

**DOUBLE DIAMOND MODEL ON TRANSNATIONAL M&A IN CHINA'S CHIP
INDUSTRY**

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ABSTRACT

This dissertation provides a comprehensive study of the phenomenon of transnational M&A of Chinese chip companies using a combination of literature review, mathematical statistics, and logical analysis. Sixteen representative cases are selected, and the weak links and key factors in the influencing factors of transnational M&A of Chinese chip companies are analyzed through a nine-factor double diamond model. Furthermore, the performance of the cases is analyzed to provide reference for future transnational M&A of Chinese chip companies as well as for government policy-making in the industry.

Key words: Chinese chip companies; transnational M&A; influencing factors; nine-factor double diamond model

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CHAPTER 1

INTRODUCTION

Semiconductor is one of the greatest inventions of the 20th century. After more than 70 years of development, the semiconductor industry has formed a cluster of thousands of chips and nearly 100,000 discrete devices, with a global annual output value of nearly USD 600 billion. The upstream and downstream industries derived from the semiconductor industry, including various electronic products and systems, have a total output value of trillions of dollars, and have further spurred the digital economy industries such as the internet, Internet of Things, and big data, which have an annual output value exceeding USD 40 trillion. The semiconductor industry has driven steady global GDP growth over the past 20 years. According to statistics from the Semiconductor Industry Association (SIA), the global semiconductor market has grown from USD 311.4 billion in 2012 to USD 546.3 billion in 2021, driving global GDP from USD 75.31 trillion to USD 94.94 trillion during the same period.

The semiconductor industry relies heavily on the development and production of chips, which is an area where Chinese companies have struggled to compete. In the midst of the ongoing trade tensions between China and the United States, chips have become a focal point for countries like Europe and the US to counterbalance China's growing influence in the industry. Faced with the dilemma of restrictions on the chip industry, the Chinese government is strengthening its support for domestically innovative chip companies. From the perspective of industry development pattern, the chip industry features huge investment, high iteration frequency, and large investment risk. Therefore,

chip giants and technology giants trying to enter the chip industry often develop and grow through M&As.

Michael Porter, a leading strategic management expert at Harvard Business School, put forward the Michael Porter Diamond Model in 1990, which is highly persuasive in explaining the international competitiveness of enterprises from certain countries. As an innovation based on the Porter Diamond Model, the nine-factor double diamond model treats both the motivations and influencing factors of transnational M&As as endogenous variables and analyzes the competitiveness of the relevant industries by examining these factors.

This dissertation focuses on the transnational M&As by leading enterprises in China's chip industry, analyzes the weaknesses and key factors in the influencing factors in transnational M&As by Chinese chip enterprises with the nine-factor double diamond model through sixteen typical cases, analyzes the performance after M&As, and provides decision-making reference for future transnational M&As by Chinese chip enterprises and industrial policy formulation by the government.

This dissertation is divided into six parts: the first part briefly introduces the main content of this dissertation; the second part introduces the motivation for the research and raises the research questions, namely, the driving forces and challenges faced by Chinese chip companies in cross-border M&A; the third part reviews domestic and foreign literature, borrows their research methods, and describes the main structure and innovation points of this dissertation; the fourth part proposes the concept and model based on a brief analysis of the aforementioned problems, and selects the model and puts forward hypotheses according to the development process of the model and the characteristics of

M&A in the chip industry; the fifth part selects 16 cross-border M&A cases of Chinese chip companies from two stages around 2020 and analyzes the motivations of the acquirers and the short-term performance changes before and after the M&A; and the sixth part, based on summarizing the entire dissertation, puts forward practical and feasible suggestions for the M&A of Chinese chip companies and government support policies in the chip field.

CHAPTER 2

DEVELOPMENT PROCESS OF CHINA'S CHIP INDUSTRY AND THE PROBLEMS IT FACES

The Development of the Chip Industry

From the invention of the transistor by Shockley to today, a period of 75 years, the early semiconductor industry was primarily used in the military field. Later, Japan laid the industrial foundation of the semiconductor industry by producing transistor radios and promoted the rapid expansion of the integrated circuit industry through calculators. In the 1970s, with the rise of personal computers and consumer electronics products, chips became the core of semiconductor industry competition. Chip technology is the result of long-term accumulation of human wisdom, but at critical moments, an important invention and creation may change the direction of chip technology development. ^①In 1971, the US-based company Intel launched the world's first microprocessor 4004 chip. ^②In 1981, IBM launched the world's first personal computer (PC) based on the 8088, marking the beginning of an era driven by PC consumption for chip technology innovation and industrial development. ^③In 1994, the successful development of the 1G DRAM, which integrated 100 million components, marked the era of giant scale integrated circuits (Giga Scale Integrated circuits, GSI). ^④In 1999, the birth of FinFET technology made 3D transistors a further increase in chip transistor density. ^⑤In 2007, Apple introduced the iPhone, marking the beginning of the era of smartphones. ^⑥In 2012, Samsung invented stacked 3D NAND Flash, and chip technology entered the 3D era. The invention of the CPU, PC, and large-scale memory opened the

curtain for global computerization and informationization, formed the Wintel computer architecture, and the desktop internet became the main force for promoting the progress and development of chip technology. Since 2000, the development of such technologies as Internet of Things, 5G communication, and artificial intelligence has injected new momentum into chip technology and industry, and application, innovation, and competition are the inexhaustible driving forces for the development of chip technology and industry.

It is worth noting that the semiconductor industry updates quickly and requires massive investment in equipment. Roughly every four years, there is a large cycle period (Moore's Law), leading to the development of more precise and higher-capacity chips. This often results in many chip companies falling behind the times once they make a wrong decision, with the semiconductor prodigy, Intel, and its old rival AMD's founders both originating from the semiconductor prodigy, which eventually disintegrated after its initial boom. Intel took a nosedive in the 1980s. Nvidia and Micron rose rapidly with less than thirty years.

In the global semiconductor industry, the United States holds nearly half of the market share and is a leader globally. In the past over 20 years, the percentage of the annual R&D spending of US chip enterprises to sales has exceeded 16%, far higher than other countries and regions. In May 2021, the US federal government confirmed an allocation of USD 52 billion for supporting chip research and development. Additionally, in IC Insight's 2020 global semiconductor R&D spending TOP 10 ranking, the US had six companies, with Intel firmly in first place.

China is the world's largest consumer of chips, with a vast consumer market and a complete industrial chain system. However, China's chip companies are always at a disadvantage in global competition. According to IC Insights' data, China's chip market size in 2021 was USD 186.5 billion, and domestic chip output was only USD 31.2 billion, with a self-sufficiency rate of only 16.7%, and companies headquartered in China had a self-sufficiency rate of only 6.6%.

Since entering the 21st century, with the continuous segmentation of the market and the constant rise in production costs, the global chip industry has generally fallen into a quagmire of profit contraction and even sluggish development. The continuous reduction of room for growth and the weak exploration of new space have forced enterprises to slow down their operations, and they can only contract their front line and divest themselves of bad businesses and restructure their existing businesses. This has led to a wave of mergers and acquisitions in the chip industry. Chinese chip companies are also attempting to acquire global leading technology and market share and participate in global competition through mergers and acquisitions.

Problems Facing China's Chip Industry

However, with the outbreak of the China-US trade friction, the chip industry has become the focus of the game between China and the US, after former US President Trump signed a memorandum on March 22, 2018, instructing to impose tariffs on about USD 60 billion worth of goods imported from China and restricting Chinese companies' investment and mergers and acquisitions in the US. Subsequently, Chinese chip companies such as ZTE and Huawei were sanctioned by the US, and the US federal government used diplomatic and commercial means to restrict chip companies from other

countries from cooperating with China. In August 2022, US President Biden officially signed the 2022 Chips and Science Act, which set up a "China barrier" provision, prohibiting subsidized companies from substantially expanding advanced chip production on the mainland of China and engaging in major transactions within 10 years. Subsequently, the US Department of Commerce listed EDA software based on nanometer gate devices, diamond, and gallium oxide wide-bandgap semiconductor materials on the commercial control list, which restricted China's chip design and raw material supply. On October 7, 2022, the US Department of Commerce's Bureau of Industry and Security announced a series of new export control regulations targeting China under the Export Administration Regulations, stipulating that US chip equipment manufacturers must obtain approval from the US Department of Commerce before exporting semiconductor and chip manufacturing equipment to China.

The Chinese government has also long been aware of the problems facing the chip industry. Since the State Council issued the "Several Policies to Further Encourage the Development of the Software and Integrated Circuit Industries" in January 2011, China has introduced policies to support the semiconductor industry from various aspects such as finance and taxation, and industrial coordination every year. The first phase of the National Integrated Circuit Industry Investment Fund, established in September 2014, has a total investment of over RMB 100 billion, and the second phase of the large fund, which raised more than RMB 200 billion, was established in May 2019. As of March 31, 2022, the second phase of the large fund had announced investments in 38 companies, with a total committed investment of RMB 79 billion, of which investment in wafer manufacturing accounted for 75% (RMB 59.4 billion), investment in integrated circuit

design tools and chip design accounted for 10% (RMB 8.1 billion), investment in packaging and testing accounted for 2.6% (RMB 2.1 billion), investment in equipment, components, and materials accounted for 10% (RMB 7.5 billion), and application accounted for 2.4% (RMB 1.9 billion). The second phase of the large fund aims to continuously improve the semiconductor industry chain in order to achieve large-scale development of the integrated circuit industry in the future. The "14th Five-Year Plan for National Economic and Social Development of the People's Republic of China and the Outline of Long-term Goals for 2035" was released during the 2021 Two Sessions, proposing the need to concentrate superior resources to tackle key core technologies in multiple fields, including the integrated circuit field, which includes the development of integrated circuit design tools, key equipment and high-purity target materials, breakthroughs in advanced process and insulated gate bipolar transistor (IGBT), micro-electro-mechanical systems (MEMS) and other featured processes, upgrades in advanced storage technology, and the development of wide-bandgap semiconductors such as silicon carbide and gallium nitride.

This passage describes the expansion of Chinese companies overseas from 2015 to 2017 in an effort to improve their domestic market position through the acquisition of brands, technology, and talent. However, the application of new technologies such as AI and VR has increased the demand for semiconductor chips, leading to intensified competition among technology giants. Despite this, global trade protectionism has hindered Chinese overseas mergers and acquisitions since 2018. On January 13, 2020, the US Department of Treasury, representing the Committee on Foreign Investment in the United States (CFIUS), officially released regulations implementing the Foreign

Investment Risk Review Modernization Act (FIRREA), making it even more stringent for Chinese companies to acquire US firms. According to incomplete public information, in the past five years, CFIUS has vetoed Chinese acquisitions in various fields such as swine, finance, wind power, and autonomous driving, with the semiconductor industry being a sensitive target and accounting for half of the vetoed projects. Even in 2021, the UK-based NWF wafer factory acquired by Nexperia (China) was later revoked, indicating that this tense external environment restricts cross-border mergers and acquisitions by Chinese companies.

Looking back at the US-Japan trade war in the 1980s and 1990s, we can see that the focal point of the US attack on Japan was the semiconductor industry. Through anti-dumping, anti-investment, anti-merger, and patent wars, the US engaged in a full-scale suppression of Japan's semiconductor industry. At the same time, Japan's rigid vertical division of labor restrictions prevented Japanese companies from keeping up with the rapid development of consumer electronics. In the mid-1980s, over 50% of the world's semiconductor products were produced in Japan. In the 1990s, NEC, Toshiba, Hitachi, Fujitsu, and Mitsubishi once held half of the top ten semiconductor companies in the world. Today, only Toshiba remains on the top ten list. In the current US-China trade friction, the US is targeting Chinese high-tech companies represented by Huawei.

In the past few years, major chip-producing countries and regions around the world have increased their support for the chip industry. On May 13, 2021, the South Korean government issued the "K-Semiconductor Strategy," which plans to invest KRW 510 trillion over 10 years and proposes specific measures such as industry clusters, talent cultivation, water and electricity security, regulations, tax incentives, and technology

protection. At the end of 2021, the Japanese government approved a budget amendment, the "Emergency Strengthening of the Semiconductor Industry Comprehensive Plan," which received a budget of JPY 774 billion and covers semiconductor production, semiconductor equipment, 5G communication, and more. In February 2022, the European Commission announced the "European Chips Act," which plans to use more than EUR 43 billion of public and private funds by 2030 to support chip production, pilot projects, startups, and the construction of large chip manufacturing plants, with the goal of increasing the global share of chip production from the current 10% to 20%. In August 2022, the US Congress passed the "Chip and Science Act," providing USD 280 billion in subsidies to the domestic chip industry and restricting some related companies' normal economic and trade activities and investment in China.

While the external environment is not favorable for Chinese chip companies' transnational M&A, a number of corruption cases have occurred at the same time in the Chinese chip industry. From July to September 2022, seven high-ranking officials connected to the National Integrated Circuit Industry Investment Fund (hereinafter referred to as "the IC Fund") were investigated for serious violations, including Lu Jun, the former deputy director of the Development Fund Management Department of the China Development Bank, Ding Wenwu, the former general manager of the IC Fund, Ren kai, the vice president of Huaxin Investment Management Co., Ltd. (the company that manages the IC Fund), Du Yang, the former director of the investment management department of Huaxin Investment Management Co., Ltd., Liu Yang, the former general manager of the No. 2 Investment Department of Huaxin Investment Management Co., Ltd., Yang Zhengfan, the deputy general manager of the No. 3 Investment Department of

Huaxin Investment Management Co., Ltd., and Gao Songtao, the former vice president of Huaxin Investment Management Co., Ltd., who had previously been investigated. In addition, several key figures in the transnational M&A of the chip industry, such as Zhao Weiguo, former chairman of Unigroup, and Diao Shichuan, former president of Unigroup, have been rumored to be under investigation. Media reports are unclear about the specifics of the anti-corruption storm related to the National Integrated Circuit Industry Investment Fund. However, overall, many insiders believe that the problems facing the Chinese chip industry are related to the system and political attention, lack of understanding of the development rules and strategic plans for integrated circuits, emphasis on introduction rather than digestion, and insufficient investment. With the anti-corruption storm sweeping through the chip industry, the market generally believes that the operation of the National Integrated Circuit Industry Investment Fund, especially overseas mergers and acquisitions dominated by Unigroup, has not been successful in guiding and encouraging the development of the chip industry.

Amid the corruption case of the IC Fund, China's semiconductor industry in 2022 is like a mix of water and fire, with half of it being affected and half of it remaining unaffected. Despite positive news such as the mass production of 14-nanometer chips in 2022, the release of the fourth generation flash memory by Yangtze Memory Technologies, and breakthroughs in the development of domestic DUV lithography machines by the Harbin Institute of Technology's experimental team, the overall industry data for the year shows that over 5,700 chip companies were revoked or cancelled in China, a 70% increase from 2021, with an average of approximately 16 chip companies going out of business each day. Despite this, hot money continues to pour into this hot

field, with over 62,000 new chip companies established in the year, a 30% increase from 2021. However, out of these 60,000 companies, only 109 received angel or seed round investments, 22 entered the A round of financing, and only 2 entered the B round of financing. According to media reports, the number of reports on groundbreaking technologies in the industry has decreased by 11.6%. Another noteworthy point is that due to the global energy crisis caused by the Russia-Ukraine conflict, there has been a decline in the consumer electronics sector in 2022. Statistics from third-party research firm Omdia show that the global smartphone shipments in Q4 2022 totaled 301.5 million units, a 15.4% decrease from the previous year. Meanwhile, the global PC market shipments during the same period plummeted by 28.5%, marking the largest quarterly decline since multiple institutions began tracking PC market shipments. The downward trend in demand has also led to a surplus of chips in 2022, compared to the chip shortage in 2021.

As a result, the Chinese chip industry faces three major challenges: drastic market demand fluctuations, gradually tightening external restrictions, and policy shocks caused by domestic anti-corruption efforts. To overcome these challenges and emerge from the current predicament, the industry will need to enhance its own strength through strategic integration.

CHAPTER 3

LITERATURE REVIEW

The global enterprise M&A has experienced six M&A waves, generating a wealth of research involving many aspects such as M&A incentive and outcomes of M&A, screening of objectives, enterprise value assessment, financing methods, M&A solutions, M&A risk prevention and post-M&A integration management.

Theory of Transnational M&A

The theory of transnational M&A in global enterprises first originated from the theory of outward foreign direct investment (OFDI). Hymer's monopolistic advantage theory in the 1960s, the internalization advantage theory proposed by Peter. J. Buckley (1976), the product life cycle theory proposed by Vernon (1979) and the Eclectic Paradigm of International Production proposed by Dunning (1977) have provided theoretical support for enterprises' transnational investment. According to the analysis of Dunning in its International Production and the Multinational Enterprise published in 1981, the motivations for foreign direct investment by transnational companies are summarized as three advantages relative to ownership, location and internalization of the host country, different combinations of which also determine the sectoral structure of OFDI and the type of international production. There is often a large gap between the transnational companies that come to engage in investing activities and the local enterprises in the host country.

With the end of the Cold War, the global economy entered a new cycle of rapid development, and transnational M&A achieved rapid development in the 1990s, there were also some cases of reverse investment M&A in developing countries, and the

original theories were difficult to explain such M&A, which led to the emergence of many new theories. ^①Bettis and Montgomery (1992) et al, after reviewing the strategies adopted by Western enterprises since the mid-1980s, argued that the different businesses of an enterprise could often gain cost advantages or other competitive advantages for the enterprise as a whole if they could share the core competencies they possess.

^②Berkovitch & Narayana (1993) summarized the motivations for M&A in three areas, namely, synergy, agency problems and managerial hubris. ^③Hin (1994), in a study of large transnational companies that have carried out mixed M&A in the U.S. over the past 30 years, found that the vast majority of companies that have achieved adequate profit returns have diversified their M&As and operations around their core competencies.

According to ^④Brouthers et al (1998), M&A motivations can be classified into three categories: economic, personal and strategic motivations. ^⑤Andrade et al (2001) found that industry shocks could trigger the emergence of waves of enterprise M&As, resulting in industrial agglomeration. ^⑥Stefano & Paolo (2004) studied the M&A cases of 49 countries from 1990 to 2002 and found that legal and institutional differences between countries are one of the main drivers of transnational M&A, and that countries with better accounting standards and stronger shareholder protection had more M&As.

Gereffi (2001) introduced the concept of global value chain based on global commodity chain. The theory of division of labor in the global value chain further explains the cross-territorial layout of production activities under the leadership of transnational companies. The value chain consists of a series of links such as design,

production, assembly, marketing and after-sales services, but the profit level of each link in the chain varies, and there are strategic links in each global value chain that can generate higher profits for enterprises (Kaplinsky, 2000). Michele Ruta, Senior Economist in the Strategy, Policy, and Review Department of the IMF, and Mika Saito, Senior Economist in the Africa Department of the IMF, argued that the growth of the global value chain has brought wealth to the countries participating in the chain, but that the rate of wealth growth varies across countries; that global value chain has also changed the meaning of competitiveness, making the measurement of competitiveness more focused on the cross-border production of enterprises; and that the global value chain has deepened the interdependence of countries and that cooperation has become increasingly important.

Chinese researcher Wu Xianming's research suggests that Chinese enterprises' main motivation for reverse investment is the pursuit of technological advantages, brand effects and other creative assets in developed countries; Xian Guoming and Yang Rui referred to China's reverse investment behavior as learning transnational investment, arguing that Chinese enterprises' motivation for transnational M&A is to acquire advanced technology and management skills to bridge the gap with developed countries and seek vast overseas markets. Professor Wu Qing argued that the selection of target companies can enable financial enterprises to effectively avoid M&A traps and thus increase the success rate of M&A.

In the process of transnational M&A, financing is extremely important. ^①Lucas McDonald (1984) proposed the dynamic pecking-order theory, which argues that enterprises prefer internal financing and that equity financing should only be adopted on

the premise of good performance. ^② Anu Bharadwaja and Anil Shivdasani (2003) studied the impact of bank financing channels on M&A financing and found that bank financing is important for M&A financing because it has a positive monitoring effect on acquisition quality and investors are very receptive to bank financing signals. ^③ Rajan and Zingales (1995), based on the theory of information asymmetry, argued that large-scale enterprises receive more outside attention because of their stronger financial backing and economic strength, and that it is easier to win more potential investors to invest because the information asymmetry costs for investors are smaller compared to small-scale enterprises, thus large-scale enterprises tend to favor equity financing. ^④ Frank and Goyal (2009) argued that due to the lower supervision costs and stronger lending capacity of large-scale enterprises, they are more likely to be welcomed by creditors and have a favorable situation for lending compared to small-scale enterprises, and thus tend to prefer debt financing. ^⑤ Marina Martynov and Luc Renneboog (2009) found through their study that when faced with a bona fide acquisition, acquirers generally use the issuance of shares, while cash is more often used to achieve a quick M&A when a hostile acquisition is carried out. M&A financing is influenced by issues such as payment methods and the capital cost.

From the perspective of the factors influencing M&A financing, Xu Jing (2004) points out in the Analysis of M&A Financing in China that equity and debt financing is limited due to the limitation of issuing quota, and that diversified financing channels should be actively expanded on the basis of improving the stock and bond markets.

From the perspective of the current situation of M&A financing, ^①Zhou Xianhua, Tian Jinxin and Zhou Aimin (2005) argued that China's capital market is not yet mature, new financial instruments should be actively developed and M&A funds and leveraged buyouts etc. should be implemented in line with national conditions; ^②Lu Qing and Hou Jian (2011) pointed out that China's transnational M&A financing channels are narrow and the financing role of transnational banks and international financial centers needs to be better developed and utilized; ^③Jiang Qiankun and Wang Zexia (2012) built an innovative model of transnational M&A financing that combines internal capital market and global strategic alliance financing to address the current situation of transnational M&A financing; ^④Guo Jiao, Tang Wei and Geng Hongyan (2013) established three models for selecting M&A financing methods based on the analysis of internal financing, debt financing and equity financing methods, combined with relevant theories; ^⑤Xu Fang (2012) pointed out that there are various problems in China's M&A financing, such as the many restrictions on financing methods and the limited role of financial institutions, and believed that financial liberalization and diversification of financial instruments are the direction of market development. Regarding the selection of financing method, ^①Li Yang (2011) believed that debt financing can effectively reduce free cash flow and agency costs, and should be the preferred choice for M&A financing. ^②Sun Shipan, Zhao Xi and Li Shengnan (2011) took a sample of M&A enterprises from 2008 to 2011 and pointed out that the controlling stake and debt capacity have a significant impact on the selection of financing and payment methods; ^③Yu Pengyi and Li Shanmin (2011) selected a

sample of 338 domestic and foreign M&A enterprises for empirical study, and the empirical results indicated that the stronger the profitability, the more listed companies tend to select non-equity financing methods; the higher the asset-liability ratio, the more they tend to select equity financing methods for M&As. Using the 2011 M&A cases in China as a research object, ^④Lv Dong (2015) analyzed the relationship between financing method, payment method and M&A performance, and proved that the three do affect each other.

In terms of research on post-M&A integration behavior, ^①Kearney (1999) conducted a survey of 115 M&A transactions that took place worldwide in 1998-1999, in which 53% of the respondents attributed the main reason for M&A failure to integration failure. As a result, both academic research and the industry have attached great importance to post-M&A integration. ^②Malekzadeh & Nahavandi (1990) pointed out that the integration of organizational culture between the acquiring company and acquired company is a key factor affecting a company's acquisition strategy and long-term business performance. ^③Nardozza (1997) argued that the organizational strategy, organizational structure, culture and human resources etc. are all extremely important factors in the integration process, and has conducted an empirical analysis. ^④Paul (2003) also pointed out in a report that factors such as integrating systems quickly, remaining sensitive to culture, and retaining key employees have a positive impact on increasing the success of M&A. ^⑤Marc (2004) found through a number of case studies that seven factors including the strategic vision, strategic fit, deal structure, due diligence, acquisition planning, post-M&A integration and the external environment are

determinants of M&A success. ^⑥Haber et al. (2003) argued that an effective strategy for M&A integration is to obtain timely initial wins after the M&A by quickly implementing a number of important and sustainable actions to demonstrate that the M&A is leading to improvements and progress. According to ^⑦HeJLly, the risks of M&A include that the future profits of the enterprise cannot cover the costs of the M&A, making it impossible for the enterprise to achieve the desired financial results through the M&A. ^⑧Samuel Weaver and Ferd Weaton argued that the financial risk arising from enterprise undertaking M&A activities mainly stems from errors in the valuation of the target enterprise by the acquiring enterprise, and proposed that the uncertainty in the valuation of the enterprise can be resolved by means of a share swap, and thus reduce the financial risk of the enterprise. ^⑨SchlingemJLnn's research shows that raising capital by means of equity financing in M&A activities can help improve the performance of enterprises. Comprehensive studies have shown that the leading factors for global M&A include the enterprises' need for growth, access to new technology, breaking market barriers, obtaining synergies, following customer demand and securing raw material supplies. Scholars have concluded that Chinese companies' transnational M&As suffer from the following problems: (1) most of the M&A targets are of underperforming or insolvent companies overseas; (2) weak overall competitiveness and serious institutional constraints; (3) lack of transnational M&A strategies and inadequate preparation of M&A plans; (4) lack of international talents and weak integration and management capabilities; (5) excessive government intervention and imperfect legal systems; and (6) insufficient capital and lack of intermediary support (Jia Mingqing and Fang Lin, 2007). Nevertheless,

acquiring core technologies through transnational M&A is still an effective way to enhance the core competitiveness of Chinese enterprises (Wu Tianzu and Chen Lihua, 2006). Empirical studies have also shown that Chinese enterprises' transnational M&A can contribute to national economic growth (Pan Yonghui, 2007).

The transnational M&A in China's chip industry is even more special due to its core position in the industrial structure and international trade, and with the deepening of China's reform and opening-up, and in terms of the Chinese government's support for the chip industry, guidance fund has become an inescapable topic in addition to the original fiscal taxation and credit measures. According to experts such as Huang Manyuan, Meng Yan and Xu Wen, China should learn from the operation model of the European Investment Fund (EIF), whose core mission is to provide financing support to small, medium and micro enterprises in European countries to promote the achievement of the EU's strategic objectives in the areas of innovation, science and technology, economic growth, employment and regional development, etc. The targets of EIF's support are not limited to technology enterprises, but cover mainly scientific and technological innovation and transformation of achievements. China should implement market-based operations, improve the management level and efficiency of the guidance fund, give full play to the guidance fund's role in driving social capital, provide a convenient environment for entrepreneurship and innovation for emerging industries and technology-based SMEs, and better serve the national innovation strategy.

The study of government intervention in venture capital is an essential part of the field of entrepreneurship and regional innovation systems research (Christensen, 2011). Information asymmetries and innovation externalities in the venture capital process have

led to a failure in the allocation of market resources to innovation, especially the lack of seed capital and difficulties in early stage financing for start-ups (Metrick & Yasuda, 2010), providing an opportunity for government intervention. Appropriate government intervention in the venture capital market can effectively mitigate market failures caused by information asymmetries and externalities (Cumming, 2007). As an external stimulus (Schilder, 2006), government intervention in the venture capital market sends a positive signal, which helps create a favorable external environment for the healthy development of the venture capital market and stimulates technological spillovers from the innovation activities of entrepreneurial enterprises. However, due to incomplete information on enterprise productivity, etc., especially in developing countries where rent-seeking behavior by firms sending false signals of "innovation" is common (Gill, 2007), direct government funding for innovative start-ups can create distortions (Xue & Klein, 2010), allowing inefficient enterprises to survive while efficient enterprises are prevented from surviving.

As a financial policy tool, the government guidance fund was initially established to address the failure of the venture capital market and to intervene on the supply side of capital (Colombo et al., 2016), and scholars have used different names in their studies either depending on the extent of government intervention in the market or depending on how the fund operates. However, whether the government enters the market in the form of a specially established venture capital agency or fund, or invests in cooperation with private capital, a guidance fund is a means adopted by the government to intervene in the market as a supplier of capital.

There is currently no fixed model for the operation of government guidance funds, which may be divided into direct and indirect guidance according to whether government funds are directed to the enterprise level in a direct or indirect manner. Under the direct guidance model, the first is that the government establishes a self-managed fund project or funds a venture capital institution, which invests funds in the form of equity, debt or a combination of these, usually for the purpose of promoting venture capital development in a particular industry or type of business. cutting-edge technology companies such as technology (Bruton et al., 2005). The second is to invest capital in the start-up in the form of financing guarantees or tax reduction and exemption by taking specific projects as the carrier. Under the indirect guidance fund model, the guidance fund injects capital into the venture in the form of equity or debt into a market-based investment fund, forming Hybrid Funds (OECD, 1997). Depending on its investment methods, it can be broadly divided into two categories: firstly, Private Public Funds, which are jointly funded by public capital and private capital, with public funds matching private investment, and where the private sector is responsible for the day-to-day management and investment decisions (Clarysse et al., 2009). For example, the High-Tech Gründerfonds Fund, launched by the German federal government, is funded by the German Federal Ministry of Economics and Technology, the KfW Group and 12 industry teams (Wilson & Silva, 2013). The second is the Fund of Funds, that is, the guidance fund is invested in other investment funds rather than in start-ups, with the government effectively acting as a Limited Partner (LP) of the venture capital fund, and with the General Partner (GP) selecting the funds to be invested in and overseeing the overall strategy and investment process of the fund.

In the case of guidance fund under direct guidance model, it is less efficient and less effective than private venture capital. Chinese social traditional strong cultural awareness has created a social and business environment that differs from that of the West (Peng & Heath, 1996), resulting in the differential performance of Chinese and Western enterprises in their entrepreneurial efforts (Peng, 2001). As a key driver of China's rapid economic growth (Lin & Liu, 2000), local governments have decided the local institutional environment that entrepreneurial investors need to adapt to (Bruton et al., 1999). In particular, Chinese venture capital funds are mainly sourced from central and local governments at all levels, large state-owned enterprises, universities, etc. There is a linkage of interests between these institutions and the venture capital market (Guo, 2008), and the government focuses more on overall economic development objectives than on the performance of the industrial guidance funds themselves, it is difficult to analyze the actual impact of the guidance funds in terms of the outcomes of the enterprises in which they invest.

Combining with the characteristics of the chip industry, the mergers and acquisitions in the chip industry are more focused on the following reasons.

First, the chip industry is typically characterized by economies of scale. Through mergers and acquisitions, product specifications can be standardized, and unit purchase costs can be reduced, which is beneficial for the specialization and streamlining of management and engineering and technical personnel, as well as for new product development, making itself more competitive. Therefore, the chip industry, based on economic rational thinking, pursues continuous growth and strength of the enterprise. For example, Freescale's acquisition of Silicon Motion and Spreadtrum's acquisition of US

Quorum were both aimed at obtaining unique technologies from the acquired companies, improving product platforms, and achieving greater competitiveness in the corresponding markets.

Second, the mergers and acquisitions in the chip industry can achieve synergies, that is, " $1+1>2$ " or " $2+2=5$ ". Chip operators can effectively utilize resources through mergers and acquisitions, complete the strategic layout of the enterprise in continuous mergers, and set high barriers to entry for competitors or latecomers in the same industry by expanding the scale of the enterprise and increasing its visibility. The overall benefits of the merged company are greater than the sum of its independent components.

Third, the mergers and acquisitions in the chip industry also bring about industrial cluster effects, which enable a high degree of concentration of the chip industry within a certain spatial range. Through vertical integration, enterprises can reduce transaction costs, enhance the stability of enterprise production and sales, form certain competitive advantages in production costs, raw material supply, product sales channels, and prices, and improve the sensitivity of enterprises to market information.

M&A Performance

In terms of merger and acquisition (M&A) performance, ^①Harris (1991) conducted a study based on data from nearly 200 M&A cases and found that companies experienced a significant increase in cash flow returns after mergers and acquisitions. Notably, when the acquiring and target companies have overlapping business scopes, the increase in cash flow returns due to the M&A becomes more pronounced. ^②Stafford (2001) discovered that after M&A, target companies often achieve considerable gains in shareholder wealth, with the stock value experiencing varying degrees of growth;

however, the stock price of the acquiring company does not exhibit significant growth.

^③Bruner (2002) confirmed this view after reviewing 130 related articles. The cumulative abnormal return (CAR) of the target companies showed a noticeable increase, and this increase became more significant over time; in contrast, the CAR of the acquiring companies did not change significantly. He believed that "although some people think mergers and acquisitions are worthwhile, in most literature, the acquiring party has almost no benefits, so companies should be very cautious when engaging in M&A."

However, the M&A performance of Chinese companies seems to be less than ideal. ^④Li Zhenzhen (2009) conducted a factor analysis of M&A events in the internet industry between 2002 and 2005, taking into account several important factors, including profit margins and growth prospects. The results showed that companies experienced performance growth in the short term after the M&A, but this growth slowed down and eventually disappeared over time. In the long run, the expected results were not achieved.

^⑤Luo Haiying (2015) pointed out that in the development of the integrated circuit industry, there are numerous examples of world-class companies formed through M&A. In recent years, there has been a wave of M&A in the domestic and international chip industries. However, due to the need for massive capital support for companies in this field to seek development, and the technology restrictions imposed by Western countries on Chinese companies, the development of domestic enterprises has been significantly hampered.

Research Object, Method, and Innovations of This Study

The research object of this study is cross-border M&A of Chinese-funded semiconductor companies, using case study analysis. Due to the unavailability of

important data such as financial data of non-listed companies, this study conducts qualitative analysis based on various information obtained from public sources.

As can be seen from the previous text, past scholars either focused on a global perspective of M&A research or emphasized in-depth analysis of typical cases. Global research takes all cross-border M&A events of Chinese-funded companies as objects, summarizing and identifying the characteristics of stages, risk features, financing models, management models, and problems faced to provide advice. In-depth analysis of typical cases involves reviewing a company's cross-border M&A process, summarizing experiences and lessons learned, identifying issues, and providing advice for similar companies. Although the research methods for M&A performance have been relatively mature, scholars have not reached a consensus on research results. The difference in the industries where the acquiring companies are situated may be the reason for the inconsistent conclusions. There are few papers that specifically focus on sub-sectors based on industry characteristics, especially the semiconductor industry. As an industry at the forefront of China-US trade friction, Chinese-funded companies' cross-border M&A has some unique features compared to traditional industry M&A, and the support policies adopted by the Chinese government also differ from the past. Therefore, choosing the semiconductor industry as the research object has a certain innovative significance.

CHAPTER 4

CONCEPTUAL MODEL AND HYPOTHESIS

Porter Diamond Model

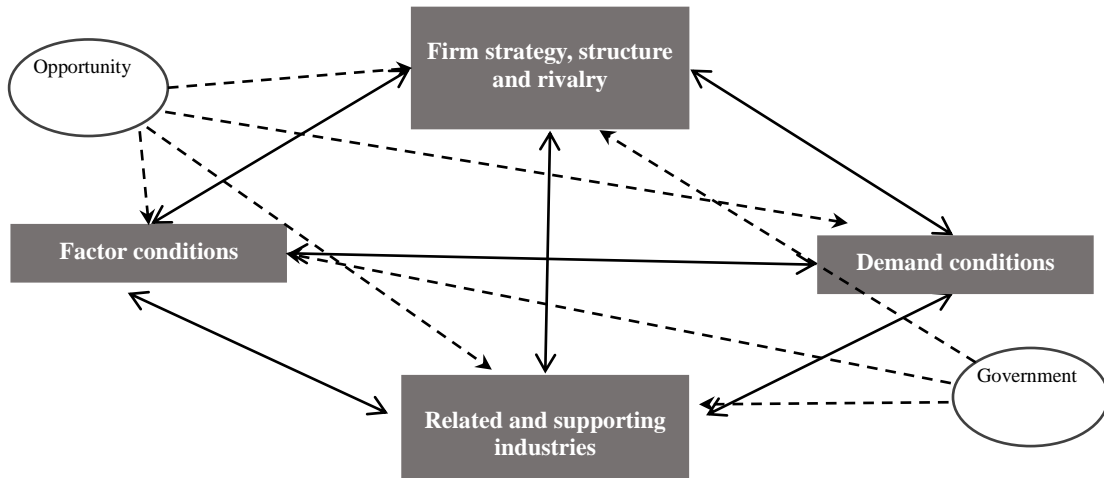


Figure 1. Porter Diamond Model

Michael Porter, a leading strategic management expert at Harvard Business School, put forward the Michael Porter Diamond Model in 1990, arguing that a country's domestic economic environment has a great impact on an enterprise's ability to develop its own competitiveness, with the most influential and direct factors being: (1) factor conditions, including primary and advanced factors (the latter being more important for competitive advantage); (2) demand conditions, including the structure of home market demand, demand scale, the way demand is pulled, and the global, forward-looking and selective nature of demand; (3) related and supporting industries, including the competitive advantages of upstream supply industries and related industries; and (4) firm strategy, structure and rivalry, including the way firms are formed and organized and

managed, the intensity of competition, innovation and entrepreneurial talent. In addition, opportunity and government, as two other supporting elements, influence the above four elements. These six elements interact, influence and reinforce each other, together forming a dynamic competitive environment that stimulates innovation and thus constitutes the source of a country's international competitiveness.

Porter's model is highly persuasive in explaining the sources of international competitiveness in developed countries such as the U.S., Japan, Germany and the UK, which have good domestic economic environments. However, for other countries and regions, some lacking sufficiently large market capacity, others lacking capital, technological elements, etc., Porter did not provide an answer as to how these countries should build up a competitive advantage. In response to the shortcomings of Porter Diamond Model, scholars in various countries have further expanded the diamond model.

International Diamond Model

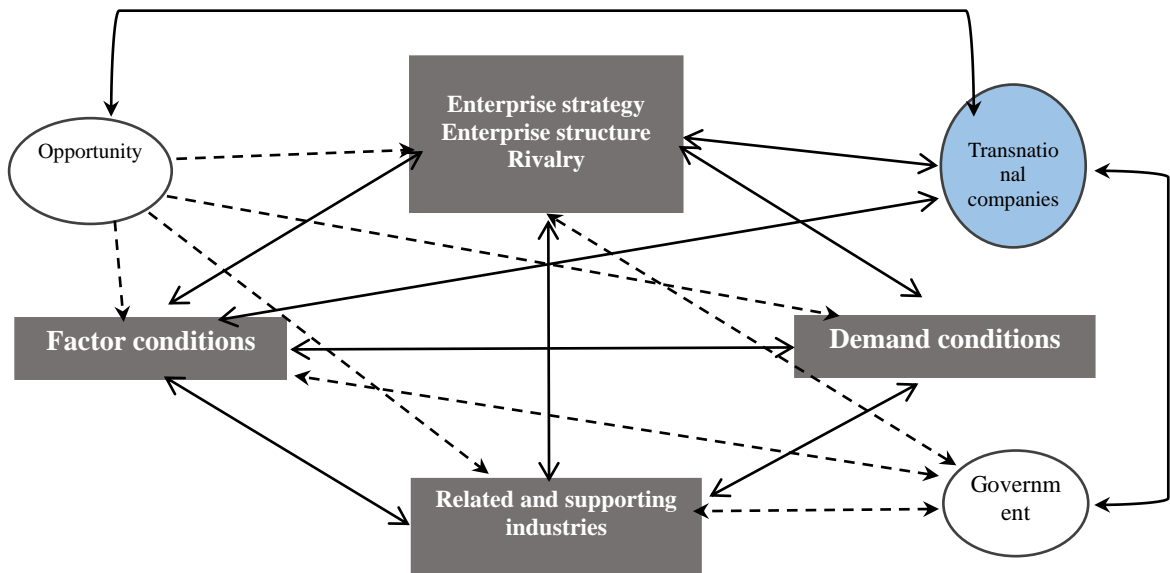


Figure 2. International Diamond Model

With the end of the Cold War and the acceleration of economic globalization, transnational capital flows and operations have influenced the key elements of the interactions in Porter Diamond Model, so John Harry Dunning, a British economist in the field of international investment, added the activities of transnational companies as a third exogenous variable to the Diamond Model through an in-depth study of international investment. Dunning's international diamond model is a good solution to the problem that Porter Diamond Model underestimates the impact of globalization and transnational companies on national competitive advantage.

Double Diamond Model

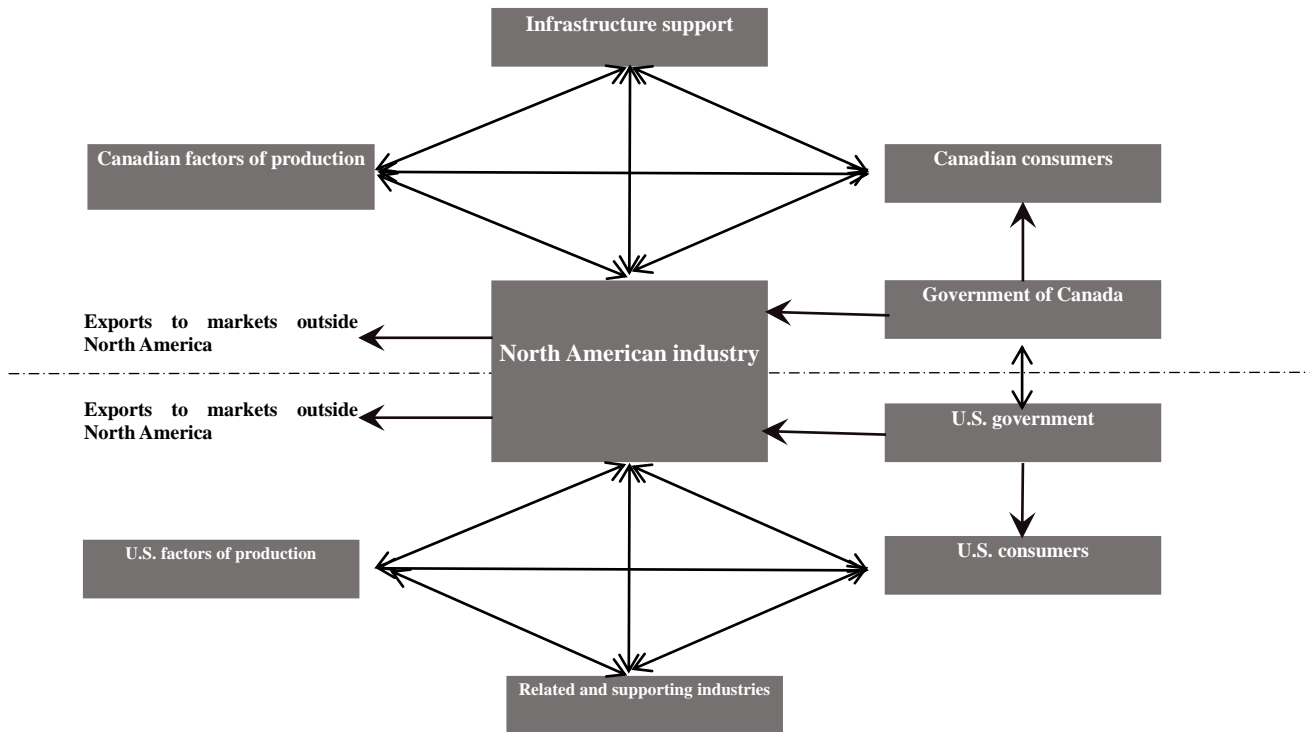


Figure 3. Double Diamond Model

In 1993, Rugman & Cruz (1993), in their study of Canada's national competitive advantage, found that a single "home country diamond model" could not explain well the sources of competitive advantage in countries with small economies of scale and open trading economies. On the one hand, Canadian enterprises can use the U.S. market to expand production and achieve economies of scale; on the other, the U.S. enterprises with a strong competitive advantage invest and develop production in Canada, creating competitive pressure for Canadian domestic enterprises. The competitive advantage of the Industry thus stems not only from the domestic economic environment of Canada, but also from the domestic economic environment of the U.S., and moreover from the environment formed by the economic exchanges between the two countries. To this end,

Rugman and Cruz constructed a double diamond model to explain the source of Canada's competitive advantage.

Nine-Factor Diamond Model

In 1994, Cho, D.Sung, a scholar at Seoul National University, established the "Nine-Factor Model" for the international competitiveness of industries in underdeveloped and developing countries, using the development of the Korean economy as an example. The model identifies five essential elements: workers, politicians and bureaucrats, entrepreneurs, professional managers, and engineers, as well as four contextual elements: business environment, resource endowment, related industry support, and domestic demand.

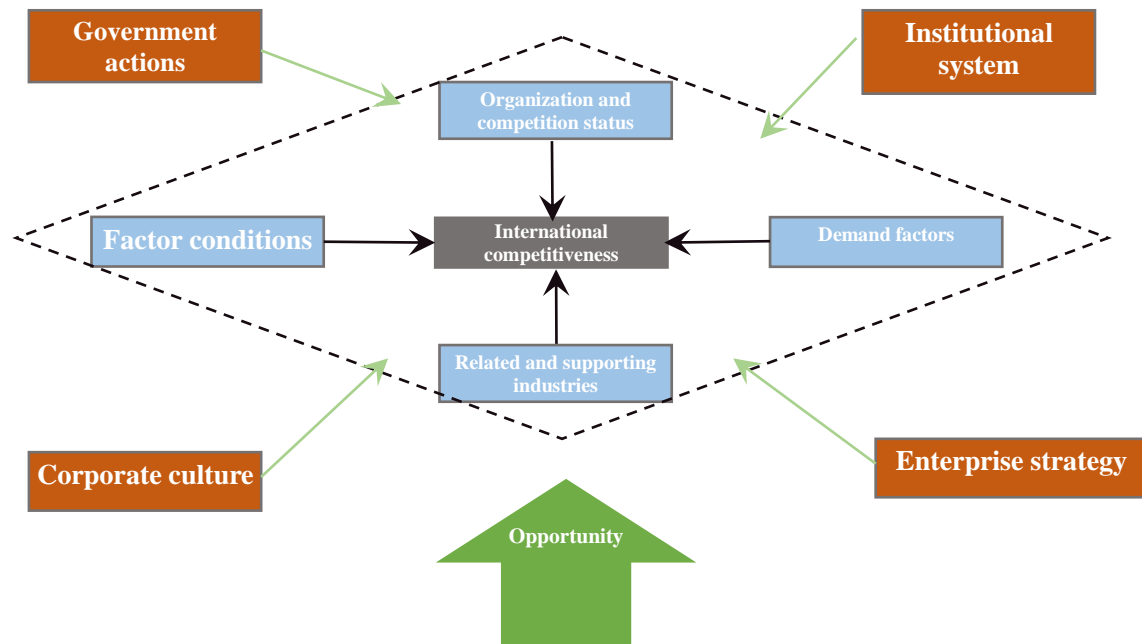


Figure 4. The Nine-Factor Model

Generalized Double Diamond Model

In 1998, H. Chang Moon, Alan M. Rugman and Alain Verbeke found, based on their study of the double diamond model, that Canada, as a member of North American Free Trade Area, was significantly influenced by economic activity in the U.S. and that this model was not applicable to other effects. They therefore extend the double diamond model to a generalized double diamond model, where the competitiveness of small economies is influenced by both "domestic diamond" and "international diamond", for small countries whose resources and markets are not only domestic but more dependent on international markets. This demonstrates that the generalized double diamond model is more explanatory and adaptable than Porter Diamond Model when applied to small economies. In the modified double diamond model, the outermost diamond represents the global factor and the innermost diamond represents the domestic factor of the host country. The size of the outer global diamond corresponds to a fixed period of time, while the size of the inner domestic diamond varies according to the size of the country and its competitiveness. The diamond formed by the dotted line in the middle is the international diamond and represents a country's competitiveness determined by a combination of domestic and international variables. The difference between domestic and international diamonds is the inclusion of transnational activities.

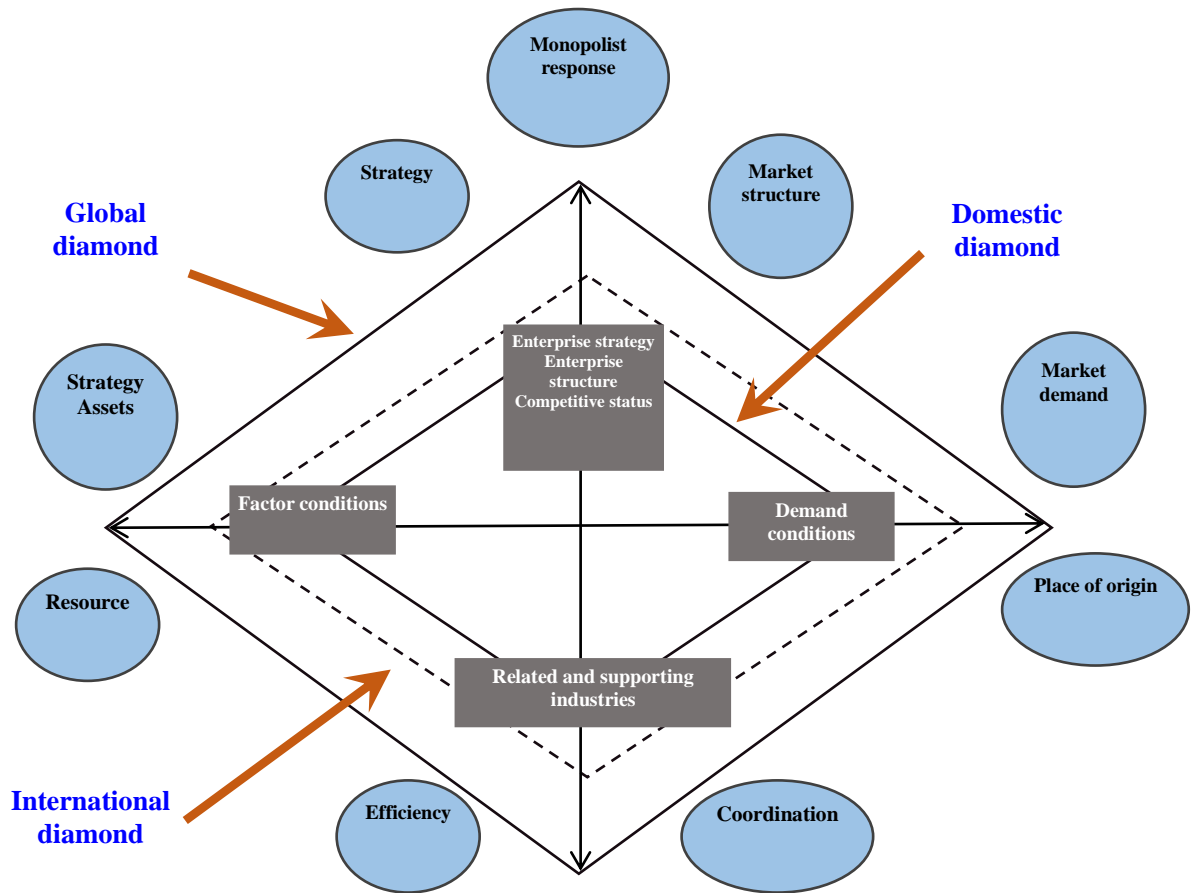


Figure 5. Generalized Double Diamond Model

Rui Mingjie Diamond Model

In 2003, Jin Bei, a Chinese scholar, pointed out in his *Economics of Competitiveness* that although Porter Diamond Model is very enlightening, the analytical paradigm is not necessarily the same for different countries and different stages of economic development. Jin Bei used the method of economics to study competitiveness and constructed a paradigm for the economic analysis of the sources of industrial competitiveness. The direct sources of industrial competitiveness include seven factors: price, cost, quality, brand, product structure, service and differentiation, and the indirect sources include nine factors: factors of production, demand factors, related and

supporting industries, corporate strategy, organization and competitive status, institutional system, corporate culture, government actions and opportunities, which ultimately originate from core competencies and the level of technological innovation.

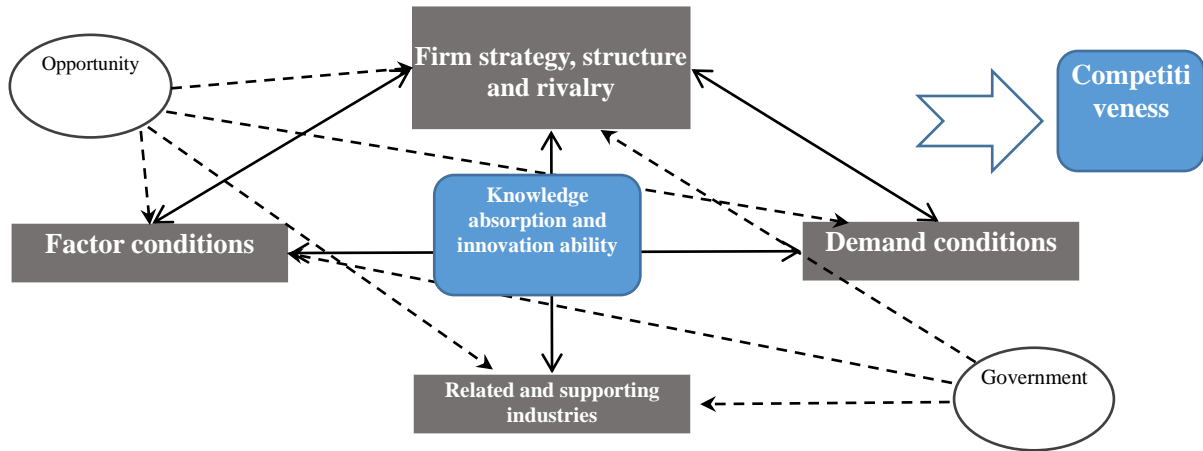


Figure 6. Rui Mingjie Diamond Model

In 2006, Professor Rui Mingjie of Fudan University added a core to Porter's model, namely knowledge absorption and innovation ability, arguing that the native variable of industrial competitiveness should be the industry's knowledge absorption and innovation ability, and that there are already cases where its factor endowment, demand conditions, related industrial support, and market structure shape do not necessarily meet Porter's requirements well, but the corresponding industry has considerable competitiveness.

Hypothesis for Study with Nine-Factor Double Diamond Model

According to the development trend of the double diamond model, this paper summarizes the single diamond model of Porter (1990), the double diamond model of Moon, Rugman and Verbeke (1995, 1998), the supplement of Moon and Roehl (2001) to the single diamond model, the modifications of Dunning (2000, 2003) to the single diamond model, the double diamond model of Moon (2003) in the APEC report and the extended studies of Jin Bei and Rui Mingjie, actively creates the nine-factor double diamond model, and studies the transnational M&As in China's chip industry through such model.

The nine-factor double diamond model treats both the motivations and influencing factors of transnational M&As as endogenous variables and analyzes the competitiveness of the relevant industries by examining these factors. In the nine-factor double diamond model, the motivations and influencing factors of transnational M&As involving strategic assets and resources are grouped into factor conditions; those involving market demand and place of origin are grouped into demand conditions; those involving strategy, monopolist response and market structure are grouped into firm strategy, firm structure and rivalry; and those involving efficiency and synergies are grouped into related and supporting industries.

It is difficult to explain the complexity and variability of motivations of M &A with an economic theory. There are profound social, political and economic reasons for the emergence and development of M&A in different regions and historical periods. The motivation of M&A of an enterprise varies according to period. According to Weston's theory and the research results of other literature, the motiv

ations of M&A can be classified into two categories: the first is the M&A approval theory, including efficiency theory (management synergy theory, operation synergy theory, financial synergy theory, diversification theory, and undervaluation theory), information and signal theory, and agency cost theory; the second is the skepticism of M&A, including managerialism, Hubris Hypothesis, idle cash flow theory and market power theory. Based on the news media reports on Chinese chip companies and the information disclosure of related listed companies, we believe that for Chinese chip companies, the motivations of M&A mainly include the following aspects:

(1) Enhancing international competitiveness. China's domestic industry is now facing unprecedented challenges from international competition. Foreign capital invests in China's industry and wins market share with the competitive advantage in the capital strength. In order to survive and develop, Chinese enterprises must go global to participate in international competition.

(2) Optimizing the allocation of resources. In order to lower risks, consolidate the corporate position and reduce external competition pressure, enterprises often seize the market quickly through M&A.

(3) Boosting the stock market value of companies. In the M&A, the information about the undervalued shares of the target company will be released and the market will be promoted to revalue such shares. Even if the acquisition of the company does not succeed in the end, the valuation of the target company's shares will be raised during the acquisition, which will prompt the company's shareholders to approve the M&A.

(4) Enhancing the operation synergy. Due to economic complementarity and economies of scale, the merger of two or more companies can improve the efficiency of their production and operation activities.

(5) Promoting management synergy. Assuming that the management efficiency of two companies is different, after the acquisition of another company by a company with high management efficiency, the management efficiency of the company with low management efficiency can be improved to create value through asset reorganization and business integration.

(6) Mixed M&A and diversification. Diversification can be accomplished either through internal development or through M&A. However, in certain circumstances, diversification achieved through M&A is preferable to that through internal development. An enterprise may lack internal development opportunities simply because it lacks necessary resources or its potential has exceeded the industry capacity, so it needs to diversify these resources or potential through mixed M&A.

(7) Brand strategy. Through the implementation of brand strategy, corporate awareness will be improved.

(8) Expanding the market share. Market share quality refers to the gold content of market share, which is the sum of benefits that the market share can bring to enterprises. In addition to the cash income, such benefits include the income generated by the appreciation of intangible assets.

(9) Implementing the development strategy. In order to achieve the company's development strategy, the advanced production technology, management experience, operation network, professional personnel and other resources will be obtained through M&A.

(10) Coping with the impact of globalization. Economic globalization and information technology revolution lead to the intensified global competition, which in turn forces countries around the world to relax regulatory policies, creating the more favorable internal pressure of enterprises and external environment for M&A.

Taking the start of the trade dispute between the U.S. and China in 2018 as a watershed, and considering the lag of the impact of the trade war and the profound impact of the COVID-19 pandemic, this paper selects transnational M&A cases of Chinese enterprises in the chip industry before 2020 and from 2020 to the present as the research objects, with eight samples selected for each time stage (see the analysis of motions and impacts of the samples). We first analyzed and recorded the motions and impacts of transnational M&As through tables (see Tables 1 and 2), which are placed under the framework of the diamond model. The small numbers in the cells of the tables are the frequencies of the motions and impacts involved in M&As, and the mean is the quotient of the sum of these frequencies and the number of cases. And then, after grouping the motions and impacts of transnational M&A of Chinese chip enterprise into four major categories of factors of the diamond model, used the international diamond in the diamond model to express the effects of these variables on China in the form of a diamond diagram, analyzed the weaknesses and key factors that influence transnational

M&A of Chinese chip enterprises, providing a reference for future transnational M&A of Chinese chip enterprises and for the government to formulate industrial policies.

Table 1. Analysis on Transnational M&A of Chinese Chip Enterprises Before 2020

Before 2020	Factor conditions	Demand conditions	Related and supporting industries	Enterprise strategy, structure and rivalry	Government support
Unigroup acquired Spreadtrum and RDK with USD 4.007 billion	Capital support and manpower support (2)	Rapid market growth and new products (2)		Reduce rivalries through alliance between giants (2)	Loan support (1)
JCET acquired STATSChipPA C with the consideration of USD 780 million	Capital support (1)	Rapid market growth (1)		Increased market share and patent technology reserves (2)	Loan support, IC industry fund support (2)
Wingtech acquired 75.86% shares of Nexperia with USD 3.6 billion	Capital support (1)	Power discrete devices market maintains steady growth (1)	Mature sales channels (1)	Increased market share (1)	
JSS acquired Takata Assets with USD 1.588 billion	Industrial collaboration (1)	New products and market leadership (2)	Automobile industry cluster (1)	Increased market share and corner overtaking (1)	
WILLSEMI acquired three companies including Omnivision with RMB 15.53 billion	Capital support (1)	Rapid market growth and technological innovation (2)		Improvement of R&D capability and market share (2)	M&A fund support (1)
Ingenic acquired ISSI, an US company, with RMB 7.2 billion	Industrial collaboration (1)	Rapid market growth (1)	Automobile industry cluster (1)	Corner overtaking (1)	

Table 1. Analysis on Transnational M&A of Chinese Chip Enterprises Before 2020 (continued)

Before 2020	Factor conditions	Demand conditions	Related and supporting industries	Enterprise strategy, structure and rivalry	Government support
E-town International Industrial Investment Management acquired Mattson, an US company, with USD 300 million	Capital support (1)	Rapid market growth (1)	Semiconductor industry cluster (1)	Filling market gaps (1)	Government industrial fund support (1)
Tongfu Microelectronics acquired AMD's Suzhou and Penang factories with USD 371 million	Industrial collaboration (1)	Technical innovation and rapid market growth (2)		Industrial transfer, complementary advantages (2)	Integrated circuit industry fund support (1)
Average value	1.25	1.5	0.5	1.5	0.75

Table 2. Analysis on Transnational M&A of Chinese Chip Enterprises After 2020

2020 - present	Factor conditions	Demand conditions	Related and supporting industries	Enterprise strategy, structure and rivalry	Government support
Yitoo acquired Pioneer Micro Technology with JPY 3 billion	Capital support and mature sales channels (2)	Huge market (1)		Strategic transformation (1)	
WILLSEMI acquired the TDDI business of Synaptics in Asia with RMB 850 million		Potential market (1)	Consumer electronics (1)	Complementary advantages (1)	
HG Semiconductor and China Wafer Level Csp acquired Israel VisIC Technologies Ltd with USD 95 million	Capital support and industrial collaboration (2)	Market leadership (1)	Automotive semiconductor (1)	Obtain advanced technology and open the international market (2)	Industrial fund (1)
LUXVISIONS Innovation acquired 44.87% shares of Cowell E with HKD 2.196 billion	Capital support and industrial collaboration (2)	New market (1)	Consumer electronics (1)	Increase market share (2)	

Table 2. Analysis on Transnational M&A of Chinese Chip Enterprises After 2020 (continued)

2020 - present	Factor conditions	Demand conditions	Related and supporting industries	Enterprise strategy, structure and rivalry	Government support
Eoptolink acquired 62.1% equity of Alpine Optoelectronics, Inc. of the United States with USD 44.437 million.	Industrial collaboration (1)	New markets, increased exports (2)	Optical chip (1)	Obtain advanced technology and open the international market (2)	
Wise Road Capital acquired UTAC, PTI's packaging and testing factory located in Singapore and all of ASE Group's packaging and testing factories in Chinese mainland	Capital support and industrial optimization and integration (1)	New markets, increased exports (2)	Chip industry (1)	Integrate to improve efficiency and improve product structure (2)	
Suzhou Star Test acquired GSI Co., Ltd	Capital support (1)			Diversified attempt (1)	
SPARC acquired Ampleon	Capital support and industrial collaboration (2)	New markets, increased exports (2)	Consumer electronics (1)	Obtain advanced technology and open the international market (2)	State-owned capital support
Average value	1.5	1.25	0.75	1.625	0.25

CHAPTER 5

SAMPLES SELECTION AND CASE STUDIES

Basis of Sample Selection

Overall, the cross-border M&A of Chinese-funded semiconductor companies entered a high-speed growth phase since 2011, particularly with several overseas acquisitions by the Unigroup and the acquisition of three business divisions of NXP by JAC Capital, with transaction amounts often reaching tens of billions or even hundreds of billions of dollars, ranking in the top ten of the industry's annual total M&A.

Unlike many news media and some research institutions that make the announcement-oriented statistics of M&A cases, this dissertation does not take the time when M&A is announced as the time interval for the statistics of M&A cases, but instead, based on the study on the impact of M&A performance, this dissertation chooses the result-oriented statistical standard, namely, the time interval of completion of M&A, mainly because there are many uncertainties affecting the outcome of the acquisition after the announcement of the acquisition. For example, according to the statistical report of IC Insights, the news media released a report titled "Global Semiconductor M&A in 2020 Hit a Record High of USD118 Billion", but this statistical data was actually biased. First of all, the largest M&A announced that year was NVIDIA's planned acquisition of ARM for USD40 billion, which accounted for one-third of the year's statistics, but it ultimately failed because of the clear opposition of national regulators and industry giants such as Qualcomm, Samsung and Apple; according to the report of Reuters on July 11 local time, people familiar with the matter said Arm was tentatively looking to raise USD10 billion in an IPO on the New York Stock Exchange in September. In addition, the acquisition of

the remaining equity of Nexperia by WingTech for less than USD1.1 billion included in the acquisition amount that year was actually announced as early as 2018, and the first phase was completed in 2019. The second largest M&A announced that year was the announced acquisition of the world's largest FPGA supplier Xilinx by AMD for USD35 billion (stocks), but it was actually announced as completed on February 14, 2022, and due to the rise in AMD's stock price, the actual value of the acquisition exceeded USD49 billion; in the review of 2022 at the beginning of 2023, the acquisition was included in the records of 2022 by many media.

Therefore, this dissertation chooses 2020 as the watershed. On the one hand, it considers the lag of the completion of M&A cases (mostly 14-18 months), and the lag of the Sino-US trade war that started in March 2018. On the other hand, the outbreak of the COVID-19 epidemic in 2020 has profoundly changed the production and life style of human beings. According to the Annual Overview of China's Overseas Investment in 2020 released by Ernst & Young, the total amount of overseas M&As announced by Chinese enterprises in the year was USD46.41 billion, down 46.2% year on year, and the number of announced M&As was 530, down 18.5% year on year. The COVID-19 epidemic has increased the financial pressure of some Chinese enterprises. The amount of overseas investment withdrawal projects announced by Chinese enterprises in 2020 rose 124% from 2019 to USD49.33 billion, exceeding the total amount of M&As announced in the whole year for the first time. Since from 2020, the focus of M&A selection of Chinese enterprises has been different from that of the past. Therefore, by comprehensively weighing the influencing factors, this dissertation takes 2020 as the watershed, gives priority to selecting the cases involving listed companies with more

transparent information, and takes into account the cases involving the top M&A scale with more news reports and more information.

Analysis on M&A Cases Before 2020

Prior to 2020, Chinese-funded semiconductor companies had participated in numerous high-stake acquisitions in the international market. However, the performance of many acquired targets fell short of the initial market expectations at the time of the acquisition. While various factors such as market environment changes and industry policies played a role, one of the reasons was that the companies' needs were not fully considered at the outset of the acquisition.

Unigroup's Acquisition of Spreadtrum And RDA

Field: mobile phone processor, RF IC design

Target nature: a Chinese-funded company listed in the U.S.

In December 2013, Unigroup acquired Spreadtrum at a consideration of USD10.33 per share/ADS31 and became a subsidiary of Unigroup. The total amount of this M&A case was about USD1.78 billion. In July 2014, Unigroup acquired RDA Microelectronics, a company listed in the U.S., at a consideration of USD907 million to improve integration and collaboration in the integrated circuit industry. After the completion of the two acquisitions, Unigroup integrated Spreadtrum and RDA into UNISOC, and received a capital injection of RMB9 billion (about USD 1.5 billion) from Intel in 2014.

As a core enterprise in the Unigroup integrated circuit industry chain, UNISOC is committed to the independent R&D and design of core chips in the field of mobile communications and the Internet of Things. Its products cover 2G/3G/4G mobile

communication baseband chips, radio frequency chips, wireless connection chips, security chips, TV chips, image sensor chips.

Currently, UNISOC has more than 4,500 employees, 14 technology R&D centers and 7 customer support centers around the world. It has become one of the world's top three mobile phone baseband chip design enterprises, and the largest pan-chip supplier in China, and a leading 5G communication chip enterprise in China.

Since 2013, Unigroup has started to build a semiconductor kingdom. It has successively acquired Spreadtrum Communications, an integrated circuit chip company listed in the U.S., and RDA Microelectronics, an Internet of Things chip company, acquired 51% control of H3C and nearly 100 % equity of Linxens, a French microconnector company. It also established, through merger, UNISOC, established Yangtze Memory, constructed Wuhan storage base, and controlled Shanghai UNIMOS Microelectronics. Unigroup and its affiliated companies have successively initiated M&A offers to more than 20 companies and invested more than RMB100 billion within six years.

Unigroup is the main platform for overseas M&As of Chinese enterprises. It has said that it will acquire TSMC. In 2021, as it could not pay off matured bonds, creditors applied for its bankruptcy reorganization. In fact, in 2020, rumors about the breakup of the bankruptcy capital chain of Unigroup were constantly heard. On October 29 last year, Unigroup decided not to exercise the redemption right of "15 Unigroup PPN006" perpetual bonds, and subsequently defaulted on a number of bonds issued by it, including several USD bonds.

The crisis of Unigroup also warn us that companies should be cautious in M&As and blind expansion should be avoided.

Motions of M&A:

1) Capital support from Unigroup, human resources support from executives and professionals; (motion 3)

2) China's rapidly growing smartphone market demand and the need for innovation involving new products; (motion 2)

3) Spreadtrum and UNISOC cooperate to reduce horizontal competition, and policy guidance needs a more prominent leader in niche market segments. (motion 4)

Special note: Unigroup has received policy-based loan support.

M&A performance: UNISOC's CEO, Ren Qiwei, revealed at an investor conference in early 2023 that the company achieved operating revenue of RMB 14 billion in 2022, growing against the trend by 20%. Since its establishment, UNISOC has accumulated rich experience and broadly expanded into areas such as communications, computing, and artificial intelligence. In the future, the company plans to actively focus on four major business segments: smartphones, IoT, automotive electronics, and smart displays. According to the report, there are only three companies in the global public market that can produce 5G chips: Qualcomm, MediaTek, and UNISOC. UNISOC is fully committed to technological innovation in areas such as mobile communications, semiconductor processes, and intelligent computing, possessing scarce large-scale chip integration capabilities and complete peripheral chip-set capabilities. In 2022, UNISOC achieved the world's first 5G R17 NTN civilian satellite test and completed China Mobile's first 5G R17 RedCap function and performance verification, further solidifying

its 5G cutting-edge technology. According to Counterpoint Research data, in 2022, UNISOC's share of the global smartphone chip market reached about 11%, ranking fourth, only behind Qualcomm, MediaTek, and Apple. In the fourth quarter of 2021, its share of the global cellular IoT chip market reached 26%, ranking second, only behind Qualcomm. Based on its development trend, the overall market share has not changed significantly, and there is still a long way to go to further expand and develop the market.

In the first half of 2023, UNISOC plans to conduct a new round of financing not exceeding RMB 15 billion. With a post-investment valuation of RMB 62 billion in the last round, the pre-investment valuation of this round will certainly not be lower than this level. Market analysis estimates it to be around RMB 70 billion. However, considering the incomplete news coverage, Unigroup's acquisitions totaled USD 2.687 billion. Including subsequent rounds of financing, shareholders have invested nearly RMB 40 billion in the company. Even with a valuation of RMB 70 billion, the average annual return is less than 10%. Of course, since the company has not disclosed its financial statements and specific financing plans, the above data is only an estimate based on news and may not be accurate. But based on the existing valuation level, although UNISOC's acquisition has achieved a strong alliance, the industrial integration effect is lower than the original expectation.

UNISOC had an IPO plan in 2021, but no clear progress has been made so far.

JCET's Acquisition of STATS ChipPac

Field: packaging and testing

Target nature: a listed company in Singapore

According to financial reports, STATS ChipPAC recorded revenue of USD1.599 billion 2013, ranking fourth in the global packaging and testing field, while China's listed company JCET only recorded revenue of USD850 million, only about half of that of STATS ChipPAC and ranking sixth. In 2015, JCET offered to acquire 100% equity of STATS ChipPAC at a consideration of RMB4.77 billion, becoming one of the top five packaging and testing manufacturers in the world. After the completion of the acquisition, STATS ChipPAC suffered substantial losses for three consecutive years. JCET did not provide for the impairment in STATS ChipPAC's goodwill being more than RMB2 billion on the ground that there was no impairment in performance forecasts. Due to the inclusion of STATS ChipPAC in the consolidated financial statements, JCET's gross profit margin declined year after year, being 17.8%,11.8% and 11.7% respectively in 2015, 2016 and 2017. However, after the acquisition, JCET's market share in the semiconductor packaging and testing industry has rapidly grown and reached the top three in the world. At the same time, the acquisition brought in a large number of patented technologies of STATS ChipPAC. After the end of the bottleneck period of acquisition and integration, JCET recorded total operating revenue of RMB30.5 billion (up 15.3% YoY) and net profit attributable to shareholders of the parent company of RMB2.96 billion (up 227.69% YoY) in 2020, both hitting record highs.

From the perspective of the secondary market trend, JCET's stock price fell due to poor performance after the M&A. But with its performance recovery brought about by the improved status in the industry, JCET's stock price has risen steadily. As of September 30, 2022, its market value was about RMB38.1 billion, more than double that before the M&A, showing an overall upward trend.



Figure 7. K Curve of JCET's Stock Price

Motions of M&A:

- 1) JCET supports the M&A through its refinancing plan; (motion 3)
- 2) China's semiconductor packaging and testing market develops quickly, and the East China region where JCET is located is a concentrated area of China's chip industry; (motion 2)
- 3) The M&A by a small company of a large company is conducive to rapid expansion of scale, reduction of costs, and increase of market share; (motion 5)
- 4) Expand technical reserves through the acquisition of the mature enterprise. (motion 9)

Special note: Support from special government loan and integrated circuit industry fund at the start of this acquisition project.

M&A performance: JCET is the world's third-largest semiconductor assembly and test company and has collaborated with a vast majority of the world's leading semiconductor companies. Its prominent advantage lies in its patent technology reserves. JCET continues to maintain its leading position in Chinese mainland while experiencing

significant growth in patent numbers and market value. JCET can be considered a successful example of cross-border acquisitions by Chinese chip companies.

Wingtech's Acquisition of Nexperia

Field: standard parts

Target nature: a spin-off subsidiary of NXP in the Netherlands

Nexperia is the standard product division of NXP Group that was spined off from NXP in 2016. In 2016, JAC Capital and Wise Road Capital jointly acquired NXP's standard product business at a consideration of RMB18.1 billion. To this end, NXP had implemented a series of asset reorganizations internally, and established a new wholly-owned subsidiary Nexperia Semiconductors, which is called Nexperia nowadays. Nexperia is a world-renowned semiconductor IDM company that can deliver more than 90 billion products every year. It has the largest diode and transistor shipment volume, the second largest logic chip shipment volume, the largest ESD protection device shipment volume, and the ninth largest power device shipment volume in the world. In 2018, Wingtech participated in the acquisition of Nexperia, and won the acquisition qualification after 200 rounds of bidding. In 2019, Wingtech acquired 74.45% equity of Nexperia at a consideration of about RMB26.09 billion, and included it in the scope of consolidation. In 2020, Wingtech acquired the remaining equity Nexperia as scheduled, and Nexperia became its wholly-owned subsidiary.

Thanks to this largest cross-border M&A in the history of China's semiconductor industry, Wingtech recorded operating revenue of RMB41.578 billion and RMB51.707 billion in 2019 and 2020, up 139.85% and 24.36% YoY respectively; and the corresponding net profits were RMB1.254 billion and RMB2.415 billion, up YoY

1954.37% and 92.68% respectively. However, in February 2017, JAC Assets took the lead in being transferred with the equity of Nexperia at a consideration of RMB18.1 billion. At the time of Wingtech's acquisition, Nexperia had an average valuation of RMB33.9 billion, up 87%, leading to a sharp increase of RMB21.397 billion in Wingtech's goodwill. As at the end of 2020, the total assets of Wingtech were RMB59.891 billion, and the existing goodwill accounted for about 37.90% of the total assets. Wingtech did not impair the goodwill of Nexperia, but the operation of Nexperia was not in smooth sailing. From 2017 to 2021, Nexperia's operating revenue was RMB9.443 billion, RMB10.431 billion, RMB10.307 billion, and RMB9.953 billion, respectively and its net profit was RMB819 million, RMB1.340 billion, RMB1.258 billion, and RMB988 million respectively. In the past two years, both operating revenue and net profit have declined. Even in 2019 without the impact of the epidemic, its operating revenue and net profit declined. It was not until 2021 that Nexperia's operating revenue increased significantly to RMB13.803 billion, and its net profit increased to RMB2.632 billion due to the tight supply of chips.

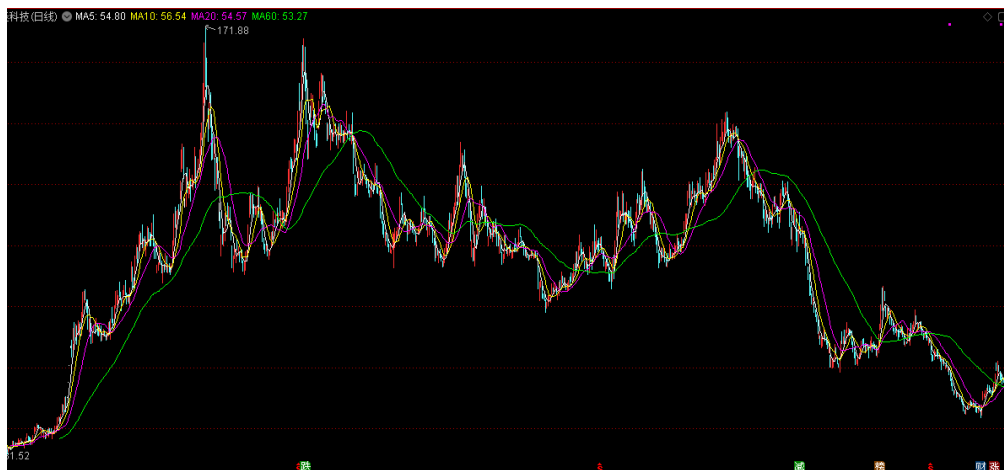


Figure 8. K Curve of Wingtech's Stock Price

From the perspective of the secondary market trend, Wingtech has been repeatedly hyped by the market because of the popularity of the first semiconductor M&A case. Affected by the international trade war, Wingtech was hindered from acquiring the Newport Wafer Fab in the UK and saw lower and lower stock price in 2022. As of September 2022, its market value was less than RMB61.2 billion, twice that before the M&A but less than half of that at the time of the M&A.

Motions of M&A:

- 1) Wingtech plans to transform and fully supports the M&A through its refinancing plan; (motion 3)
- 2) Standard parts are widely used in China's market; (motion 8)
- 3) Wingtech has mature sales channels. (motion 6)

Supplementary note: This merger has the support of state-owned strategic investors.

M&A performance: The acquisition of Wingtech ranks among the top ten chip merger cases of the year. However, it also resulted in a huge amount of goodwill for the company. The company plans to continue expanding its market through acquisitions, but the failed acquisition of the UK's NWF wafer plant indicates that its previous expansion plans may be difficult to achieve. After the lifting of restrictions on the sale of shares issued through increased borrowing in the same year, the pressure to reduce holdings and the huge amount of goodwill have also put pressure on the company's stock price. Although the company has achieved strategic transformation, the implementation of its business strategy after the merger still needs to be tested.

JSS's Acquisition of Takata

Field: automotive security chip

Target nature: a Japanese company under bankruptcy reorganization

In 2017, several large automobile companies including Volkswagen and General Motors suddenly announced a large-scale automobile recall plan. This was because that Japan's Takata, the world's second largest airbag manufacturer at that time, formally pleaded guilty in the U.S. federal court, admitting that it concealed the existence of fatal defects in airbags. In the past ten years, Takata's airbag defects have caused the death of many drivers, leading to the bankruptcy of Takata in June 2017. Given that Takata had a profound production and technical background and more than 50,000 employees and billions of assets around the world, many peers were interested in the disposal of Takata's assets after bankruptcy, but in the end Joyson Electronics, the largest automotive safety system manufacturer in China, announced its acquisition of all asset packages of Takata except the PSAN business (business in which potential safety hazards were concealed) at a consideration of USD1.588 billion. However, Joyson Electronics likes to take an unusual path in cross-border M&As. Before acquiring Takata, it had carried out 9 acquisitions, including the acquisition of the world's fourth largest automotive safety system manufacturer KSS, but these acquisition targets had an outstanding feature – extremely high asset-liability ratio. These acquisitions have left a heavy burden of goodwill on Joyson Electronics, such as KSS, whose net book assets were only RMB772 million at the time of acquisition, and Joyson Electronics paid a premium of 10 times the net assets for KSS, and recognized a huge book value of goodwill (RMB6.3 billion). It also recognized a goodwill impairment of RMB2 billion in 2021, superpose with the

losses incurred by Joyson Electronics' own business, its net profit attributable to shareholders of the parent company in 2021 was of -RMB3.787 billion. Although according to the 22Q3 report, the total revenue of Joyson Electronics in 22Q3 was RMB12.823 billion, up 22.63% YoY and 14.6% QoQ. After Joyson Electronics' quarterly net profit attributable to shareholders of the parent company turned from loss to profit in 22Q2, and further increased to RMB236 million in 22Q3. However, after excluding the foreign exchange gains brought about by Renminbi depreciation, Joyson Electronics was still in a state of loss.



Figure 9. K Curve of Joyson Electronics' Stock Price

According to the secondary market trend, investors did not recognize Joyson Electronics' risky M&A strategy. As of September 2022, its market value was only RMB18.6 billion, less than half of that before the M&A. And Desay SV, a main domestic competitor of Joyson Electronics, had a market value of more than three times that of Joyson Electronics though its revenue was less than one-third of that of Joyson Electronics.

Motions of M&A:

1) The main business of Joyson Electronics is highly related to the acquired business, so there is an industrial synergy; (motion 4)

2) Takata's technology is internationally leading, and automotive safety chips are in a critical period of industry upgrading; (motion 7)

3) China has a huge automobile industry chain; (motion 2)

4) Joyson Electronics has a strong need to increase its market share through M&As; (motion 8)

5) Joyson Electronics hopes to obtain the technology R&D reserves of the industry-leading company through acquisitions to enhance its own R&D strength. (motion 9)

M&A performance: After going public, Joyson Electronics has been continuously expanding through mergers and acquisitions, achieving leapfrog growth in revenue scale. The revenue increased from over RMB 6.1 billion in 2013 to RMB 45.67 billion in 2021. However, the market is not convinced by Joyson Electronics' expansion, as the company's hidden risks are quite obvious, such as low net profit and non-recurring net profit, as well as low gross margin and net profit margin. A large amount of interest-bearing debt and the risk of goodwill impairment have put a heavy burden on the company. Pursuing the scale of mergers and acquisitions without focusing on post-acquisition integration has led to poor performance in the company's M&A efforts.

Willsemi's Acquisition of Omnivision

Field: CMOS imaging

Target nature: a start-up company in Silicon Valley, the team members came from Motorola

Omnivision is the earliest and largest manufacturer of CMOS sensor applied in camera phones. When camera phones first started to be used in 2003, CCD technology suppliers from Japan occupied the most market share, while CMOS technology suppliers were mainly from European and the U.S. Among them, Omnivision's products were the most influential and used in one-third of the world's mobile phone cameras. From 1998 to the end of 2004, Omnivision shipped a total of 190 million CMOS image sensing components. But due to the subsequent rise of SONY and Samsung, Omnivision's market share declined. In 2015, it was acquired by a consortium invested in by CITIC Capital, Hua Capital and Goldstone at a consideration of USD1.9 billion. Beijing Ingenic planned to acquire Beijing Omnivision, the domestic shareholder of Omnivision in 2016 and Willsemi planned to do the same in 2017. But Beijing Ingenic failed due to new regulation of the CSRC on reorganization, and Willsemi failed due to the opposition of the large shareholders. After that, Willsemi persevered, adjusted the plan, and finally completed the acquisition of Beijing Omnivision in July 2019. The estimated value of the 100% equity of Beijing Omnivision in the transaction plan was about RMB16 billion, about RMB3 billion higher than the purchase price in 2015 and with an annualized rate of return of only 5%. Omnivision's total assets before the M&A were almost five times that of Willsemi. As a result of this acquisition, Willsemi formed a situation where the three major business systems of image sensors, touch and display and simulation solutions

were developing synergistically and benignly, with good cash position, basically positive net operating cash flow, current ratio greater than 2, lower debt ratio, and stronger solvency. However, Willsemi's original book value of goodwill in 2020 was RMB2.799 billion, accounting for 23.72% of net assets. After Willsemi acquires Omnivision, it only conducted a goodwill impairment test and provide for goodwill impairment, so there is a risk of goodwill thunderstorms.

From the perspective of the secondary market trend, the stock price of Willsemi had been on a steady upward path since it planned the M&A with Beijing Omnivision, but eventually fell back after the M&A due to market differences and fluctuations. Its current market value exceeds RMB94.9 billion, less than half of the peak but nearly 6 times that before the M&A.



Figure 10. K Curve of Willsemi's Stock Price

Motions of M&A:

- 1) The shareholders of Willsemi supported its strategic transformation through M&A; (motion 3)

2) The market of CMOS imaging was growing rapidly under the background of large-scale application in mobile phone multi-camera and security field; (motion 2)

3) New materials and new technologies accelerate industry iteration; (motion 10)

4) Willsemi hoped to obtain the technology R&D reserves of the industry-leading company through acquisition and improve its R&D strength. (motion 9)

5) Expand market share. (motion 8)

Special note: This acquisition was supported by M&A fund.

M&A performance: After years of industrial layout, Willsemi has become the world's third-largest mobile phone CIS manufacturer, only after Sony and Samsung. In the global chip shortage of 2021, the company's net profit exceeded RMB 4 billion, demonstrating strong profitability. However, the impact of the consumer electronics downturn in 2022 on the company is also evident. On the evening of January 13, 2023, Willsemi released a notice of a decrease in its 2022 annual performance, expecting a 70% year-on-year decline in net profit and a 97% year-on-year decline in net profit excluding non-recurring gains and losses, which far exceeded market expectations. Analyzing quarterly data, Willsemi had a loss of RMB -120 million in the third quarter of 2022. According to the loss forecast announcement, the fourth-quarter loss may reach RMB 1.349 billion. What worries market analysts even more is that at the end of the third quarter last year, Willsemi's inventory balance was RMB 14.113 billion, almost double the RMB 7.119 billion from the same period the previous year. For the fast-paced consumer electronics industry, Willsemi faces enormous pressure to clear its inventory, and the net realizable value of many products stockpiled at high prices in 2021 will further decrease. Given that the consumer electronics industry has not yet emerged from

the downturn in the first quarter of 2023, the company is highly likely to continue to suffer losses in the first quarter of 2023. On the one hand, this indicates that the company's management has made misjudgments about the market, and on the other hand, it also shows that the integration effect after the company's snake-eating-elephant-style acquisitions is not ideal, with insufficient capacity to withstand industry fluctuations and risks.

Ingenic's Acquisition of ISSI

Field: memory chip

Target nature: a leader in the field of automotive memory chip

ISSI's main business is the design and sales of storage IC chips. Founded in Silicon Valley in 1988, the company primarily provides, develops, and designs high-tech, high-performance, high-quality, and cost-effective integrated circuit chips for electronic products in markets such as automotive, industrial and medical, communications and enterprise equipment, and consumer electronics. The company's DRAM product development focuses on specialized application areas with higher technical barriers, offering products with different capacities, interfaces, and power consumption specifications to meet the requirements of industrial, medical, backbone communication, and automotive-grade products. These products feature stable performance in extreme environments and energy-saving characteristics. Since 1999, ISSI has been a qualified automotive memory supplier, and its automotive storage products have certain advantages in terms of temperature, lifespan, materials, and quality. ISSI has top-tier international automotive and industrial customers, such as Delphi, Valeo Group, TRW in the automotive sector, and Siemens, Schneider, Honeywell, GE, ABB, Mitsubishi and

other leading enterprises in the industrial sector, and the company serves as their core supplier. The company's R&D personnel are mainly distributed in Silicon Valley and Colorado, South Korea, Beijing, Shanghai, Xiamen, Wuhan, Israel, and other locations, with a high level of globalization in the team and core technical staff having an average industry experience of over 20 years. The experienced R&D team and long-term stable core technical team have laid a solid foundation for the company to maintain its continuous competitiveness.

In 2015, ISSI was acquired by Summitview Capital and other investors for USD 764 million through the establishment of Beijing ShanSheng (later renamed Beijing Xicheng). During the acquisition process, another American company, Cypress, intervened, causing the offer to gradually increase, which was 19.47% higher than the initial offer of USD 639.5 million. In 2016 and 2018, listed companies GigaDevice and Sieyuan planned to acquire ISSI, but due to opposition from major suppliers and other shareholders, the acquisition plans could not be implemented.

In May 2020, Ingenic raised a total of RMB 7.2 billion through issuing shares to complete the acquisition of ISSI's parent company, Beijing Xicheng, which was 33.33% higher than the acquisition price in 2015 and had an annualized return of only 6.66%. This acquisition was also a "snake swallowing an elephant" style, as before the acquisition, Beijing Xicheng's net assets were almost three times that of Ingenic, and Beijing Xicheng's average net profit for 2016-2017 was nearly nine times that of Ingenic. More importantly, Ingenic's original main application market for products such as e-books, MP3s, and MP4s shrank due to the rise of smartphones. From 2014 to 2019, Ingenic's net profit attributable to the parent, excluding non-recurring items, was

continuously negative. The acquisition of ISSI allowed Ingenic to be reborn, and the company's main business shifted to the automotive electronics market. In the 2021 chip market, its stock price doubled. However, the premium acquisition also resulted in RMB 2.989 billion of goodwill for Ingenic. In the acquisition plan, Beijing Xicheng promised that its net profit attributable to the parent, excluding non-recurring items, would not be lower than USD 49 million, USD 64 million, and USD 79 million for the years 2019-2021, respectively, but it failed to meet these targets. This led to the company's stock price falling continuously after hitting a new high in 2021, and the shareholders participating in the company's non-public offering in November 2021 were deeply trapped after the lock-up period ended. However, in 2022, Willsemi increased its holdings in Ingenic by setting up an industrial fund, and the two companies, both facing the risk of goodwill impairment due to overseas acquisitions, may seek warmth together.



Figure 11. K Curve of Ingenic's Stock Price

Looking at the secondary market trend, Ingenic's stock price has been on the rise since the acquisition plan was formulated in 2018, with the maximum increase exceeding

700% before the additional issuance in 2020. However, this kind of pre-emptive speculation has to some extent depleted the positive effects, and after completing the additional issuance, the stock price had only a small increase before oscillating downwards. The maximum decline from the 2020 high to the 2021 low exceeded 60%. Subsequently, due to the booming semiconductor sector in the Chinese stock market, the stock experienced a surge, reaching a new high with a stock price approaching RMB 200. However, as the impact of COVID-19 and the chip shortage eased, the stock price returned to a normal level, with its current market value being less than half of its historical high, but still 9.5 times higher compared to before the acquisition.

Motions of M&A:

1) The shrinking of the original business makes the company's strategic transformation urgently needed; (motion 9)

2) Before the acquisition, ISSI's DRAM products ranked 7th in the global market, and its SRAM product revenue ranked 2nd in the global market; (motion 7)

3) The Chinese automotive electronics market is in a period of rapid growth; (motion 2)

4) Ingenic hopes to acquire ISSI's large customer base through the acquisition, expanding into multiple market areas such as automotive, industrial, medical, communications, high-end consumer, and mass consumer markets. (motion 6)

M&A performance: According to public information, the gross profit margin of Beijing Xicheng's memory chips before the acquisition was relatively stable, maintaining above 35%. After the acquisition, the gross profit margin dropped to 20.73%. Although the gross profit margin of memory chips in 2021 has recovered to some extent, rising to

30.40%, it is still far below the previous level, indicating that there may be resource integration issues after the acquisition. In 2022, as the overall chip industry experienced oversupply, Ingenic's revenue decline only appeared in the third quarter due to the less obvious decline in automotive memory chips. However, as the industry's winter approaches, the company's operations will be tested. At least in terms of shareholder attitude, in 2022, major shareholders Summitview Capital's subsidiary funds, one of the controlling shareholders, Li Jie, and executives all have continuous plans to reduce their holdings. At the same time, Shaoxing Weihao, a subsidiary of Willsemi, claims to invest RMB 4 billion to increase its holdings in Ingenic. If the original shareholders' reduction plan and Shaoxing Weihao's increase plan are completed, Shaoxing Weihao will become the third-largest shareholder of Ingenic, making the shareholding ratio of the top three shareholders similar. However, the fact is that the original shareholders' reduction plan was implemented as scheduled, and Shaoxing Weihao's shareholding ratio in Ingenic has not changed since the end of June 2022, which also indirectly shows that shareholders lack long-term confidence in the company's integration effect.

E-Town Dragon's Acquisition of Mattson Technology Inc.

Field: semiconductor device

Target nature: a leading global supplier of dry stripping and rapid thermal processing equipment

Beijing E-Town Dragon Semiconductor Industry Investment Center (E-Town Dragon Limited Partnership), a subsidiary of Beijing E-town International Industrial Investment Management Co., Ltd. (E-town International Industrial Investment Management), acquired the outstanding shares of Mattson Technology Inc. at USD 3.8

per share for a total cash consideration of approximately USD 300 million, representing a premium of about 23%. Mattson, founded in 1989, is a major supplier of key equipment (dry stripping and RTP equipment) for global semiconductor wafer foundries. The company is a global leader in etching, rapid thermal processing (RTP), photoresist stripping, and cleaning technologies. Founded in February 2009, E-town International Industrial Investment Management is a state-owned investment and financing company serving the industrial transformation, upgrading, and technological innovation in E-town field. This acquisition is the first successful case of Chinese capital acquiring an international semiconductor equipment company and the only successful cross-border acquisition case in China's semiconductor equipment industry so far. Subsequently, E-town International Industrial Investment Management integrated Mattson Technology Inc. into its subsidiary E-Town Dragon. However, there are risks of business and corporate culture integration in Chinese capital's overseas acquisitions. In the first year after the acquisition, Mattson's revenue declined by 40%, and the company experienced losses. After the integration efforts of E-Town Dragon's new management team, the company finally emerged from the trough. According to Gartner's statistics, in 2020, the company's market share of dry stripping and rapid thermal processing equipment ranked first and second globally. In August 2021, E-Town Dragon was approved to list on the Science and Technology Innovation Board of the Shanghai Stock Exchange, but its IPO was full of twists and turns. In January 2022, the securities service agency hired by the company was investigated by the China Securities Regulatory Commission, leading to the suspension of the company's issuance registration process. Although the issuance registration process resumed in February, the company had not been listed as of the end

of January 2023. During this period, the company did not disclose the specific situation of its three rounds of financing. According to the IPO prospectus, from 2018 to 2020, E-Town Dragon achieved operating revenues of RMB 1.518 billion, RMB 1.574 billion, and RMB 2.313 billion, with a compound annual growth rate of 23.41%. The company achieved net profits of RMB 23.9583 million, RMB -88.1398 million, and RMB 24.7616 million. The loss in 2019 was the result of the construction of a new production base. The company has always maintained a leading position in the fierce global competition and has long-established close business cooperation relationships with well-known overseas integrated circuit manufacturers such as Samsung, TSMC, and MEGGON. Based on the IPO price, the company's valuation has increased 15 times.

Motions of M&A:

1) State-owned industrial capital seeks to foster and develop new industry clusters; (motion 3)

2) The "overseas asset acquisition + landing in overseas high-tech regions" model is beneficial for China's semiconductor industry to absorb and integrate advanced foreign technologies; (motion 9)

3) Semiconductor equipment is extremely scarce in China, and the market outlook is promising; (motion 8)

4) Mattson Technology Inc. has a prominent position in its niche industry. (motion 2)

M&A performance: Due to the scarcity of the semiconductor equipment it acquired, E-Town Dragon's valuation is relatively high. From the acquisition to the present, its valuation has increased 15 times over 8 years, suggesting that evaluating the M&A performance in the semiconductor industry may require a longer period.

Tongfu Microelectronics's Acquisition of Two Factories Owned by AMD in Suzhou and Penang

Field: chip packaging and testing

Target nature: mature production lines in big chip factories

In March 2022, major players including Intel, AMD, ARM, Qualcomm, Samsung, TSMC, ASE Group, Google Cloud, Meta, and Microsoft established the Chiplet Standards Alliance and developed the Universal Chiplet Interconnect (UCIe) standard for general Chiplets. In early 2023, the "Technical Requirements for Chiplet Interface Bus" group standard, led by Chinese integrated circuit enterprises and experts, was officially approved and released by the China Electronics Standardization Technology Association under the Ministry of Industry and Information Technology. Chiplet is a new chip design and packaging technology that requires collaboration across the entire industry chain. The interconnect standard between chiplets is controlled by the front-end process manufacturers, while packaging and testing manufacturers play an irreplaceable role in the details of the packaging process and the technical aspects of chip/wafer bonding. Market analysis suggests that the determination of international and domestic Chiplet standards will enhance the market position of chip packaging and testing enterprises. Tongfu Microelectronics, the world's third-largest and China's sixth-largest packaging and testing company, saw significant growth after it acquired an 85% stake in AMD's

packaging and testing factories in Suzhou and Penang for USD 371 million in 2016. Through this acquisition, the company signed a long-term business cooperation agreement with AMD, and the two sides formed a "joint venture + cooperation" strong alliance model, establishing a close strategic partnership. According to Tongfu Microelectronics, the company's advanced packaging has achieved large-scale industrial production, with advanced packaging revenue accounting for over 70%. At the same time, the company is actively deploying top-level packaging technologies such as Chiplets, 2.5D/3D, and has already taken the lead in the market in Chiplet packaging technology, forming a competitive advantage.

AMD is a semiconductor company that specializes in designing and manufacturing innovative microprocessors (CPUs, GPUs, motherboard chipsets, TV card chips, etc.) for the computer, communication, and consumer electronics industries, as well as providing flash memory and low-power processor solutions. It is the world's second-largest CPU manufacturer after Intel. Prior to this acquisition in 2016, AMD had been experiencing continuous losses. Selling AMD Suzhou and AMD Penang helped alleviate financial pressure for AMD and reduced debt risk. For Tongfu Microelectronics, the acquisition made it AMD's core packaging and testing enterprise and also earned AMD's technical certification, which is beneficial for the company's international market expansion. With the company's strengthened R&D, in the display driver field, Tongfu Microelectronics has completed the development of the COP process required for OLED/Borderless panels and became the first domestic packaging and testing company to achieve mass production of gold bump packaging. In the field of memory product

packaging and display driver chip packaging, the company's products have significant potential to replace imported products.



Figure 12. K Curve of Tongfu Microelectronics' Stock Price

Looking at the trend of the secondary market, the company's stock price did not perform well before and after the acquisition due to the relatively low market sentiment in China when the acquisition plan was announced. However, with the technology accumulation and performance growth brought by the acquisition, the stock price saw a big increase in 2020. However, compared to other listed companies that have undergone overall acquisitions, the company's market value has not increased significantly.

Motions of M&A:

- 1) The acquisition was in line with Tongfu Microelectronics' development strategy, which aimed to enhance the company's production scale. (motion 9)
- 2) It helped increase Tongfu Microelectronics' international influence and industry status. (motion 7)

3) The acquisition also helped the semiconductor industry in the Yangtze River Delta region to form a cluster. (motion 8)

4) At the time of the acquisition, the target company AMD had a strong intention to sell its assets and cooperate for mutual benefit. (motion 10)

Special note: the acquisition was also supported by the National Integrated Circuit Industry Investment Fund.

M&A performance: Tongfu Microelectronics formed a strong alliance with AMD through the "joint venture + cooperation" model, and fully utilized the TF-AMD Suzhou and TF-AMD Penang, which are two high-end CPU/GPU mass production testing platforms. The company actively undertook the high-end FCBGA, FCLGA, and FCPGA packaging and testing business of domestic and foreign customers. However, cooperating with major players required Tongfu Microelectronics to consider partially giving up profits, which led to the company's compound growth rate being lower than that of JCET.

Conclusion of Analysis on M&A Cases Before 2020

During the same period, there were also numerous international semiconductor industry acquisition cases. For example, in 2018, whether it was successful cases such as Bain's acquisition of Toshiba's storage business, or Microchip's acquisition of Microsemi, or failed cases such as Broadcom's acquisition of Qualcomm, Qualcomm's acquisition of NXP, or Infineon's acquisition of STMicroelectronics, all of which caused global attention and left a significant mark in the history of semiconductors. In that year of large-scale semiconductor industry mergers and acquisitions, Chinese companies also occupied three of the top ten mergers and acquisitions, fully demonstrating the courage of

Chinese chip companies to engage in large-scale acquisitions. In the top ten semiconductor industry mergers and acquisitions in 2019, Chinese companies were also present.

Before 2020, overseas M&As of Chinese chip enterprises were extremely active, mainly for the following three reasons:

(1) After more than 30 years of reform and opening-up, especially after the 2008 financial crisis, Chinese enterprises have achieved unprecedented development. The wave of economic globalization has accelerated the free flow and optimal allocation of production factors around the world. Chinese enterprises dare to cleverly enter the global production system of multinational corporations by use of their low-cost manufacturing technology and quality control, and seek more favorable investment areas and resource advantages through cross-border M&As.

(2) The semiconductor industry is a weak link in China's industrial structure. The 2008 financial crisis has led to the demand of many chip enterprises for equity transfer by shareholders. Chinese chip enterprises can obtain radio frequency, power, CMOS imaging, graphics processing and other domestic scarce technologies through M&As. Chinese enterprises want to actively import technologies through overseas M&As, which is also strongly supported by the government.

(3) Based on the gap between Chinese and international advanced levels in the semiconductor industry, even if Chinese enterprises acquire overseas leading enterprises at a high premium, they can also increase their market value in the domestic market and maximize the interests of shareholders.

However, looking at the above eight cases, few companies have achieved good results in terms of industry status, operating capabilities, profitability, or market value, with the main ones being JCET and Tongfu Microelectronics. The reason for this is that these two companies mainly focused on M&A within the same industry, and focused on the development of segmented industries.

Cases such as Willsemi and Ingenic, which involved cross-border M&A, have achieved periodic performance growth and significant market value increases, but this was mainly due to the influence of China's stock market speculation. These companies had significant fluctuations in profitability during the merger and integration process.

For the cross-border cases led by government funds such as SMIC and E-Town Dragon, it seems that government funds are more focused on gaining industry status, and the company's operating performance is generally not meeting the listing requirements of China's stock market for a long time. From the perspective of the merger and acquisition effect, it is lower than the market expectations.

As for companies with prominent industry status like Wingtech, it is difficult to judge their performance in the short term due to restrictions in Europe and America.

As for the case of Joyson Electronics, the capital market's reaction shows that only pursuing M&A scale is difficult to achieve expected performance.

Table 3. Top 10 M&A Cases in 2018

No.	Date	Acquisition cases
1	November 2018	U.S. chip giant Broadcom plans to acquire software company CA Technologies with USD 18.9 billion in cash.
2	June 2018	Led by Bain Capital of U.S., the Japanese, American and Korean consortium, including Apple, acquired Toshiba's storage business with USD 18 billion
3	March 2018	Microchip Technology, a leading U.S. semiconductor manufacturer, has announced the acquisition of Microsemi Corp. with the consideration of approximately USD 8.35 billion in cash.
4	September 2018	Japanese chipmaker Renesas acquired American chipmaker Integrated Device Technology (IDT) in a cash transaction of about USD 6.7 billion
5	July 2018	Marvell agreed to acquire its rival Cavium with USD 6 billion in cash and stock.
6	December 2018	Wingtech acquired 75.86% shares of Nexperia, a Dutch chipmaker, with USD 3.6 billion.
7	September 2018	WILLSEMI acquired three CMOS image sensor development companies including Omnivision with RMB 15.53 billion.
8	April 2018	JSS, a subsidiary of Joyson Electronic, successfully completed the acquisition of Takada Assets with USD 1.588 billion.
9	October 2018	Micron Technology acquired the shares of IM Flash, a joint venture subsidiary of Intel, with USD 1.5 billion.
10	January 2018	Google acquired the HTC Pixel team at a price of USD 1.1 billion, hoping to expand its advantages in the field of consumer hardware and special chips.

Table 4. Top 10 M&A Cases in 2019

No.	Date	Acquisition cases
1	August 2019	Broadcom acquired the enterprise security business of Symantec, an anti-virus software manufacturer, with USD 10.7 billion.
2	June 2019	Infineon acquired Cypress in cash at USD 23.85 per share, with a total value of EUR 9 billion.
3	March 2019	NVIDIA acquired Mellanox, an Israeli chipmaker, with more than USD 7 billion in cash.
4	June 2019	Guoxin Micro acquired 100% equity of Unic-Linxens with RMB 18 billion.
5	July 2019	Applied Materials plans to acquire Kokusai Electric from KKR with USD 2.2 billion in cash.
6	September 2019	Intel acquired Habana Labs, an Israeli artificial intelligence processor company, with about USD 2 billion.
7	May 2019	NXP acquired Marvell's wireless connectivity business with USD 1.76 billion.
8	March 2019	ON Semiconductor acquired Quantenna with USD 1.07 billion.
9	July 2019	Apple announced that it has signed an agreement with Intel to acquire most of Intel's smartphone modem businesses with about USD 1 billion.
10	May 2019	Marvell acquired Avera Semiconductor, a subsidiary of GlobalFoundries, with USD 740 million. Marvell reached a plan to acquire Aquantia for with USD 452 million.

Analysis on M&A Cases after 2020

After 2020, the chip field has become the focus of checks and balances and countermeasures in Sino-US trade frictions. The State Council of China issued a series of policies to support the development of Chinese chip enterprises such as the Several Policies for Promoting the High-quality Development of the Integrated Circuit Industry and Software Industry in the New Era. From a perspective of policy, Chinese government departments encourage overseas M&As. From a perspective of industry, the rapid development of big data, artificial intelligence, virtual reality and other technologies has changed the industry ecology, and the M&A in the chip field has changed from the vertical M&A focusing on the upstream and downstream of the industry chain to the

horizontal and vertical integration of the industry, so as to form the industry ecology and strengthen the innovation ability and competitiveness in new application fields. The limit on overseas M&A of Chinese enterprises and the tightening anti-monopoly policy have inhibited the completion of transactions. The giant transactions such as acquisition of Qualcomm by Broadcom and acquisition of ARM by NVIDIA have failed due to regulatory examination. Meanwhile, some local governments in China focused more on directly investing in building chip projects, coupled with the impact of the COVID-19 pandemic, and the cross-border merger and acquisition scale of Chinese chip companies during this phase was not significant. Moreover, from the choice of acquisition targets, more emphasis was placed on effectiveness.

YITOA's M&A of Pioneer Micro Technology

Field: analog IC and digital IC products

Target nature: a subsidiary of Japan Pioneer Group

The main business of YITOA is the distribution of electronic components, and the customers of distribution are well-known domestic companies such as Xiaomi, Hikvision, and Midea. In 2020, YITOA wholly acquired Japan's Pioneer Micro Technology whose assets included mature chip production lines and senior management and front-line technical staff with an average experience of more than 15 years in the field of 130 chip manufacturing, and 5 lithography machines. Founded in 2003, Pioneer Micro Technology can be traced back to the semiconductor laboratory established by its parent company Pioneer Group in 1977. It had focused on the R&D and production of analog IC and digital IC products for photoelectric conversion and image processing. It had long-term accumulation in the photoelectric digital signal conversion transmission field, and

adopted the IDM operation mode. Currently, it has major products including optoelectronic integrated circuits, optical sensors, display driver ICs, vehicle-mounted ICs, and MEMS vibrating mirrors, and provides MBE and wafer foundry services. Pioneer Micro Technology hoped to gradually upgrade and transform from "global procurement of chip for distribution" to "a comprehensive chip enterprise integrating distribution, production and manufacturing" through the acquisition. In 2021, Pioneer Micro Technology acquired 40% equity of Shanghai Core-Stone, absorbing and integrating its technical reserves and experience in the power semiconductor field. Combining the previously acquired YITOA Microtechnology and its own R&D team, Pioneer Micro Technology would have completely independent R&D and production capabilities for power devices and sensors. Pioneer Micro Technology has a profound historical accumulation in automotive Ics and its first automobile audio IC was mass-produced in 1987. Pioneer Micro Technology mass-produced demodulation ICs for automotive digital broadcasting systems in 2008 and mass-produced voltage monitor ICs for automotive in 2020. However, the acquisition did not improve the operating performance of YITOA. YITOA recorded total operating revenue of RMB6.34 billion in 2021, down 39.2% YoY which was greater than that in the same period of 2020; recorded net profit attributable to shareholders of the parent company of RMB28.822 million, down 89.3% YoY; and recorded earnings per share of only RMB0.03.

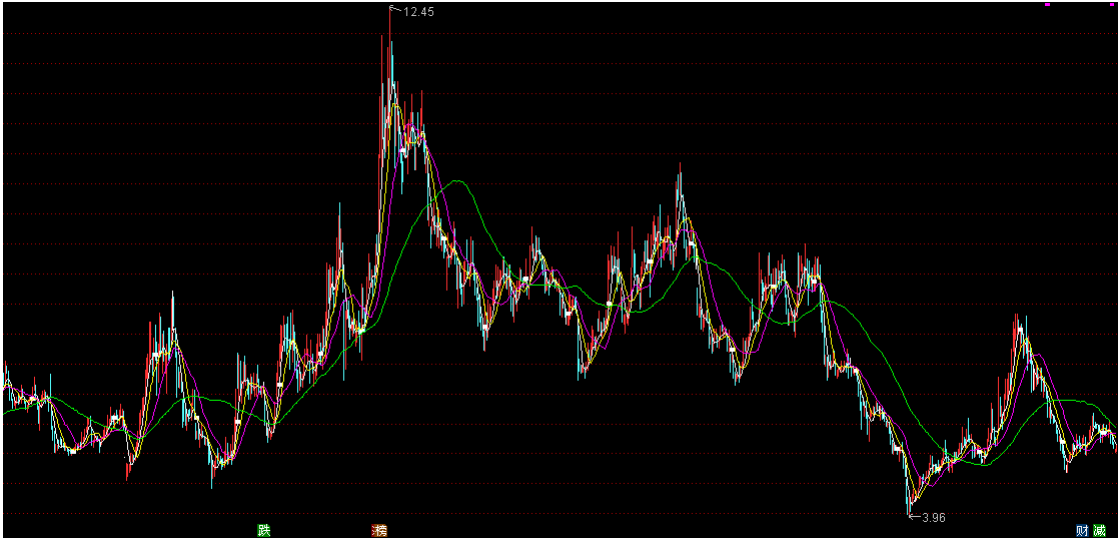


Figure 13. K Curve of YITOA's Stock Price

YITOA's stock price peaked at the time of the acquisition and fluctuated and declined all the way thereafter. As of September 30, 2022, its market value was less than RMB6 billion, less than half of that immediately after the exposure of the M&A.

Motions of M&A:

- 1) YITOA's shareholders supported the acquisition; (motion 3)
- 2) YITOA specializes in distribution and has mature sales channel support; (motion 4)
- 3) There is a huger market for analog IC and digital IC products; (motion 8)
- 4) YITOA has a strong need for strategic transformation. (motion 9)

M&A performance: The acquisition of YITOA was mainly to seek strategic transformation. Although the acquisition target had a certain technological content, its performance was poor. After the acquisition, the company made breakthroughs in domestically scarce products such as MEMS scanning mirror products, but they are yet to be put into mass production. Therefore, both performance and market value did not meet

expectations after the acquisition. Industry experts analyzed that it may take 1-3 years for the company's new technology to be fully applied, and the company is still in the integration period after the acquisition, and the effectiveness of the acquisition is yet to be verified.

Willsemi's Acquisition of TDDI Business of Synaptics in Asia

Field: touch and display driver

Target nature: the touch and display driver integration business of Synaptics in Asia

In 2020, Willsemi held 70% equity of Creative Legend Investment Ltd. through cash capital increase to purchase Synaptics Incorporated's single-chip liquid crystal touch and display driver integrated chip business based in Asia. In 2021, it acquired the remaining 30% equity of Creative Legend Investment Ltd, totaling USD 120 million. Founded in 1986, Synaptics is a world-leading design and manufacturing company for human-machine interface interaction development solutions for mobile computing, communication and entertainment devices. In 2014, Synaptics first introduced the TDDI concept, that is, the integration of touch and display drivers, enabling mobile electronic devices to be thinner, lighter, and have longer battery life, lower cost, and better display effect. After years of promotion by Synaptics, TDDI technology has become the mainstream technology for mobile terminal display and touch control, and its penetration rate has rapidly expanded. The main customers of Synaptics' TDDI chip include Huawei, OPPO, Samsung, Xiaomi and other well-known mobile phone manufacturers.

Motions of M&A:

- 1) TDDI has great potential as an emerging chip market segment; (motion 8)
- 2) Willsemi have a deep background in the field of consumer electronics; (motion 4)
- 3) The acquisition is conducive to enriching the product layout and optimizing the competitive environment. (motion 9)

M&A performance: This acquisition of TDDI business and end customers has significant overlap with Willsemi's existing business. After the acquisition, it will enrich Willsemi's product layout and optimize the competitive environment. However, as the acquisition was made in 2021 when chips were in short supply, some market analysts believe that the acquisition price may be high. Looking at the market performance after the acquisition, compared to previous billion-dollar acquisitions, this acquisition did not have a significant boost on the company's stock price.

HG Semiconductor and WLCSP's Acquisition of VisIC Technologies Ltd of Israel

Field: automotive semiconductors

Target nature: an Israeli company

Founded in 2010 and headquartered in NessZiona, Israel, VisIC is the world's leading third-generation semiconductor GaN (gallium nitride) device design company. Its patented GaN power devices can be widely used in fast charging, electric automobiles, 5G base stations and data centers, high-power lasers, etc. At present, VisIC is actively cooperating with internationally renowned automobile manufacturers to jointly develop vehicle-mounted high-power GaN modules at 800V or above, providing power device

products with higher conversion efficiency, smaller module size and higher reliability for new electric automobiles.

Established in 2010, HG Semiconductor was formerly known as Hongguang Lighting Holdings Co., Ltd. Its main products include LED lamp beads, GaN chips, GaN devices and related GaN application products, as well as fast charging products. HG Semiconductor also focuses on related subdivisions by acquiring GSRGO Holding Cooperation mainly engaged in the R&D of fast battery charging system solutions, and investing in GaN Systems Inc, a Canadian GaN technology leader specializing in civilian products.

Unlike traditional packaging and testing companies, WLCSP has been focused on developing innovative technologies since its establishment, to assist customers in implementing high-volume manufacturing of reliable, small-sized, high-performance, and cost-effective semiconductor CMOS image sensor packaging. Its business field includes smart phones, security monitoring digital and other AIOT, automobile related application fields. With the rapid development of automobile intelligence, electrification and networking, the application of in-vehicle cameras will show a rapid growth trend. WLCSP has developed in the field of in-vehicle cameras for many years, and strategically cooperated with mainstream customers with large-scale mass output realized. WLCSP will continue to deploy and improve processes and production capacity in light of market conditions.



Figure 14. K Curve of WLCSP's Stock Price

According to the secondary market trend, WLCSP's stock price rose sharply after the announcement of the M&A but quickly fell back after two waves of rise. Its current market value is equivalent to that before the M&A.

Motions of M&A:

- 1) Both WLCSP and HG Semiconductor are supported by industrial M&A fund; (motion 3)
- 2) VisIC is a global leader in the segment market; (motion 7)
- 3) WLCSP and HG Semiconductor can obtain new GaN technologies through the acquisition; (motion 9)
- 4) Help to open up the international market for new products. (motion 1)

M&A performance: WLCSP's focus on technological research and development, rather than scale, aligns with its participation in the acquisition of VisIC. The company has maintained a high level of gross margin, around 40%, even in 2022 despite industry fluctuations, far exceeding the less than 20% level of its peers. Although the short-term impact of the VisIC acquisition on the company's performance is not significant, the

company's choice to pursue a development path that suits its own needs has gained recognition from securities research institutions, and its future prospects are promising.

Luxvisions Innovation' Acquisition of Cowell

Field: standard parts

Target nature: a Korean company listed in Hong Kong

Founded in 2006, Cowell E Holdings Inc. is an optical component and camera module manufacturer in South Korean. In the early years, it gradually developed and grew to the supplier of South Korea's second largest electronics manufacturer - LG Group (LPL.N). In 2009, Cowell was recognized by Apple and began to supply camera modules for it, thus officially becoming a member of the Apple's supply chain and having further stronger performance. By 2013, Cowell had become the sixth largest camera module supplier in the world. In 2015, Cowell was officially listed on the Hong Kong Stock Exchange. According to its financial report, Cowell's main business is divided into two categories: camera modules and optical components. But the main business of camera modules has always accounted for more than 99%, so it can be said that its main business is highly specialized, and the optical component business is almost negligible. And due to losses, Cowell has completely stopped the optical component business in 2021, and camera module business has become the only main business. Its top five customers in 2020 and 2021 contributed to more than 99% of its revenue, and the single customer (Apple) contributed to 96.9% and 99.3% respectively of its revenue.

Luxshare ICT is a technology-oriented company that focuses on the R&D, production and sales of connectors, cables, motors, wireless charging, FPC, antennas, acoustic and electronic modules, and the development of high-frequency products. It is a

key enterprise in Apple's supply chain and its products are widely used in consumer electronics, communication, enterprise level, automobile, medical care and other important fields in the world. Under the promotion of Apple, Luxvisions Innovation Technology Limited, a subsidiary of Luxshare ICT, acquired 62.67% equity of Cowell.



Figure 15. K Curve of Luxshare ICT's Stock Price

After the acquisition in 2020, since the revenue of Cowell was only a fraction of Luxshare ICT, the acquisition has had insignificant impact on Luxshare ICT, but the stock price of Cowell has risen several times.

Motions of M&A:

- 1) Apple supports the integration of enterprises in the industrial chain; (motion 7)
- 2) Major shareholders support the acquisition by Luxvisions Innovation; (motion 3)
- 3) Enter new markets by circumventing U.S. regulatory restrictions through the acquisition; (motion 10)
- 4) Luxshare ICT has a rich product line to support the application of Cowell's products; (motion 4)

5) Improve the localization rate and market share of mobile phone optical device products. (motion 1)

M&A performance: Based on the financial reports of Cowell after the acquisition, the company's profitability and growth have both significantly rebounded by June 2022, despite the industry downturn in 2022. The merger with Luxshare ICT is expected to benefit the company's development. However, the impact of the acquisition on Luxshare ICT is not significant.

Eoptolink's Acquisition of Alpine Optoelectronics, Inc

Field: optical module

Target nature: a Japanese company under bankruptcy reorganization

Founded in 2018 and headquartered in California, USA, Alpine focuses on silicon photonics, PAM4 and coherent optical technologies in the optoelectronics field. It has established a close cooperative relationship with core raw material suppliers through R&D cooperations and guidance on key technologies. Its technical team has rich experience in communication system design, can quickly understand the needs of end customers, and provide optimized overall solutions and technical support.

Eoptolink is an optical module manufacturer, whose main business is the R&D, production and sales of optical modules. The so-called optical module is a component used for data transmission, functions to realize the mutual conversion between optical signals and electrical signals and is mainly used in the telecommunications field represented by base stations, access networks and transmission networks, and the data communication field represented by the data center.

However, the announcement shows that the target company recorded operating revenue of RMB47.6123 million, of which Eoptolink purchased materials and services amounting to RMB41.986 million from the target company, contributing to 88.13% of the operating revenue of the target company.



Figure 16. K Curve of Eoptolink's Stock Price

According to the secondary market trend, Eoptolink once saw a round of slight rise after its planned the acquisition to the date when it confirmed the acquisition, but had poor market performance thereafter. This also shows that this kind of M&A is not recognized by the market.

Motions of M&A:

- 1) Eoptolink and Alpine form industrial synergy; (motion 4)
- 2) Alpine can help Eoptolink expand the U.S. market and increase export share; (motion 1)
- 3) Eoptolink has a certain market accumulation in optical chips; (motion 8)
- 4) Obtain advanced technology through the M&A. (motion 9)

M&A performance: In terms of product layout and industry synergy, Alpine has achieved research results in silicon photonics chip design technology, and has formed complementary relationships with Eoptolink in the supply chain. According to Eoptolink's financial report, after the acquisition, the company's growth and profitability have improved to a certain extent, and the financial risk has decreased, with the performance forecast showing a significant increase in net profit. However, the company is still in the performance commitment period after the acquisition of the target company by Eoptolink, and it is difficult to judge whether the performance will decline after the commitment period expires. Industry analysts believe that the company's acquisition is based on considerations of complementary advantages, and may achieve the effect of "1+1>2".

Wise Road Capital's Acquisition of UTAC, PTI's Packaging and Testing Factory Located in Singapore and ASE Group's Packaging and Testing Factories in Chinese Mainland

Field: packaging and testing

Target nature: assets of loss-making packaging and testing companies and some assets of industry leading enterprises

Wise Road Capital is a global professional equity investment institution that focuses on investing in semiconductor core technology and other emerging high-end technology opportunities. Its investors include global leading high-tech companies, large financial institutions, and family funds. However, in practice, Wise Road Capital has strong Chinese background and has cooperated with JAC Capital multiple times, which led to the failure of its acquisition of Magnachip in 2021 due to CFIUS's intervention.

Nevertheless, in 2020-2021, Wise Road Capital made significant acquisitions in the field of semiconductor packaging and testing. In August 2020, it acquired UTAC, a semiconductor packaging and testing factory based in Singapore. In January 2021,

through the acquisition of UTAC, Wise Road Capital acquired the testing factory of PTI, which was ranked fourth in the world at the time, in Singapore. With the completion of this transaction, UTAC can provide advanced 12-inch wafer bumping capabilities and technologies, supplementing UTAC's WLCSP capabilities. The transaction prices of these two deals were not disclosed.

UTAC is one of the largest testing and assembly service providers in Singapore, capable of providing memory, mixed signal/RF and logic integrated circuits for various semiconductor devices. It has manufacturing facilities in Singapore, Thailand, Taiwan, China, Indonesia, and Malaysia, and ranks seventh among the world's outsourced semiconductor assembly and testing companies. However, under the management of its former shareholder, Texas Pacific Group (TPG), the company has been losing money. Since being acquired by Chinese Wise Road Capital in 2019, the company's revenue in 2021 has approached USD 1.5 billion, with net profit exceeding USD 100 million, achieving profitability for the first time in 8 years.

ASE Group was founded in 1984 and listed on NASDAQ in 1996. It provides testing services for various stages of chip production, including front-end testing, wafer probing, packaging, material and finished product testing. It is currently the world's largest packaging and testing company. With the escalation of the US-China trade war and the continued expansion of US restrictions on Chinese mainland 's semiconductor industry, some foreign companies have begun to show signs of accelerating the transfer of relevant factories and supply chains outside Chinese mainland. ASE Group chose to transfer all of its factories in Chinese mainland.

After completing the above acquisitions, Wise Road Capital established Wise Road Packaging and Testing, which has a global market share of 3.48% and maintains its ranking as the seventh largest packaging and testing factory in the world. Although the threshold of packaging and testing in the semiconductor industry chain is relatively low, with the widespread application of Chiplet technology, packaging technology is becoming increasingly important. Wise Road Capital's acquisition seems to have the potential to reshape the industry landscape. In 2022, the combined market share of JCET Tongfu Microelectronics, Hua Tian Technology, and Wise Road Packaging and Testing, ranking third, fourth, sixth, and seventh respectively in the packaging and testing field, has reached 24.54%, approaching the industry leader ASE Group.

Motions of M&A:

1) After setbacks in acquiring high-end chip companies, Wise Road Capital, as an investment firm, chose a more certain field to invest in; (motion 3)

2) By acquiring, Wise Road Capital promotes industrial synergy among its invested packaging and testing companies, and enhances its market share; (motion 8)

3) Wise Road Capital has increased its discourse power of China's packaging and testing companies; (motion 10)

4) Wise Road Capital has acquired advanced technology through M&A. (motion 9)

M&A performance: There is not much public information on Wise Road Packaging and Testing, but mainly about its industry status reports and news of its investment in building a factory in Yantai. The Yantai project primarily introduces leading global technologies such as automotive-grade QFN and SiP packaging, with plans to start

mass production in April 2023. At that time, Wise Road Packaging and Testing's market share in packaging and testing is expected to continue to rise, promoting the upgrading and iteration of China's local semiconductor packaging and testing industry. Given that chiplets have become the hottest technology in the packaging and testing field recently, Zhilu's acquisition grasps the opportunity of the industry's development, and the prospects are promising.

Suzhou Star Test's Acquisition of GSI Co., Ltd

Field: semiconductor device

Target nature: some assets of industry leaders

Yawei (002559.SZ) invested RMB 18.75 million with its own funds, along with other affiliated parties, to invest a total of RMB 45 million in Suzhou Star Test. In April 2021, it spent RMB 27 million to acquire 100% equity of South Korean GSI Co., Ltd. GSI, established in 2014, possesses high-level semiconductor testing technology for memory chips and has been a stable supplier for industry leaders such as Hynix and Amkor Technology. After the acquisition, the semiconductor testing technology owned by GSI will be licensed to Suzhou Star Test and its employees will receive relevant technical training to ensure that Suzhou Star Test has complete, accurate, and reliable technology to produce products that meet the agreed technical performance indicators and are at the same level as GSI. In the domestic semiconductor testing equipment market, China's companies have a certain market share in the relatively lower-technology sorting and analog/mixed-signal testing equipment fields, while memory storage testing equipment is monopolized by American and Japanese companies. This acquisition is conducive to the localization of high-end semiconductor equipment in China.



Figure 17. K Curve of Yawei's Stock Price

From the trend of the secondary market, after announcing the acquisition plan, the stock price of Yawei experienced a surge, coinciding with the speculation of the semiconductor sector in the Chinese stock market, causing the stock price to double within six months, but eventually fell back as the actual impact on the company's performance was minimal.

Motions of M&A:

- 1) The need for diversified business layout; (motion 6)
- 2) Acquiring mature technology through mergers and acquisitions to open up overseas markets; (motion 1)
- 3) Great potential for domestic substitution in high-end equipment in segmented fields; (motion 8)
- 4) The need for market value management by the company. (motion 3)

M&A performance: The transaction price of this acquisition is only RMB 27 million, which is only one ten-thousandth of Yawei' market value as one of the funding

parties. Therefore, the actual impact on Awi Holdings is minimal. However, this transaction is included in the top ten cases of annual overseas mergers and acquisitions by Chinese chip companies, which is enough to illustrate the difficulties faced by Chinese chip companies in 2021 under the background of chip shortages.

SPARC's Acquisition of Ampleon

Field: RF semiconductor

Target nature: the second-largest mobile base station RF chip company globally, acquired by China Merger & Acquisition Fund

SPARC was established in June 2019 with investments from five companies, including Wuxi Industry Development Group Co., Ltd., WEIFU Group, Wuxi Taiji Industry Corporation Limited, Wuxi SPARC Microelectronics Limited Partnership (limited partnership), and Chuxin Semiconductor Technology Co., Ltd. In its founding year, the company acquired 70% of LFoundry, an Italian integrated circuit wafer foundry with advanced 8-inch production lines and 150nm and 110nm process technologies, which supports CMOS image sensors, intelligent power, touch displays, and embedded memory.

Ampleon Coöperatief U.A. is a global leading supplier of RF power chips, specializing in the research, design, production, and sales of high-power RF power chip products. Its products are mainly used in the field of mobile communication (base stations) and have a wide range of applications in aerospace, lighting, energy transmission, and other fields. Ampleon was formerly the RF power department of the world-renowned chip company NXP and has over 50 years of operating experience in the RF power chip industry. After the merger of NXP and Freescale, it was sold by NXP to

comply with relevant national antitrust regulations, and was later acquired by Chinese capital and renamed Ampleon Group. The company's operating center is located in Nijmegen, the Netherlands, and currently has multiple R&D centers, sales centers, customer service centers, and distribution networks in 18 countries or regions across 3 continents. The company's core products are mobile communication base station RF chip products, with major customers including Huawei, Ericsson, ZTE, Samsung, and Nokia, and currently has the second-largest market share in the world. Ampleon focuses on continuously improving the performance of RF power chips and conducts forward-looking research and development and technology reserves in line with the technological iteration of the mobile communication industry.

In July 2022, it was reported that SPARC had completed the acquisition of Ampleon, which will help SPARC continuously expand its business lines and become a multinational enterprise group in the national semiconductor IDM model, providing high-end chip products for applications in China's automotive, new energy, and other fields.

It is worth noting that Ampleon and Nexperia, the predecessor of case Nexperia, were both owned by NXP. The three businesses that were divested during the NXP and Freescale merger were all acquired by Chinese capital, with Nexperia going public through a reverse merger with Wingtech. However, the listing paths of Ampleon and WeEn, which focuses on bipolar power transistor product lines, have been fraught with difficulties. Since 2017, there have been public announcements and rumors of acquisition intentions from multiple listed companies, such as Auride (600666), Watertek (300324), YOTRIO (002489), and LEO (002131). However, the acquisition could not be completed

due to the cash settlement requirement of JAC Capital. This deal was not publicized with a transaction price, only stating that it was over RMB 10 billion, and it is likely that the capital parties at the time suffered losses. Another company, WeEn, has also been rumored to be seeking a reverse merger and has submitted and withdrawn an IPO application several times. The reason for this is that cross-border M&A by JAC Capital, which is purely capital-oriented, cannot effectively localize, and the complex private equity establishment model also affects its domestic IPO prospects.

Motions of M&A:

- 1) Shareholders of SPARC support the company's expansion through M&A; (motion 3)
- 2) The leading position of Ampelon in the segmented industry is beneficial for SPARC to expand its market through its channels; (motion 7)
- 3) Shareholders of Ampelon have a strong demand for cashing out; (motion 9)
- 4) The global communications market is still in a steady growth stage. (motion 8)

M&A performance: Since its establishment, SPARC has built a chip IDM business model through mergers and acquisitions, and has grown into a core integrated circuit enterprise covering the entire industry chain ecology of "chip design-manufacturing-packaging and testing-module products". The initiators are mainly large local enterprises in Wuxi, reflecting the intention of the local government to develop the chip industry. However, in the three years since its establishment, apart from acquiring the Italian wafer foundry LFoundry, it has also acquired three chip companies in different regions of China. This is a major test for the company's integration and operation capabilities. Moreover, according to the analysis of public information on

Ampelon, although Ampelon ranks second in the field of radio frequency chips, the company was divested by NXP because its technology level was relatively lower than that of Freescale's radio frequency chips, and the company has few layouts in 5G chips. In addition, considering the lesson from the rapid expansion of Unigroup, the market has a low evaluation of SPARC' acquisition this time.

Conclusion of Analysis on M&A Cases After 2020

Compared to M&A cases before 2020, the recent M&A cases have shown a decline in asset size and industry status to varying degrees. It is also difficult to see Chinese enterprises in the top ten annual semiconductor M&A cases. This is likely due to the governments of countries such as the United States, the United Kingdom, Germany, and Italy excluding Chinese enterprises from acquiring local enterprises during foreign acquisition reviews. For example, the German government blocked Saiwei Electronics's Swedish subsidiary from acquiring the old production line of German semiconductor manufacturer Elmos. The Italian government also prevented the acquisition of Italian SiC/Si epitaxial equipment manufacturer LPE by China's Shenzhen Investment Fund. Even Zhejiang Jingsheng Mechanical & Electrical's plan to acquire the screen printing equipment business in Italy was vetoed. The UK government overturned the deal of Wingtech's Dutch subsidiary Nexperia acquiring Newport Wafer Fab, a British semiconductor manufacturer. Wingtech was forced to sell at least 86% of the equity of Newport Wafer Fab (NWF), which it had previously acquired. Chinese enterprises' acquisitions in Europe and the United States are hindered, and other acquisitions are also difficult to complete. Wise Road Capital had planned to acquire MagnaChip, a South Korean semiconductor company, at a high premium. However, because MagnaChip is a

Korean company listed in the United States, it is regulated by the Committee on Foreign Investment in the United States. The US side has not approved the transaction, and the deal had to be terminated.

If the reasons for regulatory rejections of Nvidia's acquisition of ARM and the merger between Qualcomm and Broadcom are concerns about creating monopolies that affect competition, then many analysts believe that the rejections of smaller-scale M&A by Chinese enterprises have political implications.

In summary, after 2020, overseas M&As of Chinese chip enterprises have suffered the decrease in the scale and slowdown in the pace, mainly for the following three reasons:

(1) Impact of the trade war. Since 2018, the Sino-US trade war has gradually escalated; chips, especially high-end chips, have become the main field in which the United States restricts the development of China; the approval obstruction of the CFIUS in the United States has led to the difficulties in overseas M&As of Chinese enterprises. For example, the acquisition of MEGGON and Western Digital by Unigroup was rejected by the CFIUS, even if the M&A offer of the Chinese institution was higher than that of competitors. The CHIPS and Science Act of 2022 of the U.S. issued in August 2022 specifically set forth the firewall provision, prohibiting companies from investing in some fabs or semiconductor facilities in countries such as China for 10 years after receiving federal funding. This makes it difficult for Chinese enterprises to make overseas M&As in the field of high-end chips. Chinese enterprises can only acquire mature technologies in areas such as packaging.

(2) Impact of COVID-19. On the one hand, the epidemic prevention and control policy advocates the reduction of the number of outings, making it difficult to effectively carry out business exchanges and M&A due diligence, so that enterprises have missed many opportunities. On the other hand, the huge impact of the epidemic on the economy has caused many entrepreneurs who originally had the intention of M&A to change their M&A plans.

(3) Drastic fluctuations in the industry. Since 2020, the price fluctuation of products in the semiconductor industry has been more violent than electrocardiogram. The epidemic outbreak in the first half of 2020 led to a decline in chip prices; from the second half of 2020 to 2021, due to the expected economic recovery and the growth of the demand for 5G and new energy vehicles, chip prices rose sharply in 2021, and some product prices rose by 30 times; however, with the production expansion of large factories and the decline in the demand for consumer electronics, some chip prices have plunged by more than 80% since the second half of 2021. Chips are a capital-intensive industry. Sharp price fluctuations make enterprises afraid to make M&As easily.

Therefore, after 2020, Chinese enterprises have made M&As mainly for enhancing the scale effect, ensuring growth, and maintaining the market value of listed companies.

Most of the M&A deals after 2020 have been of small volume, and the impact on listed companies in multiple cases has been minimal, with no significant improvement in M&A performance. However, from the perspective of the development strategies of relevant companies, these deals complement the original business and are conducive to

the development of the company. This indicates that the companies initiating the acquisitions are more focused on the actual needs of the company rather than using the chip as a gimmick to pursue an increase in market value.

The two large-scale M&A cases of Wise Road Packaging and Testing and SPARC were both initiated by non-listed companies, and the information disclosed is limited. However, in the context of the declining industry, these capital-led acquisitions supported by government funds focus more on the scale effect. The actual operational effect is difficult to judge due to insufficient information.

Table 5. Top 10 M&A Cases in 2020

No.	Date	Acquisition cases
1	September 2020	NVIDIA announced the acquisition of ARM, a semiconductor intellectual property (IP) provider, with USD 40 billion.
2	October 2020	AMD announced the acquisition of Xilinx, the world's largest FPGA supplier, with USD 35 billion (stock)
3	July 2020	American analog chip giant ADI (Analog Devices Inc) announced its acquisition of its competitor Maxim Integrated Products with USD 21 billion (stock).
4	October 2020	Marvell announced its acquisition of Inphi, a data center component chipmaker, with USD 10 billion.
5	October 2020	SK Hynix acquired Intel's NAND flash memory chip and storage business with USD 9 billion.
6	November 2020	Global Wafer acquired Siltronic AG, a German silicon wafer manufacturer, with EUR 3.75 billion.
7	July 2020	AMS AG acquired Osram with EUR 2.7 billion
8	February 2020	Dialog Semiconductor, a highly integrated power management, charging, AC/DC power conversion, Wi-Fi and Bluetooth Low Energy technology provider, acquired Adesto with about USD 500 million
9	January 2020	On-Bright, a power management IC factory, was sold to Orthosie Investment Holdings, a private equity fund, at a price of TWD 12.876 billion (equivalent to USD 470 million)
10	July - October 2020	ST acquired successively the cellular IoT connection assets and SOMOS semiconductor assets of BeSpoon and Riot Micro, experts of ultra wideband (UWB), but the amount has not been announced.

Table 6. Top 10 M&A Cases in 2021

No.	Date	Acquisition cases
1	August 2021	Marvell acquired Inphi with USD 10 billion. The merged company is committed to becoming an end-to-end technology leader in the field of data network infrastructure.
2	December 2021	American semiconductor material manufacturer Entegris will acquire its competitor CMC Materials with USD 6.5 billion.
3	January 2021	Lumentum, an optical component manufacturer, acquired laser manufacturer Coherent with USD 5.7 billion.
4	August 2021	Renesa Electronics completed the acquisition of Dialog with a total equity value of about EUR 4.8 billion.
5	October 2021	Qualcomm acquired Swedish Veoneer with USD 4.5 billion.
6	April 2021	Skyworks, a semiconductor RF supplier, acquired Silicon Labs' infrastructure and automotive business with USD 2.75 billion.
7	December 2021	Wise Road Capital acquired four sealing and testing plants in Chinese mainland including ASE with USD 1.46 billion
8	June 2021	Texas Instruments acquired Micron Technology's Lehi 12 inch wafer factory in Utah with USD 900 million.
9	September 2021	JSR, a Japanese semiconductor material manufacturer, announced that it would acquire Inpria, headquartered in Corvallis, Oregon, with USD 514 million.
10	October 2021	SK Hynix announced that it would acquire Key Foundry, a wafer foundry based in South Korea, with KRW 576 billion (USD 493 million).
11	December 2021	Renesa Electronics completed the acquisition of Celeno Communications, a leading intelligent and innovative Wi-Fi solution provider, with USD 315 million

Table 7. Top 10 M&A Cases in 2022

No.	Date	Acquisition cases
1	May 2022	Broadcom offered USD 61 billion for acquiring Broadcom, a supplier of semiconductor and infrastructure software products, and VMware, a leader in virtualization technology.
2	July 2022	US semiconductor materials manufacturer Entegris is to acquire CMC Materials for USD 5.7 billion.
3	February 2022	Intel plans to acquire Israeli wafer foundry Tower Semiconductor at a price of USD 5.4 billion.
4	May 2022	MaxLinear announced the acquisition of Silicon Motion in Taiwan, China, with USD 3.8 billion in cash and stock.
5	April 2022	AMD plans to acquire Pensando Systems, a cloud service provider, with USD 1.9 billion to continue to expand its data center business.
6	April 2022	IC distributor WT Microelectronics plans to acquire 100% equity of Singapore chip distributor Excelpoint Technology with USD 1.08 billion.
7	October 2022	Taiwan's YAGEO acquires Schneider's Telemecanique Sensors business for EUR 686 million.
8	November 2022	Nexperia completes the acquisition of Dutch semiconductor company Nowi.
9	June 2022	Diodes acquires ON Semiconductor's wafer fabrication facility in Maine with undisclosed transaction price, but according to public information from ON Semiconductor, the price was not low.
10	October 2022	A Japanese fund supported by the Development Bank of Japan and Itochu plans to acquire a chip factory owned by ON Semiconductor for USD 135 million.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

Based on the case analysis and studies above and in combination with Porter's single diamond model, Moon, Rugman, and Verbeke's double diamond model, Moon and Roehl's supplement to the single diamond model, Dunning's amendment to the single diamond model, Moon's double diamond model in the APEC report, and Jin Bei and Rui Mingjie's extended research, the diamond model of overseas M&A by Chinese chip companies in different stages is obtained after expansion and shown in the following figure:

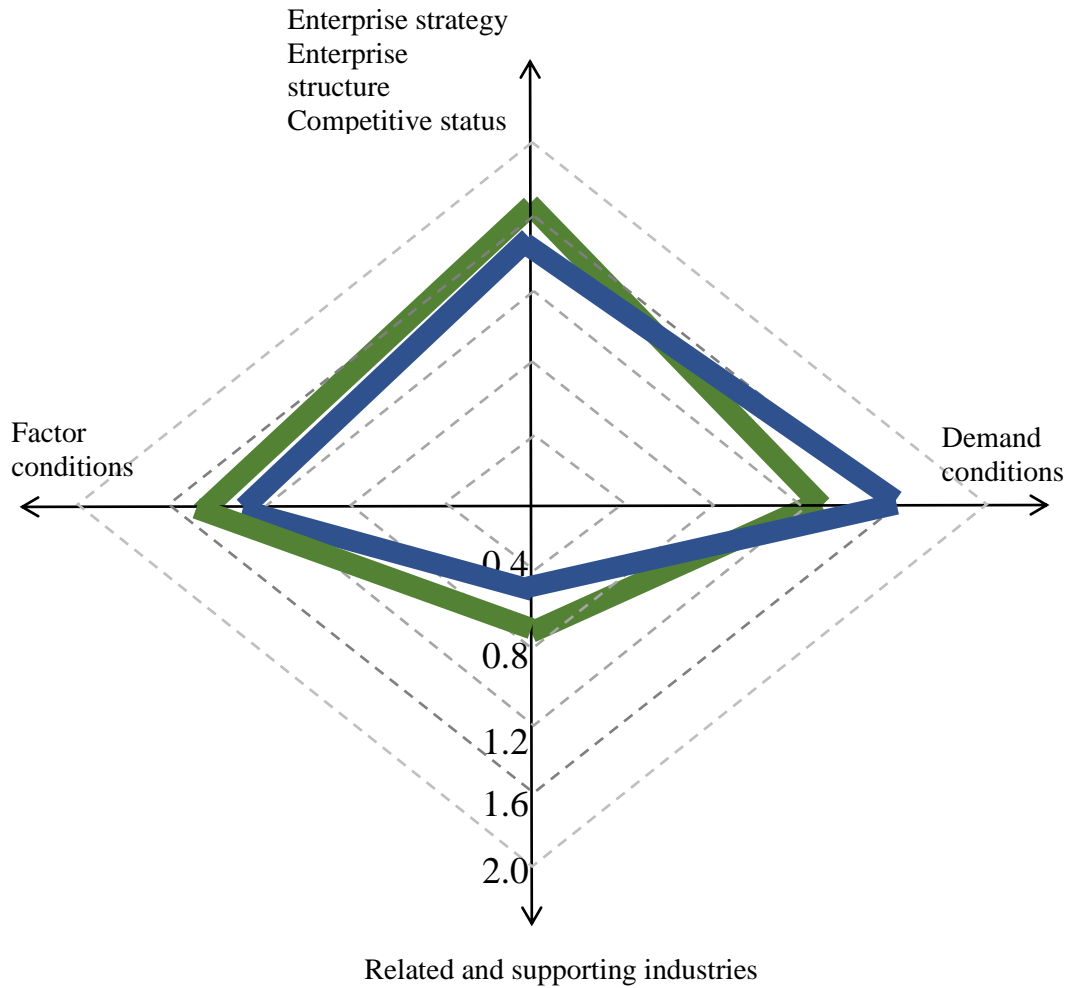


Figure 18. Nine-Factor Double Diamond Model

The blue diamond in the figure show the influencing factors on the transnational M&A of Chinese chip enterprises before 2020, and at this stage, Chinese enterprises' choices for transnational M&As mainly focus on three aspects: factor conditions, demand conditions and firm strategy, and they are not concerned about whether they have relevant supporting industries with the target of acquisition, but are more concerned about the technological leadership, scale and the possibility of obtaining policy subsidies of the target of M&A.

Green diamond shows the influencing factors of transnational M&A of Chinese chip enterprises from 2020 to the present. At this stage, Chinese enterprises are more concerned about the factors of production and the role of enterprise strategy, corporate structure and rivalry, which indicates that in the face of the impact of trade frictions, the overseas M&As of Chinese enterprises in many key areas have been rejected, and enterprises are more concerned about their own development strategy needs and do not attach as much importance to policy support as before.

When comparing the two stages, the first is that the size of the diamonds is different. Having accumulated experience in transnational M&A in the previous stage, Chinese enterprises are more rational in their selection of M&A targets and offers, and in terms of performance assessment, despite the small amount of M&As in this stage, they have significantly improved their competitiveness and made a positive impact in terms of global network building, certain weak industries and market channels in China.

Overall, the "diamond" shape of Chinese chip enterprises' selection of transnational M&A is relatively well balanced in all three areas, except for the weaknesses in related and supporting industries. After the outbreak of the COVID-19 in 2020, the global political landscape showed a tendency towards multipolarization and populism. The energy crisis caused by the Russia-Ukraine conflict exacerbated the already fragile global economy, with the US Federal Reserve raising interest rates eight times in less than twelve months, and other major central banks also implementing interest rate hikes at the fastest and largest scale in over 20 years, in an effort to curb soaring inflation. Countries such as Zambia, Argentina, Sri Lanka, Lebanon, and Ghana defaulted on their debts. The World Bank report suggests that the global economy is at

risk of recession. Faced with the severe economic situation, many companies choose to enhance their core competitiveness through mergers and acquisitions. Drawing on past successful cases and combining with the current complex international political and economic situation, it is suggested that Chinese enterprises learn from the lessons of the Unigroup and JAC Capital when choosing overseas M&As, pay more attention to market-oriented factors and scientifically formulate their M&A strategies.

1) Before carrying out transnational M&A, take the development strategy of increasing the core competitiveness and sustainable development capacity of the enterprise, which is positioned to obtain the resources needed in the process of economic development; there is no good or bad choice for the target enterprise, only appropriate or not. Obtaining a perfect market network and improving the core competitiveness through business integration are the fundamental of a company's appreciation.

2) By employing professional intermediaries to conduct a detailed investigation and assessment of the company's organizational capital and human capital, determine whether the objective environment, operating conditions, business operations, etc. of the target enterprise is relevant to the company and whether it has development potential and plasticity, etc.

3) Cooperate with the financing institutions including banks to broaden the source of funds and resolve financing traps.

4) Cooperate with intermediaries such as investment banks, law firms, accounting firms and consulting firms to conduct a comprehensive analysis of the target enterprise's industrial environment, financial position and operating capabilities, and make reasonable predictions on the core strengths, key technologies, marketing channels, etc., so as to make the appraisal value closer to the real value of the target enterprise.

5) Focusing on post-M&A integration and effective management of M&A enterprises are an important factor for the success of transnational M&A. How to combine the low-cost structure of China with the knowledge and technology advantages of developed countries and bring them into effect requires not only changes in the business model and product structure, but more importantly, integration and coordination of different cultures.

6) The government should simplify the approval process, relax the restrictions on M&A subjects and change the approval system to a filing system. The government should also provide information services and technical support for overseas investment such as information support, financing support, diplomatic support, tax support, etc. At the same time, the government should also establish various systems and policies to create a good macro environment and policy framework for overseas investment, and formulate overseas investment promotion laws and overseas investment insurance laws, etc. to encourage transnational M&A. The government should play a greater role in this regard.

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