performance of M&A is different when the acquirer is state-owned company. This paper adopts the event study method and selects the M&A events in the past 20 years as a sample to try to fill the research gap in this field.

1.2. Literature Review

A lot of studies have been carried out in China and abroad on whether M&A can create value for enterprises, but these research conclusions are not completely consistent. Furthermore, some studies have highlighted that organizations can create value for themselves, via the reallocation of resources and cooperative operations through M&A. Additionally, other studies highlight that M&A cannot improve organizational performance. There in turn seems to be a conflicting narrative present among the current researchers.

Jensen and Rubeck (1983) summarized 13 articles about M&A and concluded that a successful M&A can bring 20% of the cumulative excess return rate to the target shareholders. However, it cannot bring benefits to the acquirer shareholders, but also it presents no losses. Bradley (1983) found that the successful tender offer increased the value of both companies by 7.4% on average. Wang (2018) took the market value of enterprises as the benchmark and found that in the active M&A market. Wang finds the value of an active merger market is about 13% for acquirers, while the overall income of the target was 48%. Renneboog and Vansteenkiste (2019) summarized the academic literature related to M&A, and found that the performance of M&A companies was often inferior to that of

companies that did not make M&A. Most shareholders of the acquirer had zero or even negative announcement returns. Even if there was a positive short-term announcement return, it could not be maintained for a long time.

Malmendier, Moretti, and Peters (2018) proposed a new method to measure M&A performance. In a new competitive bidding dataset, they used the performance of unsuccessful bidders after M&A as the counterfactual performance of successful bidders without winning the bidding. The results highlighted that after a period of three years the performance of unsuccessful bidders was 24% higher than successful bidders. This highlights that entering M&A may not be as profitable for organisations as presumed. Alexandridis, Antypas, and Travlos (2017) studied the M&A transactions in the United States from 1990 to 2015, and found that the cumulative excess return of the target was 29%, while the acquirer was only slightly positive. After the merger, the weighted announcement return of the acquirer and the target was 4.51%, which showed that the cumulative excess return of the acquirer was lower and far less than that of the target.

Healy, Palepu, and Ruback (1992) studied the accounting performance of the 50 largest M&A transactions in the United States between 1979 and 1984. The study found that the management level and efficiency of enterprises after M&A as well as the return on assets were improved. Parrino and Harris (1999) reached the same conclusion, thus highlighting improvements. Sheen's (2014) research found that after M&A, the operating efficiency of enterprises improved, and the operating costs also decreased. Therefore, the operating performance after M&A has been improved, which shows a huge boost for companies venturing into M&A. Aggarwal and Gargt (2022) studied the accounting performance of Indian M&A transactions and found that M&A had a significant positive impact on the profitability and liquidity of the acquirer within five years. However, this had no significant impact on the solvency of the company. Borodin et al. (2020) studied the accounting performance of 138 M&As in the United States and Europe from 2014 to 2018, and found positive effects. Reddy, Qamar, and Yahanpath (2019) found that M&As create value for Chinese firms, whereas for the Indian firms no such value is created for the same event windows. However, some studies have found that the business performance of the acquirer has deteriorated after the merger. This shows that from a business performance perspective, it may not be as fruitful for the acquirer to undertake an M&A transaction.

Due to the late start of China's capital market, the relevant research on M&A and M&A performance is lagging when compared with western countries. Yu and Yang (2000) conducted event research and analysis on mergers and acquisitions in Shanghai and Shenzhen Stock Exchanges from 1993 to 2000. They in turn found that the cumulative

excess return of the target shareholders was positive, while the acquirer shareholders had difficulty generating shareholder value in the merger. Li Shanmin and Chen Yugang's (2002) research on the performance of M&A transactions in China from 1999 to 2000 shows that M&A will bring significant benefits to the shareholders of the acquirer, but has no significant impact on the benefits of the shareholders of the target company. It in turn is not clear if it's viable for the target company's shareholders to enter into a M&A. Zhu Hongjun and Wang Hui (2005) studied the long-term market performance of M&A transactions, and the conclusion shows that shareholders of the target enterprise have achieved significant excess returns in the five years after M&A. The analysis of Feng Genfu and Wang Huifang (2001) show that the enterprise performance has been improved in the year after M&A, but it has declined since then. Zhu Tao (2007) analyzed the short-term market performance and long-term market performance of M&A respectively. He found that shareholders of the acquirer were able to gain short-term returns. However this in turn became negative in the long term. More recently, Deng Ying (2016), Ji Kailun (2016) and Liao Ming (2014) have studied the M&A of the GEM(Growth Enterprise Market) and found that the M&A of the listed companies on the GEM has positive stock price effect, which can bring positive market performance to the acquirers.

Yuan Hongqi and Wu Xingyu (1998) selected the transaction events in 1997 as a sample to study the financial performance of enterprises after mergers and acquisitions. They in turn found that the financial performance of the sample enterprises after mergers and acquisitions improved. Feng Genfu and Wu Linjiang (2001) selected four indicators to study the accounting performance of M&A transactions in China from 1994 to 1998, and found that the accounting performance showed a trend of rising first and then falling. Liao Li and Zhu Zhengqin (2004) took 71 listed companies that had undergone major asset restructuring in China in 2001 as samples. After analyzing their financial performance before and after the restructuring, they found that the profitability of the companies had improved significantly after the restructuring. However, the improvements on the financial stability, operations, and cash flow management were significant to highlight valid improvements as a whole for organizations.

No matter the market performance or accounting performance of enterprises after M&A, there is no consensus in domestic research.

Chinese scholars have also done a lot of research on mergers and acquisitions of state-owned enterprises. Lv Ruosi et al. (2017) studied Chinese enterprises acquired by foreign investors from 1998 to 2007, and found that foreign mergers and acquisitions significantly improved the total factor productivity of target enterprises. Ma Ming (2016) studied more

than 300 Chinese local M&A cases disclosed by the CSRC from 1998 to 2009. Data shows that when non-state-owned enterprises announce mergers and acquisitions, the stock price will have a positive reaction, while when state-owned enterprises announce mergers and acquisitions, the stock price will have a negative reaction. This in turn highlights that the market is stronger for non-state-owned enterprises. This is primarily due to the fact that non-state-owned enterprises are freer to utilize their resources and invest in further growth without government hindrances. The capital which they gain can be more freely distributed and invested back into the business.

In terms of research methods, some papers have evaluated the performance of enterprise M&A from the following perspectives: Firstly, measure the evaluation of capital markets of the M&A activities, that is, the shareholder wealth effect. The main method is event study method, including short-term event study and long-term event study. Secondly, measure the business activities of enterprises, especially evaluate the M&A activities from the perspective of accounting performance. It is mainly reflected in the changes of financial indicators, namely operating performance. The main method is financial index method (including factor analysis method). Thirdly, the main method to measure the impact of M&A activities on the efficiency of resource allocation in the economic system or individual industries is data envelopment analysis. Data Envelopment Analysis (DEA) is a non-parametric method used to evaluate the relative efficiency of decision-making units (DMUs) by comparing their inputs to their outputs.

Representative performance measurement methods include event research method, financial index method (including factor analysis method), DEA, questionnaire survey method (subjective evaluation of managers) and case analysis method. In China, economic added value is also used. The mainstream methods to measure M&A performance in the corporate finance field are the event research method and the financial index method.

Table 1.1 Summary of M&A Performance Research Methods

Measurement Method	Applicable Type
Event Study Method CAR	Short Term Market Reaction
Event Study Method BHAR	Long Term Market Performance
Financial Index Method	Business Performance
Data Envelopment Analysis	Enterprise Efficiency Improvement
Case Analysis Method	Manager's Subjective Assessment
Questionnaire Survey Method	Efficiency of Case Acquisition

2. Theory and Hypothesis

2.1. Enterprise Merger and Acquisition Theory

2.1.1. Motivation of M&A

（1）Synergy Effect Theory

Synergy theory believes that mergers and acquisitions will produce ‘synergy’ between the bidder and the target. This theory contains two basic points: First, the occurrence of M&A and reorganization is conducive to improving the management's operating performance; Second, enterprise M&A and reorganization will lead to some form of synergy. The synergy of M&A can be summarized as management synergy, operational synergy, financial synergy, higher market power, etc.

One way this can be achieved is by improving the management operations of a target firm and thus creating value. When a well-managed company acquires a target company with low efficiency in management through appropriate merger and acquisition integration, the value of the target company will be increased. Thus, this will result in the synergy bringing in the benefits of M&A. This will not only bring efficiency to a single enterprise, but also improve the welfare of the whole society, which would consist of a Pareto improvement. The return on net assets of the target company before acquisition can be used to measure its operating efficiency. In addition, Tobin’s Q is often used to judge if the firm suffers from agency costs or has high operating efficiency.

The generation of economies of scale through mergers and acquisitions is also one of the ways to achieve synergies. According to the theory of business collaboration, companies in the same industry can achieve economies of scale through mergers and acquisitions if they do not reach the optimal production level. Such economies of scale can originate from resource sharing in production and manufacturing or R&D. They can also create new links with suppliers and business partners, which can result in cheaper production and supply costs. Companies in the same industry are more likely to implement mergers and acquisitions based on the motivation of business synergy.

Third, reducing the internal financing cost of enterprises through M&A to achieve financial synergy is also a source of M&A induced synergies. According to the theory of financial synergy, enterprises with a large amount of internal cash flow and a small amount of investment opportunities and enterprises with investment opportunities but lack of internal funds may obtain a lower internal capital costs when merging. In other words, for acquiring companies, if the target company has a high level of cash holdings, the cost of capital can be effectively reduced through mergers and acquisitions. It will result in further funds being made available and will reduce the risk of losing capital through M&A.

Therefore, the cash holdings of the target company can be used to determine whether the acquisition motivation of the acquiring company is to achieve financial synergy. In addition, the financial synergy achieved by mergers and acquisitions is also reflected in the improvement of the company's debt capacity after the merger. Therefore, when the capital structures of the acquiring company and the target company differ greatly, it can also indicate that the capital costs of the two companies differ significantly. Thus, the possibility of achieving financial synergy through mergers and acquisitions is also great. Finally, mergers and acquisitions may lead to the redistribution of wealth between the government and the company, thus saving taxes for the company. This would be highly beneficial as it would give the company strength to grow, while paying less tax and being hindered by high investment costs.

（2）Agency Theory

The agency theory of corporate governance was proposed by Alchian and Demsetz (1972) and Jensen and Meckling (1976). They believe that enterprises can be regarded as the link of a series of contractual relationships between individuals, while classical economics regards enterprises as a single product entity with the purpose of maximizing profits.

The agency theory explains the behavior of a company from the perspective of various contracts between different parties. Shareholders are sometimes not involved in the management of the firm, which is delegated to managers. They are in turn risk takers of the company, who gamble and set targets to achieve their goals. In the real world, the company's managers obtain funds from investors, and investors believe that the managers use funds efficiently to create profits for the company. Managers sign contracts to determine the activities they should engage in and specify how profits are distributed between managers and investors. Furthermore, because it is difficult to describe and predict future contingencies, contracts signed by managers are difficult to implement (Shleifer and Vishny 1997). Therefore, the management has the right to make decisions beyond the contract. It is in turn, natural within human nature to make decisions which are in line with one’s own personal interests. Management also holds this trait and will implement policies which best suits their own interests (and not necessarily the owners of the firm). They will make decisions that are beneficial to themselves, but rarely consider the interests of shareholders. This leads to agency problems (Ross 1973; Fama and Jensen 1983).

Agency theory describes managers as agents and shareholders as principals. According to this theory, if appropriate incentives or supervision are not enough to prevent enterprise managers from using their own discretion to maximize their own interests, then the value of enterprises cannot be maximized. This can further explain: First, the interests of the principal

and agent need to be matched to overcome their different preferences for the company's activities and different attitudes towards risk exposure. Second, because information asymmetry means that the principal and the agent hold different amounts of information (the agent can obtain more information than the principal), it is difficult for the principal to monitor the agent's behavior, and the cost is also high. Jensen and Meckling (1976) identified three agency costs for the principal to monitor the agent's behavior: monitoring management, binding the agent to the principal, and residual losses.

（3）Overconfidence Theory

The ‘arrogance’ of managers may lead to excessive prices paid to the shareholders of the acquired company in M&A activities, thus causing losses to the shareholders of the acquiring company. This means it is important for shareholders to place management who have the best interests of the firm at heart in order to maximize profits. It is worth noting that this hypothesis does not assume that managers are selfish. Managers may have good intentions at the beginning of the decision on M&A and reorganization. However, they can be overly ambitious and underestimate the difficulty of the policies they have to implement, which would then result in them failing. Furthermore, they could be too egotistical to take the accurate advice to administer the right changes when they are required. Thus, these personality traits would result in the M&A and possible its failure.

In recent years, with the development and maturity of behavioral finance, managers' overconfidence has become a hot topic in the field of corporate finance. Studies have found that people want to succeed, so they tend to attribute success to their own actions and failure to bad luck. Furthermore, when people critique their own skills, they often illustrate that they are superior in comparison with others. This superior effect may extend to economic decisions such as investment decisions. Subsequently, the researchers found that any of the following three factors could lead to overconfidence: controlling illusion, highly yearning for good returns, and difficultly to compare the abstract reference points of individual performance. (Montier 2010)

The subsequent survey results show that managers always underestimate the internal instability, and executives who believe they can fully control the company's operating performance. They have investment projects and always believe they can control the earnings. Thus, in turn they tend to underestimate the possibility of failure. The research also believes that managers pay close attention to company performance based on wealth, professional reputation and other considerations, and show overconfidence in the investment process. (March and Shapira 1987)

In terms of empirical research, Lys and Vincent (1995) used the method of case study

to analyze the merger and acquisition decision of NCR's AT&T. Research shows that the value destruction in M&A is related to managers' overconfidence. Hayward and Hambrick (1997) also verified the "arrogance" hypothesis through empirical research, and believed that good corporate performance, media praise of executives, and executives' psychological reaction to relatively high compensation would lead to executives' overconfidence. It can also be highlighted that with overconfidence present among executives, it will lead to a lack of clear strategic focus. This will lead to high costs in the long run while trying to achieve their goals.

（4）Stock Market Driven Acquisition Theory

The theory of stock market driving M&A believes that the mispricing in the stock market is an important driving factor for corporate mergers and acquisitions. Nelson Lowell, and National Bureau of Economic Research (1959) put forward the embryonic idea of stock market driven M&A. Shleifer and Vishny (2003) established a theoretical model of stock market driven M&A. Friedman (2004) further added the variable of managers' private interests on the basis of the theoretical model of Shleifer and Vishny. (2003) Based on the stock market-driven M&A motivation theory, it can well explain such issues as 'who buys who', 'cash purchase or stock exchange purchase', and 'how the M&A wave comes into being'.

（5）Tunneling Theory

Johnson et al. (2000) used the term 'tunneling' to describe the transfer of resources from the company to the controlling shareholders. It is embodied in direct theft, excessive management compensation, loan guarantees for controlling shareholders, encroachment on the company's development opportunities, and other forms. Claessens et al. (2002) and others conducted an empirical study on companies in East Asia, and found that through cross shareholding and pyramid ownership structure, controlling shareholders have control over the company's cash flow. Driven by the private interests of control, there is a widespread phenomenon of large shareholders seizing small shareholders in East Asia. With the gradual development of China's capital market regulatory governance system, the enforcement and supervision of regulatory agencies have been gradually strengthened, and the tunneling behavior of some major shareholders has been controlled to a certain extent, but it is still not uncommon. At present, the tunneling channels of large shareholders are more and more hidden, and the tunneling objects are larger and larger. This will not only lead to directly tunneling the listed companies themselves, but also tunneling small and medium-sized investors.

2.1.2. Type of M&A

Any M&A of listed companies will have certain purpose tendencies to meet their own needs. These M&A purposes include horizontal integration, vertical integration, or industry integration, or industry diversification.

Horizontal integration represents mergers and acquisitions at the same level as the industrial chain, from which companies can obtain, integrate, and optimize their business. In the actual operation process, this type of M&A will be manifested as M&A of similar businesses or substitute businesses. This will help weaken the threat of competition who enters the market and prevent it from impacting the organization.

Vertical integration represents mergers and acquisitions at the vertical level of the industrial chain, mainly in the form of integrating suppliers or dealers. This is done in order to reduce costs, improve efficiency, and optimize business. In the actual operation process, this type of M&A is mainly manifested in the acquisition of upstream and downstream companies. It will help to reduce the cost of upstream circulation of the industrial chain, improve the production efficiency of enterprises, or expand the company's influence in the entire industrial chain. Thus, this will increase the market share of the firm and help the organization maintain its stronghold.

Industry integration means that both parties to the merger and acquisition have businesses and products at the same level of the value chain. This as well as businesses and products upstream and downstream of the value chain. It cannot be classified as horizontal integration or vertical integration. Such enterprises have often left the initial stage and reached a period of vigorous development. Mergers and acquisitions of such enterprises can not only improve the business ability in the horizontal aspect of the industry, but also improve the voice of the industry in the vertical aspect. It is important for such firms to invest in an organization which requires a high level of integration of the policies and procedures with the acquired firm.

Diversification strategy represents an enterprise strategy that can provide more than two products or services at the same time through mergers and acquisitions. In reality, diversified strategic operation is conducive to the company's gradual progress towards new industries, especially emerging industries with good prospects. Such integration can not only improve the security of enterprise operation, but also disperse potential risks. This in turn can be important for the organization to remain innovative and negate any risks.

Capital operation represents the enterprise's behavior of using, planning, and operating the company's capital and capital movement under the purpose of maximizing capital acquisition. In practical operation, capital operation is more inclined to increase the

profitability of capital, that is, to earn more profits through capital. This can be done through moving funds and reinvesting them into the business to maximize profits.

Strategic cooperation represents a win-win way established by both enterprises during the cooperation period. Most of it is to achieve their own survival and development. It belongs to the long-term plans of both enterprises based on the overall situation and their own.

Financial investment represents the behavior of enterprise M&A mainly aimed at achieving medium or short-term financial value, which is usually manifested as financial withdrawal after capital appreciation to obtain premium.

2.1.3. Recombination Type

（1）Acquisition by Agreement.

Agreed acquisition refers to the acquisition behavior in which investors privately negotiate with major shareholders of the target company on the share price, acquisition ratio and other aspects of the acquisition. This reorganization of the market is done to purchase the shares of the target company, without any hindrances, this will in turn help facilitate a friendly takeover.

（2）Issue Shares to Purchase Assets.

The issue of shares to purchase assets refers to the merger and acquisition of the listed company of the main merging party by issuing additional shares of its own company to the target party in exchange for the assets or equity of the target company.

（3）Capital Increase and Merger.

Capital increase M&A refers to the M&A of the listed company of the main merging party through joint venture with the surviving shareholders of the target party to achieve the purpose of M&A.

（4）Secondary Market Acquisition.

The secondary market acquisition refers to the M&A of the target party through the acquisition of the target party's tradable shares in the secondary market when the acquiree is a listed company.

（5）Tender Offer.

Takeover by tender offer means that when the acquiree is a listed company, the acquirer issues an acquisition announcement to the target shareholders, which is confirmed by the target listed company, and then implements the acquisition. Tender offer is the mainstream

form of acquisition in the stock market of various countries, which is characterized by offering to all shareholders of the target party and then implementing the acquisition.

（6）Merger by Absorption.

Merger by absorption means that after the merger between the acquirer and the target, the acquirer absorbs the target and continues to exist, while the target company dies. The acquirer acquires all the net assets of the target party of the merged party, cancels the legal personality of the target after the merger, and holds the assets and liabilities of the merged party.

（7）Indirect Acquisition.

Indirect acquisition refers to the acquisition behavior that the main merging party does not directly acquire the target party but purchases the common stock equity with voting rights on the target party in the circulation market, thereby obtaining the control over the target party.

2.1.4. Payment Method

In the M&A events, the payment method is a very important factor, which is directly related to the realization of transactions and the interests of both parties. In this paper, a simple definition of M&A payment method is given: the payment method adopted by the acquirer to realize the M&A, which, in general, refers to what the acquirer uses to exchange the equity of the acquiree equivalently.

（1）Cash Payment Method

The acquirer realizes the merger transaction through cash and obtains the control of the acquiree. Cash payment is common in the following situations: First, because there is little choice of payment methods, cash payment often occurs in the early M&A market. Second, Cash payments can complete transactions more quickly. Compared to other payment methods (such as stocks, bonds, etc.), cash payments can complete transactions and transfer ownership more quickly because they do not require financing, settlements, or other complex procedures. Third, when the equity of the acquiree is not concentrated and the shareholding ratio of the largest shareholder is not high, they prefer to use cash as the payment method. In the current M&A market in China, cash payment still plays an important role. Forth, Cash payments can reduce uncertainty. Since the prices of stocks and bonds are influenced by market fluctuations and expected changes, using these payment methods may result in changes in the final value of the transaction due to price fluctuations. Using cash payments can avoid the influence of these uncertainty factors, making the transaction more stable.

（2）Equity Payment Method.

The payment method by which the acquirer achieves the acquisition transaction by exchanging shares or issuing additional shares to obtain the assets or equity of the acquiree. This M&A payment method has the following characteristics: First, the transaction process does not involve a large amount of cash, that is, the acquirer does not have to pay a large amount of cash. They aim is to exchange some equity for a stake in the target firm, which will help the firm not pay in cash. Second, the shareholders of the acquiree will become shareholders of the newly merged enterprise after the successful merger. Third, when the acquirer is a listed company, this payment method is usually used to enable the acquiree to go public through backdoor listing. Fourth, if the merger transaction is implemented by issuing new shares, it will dilute the equity of the original shareholders of the acquirer, and the ownership structure before the merger will change accordingly. In international M&A events, most large M&A cases use the form of share exchange to achieve M&A transactions. Furthermore, the equity payment method accounts for a significant proportion of international M&A transactions. However, in China's M&A market, the equity payment method is not the mainstream payment method. The M&A under the equity payment method is more like ‘big fish eat small fish’, while it is rare to achieve ‘strong alliance’ through share exchange.

2.2. Hypothesis

Assuming that the market is efficient, and the information is symmetrical, investors will not buy the company's shares in advance before the first announcement of the merger and acquisition. The stock price before the announcement of the merger and acquisition will not fluctuate abnormally. After the announcement of M&A, investors will increase the purchase of the company's shares due to the information they get, so that the company's share price will have a positive fluctuation. Therefore, the researcher will propose assumptions about the short-term performance of the acquirer:

H1: The short-term market performance of the company will increase after the M&A event.

Assuming that the M&A decision-makers are rational, managers will only conduct M&A when the M&A transaction is done to add value to both companies. Therefore, based on the synergy theory, we propose assumptions about the long-term performance of the acquirer.

H2: The long-term market performance of the company will increase after the M&A event.

From the perspective of organizational form, according to the principal-agent theory and the tunneling theory of large shareholders, mergers and acquisitions will have a negative impact on the performance of enterprises. This study divides the organizational forms of enterprises into state-owned holding and non-state-owned holding. The researcher believes that state-owned holding enterprises are more likely to fall into the principal-agent trap and the tunneling trap of large shareholders, thus putting forward assumptions about the factors affecting the long-term performance of acquirers:

H3: The long-term performance of mergers and acquisitions of non-state-owned holding enterprises is superior to that of non-state-owned holding enterprises.

China's market-oriented reform has progressed smoothly in recent years and the relevant financial supervision has become stricter. Since 2015, China's capital market has experienced the market-oriented reform of interest rates, the bull bear switch of China's stock market, and the financial anti-corruption. The market has undergone tremendous changes. So, another assumption about the impact of organizational form on long-term performance of M&A transactions in this study is:

H4: With the smooth progress of market-oriented reform, the long-term performance of mergers and acquisitions of state-owned holding enterprises in 2015 and later is better than that before 2015.

3. Methodology

3.1. Data Source and Sample Screening

The data selected in this study are all from the CSMAR M&A and reorganization database, which collects and collates the data on M&A and reorganization of companies listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange since 1995. It also collates other relevant data, which is relevant to this study, the researcher will utilize all core datasets. The data source is authoritative and stable, it can completely present the relevant data on M&A and reorganization of listed companies.

From 1995 to 2022, there were 125017 mergers and acquisitions of domestic enterprises recorded in the CSMAR database. This research project selects mergers and acquisitions from 2000 to the end of 2019, and those meeting the following criteria will be retained, otherwise they will be deleted:

（1） Successful M&A events in the screening period from the years 2000 to 2019
（2） The listed company is the buyer
（3） Exclusion types include asset stripping, asset replacement, debt restructuring and share repurchase
（4） Not delisted within 3 years after the announcement date. (Another M&A event during the window period can affect the results of the experimental subjects.)
（5） All events of companies that have been listed or are in normal listing status in the first half of the announcement date excluding multiple mergers and acquisitions within the given event window
（6） Exclude all events of companies acquired multiple times within a given event window (36 months)
（7） Remove related transactions
（8） Eliminate the transactions with insufficient data of the acquirer (final sample)

After the screening of the above steps, 1455 M&A transactions were finally retained. The following table shows the whole process of sample screening.

Table 3.1 Determination Process of Merger and Acquisition Samples

Sample Selection of M&A Events		
1	Successful M&A events in the screening period from 2000 to 2019	48054
2	The listed company is the buyer	6251
3	Exclusion types include asset stripping, asset replacement, debt restructuring, and share repurchase	6089
4	Not delisted within 3 years after the announcement date	6085
5	Listed in the first half of the announcement date or in normal listing status	5911
6	Exclude all events of companies acquired multiple times within a given event window (36 months)	2154
7	Remove related transactions	1455
8	Eliminate the transactions with insufficient data of the acquirer (final sample)	1455

3.2. Sample Distribution

After applying the screening procedure described in Section 3.1, 1455 valid samples were retained. Tables 3.2, 3.4, and 3.5 show the distribution of the 1455 sample transactions by industry, years, and organization of the acquiring company.

In terms of industries, the largest number of M&A transactions comes from manufacturing industries totaled 938, accounting for 64.47%. The second is Information transmission, software, and information technology services industry, with 151 cases in total, accounting for 10.38%. Wholesale and retail, leasing and business services, electricity, heat, gas and water production and supply industries accounted for less than 4%. As the sample of manufacturing industry accounts for the highest proportion, Table 3.3 shows the breakdown of transactions involving manufacturing firms into finer categories. Specifically, this project divides the manufacturing sector into 29 categories: 163 transactions pertain to the computer, communication and other electronic equipment manufacturing industries, accounting for 17.38% of all transactions from the manufacturing sector. There are 101 transactions involving firms from the electrical machinery and equipment manufacturing industries, accounting for 10.77%. There are 98 chemical raw materials and chemical products manufacturing industries and pharmaceutical manufacturing industries, accounting for 10.45%.

Table 3.2 Distribution of Sample Industries

Industry	Industry Code	Count Item: Industry	Percentage
Manufacturing	C	938	64.47%
Information Transmission, Software, & Information Technology Services	I	151	10.38%
Wholesale and Retail	F	44	3.02%
Leasing and Business Services	L	43	2.96%
Electricity, Heat, Gas and Water Production & Supply	D	37	2.54%
Construction	E	35	2.41%
Real Estate	K	33	2.27%
Mining	B	24	1.65%
Scientific Research & Technology Services	M	24	1.65%
Transportation, Storage &Postal Services	G	23	1.58%
Finance	J	23	1.58%
Culture, Sports, and Entertainment	R	22	1.51%
Water Conservancy, Environment & Public Facilities Management	N	21	1.44%
Agriculture, Forestry, Animal Husbandry & Fishery	A	16	1.10%
Other	-	10	0.69%
Education	P	5	0.34%
Health & Social Work	Q	4	0.27%
Accommodation & Catering	H	2	0.14%
Total		1455	

Table 3.3 Distribution of Sample Manufacturing Industries

Category of Manufacturing Industry	Quantity	Proportion
Computer, Communication & Other Electronic Equipment Manufacturing	163	17.38%
Electrical Machinery& Equipment Manufacturing	101	10.77%
Chemical Raw Materials & Chemical Products Manufacturing	98	10.45%
Pharmaceutical Manufacturing	98	10.45%
Special Equipment Manufacturing	83	8.85%
General Equipment Manufacturing	60	6.40%
Automobile Manufacturing	57	6.08%
Nonferrous Metal Smelting & Rolling Processing Industry	31	3.30%
Nonmetallic Mineral Products Industry	29	3.09%
Instrument Manufacturing	27	2.88%
Rubber & Plastic Products Industry	26	2.77%
Agricultural and Sideline Food Processing Industry	24	2.56%
Metal Products Industry	23	2.45%
Food Manufacturing	17	1.81%
Culture and Education, Arts and Crafts, Sports & Entertainment Products Manufacturing	12	1.28%
Paper Making & Paper Products Industry	11	1.17%
Wine, Beverage & Refined Tea Manufacturing	10	1.07%
Printing & Recording Media Reproduction Industry	8	0.85%
Manufacturing of Railway, Ship, Aerospace & Other Transport Equipment	8	0.85%
Textile and Clothing Industry	8	0.85%
Furniture Manufacturing	7	0.75%
Textile Industry	7	0.75%
Wood Processing and Wood, Bamboo, Rattan, Palm & Grass Products	6	0.64%
Petroleum, Coal, And Other Fuel Processing Industry	6	0.64%
Other Manufacturing Industries	5	0.53%
Leather, Fur, Feathers and Their Products & Footwear Industry	5	0.53%
Comprehensive Utilization of Waste Resources	3	0.32%
Chemical Fiber Manufacturing	3	0.32%
Ferrous Metal Smelting & Rolling Processing Industry	2	0.21%
Total	**938**	100%

By year, the sample includes 1455 M&A events from 2000 to 2019, and a large number of sample events are concentrated after 2015. This study divides the 20-year time span into three parts: 2000-2009, 2010-2014, 2015-2019. In the first ten years, there were 62 sample events, from 2010 to 2014, there were 249 sample events, and from 2015 to 2019, there were

1144 sample events. It can be seen that with the continuous development of the domestic capital market, the frequency of mergers and acquisitions has been increasing in the most recent periods of the sample.

Table 3.4 Sample Year Distribution

Year	Count	Year	Count
2000	1	2010	14
2001	2	2011	18
2002	3	2012	44
2003	2	2013	65
2004	5	2014	108
2005	2	2015	195
2006	5	2016	211
2007	15	2017	239
2008	9	2018	255
2009	18	2019	244
Total		**1455**	

In terms of organizational form, 1455 valid sample events can be divided into private enterprises, local state-owned enterprises, central state-owned enterprises, etc. Among them, there were 1006 private enterprises, accounting for the highest proportion, and 270 local state-owned enterprises ranked second. Table 3.5 shows the sample distribution of different organizational forms.

Table 3.5 Distribution of Sample Organizational Forms

Row Label	Counting Item: Enterprise Nature
Private Enterprise	1006
Local State-Owned Enterprises	270
Central State-Owned Enterprises	119
Foreign Enterprise	36
Sino Foreign Joint Venture	20
Collective Enterprise	4
Total	**1455**

3.3. Event Research Method

Event Study is a statistical method to study whether the stock price will fluctuate and whether ‘abnormal returns’ will accrue when an event occurs in the market. With this methodology, it can be inferred if stock prices change as a result of a certain type of event.

The event study method was initiated by Ball and Brown (1968) and Fama et al. (1969). The event study method is based on the efficient market hypothesis, that is, the stock price reflects all known public information. Since investors are rational and investors' responses to new information are rational, the abnormal return can be obtained by removing the normal return estimated on the assumption that an event did not occur, from the actual return of the sample stock. Thus, an abnormal return can evaluate the degree of abnormal stock market reaction in relation to events and the contained information.

Take each enterprise's M&A transaction as an event. Set an event period, verify the impact of this M&A event on the stock valuation by calculating the enterprise's excess or abnormal return. This method is used in general to evaluate the performance of M&A, by contrasting changes in the market value both before and after an M&A. According to the length of the event period, the event research method can be divided into short-term event research and long-term event research. Short-term event studies generally measure short-term market performance through cumulative abnormal return (CAR). Long-term event studies generally measure long-term market performance through buy-and-hold abnormal return (BHAR). The measuring stick for both are opposite and may present different results. When using the event study method, it is necessary to determine an event period, which is mostly several days around the announcement date of the merger. The choice of the event period is the key to the event study method. If the event period is too short, it will be difficult to get the true value implications of M&A. If the event period is too long, although more comprehensive M&A information can be obtained, there may be other irrelevant factors and events. Thus, it is important to collect data during an accurate time period to gain valid results.

In terms of premise assumptions, this project studies the premise that meets the efficient market hypothesis. An efficient market is a capital market where the current market price of an asset fully reflects all relevant and available information. It includes three forms: weak efficient markets, semi strong efficient markets, and strong efficient market. American financial scientist Fama (1970) put forward the ‘efficient market hypothesis. It is presumed that under the narrative of a ‘efficient market’ the stock prices can fully reflect all the variables and unreasonable prices will be terminated soon. Under this assumption, any investment based on information cannot generate excess returns. The capital market is a perfectly competitive market, and each participant is a price receiver. Therefore, the price of the capital market can provide a basis for enterprise investment and financing decisions. The efficient market hypothesis is one of the important theoretical cornerstones in the field of modern finance.

As early as 2003, Zhang Bing (2003) passed the gradual efficiency test of emerging stock markets and concluded that China's stock market has been a weak efficient market since 1997. Later, many empirical studies have proved that China's capital market has achieved weak efficiency, and its efficiency has been continuously enhanced. Some researchers believe that it has reached semi strong efficiency. Yang Zhiyong et al. (2018) used arbitrage pricing theory to test the efficiency of China's capital market, and believed that the market has reached semi strong effectiveness. Therefore, the analysis on market performance based on the event study method in this project, in turn meets the criteria for an efficient market hypothesis.

Next, we will explain the CAR and BHAR measures in the context of event study method adopted in this study.

3.4. CAR

（1）Day and Event Window

In this study, the event date is defined as the date when the merger information is released to the public, that is, the first announcement date of the merger. In the event window, the first announcement date is 0 day, and the number of trading days are postponed forward and backward. In this project, 90 trading day before the event date to 30 trading days after the event date is taken as the time window for the study. This is where [- 90, - 10] days is used as the time window for CAPM model estimation ("estimation window"), and [- 10, 30] days is used as the time window for the study of M&A events on stock price changes ("event window").

（2）Cumulative Abnormal Returns

We use the CAPM model to calculate the benchmark return (the CAPM model will be described in detail in the third part of this section), that is, first use the daily returns from the 90th day before the announcement date to the 11th day before the announcement date to estimate the parameters α_i, β_i (i=1,2,..., 1455). Furthermore, use the estimated parameters and the return data from the 10th day before the announcement date to the 30th day after the announcement date (i.e. window [- 10,30]) to estimate the normal return according to the following formula:

$$R_{it} = \alpha_i + \beta_i R_{mt}$$

Calculate the daily expected return $\hat{R}_{it}$ in the window [- 10, 30], and then subtract the calculated expected return from the actual daily return R_{it} to get the daily abnormal return, that is

$$AR_{it} = R_{it} - \hat{R}_{it}(t = -10, -9, \dots, 30)$$

Thus, then calculate the average daily abnormal return in the window [- 10, 30], where *n* is the total number of samples

$$AAR_t = \frac{1}{n}\sum_{i=1}^{n} AR_{it}\ (t = -10, -9, \dots, 30)$$

Finally, the cumulative abnormal return of each day in the window period is calculated according to the following formula

$$CAR_T = \sum_{t=-10}^{T} AAR_t\ (T = -10, -9, \dots, 30)$$

Next, check whether CAR is significantly different from 0. If *CAR>0* and the test result is statistically significant, it indicates that the wealth of shareholders has increased. In contrast, if *CAR<0*, and the test results are significant, it indicates that the wealth of shareholders has decreased. When the difference between CAR and 0 is not significant, it can be considered that the wealth of shareholders has not changed in M&A. The inspection part will be described in chapter 4 of this paper.

3.4.1. BHAR

BHAR measures the difference of the company's stock return relative to the benchmark return from the date of acquisition transaction to the end of a holding period, which is typically chosen to be several years after the transaction announcement. BHAR takes a longer-term approach and avoids the fluctuation of the company's stock price during the short-term event period. Furthermore, it can help to better assess a firm's long-term market performance over several years following the merger and acquisition event. BHAR is also one of the most commonly used metrics to study the long-term performance of M&A events at home and abroad. (Li and Zhu 2006) Compared with the cumulative abnormal return CAR, BHAR pays more attention on returns further away from the merger announcement.

（1）Event Day and Event Window

This study uses the BHAR method to calculate the long-term performance of M&A events. The selected event date is the first announcement date of M&A events, recorded as t0, and the event window is 36 months after the first announcement date of M&A. The reason for selecting 36 months is that most M&A events take a certain time to implement and complete. If the window period for selecting events is too short, there is not enough time to observe the long-term performance of M&A brought by the synergy effect after the completion of M&A. If the selected time window is too long, there are many other interfering factors that interfere with the impact of M&A events on performance. This project in turn

chooses 36 months to be consistent with the common practice of existing research (Ritter 1991), and the window period is sufficient to observe the performance changes brought about by M&A events.

（2）Abnormal Returns

First, define the return rate of stock purchased and held by the acquirer in period *T* as BH_i, and the calculation formula of *T* is as follows:

$$BH_{i,\ T} = \prod_{T_1}^{T_n} \left[1 + R_{i,\ t}\right]$$

$R_{i,\ t}$ is the simple monthly return of the acquirer *i* in month *t* (from *T1* to *Tn*) after the acquisition. $BH_{i,\ T}$ is the accumulated income of holding the company's shares from the date of the merger and acquisition to month *T*.

The definition of excess return rate is as follows:

$$BHAR_{i,\ T} = \prod_{T_1}^{T_n} \left[1 + R_{i,\ t}\right] - \prod_{T_1}^{T_n} \left[1 + R_{m,\ t}\right]$$

In addition to the cumulative return, to calculate the abnormal return, we also need to calculate the market return $R_{m,\ t}$. It is different from the CAR method. This study uses the market model as the benchmark return model of the BHAR method. Additionally, it also uses the return of the equal weight index of the company's industry as the benchmark return.

3.4.2. Measurement of Benchmark Return

（1）Measurement of CAR Benchmark Return

Common CAR benchmark return measurement includes market model, Fama-French model and CAPM model.

The market model will in turn harness the market return as the benchmark. Additionally, the benchmark return of securities within the same market portfolio will remain unchanged. It is based on the market return and basically does not need to be estimated. When the security price is highly correlated with its market portfolio, the model can better reflect the benchmark return in the analysis.

The Fama and French (1993) model belong to the arbitrage pricing model. Based on the asset pricing theory, the expected return is determined through the linear combination of various factors. Considering that the CAPM model's ability to explain the cross section of stock returns is weak, Fama and French (1993), based on CAPM, added a size and a book to market ratio factor, and built a three-factor model to explain the expected return of the stocks.

The Capital Asset Pricing Model (CAPM) was developed by American scholars

William Sharpe, John Lintner, Jack Treynor and Jan Mossin in 1964 on the basis of asset portfolio theory and capital market theory. (Sharpe 1964) It in turn mainly evaluates the relationship between the expected return on assets and systematic risk. It also assesses how the equilibrium price is formed and is a pillar of financial market theory, which is widely used in investment decision-making and corporate finance. The capital asset pricing model assumes that all investors invest according to Markowitz's portfolio selection theory. (Markowitz 1952) Based on this assumption, the focus of capital asset pricing model research is to explore the quantitative relationship between return and risk. That is in turn, how much return should investors get in order to compensate for a certain degree of risk.

The CAPM model formula is as follows:

$$R_i = R_f + \beta(R_m - R_f)$$

Where, R_i is the expected return of asset *i*, R_f is the risk-free return, R_m is the market return, and $R_m - R_f$ is the market risk premium, that is, the difference between the expected market return and the risk-free return. The coefficient β is the systematic risk of asset *i*.

In practical application, the formula above is used less frequently, and the simplified CAPM formula is often used:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

Where, R_{it} represents the return of asset *i* in period *t*, and R_{mt} represents the return of corresponding market portfolio m in period *t*. Using the least squares method to estimate the coefficients α_i and β_i, the following equation can be obtained:

$$\hat{R}_{it} = \hat{\alpha}_i + \hat{\beta}_i R_{mt}$$

Where $\hat{R}_{it}$ is the benchmark return under the CAPM model. The CAR method in this paper adopts CAPM model.

（2）Measurement of BHAR benchmark return

In BHAR method, the measurement of benchmark return is different from CAR method. The commonly used models in BHAR include market model, CAPM model and cross-sectional regression model.

The cross-sectional regression model is a commonly used method for measuring benchmark returns. It involves dividing securities into groups based on a particular characteristic, such as market capitalization, dividend yield, or growth potential, and calculating the average return for each group. The model then performs a regression analysis between the securities' returns and the market portfolio's returns to determine each group's excess returns. The benchmark return is calculated by taking the weighted average of all groups' excess returns. One advantage of the cross-sectional regression model is its ability

to account for heterogeneity among securities, which can improve the accuracy and reliability of benchmark returns. However, the model also has some limitations, such as the potential subjectivity of grouping securities based on different characteristics and the limited explanatory power of regression models. Overall, the cross-sectional regression model is a practical method for measuring benchmark returns, but it is important to consider its limitations and assumptions when using it. (Fama and French 1992)

This research uses the market model as the benchmark return measurement tool of the BHAR method because the assumptions of the CAPM model are too strict for the consideration of long-term performance, which may not be applicable to the complex real economic environment in practical application. More and more scholars at home and abroad have found that the coefficients β_i in the CAPM model cannot fully explain the cross-sectional expected return of stocks. Compared with the cross-grouping model, the market model is simpler and more intuitive, and is not easy to fall into the "accurate error" of the stock market.

3.5. Parameter Test

In the CAR method, this paper uses the test of AAR (average abnormal return) to test the average abnormal return series of the sample population on any day in the event window period. The purpose of this test is to determine whether the mean value of AAR on that day is significantly non-zero.

This part of the test puts forward assumptions:

$$H_0: \overline{AAR} = 0$$
$$H_1: \overline{AAR} \neq 0$$

The *t*-test formula of the average abnormal return rate AAR_t in day *t* is as follows:

$$t_{AAR_t} = \frac{AAR_t}{S(AAR_t)/\sqrt{n}}$$

The *t*-test formula of the cumulative abnormal return *CAR* in day *t* is as follows:

$$t_{CAR_t} = \frac{CAR_t}{S(CAR_t)/\sqrt{n}}$$

Where, $S\ (CAR_t)$ is the standard deviation of *CAR* value of *n* sample events, and *n* is the number of samples.

Set significance level α, test the CAR and AAR at each time point in the event window. If the calculated t-statistic is greater than the critical value, the null hypothesis is rejected, indicating that the occurrence of a specific event does affect the stock price.

In the BHAR method, this paper also applies conventional *t*-tests, and the hypothesis test is as follows:

$$H_0: \overline{BHAR} = 0$$

$$H_1: \overline{BHAR} \neq 0$$

The formula of *t* statistics is as follows:

$$\theta = \frac{\overline{BHAR_t}}{S(BHAR_t)/\sqrt{n}} \sim t$$

It obeys student t distribution but approximates normal distribution for large samples (according to central limit theorem and asymptotic theory). Where, $\overline{BHAR_t}$ is the average BHAR of *n* samples, and $S\ (BHAR_t)$ is the standard deviation of cross section sample of BHAR of *n* M&A samples in *t* period.

3.6. Variable Design

This project studies the performance difference between state-owned enterprises and private enterprises in M&A events. Furthermore, it also tries to answer what kind of organizational form is more efficient in M&A events in the market. $BHAR_{36}$ is taken as the dependent variable, and the enterprise organization form is taken as the explanatory variable. The control variables of this study are enterprise scale, profitability, leverage, acquisition method, payment method, acquisition type, payment amount, cash flow, management ability, and a variable indicating whether cross-regional acquisition.

This study uses the ROE of the year before the M&A event as a measure of corporate profitability.

The acquisition methods are divided into asset acquisition and non-asset acquisition. The types of M&A are divided into horizontal M&A and vertical M&A.

The payment amount is the natural logarithm of the amount paid by the acquirer for the purchase object.

The cashflow of an organization is the available resources and funds the entity has available. The company's M&A decision is bound to be constrained by the resources available to the company. This study argues the narrative that companies which have a rich level of cash flow, can in turn play a synergistic role when in M&A business negotiations. This study uses free cash flow/total assets at the end of the year before M&A as an indicator to measure this variable.

The management level of an enterprise is a pivotal factor in impacting the performance of organizations during mergers and acquisitions. This study uses Tobin's Q in the year before M&A as a measure of enterprise management level. Tobin Q theory is a famous coefficient proposed by economist Tobin in 1969 (Tobin 1969), namely "Tobin Q" coefficient (also known as Tobin Q ratio). This coefficient is the ratio of the market value of

the enterprise's stock to the replacement cost of the asset represented by the stock. In western countries, the Q ratio fluctuates between 0.5 and 0.6. (Li and Zhu 2006) Therefore, many enterprises wishing to expand their production capacity will find that the cost of acquiring additional production capacity by acquiring other enterprises is much lower than that of starting from scratch. This will give firms existing resources from the target firm, which can be cheaper and utilized. The calculation formula is:

$$Q = \frac{\begin{array}{l}\text{value of circulating stock market} \\ + \text{value of non} - \text{circulating stock market} \\ + \text{liabilities} \\ - \text{short} - \text{term assets}\end{array}}{\text{book value of total assets}}$$

The study also uses a variable indicating whether cross-regional M&A can be divided into cross provincial M&A and non-cross provincial M&A.

Finally, the analysis also considers that M&A events are distributed in multiple years for this study. These also belong to multiple industries of different categories and belong to independent pooled cross section data. The annual dummy variable γ_t is in turn introduced in regression analysis to eliminate the impact of time. The categorical industry variable $Industry_i$ eliminates the impact of industry.

The regression equation is as follows:

$$BHAR_{it} = \beta_0 + \beta_1 IsStateOwn + \delta X_{it} + \gamma_t + Industry_i + \varepsilon_{it}.$$

The vector X_{it} include *ROE*, *IsVertical*, *LnPay*, *FCF*, *Q* and *IsCrossProvince*.

Table 3.6 Variable Definitions

Variable Type	Variable Code	Variable Name	Variable Description
Dependent Variable	BHAR36	Long Term Performance	BHAR return in the 36th month of M&A
Explanatory Variable	SOE	Organizational Form	1 is state-owned holding, 0 is non-state-owned holding
Control Variables	ROE	Profitability	Return on net assets in the year before the merger and acquisition event
	IsVertical	Type of M&A	1 is vertical merger, 0 is horizontal merger
	LnPay	Payment Amount	The natural logarithm of the amount paid by the acquirer for the purchase of the subject matter
	FCF	Free Cash Flow	Free cash flow/total assets at the end of the year before M&A
	Q	Management Ability	Q = (value of circulating stock market + value of non-circulating stock market + liabilities - short-term assets) /book value of total assets
	IsCrossProvince	Whether Cross Regional M&A	1 is cross provincial M&A, 0 is non cross provincial M&A
	Year	Particular Year	Year Fixed Effect
	Industry	Industry	Industry Fixed Effect

4. Analysis

4.1. Empirical Analysis of Short-Term Performance

After applying CAR method to 1455 samples, the descriptive statistical results are shown in Table 4.1, and the results of AAR and CAR are shown in Figure 1.1. Within 30 days after the merger and acquisition of the overall sample companies, AAR has a small change in the [-10,0] range, and most of them are negative. The average abnormal return for M&A fluctuates around zero, there is no increase or decreasing trends visible. It can be seen that mergers and acquisitions have little impact on stock prices before the merger and acquisition announcement date. On the first day after the M&A announcement, the average abnormal return reached a peak of 1.01% and reached 0.58% on the second day. This in turn indicates that the M&A announcement has obvious market reaction in the short term. However, on the 13th and 18th days after the M&A announcement date, the average abnormal return appeared at the trough of - 0.22% and -0.20%, which we can think is caused by the cooling of the market news in the [10, 20] range, the recovery of the market rationality, and the realization of investors after profits.

CAR was almost negative during [-10,0], which shows that the wealth of shareholders did not increase before the merger announcement date. During the first [0,10] period, the CAR increased significantly, and reached a peak of 2.05% on the 10th day. Then, the CAR gradually fell back, and it was 0.82% on the 30th day. It shows that the CAR obtained by the shareholders of the acquiring company is almost always positive from the announcement date until the 30th day after the announcement date, and the wealth of shareholders is increased.

Table 4.1 CAR Method for Overall Samples

Event Day	AAR	CAR	t_ CAR
-10	0.04	0.04	0.07
-9	-0.12	-0.08	-0.13
-8	0.06	-0.02	-0.04
-7	-0.09	-0.12	-0.19
-6	0.04	-0.08	-0.13
-5	0.04	-0.04	-0.06
-4	-0.06	-0.09	-0.16
-3	-0.09	-0.19	-0.31
-2	-0.07	-0.26	-0.43
-1	0.02	-0.23	-0.39
0	0.00	-0.24	-0.39
1	1.01	0.77	1.27
2	0.58	1.35	2.23*
3	0.19	1.54	2.54*
4	0.10	1.64	2.71*
5	0.05	1.70	2.8***
6	0.10	1.79	2.96***
7	0.08	1.88	3.09***
8	-0.03	1.85	3.04***
9	0.08	1.93	3.18***
10	0.12	2.05	3.38***
11	-0.06	1.99	3.28***
12	0.01	2.00	3.3***
13	-0.22	1.78	2.94***
14	-0.01	1.78	2.93***
15	-0.07	1.71	2.81***
16	-0.01	1.70	2.8***
17	0.04	1.73	2.86***
18	-0.20	1.53	2.52**
19	0.06	1.59	2.62**
20	-0.08	1.51	2.49**
21	-0.12	1.40	2.3**
22	-0.06	1.34	2.2**
23	-0.03	1.30	2.15**
24	-0.12	1.18	1.94*
25	-0.13	1.05	1.73*
26	0.04	1.09	1.8*
27	-0.15	0.94	1.55
28	-0.08	0.86	1.42
29	-0.06	0.80	1.32
30	0.01	0.82	1.35

Note: * * *, * * and * are significant at 10%, 5% and 1% levels respectively.

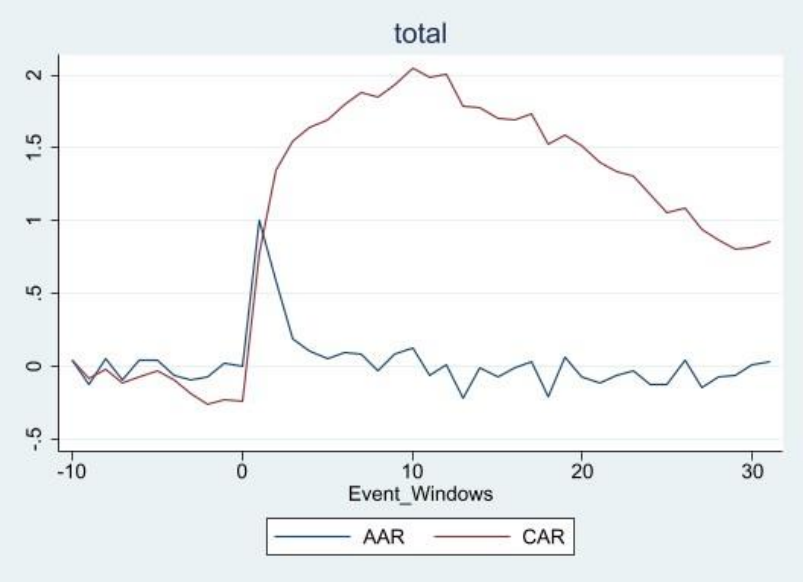

Figure 1.1 AAR and CAR of Population Sample

4.1.1. Sub Sample Analysis by Industry

Figure 1.2 shows the AAR and CAR results of the subsample of industries. After classifying the overall sample by industry category, the remaining nine categories are manufacturing, information transmission, software and information technology services, wholesale and retail, leasing and business services, electricity, heat, gas and water production and supply, construction, real estate, mining, scientific research and technical services, excluding the number of categories with less than 24 samples.

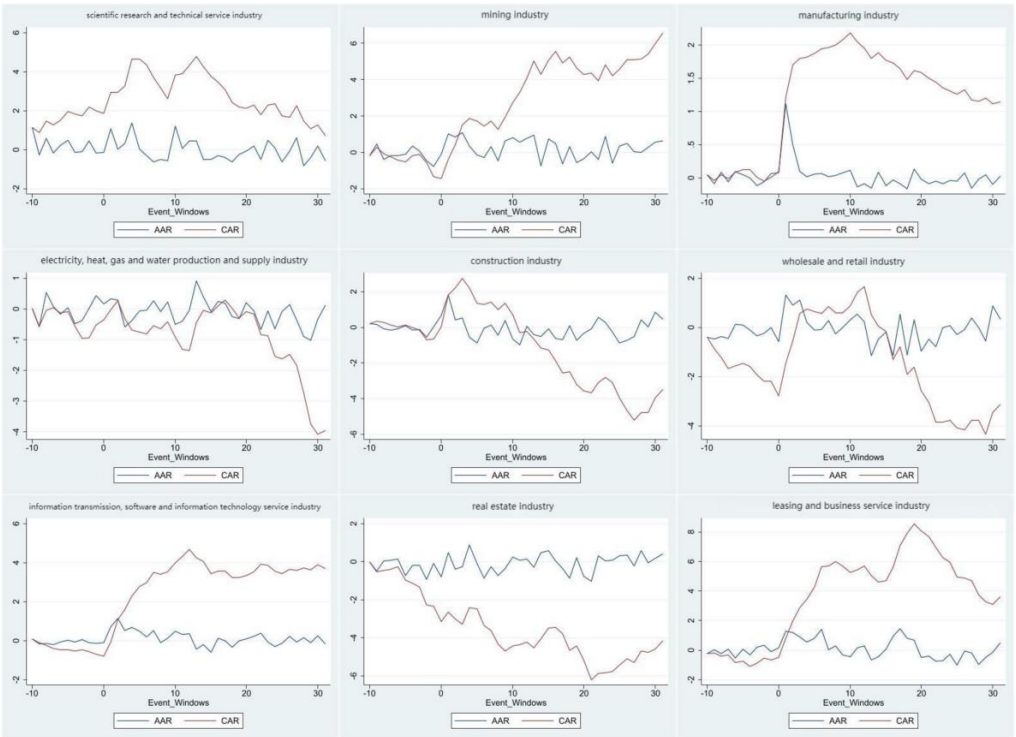

Figure 1.2 Sub Sample AAR and CAR of Branches

(Figure 1.2 corresponds to scientific research and technical service industry: M, electricity, heat, gas and water production and supply industry: D, information transmission, software and information technology service industry: I, mining industry: B, construction industry: E, real estate industry: K, manufacturing industry: C, wholesale and retail industry: F, leasing and business service industry: L)

From the figure, we can see that the trends of manufacturing (C), leasing and business services (L), information transmission, software and information technology services (I) and mining (B) are basically the same as those of the overall sample.

（1）Manufacturing

Furthermore, because of the large number of samples, it has a great impact on the overall sample results, and the manufacturing CAR is also close to the overall sample results. Within the [- 10, 0] range, AAR fluctuates slightly around the zero value, and the average CAR does not exceed 0.05%. CAR reached a peak of 2.19% on the 10th day, and then gradually declined to 1.11% on the 30th day.

（2）Leasing & Business Services

There are 43 samples in this category, mainly distributed in 2010 and later. The AAR of this category fluctuates by more than 0.5% in the [- 10,0] range, and the CAR is -0.66% on the - 1 day. The CAR peak of this category was 8.56% on the 19th, higher than the average of other industries. The CAR value on the 30th day was 3.11%, higher than the peak value of the overall sample. It can in turn be highlighted that the stock price is this industry has a large raising increase after the merger announcement.

（3）Information Transmission, Software & Information Technology Services

There are 151 samples in this category, mainly distributed from 2014 to 2019. The AAR of this category is almost negative in the [- 10,0] range, reaching 0.73% and 1.11% on the first and second days. It can be seen that mergers and acquisitions in this industry have a positive impact on stock prices in the short term. This then illustrates the short-term gains for firms using these methods for growth. CAR was -0.66% one day prior to the announcement date. The CAR peak of this category appeared on the 12^{th} day after the announcement, with a peak of 4.68%. The CAR value on the 30th day was 3.88%, higher than the peak value of the overall sample.

（4）Mining

The number of samples in this category is small, with a total of 24, mainly concentrated in 2012 and 2015. The AAR of this category is almost negative in the [- 10,0] range, reaching 1.03%, 0.83% and 1.09% respectively on the 1st, 2nd and 3rd days, and the CAR reached a peak of 5.97% on the 30th day. It can be highlighted that M&A events in this industry have a positive impact on stock prices in the short term. CAR has always been increasing in the [0, 30] range.

On the other hand, the CAR trends of scientific research and technical services (M),

power, heat, gas and water production and supply (D), construction (E), real estate (K) and wholesale and retail (F) are different.

（5）Scientific Research & Technology Services

The number of samples in this category is small, with a total of 24, mainly concentrated in 2018 and 2019. The AAR of this category is almost negative in the [- 10,0] range, but it reached 1.13% on the - 10 day. The AAR reached 1.03%, 0.83% and 1.09% on the 1st, 2nd and 3rd days respectively, and the CAR reached 4.65% and 4.77% on the 5th and 13th days respectively, forming a double peak. In the [13,30] range, the CAR was 0.72% on the 30th. It can be seen that mergers and acquisitions in this industry have a positive impact on the stock price in the short term. The market style varied, and it has dropped sharply after reaching a second peak stage. The service industry M&A is a long-term strategic deployment. The service industry's long-term M&A performance exceeds the average level of the manufacturing industry, but it is more affected by the crisis. Therefore, the scientific research and technology service industry's M&A events are not favored by investors in the short term.

（6）Electricity, Heat, Gas and Water Production & Supply

The number of samples in this category is also small, totaling 37, mainly from 2017 to 2019. The AAR of this category fluctuates greatly in the [- 10,30] interval, and the AAR in the [0,10] interval does not show obvious anomalies like other categories. Interestingly, CAR declined rapidly in the [20,30] range and reached a low of - 4.08% on the 30th. It can be highlighted that the electricity, heat, gas, etc. mergers and acquisitions will not deliver positive effects on their stock prices in the short-term. It will in turn show negative effects after 20 days of trading, which will not bode well for the firms investing. There are many internal related party transactions in the M&A of power, heat, gas and water production and supply industries. Although this study excludes the sample of related party transactions, the phenomenon of statement whitewashing, risk transfer and benefit transmission cannot be excluded. Thus, the market's expectation of such M&A is conservative. In addition, in the context of the economic downturn, the cost of electricity, heat, gas and water production and supply industries has risen while the prices are under the control of the state. This is often facing a situation where supply exceeds demand and competition intensifies, so investors' expectations of their mergers and acquisitions have been greatly reduced.

（7）Construction

There are 35 samples in the construction industry, which are distributed in 14, 16 and 18 years. The CAR of this category fluctuates positively in the [0,10] range, which means that mergers and acquisitions can have a positive impact on stock prices within a few days

of the first announcement of mergers and acquisitions. However, in the [10,30] range, CAR changed from positive to negative, and fell below -5.20% on the 26th. This shows that the merger and acquisition did not play a positive role in promoting the stock prices of the construction enterprises in the short term after the news popularity faded. According to the research of Xu Hui (2011), before the financial crisis, construction enterprises were mainly engaged in horizontal mergers and acquisitions to improve industry concentration. However, during the financial crisis organizations were mainly only partaking in vertical mergers and acquisitions. This was done to utilize upstream and downstream resources. Thus, the market did not recognize the mergers and acquisitions of construction enterprises.

（8）Real Estate

There are 33 samples of real estate in total. Due to the particularity of real estate in recent years, CAR trend has turned negative before the announcement date, and has been declining in [0,30] days, reaching -4.59% on the 30th. Influenced by the continuous macro-control of the state and the cyclical fluctuations of the industry, horizontal mergers and acquisitions (M&As) for the purpose of acquiring land resources and industry integration have become the main type of M&A activities of real estate enterprises. Both the number and number of transactions are dominant, which is reflected in the fact that large and medium-sized real estate enterprises constantly expand market power, improve market concentration, obtain monopoly profits, and seek 'snowball' growth through M&As of small real estate enterprises. At present, M&A events in the real estate industry in China occur frequently. Thus, with the national policy tendency of promoting the merger and reorganization of the real estate industry and improving the industrial concentration, real estate M&A is often accompanied by the nature of the reorganization and rescue, so real estate M&A events cannot bring positive effects in the short term.

（9）Wholesale & Retail

There are 44 samples in this category, and the distribution is concentrated in 15-19 years. The AAR of this category is almost negative in the [- 10, 0] range, so the CAR has dropped to -2.78% before the IPO on the merger announcement date. In the range [0,30], positive stock price fluctuations were created due to the initial announcement of mergers and acquisitions. CAR reached a peak of 1.65% on the 12th, then turned negative, and reached -4.35% on the 29th. Liao Yunfeng (2010) believes that the performance level of the retail industry has not reached an effective state since 2002. The established resources fail to bring maximum benefits. This highlights that China's retail sector is in a negative development trend in recent years. The reason is that China's retail industry is in a saturated state and there

is widespread vicious competition in the industry, which leads to the general ineffectiveness of enterprise performance. Therefore, the merger and acquisition of retail and wholesale industry cannot promote the stock price to rise in the short term.

4.1.2. Sub Sample Analysis Based on Three Different Periods

This section divides the overall sample into three parts according to the year of M&A events, namely, 2000-2009, 2010-2014 and 2015-2019.

（1）A Sample of 62 M&As from 2000 to 2009.

Within the range of [- 10, 0], AAR fluctuated slightly from zero to zero. CAR remained positive before the announcement date of merger and acquisition and turned negative after the announcement date of merger and acquisition, reaching -5.26% on the 30th. In the first decade of the 20th century, China's capital market developed rapidly, and M&A events were also increasing. However, with China being an emerging market the regulations which are currently in place are not perfect for investors. Investors are irrational and the information is not valid to invest. There is a possibility of insider trading before the announcement of the merger and acquisition event, and after the merger and acquisition event, there is also a tunneling behavior of major shareholders. Therefore, on the one hand, investors do not recognize the short-term performance brought by the merger and acquisition. On the other hand, due to the possibility of potential insider trading, market operators have the motivation to take advantage of good shipping.

Zhang Xin (2003), when explaining the poor M&A performance of China's enterprises in the early stage, believed that, on the one hand, Chinese entrepreneurs are still immature and like to speculate on concepts. They will enter fields they are not familiar with. Believe in their ‘wrong judgment’, which makes the M&A and reorganization of companies’ blind. The final result is to destroy the value of the acquired companies. On the other hand, the defects in the governance of listed companies in China lead to widespread insider control, so the agency problem is particularly noteworthy in China. The unscientific decision-making mechanism of M&A transactions directly affected the quality of early M&A transactions in China.

（2）249 Samples From 2010 to 2014

In the [- 10, 0] range, AAR fluctuated slightly, but almost all of them were negative. Therefore, CAR remained negative before the merger announcement date. On the first day after the merger announcement date, AAR exceeded 2%, CAR quickly became positive, and reached a peak of 4.85% on the seventh day, then gradually decreased, and reached 2.67% on the 30th. It can be seen that during the period of 10 to 14 years, M&A events can have a

greater positive effect on stock prices in the short term.

During the period from 2010 to 2014, China's capital market experienced a three-year bear market from 2010 to 2013. Only in the second half of 2014 did China deepen its institutional reform and usher in a bull market in 2015. During the period of 10-14 years, the market was generally depressed. Chinese investors' investment philosophy was not yet mature, and they liked to speculate about hot spots. Mergers and acquisitions events were marketed as inciting events, to entice investors into venturing on investment in M&A. Therefore, the benchmark return rate was low and the excess return rate was high during this period.

（3）1144 Samples From 2015 to 2019

In the [- 10, 0] range, AAR fluctuated slightly up and down the value of 0. CAR remained negative before the merger announcement date. On the first day after the merger announcement date, AAR was close to 1%. CAR quickly became positive and reached a peak of 1.74% on the 10th day, then gradually decreased, and reached 0.74% on the 30th day, which was smaller than the overall sample value.

The period from 2015 to 2016 was a bull market. China's capital market has achieved unprecedented development, accompanied by the rise of high-end manufacturing in China. Among the 1144 samples, there are 764 samples of manufacturing M&A, accounting for more than 66%. Additionally, due to the changes in Chinese investors' mindsets, the nation's market has become stronger and efficient. Thus, making it a fruitful market to invest in M&A to boost development for organisations. After the announcement of the merger and acquisition event, the stock prices gradually reflect the company's value fairly, and will not overcorrect as it did in the previous five years. The promotion of the merger and acquisition event on short-term stock prices is positive, but the volatility has been suppressed to a certain extent.

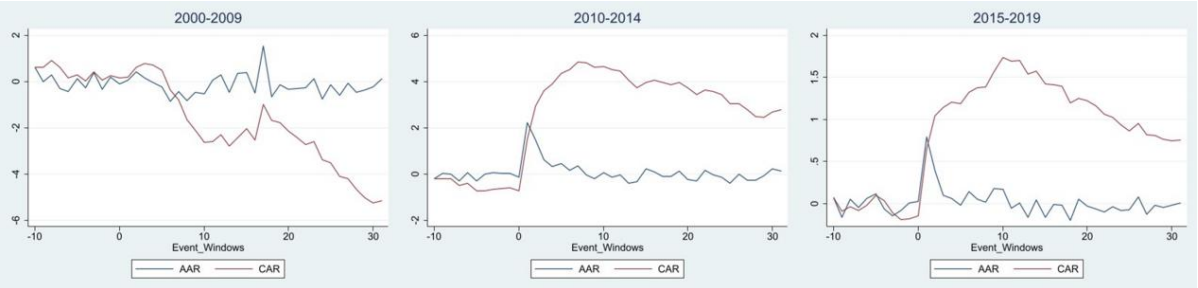

Figure 1.3 AAR and CAR of the Sample by Year

(From left to right, the samples of M&A in 2000-2009, 2010-2014 and 2015-2019 respectively)

4.1.3. Sub Sample Analysis of Organizational Form

In this section, the overall sample is divided into three organizational forms: state-owned enterprises, private enterprises and foreign capital for experiments. The purpose is to test the short-term impact of mergers and acquisitions on company stock prices under different organizational forms.

（1）State-Owned Enterprise

The CAR of this subsample showed a trend of first rising and then declining in the [0, 30] range. The peak value appeared on the seventh day, with CAR reaching 2.52%, and on the 30th day, CAR reaching 0.64%. China has experienced the transition from a planned economy to a market economy. The path of economic development is different from that of most countries. The extent of government intervention in enterprise mergers and acquisitions varies vastly between China and western nations. This is primarily due to the power of the Chinese government within the state, as there is only one governing party. They in turn have a stronghold on policies and legislation within the nation. This is reflected in the way the Chinese government acts in enterprise mergers and acquisitions, which has both the common characteristics of 'universal intervention' and Chinese characteristics. In the short term, the capital market has a good response to the merger and acquisition of state-owned enterprises, and the positive effect of the stock price after the announcement of the merger and acquisition of state-owned enterprises is obvious.

（2）Privately Operated

The CAR of this subsample is negative in the [- 10,0] range. The CAR in the [0, 30] range first rises and then decreases. The peak value appears on the 12th day, CAR reaches 1.84%, and CAR reaches 0.54% on the 30th day. This result is surprising, which shows that the short-term market performance of private enterprises is inferior to that of state-owned enterprises.

According to the overconfidence hypothesis of managers, the value of the acquiree company is wrongly estimated due to overconfidence and optimism, which leads to the acquisition of the target company at an excessive price, thus damaging the shareholders and investors of the acquirer company. The "arrogance" of the managers of private enterprises may bring losses to the acquiring companies, which is not conducive to the M&A performance of enterprises. On the other hand, the transaction cost of M&A of private enterprises is often higher than that of state-owned enterprises, and sometimes they will participate in M&A at a higher market price, resulting in a higher risk of goodwill impairment. In China, SOEs are subject to stronger regulatory constraints, and managers

rarely speak out when making decisions. Although this will reduce the efficiency of SOEs' market participation to some extent, it also makes it easier for them to avoid risks. Therefore, the market's response to this in the short term is not as strong as that of state-owned enterprises and foreign investors.

（3）Foreign Capital

The CAR of this subsample shows a band rising trend in the [0, 30] range. The peak value of the first band appears on the 5th day, and the CAR reaches 5.53%. Then it decreases slightly, continues to rise on the 15th day, and the CAR reaches 7.11% on the 30th day. Such a high CAR indicates that the Chinese market is more inclined to mergers and acquisitions in the Chinese market with foreign participation. After China's accession to the World Trade Organization in 2001, foreign capital M&A, as a new way of capital operation, has been highly valued by the government and enterprises. Enterprise capital structure restricts the behavior of enterprise managers and reduces agent risk. On the other hand, more mature and stronger overseas capital entering enterprises provides more confidence to the capital market.

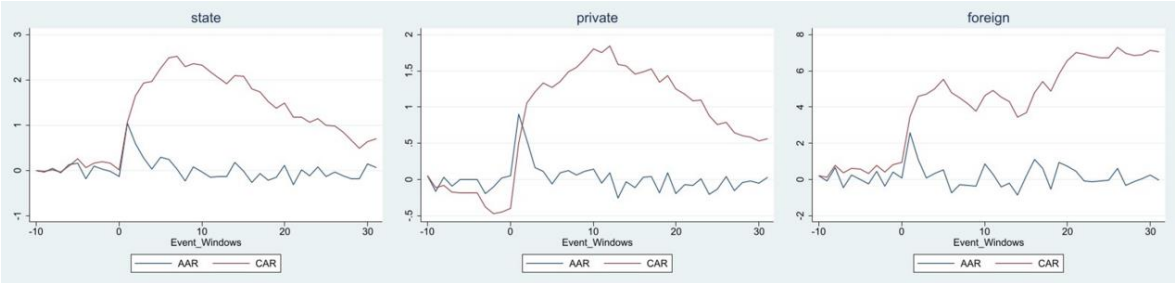

Figure 1.4 AAR and CAR of the Sample by Year

(From left to right, the samples of mergers and acquisitions of state-owned enterprises, private enterprises and foreign investors are respectively.)

4.2. Long-Term Performance Analysis

The measurement results and statistical tests of long-term market performance are mainly summarized in Table 4.2. It can be seen from Table 4.2 that, on average, the long-term market performance is positive no matter 12 months, 24 months or 36 months after M&A, and the value of 36 months is about 13.68%, indicating that in the long run, M&A creates value for the shareholders of the acquirer's enterprise.

Table 4.2 Overall Performance of Acquirers: Descriptive Statistics, Statistical Tests (%)

Period	BHAR12	BHAR24	BHAR36
avg	5.18	10.19	13.68
min	-96.98	-156.92	-173.59
max	559.44	752.25	1587.62
std	46.13	75.65	114.01
avg>0	25.25	60.59	93.98
avg<0	-7.49	-21.63	-37.03
t	4.28(***)	5.13(***)	4.57(***)

Note: * * * means significant at 1% level.

Figure 1.5 shows the BHAR trend of the overall sample and the trend for the subsample of transactions generating the positive and negative BHAR mean values after 12 months. In the graph, the abscissa represents the month and the ordinate represents the buy and hold return in %. This paper divides the overall sample into positive BHAR and negative BHAR according to the sign of BHAR in the 12th month. The results show that the absolute value of the sample return of positive BHAR is significantly higher than that of negative BHAR sample. It can be highlighted that for the long-term performance brought by mergers and acquisitions, the income from 'value creation' is much higher than the loss from 'value destruction'.

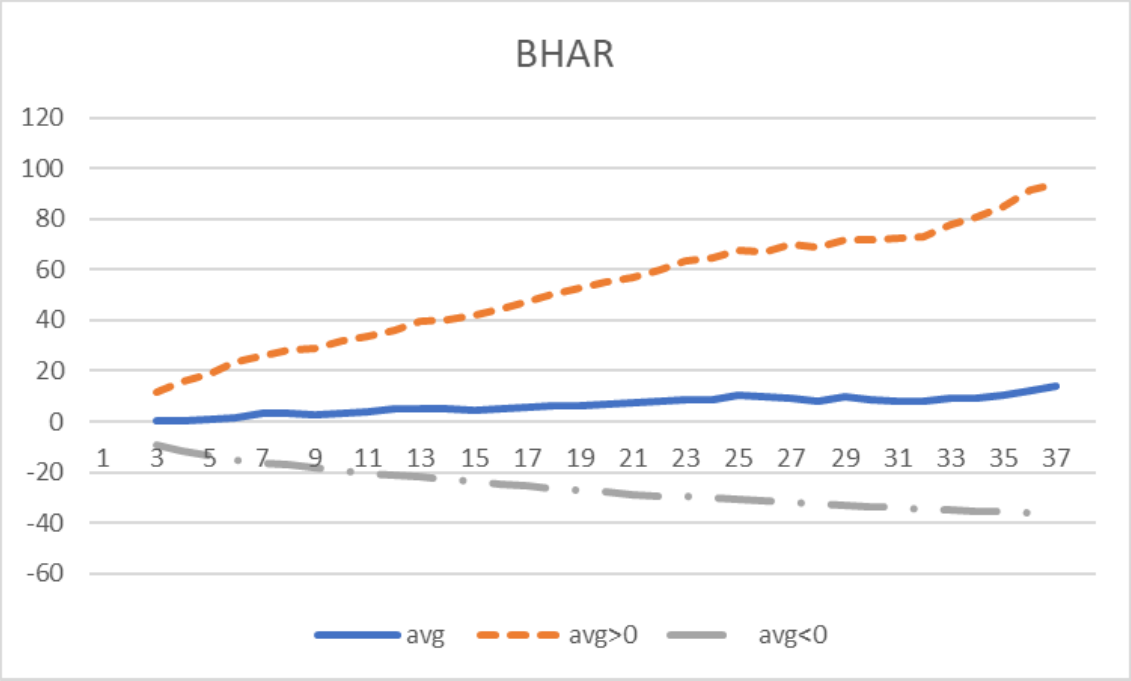

Figure 1.5 Sample BHAR

4.3. The Influence of Organizational Form on the Long-Term Performance of Mergers and Acquisitions

First, the descriptive statistics of variables are shown in Table 4.3 below:

Table 4.3 Descriptive Statistics

	obs	avg	std	med	min	max
BHAR36	1455	12.58	114.05	-15.97	-177.59	1587.62
IsStateOwn	1455	0.27	0.44	-	0.00	1.00
ROE	1455	7.68	8.49	7.05	-28.07	91.94
IsVertical	1455	0.54	0.50	-	0.00	1.00
LnPay	1455	17.53	4.59	16.77	0.00	23.29
FCF	1455	0.02	0.13	0.11	-0.99	0.89
Q	1455	1.16	1.90	1.21	-1.29	4.36
IsCrossProvince	1455	0.36	0.48	-	0.00	1.00
Year	1455	-	-	-	2000	2019

This section uses the following regression equation to prove that the performance of long-term M&A is affected by the corporate organizational form.

$$BHAR_{it} = \beta_0 + \beta_1 IsStateOwn + \delta X_{it} + \gamma_t + Industry_i + \varepsilon_{it}$$

The results are as follows:

Table 4.4 Regression Results of Overall Samples

	（1）
	Population Regression Model
IsStateOwn	-12.323*
	(-1.83)
FCF	57.560**
	(2.54)
ROE	0.001
	(0.31)
IsVertical	-0.894
	(-0.15)
LnPay	-0.612
	(-0.93)
Q	-1.528
	(-0.97)
IsCrossProvince	-11.005*
	(-1.75)
_ cons	31.652**
N	1455

Note: * * *, * * and * are significant at 10%, 5% and 1% levels respectively.

From regression (1), we can see that the regression coefficient of *IsStateOwn* is -12.323, and it is statistically significant at the level of 10%, which indicates that compared with non-state-owned enterprises, the market performance of state-owned enterprises is worse 36 months after the merger announcement. At the same time, it shows that the integration ability of private enterprises is stronger 36 months after M&A, which can better play the synergy of enterprises.

Next, we regress the positive BHAR and the negative BHAR respectively to get the results in Table 4.4:

Table 4.4 Regression Results of Positive BHAR and Negative BHAR Samples (contd.)

	(4)	(5)
	Negative BHAR	Positive BHAR
IsStateOwn	-35.291**	-0.198
	(-2.37)	(-0.12)
FCF	44.526	6.429
	(0.77)	(1.26)
ROE	-0.073	-0.000
	(-0.22)	(-0.26)
IsVertical	10.867	-0.268
	(0.88)	(-0.19)
LnPay	0.698	-0.159
	(0.54)	(-0.93)
Q	9.996**	0.670**
	(2.08)	(2.03)
IsCrossProvince	-6.992	-1.517
	(-0.53)	(-1.02)
_ cons	78.112***	-33.178***
	(3.30)	(-10.21)
N	548	902

Note: * * *, * * and * are significant at 10%, 5% and 1% levels respectively.

It can be seen from the column (4) that when the negative BHAR is taken as the explained variable, the regression coefficient of *IsStateOwn* reaches -35.291, which is significant at the 5% level. This shows that SOEs play a significant role in companies with poor M&A performance (*t*=-2.37), while they play little role in companies with good M&A performance (*t*=-0.198). If we think that these M&A activities with poor M&A performance ($BHAR_{36}$<0) are inefficient, and the impact of state-owned enterprises on the performance of M&A companies is mainly concentrated on the companies with poor M&A performance, it shows that state-owned enterprises have more inefficient M&A.

Combined with regression analysis (5), it can be seen whether state-owned enterprises have not had much impact on the results in efficient M&A events, while management level

Q has a significant impact on $BHAR_{36}$. In inefficient ($BHAR_{36}<0$) M&A events, enterprises with high management level can reduce the degree of "value destruction" caused by M&A, while in efficient ($BHAR_{36}>0$) M&A events, the impact of management level is less obvious.

Then, we divided the overall sample into M&A events before 2015 and M&A events after 2015 (BHAR36 is the dependent variable here), regressed the subsample and obtained the following results:

Table 4.5 Regression Results of BHAR Samples Before 2015 and After 2015

	(6)	(7)
	Before 2015	After 2015
IsStateOwn	-34.463*	-8.905
	(-1.86)	(-1.25)
FCF	92.503	8.829
	(1.30)	(0.39)
ROE	0.035	0.002
	(0.27)	(0.63)
IsVertical	15.736	-0.675
	(0.89)	(-0.11)
LnPay	-1.156	0.684
	(-0.62)	(1.02)
Q	0.800	0.036
	(0.12)	(0.02)
IsCrossProvince	-8.093	-10.591*
	(-0.44)	(-1.70)
N	309	1143

Note: * * *, * * and * are significant at 10%, 5% and 1% levels respectively.

According to regression (6), when focusing on transactions before 2015 and using BHAR36 as the dependent variable, the regression coefficient of *IsStateOwn* reached -34.463, which was significant at the 10% level. This shows that SOEs have played a negative role in M&A before 2015. However, after 2015, the long-term performance impact of SOE M&A is not significant, indicating that the impact of SOEs has been weakened. This in turn highlights that the further the intervention of the Chinese state in market-oriented reform the further negative impact it has on state-owned firms. Thus, with the negative impact in state-owned enterprises M&As are slowly weakening.

In addition, in the M&A sample after 2015, the regression coefficient of cross provincial M&A reached -10.591 and was significant at the level of 10%, suggesting that cross-provincial M&A destroy M&A, but only in transactions after 2015. The free flow of capital across regions is not only conducive to the optimal allocation of resources, but also can help the implementation of regional coordinated development strategies. In recent years, due to the acceleration of cross-regional industrial collaboration, the separation between

China's regional markets has gradually broken, and the frequency of cross-regional mergers and acquisitions of enterprises is increasing. In addition, in the context of Sino-US trade frictions, China has broken the market segmentation between regions and built a ‘new development pattern with domestic big circulation as the main body and domestic and international double circulation promoting each other’.(Huang 2020) In order to fully tap domestic potential, the state will also encourage enterprises to conduct cross-regional mergers and acquisitions. However, cross-regional M&A is a typical contract intensive economic activity. Any aspect that is poorly considered may lead to incomplete contracts, making M&A more difficult and affecting M&A performance. Therefore, in the M&A events after 2015, cross provincial M&A has played a significant negative role.

5. Conclusion

5.1. Research Conclusion

The M&A activity in China, which takes modern enterprises as the main organizational form, began in the early 1980s. With the promotion of market economic reform and the establishment of the modern enterprise system, the M&A of Chinese enterprises has experienced a development process from scratch. This has ranged from administrative dominance to market spontaneity, from nonstandard to slowly standardized. The non-tradable share reform started at the end of April 2005 has brought opportunities for M&A in China, which has seen opportunities to boost this sector. The number of M&A has increased vastly in China and the transactions of listed companies have ventured onto great heights.

What can M&A bring to the company? What can it bring to investors? These questions may have different answers in any space domain and time domain. Furthermore, because the existing research conclusions are different, this paper analyses the short-term market performance and long-term market performance of M&A events. It in turn discusses them based on industry, years, ownership form. The thesis tries to answer the following questions: First, what is the impact of M&A on the acquirer's stock price in the short term after the announcement of the M&A event? Second, three years after the M&A event, can the M&A event provide a boost to the market performance of the acquirer? Third, what impact will the different industries of the acquirer have on the short-term or long-term performance of the acquisition? Fourth, as China's capital market is deepening reform, will M&A events in different periods bring different results? Fifth, will the organizational form of the acquirer affect the post-merger market performance?

This study selects 1455 eligible M&A events from 2000 to 2019, studies the sample events, and draws the following conclusions from the previous analysis:

（1）M&A events can bring a positive effect on the stock price of listed companies in the short term, but the effect seems to revert slightly 20 days after the announcement. This conclusion satisfies the first hypothesis of this study. It can be highlighted that M&A has a clear stock price impact and can bring good investments in for the securities market in the nation. However, market sentiment will recover soon, and the excess return rate will gradually decline.

（2）In terms of short-term stock price reactions to M&A announcements, firms from different industries display different effects. Manufacturing (C), leasing and business services (L), information transmission, software and information technology services (I) and mining (B) can bring strong positive reactions. Scientific research and technical services (M), electricity, heat, gas and water production and supply (D), construction (E), real estate (K)

and wholesale and retail (F) did not perform well.

（3）In terms of short-term stock price fluctuation, M&A in different years will have different performances. Specifically, M&A events in the first 10 years of the 21st century did not have a significant positive effect on stock prices. However, M&A transactions in the second half of the sample period exhibit positive effects on stock prices, especially in the years after 2015.

（4）M&A events can bring positive market performance to listed companies' stocks in the long run. According to the synergy theory, after the merger and acquisition, the company can play a synergistic effect to improve its comprehensive ability, and the improvement of ability is reflected in the market performance.

（5）When looking at the long-term performance of M&A, non-state-owned enterprises perform well. Compared with non-state-owned enterprises, the market performance of state-owned enterprises is worse 36 months after the M&A announcement. On the one hand, state-owned enterprises do not pay much attention to the improvement of business performance when conducting mergers and acquisitions. This is in turn based on the overall national strategic layout, while most mergers and acquisitions of non-state-owned enterprises take economic interests as the priority. This is done while considering the maximization of enterprise profits, which is the core goal of the firm investing into an M&A. On the other hand, state-owned enterprises are more likely to fall into the principal-agent trap and the tunneling trap of large shareholders, thus making M&A inefficient. Empirical evidence shows that the effect of state-owned enterprises cannot be ignored and is very significant in inefficient M&A.

（6）This paper compares the long-term performance of M&A before 2015 and after 2015, and shows that the long-term performance of state-owned enterprises M&A before 2015 is poor, while the long-term performance of state-owned enterprises M&A after 2015 is no longer as significant as before 2015. This proves that the marketisation reform of state-owned enterprises has been carried out successfully since 2015.

5.2. Research Prospect

This study selects the M&A events between 2000 and 2019 and obtains 1455 sample events through applying strict screening conditions. It studies the impact of M&A events on the company's market performance, partially answers the questions of ‘whether M&A can create value’ and ‘what kind of M&A can create value’, and has made certain research achievements, but there are still deficiencies and room for further research.

First of all, the time span of this study covers 20 years, but the number of eligible samples from 2000 to 2010 is limited, which has a certain impact on the accuracy of the study. Second, there are many factors that affect the performance of enterprise M&A, and the variables selected in this paper are limited. The follow-up research will continue to explore other factors that affect the performance of enterprise M&A in China. Finally, although this study analyses the impact of M&A on market performance from an empirical perspective, the current domestic theories related to M&A are not mature enough to keep up with the rapidly changing capital market. Subsequent research will focus on theoretical research to further explain the issues such as 'whether M&A creates value', 'how Chinese enterprises should conduct M&A today', and 'how investors can obtain profits from M&A'. These further studies will help gain a deeper understanding of the research topic as a whole and will help explore new narratives.

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Appendix A: Subsample result

Table A1: Manufacturing

Event day	AAR	CAR	t_CAR
-10	0.05	0.05	0.09
-9	-0.09	-0.04	-0.07
-8	0.09	0.05	0.09
-7	-0.06	-0.01	-0.02
-6	0.09	0.08	0.14
-5	0.05	0.13	0.22
-4	0.00	0.13	0.22
-3	-0.12	0.01	0.02
-2	-0.06	-0.05	-0.09
-1	0.06	0.01	0.02
0	0.08	0.09	0.15
1	1.12	1.21	2.06***
2	0.49	1.70	2.9***
3	0.10	1.80	3.07***
4	0.02	1.82	3.11***
5	0.05	1.87	3.2***
6	0.07	1.94	3.32***
7	0.02	1.96	3.35***
8	0.03	2.00	3.41***
9	0.07	2.07	3.54***
10	0.11	2.19	3.73***
11	-0.14	2.05	3.49***
12	-0.09	1.96	3.34***
13	-0.16	1.80	3.07***
14	0.08	1.88	3.21***
15	-0.12	1.77	3.01***
16	-0.03	1.73	2.96***
17	-0.09	1.64	2.8***
18	-0.16	1.48	2.52***
19	0.13	1.61	2.75***
20	-0.02	1.59	2.71***
21	-0.09	1.50	2.56***
22	-0.05	1.45	2.47***
23	-0.09	1.35	2.31***
24	-0.04	1.31	2.24***
25	-0.05	1.26	2.15***
26	0.07	1.33	2.27***
27	-0.16	1.17	2.00***
28	-0.02	1.16	1.97**
29	0.05	1.20	2.06***
30	-0.09	1.11	1.90**
31	0.03	1.14	1.94**

Note: * * *, * * and * are significant at 10%, 5% and 1% levels respectively. The same below.

Table A2: Leasing & Business Services

Event day	AAR	CAR	t_CAR
-10	-0.23	-0.23	-0.1
-9	0.04	-0.18	-0.08
-8	-0.22	-0.40	-0.17
-7	0.08	-0.33	-0.14
-6	-0.52	-0.85	-0.37
-5	0.08	-0.76	-0.33
-4	-0.33	-1.10	-0.47
-3	0.21	-0.88	-0.38
-2	0.34	-0.54	-0.23
-1	-0.12	-0.66	-0.29
0	0.16	-0.49	-0.21
1	1.28	0.79	0.34
2	1.20	1.98	0.86
3	0.89	2.88	1.25
4	0.56	3.44	1.49*
5	0.82	4.26	1.84**
6	1.39	5.65	2.44***
7	0.03	5.68	2.46***
8	0.30	5.98	2.59***
9	-0.30	5.68	2.46***
10	-0.44	5.24	2.27***
11	0.17	5.41	2.34***
12	0.28	5.69	2.46***
13	-0.66	5.03	2.17***
14	-0.43	4.60	1.99**
15	0.08	4.68	2.02***
16	0.94	5.62	2.43***
17	1.46	7.09	3.06***
18	0.80	7.89	3.41***
19	0.67	8.56	3.7***
20	-0.48	8.08	3.49***
21	-0.39	7.69	3.33***
22	-0.74	6.95	3.01***
23	-0.71	6.24	2.7***
24	-0.28	5.96	2.58***
25	-1.00	4.96	2.15***
26	-0.07	4.89	2.11***
27	-0.21	4.68	2.02***
28	-0.95	3.73	1.61*
29	-0.47	3.26	1.41*
30	-0.15	3.11	1.35*
31	0.49	3.60	1.56*

Table A3: Information Transmission, Software & Information Technology Services

Event day	AAR	CAR	t_CAR
-10	0.09	0.09	0.06
-9	-0.18	-0.10	-0.07
-8	-0.12	-0.22	-0.15
-7	-0.19	-0.41	-0.28
-6	-0.06	-0.47	-0.32
-5	0.01	-0.46	-0.32
-4	-0.06	-0.52	-0.36
-3	0.05	-0.47	-0.32
-2	-0.11	-0.58	-0.4
-1	-0.13	-0.71	-0.49
0	-0.09	-0.80	-0.55
1	0.73	-0.07	-0.05
2	1.14	1.07	0.74
3	0.53	1.60	1.1
4	0.69	2.29	1.58*
5	0.48	2.77	1.91**
6	0.20	2.97	2.05***
7	0.53	3.49	2.41***
8	-0.09	3.40	2.35***
9	0.13	3.53	2.44***
10	0.47	4.00	2.76***
11	0.31	4.31	2.97***
12	0.37	4.68	3.23***
13	-0.42	4.26	2.94***
14	-0.21	4.04	2.79***
15	-0.60	3.44	2.37***
16	0.12	3.56	2.46***
17	0.01	3.57	2.46***
18	-0.34	3.23	2.23***
19	-0.01	3.22	2.22***
20	0.11	3.33	2.3***
21	0.21	3.54	2.44***
22	0.39	3.93	2.71***
23	-0.07	3.86	2.66***
24	-0.29	3.57	2.46***
25	-0.13	3.44	2.37***
26	0.22	3.66	2.52***
27	-0.07	3.59	2.47***
28	0.15	3.74	2.58***
29	-0.12	3.62	2.5***
30	0.26	3.88	2.68***
31	-0.17	3.71	2.56***

Table A4: Scientific Research & Technology Services

Event day	AAR	CAR	t_CAR
-10	1.13	1.13	1.27
-9	-0.26	0.86	0.97
-8	0.59	1.46	1.64*
-7	-0.18	1.28	1.44*
-6	0.21	1.49	1.67*
-5	0.47	1.96	2.21***
-4	-0.13	1.83	2.06***
-3	-0.10	1.74	1.95**
-2	0.45	2.18	2.45***
-1	-0.18	2.00	2.25***
0	-0.15	1.86	2.09***
1	1.08	2.94	3.31***
2	0.02	2.96	3.32***
3	0.31	3.27	3.68***
4	1.36	4.63	5.21***
5	0.01	4.65	5.22***
6	-0.31	4.34	4.88***
7	-0.64	3.70	4.16***
8	-0.51	3.19	3.58***
9	-0.57	2.62	2.94***
10	1.19	3.81	4.29***
11	0.07	3.88	4.36***
12	0.45	4.33	4.86***
13	0.44	4.77	5.36***
14	-0.51	4.26	4.79***
15	-0.50	3.76	4.23***
16	-0.29	3.47	3.9***
17	-0.41	3.06	3.44***
18	-0.64	2.42	2.72***
19	-0.22	2.20	2.47***
20	-0.08	2.12	2.38***
21	0.18	2.30	2.59***
22	-0.49	1.81	2.04***
23	0.47	2.28	2.57***
24	0.08	2.36	2.65***
25	-0.64	1.72	1.93**
26	-0.07	1.65	1.85**
27	0.62	2.27	2.55***
28	-0.81	1.46	1.64*
29	-0.39	1.07	1.2
30	0.20	1.27	1.43*
31	-0.55	0.72	0.81

Table A5: Mining

Event day	AAR	CAR	t_CAR
-10	-0.17	-0.17	-0.09
-9	0.46	0.30	0.16
-8	-0.38	-0.09	-0.05
-7	-0.17	-0.25	-0.13
-6	-0.18	-0.43	-0.23
-5	-0.10	-0.53	-0.28
-4	0.35	-0.18	-0.1
-3	0.09	-0.09	-0.05
-2	-0.47	-0.56	-0.3
-1	-0.78	-1.35	-0.72
0	-0.09	-1.44	-0.76
1	1.03	-0.40	-0.21
2	0.83	0.43	0.23
3	1.09	1.51	0.8
4	0.35	1.86	0.99
5	-0.15	1.71	0.91
6	-0.28	1.43	0.76
7	0.31	1.74	0.92
8	-0.45	1.29	0.68
9	0.65	1.94	1.03
10	0.80	2.74	1.45*
11	0.57	3.31	1.76**
12	0.77	4.08	2.17***
13	0.95	5.03	2.67***
14	-0.73	4.30	2.28***
15	0.75	5.05	2.68***
16	0.50	5.56	2.95***
17	-0.63	4.93	2.62***
18	0.31	5.24	2.78***
19	-0.58	4.66	2.47***
20	-0.36	4.30	2.28***
21	0.05	4.35	2.31***
22	-0.39	3.95	2.1***
23	0.87	4.83	2.56***
24	-0.60	4.23	2.24***
25	0.36	4.59	2.43***
26	0.50	5.09	2.7***
27	0.03	5.12	2.71***
28	0.02	5.13	2.72***
29	0.28	5.42	2.87***
30	0.55	5.97	3.17***
31	0.62	6.59	3.5***

Table A6: Electricity, Heat, Gas and Water Production & Supply

Event day	AAR	CAR	t_CAR
-10	0.02	0.02	0.03
-9	-0.59	-0.57	-0.68
-8	0.53	-0.04	-0.05
-7	0.08	0.04	0.05
-6	-0.16	-0.12	-0.15
-5	0.03	-0.09	-0.11
-4	-0.48	-0.58	-0.69
-3	-0.38	-0.95	-1.15
-2	0.01	-0.95	-1.14
-1	0.42	-0.52	-0.63
0	0.16	-0.36	-0.44
1	0.33	-0.03	-0.04
2	0.29	0.26	0.32
3	-0.58	-0.32	-0.39
4	-0.37	-0.69	-0.83
5	-0.06	-0.76	-0.91
6	-0.05	-0.81	-0.98
7	0.27	-0.54	-0.65
8	-0.10	-0.64	-0.77
9	0.22	-0.41	-0.5
10	-0.50	-0.92	-1.11
11	-0.40	-1.32	-1.59*
12	-0.04	-1.35	-1.63*
13	0.91	-0.45	-0.54
14	0.40	-0.05	-0.06
15	-0.09	-0.14	-0.17
16	0.24	0.10	0.12
17	0.19	0.29	0.35
18	-0.26	0.03	0.03
19	-0.33	-0.30	-0.36
20	0.21	-0.09	-0.11
21	-0.07	-0.17	-0.2
22	-0.66	-0.83	-1
23	-0.06	-0.89	-1.07
24	-0.65	-1.54	-1.85**
25	-0.08	-1.62	-1.95**
26	0.15	-1.47	-1.77**
27	-0.36	-1.83	-2.21***
28	-0.89	-2.72	-3.28***
29	-1.02	-3.75	-4.51***
30	-0.33	-4.08	-4.91***
31	0.13	-3.95	-4.75***

Table A7: Construction

Event day	AAR	CAR	t_CAR
-10	0.20	0.20	0.12
-9	0.15	0.35	0.2
-8	-0.07	0.27	0.16
-7	-0.15	0.13	0.07
-6	-0.09	0.04	0.02
-5	0.09	0.13	0.08
-4	-0.16	-0.03	-0.02
-3	-0.13	-0.16	-0.09
-2	-0.54	-0.70	-0.4
-1	0.02	-0.68	-0.39
0	0.69	0.01	0
1	1.81	1.82	1.05
2	0.41	2.23	1.28
3	0.53	2.76	1.59*
4	-0.54	2.22	1.28
5	-0.88	1.34	0.77
6	-0.05	1.29	0.74
7	0.14	1.43	0.83
8	-0.44	0.99	0.57
9	0.37	1.36	0.79
10	-0.66	0.71	0.41
11	-1.00	-0.29	-0.17
12	0.07	-0.22	-0.13
13	-0.43	-0.65	-0.37
14	-0.52	-1.17	-0.67
15	-0.09	-1.26	-0.73
16	-0.63	-1.90	-1.09
17	-0.68	-2.58	-1.49*
18	0.10	-2.48	-1.43*
19	-0.74	-3.22	-1.86**
20	-0.35	-3.57	-2.06***
21	-0.09	-3.66	-2.11***
22	0.55	-3.11	-1.79**
23	0.28	-2.82	-1.63*
24	-0.26	-3.08	-1.78**
25	-0.88	-3.97	-2.29***
26	-0.72	-4.69	-2.7***
27	-0.51	-5.20	-3***
28	0.40	-4.80	-2.77***
29	0.03	-4.77	-2.75***
30	0.83	-3.94	-2.27***
31	0.46	-3.49	-2.01**

Table A8: Real estate

Event day	AAR	CAR	t_CAR
-10	-0.03	-0.03	-0.02
-9	-0.49	-0.51	-0.38
-8	0.05	-0.46	-0.34
-7	0.08	-0.38	-0.28
-6	0.13	-0.25	-0.19
-5	-0.71	-0.97	-0.72
-4	-0.18	-1.14	-0.85
-3	-0.19	-1.33	-0.99
-2	-0.93	-2.26	-1.69**
-1	-0.08	-2.34	-1.75**
0	-0.80	-3.13	-2.34***
1	0.49	-2.64	-1.97**
2	-0.39	-3.03	-2.26***
3	-0.25	-3.28	-2.45***
4	0.87	-2.41	-1.8**
5	-0.08	-2.49	-1.86**
6	-0.87	-3.36	-2.51***
7	-0.25	-3.62	-2.7***
8	-0.71	-4.33	-3.23***
9	-0.36	-4.69	-3.5***
10	0.26	-4.43	-3.31***
11	0.07	-4.36	-3.25***
12	0.13	-4.22	-3.15***
13	-0.31	-4.53	-3.39***
14	0.49	-4.05	-3.02***
15	0.57	-3.48	-2.6***
16	0.04	-3.44	-2.57***
17	-0.35	-3.79	-2.83***
18	-0.86	-4.65	-3.47***
19	0.22	-4.42	-3.3***
20	-0.75	-5.17	-3.86***
21	-1.03	-6.20	-4.63***
22	0.32	-5.87	-4.39***
23	0.03	-5.84	-4.36***
24	0.08	-5.76	-4.3***
25	0.32	-5.44	-4.06***
26	0.36	-5.08	-3.79***
27	-0.21	-5.29	-3.95***
28	0.59	-4.71	-3.51***
29	-0.06	-4.76	-3.56***
30	0.17	-4.59	-3.43***
31	0.42	-4.17	-3.11***

Table C9: Wholesale & Retail

Event day	AAR	CAR	t_CAR
-10	-0.39	-0.39	-0.29
-9	-0.47	-0.86	-0.63
-8	-0.37	-1.23	-0.89
-7	-0.45	-1.68	-1.22
-6	0.11	-1.57	-1.14
-5	0.09	-1.48	-1.07
-4	-0.11	-1.59	-1.15
-3	-0.35	-1.94	-1.41*
-2	-0.25	-2.19	-1.59*
-1	0.00	-2.19	-1.59*
0	-0.59	-2.78	-2.02**
1	1.33	-1.46	-1.06
2	0.91	-0.55	-0.4
3	1.10	0.55	0.4
4	0.20	0.75	0.55
5	-0.11	0.64	0.46
6	-0.08	0.56	0.41
7	0.29	0.85	0.62
8	-0.26	0.58	0.42
9	-0.01	0.58	0.42
10	0.30	0.87	0.63
11	0.54	1.42	1.03
12	0.23	1.65	1.2
13	-1.14	0.50	0.37
14	-0.47	0.04	0.03
15	-0.20	-0.16	-0.11
16	-1.16	-1.32	-0.96
17	0.53	-0.79	-0.57
18	-1.13	-1.92	-1.39*
19	0.30	-1.61	-1.17
20	-0.96	-2.58	-1.87**
21	-0.47	-3.04	-2.21***
22	-0.80	-3.84	-2.79***
23	0.00	-3.85	-2.79***
24	0.06	-3.79	-2.75***
25	-0.29	-4.08	-2.96***
26	-0.08	-4.16	-3.02***
27	0.39	-3.77	-2.73***
28	-0.01	-3.78	-2.74***
29	-0.56	-4.35	-3.15***
30	0.88	-3.46	-2.51***
31	0.34	-3.12	-2.26***

Table A10: A Sample of 62 M&As from 2000 to 2009.

Event day	AAR	CAR	t_CAR
-10	0.63	0.63	0.43
-9	-0.02	0.61	0.42
-8	0.29	0.91	0.62
-7	-0.29	0.62	0.42
-6	-0.44	0.17	0.12
-5	0.11	0.28	0.19
-4	-0.26	0.02	0.01
-3	0.39	0.40	0.28
-2	-0.35	0.06	0.04
-1	0.19	0.25	0.17
0	-0.10	0.15	0.1
1	0.05	0.19	0.13
2	0.42	0.61	0.42
3	0.17	0.77	0.53
4	-0.05	0.72	0.49
5	-0.24	0.48	0.33
6	-0.86	-0.37	-0.25
7	-0.42	-0.80	-0.54
8	-0.84	-1.64	-1.12
9	-0.47	-2.11	-1.44*
10	-0.53	-2.63	-1.8**
11	0.05	-2.58	-1.76**
12	0.28	-2.31	-1.58*
13	-0.48	-2.79	-1.9**
14	0.37	-2.42	-1.66*
15	0.38	-2.05	-1.4*
16	-0.49	-2.53	-1.73**
17	1.54	-0.99	-0.68
18	-0.68	-1.67	-1.14
19	-0.13	-1.79	-1.22
20	-0.33	-2.13	-1.45*
21	-0.32	-2.45	-1.67*
22	-0.28	-2.73	-1.86**
23	0.12	-2.61	-1.78**
24	-0.77	-3.38	-2.31***
25	-0.13	-3.51	-2.4***
26	-0.61	-4.11	-2.81***
27	-0.07	-4.19	-2.86***
28	-0.46	-4.65	-3.17***
29	-0.38	-5.02	-3.43***
30	-0.24	-5.26	-3.59***
31	0.12	-5.14	-3.51***

Table A11: 249 Samples from 2010 to 2014

Event day	AAR	CAR	t_CAR
-10	-0.21	-0.21	-0.14
-9	0.01	-0.20	-0.13
-8	0.01	-0.19	-0.12
-7	-0.29	-0.48	-0.31
-6	0.07	-0.41	-0.27
-5	-0.31	-0.73	-0.47
-4	0.01	-0.72	-0.47
-3	0.05	-0.67	-0.44
-2	0.03	-0.64	-0.42
-1	0.04	-0.61	-0.4
0	-0.13	-0.74	-0.48
1	2.23	1.49	0.97
2	1.47	2.95	1.92**
3	0.63	3.58	2.33***
4	0.32	3.90	2.53***
5	0.46	4.36	2.83***
6	0.14	4.50	2.93***
7	0.35	4.85	3.15***
8	-0.03	4.82	3.13***
9	-0.22	4.60	2.99***
10	0.05	4.65	3.02***
11	-0.13	4.51	2.93***
12	-0.05	4.47	2.9***
13	-0.40	4.07	2.64***
14	-0.33	3.74	2.43***
15	0.22	3.96	2.57***
16	0.10	4.06	2.64***
17	-0.09	3.96	2.58***
18	-0.12	3.85	2.5***
19	0.12	3.97	2.58***
20	-0.24	3.73	2.43***
21	-0.29	3.45	2.24***
22	0.17	3.62	2.35***
23	-0.05	3.57	2.32***
24	-0.14	3.43	2.23***
25	-0.40	3.03	1.97**
26	0.00	3.03	1.97**
27	-0.26	2.77	1.8**
28	-0.27	2.50	1.62*
29	-0.06	2.44	1.58*
30	0.23	2.67	1.73**
31	0.12	2.79	1.81**

Table A12: 1144 Samples from 2015 to 2019

Event days	AAR	CAR	t_CAR
-10	0.07	0.07	0.14
-9	-0.16	-0.09	-0.19
-8	0.05	-0.04	-0.08
-7	-0.04	-0.08	-0.16
-6	0.06	-0.02	-0.04
-5	0.12	0.10	0.2
-4	-0.06	0.04	0.07
-3	-0.15	-0.11	-0.23
-2	-0.08	-0.19	-0.4
-1	0.01	-0.18	-0.37
0	0.03	-0.15	-0.31
1	0.79	0.64	1.34*
2	0.40	1.04	2.17***
3	0.10	1.14	2.37***
4	0.06	1.20	2.5***
5	-0.02	1.18	2.46***
6	0.14	1.32	2.75***
7	0.05	1.37	2.86***
8	0.01	1.39	2.89***
9	0.18	1.57	3.26***
10	0.17	1.74	3.62***
11	-0.05	1.69	3.51***
12	0.01	1.70	3.54***
13	-0.17	1.53	3.19***
14	0.04	1.58	3.29***
15	-0.16	1.42	2.95***
16	-0.01	1.41	2.94***
17	-0.02	1.39	2.9***
18	-0.20	1.20	2.49***
19	0.06	1.25	2.61***
20	-0.03	1.23	2.55***
21	-0.07	1.16	2.41***
22	-0.10	1.06	2.21***
23	-0.04	1.02	2.13***
24	-0.08	0.94	1.95**
25	-0.07	0.87	1.81**
26	0.08	0.95	1.98**
27	-0.13	0.82	1.71**
28	-0.01	0.81	1.68*
29	-0.04	0.76	1.59*
30	-0.02	0.74	1.55*
31	0.01	0.76	1.57*

Table A13: State-Owned Enterprise

Event days	AAR	CAR	t_CAR
-10	0.00	0.00	0.01
-9	-0.03	-0.03	-0.04
-8	0.04	0.02	0.03
-7	-0.05	-0.03	-0.05
-6	0.12	0.09	0.14
-5	0.16	0.25	0.39
-4	-0.19	0.07	0.1
-3	0.09	0.16	0.24
-2	0.03	0.19	0.29
-1	-0.03	0.16	0.25
0	-0.14	0.02	0.03
1	1.04	1.06	1.61*
2	0.59	1.65	2.5***
3	0.28	1.94	2.93***
4	0.03	1.97	2.97***
5	0.29	2.25	3.41***
6	0.24	2.49	3.77***
7	0.03	2.52	3.81***
8	-0.23	2.28	3.46***
9	0.08	2.36	3.57***
10	-0.03	2.32	3.52***
11	-0.14	2.18	3.3***
12	-0.13	2.05	3.1***
13	-0.13	1.92	2.9***
14	0.17	2.09	3.16***
15	-0.02	2.07	3.14***
16	-0.27	1.80	2.73***
17	-0.07	1.74	2.63***
18	-0.21	1.53	2.31***
19	-0.16	1.37	2.08***
20	0.11	1.48	2.24***
21	-0.31	1.17	1.77**
22	0.01	1.18	1.78**
23	-0.12	1.06	1.6*
24	0.09	1.14	1.73**
25	-0.14	1.00	1.52*
26	-0.03	0.97	1.47*
27	-0.12	0.85	1.29
28	-0.18	0.67	1.02
29	-0.18	0.50	0.75
30	0.14	0.64	0.97
31	0.07	0.71	1.07

Table A14: Privately Operated

Event days	AAR	CAR	t_CAR
-10	0.05	0.05	0.09
-9	-0.16	-0.11	-0.2
-8	0.03	-0.08	-0.15
-7	-0.09	-0.18	-0.31
-6	0.00	-0.18	-0.32
-5	0.00	-0.18	-0.32
-4	0.00	-0.18	-0.32
-3	-0.19	-0.37	-0.66
-2	-0.10	-0.47	-0.83
-1	0.02	-0.45	-0.79
0	0.05	-0.40	-0.71
1	0.91	0.50	0.89
2	0.55	1.05	1.85**
3	0.16	1.21	2.13***
4	0.12	1.33	2.34***
5	-0.06	1.27	2.23***
6	0.09	1.35	2.38***
7	0.13	1.48	2.61***
8	0.07	1.55	2.72***
9	0.11	1.66	2.92***
10	0.14	1.80	3.17***
11	-0.05	1.75	3.08***
12	0.09	1.84	3.24***
13	-0.25	1.59	2.8***
14	-0.03	1.56	2.75***
15	-0.11	1.45	2.55***
16	0.03	1.48	2.6***
17	0.04	1.52	2.68***
18	-0.18	1.34	2.36***
19	0.10	1.44	2.53***
20	-0.19	1.24	2.19***
21	-0.07	1.17	2.06***
22	-0.09	1.09	1.91**
23	0.01	1.09	1.92**
24	-0.21	0.88	1.56*
25	-0.13	0.75	1.33*
26	0.04	0.79	1.39*
27	-0.15	0.64	1.13
28	-0.04	0.60	1.06
29	-0.02	0.59	1.03
30	-0.05	0.54	0.94
31	0.03	0.56	0.99

Table A15: Foreign Capital

Event days	AAR	CAR	t_CAR
-10	0.20	0.20	0.11
-9	-0.07	0.13	0.07
-8	0.67	0.79	0.42
-7	-0.43	0.36	0.19
-6	0.24	0.61	0.32
-5	-0.02	0.59	0.31
-4	-0.25	0.34	0.18
-3	0.44	0.78	0.41
-2	-0.35	0.43	0.23
-1	0.40	0.83	0.44
0	0.10	0.93	0.49
1	2.56	3.50	1.83**
2	1.11	4.61	2.42***
3	0.09	4.70	2.47***
4	0.31	5.01	2.63***
5	0.52	5.53	2.9***
6	-0.74	4.80	2.52***
7	-0.30	4.49	2.36***
8	-0.33	4.16	2.18***
9	-0.38	3.78	1.99**
10	0.85	4.63	2.43***
11	0.30	4.93	2.58***
12	-0.39	4.53	2.38***
13	-0.22	4.31	2.26***
14	-0.86	3.46	1.81**
15	0.22	3.67	1.93**
16	1.12	4.79	2.51***
17	0.63	5.42	2.84***
18	-0.55	4.87	2.56***
19	0.94	5.81	3.05***
20	0.74	6.55	3.44***
21	0.46	7.01	3.68***
22	-0.07	6.94	3.64***
23	-0.13	6.81	3.57***
24	-0.09	6.72	3.53***
25	-0.03	6.70	3.51***
26	0.60	7.29	3.83***
27	-0.32	6.97	3.66***
28	-0.12	6.85	3.59***
29	0.03	6.88	3.61***
30	0.23	7.11	3.73***
31	-0.05	7.06	3.7***

Resume of the Author

Zhao Jihong, born on December 1962, is a senior economist and the president of Hangzhou ROBM Industrial Group Co., Ltd. His career success has been acknowledged with the prestigious “National Outstanding Entrepreneur” and “International Outstanding Hangzhou Businessman” awards.

Since 2000, in the face of strong competitors, Mr. Zhao has maintained a high-speed growth rate of more than 40% a year, considered as miracle in the industry. Serving as the president of ROBAM Group, he has led the investment of a number of excellent enterprises. Due to his outstanding performance, Zhao Jihong was awarded the titles of "Top Ten Influential Figures in Chinese Kitchen and Bathroom Industry", "Top Ten Individual Figures in Chinese Home Appliance Industry", "The Most Influential Wealth Figures in China", "Hangzhou Top Ten Brand Professional Manager", "Outstanding Manager Achievement Award in Zhejiang Province" and "Mundell World Manager Achievement Award" twice.

Finally, he was selected to figure as a Chinese expert in the “Celebrity Dictionary”.