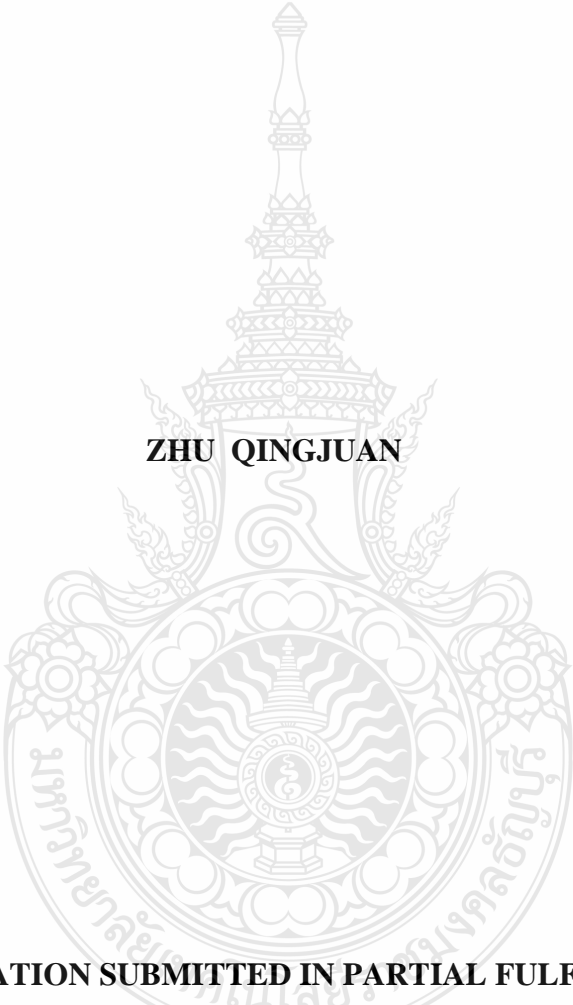


**CORPORATE SOCIAL CAPITAL AND ENTERPRISE PERFORMANCE:
EXPLORING THE MEDIATING ROLE OF KNOWLEDGE INTEGRATION
ABILITY AND THE MODERATING EFFECT OF WELL-PERFORMING
AND POORLY-PERFORMING ENTERPRISES**

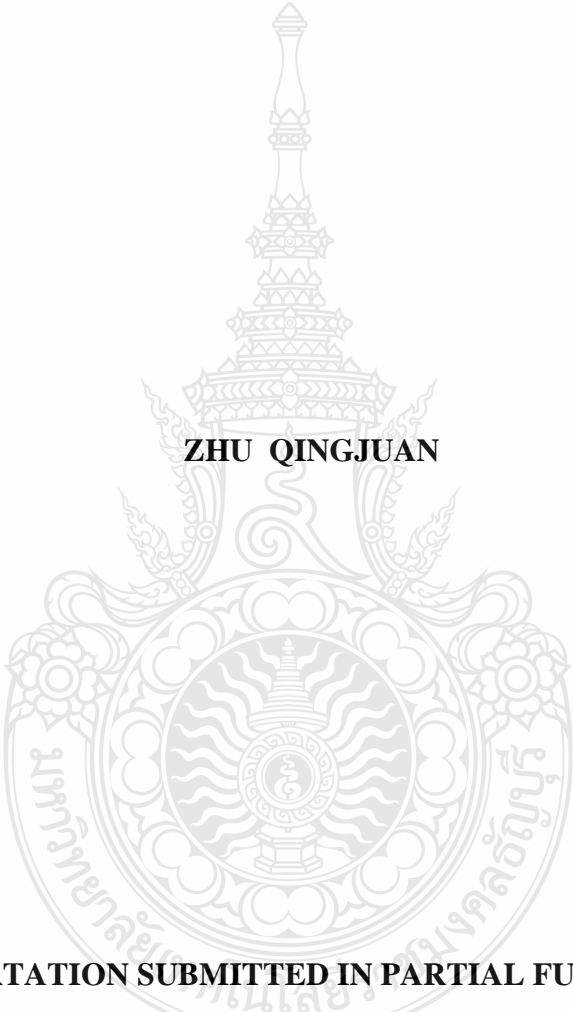
ZHU QINGJUAN



**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY PROGRAM IN BUSINESS ADMINISTRATION
FACULTY OF BUSINESS ADMINISTRATION
RAJAMANGALA UNIVERSITY OF TECHNOLOGY THANYABURI
ACADEMIC YEAR 2023
COPY RIGHT OF RAJAMANGALA UNIVERSITY
OF TECHNOLOGY THANYABURI**

**CORPORATE SOCIAL CAPITAL AND ENTERPRISE PERFORMANCE:
EXPLORING THE MEDIATING ROLE OF KNOWLEDGE INTEGRATION
ABILITY AND THE MODERATING EFFECT OF WELL-PERFORMING
AND POORLY-PERFORMING ENTERPRISES**

ZHU QINGJUAN



**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY PROGRAM IN BUSINESS ADMINISTRATION
FACULTY OF BUSINESS ADMINISTRATION
RAJAMANGALA UNIVERSITY OF TECHNOLOGY THANYABURI
ACADEMIC YEAR 2023
COPY RIGHT OF RAJAMANGALA UNIVERSITY
OF TECHNOLOGY THANYABURI**

Dissertation Title Corporate Social Capital and Enterprise Performance:
Exploring the Mediating Role of Knowledge Integration
Ability and the Moderating Effect of Well-performing and
Poorly-performing Enterprises

Name – Surname Mrs. Zhu Qingjuan

Program Business Administration

Dissertation Advisor Assistant Professor Nartraphee Tancho, Ph.D.

Dissertation Co-Advisor Assistant Professor Supa Tongkong, Ph.D.


Academic Year 2023

DISSERTATION COMMITTEE


..... Chairman
(Assistant Professor Krit Jarinto, D.B.A.)



..... Committee
(Associate Professor Sungworn Ngudgratoke, Ph.D.)


..... Committee
(Assistant Professor Teetut Tresirichood, D.B.A.)


..... Committee
(Assistant Professor Supa Tongkong, Ph.D.)


..... Committee
(Assistant Professor Nartraphee Tancho, Ph.D.)

Approved by the Faculty of Business Administration, Rajamangala University
of Technology Thanyaburi in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy


..... Dean of Faculty of Business Administration
(Associate Professor Khahan Na-Nan, Ph.D.)

5 November 2023

Dissertation Title	Corporate Social Capital and Enterprise Performance: Exploring the Mediating Role of Knowledge Integration Ability and the Moderating Effect of Well-performing and Poorly-performing Enterprises
Name - Surname	Mrs. Zhu Qingjuan
Program	Business Administration
Dissertation Advisor	Assistant Professor Nartraphee Tancho, Ph.D.
Dissertation Co-Advisor	Assistant Professor Supa Tongkong, Ph.D.
Academic Year	2023

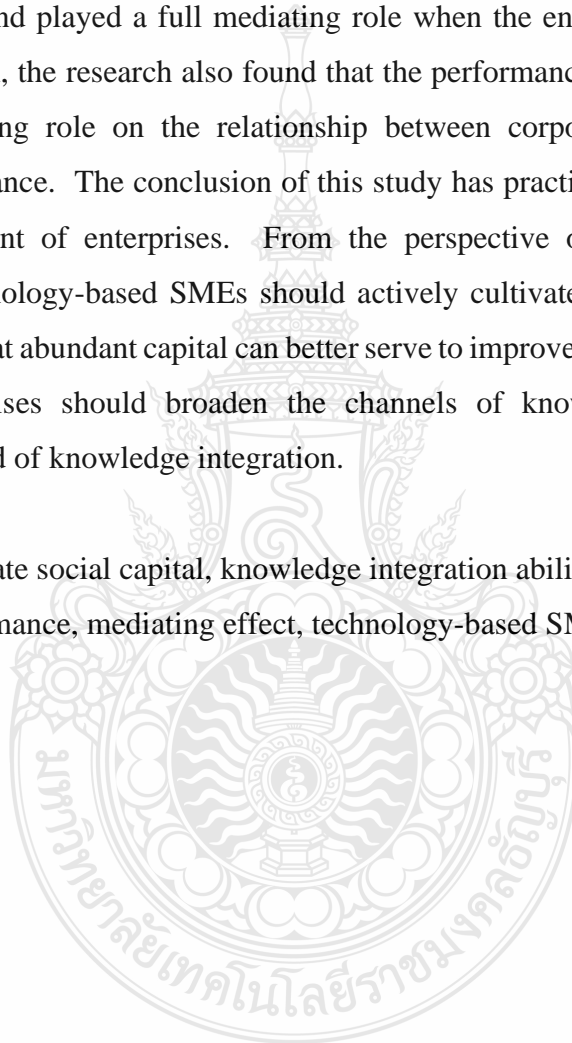
ABSTRACT

The improvement of enterprise performance is a research topic that has been widely studied for a long time. As an enterprise's internal resources are insufficient to achieve competitive advantage and achieve its performance, they need to obtain resources from outside the organization, especially external knowledge. Thus, this research aimed to investigate: (1) the mediating role of knowledge integration ability on the relationship between corporate social capital and enterprise performance, and (2) the moderating effect of enterprise performance itself, exhibited by well-performing and poorly-performing enterprises, on the impact of corporate social capital on enterprise performance.

Technology-based small and medium-sized enterprises (technology-based SMEs) play an important role in modern rapid economic development, especially in China. Hence, the samples used in this study comprised 300 technology-based SMEs operating in China. The instrument used to collect data was a questionnaire that passed assessment in terms of content validity and reliability. A structural equation model was used to analyze the relationship between the variables and the mediating role of knowledge integration ability. Multi-group analysis was used to analyze the moderating effects of well-performing enterprises and poorly-performing enterprises on the impact of corporate social capital on enterprise performance. Data were analyzed using SPSS Statistics for Windows and Mplus Software.

The research results revealed that corporate social capital had a positive effect on enterprise performance. Furthermore, corporate social capital had a positive effect on knowledge integration ability, which, in turn, had a positive effect on enterprise performance. Knowledge integration ability played a mediating role between corporate social capital and enterprise performance. For the whole samples, it played a partial mediating role, and also played a partial mediating role when the enterprise was performing well, and played a full mediating role when the enterprise was performing poorly. In addition, the research also found that the performance of the enterprise itself played a moderating role on the relationship between corporate social capital and enterprise performance. The conclusion of this study has practical guiding significance for the development of enterprises. From the perspective of improving enterprise performance, technology-based SMEs should actively cultivate and develop corporate social capital, so that abundant capital can better serve to improve enterprise performance. Moreover, enterprises should broaden the channels of knowledge integration and accelerate the speed of knowledge integration.

Keywords: corporate social capital, knowledge integration ability, enterprise performance, mediating effect, technology-based SMEs



Acknowledgments

Time goes by; Years, precipitation, a turn around is a time of the story, I believe that time can witness everything. Looking back on more than three years of doctoral study life, filled with emotion. Along the way, I have encountered many difficulties and gained a lot. Although the doctoral dissertation is not the most perfect, it embodies the careful guidance of my advisor and my own hard work.

I successfully defended my doctoral dissertation, thanks to many people who helped me. First of all, I would like to express my gratitude to my two advisors who took time out of their busy schedules to give me careful guidance and careful review during the writing of my thesis. And in the life of my meticulous care, let me feel very warm in a foreign country, full of positive power ; Secondly, I would also like to express my gratitude to the members of the defense committee and every teacher in the college. Their profound knowledge and rigorous scientific research attitude make me unforgettable all my life, and let me learn more professional knowledge and the truth of life. Here I would like to express my most sincere thanks to my most respected teachers!

Finally, I would like to express my gratitude to my family who have always supported me, giving me spiritual encouragement and companionship when I was confused and helpless. I am grateful to my parents for their kindness and my mother for worrying about me all the time. Whenever I encounter difficulties in my studies, her encouragement is always warm and powerful; I would like to express thanks to my husband for supporting and encouraging me all the time during my study, sharing a lot of family pressure; Many thanks to my two children to understand their mother's hard work, become clever sensible; Thanks to all relatives for their tolerance and care; Thanks to my classmates and friends for their company and encouragement. During my study, my family's tolerance made me have no worries, and my friends' encouragement made my boring study life full of joy. All of you are the most powerful driving force in my long study road.

In my study and thesis writing, there are many people who gave me help and support, which I will keep in mind, and I am deeply grateful to you! There is a long way to go, I will continue to work hard, I wish all teachers and students in the future life all the way to flowers.

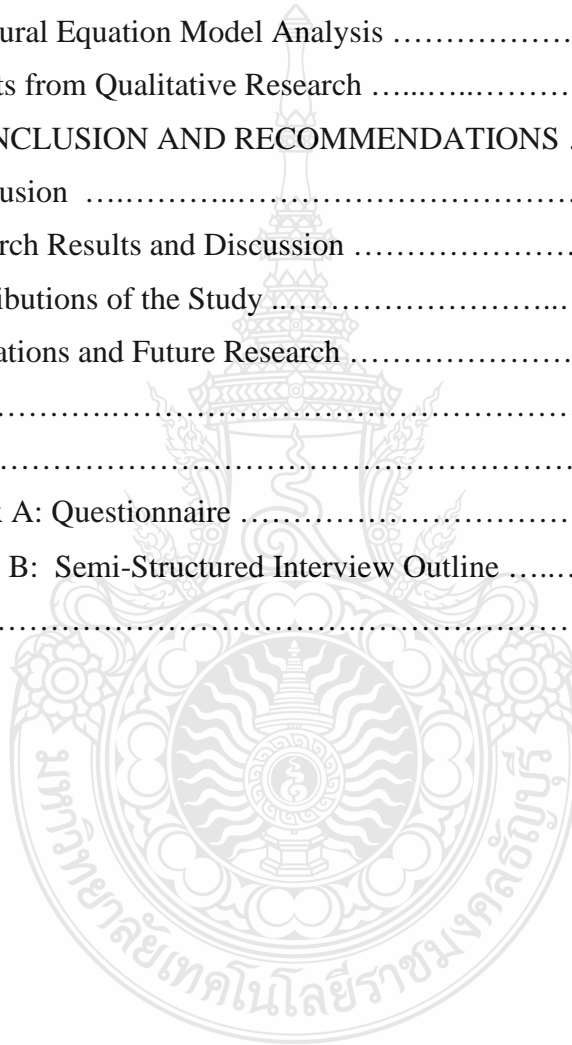
Zhu Qingjuan

Table of Contents

	Page
Abstract	(3)
Acknowledgements	(5)
Table of Contents	(6)
List of Tables	(8)
List of Figures	(9)
CHAPTER 1 INTRODUCTION	11
1.1 Research Background	11
1.2 Purpose of the Study	15
1.3 Significance of the Study	15
1.4 Research Question	17
1.5 Research Variables and Definitions	18
1.6 Technology-based SMEs	20
1.7 Research Scope	21
1.8 Conceptual Framework and Research Hypothesis	22
1.9 Research Contribution	23
CHAPTER 2 REVIEW OF THE LITERATURE	25
2.1 Overview of Social Capital	25
2.2 Knowledge Integration Ability	40
2.3 Enterprise Performance	55
2.4 Review of Moderating Variables between Corporate Social Capital and Enterprise Performance	59
2.5 Research Hypotheses	61
CHAPTER 3 RESEARCH METHODOLOGY	67
3.1 Research Design	67
3.2 Data Collection Method	68
3.3 Variable and measurement index selection	73
3.4 Reliability and Validity	78
3.5 Statistics and Data Analysis Methods	81
3.6 Pre Test	82

Table of Contents (Continued)

	Page
CHAPTER 4 RESEARCH RESULTS	85
4.1 Descriptive Statistical Analysis of Samples	85
4.2 Quality Inspection of Large Sample Data	89
4.3 Correlation Test	94
4.4 Structural Equation Model Analysis	95
4.5 Results from Qualitative Research	103
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS	110
5.1 Conclusion	110
5.2 Research Results and Discussion	111
5.3 Contributions of the Study	118
5.4 Limitations and Future Research	122
Bibliography	123
Appendices	136
Appendix A: Questionnaire	137
Appendix B: Semi-Structured Interview Outline	143
Biography.....	146



List of Tables

		Page
Table 2.1	The concept of corporate social capital	31
Table 2.2	Measurement of corporate social capital	38
Table 2.3	Concept of knowledge integration ability	44
Table 2.4	Measurement of knowledge integration ability	49
Table 3.1	Measurement of corporate social capital	75
Table 3.2	Measurement of knowledge integration ability	77
Table 3.3	Measurement of enterprise performance	78
Table 3.4	Reliability analysis results of the corporate social capital scale	83
Table 3.5	Reliability analysis results of the knowledge integration ability scale .	84
Table 3.6	Reliability analysis results of the enterprise performance scale	84
Table 4.1	Sample feature description statistics	86
Table 4.2	Descriptive statistics of variables	88
Table 4.3	Reliability analysis results of various variable scales	89
Table 4.4	Results of confirmatory factor analysis of variables	91
Table 4.5	List of main fitting indexes of model confirmatory factor analysis ...	94
Table 4.6	Pearson correlation analysis results between variables	94
Table 4.7	Path coefficient table	96
Table 4.8	Sample feature description statistics (model 1)	97
Table 4.9	Path coefficient table	98
Table 4.10	Sample feature description statistics (model 2)	99
Table 4.11	Path coefficient table	100
Table 4.12	Independent-samples T-test	102
Table 4.13	Multiple group analysis results	103
Table 4.14	Descriptive analysis of interviewees	105

List of Figures

	Page
Figure 1.1 Conceptual framework of the study	23
Figure 4.1 Confirmatory factor analysis model	93
Figure 4.2 Overall Structure equation model diagram (N=300)	95
Figure 4.3 Model 1 (N=150)	98
Figure 4.4 Model 2 (N=150)	100



List of Abbreviations

SMEs	Small and Medium-sized Enterprises
CSC	Corporate Social Capital
KIA	Knowledge Integration Ability
EP	Enterprise Performance



CHAPTER 1

INTRODUCTION

1.1 Research Background

How to improve enterprise performance is a research topic that has been widely concerned for a long time. Since the reform and opening up, China's economy has maintained a momentum of sustained and rapid growth. However, with the advent of the post-financial crisis period and low-carbon economy, the international economic structure and consumption pattern have undergone major changes, and there is an urgent need to change the current development mode and seek a new economic growth breakthrough. Driven by the trend of economic development, the capital of enterprises shows a trend of generalization, that is, the traditional financial capital (physical capital and financial capital) is expanded to a broad concept covering many capital forms such as physical capital, financial capital, human capital and social capital. As a result, the driving factors of enterprise value creation show a diversified trend. Intangible capital, represented by enterprise social capital, is becoming more and more important (Wang B. & Gao C, 2001), and enterprise social capital has become an important driving factor for modern enterprise value creation.

Social capital based on psychological research is very important to the development of enterprise internal network. It affects the direction and tendency of entrepreneurial enterprises' network connectivity, and gradually has important significance in entrepreneurial academic research. The link between this and innovation efficiency is uncertain. This research divides social capital into connection and bridge forms, and collects detailed information of agricultural entrepreneurs through questionnaire survey. The results show that the performance of agricultural entrepreneurship is significantly affected by the connection and bridging of social capital. In the relationship between comprehensive social capital and innovation performance, operational ability is a positive factor and opportunity recognition is a negative factor. On the other hand, opportunity cognition plays a positive role, while operational ability plays a negative role in the relationship between social capital and innovation performance.

Finally, this study presents the theoretical and practical results and ideas for further research based on the above findings.

Moreover, the deepening of economic globalization makes the competition faced by enterprises more and more fierce. The internal resources of the enterprise can no longer satisfy its survival and development in the competition. The enterprise also needs to obtain resources from the outside, obtain and utilize the external knowledge as much as possible, so as to form its own competitive advantage and improve the performance of the enterprise. With the advent of the knowledge economy, knowledge resources have become the most important strategic resources for enterprises. Knowledge is the source for organizations to obtain sustainable competitive advantages. The future survival and development of enterprises depends on the ability to acquire and utilize knowledge resources. If an enterprise wants to establish and maintain a competitive advantage in the fierce and dynamic market competition, it needs to continuously learn and continuously acquire new knowledge for the development of the organization. It has become the most important thing for an enterprise to obtain the latest knowledge resources faster than its competitors. One of the core competencies, only by continuously developing or absorbing external knowledge can an enterprise improve its performance and maintain its competitive advantage. Enterprises want to maintain stable development, not only to transfer and use knowledge, but also to constantly create new knowledge. The more high-quality knowledge a company has, the more obvious its competitive advantage will be, and the more favorable it will be in the market. With the increasing complexity of knowledge, it becomes more and more important to collect the latest knowledge in time and update one's original knowledge system.

Over the past 40 years since China's reform and opening up, small and medium-sized enterprises (SMEs) have achieved rapid development. They have become an important force in the development of the socialist economy with Chinese characteristics in the new era. They have played an irreplaceable positive role in promoting China's economic growth, increasing employment opportunities, promoting technological innovation and maintaining social harmony and stability, which is of great significance to the national economy and social development. According to relevant data, at present, China's SMEs account for 99.7% of the total number of enterprises in the country, the

value of products and services created accounts for 60% of GDP, and the tax payment is about 50% of the total national tax revenue. At the same time, it solved the employment problem of 80% laid-off and unemployed workers in state-owned enterprises and a large number of rural migrant workers (Liu L.G & Meng W, 2016).

As a new force in the small and medium-sized enterprise team, technology-based SMEs are successful examples of the combination of science and technology and economy, and the main force to improve independent innovation capability. They integrate the advantages of small and medium-sized enterprises and high-tech enterprises, and have advantages in high flexibility, strong adaptability, outstanding innovation capability, large exogenous technological innovation, high risk and high income. After more than 40 years of development, the total number of China's technology-based SMEs has grown steadily, their business scale has been expanding, their system structure has become more reasonable, their economic benefits have been significantly improved, and their technological innovation ability has become an important part of China's national economy and a new economic growth point. According to relevant data, technology-based SMEs are far higher than large enterprises in solving social employment and creating economic benefits. Among 112 national and provincial high-tech development zones in China, technology-based SEMs account for more than 70%, with about 3,280 million. About 65% of the country's patented inventions, more than 75% of technological innovations and more than 80% of new products are actively contributed by technology-based SMEs.

Enterprises must innovate to maintain their advantages and competitiveness in the information economy. Due to the importance of the construction industry to China's economy and the challenge posed by the "getting out" policy, there has been a strong push for technological and managerial innovation in both the academic and practical worlds. Social capital, a resource in a social network, is the cornerstone for giving businesses a lasting competitive edge. Social capital has a significant role in determining the innovation performance and innovative accomplishments of businesses. Enterprises must engage in knowledge transfer with the others in their networks in order to be competitive in the market. Few academics have, however, investigated whether social capital has any

impact on innovation performance in businesses. This study investigated how corporate social capital impacts businesses' performance from knowledge integration perspective.

In the knowledge-based economy, knowledge and intellectual capital are increasingly recognized as the primary sources of competitive advantages. Small and medium-sized businesses in particular are finding that they need to pay more attention to knowledge management systems, which acts as a mediating factor between social capital and enterprise performance.

To sum up, as a key channel for enterprises to obtain innovative resources, corporate social capital is an important force and effective means to promote technological innovation of technology-based SMEs. Enterprises can obtain rich tangible and intangible resources by building external social networks, which will help to improve the level of performance. Many enterprises have made great efforts to build social capital in order to achieve development in the fierce competition. However, the study found that although many enterprises invested heavily in building social capital, it did not bring good performance to enterprises. For example, Li Peiya (2012) divided corporate social capital into political, financial, market and regional social capital, and his research conclusion showed that political social capital is not conducive to enterprise performance. The empirical research results of Florida et al. (2002) show that there is even an inverse relationship between social capital and innovation performance. They believe that organizations with high scores of social capital will hinder innovation due to complacency or isolation from external information and challenges. Liu Linping (2006) found in the study of corporate social capital that the cost of building social networks invested by enterprises and enterprise performance are not as strongly positive as people expected. Gong Heqiang and Lin Jian (2007) defined the social capital of the relationship dimension from two aspects of relationship operation and relationship cognition, and found that the social capital of the relationship dimension can not only effectively improve sales and profit margins, but also play a negative role. Therefore, empirical research on the mechanism of the impact of corporate social capital on enterprise performance is an important and interesting topic to be studied.

1.2 Purpose of the Study

Based on the above analysis of the research background, this study constructs a theoretical model of the impact of corporate social capital on the performance of technology-based SMEs through empirical analysis, and studies the impact of corporate social capital on enterprise performance.

(1) Construct a theoretical model that the performance of technology-based SMEs is affected by corporate social capital. Taking China's technology-based SMEs as a sample, this paper comprehensively discusses the interaction among corporate social capital, knowledge integration capability and enterprise performance by combining quantitative analysis with qualitative analysis.

(2) The existing research literatures do not pay sufficient attention to the relationship between corporate social capital and enterprise performance and the research is not deep enough. Most studies only explore the direct effect of corporate social capital and enterprise performance, and few studies explore the intermediary role of knowledge integration ability in the relationship between these two constructs. This study examines whether knowledge integration capability plays a mediating role in the relationship between corporate social capital and enterprise performance, and clarifies the specific mechanism of corporate social capital affecting enterprise performance.

(3) This study divides the sample enterprises into two groups according to the performance of the enterprises themselves, and discusses whether the performance plays a moderating role in the impact of corporate social capital on corporate performance.

1.3 Significance of the Study

From an enterprise perspective, in today's knowledge-based enterprises, there are almost nothing simple repeated or mechanical. The competitive advantage of enterprises comes from knowledge integration, not a single knowledge, because integrating knowledge can guide enterprises to make a good combination of products and markets in a rapidly changing environment, and develop products quickly to meet different market needs. In this case, employees of enterprises are required to have response and creativity, and require mutual cooperation and trust between enterprises and

stakeholders. Enterprises will be affected by the lack of social capital, and these companies strongly depend on social capital.

Although the concept of corporate social capital has not appeared for a long time, it has produced rich research results around the concept, measurement, efficacy, and mechanism of action around corporate social capital. For example, knowledge can bring high returns to enterprises, but the transfer and integration of corporate knowledge is not spontaneous. Due to corporate knowledge, especially the core knowledge of the enterprise, it has the characteristics of integrity, heterogeneity, and derivatives. The integration of corporate knowledge requires related enterprises to invest a certain amount of relationship costs. The social capital of the enterprise provides static knowledge resources for enterprises. If there is no dynamic ability to integrate its organization, it is difficult to achieve value-added of its value. In recent years, it has mainly studied from the integration mechanism of knowledge. There are more research on the perspective of integration, and fewer research from the perspective of ability.

Knowledge, entrepreneurship, and innovation have all been identified as the cornerstones of economic growth and competition (Pineiro-Chousa, 2020). Social capital enables businesses seeking new information to identify flaws in the way the market now functions and what could be done proactively to recognize and meet customers' demands and aspirations (Nafei, 2016). Research has revealed that proactiveness is dependent on cooperation between business partners and other members of corporate social networks (e.g., Chen, Jiao, Zeng, & Wu, 2016). However, collaboration is essential in the social process of knowledge transfer and incorporation through social networks, giving firms access to the social capital present in these networks. Social capital influences organizational performance by acting as a component of collaborative knowledge generation, according to Wang (2016). The impact of social capital and cooperative knowledge generation during global pandemics in China, however, has not been adequately studied empirically. Although it is well acknowledged that social capital and collaborative knowledge generation help to maintain a competitive advantage, there is no empirical support for the connections between these constructs. Therefore, this study will focus on the effects of corporate social capital on enterprise performance especially the mediating role of knowledge integration ability.

Based on social capital theory and knowledge integration theory, this study constructs a model of corporate social capital, knowledge integration capability and enterprise performance, and discusses the intermediary role of knowledge integration capability between the two. The meaning is as follows:

1. Few scholars put these three variables together to study. In this study, we build a model of corporate social capital, knowledge integration capability and enterprise performance, and explore the intermediary role of knowledge integration capability between the two, enriching the mechanism of corporate social capital affecting enterprise performance.

2. The discussion of the relationship between corporate social capital and the process of knowledge integration capability will help enterprises realize that in the knowledge economy, social capital has become a key factor to determine knowledge integration capability, thus promoting enterprises to establish a wide range of connections inside and outside. These connections and the trust built on this basis will help enterprises improve their knowledge integration capability, thereby improving enterprise performance.

3. Now the market competition is intensifying. It is increasingly important to fully obtain and use resources to innovate the knowledge system. Study the composition of knowledge integration ability, and form a knowledge theory system that can guide the cultivation of knowledge integration ability of Chinese enterprises.

4. In this study, the impact of the integration ability of corporate social capital and knowledge on Enterprise performance has been determined, so that enterprises can take corresponding measures in practice, accumulate corporate social capital, optimize the allocation of corporate social capital and guide its rational flow, thereby enhancing knowledge integration ability and improving performance. This will be a positive and beneficial attempt and exploration for enterprise management practice.

1.4 Research Question

1. How does corporate social capital affect enterprise performance?

1.1 To what extent corporate social capital affect enterprise performance.

1.2 To what extent corporate social capital affect knowledge integration ability.

1.3 To what extent knowledge integration ability affect enterprise performance.

1.4 To what extent knowledge integration ability mediating the effect of corporate social capital on enterprise performance.

2. Will the difference of corporate performance change the impact of corporate social capital on enterprise performance?

1.5 Research Variables and Definitions

1.5.1 Corporate Social Capital

From the literature review, we can see that social capital can be divided into three dimensions: the structural dimension, the relational dimension and the cognitive dimension . But there is no consensus on what each dimension consists of. This paper uses this method to divide the dimensions of enterprise social capital.

(1) The structural dimension of corporate social capital

In this study, the structural dimension of corporate social capital is mainly studied from the network interaction relationship between enterprises and suppliers, customers, and the network interaction between departments and department members. Interaction is the relationship between members of an organization. According to the strength of the connection between the actors, the connection can be divided into two types: "strong connection" and "weak connection". Strong ties refer to the ties formed by close or frequent interactions between subjects; weak ties refer to looser ties between subjects.

(2) The relationship dimension of corporate social capital

The relational dimension of corporate social capital refers to the assets created and utilized through transactional relationships, and is a standardized dimension to measure this behavior, including attributes such as trust, norms, recognition, and privacy that exist in the relationship. Nahapiet and Ghoshal (1998) pointed out that the relational dimension of corporate social capital affects the transfer and exchange of knowledge

between organizations in various ways, including trust, norms and future expectations between relational subjects.

(3) Cognitive dimension of corporate social capital

Nahapiet and Ghoshal (1998) pointed out that the acquisition of knowledge will be promoted to a great extent if the two parties in the contact share a language to a certain extent. Tsai and Ghoshal (1998) used 2 items to measure the cognitive dimension of social capital: (1) our department shares common values with other departments in the face of work tasks; (2) our department's employees are committed to accomplishing the entire enterprise overall goals and tasks. When Wei Ying (2005) studied the relationship between corporate social capital and corporate technological innovation performance, when studying the cognitive dimension, two items were used to quantify: (1) common language; (2) similar values. This paper studies the impact of corporate social capital on enterprise performance, adopts Likert five-level scoring method, selects the shared language and knowledge platform and similar values as indicators to measure the cognitive dimension of corporate social capital.

1.5.2 Knowledge Integration Ability

The ability of knowledge integration is the ability of an enterprise to integrate the new knowledge collected from different channels and carriers with its own existing knowledge, update the knowledge system of the enterprise, thereby improving the market competitiveness of the enterprise, and is an important ability for the long-term business development of the enterprise. This research will divide knowledge integration ability into three dimensions: knowledge acquisition ability, knowledge transfer ability, and knowledge utilization ability. (Refer to the mature scale of relevant scholars to formulate the research scale of this article for measurement).

1.5.3 Enterprise Performance

Enterprise performance is the use of some quantitative or qualitative indicators to analyze the enterprise's operating efficiency and development in a certain period of operation. This comprehensive indicator is also often used as a standard to measure the success of an enterprise. The improvement of enterprise performance should not only focus on the current performance (financial performance) of the enterprise to meet the vested interests of employees, shareholders and other stakeholders, but also consider that

the enterprise must continue to provide new products and new technologies (innovative performance) to promote the future progress and development of the enterprise. This paper hopes to explore the relationship between corporate social capital and enterprise performance. Therefore, the measurement of enterprise performance is evaluated from two aspects: innovation performance and financial performance. In the existing empirical studies, most scholars only consider the impact of social capital on innovation performance, but seldom discuss the combination of financial and innovation performance. With reference to the existing research results, financial performance and innovation performance were respectively measured by referring to the maturity scales of relevant scholars.

1.6 Technology-based SMEs

(1) Definition of Chinese Scientific and Technological Enterprises

The Ministry of Commerce and the Ministry of Science and Technology of China issued Several Opinions on Encouraging Scientific and Technological Enterprises to "Go Global", which pointed out that scientific and technological enterprises must meet the following two points:

First, scientific and technological enterprises must be high-tech enterprises and must be recognized by the competent science and technology department of the people's government.

Second, 20% of the scientific and technological personnel in the enterprise staff should have college degree or above; more than 50% of the enterprise's annual income should be related to technology and high-tech products; more than 3% of the annual sales of the enterprise is used for enterprise technology research and development funds.

(2) Definition of China's SMEs

The China Economic and Trade Commission, the Development Commission and the Bureau of Statistics jointly issued the provisions on the criteria for the classification of small and medium sized enterprises. The standard specifies different classification standards according to industry characteristics, employees, total assets of enterprises and other factors. Small and medium-sized enterprises are divided into micro,

small and medium-sized enterprises. The enterprise industry includes 13 different industries such as agriculture, construction and software service.

(3) China's technology-based SMEs

According to the above analysis and referring to the Interim Measures for the Management of Technological Innovation Fund Projects for Small and Medium sized Technological Enterprises jointly issued by the Ministry of Science and Technology and the Ministry of Finance in 2005, this study defines small and medium-sized technological enterprises as follows: they have independent legal personality and are mainly engaged in the R&D, development, production and service of high-tech products, with no more than 500 employees, no more than 200 million yuan of annual sales revenue and no more than 200 million yuan of total assets. The proportion of scientific and technological personnel with college degree or above shall not be less than 30% of the total number of employees, and the proportion of scientific and technological personnel directly engaged in research and development shall not be less than 10% of the total number of employees. Small and medium-sized enterprises meeting the above conditions are technology-based small and medium-sized enterprises.

1.7 Research Scope

This study aims to explore the impact of corporate social capital on enterprise performance, as well as the intermediary role of knowledge integration capabilities in the two variables. Few scholars put these three variables to study together, and the intermediary role of knowledge integration ability is worth exploring. The method used in this study is a mixed method.

This study first demonstrates the impact of corporate social capital on enterprise performance and the intermediary role of knowledge integration capability in technology-based SMEs through quantitative research methods. This study collected data by distributing questionnaires to SMEs enterprises. According to the content design of the questionnaire, the respondents are required to know more about the overall situation of the enterprise. Therefore, the respondents are mainly middle and senior managers of enterprises, who have enough knowledge to answer the questions about various aspects of the enterprise in the questionnaire. There are 328000 technology-based SMEs in China.

The researchers will select 300 companies, and one manager from each company will complete the questionnaire. Finally, 300 questionnaires will be distributed online to enterprise management personnel in the form of electronic questionnaires. Based on the collected questionnaires, use SEM analysis to obtain the argumentation results.

By reviewing relevant literature, most of the research results confirm the positive role of corporate social capital on enterprise performance, while some scholars also find the negative role of corporate social capital. After obtaining quantitative research results, this study boldly hypothesizes whether the verification results are related to the performance of the enterprise itself. Therefore, this study also discusses whether the performance of the enterprise itself will change the relationship between the impact of corporate social capital on enterprise performance. Finally, the hypotheses verified in SEM analysis are further confirmed by qualitative research methods. The specific method is to divide the survey enterprises into two groups, namely, small and medium-sized enterprises with good performance and small and medium-sized enterprises with poor performance. Performance will be grouped according to the median of the average score of the measured data of the enterprise performance items in the questionnaire. 150 enterprises above the median are considered to have good performance, and 150 enterprises below the median are considered to have poor performance. The results will be compared and analyzed by structural equation model respectively. Then, the researcher will select 10 leaders of small and medium-sized enterprises with good performance and 10 leaders of small and medium-sized enterprises with poor performance for in-depth interviews, and verify the hypothesis according to the collected interview results.

1.8 Conceptual Framework and Research Hypothesis

Based on the results of previous studies and the primary data obtained through questionnaires, this paper explores the interaction among corporate social capital, knowledge integration ability and enterprise performance by using the method of qualitative analysis and quantitative analysis. The research hypothesis are as follows:

H1: Corporate Social Capital has a positive effect on Enterprise Performance.

H2: Corporate Social Capital has a positive effect on Knowledge Integration Capabilities.

H3: Knowledge Integration Ability has a positive effect on Enterprise Performance.

H4: Knowledge Integration Ability has a mediating role between Corporate Social Capital and Enterprise Performance.

H5: In the impact of corporate social capital on enterprise performance, the performance of the corporate itself has a moderating effect.

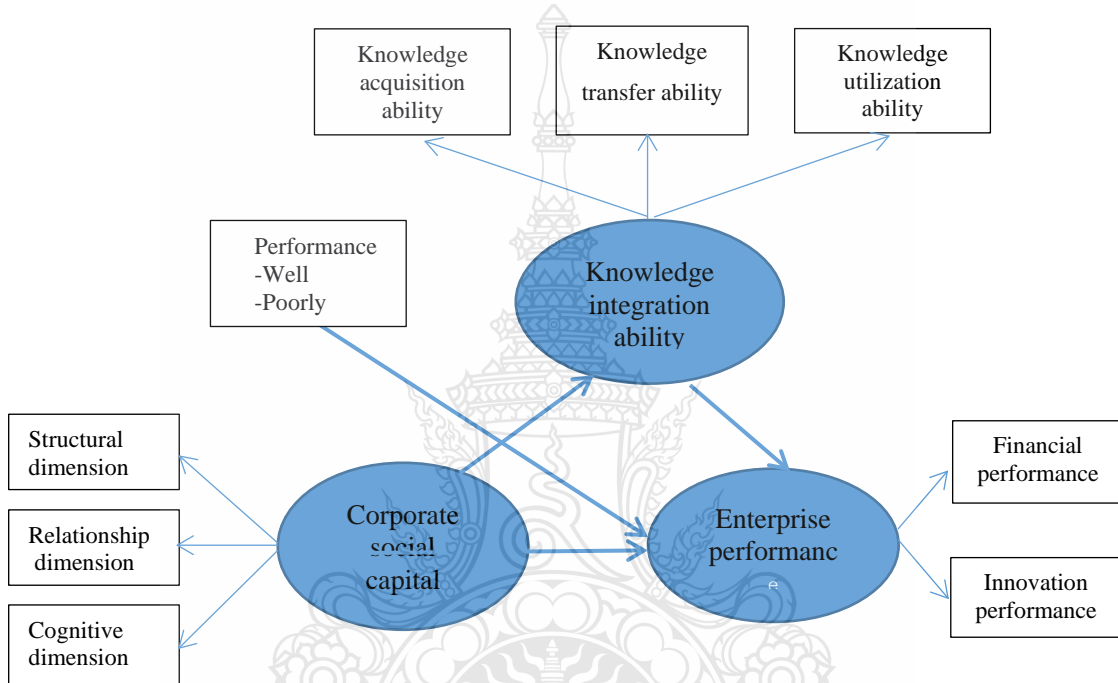


Figure 1.1 Conceptual framework of the study

1.9 Research Contribution

This study takes the relationship between corporate social capital, knowledge integration ability and enterprise performance as its research content, builds a theoretical framework, and conducts empirical tests. The contributions are as follows:

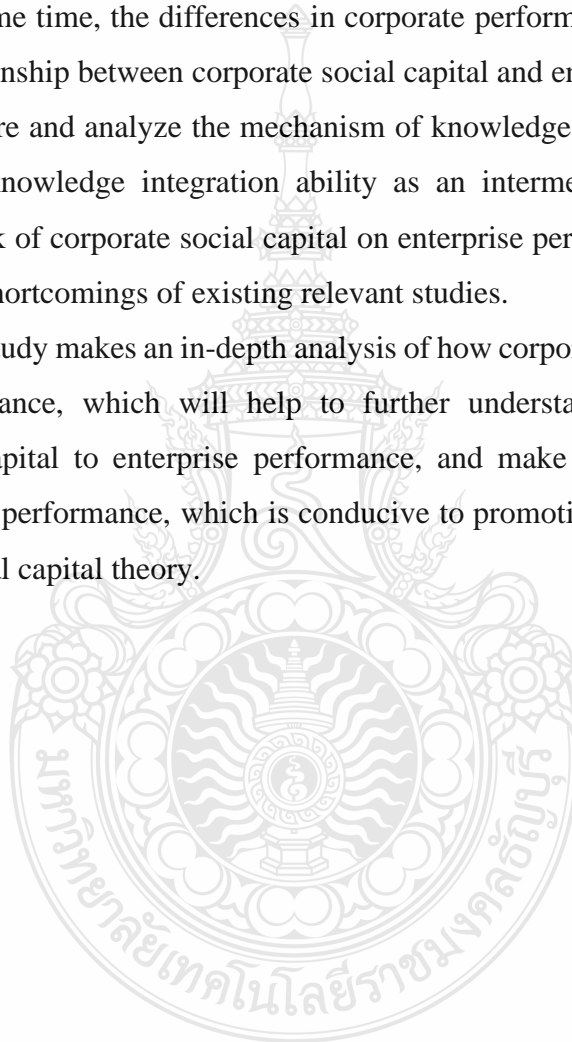
(1) The conceptual models of corporate social capital, knowledge integration ability and enterprise performance are established. Integrating the key factors of corporate social capital, knowledge integration ability and enterprise performance in a framework, the micro-mechanism of enterprise performance improvement through social capital and

knowledge integration ability is thoroughly revealed, and the knowledge management theory and innovation theory are expanded.

(2) A combination of qualitative and quantitative analysis method is used to summarize the dimensions of core constructs such as corporate social capital, knowledge integration ability and enterprise performance, which improves the effectiveness of the measurement of relevant variables. Qualitative analysis verifies the results of quantitative analysis. At the same time, the differences in corporate performance have a moderating effect on the relationship between corporate social capital and enterprise performance.

(3) Explore and analyze the mechanism of knowledge integration ability. This study introduces knowledge integration ability as an intermediary variable into the research framework of corporate social capital on enterprise performance, which further complements the shortcomings of existing relevant studies.

(4) This study makes an in-depth analysis of how corporate social capital affects enterprise performance, which will help to further understand the contribution of corporate social capital to enterprise performance, and make suggestions on how to improve enterprise performance, which is conducive to promoting the development and application of social capital theory.



CHAPTER 2

REVIEW OF THE LITERATURE

This chapter starts from the current research status of corporate social capital, knowledge integration ability and enterprise performance, and expounds the representative research of corporate social capital and knowledge integration ability. This paper discusses the definition and analysis level of social capital, the measurement of social capital, the concept of knowledge integration ability, empirical research and measurement of basic theories. Through the process of analyzing the relevant literature, the theoretical foundation is laid for the research hypothesis and model construction.

2.1 Overview of Social Capital

2.1.1 Research on Social Capital and its theoretical development

2.1.1.1 Research on social capital

In recent years, with the rise and vigorous development of research on social capital in sociology and economics, social capital theory has become one of the most influential theoretical theories in the field of social and economic research.

The concept of social capital was first put forward by Bourdieu (1985), and the sum of social associations owned by organizations or individuals is his interpretation of social capital. In the business activities of enterprises, enterprises not only need human capital and physical capital, but also need social capital, which is the social resources formed by the accumulation of production factors in the production field by the economic activities of enterprises. In essence, social capital is the network of social relationships formed by family, friends, and ordinary relationships, from which important intellectual resources, information, and support are obtained. Knoke (1999) explained the concept of corporate social capital as the relationship network formed by the close connection between the company and external stakeholders, or the mutual communication and sharing of resources between the internal organizations of the company. Stakeholders get the scarce resources they need. Parts defines social capital very broadly as "the institutions, social relationships, networks, trust and norms that shape the quality and quantity of social interactions" (Parts, 2003). Pollitt refers to the evocative

nature of the term social capital: "It conveys the idea that something has certain characteristics of physical capital, which may accumulate or depreciate through investment or abuse (Pollitt, 2002). Like physical capital, it is a productive asset from which businesses can increase productivity. It contributes positively to the economy; however, it is also socially interactive. Hence, the term social capital refers to important social capabilities.

In economic life, social capital plays an important role, including both the relationship network and the resources that may be used by the relationship network. Social capital plays an important decisive role in improving the feasibility and execution efficiency of economic activities. In order to improve the efficiency of resource allocation, it is necessary to have good coordination and cooperation within and between organizations, and interpersonal relationships, norms and trust have played a role in promoting.

As a key source of enterprise innovation, social capital is conducive to the generation of new ideas, the development of new products, and the diffusion of new technologies. It has become an important force for enterprises to obtain resources, conduct technical exchanges and share knowledge (Lawson B, Tyler B B, Cousins P D, 2008). Most of the research results show that corporate social capital is a resource shared by individuals or organizations through social relations. The connection between the enterprise and external entities and the connection between various departments within the enterprise constitute the social capital of the enterprise. Since management introduced the concept of social capital, and incorporated the elements of social capital, such as trust, norms, and networks into the research framework of management theory, it has enriched the research scope of management theory, especially the research elements of competition theory. Social capital has received extensive attention from research on competition theory.

The reason why corporate social capital enhances the competitive advantage of enterprises is that enterprises can obtain scarce and heterogeneous resources that are not available within the enterprise from the outside, and improve the technical capabilities, capital strength, and marketing capabilities of enterprises, such as Collins & Clark (2003) thinking that with the help of social capital, enterprises can obtain more

sufficient human, financial and technical resources that are conducive to the development of enterprises. Deng Xiuli (2010) proposed that social capital can affect the economic benefits, management level, Technological innovation and competitive advantage have a certain impact. Therefore, in order to establish a competitive advantage in the market, enterprises need to give full play to the role of corporate social capital resources, tap external scarce and heterogeneous market and technical resources, and conduct all-round communication and exchanges with external social networks. Innovation to create a company's competitive advantage.

2.1.1.2 The theoretical development of social capital

The concept of social capital has evolved from the concept of capital in economics, and its appearance is the result of “the constant generalization of the concept of capital” in academia (Li Huibin and Yang Xuedong, 2000). Judging from the discussion on the capital issue in economics, the content of the concept of capital has developed from physical capital to human capital, and then to social capital. In the 1960s, Schultz (1963) and Becker (1964) introduced the concept of human capital into economics for analysis, which made capital for the first time get rid of the specific material form and expand to an abstract and generalized level. With the development of society and economy, the connotation of capital is further expanded and becomes all resources that can bring value added. After the 1970s, Western sociologists Bourdieu, Coleman, Burt, Lin Nan and other scholars brought the social relationship and social structure that economists used to ignore into the category of capital analysis, and put forward the representative theoretical viewpoint of social capital.

According to relevant literature records, systematic research on the field of social capital began in the 1980s. The French scholar Pierre Bourdieu (1985) first systematically proposed the concept of social capital. The collection of actual or potential resources acquired by possession, and then opened the era of social capital research, and many scholars began to do a lot of exploration work in this field. Baker (1990) defined social capital as the resources that actors obtain from a specific social structure and use these resources to pursue their respective interests, which are generated through changes in the relationship between actors; Fukuyama (1995) believes: "Social capital is the ability of people to work together for a common goal within organizations and groups, where

trust is given a heavier weight. Portes (1998) defines social capital as the Membership's ability to access scarce resources within a network or wider social structure, which is not inherent to an individual, but an asset contained in an individual's relationship with others; Durlauf and Fafchamps (2003) pointed out that social capital is based on the behavioral norms and trust among people formed by the network process, which can lead to good social and economic outcomes.

With the continuous development of social capital theory, the application of social capital theory has gradually expanded to the fields of economics and management, becoming a new concept that has received great attention in many social science fields such as sociology, economics, and management (Adler & K won, 2002).

2.1.2 The concept of Corporate Social Capital

Scholars have given different definitions of corporate social capital from their professional fields. According to different research needs, some scholars directly equate the entrepreneur's personal social capital with corporate social capital, while others simplify corporate social capital as corporate credit., more scholars try to comprehensively define corporate social capital from multiple dimensions. These definitions not only start from different majors such as political science, economics and sociology, but also start from different perspectives such as macro and micro. The initial research on social capital was based on individuals in the social structure. Later, many scholars found that social capital can be studied at many levels, such as the individual level, the organizational level, the inter-organizational level, and the entire country level. The research on corporate social capital can be divided into two research levels: individuals and groups. The field of sociology mostly studies issues related to social relations from the level of individuals. The field of economics focuses on social capital and economic growth and institutional selection issues. Management The academic disciplines study issues such as inter-organizational cooperation and innovation from the perspective of organizations.

Nahapiet and Ghoshal believed that the social capital of an enterprise should be "the sum of the actual or potential resources in the relational network owned by the enterprise (including its internal members), available through the relational network, and from the relational network". The resources mentioned in the definition by Nahapiet and

Ghoshal refer to some variables that reflect the relational, structural and locational characteristics of the relational network, such as trust, norm, shared vision, location centrality, etc. Leana and Van Buren defined social capital as "resources that reflect the characteristics of social relations within an enterprise" when they studied social capital within an enterprise. Gabbay, who systematically put forward the concept of corporate social capital and explained it, believes that corporate social capital is the tangible or intangible resources that enterprises obtain through social relations and can promote the realization of their goals. These resources help businesses achieve specific goals through other social connections. Gabbay proposes that social capital is an asset that is rooted in and available through a network of relationships, and defines corporate social capital as: tangible or virtual resources owned by an enterprise, which can be increased through social relationships that promote the achievement of goals.

Fukuyama (2015), a well-known American scholar, explained the connotation and extension of social capital in many works. He believes that social capital is "a set of informal values and norms that are shared by members of a certain group and can form cooperation", he pointed out that social capital is a kind of ability "derived from the trust that prevails in a society or a specific part of society" (2016). Klaus Offie and Susan Fuchs (2014), professors of Homberg University in Germany, believe that social capital is a complex combination of attitudes, behavioral tendencies, and structural patterns", "trust" and "concern" three components to evaluate social capital. Professor Krishna of Cornell University (2005) simply defines social capital as "various social assets that can generate profit streams".

Bian Yanjie and Qiu Haixiong (2000) believe that social capital is an ability of enterprises to continuously establish contact with external organizations for their own development and improvement of their own strength to obtain scarce social resources. Xu Ping (2007) pointed out that corporate social capital refers to the ability of an enterprise to obtain resources from the social connections of members of the organization and the social connections of the organization as a whole in order to achieve its own goals. Wu Zhiwei (2003), on the basis of a comparative analysis of the relationship between social capital and social structure, believes that the social capital of an enterprise can actually be seen as contained in the social structure or network constructed by the enterprise, and

can be reduced by reducing transaction costs and other means. A structural resource that helps an enterprise or its members more easily obtain a certain resource and helps the enterprise achieve its specific goals. Yu Hong (2006), Wei Ying (2007) believe that corporate social capital is based on trust, norms and networks, and is embedded in the existing stable social network and structure of the enterprise. A collection of actual or potential resources that enable an organization to grow and contribute to its goals. Yan Jirong (2015) believes that social capital, as a newly discovered and newly recognized resource, can be used for socio-economic and political explanations, which refers to "all social norms that are conducive to promoting the common benefits of a society or group and promoting collective action. and social network relationships". Sui Min (2012), after a comprehensive analysis of the nature of various types of capital in an enterprise, believes that corporate social capital is the value brought by corporate sociality, that is, provided by external stakeholders outside the corporate boundaries as social subjects, the internal stakeholders of the enterprise merely transform their personal social relations into favorable relations with the external stakeholders of the enterprise, and the internal stakeholders play an intermediary role.

There is a lack of research on the concept of corporate social capital in the existing research. Generally speaking, the concept of corporate social capital can be divided into two types: the concept based on resources and the concept based on capability. The concept of resource-based corporate social capital regards it as a resource of an enterprise. For example, Nahapiet and Ghoshal (1997) first clearly defined enterprise-level social capital as embedded, available and derived from individuals or society. The actual and potential resources in the network of relationships that the unit owns. The concept of capability-based corporate social capital takes corporate social capital as an enterprise's ability to acquire resources in network relationships. The ability to absorb scarce resources through various networks created by the enterprise, just like the financial capital and human capital of the enterprise, the social capital of the enterprise also needs to be accumulated and reproduced, which is one of the indispensable elements for the development of the enterprise.

This study tends to adopt a resource-based concept of corporate social capital. Social capital is a long-term asset. By investing in the establishment of external

relationship networks, enterprises can increase their social capital, and thus obtain benefits in the form of better access to information and gain trust; by investing in the development of internal relationships, enterprises can It enhances collective coherence and enhances the capacity for collective action.

Table 2.1 The concept of corporate social capital

Name	Year	Viewpoint
Bian Yanjie, Qiu Haixiong	2000	Social capital is a kind of ability for enterprises to constantly establish contacts with external organizations to obtain scarce social resources for their own development and enhancement of their own strength.
Wu Zhiwei	2003	In fact, the social capital of an enterprise can be seen as a structural resource contained in the social structure or network constructed by the enterprise, which can help the enterprise or its members more conveniently obtain certain resources and help the enterprise achieve its specific goals by reducing transaction costs.
Xu Ping	2007	Corporate social capital refers to the ability of an enterprise to obtain resources from the social connections of its members and the whole organization in order to achieve its own goals.
Sui Min	2012	Corporate social capital is the value brought to it by corporate sociality, that is, the resources provided by external stakeholders who exist outside the corporate boundary as social subjects
Klaus Offey, Susan Fuchs, Germany	2014	Social capital is a complex combination of "attitudes, behavioral tendencies and structural patterns". They proposed to evaluate social capital with three components: "organizational", "trust" and "concern".
Yan Jirong	2015	Social capital refers to "all social norms and social network relationships that are conducive to promoting the common benefits of a society or group and promoting collective action".
[Us] Francis Fukuyama	2016	Social capital is a kind of ability, which "originates from the trust prevailing in a certain society or a specific part of society".

2.1.3 Measurement of Corporate Social Capital

Yli-Renko (2001) believes that corporate social capital can be divided into the following three parts: the level of social interaction between enterprises, the quality of

relationships described in terms of trust and reciprocity, and the level of network connections established through relationships. Landry et al believe that social capital cannot be measured by a single indicator, and its measurement should be considered from different forms. When Nahapiet and Ghoshal studied the relationship between social capital, intellectual capital and enterprise value creation, they divided social capital into three dimensions: Structural Dimension, Relational Dimension and Cognitive Dimension. Westlund (2003) divided corporate social capital into two parts: internal and external. He regarded the relationship between managers and individual employees as internal social capital, while external social capital was divided into production-related and environment-related social capital. Market-related social capital.

Tsai and Ghoshal (1998) used Nahapiet and Ghoshal's (1997) division of social capital dimensions to examine the relationship between the social capital structure dimension, relational dimension and cognitive dimension. In their research, they take social interactions, trust and trustworthiness, and shared vision as the manifestations of social capital structure dimension, relational dimension and cognitive dimension, respectively, and use the A Likert-7-level scale with 2 items to measure social interaction, trust and trustworthiness, and shared vision between different business units.

Yli-Renko, Autio, and Sapienza (2001) examined the impact of social capital in key customer relationships on knowledge acquisition and knowledge utilization, and they argue that the amount of external knowledge that young firms acquire from their key customers depends on their relationship. Three aspects of social capital are included, namely social interaction, relationship quality and customer network connection, and in the Likert-7 scale, 2 items are used to measure social interaction and customer network connection, and 3 items are used to measure social interaction and customer network connection. Measure relationship quality.

Chen, Chang, and Hung (2008) divided social capital into structural social capital, relational social capital and cognitive social capital. They used social interaction and network connections to represent structural social capital, and expressed mutual trust, common goals, and They use 3 items to measure social interaction, 4 items to measure network connection, and 3 items to measure mutual trust and common goals.

Liu Shouxian (2008) used the Likert-5 scale to measure the three dimensions of corporate social capital. He divided the corporate-level structural dimension of social capital into four: social interaction, centrality, industry external links and industry internal links. Aspects are used as measurement dimensions, and at the same time, 3 items, 8 items, 3 items, and 3 items are used to measure social interaction, centrality, industry external connection and industry internal connection variables; he uses trust as The measurement dimension of social capital in the relationship dimension at the enterprise level, and uses 7 items to measure the trust variable; he divides the cognitive dimension social capital at the enterprise level into two aspects: solidarity consistency and strategic synergy as the measurement dimension, and Three items are used to measure solidarity coherence variables, and four items are used to measure strategic coherence variables.

Yang Kun (2011) used the internal and external social interaction of the enterprise as the manifestation of the dimension of enterprise social capital structure in the study of the impact of social capital and absorptive capacity on the innovation performance of enterprises, and used 6 items to measure. Using cognition and emotion-based trust as the manifestation of the dimension of corporate social capital relationship, 7 items are used to measure. Use common language and common vision as the manifestation of the cognitive dimension of corporate social responsibility, and use 7 items to measure.

The establishment of trust relationship between enterprises can make enterprises achieve better performance (Dyer, 1998). Madhok (1995) believes that trust between partners consists of two parts: the structural part and the behavioral part. The interpersonal relationship and trust established by enterprises and other enterprises can reduce the information asymmetry between enterprises (Zaheer et al., 1998), and also contribute to the transfer of knowledge between enterprises (Lorenzoni and Lipparin, 1999). Mishira (1996) believed that the trust relationship is multi-dimensional, which is manifested from four aspects of willingness: ① trust in the good intentions and attitudes of the exchange team; ② trust in their competitiveness and ability; ③ trust in their reliability; ④ An open mind that the other party can perceive. Fukuyama (1995) believes that China is a low-trust society, so trust is especially important for Chinese enterprises.

Chinese scholars have also measured the relevant dimensions of corporate social capital in relevant empirical research. Wei Ying (2005) researched the relationship between corporate social capital and corporate technological innovation performance. When studying the relationship dimension, it was quantified from three items: trust based on vigilance, sincere cooperation and keeping promises. . When studying the cognitive dimension, two items are used to quantify: (1) common language; (2) similar values.

Wang Sanyi and He Fenglin (2007) used 5 items to quantify the cognitive dimension of corporate social capital when they studied the impact of the cognitive dimension of corporate social capital on knowledge transfer: (1) the level of ethical norm sharing; (2) Similarity of corporate culture; (3) Shared language platform; (4) Common basic knowledge; (5) Consistency of regional cultural level.

Zhang Peng (2009) in the research on corporate social capital, organizational learning and technological innovation performance, divided the corporate-level structural dimension of social capital into four aspects: social interaction, centrality, industry external links and industry internal links. The measurement indicators of the research, the questionnaire design has a total of 17 measurement items. Using trust as the measurement index of the social capital research of the relationship dimension at the enterprise level, 7 measurement items are designed. The cognitive dimension of social capital at the enterprise level is divided into two aspects: solidarity consistency and strategic synergy as the measurement indicators of the research. A total of 17 measurement items are designed in the questionnaire.

Zhao Rui (2013) divides social capital into internal social capital and external social capital. Internal social capital includes trust relationship and network relationship, and external social capital includes government relationship, social relationship, bank relationship, supplier relationship, etc. There are 15 measurement indicators in six aspects: relationship, customer relationship and cooperative relationship.

Zeng Ping et al. (2013, 2017) divided corporate social capital into institutional social capital, business social capital and technical social capital, and examined the impact of corporate social capital on corporate innovation and business model innovation, and applied 5 The Likert scale method was used to design and revise 9 items to measure social capital in different dimensions.

Ao Jiazhuo et al. (2013) investigated the business social capital, political social capital, and technical social capital of executives, comprehensively considered the network scale and network strength of executives, and measured it with publicly available data. The influence of corporate heterogeneous social capital on Enterprise performance is investigated.

From the literature review, we can see that social capital can be divided into three dimensions: the structural dimension (Structure Dimension), the relational dimension (Relational Dimension) and the cognitive dimension (Cognition Dimension). But there is no consensus on what each dimension consists of. This paper adopts this division method to divide the dimensions of corporate social capital.

(1) The structural dimension of corporate social capital

The structural dimension of corporate social capital refers to the overall pattern of connections between actors, and it is mainly concerned with the existence of network connections, the strength of connections, and network structure. Nahapiet and Ghoshal believe that structural capital refers to the overall pattern of connections between network participants, that is, who is connected with and the strength of the connection, including network connections, network architecture, and network invocation. Inkpen and Tsang (2005) believed that structural capital includes the properties of network connections, network density and so on. Yli-Renko et al. (2001) selected key customers to study the relationship between social capital and their knowledge acquisition and utilization, and used the following two items to measure the social interaction of the network: we have close social relationships with customers, We understand our clients' employees on an individual level. Tsa and Ghoshal (1998) affirmed that the intra-enterprise network can promote the improvement of performance and value in the research on the internal network of the enterprise. When measuring the structural dimension of the internal social capital of the enterprise, the following items were used. Next, which department do you spend more time with; which departments do you keep close to.

In this study, the structural dimension of corporate social capital is mainly studied from the level of interaction between enterprises and suppliers, customers, between departments, and between department members. The measurement scale is as follows: The structural dimension of corporate social capital is measured through 5 items:

A1 We often contact, exchange visits or meet with customers, suppliers and other enterprises; A2 Our department often dispatches personnel to other departments in the company Understand the situation; A3 We often discuss and solve problems existing in the company's operations with colleagues from other departments in the company; A4 The degree of connection between the production department of the enterprise and the R & D, sales and other departments.

(2) The relationship dimension of corporate social capital

The relational dimension of corporate social capital refers to the assets created and utilized through transactional relationships, and is a standardized dimension to measure this behavior, including attributes such as trust, norms, recognition, and privacy that exist in the relationship. Nahapiet and Ghoshal (1998) pointed out that the relational dimension of corporate social capital affects the transfer and exchange of knowledge between organizations in various ways, including trust, norms and future expectations between relational subjects. Trust is an important indicator to measure the dimension of corporate social capital relationship. Trust can reduce opportunistic behavior and promote long-term relationships between trusting parties (Bradach & Eeels, 1989; Gulati, 1995). Yli-Renko believes that relationship capital refers to the quality of the relationship between network participants, including trust, obligation, and friendship in network relationships. Nahapiet and Ghoshal (1998) believed that social capital at the relational level includes trust and reliability, norms and constraints, obligations, identification and identification, etc.

The relational dimension of corporate social capital refers to the assets created and utilized through transactional relationships, and is a standardized dimension to measure this behavior, including attributes such as trust, norms, recognition, and privacy that exist in the relationship. The higher the level of enterprise social capital relationship dimension, the easier it is for the enterprise to exchange and transfer information and knowledge from internal and external connections. Mutual trust forms the basis of a lasting and effective relationship between the parties. This study uses trust as an indicator to measure the dimension of corporate social capital relationship. The relationship dimension of corporate social capital is measured through 5 items: B1 If I encounter problems at work, colleagues in other departments in the company will give me care and

advice; B2 In the work interaction with colleagues in other departments of the company, we always worry about the interests of each other being damaged; B3 We trust that affiliated enterprises can successfully fulfill their responsibilities.

(3) Cognitive dimension of corporate social capital

Nahapiet and Ghoshal (1998) pointed out that the acquisition of knowledge will be promoted to a great extent if the two sides of the contact share a language to a certain extent. Tsai and Ghoshal (1998) use 2 items to measure the cognitive dimension of social capital: (1) our department shares common values with other departments in the face of work tasks; (2) our department's employees are committed to accomplishing the entire enterprise overall goals and tasks. Adler and Kwon (2002) made a new definition of the concept of social capital, arguing that the measurement of the cognitive dimension of social capital should mainly focus on the measurement of the consistency of both parties in the relationship, and put the realization of collective goals in the first place. And put the completion of individual goals in the second position and other items to express. When Wei Ying (2005) studied the relationship between corporate social capital and corporate technological innovation performance, when studying the cognitive dimension, two items were used to quantify: (1) common language; (2) having similar values. This paper studies the impact of corporate social capital on Enterprise performance, using the Likert five-point scoring method, selecting the language and knowledge platforms shared by companies and similar values as indicators to measure the cognitive dimension of corporate social capital. The cognitive dimension of corporate social capital is measured through 4 items: C1 we communicate effectively with affiliated companies through common knowledge; C2 we communicate effectively with affiliated companies through a common language; C3 We have similar value orientation when communicating with others, and have consistent collective goals in the process of communication; C4 When we communicate with customers, suppliers and other enterprises, both parties can clearly understand each other's technical terms or jargon; C5 We have confidence in the expertise of our partners.

Table 2.2 Measurement of corporate social capital

Name	Year	Viewpoint
Wang Sanyi , He Fenglin	2003	When studying the impact of the cognitive dimension of corporate social capital on the path of knowledge transfer, five items were used to quantify the cognitive dimension of corporate social capital: (1) the sharing level of ethics; (2) Similarity of corporate culture; (3) Shared language platform; (4) Public basic knowledge; (5) Consistency of regional cultural level.
Yang Kun	2011	In the study of the impact of social capital and absorptive capacity on enterprise innovation performance, the internal and external social interaction of enterprises is used as the manifestation of the dimension of corporate social capital structure, and 6 items are used for measurement. Trust based on cognition and emotion is used as the manifestation of corporate social capital relationship dimension, and 7 items are used for measurement. Common language and common vision are used as the manifestation of corporate social responsibility cognitive dimension, and 7 items are used for measurement.
Zhao Rui	2013	Social capital is divided into internal social capital and external social capital. The internal social capital includes trust relationship and network relationship. The external social capital includes government relationship, social relationship, bank relationship, supplier relationship, customer relationship and cooperation relationship. There are 15 measurement indicators in total.
Zeng Ping et al	2013. 2017	Corporate social capital is divided into institutional social capital, business social capital and technological social capital. The impact of corporate social capital on enterprise innovation and enterprise business model innovation is investigated. Using the 5point Likert scale, 9 items are designed and revised to measure different dimensions of social capital.

2.1.4 Classification of Corporate Social Capital

As far as the classification of corporate social capital is concerned, corporate social capital can be divided into different levels. Many scholars divide corporate social capital into two aspects: internal social capital and external social capital. Johannes M. Pennings and Kyungmook Lee further divided the external social capital of an enterprise into the personal level and the enterprise level. The personal level refers to the long-term work process between the boundary managers (Boundary Spanner) of different

enterprises. Mutual trust and cooperative social relationship network, and enterprise level refers to an institutionalized cooperative relationship network formed between enterprises, the main body of which is the enterprise, not the boundary manager. Roger Th.A.J. Leenders and Shaul M.Gabbay believe that there are five levels of social capital related to enterprises, individual, team, department, enterprise, and joint group. The social capital at each level is not only affected by the social network at this level, but also affected by the other four levels of relational networks. In their pioneering research on corporate social capital, Western scholars divide corporate social capital into structural (structural) social capital and cognitive (cognitive) social capital. The former refers to norms, values, and opinions that affect mutual trust. and belief, mainly refers to the social trust between enterprises and suppliers, customers, government agencies and other organizations and individuals, the latter refers to the social relationship network that is beneficial to enhance the effect of cooperation, generate reciprocal expectations, and reduce transaction costs, which can be subdivided into Network assets, relationship assets, engagement assets, etc. Until now, the academic community has not reached a consensus on the concept of corporate social capital.

Interacting with or connecting with others can be advantageous for people or organizations in a number of ways. Sociologists categorize this resource as capital when combined with the idea of human capital. As a result, the idea of social capital was developed.

The meaning of social capital, which is the total of actual or potential resources enmeshed in the network of collaborative relationships generated between people. A person's social capital, which is the total of resources that may be used in a relational network, can aid in the development of important abilities. The actor can use the relationship network to access the few resources they need to succeed. Social capital, according to some academics, can foster technical innovation and increase the competitiveness of innovation. Therefore, players (such as people, organizations, and commercial entities) can access essential outside resources that foster creativity and improve performance by employing social capital.

Social capital can be broken down into three dimensions: the structural dimension, the relational dimension, and the cognitive dimension, according to scholars.

The structural dimension primarily relates to the mode and network of connections among members, as well as their structural traits, connection power, and other properties, which control how many resources each member consumes. The connection between construction businesses and other stakeholders, such as suppliers, clients, universities, and research institutions, is the focus of this work. The dimension also takes into account how frequently and closely the various company departments or personnel communicate with one another. The relationship quality between two network members is reflected in the relational dimension, which emphasizes standardization, sincerity, and trust. The relationship-based component of social capital is presented in this study using the stakeholders' trust in one another. The shared language, objectives, and vision of network members are represented by the cognitive dimension. To quantify the cognitive aspect of social capital, we select common language, shared values, and strategic goals between stakeholders in this paper.

2.2 Knowledge Integration Ability

2.2.1 Connotation of Knowledge Integration

Some scholars have introduced the concepts and ideas of integration into the field of knowledge management, trying to deconstruct the process mechanism between knowledge resources and enterprise performance (Chirico & Salvato, 2008; Jian Zhaoquan et al., 2008; Kamuriwo et al., 2016). Knowledge integration mainly refers to arranging knowledge resources based on specific knowledge management methods, based on knowledge acquisition, screening and reprocessing, and reconstructing the knowledge structure of the organization to form a new knowledge base and knowledge system. Knowledge integration mainly includes internal knowledge integration and external knowledge integration (Chen Ming, Zhou Jianming, 2009). The knowledge base of an enterprise is usually composed of fragmented and scattered cross-departmental knowledge. Effective knowledge integration can promote the interaction, sharing, transfer and transfer of knowledge between and within organizations, and at the same time enhance the internalization effect of external knowledge. Only through integration and empowerment can knowledge play its value-added and creative role.

In the 1990s, with the rise of the knowledge-based view, Kogut and Zander (1992), De Boer et al. (1999) believed that knowledge integration is the integration and application of existing new acquisitions from the perspective of integration capability. capacity for knowledge. Grant (1996) firstly put forward the concept of knowledge integration, he believes that knowledge integration is the process of enterprises integrating specialized knowledge mastered by members of organizations. On this basis, Zahra et al. (1999) believed that knowledge integration includes enterprises identifying the meaning of new knowledge, and sharing knowledge to other parts of the organization through communication and the corresponding transformation process.

With the gradual deepening of organizational learning and knowledge management research, scholars have begun to explore the connotation of knowledge integration in different contexts. Technology-intensive enterprises as an example point out that knowledge integration is absorbing and integrating the information that has been communicated. Tzabbar et al. (2013) took biotechnology companies as a sample and believed that knowledge integration refers to the process of integrating existing knowledge and knowledge acquired from outside.

Drawing on the definition of the connotation of knowledge integration by foreign scholars, domestic scholars have also proposed different connotations of knowledge integration. The method synthesizes, integrates and reconstructs knowledge from different sources, levels, structures and contents to enhance and form a new knowledge system. Chen Li and Lu Ruoyu (2003) pointed out that knowledge integration is a dynamic process in which an enterprise reorganizes its internal knowledge and organically integrates the knowledge of employees and organizations in the enterprise to form a new core knowledge system. Li Jian (2013) believes that knowledge integration is to glue together knowledge with different sources, functions, and a certain complementarity.

2.2.2 The concept of Knowledge Integration Ability

Enterprises need to introduce new technologies and new knowledge, and integrate them with the original resources of the enterprise. The new and old knowledge complement each other and jointly improve the business model of the enterprise. The ability of knowledge integration, as a continuous update and improvement ability, can

help enterprises achieve this goal. Relevant literatures have discussed the concept and constituent dimensions of knowledge integration ability from different theoretical perspectives and research situations.

The knowledge-based view holds that the essence of an enterprise is a mechanism of knowledge integration, and how to acquire knowledge and cultivate enterprise knowledge integration capabilities has become a hot research topic in the field of organizational learning and knowledge management (Jian Zhaoquan et al., 2008; Alegre et al., 2013). Grand and Nayyar (1994) put forward the concept of knowledge integration capability, and believed that knowledge integration capability is the capability to redefine resource combination based on market opportunities and enterprise status quo, and transform constitutive knowledge into structural knowledge. The acquisition and absorption of knowledge can increase the richness of enterprise knowledge resources, but if it is not integrated into a systematic knowledge system, it will be difficult to play a role. The ability of knowledge integration is an effective supplement to the absorptive capacity. Zander & Kogut (1992) first proposed the concept of knowledge integration ability. It is believed that knowledge integration ability is the ability of enterprises to comprehensively use newly acquired knowledge and original knowledge by means of tools and internal communication among employees, and it is a kind of knowledge integration through absorbing and using existing knowledge of various types and sources. process of reintegration.

From the perspective of organizational capability building, knowledge integration capability is a structural capability, which means the ability to acquire new knowledge across organizational boundaries and perform flexible integration across functional departments and cognitive structures within the organization (Henderson & Cockburn, 1994). Grant (1996) established the concept of knowledge-based organizational capability for the first time, regarded knowledge integration capability as a potential capability to build organizational competitive advantage in a dynamic environment, and deeply analyzed the formation process of organizational capability under the influence of knowledge integration, and its impact Knowledge-integration characteristics for competitive advantage acquisition, which include scope, efficiency, and flexibility. He believes that integrating the professional knowledge of organizational

members is the key ability to maintain and build the organization's competitive advantage, and points out that the scope of knowledge integration reflects the breadth of integration capabilities, the integration efficiency represents the integration degree of individual professional knowledge, and the integration flexibility indicates that the organization utilizes original knowledge and The ability to apply new knowledge.

In the domestic literature, some scholars also define knowledge integration ability. Shen Qunhong and Feng Kaidong (2002) conducted a case study on the domestic power automation industry technology, and explained the knowledge integration capability. They believed that the knowledge integration capability is the organization's screening, processing, integration and The improved dynamic ability is conducive to promoting the continuous integration and updating of the organization's knowledge in different subject dimensions, identifying and solving market needs in a timely manner, and adopting appropriate supply means to quickly adapt to market needs. Gao Wei and Ni Wenbin pointed out in 2005 based on existing research that knowledge integration can enrich the value of knowledge, and on the basis that the breadth of knowledge is limited to a certain range, integrate, improve and upgrade their own knowledge, thereby improving the market competitiveness of the organization. In 2011, Hong Daocheng divided knowledge integration into three viewpoints: process viewpoint, capability viewpoint and system viewpoint. Zhang Jiemei pointed out in 2013 that integration capability is the unique and constantly evolving capability of an enterprise to screen, transfer, and reorganize various types of knowledge. Zhong Jing et al. (2016) believe that knowledge integration is a complete process of collecting, organizing and innovatively utilizing knowledge.

The direction, scope, path and efficiency of knowledge integration and the specific context of embedding together determine the effect of knowledge integration. Existing research mainly focuses on the concept definition, dimension division and integration type of knowledge integration, and lacks the explanation of the micro-mechanism of knowledge integration (Tsai et al., 2015). Some recent studies have gone deep into the specific operational level and quantitative measurement of knowledge integration, and the research perspective and context have been further refined. Based on the research results on knowledge integration capability at home and abroad, this paper

believes that knowledge integration capability is the integration of new knowledge collected from different channels and carriers with its own existing knowledge, updating the knowledge system of the company, and improving the market of the company. The ability of competitiveness is an important ability for the long-term operation and development of an enterprise.

Table 2.3 Concept of knowledge integration ability

Name	Year	Viewpoint
Grand& Na yyar	1994	It is believed that knowledge integration ability is the ability to redefine resource combination based on market opportunities and enterprise status, and transform constitutive knowledge into structural knowledge.
Shen Qunho ng And Fen g Kaidong	2002	It is believed that knowledge integration capability is a dynamic capability for an organization to screen, process, integrate and improve the knowledge acquired externally and internally. This capability is conducive to promoting the continuous integration and updating of knowledge in different subject dimensions, timely identifying and solving the market demand, and adopting appropriate supply means to quickly adapt to the market demand
Zhang Jiem ei	2013	Knowledge integration capability is a unique and constantly changing capability for enterprises to screen, transfer and reorganize various types of knowledge
Zhong Jing et al	2016	Knowledge integration is a complete process of collecting, sorting out and innovative utilization of knowledge.

2.2.3 Empirical Research on Knowledge Integration

Looking back at the existing research, with the deepening of knowledge management and organizational learning research, knowledge integration has gradually been widely recognized and valued by the academic community. Most scholars analyze the antecedents and effects of knowledge integration from the perspective of process or capability. Scholars have carried out a series of empirical studies on knowledge integration. This paper reviews the representative empirical studies related to knowledge integration at home and abroad in chronological order.

In the early 1990s, scholars put forward the basic theory of enterprise knowledge based on the important role of knowledge resources in enterprises. The basic assumption

of this theory is that the key input and main value source of enterprises are knowledge, and enterprises are the institutions for knowledge integration (Kogut and Zander, 1992; Grant, 1996; Zahra et al., 2000; Grant and Baden Fuller, 2004) . Scholars believe that because it is difficult for the market to coordinate the different specialized knowledge required for production, the role of enterprises is to create and obtain value by effectively integrating specialized knowledge through organizations (Kogut and Zander, 1992; Grant, 1996). Strong knowledge integration capability is conducive to better integration of knowledge collected from outside. Because of the importance of knowledge in competition, knowledge has gradually become an important factor for enterprises to gain competitive advantage. The ability of knowledge integration can further affect enterprise performance.

Collins and Smith (2006) based on a field study of 136 technology companies pointed out that social atmosphere and corporate communication can help improve knowledge integration capabilities and thus Enterprise performance. Carmeli and Azeroual (2009) took 122 knowledge work departments (technology-intensive enterprises) of the Israeli defense sector as the research object, and found that the relationship capital within the department and the relationship capital between departments can help enterprises to build knowledge integration capabilities. Relational capital between departments facilitates the integration of diverse knowledge to promote sudden innovation, while intra-departmental relational capital promotes incremental innovation through knowledge integration. Gardner et al. (2012) took the accounting firm as the research object and found that the level of Enterprise performance depends on the continuous integration with environmental changes, that is, the ability of dynamic knowledge integration, and pointed out that relationship, experience and structural resources can help improve team knowledge Integration ability, and task uncertainty has a moderating role in the relationship between the two. The research of Caridi-Zahavi et al. (2016) shows that internal knowledge integration has a positive impact on three performance indicators (new product quality, development speed and new product innovation).

Similarly, Chinese scholars also regard knowledge integration as a kind of ability or process, and analyze the influence of social capital, network strategic orientation

and other factors on knowledge integration (ability). Integration ability plays a complete mediating role in the influence of learning orientation on technological innovation and management innovation. Jian Zhaoquan et al. (2008) explored and verified the positive impact of absorptive capacity on knowledge integration by taking high-tech enterprises as the research object. Pan Wen'an (2012) took enterprises in the textile industry, biopharmaceutical industry, and home appliance industry in the Yangtze River Delta as the research objects to verify the positive impact of relationship strength on the ability of external knowledge integration of enterprises. Jiang Tianying, Sun Wei and Bai Zhixin (2013) analyzed that knowledge integration (ability) has a mediating role in the relationship between market orientation and the competitive advantage or organizational innovation of SMEs. Wei Jiang and Xu Lei (2014) divide knowledge integration into complementary and auxiliary knowledge integration according to the attributes of knowledge, and verify that knowledge integration ability plays an intermediary role in the influence of dual embedding of knowledge network on innovation ability of cluster enterprises. Guo Runping and Cai Li (2017) based on the knowledge-based view and the organizational dual view, found that dual knowledge integration promotes enterprise performance by affecting entrepreneurial ability. The research by Li Lei and Yang Huaizhen (2018) shows that the knowledge integration mechanism has an impact on the performance of new service development by service providers.

2.2.4 Dimensions of Knowledge Integration Ability

Different studies have great differences in the division of the components of knowledge integration ability. Kogut and Zander pointed out that knowledge integration capability is the ability of an organization to integrate the new knowledge acquired by the outside world with its own knowledge, which can enhance the competitiveness of the organization. In the research on knowledge integration ability, they divided knowledge integration ability into three types: systematic ability, cooperative ability and socialization ability.

Frans & Henk (1999) measured knowledge integration ability from the three dimensions of systemization ability, coordination ability and socialization ability. Systematization ability refers to the degree of standardization before the implementation of behavior, which can reduce the need for communication and coordination;

coordination ability refers to the degree of connection between employees in an organization; socialization ability refers to the ability to cultivate a common sense of ideas.

Lv Hongde and Zhu Beiying (2000) constructed a measurement scale of knowledge integration ability from three dimensions of department heads, personal skills and team integration, and explored the relationship between knowledge integration, innovation strategies and knowledge transfer performance.

Tanriverdi (2005) evaluates the knowledge integration capability of enterprises from three dimensions: product knowledge integration capability, customer knowledge integration capability and management knowledge integration capability.

When Zhou Jianqi (2008) explored the relationship between knowledge integration ability and value creation in competitive alliances, he selected three dimensions of socialization ability, coordination ability and absorptive ability to measure knowledge integration ability, and used 28 items to measure.

Dahiyat (2015) divided knowledge integration ability into three dimensions: knowledge acquisition, transfer and utilization.

Mehta (2016) developed a measurement scale for internal and external knowledge integration capabilities, including 4 measurement items for internal knowledge integration capabilities; 3 measurement items for external knowledge integration capabilities, and for 12 large-scale software 326 project leaders of outsourcing service companies conducted a questionnaire survey.

In 2018, Wutong selected some node enterprises in the network, and compared and analyzed 186 sample data, and divided the knowledge integration ability into four categories: knowledge acquisition ability, knowledge digestion ability, knowledge transformation ability, and knowledge utilization ability.

Liu Zeshuang and Du Ruoxuan selected 258 members of the entrepreneurial team in 2018 to study the influence of knowledge heterogeneity and knowledge integration ability on team creativity. When measuring knowledge integration ability, four measurement dimensions were selected from a process perspective, namely knowledge. Identification ability, knowledge contribution ability, knowledge fusion ability and knowledge utilization ability.

Xie Hongming (2007) adopted the research results of Kogut, selected collaborative ability, systematization ability, and socialization ability as the measurement dimensions of knowledge integration ability, and developed a three-dimensional ability measurement scale with a total of 16 items.

Liu Lu and Yang Huixin (2008) used 5 items to measure the ability to acquire knowledge: ①Enterprises can quickly perceive changes in the market and industry; ②Enterprises have lower costs for acquiring external knowledge and information; ③Enterprises can understand the industry The status of the leading technology, products or services in the enterprise; ④ The enterprise can quickly obtain the information of customers and market demand;

Cai Youhua et al. (2013) in the process of exploring the relationship between cluster innovation network and enterprise knowledge integration, according to whether the cluster innovation network acquires internal knowledge or external knowledge, the enterprise knowledge integration capability is divided into internal and external knowledge. Integration.

Mehta et al. (2006) developed specific measurement indicators of knowledge integration capability based on Iansiti & Clark (1994) dividing knowledge integration capability into external knowledge integration capability and internal knowledge integration capability. Competency consists of 4 measurement items, and external knowledge integration capability consists of 3 measurement items.

Most of the existing studies measure knowledge integration ability through a series of proxy indicators. Based on the summarization and sorting out of the previous literature, this study carried out the measurement by the more mature measurement scales of previous scholars. The knowledge integration ability is divided into three dimensions: knowledge acquisition ability, knowledge transfer ability, and knowledge utilization ability. On the basis of referring to relevant literature, the measurement scale of knowledge acquisition ability is proposed as follows: D1. We often carry out market research activities; D2. The company has specialized personnel and systems for acquiring external knowledge; D3. We collect industry information through informal channels (such as lunch and small talk); D3. We collect industry information through informal channels (such as lunch and small talk); D5. The company regularly organizes special

meetings with customers or suppliers to acquire new knowledge; D6. We often visit other enterprises; D7. The company will explore opportunities to develop new products or services in other institutions.

The knowledge transfer capability will draw on the research results of Zhang Haijun (2017) and be measured by the following indicators: E1 Enterprises can effectively transfer the external innovative knowledge to internal enterprises;E2 enterprises can effectively process and summarize technical and market knowledge and transfer it to internal employees;E3 There is a mature communication mechanism between different departments of the enterprise;E4 The internal communication of the enterprise is timely and frequent.

The ability to use knowledge is measured by the following indicators:F1 Employees can quickly use knowledge to meet the competitive demand;F2 Information sharing within enterprises can stimulate new insights and creativity;F3 Enterprises use newly acquired knowledge to solve problems through standardized processes and mechanisms;F4 Company has a clear responsibility and division of labor in the implementation of various production and operation activities, with a high level of cooperation; F5The compensation of a company's research and development staff is related to the degree of their contribution to innovation.

Table 2.4 Measurement of knowledge integration ability

Name	Year	Viewpoint
Cai You hua	2013	In the process of exploring the relationship between cluster innovation network and enterprise knowledge integration, the enterprise knowledge integration capability is divided into internal and external knowledge integration capabilities according to whether the cluster innovation network obtains internal knowledge or external knowledge.
Dahiyat	2015	Knowledge integration capability is divided into three dimensions: knowledge acquisition, transfer and utilization.
Mehta	2016	The scale of internal and external knowledge integration ability was developed, including 4 items of internal knowledge integration ability; 3 measurement items of external knowledge integration ability.

Table 2.4 Measurement of knowledge integration ability (Cont.)

Name	Year	Viewpoint
Wutong	2018	Select some node enterprises in the network, and divide the knowledge integration ability into four categories: knowledge acquisition ability, knowledge digestion ability, knowledge transformation ability, and knowledge utilization ability.
Liu Zes huang And Du Ruoxu an	2018	When studying the influence of knowledge heterogeneity and knowledge integration ability on team creativity, four measurement dimensions are selected from the perspective of process to measure knowledge integration ability, namely knowledge recognition ability, knowledge contribution ability, knowledge integration ability and knowledge utilization ability.

2.2.5 Formation Process of Enterprise Knowledge Integration Capability

Knowledge integration is a dynamic process, for an enterprise or organization, how to fully integrate the knowledge closely related to the enterprise strategy into the enterprise's knowledge system, along with the entire life cycle of the enterprise. When the company faces new problems, it must solve the problems effectively through the effective integration of internal and external knowledge.

Knowledge integration is a multi-dimensional and multi-level model system. Some scholars analyze it from different angles and divide the process of knowledge integration. Ji Cheng, Zhu Xiaoming, and Ren Rongming (2007) dynamically study the management process of knowledge integration in corporate mergers and acquisitions from the aspects of knowledge conflict, knowledge identification, knowledge transfer, and knowledge fusion by constructing the knowledge integration value chain of corporate mergers and acquisitions. Yang Jin, You Jianxin, Cai Yiping (2006) studied the knowledge integration process in supply chain process management, and divided it into six processes: knowledge acquisition, knowledge selection, knowledge generation, knowledge internalization, and knowledge externalization. Rui Mingjie and Liu Mingyu (2006) believe that the SECI process between enterprise organizations constitutes the knowledge integration platform of the network industry chain, which includes knowledge mining, knowledge sorting and knowledge integration. Xing Xiaoqiang and Quan Yunhuan (2004) believe that the process of knowledge integration includes the identification, evaluation, rejection, transmission and fusion of knowledge. Kraaijenbrink

et al. (2007) believed that when enterprises integrate external knowledge, they need to go through three processes: knowledge identification, knowledge acquisition and knowledge application, and each process includes several sub-processes, which can be static integration completed at one time. The process can also be a continuous dynamic integration process.

The organization's knowledge resources are disseminated throughout the business, particularly in large-scale multi-program organizational networks where a significant portion of the production knowledge is found outside of traditional firm borders in the supplier base (Baldwin and Clark 1997). The ability of the focal firm to continuously integrate its dispersed "pockets" of specialized knowledge efficiently and effectively (i.e., in novel and sustainable ways) in order to carry out its production activities and maintain competitive advantage is therefore what determines organizational performance in the knowledge era (Kogut and Zander 1992; Purvis, Sambamurthy et al. 2001).

Despite this, there is still little theory as to what constitutes knowledge integration (Brown and Duguid, 2001), and even less in terms of actual organizational channels and mechanisms for integrating knowledge, and how this integration is actually achieved in practice. Although there is a broad consensus in the literature on the importance and centrality of knowledge in productive activities and the role of organizations as knowledge integrators (De Boer, Van Den Bosch et al.1999; Takeishi 2002). The concept of knowledge integration is indeed still largely conceptual due to its high degree of aggregation and the lack of a sufficiently in-depth definition of standard practice. When it comes to the idea of knowledge integration, it is also rife with high-level, vague, and often competing definitions and interpretations, because the firm's view of knowledge is a growing and relatively new force in organizational science. Therefore, starting with definitions at the conceptual and operational level that are clearer and broader in scope than those provided in the existing literature is a prerequisite for understanding the mechanisms and details of the knowledge integration process.

Knowledge integration mainly refers to the acquisition and assembly of knowledge from various sources in the process of practice. Firstly, the knowledge is acquired to the required place through the relationship established between the source and

the receiver, and then it is assembled (or combined) with other knowledge to achieve the desired goal. Thus, integration is complete when an organization is able to perform tasks that cannot be accomplished using only its prior expertise. Because new (additional) knowledge may be formed in the composition process and in applying the combined knowledge to a real situation, the resulting (integrated) knowledge is, in this sense, greater than a simple combination of acquired and existing knowledge. Thus, despite any colloquial similarities in vocabulary, this integration of definitions is different from and superior to acquisition and combination alone; The latter is actually a subset of the integration and clearly does not resemble the entire integration process.

The process of converting synthetic knowledge into applied knowledge to complete tasks in practice, usually in the process of problem solving. In organizational terms, the acquisition of knowledge is transformed into a process of transfer between the source and the recipient, and the combination of knowledge is transformed into a process of sharing with various members or groups of the recipient site.

In conclusion, the knowledge integration process entails a number of sub-processes that involve the application, transfer, and sharing of knowledge to address issues. A key step in the knowledge integration process is knowledge appropriation, and it may be claimed that the integration process cannot be adequately explained without taking the appropriation element into account.

2.2.6 The Mediating role of Knowledge Integration Ability

Wei Ying (2006) believes that corporate trust and connection can promote knowledge integration and sharing, thereby improving corporate innovation performance. Ke Jianglin (2007) and others conducted research on R&D teams and used empirical methods to verify the mediating role of knowledge integration in the impact of team social capital on team performance. He believed that the mechanisms of information transfer, knowledge sharing and comprehensive problem solving were conducive to promoting information efficiency among members flow, so that valuable knowledge can be transferred. Chen Jianxun (2009) and others concluded through empirical research that higher knowledge integration ability can help social capital play a better role. When Wu Junjie and Dai Yong (2013) conducted an empirical exploration of entrepreneurial social capital and technological innovation performance, they took knowledge integration

ability as an intermediate variable, and discussed the impact of knowledge integration ability on technological innovation performance, and concluded that knowledge integration ability has an impact on technological innovation performance. Innovation performance has a positive impact, and it also plays a mediating role in the impact of social capital on technological innovation performance. Wu Tingting (2018) found a significant positive correlation between knowledge integration ability and innovation performance in the research center of knowledge sharing and innovation performance. Meanwhile, knowledge integration ability plays a partial mediating role between knowledge sharing and innovation performance.

Modern enterprises are in a dynamic environment. The competition between enterprises is essentially the competition of knowledge, and knowledge is the basis of innovation. Therefore, if an enterprise wants to stand and be invincible in the market, it must continuously increase the knowledge of the enterprise and then continuously update the knowledge stock and inventory of the enterprise. Corporate social capital can help enterprises establish a good network platform, build trust relationships between enterprises, enable enterprises to trust each other, enhance understanding, exchange experience and other knowledge, and improve enterprise performance. Based on the above analysis, this study will explore the mediating role of knowledge integration ability between the two variables of corporate social capital and Enterprise performance.

The idea of using social networks' various information resources for team and individual success is not new. The transactive memory system, functional diversity, and information pooling are three well-established and widely-accepted fields of knowledge research that were all studied by different scholars. These three research areas shed light on how people use their networks and work groups to gain knowledge. According to the transactive memory system, shared knowledge in teams develops through mutual learning, information storage with specialists, and retrieval of useful information from them. This knowledge is essential for team effectiveness. Functional diversity, on the other hand, looks at how team members' functional differences might help the team achieve its goals. Finally, the information pooling strategy leverages interaction to exchange private information among groups; failure to do so could result in decreased

performance. Research in these three areas showed how team members' knowledge may be transformed and integrated to produce emotional performance.

Three conclusions can be drawn from these three research areas:

1) A person's ability to solve problems can be improved if they have a wide range of the appropriate knowledge for the challenge at hand.

2) When a person has access to a wide variety of knowledge, outcomes are better.

3) His or her efficacy will be increased by having access to distributed knowledge and then transforming that knowledge.

Therefore, any method of gaining knowledge from a network of people and then integrating it to solve further problems is helpful for improving performance and problem-solving skills on an individual basis. The information pooling strategy directly relates social interactions to the acquisition of useful knowledge and information for outcomes connected to performance. By supplying the necessary cognitive resources, information and knowledge exchange improve creativity. Exchange of knowledge, ideas, and information linked to the workplace was also found to be positively correlated with creativity. Researchers discovered that even though people who offer original and novel solutions to problems frequently fail, their failure can be reduced by intensive involvement in knowledge-related activities and expanding one's knowledge base for problem solving. These activities also enhance knowledge generation and problem solving. The application of creative ideas at businesses can also be impacted by knowledge management activities and knowledge processes. The aforementioned hypothesis establishes a connection between the interaction of network centrality and network cost, knowledge integration, and personal creativity. Implicitly, the debate implies that knowledge integration of individuals mediates the interaction effect of network cost and network centrality on individual innovation. In other words, network centrality, which is a structural characteristic of networks, enables the focal employee to actively participate in knowledge exchange activities and, as a result, integrate more knowledge from these exchange activities, which is linked to employee creativity at organizations.

2.3 Enterprise Performance

Enterprise performance evaluation plays an increasingly important role in modern enterprise management. Enterprise performance evaluation is to use the principles of operations research and mathematical statistics theory, and use specific evaluation methods and index systems to evaluate the operating efficiency of enterprises and operators in a period of time. Comparative analysis of performance, so as to make an objective and scientific comprehensive evaluation of the business development status of the enterprise. The academic research on Enterprise performance has a long history, but scholars' understanding of its meaning is inconsistent. Some scholars mainly define Enterprise performance from the perspective of behavior, results and the combination of the two. Chinese scholars pointed out that Enterprise performance should include the operating efficiency and operating performance of the company during a certain period of operation, which is embodied in profitability, asset operation level, debt repayment ability, follow-up development ability, and the operator's performance on the operation, growth and development of the enterprise. achievements and contributions. The concepts and dimensions of Enterprise performance have different presentations in different literature studies and have not been unified.

2.3.1 Relevant Concepts of Enterprise Performance Evaluation

Xu Li, Liu Ruiyu (2004) believe that enterprise performance evaluation refers to the use of unified evaluation standards, specific index systems, and scientific methods and procedures to objectively, fairly and accurately evaluate and explain the company's performance in a certain period of time. results and potential for future development. The research of Li Honglang (2005) shows that enterprise performance includes a wide range of contents, which not only refers to the ability of the enterprise to obtain income and profit in the process of production and operation, but also includes the transaction situation of the enterprise in order to seek new development. The ability to quickly adjust course and execute decisively as demonstrated by and changing influencing factors. Enterprise performance is the overall quality and strength of an enterprise that can accurately and effectively seize market share and continue to grow and develop in the objective situation of the rapidly changing competitive environment. Shen Zhidong (2013) believes that the performance evaluation index system refers to a system

composed of a series of indicators, which can measure and evaluate the performance of the evaluated object through some internal connection. Lv Lei (2019) proposed that in the context of fierce competition in the global economic integration, effective enterprise performance management is conducive to the long-term development of enterprises and can greatly enhance the core competitiveness of enterprises.

2.3.2 Dimensions of Enterprise Performance Evaluation

China's 2002 revised "Enterprise Performance Evaluation Operating Rules" stipulates that enterprise performance evaluation consists of four indicators system: financial efficiency, asset operation, solvency and development ability. Wu Jinchun (2000) believed that the value-oriented enterprise performance evaluation method is directly related to the interests of employees. In order to avoid the deviation of value evaluation caused by various human factors, the key performance indicator system needs to provide more fair and objective data. Kang Jinjiang, Sun Guozhong, Kang Junqing (2001) compared the traditional accounting profit, return on investment, return on equity capital and other indicators with economic value added (EVA), pointed out the advantages of EVA evaluation method in the enterprise performance evaluation system, and It is believed that the traditional financial evaluation method should be changed, and the EVA evaluation method should be emphasized. Sun Ning (2011) believes that an enterprise must survive before it can develop, and should pay special attention to the two dimensions of survival and growth when examining enterprise performance. Liu Min (2012) believes that "company performance" refers to the improvement of short-term profitability and the increase of long-term competitive advantage brought about by an enterprise's active commitment to social responsibility in its daily management practice. Wang Zhimin (2018) proposed that the Balanced Scorecard broke the traditional performance evaluation model, and gradually decomposed the strategic objectives into four dimensions, namely customers, finance, internal business processes, learning and growth, and transformed them into mutual causality and mutual balance. performance indicator system.

In terms of measuring Enterprise performance, academic circles mainly use financial indicators and non-financial indicators. Common financial indicators include return on assets, return on sales, sales growth rate, pre-tax average profit margin, financial

indicator profit margin and Tobin's Q value, etc. In addition to financial indicators, scholars also add non-financial indicators to measure Enterprise performance. For example, through the form of questionnaire survey, enterprise managers can subjectively evaluate the operation situation, and then score according to the scale to construct measurement indicators. Subjective performance is mainly derived from the respondents' evaluation of the enterprise's innovation ability, customer satisfaction with new products, and the level of product or service quality. The improvement of enterprise performance should not only focus on the current performance of the enterprise (financial performance) to meet the vested interests of employees, shareholders and other stakeholders, but also must consider the continuous provision of new products and new technologies (innovative performance) by the enterprise to promote the future progress of the enterprise. develop. This paper hopes to explore the relationship between corporate social capital and Enterprise performance. Therefore, the measurement of Enterprise performance is evaluated from two aspects: innovation performance and financial performance. In the existing empirical research, most scholars only consider the impact of social capital on innovation performance, and rarely discuss both financial and innovation performance. Referring to the existing research results, innovation performance (IP) is measured by the number of patent applications, and financial performance (FP) is measured by weighted average return on equity.

According to research on the connection between social capital and entrepreneurship, an entrepreneur's social capital makes it easier for them to adopt entrepreneurial habits (Wang et al., 2019). For instance, Li et al. (2021) empirically demonstrated that social capital plays a role in the positive relationship between "prior entrepreneurial experience-farmers' e-commerce adoption behavior" and "prior training experience-farmers' e-commerce adoption behavior," in addition to directly promoting farmers' adoption of e-commerce. In the e-commerce environment, rural residents gained a diverse and broader social network, decreased affective trust dependence, adjusted to market social norms, and developed new and richer social capital, which in turn facilitated entrepreneurial activities, according to an empirical study by Kobayashi et al. (2006).

According to Lins et al. (2017), the development of firm-specific social capital can be compared to an insurance policy that pays off when the economy as a whole and

investors experience a severe crisis of confidence. By examining the value of corporate social responsibility during the financial crisis, Lins et al. (2017) discovered the most significant clinically relevant finding. They discovered that social capital and financial capital are extremely important to firm performance and identified situations in which CSR can be advantageous for firm value. Similar to Rass et al. (2013), Dato-on et al. (2018) discovered social capital to be positively associated to firm performance. They discovered social capital to assist small businesses' innovation, which ultimately results in improved firm performance. Le Van et al. (2018) established the causal relationship between social capital and company performance utilizing a control function method within a quantile regression framework. By examining the explicit contributions of social capital to the performance of a group or team, Clopton (2011) analyzes the importance of social networks, or social capital, inside the group process. The findings showed a strong correlation between social capital and team performance (Clopton, 2011).

The concept of enterprise performance is widely used, and different studies have different interpretations and definitions of it. It can be seen from the research literature of enterprise performance dimension that almost all scholars have adopted multi-dimensional measurement of enterprise performance, and this paper also agrees with this view. This study evaluates enterprise performance from two dimensions: financial performance and innovation performance. Financial performance reflects the main financial status of the company's operation; Innovation performance reflects the company's evaluation of the development results of technology, new products or new markets. Because it is difficult to properly match the objective data on performance in cross organizational research, and the anonymous answers of the surveyed companies make it difficult to use the objective data, this study uses the method of comparative subjective evaluation to measure performance. Financial performance: refers to the quantitative comparative analysis and evaluation of the profitability, asset quality, debt risk and business growth of an enterprise in a certain period of time. The measurement items are as follows: Q1 The company's profit is higher than that of its main competitors; Q2 Compared with the main competitors, the company's sales grew rapidly; Q3 Company's ROE is higher than that of its main competitors; Q4 The company has a high market share compared with its main competitors; Q5 Companies have a high

return on investment relative to their competitors. Innovation performance: mainly refers to the achievements of the company in product innovation. The measurement items are as follows: H1 The company develops more new products than its main competitors; H2 The profit growth rate of the company's new products is faster than that of its competitors; H3 The company's market share of new products has increased rapidly compared with its major competitors; H4 Compared with the main competitors, the company has a faster reaction to the use of new information.

2.4 Review of Moderating Variables between Corporate Social Capital and Enterprise Performance

Due to the constraints of resources, information, technology and capabilities, it is difficult for enterprises to carry out innovation activities alone, and they have to seek external cooperation to make up for their own innovation deficiencies and improve enterprise performance. As a key source of enterprise innovation, corporate social capital is conducive to the generation of new ideas, the development of new products and the diffusion of new technologies, and has become an important force for enterprises to obtain resources, carry out technical exchanges and share knowledge. In order to deepen the understanding of the relationship between corporate social capital and enterprise performance, some scholars use absorptive capacity as a direct or indirect influencing factor to explore the impact of corporate social capital on enterprise performance. Ma C. (2012) took absorptive capacity as a moderating variable and listed high-tech wood companies as an example to verify the impact of internal and external social capital on enterprise performance. Hou G.H.& Zhang J.G. (2013) explored the heterogeneity of social relational capital on technological innovation performance by taking absorptive capacity as the moderating variable and conducting empirical analysis on the questionnaires issued by 76 enterprises in medical, petroleum, transportation and other fields. Enterprises with strong absorption ability can effectively identify external information and fully integrate and utilize existing knowledge, improve the diversity and stock of knowledge, and thus enhance the competitiveness of enterprises. On the contrary, enterprises with weak absorption capacity cannot effectively receive, digest, transform and utilize new knowledge, and it is difficult to form their own performance advantages.

In addition, some scholars have conducted research from the perspective of other regulating variables. Li X. (2016) studies the relationship between intellectual capital and enterprise performance and finds that environmental suitability has a positive impact on intellectual capital and enterprise performance. The complexity of environment has no regulating effect on them. It shows that environment plays a moderating role in the relationship between intellectual capital and enterprise performance. Li J.L. (2018) pointed out in his research on the relationship between intellectual capital, economic environment and enterprise performance that economic environment positively regulates the impact of human capital and relationship capital on enterprise performance, and negatively regulates the impact of structural capital on enterprise performance. Li Y.(2020) pointed in his study on the impact of intellectual capital on enterprise performance from the perspective of corporate life cycle, found that human capital and relational capital have a positive impact on enterprise performance during the maturity period, while enterprise performance is most affected by structural capital during the decline period. In the study on the impact of intellectual capital on the performance of manufacturing enterprises, Yue J.J. (2020) took institutional environment as the moderating variable and analyzed that intellectual capital as a whole can significantly improve the performance of enterprises. Among the three dimensions of institutional environment, the level of financial development, the level of government intervention and the level of legalization all have a positive impact on the moderating effectiveness of human capital and enterprise performance. The degree of government intervention has a moderating effect between relational capital and enterprise performance.

To sum up, the impact of corporate capital and enterprise performance is influenced by many factors, which can regulate the relationship between the two. Many scholars have proved that good corporate social capital can promote the improvement of enterprise performance and enhance the competitiveness and sustainable development of enterprises. And whether the performance of the corporate itself can affect the establishment and maintenance of corporate social capital? Which will have an impact on improving enterprise performance? Therefore, this study will explore whether the performance of the corporate itself has a moderating effect on the relationship between corporate social capital and enterprise performance.

2.5 Research Hypotheses

2.5.1 Corporate Social Capital and Enterprise Performance

At present, most scholars have the highest acceptance of the dimension division of corporate social capital is the research of Nahapiet and Ghoshal, which divides social capital into three dimensions: structural capital, relational capital and cognitive capital. Many scholars use this division method to conduct research in different contexts, and continue to discuss and verify the impact of the three dimensions of social capital on Enterprise performance.

Zhang Qizai (2000) research pointed out that social capital existing between workers and managers has a significant impact on the performance of enterprises. Cooke and Clifton (2002) explored the relationship between social capital and the performance of British SMEs, and demonstrated that corporate social capital has a significant role in promoting the introduction of new products and new processes and the achievement of quality standards, and Can increase the proportion of new product output value in total sales revenue. Chen Jin and Li Fei (2001) analyzed the impact of social capital between enterprises and vertical, horizontal and other external entities on the performance of technological innovation of enterprises. Zheng Shengli and Chen Guozhi (2002) studied the relationship between social capital and enterprise innovation from the perspectives of internal and external enterprises, and believed that social capital can promote the innovation performance of enterprises. Zheng Meiqun (2005) pointed out that the richer the social capital of the enterprise, the lower the transaction cost, and the trust established by the enterprise and other enterprises can help the enterprise acquire knowledge and resources, thereby improving the innovation performance of the enterprise.

Wang,Q. et al (2021) considered that enterprises must innovate to maintain their advantages and competitiveness in the information economy. Due to the importance of the construction industry to China's economy and the challenge posed by the "getting out" policy, there has been a strong push for technological and managerial innovation in both the academic and practical worlds. Social capital (SC), a resource in a social network, is the cornerstone for giving businesses a lasting competitive edge. SC has a significant role in determining the IP (innovation performance) and innovative accomplishments of businesses. Enterprises must engage in knowledge transfer (KT) with the others in their

networks in order to be competitive in the market. Few academics have, however, investigated whether SC has any impact on IP in the construction industry.

Therefore, this paper argues that corporate social capital can promote Enterprise performance, and makes the following assumptions:

H1: Corporate social capital has a positive effect on enterprise performance

2.5.2 Corporate Social Capital and Knowledge Integration Ability

Corporate social capital helps to acquire and utilize knowledge, thereby improving the level of corporate knowledge creation and technological innovation. With the development of economic globalization, knowledge integration ability, as a dynamic ability, has been regarded as the main source of competitive advantage by enterprises. It has been discussed in detail in the second chapter of the literature review.

Li Jieyi studied the enterprise virtual team in the Yangtze River Delta and received 214 questionnaires. The results show that the structural capital, relational capital and cognitive capital of virtual team social capital have a positive and significant impact on knowledge integration. Xie Hongming and others established a model to study 151 enterprises, and obtained the research results that the internal social capital of enterprises can have a positive impact on knowledge integration. Chen Jianxun selected internal social capital, knowledge integration and core competence of enterprises for research. The research results show that internal social capital has a significant impact on knowledge integration. Liu Yanfang and Xu Jianzhong adopted the research method of social network analysis to discuss the relationship between the network environment and knowledge integration, and concluded that social networks can have an impact on the knowledge integration of organizations from many aspects. Ranjay believes that the trust factor in relational capital is conducive to promoting enterprise cooperation and business exchanges on the premise of symbiosis mechanism. Shi Wengeng and Jiang Tianying believe that similar knowledge structure can be a good basis for enterprise communication, thus promoting enterprise understanding and integration of knowledge. The consistent goals of different individuals are conducive to collective learning, strengthening interaction and knowledge sharing, thus promoting knowledge integration.

K.S. Al-Omouh et al. (2020) aimed to investigate how social capital and cooperative knowledge generation might help e-businesses become more proactive in the

face of the COVID-19 challenge. Data from industries that had to continue operating during the crisis, like the pharmaceutical and cleaning products sectors, were gathered via an online poll. 198 managers made up the sample. The results demonstrate the importance of social capital and cooperative knowledge generation in establishing e-business proactiveness in the face of the pandemic. The outcomes also demonstrate the beneficial effects of group knowledge development and proactive e-business on organizational agility during the crisis. The current study offers up a wide window for the investigation of new areas in information technology studies, such as the function of collaborative knowledge generation and e-business proactiveness and their bearing on organizational agility in the face of pandemics around the world. Managers may manage the pandemic challenges by appreciating the crucial role that social capital and collaborative knowledge generation play in e-business proactiveness.

Although scholars have recognized that the relationship between corporate social capital and knowledge integration plays a positive role in the development of enterprises, the specific relationship between the two has not been clearly defined. From the current literature, there are relatively few literature devoted to the study of social capital and knowledge integration capabilities. Based on the above analysis, this paper makes the following assumptions:

H2: Corporate social capital has a positive effect on knowledge integration capabilities

2.5.3 Knowledge Integration Ability and Enterprise Performance

Knowledge management theory holds that professional integration of knowledge can improve enterprise performance, which is very important to maintain a company's competitive advantage. Knowledge acquisition ability helps to solve the current situation of enterprise resources. Strong knowledge acquisition ability can enhance the ability of enterprises to scan the external environment, acquire more valuable external knowledge, increase the knowledge capital of enterprises, and accumulate knowledge for the improvement of performance. Base. After an enterprise acquires knowledge, it can spread rapidly within the enterprise through organizational learning, and quickly utilize knowledge with each other, thereby expanding new ideas, revising or improving original ideas, improving product development efficiency, and then improving

enterprise performance. Knowledge integration facilitates process innovation and product innovation.

Jian Zhaoquan believes that knowledge integration can help organizations respond to market changes and multiple demands in a timely manner. Through empirical research, he concludes that knowledge integration can help organizations innovate, thereby improving enterprise performance. Li Zhen selected 236 innovative enterprises for empirical research, discussed the relationship between knowledge absorption, integration capability, relational learning and enterprise innovation performance, and found that knowledge integration capability can have a positive impact on innovation performance. Xie Xuemei and Zuo Leilei believed that the enterprise's ability to collect, integrate and use knowledge was positively related to the enterprise's innovation performance. Luo Hongyun and Zhang Qingpu believe that if enterprises integrate knowledge to generate new knowledge systems, they can bring competitive advantages to enterprises, thus improving their competitiveness. Hou Guangwen and Xue Huifeng believe that enterprises can improve their innovation performance by acquiring knowledge from outside and absorbing and utilizing it.

Based on the review of literature review, this paper proposes the following hypotheses:

H3: Knowledge integration ability has a positive effect on Enterprise performance

2.5.4 Mediating role of Knowledge Integration Ability

Modern enterprises are in a dynamically changing environment. The competition between enterprises is essentially the competition of knowledge, and knowledge is the basis of innovation. Therefore, if an enterprise wants to stand and be invincible in the market, it must continuously increase the knowledge of the enterprise and then continuously update the knowledge stock and inventory of the enterprise. Corporate social capital can help companies establish a good network platform, build trust relationships between companies, enable companies to trust each other, enhance understanding, exchange experience and experience and other knowledge, and improve Enterprise performance. The establishment of close connections between enterprises in the network is conducive to the formation of a good sense of trust between enterprises,

enhances the desire for mutual cooperation, and transfers the knowledge acquired in the social network in time, thereby promoting the performance of enterprises.

Hongyun, Tian & Kankam, William Adomako & Akolgo, Isaac. (2019) studied about effect of social capital on firm performance: the role of entrepreneurial orientation and dynamic capability. Good social connections that might result in mutual advantages are referred to as having social capital. The social capital idea relies on connections within networks to acquire resources, particularly information advantages not available to outsiders. The study demonstrates how social capital affects Enterprise performance. The study also looks at the mediating effect of dynamic capacities in the relationship between social capital and company performance, as well as the moderating role of entrepreneurial orientation in this relationship. The analysis of primary data from 787 small and medium-sized firms (SMEs) operating in Ghana using SmartPLS software 3.2.8 yielded findings showing social capital is positively and directly correlated with firm performance in Ghana.

Xie Hongming et al. (2007) showed that knowledge integration ability plays a completely intermediary role in learning orientation influencing technological innovation and management innovation. Jiang Tianying, Sun Wei and Bai Zhixin (2013) analyzed that knowledge integration (capability) plays an intermediary role in the relationship between market orientation and the competitive advantage or organizational innovation of SMEs. When Wu Junjie and Dai Yong made an empirical exploration of entrepreneurs' social capital and technological innovation performance, they took knowledge integration capability as an intermediate variable, discussed the impact of knowledge integration capability on technological innovation performance, and concluded that knowledge integration capability has a positive impact on technological innovation performance, and plays an intermediary role in the impact of social capital on technological innovation performance.

Therefore, this paper believes that knowledge integration ability has a mediating role between the two variables of corporate social capital and Enterprise performance, and makes the following assumptions:

H4: Knowledge integration ability has a mediating role between corporate social capital and enterprise performance

2.5.5 The Moderating Effect of the Performance of the Corporate Itself.

From the literature, it is generally believed theoretically that corporate social capital can make positive contributions to the improvement of enterprise performance. However, the empirical research results of Florida et al. (2002) show that there is even an inverse relationship between social capital and innovation performance. They believe that organizations with high scores of social capital will hinder innovation due to complacency or isolation from external information and challenges. Liu Linping (2006) found in the study of corporate social capital that the cost of building social networks invested by enterprises and enterprise performance are not as strongly positive as people expected. Gong H.Q & Lin J (2007) defined the social capital of the relationship dimension from two aspects of relationship operation and relationship cognition, and found that the social capital of the relationship dimension not only failed to effectively increase sales and profit margins, but even played a negative role. After reviewing relevant literature, it is found that corporate social capital has both positive and negative impacts on enterprise performance, and the degree of impact is different. Therefore, is there any other moderating effect in the process of corporate social capital affect on enterprise performance? So, this study divides the surveyed enterprises into two groups, namely technology-based SMEs with good performance and technology-based SMEs with poor performance, and tests the hypotheses through quantitative analysis and qualitative analysis, and the hypothesis are as follows:

H5: In the impact of corporate social capital on enterprise performance, the performance of the corporate itself has a moderating effect.

CHAPTER 3

RESEARCH METHODOLOGY

This research takes the relationship between corporate social capital, knowledge integration capability and enterprise performance as the research content, constructs a theoretical framework, and discusses the relationship between corporate social capital, knowledge integration capability and enterprise performance through descriptive statistics, reliability and validity test, correlation analysis and structural equation model test, research interview and other methods based on previous research results and primary data obtained through questionnaires.

This chapter describes the research methodology, including research process, sample and data collection, questionnaire development process, interview design, research model, variable measurement and do the Pre-test. The researchers checked the design of research methods to select appropriate paradigms and methods.

3.1 Research Design

The objective of this research is to explore the impact of corporate social capital on enterprise performance, hoping that this research can further clarify the important role of corporate social capital in improving enterprise performance and to test whether knowledge integration ability has an intermediary role in the relationship between corporate social capital and enterprise performance, and to clarify the specific mechanism by which corporate social capital affects enterprise performance. A comparative study was also conducted between the effects of corporate social capital on enterprise performance in good-performing and poor-performing enterprises. The survey enterprises are divided into two groups for comparative study, that is, the good performance of technology-based SMEs and the poor performance of technology-based SMEs. Both quantitative and qualitative research methods are used to verify whether the impact of corporate social capital on enterprise performance is different between the two methods, and whether the mediating role of knowledge integration ability is different between the two methods.

The research method used will be a combination of quantitative and qualitative methods. In this study, the researcher decided to adopt quantitative survey as the main research strategy. The researchers plan to create an online survey with closed-end questions and collect main quantitative data from the target population to test the research hypothesis and achieve the goal. The advantage of using this method is that online surveys allow researchers to collect large amounts of data in a short time, which helps to address research constraints, time and money constraints.

Since all variables in this study cannot be objectively obtained enough information only through written data, it is necessary to obtain detailed data through in-depth qualitative research to make up for the lack of previous theoretical discussion. Therefore, this study will divide the surveyed enterprises into two groups, namely technology-based small and medium-sized enterprises with good performance and technology-based small and medium-sized enterprises with poor performance. Combining semi-structured interview data, qualitative analysis methods will be used to verify the previous quantitative analysis results.

3.2 Data Collection Method

This study collected data by distributing questionnaires to enterprises. According to the content design of the questionnaire, the respondents are required to know more about the overall situation of the enterprise. Therefore, the survey objects are mainly the middle and senior executives of the enterprise, and the middle and senior executives who have sufficient knowledge to answer the questions in the questionnaire about all aspects of the enterprise.

According to the size of the enterprise, a quota sampling method will be adopted to obtain 300 samples. 62 questionnaires have been collected from technology-based SMEs with the size of less than 50 people, 54 questionnaires have been collected from enterprises with the size of 51-100 people, 96 questionnaires have been collected from enterprises with the size of 101-200 people, and 88 questionnaires have been collected from enterprises with the size of 201-500 people. Questionnaires are distributed and retrieved in four main ways to ensure that the data obtained is reliable.

The first way is to issue electronic questionnaires through MBA alumni, and select some of the alumni who are middle and senior managers in the companies. An electronic questionnaire will be made by a questionnaire star and sent it to my classmate, who will be entrusted to help collect it. Each effective reply to a questionnaire will be eligible for a lottery, and the maximum telephone fee can be 10 yuan. A total of 90 enterprises were distributed in this way.

The second method is to ask the staff of government agencies to help, directly send the electronic questionnaire to them, and make use of their contacts with the enterprise, and they will send the electronic questionnaire to the respondents of the relevant enterprise, and ask the respondents to fill in the questionnaire. A total of 50 enterprises were sent in this way.

The third way to distribute questionnaires is to use the advantages of work in college. Through students who participate in work, ask them to help forward the questionnaire as volunteers. Finally, the volunteers will ask the questionnaire to the author, and the questionnaire will be carefully completed. There are 140 questionnaires in this way.

The fourth way to distribute the questionnaire is to distribute and retrieve the questionnaire by the researcher. The researcher contacts enterprises through relatives and friends and went to relevant enterprises nearby to ask the interviewee to fill in the questionnaire on site. A total of 40 enterprises were distributed in this way.

3.2.1 Population

Population of this study is China's technological-based SMEs.

3.2.2 Sampling

The samples were 300 technological-based SMEs in China. The questionnaire will be sent to the middle and senior management of the company, who have sufficient knowledge to answer the questions about various aspects of the company. Middle and senior managers are the backbone of the enterprise. There are 328,000 technology-based SMEs in China. I will select 300 companies, and one manager from each company will complete the questionnaire. I mainly send the electronic questionnaire by the way of questionnaire star, and send the questionnaire link or two-dimensional code to the interviewees through friends, students, family members and social media. They can just

click on the website or scan the two-dimensional code to participate in the questionnaire answer, and I can always check the number of questionnaires collected. Finally, 300 valid questionnaires were recovered. Based on the collected questionnaires, use SEM analysis to obtain the argumentation results.

This study uses structural equation modeling as the main analysis method, which generally requires a large number of samples, but scholars hold different opinions on the specific number of samples. Gorsuch (1983) believed that the number of samples should be kept at more than 5 times the number of measurement items, and 10 times or more is the best. Bagozzi and Yi (1988) considered that when using linear structural equations, the sample size should preferably be more than five times the estimated parameters. Anderson and Gerbing (1988) considered 100 to 150 samples to meet the bottom line of sample size when using structural equation modeling. Following Gorsuch's (1983) point of view, since the final questionnaire of this study has a total of 37 measurement items, the final number of valid samples must be at least 185, and this research plans to have 300 questionnaires.

According to the research needs, 10 enterprises with good performance and 10 enterprises with poor performance will be selected to confirm the findings from quantitative analysis. The performance of the enterprise itself will be grouped using the median of the average score of the measurement data of the enterprise performance items in the survey questionnaire. 150 enterprises above the median are considered to have good performance, while 150 enterprises below the median are considered to have poor performance. Researchers will select the top 10 enterprises with the highest scores and the bottom 10 enterprises with the lowest scores as the analysis objects.

3.2.3 Questionnaire Design

The research object of this study is enterprises, and it is difficult to use public objective data to evaluate variables such as corporate social capital, knowledge integration ability, and enterprise performance. Therefore, this research mainly collects data through questionnaires and uses Likert scale to measure variable. In empirical research, a single item is generally used to measure narrow concepts. When you want to have a better measurement result for complex organizational phenomena, it is usually necessary to design multiple items. On the premise that the measurement items are

consistent, multiple items have higher reliability than single item measurement results (Li Dongqin, 2005). Therefore, the questionnaire of this study measures the independent variables, dependent variables and intermediary variables in the research through multiple items in order to improve the reliability and validity of the measurement. Independent variable of this study is corporate social capital, dependent variable is enterprise performance and mediating variable is knowledge integration ability.

Questionnaire design and scale development should take the following steps: (1) literature review and field surveys and interviews in enterprises; (2) discussions with academic experts; (3) discussions with relevant personnel in the business community; (4) Passing pre-tests purify the items, improve the questionnaire and finalize it. Based on the above steps, the questionnaire design process of this study is as follows:

(1) Consult a large number of domestic and foreign relevant literature. A large number of domestic and foreign literatures on corporate social capital, knowledge integration ability and enterprise performance were collected and carefully read through foreign databases, and relatively mature measurement scales were used for reference, because most of these scales have high reliability and efficiency, and have been verified by later researchers many times. At the same time, we also fully consider the actual situation of this study, combined with some classic domestic research, to form the preliminary draft of the questionnaire.

(2) Seek the advice of academic experts. Send the first draft of the questionnaire to the supervisor and the school (including professors, associate professors, doctoral students, master's students) for reading, and then ask them for revision opinions in the academic exchange meeting, and revise according to the feedback of experts and scholars to form the second draft of the questionnaire.

(3) Through interviews with relevant enterprise personnel. We had an in-depth communication with the managers of relevant departments of the three enterprises, and asked them for their suggestions on the improvement of item design and format in the second draft questionnaire. Based on their suggestions, we made corresponding modifications so that the questionnaire could not only reflect the ideas of the respondents, but also be easy for the fillers to accurately understand, and further modified the questionnaire.

(4) Pre-testing. The third draft of the questionnaire was distributed to the members of the other 40 enterprises for pre-test. According to their feedback, some measurement items were finally modified, and on this basis, the final questionnaire was formed (see Appendix A).

The final questionnaire is divided into four parts, namely: corporate social capital, knowledge integration ability, enterprise performance, and basic information about the company and the respondents. This paper uses Likert five-point scale to measure variables. Likert scale is one of the most commonly used aggregated scales. These items belonging to the same construct are scored in an aggregated manner, and individual or individual items are meaningless. It was improved by the American social psychologist Likert in 1932 on the basis of the original total plus scale. The scale is composed of a set of statements, each statement has five responses of "strongly agree", "agree", "not necessarily", "disagree" and "strongly disagree", marked as 5, 4, 3, 2, 1.

3.2.4 Interview Design

The interview method is one of the commonly used research methods in the field of management and economics, which includes two forms of interview: structured interview and semi-structured interview. The structured interview is mainly used for quantitative data research, and the interview form, design and process have formal standards and specifications; while semi-structured interviews are mostly used for qualitative analysis and research, there is no formal interview form and process. In contrast, semi-structured interview is more flexible, and survey information can be obtained through direct conversation, which is more widely used in academic research. In order to fully understand the implementation of social capital, knowledge integration capability and enterprise performance variables of technology-based SMEs in enterprises, and obtain the opinions and suggestions of enterprise managers on research related issues, so as to make the research variables and models more reasonable, this study uses semi-structured interviews.

In order to deeply and carefully understand the relationship between the variables involved in this study and the formation mechanism of the performance of technology-based SMEs, this study selected senior executives (including chairman, vice chairman, president, vice president, general manager, deputy general manager, etc.) of

technology-based SMEs who have been established for more than three years and have certain big data capabilities as the interviewees. The interviewees from 10 enterprises with good and poor performance were selected for interview.

In this study, semi-structured interviews were conducted by face-to-face interview, telephone communication, WeChat video and other means, and each interview was limited to one hour. The interview mainly includes three processes: first, before the interview. The interview outline was designed according to the research questions, and the rationality and feasibility of the outline were repeatedly demonstrated. Three experts in the field of strategic management and four senior executives of technology-based SMEs were invited to review the contents of the interview outline, put forward opinions and suggestions, and on this basis, the interview outline was revised and improved, the interviewees were contacted, and the interview related preparations were made. Second, in the interview. Introduce the purpose and purpose of the interview to the interviewees, emphasize the confidentiality of the interview, actively guide the interviewees to answer objectively and truthfully according to the interview outline questions, and actively create a relaxed and pleasant interview atmosphere, so as to trigger the interviewees to deeply exchange views, explain their opinions, avoid the cold field or cause the interviewees to dislike the interview process, and make records of the interview to obtain as much detailed information as possible. Third. After the interview. Timely sort out and summarize the interview records, mark the key information, analyze the interview content, and rationalize the relationship between variables and the theoretical framework to ensure the scientific and rigorous research. In addition, keep in touch with the interviewees, timely supplement incomplete content, clarify vague information, and constantly improve the follow-up study of this paper.

3.3 Variable and Measurement Index Selection

It can be seen from the literature review that the current corporate social capital can be divided into three dimensions: structural dimension, relational dimension and cognitive dimension. But there is no consensus on what each dimension consists of. This paper adopts this division method to divide the dimensions of corporate social capital.

In this study, the structural dimension of corporate social capital is mainly studied from the level of interaction between enterprises and suppliers, customers, between departments, and between department members.

3.3.1 Independent Variable: Corporate Social Capital Measurement

The measurement scale is as follows: The structural dimension of corporate social capital is measured through 4 items: A1 We often contact, exchange visits or meet with customers, suppliers and other enterprises; A2 Our department often dispatches personnel to other departments in the company Understand the situation; A3 We often discuss and solve problems existing in the company's operations with colleagues from other departments in the company; A4 The degree of connection between the production department of the enterprise and the R & D, sales and other departments.

The relational dimension of corporate social capital refers to the assets created and utilized through transaction relationships, and is a standardized dimension to measure such behaviors, including trust, norms, recognition, privacy and other attributes existing in relationships. The higher the relational dimension of corporate social capital, the easier it is for enterprises to exchange and transfer information and knowledge from internal and external connections. Mutual trust forms the basis for lasting and effective relations between the two sides. This study uses trust as an indicator to measure the dimensions of corporate social capital relations. The relational dimension of corporate social capital is measured through 3 items: B1 If I encounter problems at work, colleagues in other departments in the company will give me care and advice; B2 In the work interaction with colleagues in other departments of the company, we always worry about the interests of each other being damaged; B3 We trust that affiliated enterprises can successfully fulfill their responsibilities.

This paper studies the impact of corporate social capital on enterprise performance, using the Likert five-point scoring method, selecting the language and knowledge platforms shared by companies and similar values as indicators to measure the cognitive dimension of corporate social capital. The cognitive dimension of corporate social capital is measured through 5 items: C1 we communicate effectively with affiliated companies through common knowledge; C2 we communicate effectively with affiliated companies through a common language; C3 We have similar value orientation when

communicating with others, and have consistent collective goals in the process of communication;C4 When we communicate with customers, suppliers and other enterprises, both parties can clearly understand each other's technical terms or jargon;C5 We have confidence in the expertise of our partners.

Based on the summary and sorting out of the previous literature, this research uses the relatively mature measurement scales at home and abroad to measure the corporate social capital, as shown in Table 3.1.

Table 3.1 Measurement of corporate social capital

Dimension	Items	References
Structural Dimension	A1 We often contact, exchange visits or meet with customers, suppliers and other enterprises; A2 Our department often dispatches personnel to other departments in the company Understand the situation; A3 We often discuss and solve problems existing in the company's operations with colleagues from other departments in the company;A4The degree of connection between the production department of the enterprise and the R & D, sales and other departments.	Nahapiet& Ghoshal(1997), Liu Shouxian (2008),Yang Kun (2011),Zhao Rui (2013),Zeng Ping et al. (2013, 2017),Ao Jiazhuo et al. (2013).
Relationship dimension	B1 If I encounter problems at work, colleagues in other departments in the company will give me care and advice; B2 In the work interaction with colleagues in other departments of the company, we always worry about the interests of each other being damaged;B3 We trust that affiliated enterprises can successfully fulfill their responsibilities.	
Cognitive dimension	C1 we communicate effectively with affiliated companies through common knowledge; C2 we communicate effectively with affiliated companies through a common language; C3 We have similar value orientation when communicating with others, and have consistent collective goals in the process of communication;C4 When we communicate with customers, suppliers and other enterprises, both parties can clearly understand each other's technical terms or jargon;C5 We have confidence in the expertise of our partners.	

3.3.2 Mediating Variable: Knowledge Integration Ability Measurement

On the basis of referring to relevant literature, the measurement of knowledge integration ability can be divided into knowledge acquisition ability, knowledge transfer ability and knowledge utilization ability.

The measurement scale of knowledge acquisition ability is proposed as follows: D1. We often carry out market research activities; D2. The company has specialized

personnel and systems for acquiring external knowledge; D3. We collect industry information through informal channels (such as lunch and small talk); D3. We collect industry information through informal channels (such as lunch and small talk); D5. The company regularly organizes special meetings with customers or suppliers to acquire new knowledge; D6. We often visit other enterprises; D7. The company will explore opportunities to develop new products or services in other institutions.

The knowledge transfer ability of enterprises is measured by the following items: E1 Enterprises can effectively transfer the external innovative knowledge to internal enterprises; E2 enterprises can effectively process and summarize technical and market knowledge and transfer it to internal employees; E3 There is a mature communication mechanism between different departments of the enterprise; E4 The internal communication of the enterprise is timely and frequent.

Knowledge utilization ability is measured by the following indicators: F1 Employees can quickly use knowledge to meet the competitive demand; F2 Information sharing within enterprises can stimulate new insights and creativity; F3 Enterprises use newly acquired knowledge to solve problems through standardized processes and mechanisms; F4 Company has a clear responsibility and division of labor in the implementation of various production and operation activities, with a high level of cooperation; F5 The compensation of a company's research and development staff is related to the degree of their contribution to innovation.

Based on the above analysis, the mature scale of relevant scholars is used for measurement in this study, as shown in Table 3.2.

Table 3.2 Measurement of knowledge integration ability

Dimension	Items	References
Knowledge Acquisition Ability	D1. We often carry out market research activities; D2. The company has specialized personnel and systems for acquiring external knowledge; D3. We collect industry information through informal channels (such as lunch and small talk); D3. We collect industry information through informal channels (such as lunch and small talk);D5. The company regularly organizes special meetings with customers or suppliers to acquire new knowledge; D6. We often visit other enterprises;D7. The company will explore opportunities to develop new products or services in other institutions.	Zhou Jian qi (2008),Dahiya t (2015),Mehta a (2016),Wu tong(2018),Li u Ze shuang&Du Ruoxuan(2018),Xie Hong ming (2007),Liu Lu and Yang Hui xin (2008),Cai You hua et al. (2013).
Knowledge transfer capability	E1 Enterprises can effectively transfer the external innovative knowledge to internal enterprises;E2 enterprises can effectively process and summarize technical and market knowledge and transfer it to internal employees;E3 There is a mature communication mechanism between different departments of the enterprise;E4 The internal communication of the enterprise is timely and frequent.	
Knowledge utilization ability	F1 Employees can quickly use knowledge to meet the competitive demand;F2 Information sharing within enterprises can stimulate new insights and creativity;F3 Enterprises use newly acquired knowledge to solve problems through standardized processes and mechanisms;F4 Company has a clear responsibility and division of labor in the implementation of various production and operation activities, with a high level of cooperation; F5The compensation of a company's research and development staff is related to the degree of their contribution to innovation.	

3.3.3 Dependent Variable: Enterprise Performance Measurement

In the aspect of enterprise performance measurement, this paper hopes to explore the relationship between corporate social capital and enterprise performance. Therefore, the measurement of enterprise performance is evaluated from two aspects: innovation performance and financial performance. In the existing empirical research, most scholars only consider the impact of social capital on innovation performance, and rarely discuss both financial and innovation performance. Enterprise performance measurement items are as follows: Q1 The company's profit is higher than that of its main competitors;Q2 Compared with the main competitors, the company's sales grew rapidly;Q3 Company's ROE is higher than that of its main competitors; Q4 The company has a high market share compared with its main competitors;Q5 Companies have a high return on investment relative to their competitors;H1 The company develops more new products than its main competitors;H2 The profit growth rate of the company's new

products is faster than that of its competitors;H3 The company's market share of new products has increased rapidly compared with it' s major competitors;H4 Compared with the main competitors, the company has a faster reaction to the use of new information.

Based on the above analysis, the mature scale of relevant scholars is used for measurement in this study, as shown in Table 3.3.

Table 3.3 Measurement of enterprise performance

Dimension	Items	References
Financial performance	Q1 The company's profit is higher than that of its main competitors; Q2 Compared with the main competitors, the company's sales grew rapidly; Q3 Company's ROE is higher than that of its main competitors; Q4 The company has a high market share compared with its main competitors;Q5 Companies have a high return on investment relative to their competitors;	Guo Run ping (2015),Yang Kun (2011),Chen Jing (2010), Wei Ying (2005).
Innovation performance	H1 The company develops more new products than its main competitors; H2 The profit growth rate of the company's new products is faster than that of its competitors;H3 The company's market share of new products has increased rapidly compared with it' s major competitors;H4 Compared with the main competitors, the company has a faster reaction to the use of new information.	

3.3.4 Moderating Variable: Well-performing/Poorly-Performaning

In order to test whether the performance of the enterprise itself changes the relationship between corporate social capital and enterprise performance, the research samples are grouped according to the median of the average score of the measurement data of the enterprise performance items in the questionnaire. The 150 enterprises above the median are considered to have good performance, named good-performing. The 150 companies below the median are considered to have poor performance, named poor-performing. Good-performing and poor-performing are added to the model as a moderating variable to analyze the influence difference between the two groups, and finally verify whether the moderating effect exists.

3.4 Reliability and Validity

Most of the tools and scales used in this study were adapted from previous studies, but when using multi-item scales, it is important to verify the internal reliability

of the measurements. The evaluation of questionnaires and scales includes two aspects: reliability and validity.

Reliability refers to the reliability of the measurement results of the scale. The higher the repeatability and reliability of the scale, the less affected by the environment such as time and place, and the more stable the test results are. Validity refers to the accuracy of the scale, which refers to whether the scale can truly detect the target to be measured. There are many methods for estimating reliability, among which the alpha coefficient is the most used method, usually used together with EFA. This study will calculate the evaluation reliability of Cronbach's Alpha value for the questionnaire items corresponding to each variable. When the alpha coefficient of the latent variable is above 0.6, it is generally considered that the internal consistency reliability is insufficient; When it reaches 0.7~0.8, it indicates that the scale has considerable reliability, and when it reaches 0.8~0.9, it indicates that the scale has very good reliability. The coefficient is between 0-1. The closer the value is to 1, the higher the reliability of the scale.

Validity refers to the degree to which a measurement tool or means can accurately measure the transaction that needs to be measured. Validity tests include content validity and construct validity. Among them, content validity reflects the appropriateness and consistency of the items of the scale, that is, the measurement content, while construct validity refers to the degree to which the scale can measure the concepts or characteristics of the theory. The scale used in this study is based on domestic and foreign theoretical research and empirical scales. Therefore, the questionnaire used in this paper has high content validity.

The commonly used method in construct validity test is factor analysis, but before factor analysis, it is necessary to test whether the data is suitable for this method to test the validity. KMO and Bartlett's spherical test are used to judge whether the data can be used for an important indicator of factor analysis. Generally speaking, KMO is above 0.9 means that the data is very suitable for factor analysis, 0.8-0.9, very suitable; 0.7-0.8, suitable; 0.6-0.7, not very suitable; 0.5-0.6, very reluctant; less than 0.5, indicating that the data not suitable for factor analysis. Therefore, if the KMO is above 0.7, and the Bartlett's spherical test has a significant $p < 0.05$, it indicates that the data can be subjected to factor analysis.

Factor analysis includes exploratory factor analysis (Exploratory Factor Analysis, EFA) and confirmatory factor analysis (Confirmatory Factor Analysis, CFA) analysis. Among them, the role of Exploratory Factor Analysis (EFA) is to reveal the internal structure of variables according to the number of factors that affect the observed variables and the degree of correlation between each factor and each observed variable. Confirmatory factor analysis (CFA) is used to test whether the relationship between a factor and the corresponding measurement item conforms to the theoretical relationship designed by the researcher. According to the criterion of factor analysis, it is acceptable that the factor loading of each item of the measurement variable in exploratory factor analysis is greater than 0.5, while the factor loading of each item of the measurement variable in confirmatory factor analysis should generally be greater than 0.7. In this paper, confirmatory factor analysis will be carried out for each research variable involved.

Through reliability and validity analysis, it can be ensured that the measurement of each latent variable is credible and effective. In the confirmatory factor analysis, the validity of the measurement model is judged by analyzing the fit of the model. The model fitting evaluation indicators used in this study are roughly as follows:

Chi-square value, it is generally believed that when the significance level of the chi-square value is higher than 0.05, it is considered that there is a good degree of fit between the assumed model and the observed data, and the model is acceptable. However, the chi-square value is very sensitive to the sample size. When the sample is larger, the chi-square value is more likely to be significant, resulting in the rejection of the theoretical model. Therefore, the chi-square degree of freedom ratio can be used to compare the fit between the models. The smaller the chi-square degree of freedom ratio, the higher the model fit, and the worse the model fit. Generally speaking, when the chi-square degree of freedom ratio is less than 2, it means that the model has an ideal degree of fit (Carmines and Mclver, 1981), and usually more rigorous research recommends that it be no more than 3 as the standard. However, some scholars believe that when Chi-square/df is between 2.0 and 5.0, the model can also be accepted. This study uses no more than 5.0 as a criterion, within which the model is considered acceptable.

The comparative fit index (CFI) reflects the degree of fit of a hypothetical model compared to an independent model without any covariation relationship, regardless of

sample size. Generally, the value of CFI exceeds 0.90 to indicate that the model is well fitted.

The Goodness of Fit Index (GFI) is similar to the explainable variance R^2 in regression analysis, which represents the ratio of variance to covariance of the observed data that the hypothetical model can explain; the Adjusted Goodness of Fit Index (AGFI) is similar to the adjusted fit index in regression analysis. The purpose of explaining the variation is to use the ratio of degrees of freedom to the number of variables to adjust the GFI; generally, the GFI and AGFI values must exceed 0.95 to indicate a good model fit.

The root mean square error of approximation (RMSEA) is an absolute fit index that is not affected by the size of the sample and the complexity of the model. The smaller the value, the better the model fit. Generally speaking, if the RMSEA is lower than 0.06, it indicates that the model fits the data well, and the theoretical model is acceptable; if it is between 0.06 and 0.08, it can be considered that the fitting is good; If it is greater than 0.10, the model fitting effect is unacceptable.

3.5 Statistics and Data Analysis Methods

Based on the conceptual model of the relationship between corporate social capital, knowledge integration capability and enterprise performance variables, the hypothesis of the relationship between corporate social capital, knowledge integration capability and enterprise performance is proposed, and empirical analysis and model testing are conducted. The questionnaire is a scale designed with three variables, and the answers to the items are set on a five-level Likert scale, ranging from "1" to "5", that is, "strongly disagree" to "strongly agree". This research adopts the empirical research design of designing questionnaires to collect data for quantitative analysis. For the recovered questionnaire data, descriptive statistics, reliability and validity testing, correlation analysis and structural equation model testing will be carried out. The analysis software used in this study is SPSS21 and MPLUS8 analysis.

(1) Descriptive statistical analysis

Descriptive statistics mainly conduct statistical analysis on the basic data of the sample, including the size of the enterprise, the industry it belongs to, and the information of the respondents.

(2) Correlation analysis

This study uses Pearson correlation analysis to study the correlation coefficients between various dimensions of corporate social capital and variables such as enterprise performance and knowledge integration ability. It examines whether there is a significant correlation between each research variable and serves as the basis for analyzing the interaction between variables in the next step.

(3) Structural equation model

Based on the results of correlation analysis, structural equation model is used to further test the research model and hypothesis, explore the relationship between the three variables, and verify the hypothesis.

Brief Description of Structural Equation Modeling

Structural equation analysis, also often referred to as structural equation modeling (SEM), is a statistical method to analyze the relationship between variables based on the covariance matrix of variables, so it is also called structural analysis of covariance. In short, the structural equation model is a mathematical model with a wide range of coverage (Hou Jietai, Wen Zhonglin, Cheng Zijuan, 2004) , it can take some problems that cannot be directly observed but need to be studied and discussed as latent variables, and reflect these latent variables through some directly observable variables (indicators), thereby establishing the relationship between latent variables, that is, structure. At the same time, structural equation modeling is a confirmatory analysis method, which starts from a hypothetical theoretical framework and collects data to verify whether this theoretical hypothesis is true (Yi Danhui, 2008).

3.6 Pre Test

In order to improve the reliability and validity of the questionnaire and reduce the possibility of errors in large-scale sample surveys, this study analyzed the items of the questionnaire through small sample surveys and tests before large-scale distribution and data collection. The reliability analysis tool in SPSS software was used to obtain the internal consistency of the scale.

3.6.1 Description of Small Sample Data

In order to improve the effectiveness of the questionnaire, this small sample test was conducted by distributing the questionnaire to friends who held management positions in different enterprises. A total of 40 questionnaires were distributed and all 40 were returned.

3.6.2 Testing of Samples

The reliability and validity testing methods have been introduced in Chapter 3, and reliability and validity are two important indicators for testing the quality of the scale. According to the criteria for questionnaire screening in Osterlind's (1989) and Gao Haixia's (2004) research, Cronbach α should be greater than 0.7, and the relevant factor load should be greater than 0.5. Strictly compare the analysis results of the initial questionnaire with the above standards, proofread and correct the measurement scales corresponding to the variables involved in this study based on the results, achieve the purification of the scales, and then develop a formal survey questionnaire.

3.6.2.1 Reliability Analysis of the Corporate Social Capital Scale

The reliability analysis results of the initial scale of enterprise social capital are shown in Table 3.4. It can be seen from the table that the Cronbach α coefficient of structural dimension is 0.822, the Cronbach α coefficient of relational dimension is 0.851, and the Cronbach α coefficient of cognitive dimension is 0.930, both greater than 0.8. It indicates that the scale of corporate social capital variables has high reliability, which meets the requirements of this study.

Table 3.4 Reliability analysis results of the corporate social capital scale

Variable	Cronbach α
Structural dimension	0.822
Relationship dimension	0.851
Cognitive dimension	0.930

3.6.2.2 Reliability analysis of the knowledge integration ability scale

The reliability analysis results of the initial scale of knowledge integration ability are shown in Table 3.5. It can be seen from the table that the Cronbach α

coefficient of knowledge acquisition ability is 0.801, the Cronbach α coefficient of knowledge transfer ability is 0.829, and the Cronbach α coefficient of knowledge utilization ability is 0.706, all of which are greater than 0.7. It shows that the scale of knowledge integration ability variable has high reliability and meets the requirements of this study.

Table 3.5 Reliability analysis results of the knowledge integration ability scale

Variable	Cronbach α
Knowledge acquisition ability	0.801
Knowledge transfer ability	0.829
Knowledge utilization ability	0.706

3.6.2.3 Reliability Analysis of Enterprise Performance Scale

The reliability analysis results of the initial scale of enterprise performance are shown in Table 3.6. It can be seen from the table that the Cronbach α coefficient of financial performance is 0.726, the Cronbach α coefficient of innovation performance is 0.756, both of them are greater than 0.7, indicating that the scale of enterprise performance variables has high reliability and meets the requirements of this study.

Table 3.6 Reliability analysis results of the enterprise performance scale

Variable	Cronbach α
Financial performance	0.726
Innovation performance	0.756

3.6.3 Determination of Questionnaire

Through pre-investigation and small sample test, according to the results of small sample test, the measurement items involved in the initial questionnaire were purified, and the final measurement items were determined. On this basis, a formal questionnaire was formed. As shown in Appendix A.

CHAPTER 4

RESEARCH RESULT

This chapter mainly consists of three parts. The first part is the data collection and processing of large sample surveys; The second part is to test the hypotheses proposed previously; The third part is a qualitative analysis using semi structured interviews to verify the results of structural equation model analysis.

4.1 Descriptive Statistical Analysis of Samples

The real validity of data is the premise and foundation of mathematical statistics research. According to the design requirements of sample and data collection in Chapter 3, data survey was carried out from February 2023 to March 2023, lasting two months. In this survey, 320 questionnaires were sent to respondents in various provinces of China through the questionnaire Star mini program, and 315 questionnaires were recovered, with a recovery rate of 98%. Samples with a completion rate of less than 80% and questionnaires with an obvious tendency in item selection were removed as invalid questionnaires. After careful screening, 15 invalid questionnaires were removed, among which 300 were valid, with an effective rate of 95%.

Generally speaking, the number of samples adopted in the study should be more than 5 times that of the design variable, and the number of samples is more than 100 to help improve the credibility of the test results (REA and Parker, 1992). Therefore, the collected samples meet the requirements of empirical research and can be analyzed.

4.1.1 Description of Sample Characteristics of Technology-based SMEs

As a new force in the ranks of small and medium-sized enterprises, technology-based SMEs are a successful example of the integration of technology and economy. After more than 40 years of development, the total number of China's technology-based SMEs has steadily increased, the business scale has continuously expanded, the system structure has become reasonable, economic benefits have been significantly improved, and technological innovation capabilities are increasingly enhanced. They have become an important component of China's national economy and a new economic growth point. As a key channel for enterprises to obtain innovative resources, corporate social capital

is an important force and effective means to promote technological innovation in technology-based SMEs. The main research object of this study is technology-based SMEs, generally referred to as technology-based enterprises. These enterprises are mainly engaged in the development and application of products and new technologies in the fields of information, electronics, bioengineering, new materials, new energy, and other technological industries. The basic characteristic information statistics of specific survey sample enterprises are shown in Table 4.1.

Table 4.1 Sample feature description statistics

Statistical content	Classification	Number of samples	Proportion (%)
GENDER	Male	152	50.7
	Female	148	49.3
AGE	18-25	60	20.0
	26-35	189	63.0
	36-45	47	15.7
	46 and more	4	1.3
EMPLOYMENT PERIOD	1-5 years	117	40.3
	6-10years	121	39.0
	11-15years	47	15.7
	More than 15 years	15	5.0
POSITION OF RESPONDENT	Grassroots management	29	9.7
	Middle management	99	33.0
	Top management	122	40.7
	Other	50	16.7
ENTERPRISE SIZE	50 people or less	62	20.7
	51-100 people	54	18.0
	101-200 people	96	32.0
	201-500 people	88	29.3
EDUCATION LEVEL	High school or equivalent	11	3.7
	Bachelor's degree	256	85.3
	Master's degree	27	9.0
	Doctor's degree and above (Ph.D.)	6	2.0

According to the basic information statistics of the questionnaire in Table 4.1, we can see the basic characteristics of enterprises:

(1) 152 males and 148 females, with a relatively uniform gender distribution.

(2) The subjects are mainly aged between 26 and 35. Judging by the age of employment in China and the nature of the selected technological enterprises, it indicates that the interviewees have rich work experience, which can improve the effectiveness of the questionnaire.

(3) From the perspective of education level, the number of people with bachelor's degree, master's degree, and doctoral degree is 256, 27 and 6, accounting for 85.3%, 9%, and 2% of the total. The number of people with a bachelor's degree or above accounts for about 96% of the total, indicating that the questionnaire respondents can better understand the questionnaire test questions.

(4) According to the position distribution of the personnel filling in the questionnaire within the enterprise, there are 122 senior management personnel, accounting for about 40.7% of the total, 99 middle-level management personnel, accounting for about 33% of the total, and 29 grassroots management personnel, accounting for about 9.7% of the total. From the perspective of overall distribution, middle and senior managers account for 74% of the total respondents, mainly middle and senior managers. This conforms to the definition of the scope of the research object, and should be able to comprehensively and objectively reflect the performance of the enterprise.

(5) In terms of service life, there are 117 respondents who have worked in the enterprise for 1-5 years, accounting for approximately 39% of the total; There are 121 people who have worked in the enterprise for 6-10 years, accounting for about 40% of the total; There are 47 respondents who have worked in enterprises for 11-15 years, accounting for about 15.7% of the total. According to the overall distribution, the number of people who have worked in enterprises for 6-10 years is the largest, indicating that the questionnaire filling personnel are relatively familiar with the situation of the enterprise.

(6) From the perspective of enterprise scale, in order to make the research coverage more extensive and better representative, the questionnaire was designed to collect data from enterprises of different scales, and the results were consistent with the expected results. Among the 300 enterprises selected in this study, 62 enterprises have less than 50 employees, accounting for about 20.7%. The number of enterprises with 51 to 100 employees is 54, accounting for about 18%; The number of enterprises with 101-200 employees is 96, accounting for about 32%; The number of companies with 201 to 500 employees was 88, accounting for 29.3 percent. From the above analysis, it can be seen that the sample coverage of this study is relatively broad and has good representative.

4.1.2 Descriptive Statistics of Research Variables

Based on the sample data of the surveyed enterprises, this article conducts a basic descriptive statistical analysis of corporate social capital, knowledge integration ability, and enterprise performance variables involved in the questionnaire, and obtains statistical indicators such as the mean value of the above variables for the surveyed sample enterprises. See Table 4.2.

Table 4.2 Descriptive statistics of variables

Variables and measurement dimensions	Mean	SD
Corporate social capital	4.08	0.59
Structural dimension	4.09	0.66
Relational dimension	3.90	0.70
Cognitive dimension	4.17	0.65
Knowledge integration capability	4.01	0.61
Knowledge acquisition ability	3.88	0.68
Knowledge transfer ability	4.10	0.67
Knowledge utilization ability	4.10	0.63
Enterprise performance	3.83	0.71
Financial performance	3.83	0.74
Innovation performance	3.84	0.74

From Table 4.2, it can be seen that the average score of the dimensions of knowledge transfer and knowledge utilization is high, indicating that for knowledge integration ability, knowledge transfer ability (with an average of 4.10) and knowledge utilization ability (with an average of 4.10) are more important. External knowledge is better understood and transformed by enterprise members after digestion and absorption, and knowledge utilization ability is the key to whether the knowledge resources acquired by enterprises can be converted into enterprise performance. The low mean value of the relationship dimension in corporate social capital may be due to fewer assets created and utilized through trading relationships. There is no significant difference between the mean values of the two dimensions of enterprise performance, and the distribution is relatively uniform.

4.2 Quality Inspection of Large Sample Data

The quality testing of measurement models mainly involves testing the reliability and validity of various factors in the model. After analyzing the basic characteristics of the questionnaire data, this section uses SPSS 21 and Mplus8 data analysis software to evaluate the reliability and validity of the survey data to test the quality of the large sample data.

4.2.1 Data Reliability Test

The internal consistency reliability test of the collected survey data is conducted through the Cronbach α coefficient, and the specific measurement values are shown in Table 4.3. Relevant data analysis results show that the Cronbach α coefficient of corporate social capital, knowledge integration ability, and enterprise performance are all above 0.7, which indicates that the data obtained from the questionnaire conforms to the internal consistency standard and meets the requirements for further statistical testing of hypothesis relationships.

Table 4.3 Reliability analysis results of variable scales

Variables and dimensions		Measurement items	Cronbach α	N
Corporate social capital	Structural dimension	A1、A2、A3、A4	0.746	12
	Relationship dimension	B1、B2、B3	0.659	
	Cognitive dimension	C1、C2、C3、C4、C5	0.832	
Knowledge integration capability	Knowledge acquisition ability	D1、D2、D3、D4、D5、D6、D7	0.833	16
	Knowledge transfer ability	E1、E2、E3、E4	0.805	
	Knowledge utilization ability	F1、F2、F3、F4、F5	0.827	
Enterprise performance	Financial performance	Q1、Q2、Q3、Q4、Q5	0.861	9
	Innovation performance	H1、H2、H3、H4	0.825	

According to Cronbach α coefficient evaluation criteria, Cronbach α coefficient of 0.8-0.9 indicates excellent reliability, 0.7-0.8 indicates good reliability, 0.6-0.7 indicates acceptable reliability, and below 0.6 is generally considered insufficient internal consistency reliability.

There are a total of 12 measurement items for corporate social capital variables, which are divided into three dimensions. The reliability of the structural dimension scale is 0.746, the reliability of the relational dimension scale is 0.659, and the reliability of the

cognitive dimension scale is 0.832. In addition to the relatively low reliability of the relational dimension scale, which only reaches an acceptable level, the structural and cognitive reliability of the other two dimensions are good and excellent.

There are 16 measurement items in the knowledge integration ability variables, which are divided into three dimensions. The reliability of the knowledge acquisition ability scale is 0.833, the reliability of the knowledge transformation ability scale is 0.805, and the reliability of the knowledge utilization ability scale is 0.827. The reliability of the three dimensions has reached the excellent level.

There are 9 measurement items in the enterprise performance variables, which are divided into two dimensions. The reliability of the financial performance scale is 0.861, and the reliability of the innovation performance measurement scale is 0.825. The reliability of both dimensions reaches the excellent level.

In summary, the obtained large sample data meet the internal consistency criteria and meet the requirements for further statistical testing of hypothesis relationships.

4.2.2 Data Validity Test

According to the discussion in Chapter 3, according to the discriminant criteria of factor analysis, it is acceptable for the factor load of each item of the measured variable in exploratory factor analysis to be greater than 0.5, while in confirmatory factor analysis, the factor load of each item of the measured variable should generally be greater than 0.7. This study is mainly based on questionnaire data, using confirmatory factor analysis (CFA) to measure the construct validity of the variables involved through Mplus8. Through reliability and validity analysis, it can be ensured that the measurement of each latent variable is reliable and effective. In confirmatory factor analysis, the effectiveness of the measurement model is judged by analyzing the fit of the model.

Through the confirmatory factor analysis of the model, the factor loads and residuals of 37 items contained in each dimension of the three variables are obtained, and the results are shown in Table 4.4. The measurement results show that each dimension of the variable corresponds to the factor load of each item above 0.7, indicating that each latent variable corresponds to the item with a certain representativeness. The AVE of the three dimensions of corporate social capital, the three dimensions of knowledge

integration ability, and the two dimensions of corporate performance are all greater than 0.5, and the CR is greater than 0.7. Therefore, the validity of the variable measurement scale meets the requirements.

Table 4.4 Results of confirmatory factor analysis of variables

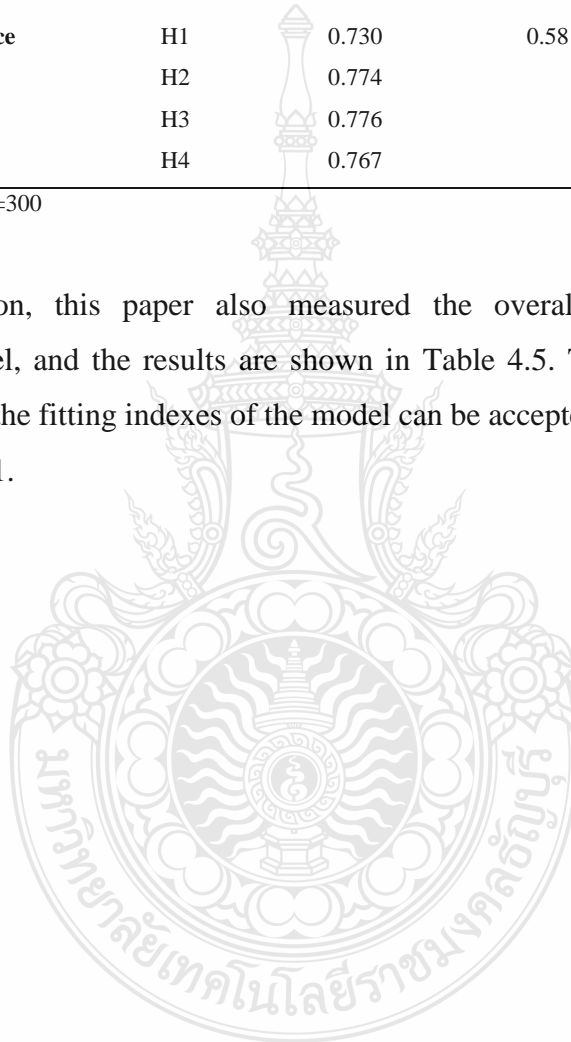
Variable	Item	Factor loading	AVE	CR
Structural dimension	A1	0.817	0.702	0.904
	A2	0.836		
	A3	0.848		
	A4	0.850		
Relationship dimension	B1	0.883	0.699	0.874
	B2	0.813		
	B3	0.810		
Cognitive dimension	C1	0.798	0.643	0.900
	C2	0.836		
	C3	0.785		
	C4	0.783		
	C5	0.805		
Knowledge acquisition ability	D1	0.781	0.606	0.915
	D2	0.798		
	D3	0.757		
	D4	0.766		
	D5	0.802		
	D6	0.767		
	D7	0.779		
Knowledge transfer ability	E1	0.770	0.656	0.884
	E2	0.826		
	E3	0.843		
	E4	0.799		
Knowledge utilization ability	F1	0.725	0.594	0.879
	F2	0.765		
	F3	0.798		
	F4	0.839		
	F5	0.719		

Table 4.4 Results of confirmatory factor analysis of variables (Cont.)

Variable	Item	Factor loading	AVE	CR
Financial performance	Q1	0.745	0.605	0.884
	Q2	0.822		
	Q3	0.798		
	Q4	0.743		
	Q5	0.777		
Innovation performance	H1	0.730	0.581	0.847
	H2	0.774		
	H3	0.776		
	H4	0.767		

Summary of this study,N=300

In addition, this paper also measured the overall fitting index of the measurement model, and the results are shown in Table 4.5. The results of statistical analysis show that the fitting indexes of the model can be accepted. The analysis model is shown in Figure 4.1.



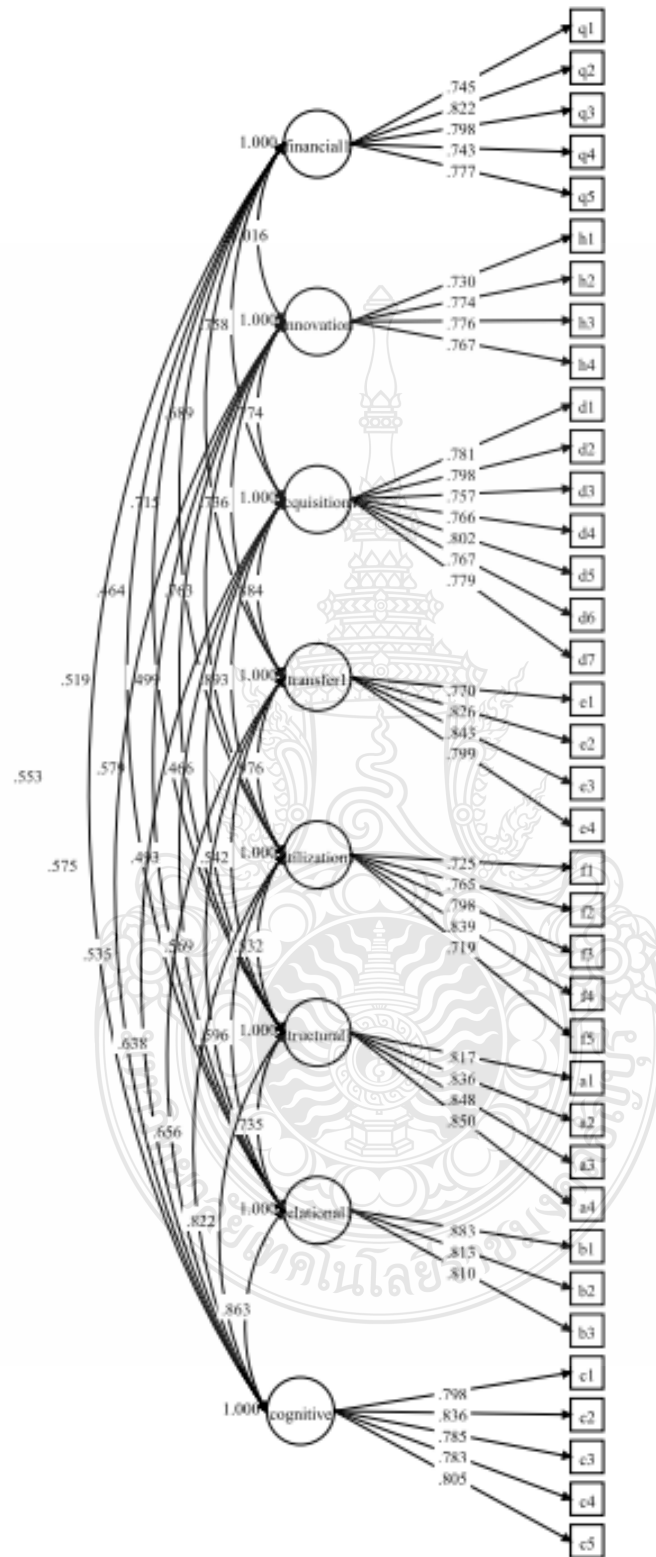


Figure 4.1 Confirmatory Factor Analysis model

As can be seen from Table 4.5, the results show that the model fitting indicators are: $\chi^2/df = 2.236$, CFI = 0.914, TLI = 0.905, RMSEA = 0.064, SRMR = 0.040. Among them, the ratio of Chi-square degrees of freedom is less than 3, indicating that the model has a good fit. The approximate error root mean square (RMSEA) is less than 0.1, which is within the acceptable range. Both CFI and TLI indexes are greater than 0.9, indicating that the model fits well. The SRMR error is less than 0.08, which is within the acceptable range. Therefore, the confirmatory factor analysis results of the model indicate that the questionnaire structure validity is good, and the model can be accepted.

Table 4.5 List of main fitting indexes of model confirmatory factor analysis

FIT INDEX	χ^2	df	χ^2/df	CFI	TLI	RMSEA	SRMR
Good fit			<3	>0.90	>0.90	<0.08	<0.05
Model	1343.772	601	2.236	0.914	0.905	0.064	0.040

Summary of this study, N=300

4.3 Correlation Test

Before using the structural equation model to test the research hypothesis, this article first conducts Pearson correlation analysis on the research variables in the model, and the results are shown in Table 4.6.

Table 4.6 Pearson correlation analysis results between variables

	corporate social capital	knowledge integration capabilities	enterprise performance
corporate social capital	1		
knowledge integration capability	.574**	1	
enterprise performance	.521**	.722**	1

Note: ** P < 0.01

From the above table, it can be seen that the correlation coefficient between corporate social capital and enterprise performance is 0.521 and P is less than 0.01, indicating a significant positive correlation between corporate social capital and

enterprise performance; The correlation coefficient between knowledge integration ability and enterprise performance is 0.722 and P is less than 0.01, indicating a significant positive correlation between knowledge integration ability and enterprise performance; The correlation coefficient between corporate social capital and knowledge integration ability is 0.574 and P is less than 0.01, indicating a significant positive correlation between corporate social capital and knowledge integration ability.

4.4 Structural Equation Model Analysis

This study explores the impact of corporate social capital on enterprise performance through structural equation modeling analysis, as well as the mediating role of knowledge integration ability between corporate social capital and enterprise performance. Obtain the overall model, Model 1 (with good performance of the enterprise itself), and Model 2 (with poor performance of the enterprise itself), as shown in Figures 4.2, 4.3, and 4.4 and obtain their fitting indicators. In addition, this study also obtained path coefficients between different variables in the structural equation model.

4.4.1 Analysis of Overall Structural Equation Model

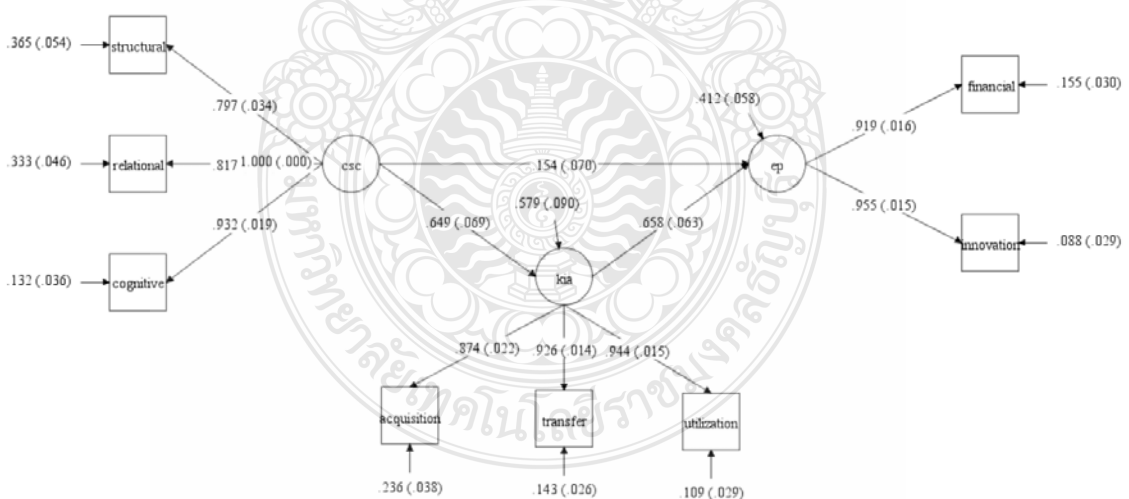


Figure 4.2 Overall structure equation model diagram (N=300)

The fitting indicators of the overall structural equation model are: $\chi^2/df=2.194$ less than 3, RMSEA=0.064 less than 0.08, CFI 0.990, TLI 0.984 all greater than 0.9,

SRMR 0.020 less than 0.05, indicating good fitting of the model. Simultaneously obtain the path coefficient table 4.7.

Table 4.7 Path coefficient table

Path	Estimate	SE	95% CL	significance
Corporate social capital → Knowledge integration capability	0.649	0.069	[0.509, 0.783]	Yes
Knowledge integration capability → Enterprise performance	0.658	0.063	[0.513, 0.765]	Yes
Corporate social capital → Enterprise performance	0.154	0.070	[0.014, 0.293]	Yes
Corporate social capital → Knowledge integration capability → Enterprise performance	0.427	0.058	[0.326, 0.557]	Yes

From the above table, it can be seen that the 95% confidence interval of the path from corporate social capital to knowledge integration capability does not include zero, indicating a significant positive impact of corporate social capital on knowledge integration capability ($\beta = 0.649$), therefore H2 has been supported; The 95% confidence interval of the path from knowledge integration capability to enterprise performance does not include zero, indicating that the path is significant, meaning that knowledge integration capability has a significant positive impact on enterprise performance ($\beta = 0.658$), therefore H3 is support; The 95% confidence interval of the path from corporate social capital to enterprise performance does not include zero, indicating that the path is significant, meaning that corporate social capital has a significant direct impact on enterprise performance ($\beta = 0.154$), therefore H1 is supported .

Since the direct effect of corporate social capital on enterprise performance is significant, and the indirect effect of corporate social capital → knowledge integration capability → enterprise performance is significant (95% confidence interval does not include zero), it indicates that this model is a partial intermediary model with significant indirect effect and the intermediary effect size is 0.427, so H4 is supported.

4.4.2 Model 1 Analysis

Based on the previous analysis of performance, the median of the average score of the measurement data of enterprise performance items in the survey questionnaire will be used to group. 150 companies above the median are considered to have good performance, while 150 companies below the median are considered to have poor

performance. In Model 1, data description analysis will be conducted on the companies with good performance, as shown in Table 4.8.

Table 4.8 Sample feature description statistics (model 1)

Statistical content	Classification	Number of samples	Proportion (%)
GENDER	Male	72	48
	Female	78	52
AGE	18-25	34	22.7
	26-35	94	62.7
	36-45	22	14.7
	46 and more	0	0
EMPLOYMENT PERIOD	1-5 years	58	38.7
	6-10years	56	37.3
	11-15years	28	18.7
	More than 15 years	8	5.3
POSITION OF RESPONDENT	Grassroots management	17	11.3
	Middle management	52	34.7
	Top management	57	38
	Other	24	16
ENTERPRISE SIZE	50 people or less	26	17.3
	51-100 people	30	20
	101-200 people	41	27.3
	201-500 people	53	35.3
EDUCATION LEVEL	High school or equivalent	4	2.7
	Bachelor's degree	134	89.3
	Master's degree	11	7.3
	Doctor's degree and above (Ph.D.)	1	0.7

The fitting indicators of model1 with good performance of the corporate itself are: $\chi^2/df=1.750$ less than 3, RMSEA=0.076 less than 0.08, CFI=0.982, TLI=0.970 all greater than 0.9, SRMR=0.031 less than 0.05, indicating a good fit of the model. At the same time obtain the path coefficient table 4.9.

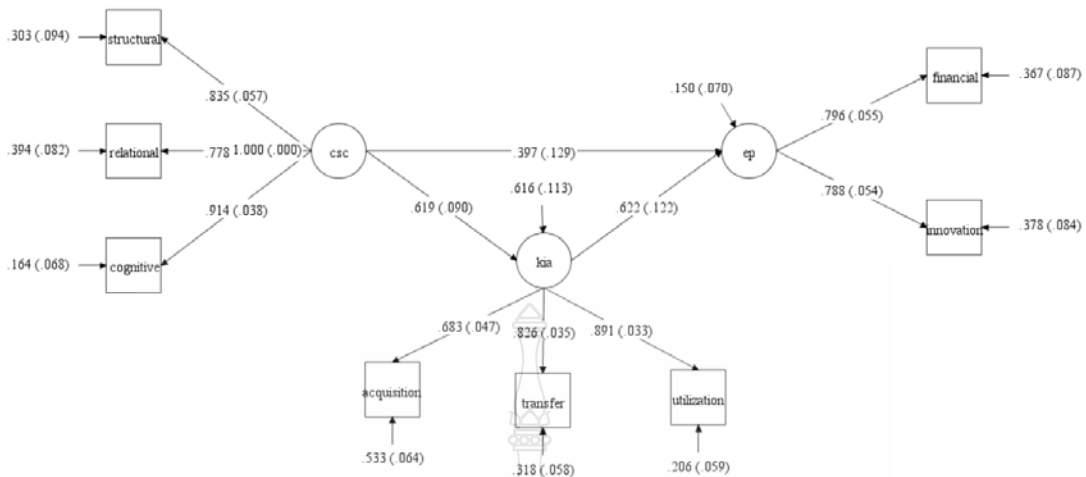


Figure 4.3 Model 1 (N=150)

Table 4.9 Path coefficient table

Path	Estimate	SE	95% CL	significance
Corporate social capital → Knowledge integration capability	0.619	0.090	[0.424, 0.778]	Yes
Knowledge integration capability → Enterprise performance	0.622	0.122	[0.415, 0.898]	Yes
Corporate social capital → Enterprise performance	0.397	0.129	[0.098, 0.618]	Yes
Corporate social capital → Knowledge integration capability → Enterprise performance	0.385	0.111	[0.220, 0.665]	Yes

From the above table, it can be seen that in Model 1, the 95% confidence interval of the path from corporate social capital to knowledge integration capability does not include zero, indicating that the path is significant, meaning that corporate social capital has a significant positive impact on knowledge integration capability ($\beta = 0.619$); The 95% confidence interval of the path from knowledge integration capability to enterprise performance does not include zero, indicating that the path is significant, meaning that knowledge integration capability has a significant positive impact on enterprise performance ($\beta = 0.622$); The 95% confidence interval of the path from corporate social capital to enterprise performance does not include zero, indicating that the path is significant, meaning that corporate social capital has a significant direct impact on corporate performance ($\beta = 0.397$).

The direct effect of corporate social capital on enterprise performance is significant, and the indirect effect of corporate social capital → knowledge integration ability → enterprise performance is significant (95% confidence interval does not include zero), it shows that the model is a partial mediation model, and the indirect effect is significant, the mediation effect size is 0.385.

4.4.3 Model 2 Analysis

In Model 2, data description analysis will be conducted on the corporate with poor performance, as shown in Table 4.10.

Table 4.10 Sample feature description statistics (model 2)

Statistical content	Classification	Number of samples	Proportion (%)
GENDER	Male	80	53.3
	Female	70	46.7
AGE	18-25	26	17.3
	26-35	95	63.3
	36-45	25	16.7
	46 and more	4	2.7
EMPLOYMENT PERIOD	1-5 years	63	42
	6-10years	19	12.7
	11-15years	19	12.7
	More than 15 years	7	4.7
POSITION OF RESPONDENT	Grassroots management	12	8
	Middle management	47	31.3
	Top management	65	43.3
	Other	26	17.3
ENTERPRISE SIZE	50 people or less	36	24
	51-100 people	24	16
	101-200 people	55	36.7
	201-500 people	35	23.3
EDUCATION LEVEL	High school or equivalent	7	4.7
	Bachelor' s degree	122	81.3
	Master' s degree	16	10.7
	Doctor's degree and above (Ph.D.)	5	3.3

The fitting indicators of Model 2 are: $\chi^2/df=1.801$ less than 3, RMSEA=0.073 less than 0.08, CFI=0.983, TLI=0.972 all greater than 0.9, SRMR=0.035 less than 0.08, indicating a good fit of the model. Simultaneously obtain the path coefficient table 4.11.

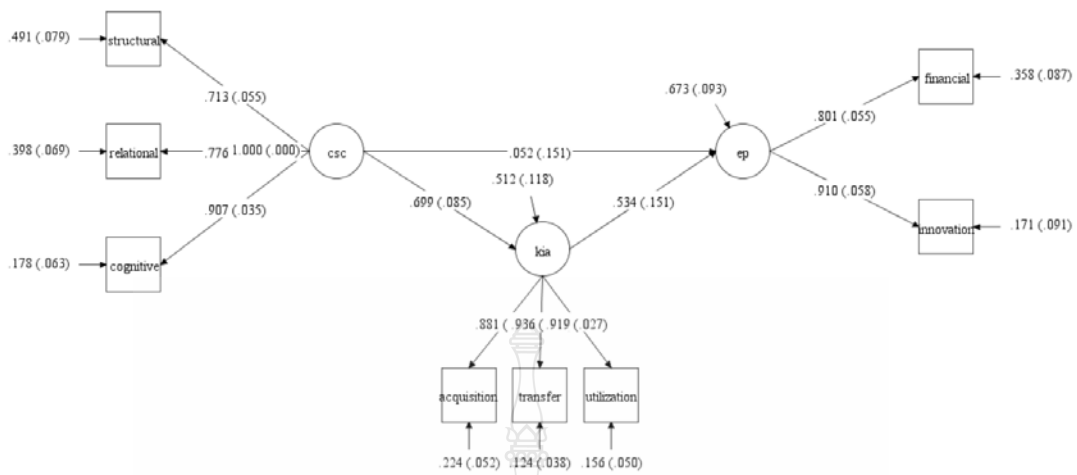


Figure 4.4 Model 2 (N=150)

Table 4.11 Path coefficient table

Path	Estimate	SE	95% CL	significance
Corporate social capital → Knowledge integration capability	0.517	0.113	[0.293, 0.727]	Yes
Knowledge integration capability → Enterprise performance	0.634	0.102	[0.435, 0.834]	Yes
Corporate social capital → Enterprise performance	-0.121	0.055	[-0.354, 0.093]	No
Corporate social capital → Knowledge integration capability → Enterprise performance	0.328	0.103	[0.177, 0.580]	Yes

From the above table, it can be seen that in Model 2, the 95% confidence interval of the path from corporate social capital to knowledge integration capability does not include zero, indicating that the path is significant, meaning that corporate social capital has a significant positive impact on knowledge integration capability ($\beta = 0.517$); The 95% confidence interval of the path from knowledge integration capability to enterprise performance does not include zero, indicating that the path is significant, meaning that knowledge integration capability has a significant positive impact on enterprise performance ($\beta = 0.634$); However, the 95% confidence interval of the path from corporate social capital to enterprise performance includes zero, indicating that the path

is not significant, meaning that corporate social capital has no significant direct impact on enterprise performance ($\beta = -0.121$).

Because the direct effect from corporate social capital on enterprise performance is not significant, but the indirect effect of corporate social capital \rightarrow knowledge integration ability \rightarrow enterprise performance is significant (95% confidence interval does not include zero), indicating that this model is a fully mediating model with significant indirect effect and an intermediary effect size of 0.328.

4.4.4 Analysis of the Moderating Effect of Enterprise Performance

According to the analysis of model 1, when the performance of the corporate itself is good, corporate social capital has a direct impact on enterprise performance, and can also have an indirect impact through knowledge integration ability. The indirect effect size is 0.385, and the total effect size is 0.782. According to the analysis of Model 2, when the performance of the corporate itself is poor, corporate social capital has no direct and significant impact on enterprise performance, but only indirectly through the intermediary role of knowledge integration ability. The intermediary effect size is 0.328, indicating that the performance of the corporate itself will make a difference in the impact of the corporate social capital on enterprise performance.

Through the analysis of Model 1 and Model 2, we learned that the impact of corporate social capital on knowledge integration capabilities is significant ($\beta = 0.766$, $\beta = 0.761$), whether the performance of the corporate itself is good or bad. Therefore, the performance of the corporate itself will not make a difference in the impact of corporate social capital on knowledge integration ability.

Through the analysis of model 1 and Model 2, it is found that the impact of knowledge integration ability on enterprise performance is significant ($\beta = 0.407$, $\beta = 0.403$), whether the enterprise performance is good or bad. Therefore, the performance of the corporate itself will not make a difference in the impact of corporate social capital on knowledge integration ability.

In Model 1, when the performance of the corporate is good, the knowledge integration ability plays a partial mediating role; When the performance of the corporate in Model 2 is poor, the knowledge integration ability plays a completely mediating role.

However, further analysis is needed to statistically explain the differences between the two groups.

4.4.4.1 Independent Sample T-test between Two Group

This study aims to compare whether the performance of the enterprise itself affects the relationship between variables. Therefore, based on the research design, independent sample T-tests were conducted on the two groups with good and poor performance to analyze whether there is a statistically significant difference in scores between the two groups. The results are shown in Table 4.12.

Table 4.12 Independent-samples T-test

	Mean	SD	t-value
Performance-good	4.4009	0.368	
Performance-poor	3.2656	0.472	1.135***

Note:*** p<0.01

It can be seen through analysis, the mean of the group with good performance is greater than that of the group with poor performance. The mean of the good performance group is 4.4009 and SD is 0.368. The mean of the poor performance group is 3.2656 and SD is 0.472. $t=1.135^{***}$, $P=0.000<0.05$. It shows that there is a statistically significant difference between corporate with good performance and corporate with poor performance.

4.4.4.2 Multiple Groups Analysis

This study uses multiple group analysis to compare whether the impact of the path from corporate social capital to enterprise performance is different under different performance groups. This paper discusses whether the performance of the corporate itself plays a moderating role in the process of corporate social capital affect enterprise performance. The analysis results are shown in Table 4.13.

Table 4.13 Multiple group analysis results

Model	χ^2	df	$\Delta \chi^2$	Δ df	P
unrestricted model	73.236	44	-	-	
restricted model	85.636	45	12.400	1	<0.001

The fitting indexes of the unrestricted model are: χ^2/df is 1.664 less than 3, RMSEA is 0.067 less than 0.08, CFI is 0.981, TLI is 0.975 are all greater than 0.9, and SRMR is 0.066 less than 0.08, indicating a good fit of the model.

The fitting indexes of the restricted model are: χ^2/df is 1.903 less than 3, RMSEA is 0.078 less than 0.08, CFI is 0.973, TLI is 0.966 are all greater than 0.9, and SRMR is 0.079 less than 0.08, indicating a good fit of the model.

As can be seen from the above table, when the constraint effect of corporate social capital on enterprise performance between the two groups is equal, χ^2 is 85.636 and df is 45. Compared with the unrestricted model, $\Delta\chi^2$ is 12.400, reaching the significance level ($P < 0.001$), indicating that corporate performance (well-performing and poorly-performing) has a moderating effect. In other words, the performance of the corporate itself plays a moderating role in the relationship between corporate social capital and enterprise performance.

4.5 Results from Qualitative Research

In the previous quantitative analysis, we found that the impact of corporate social capital on enterprise performance is different when the corporate performance is good or poor, while the mediating role of knowledge integration ability is not different. Therefore, in order to further verify the result, qualitative research method is adopted in this section to verify the previous quantitative results.

In Chapter 3, it has been introduced that in this study, the researchers selected the research method of in-depth interviews in the qualitative orientation, and used the "purposive sampling" method to select suitable research subjects. Representative 10 companies with good performance and 10 companies with poor performance were selected from the surveyed enterprises for telephone interviews, with the aim of screening

individuals with high information density and intensity for research. In the end, the researchers selected a total of 20 companies out of 300 as the research subjects. This study adopts a semi structured deep interview method to collect information. The researchers conducted in-depth interviews with each respondent over the phone, with a time limit of about one hour.

4.5.1 Interviewees

In order to thoroughly understand the relationship between the variables involved in this study, this study carefully selected the research objects and selected senior managers of 20 enterprises to conduct in-depth interviews. The interview outline should be sent before the formal interview, and the interviewees should be prepared to improve the effect and quality of the interview. Since the interviewees were scattered in various provinces in China, indirect interviews were conducted by telephone to complete one-to-one interviews. Each time, in-depth interviews were conducted with reference to the interview outline to understand the inner thoughts and true attitudes of the interviewees. The contents of each interview were recorded in the form of written records. Respondents were selected from Beijing, Shandong, Shanghai, Zhejiang, Jiangsu, Jiangxi, etc., and stratified sampling was adopted to ensure the breadth, representativeness and interpretability of the samples. The specific interview information is shown in Table 4.14.

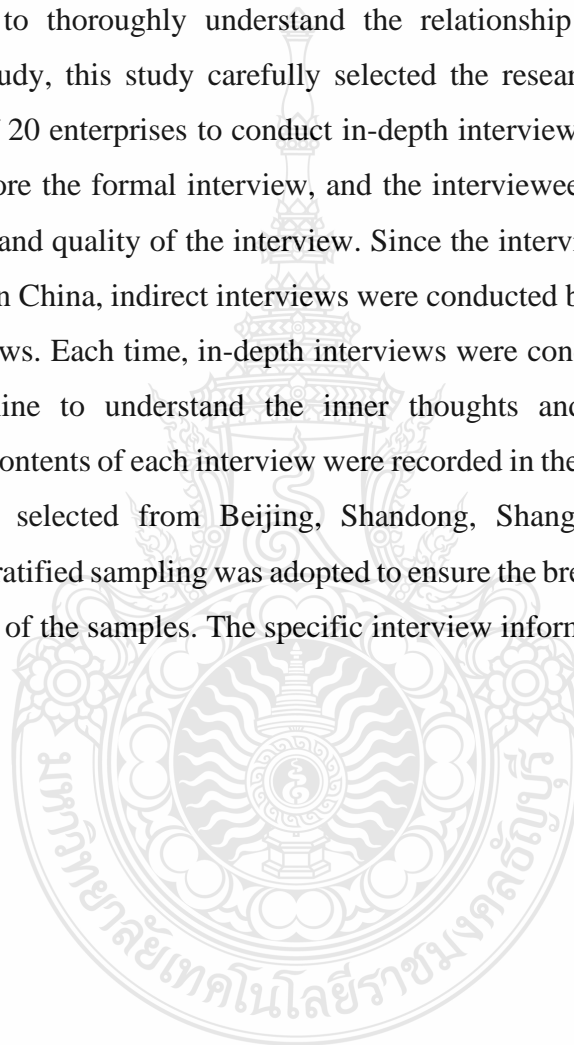


Table 4.14 Descriptive Analysis of Interviewees

Interviewee number	Province	Position	Scale	Enterprise Performance
1	Shan dong	Top management	50 people or less	Good
2	Jiang xi	Top management	101-200 people	Good
3	Zhe jiang	Top management	51-100 people	Good
4	Shan dong	Top management	201-500 people	Good
5	Bei jing	Top management	101-200 people	Good
6	Bei jing	Top management	50 people or less	Good
7	Jiang su	Top management	201-500 people	Good
8	Shan dong	Top management	101-200 people	Good
9	Shang hai	Top management	51-100 people	Good
10	Jiang su	Top management	201-500 people	Good
11	Zhe jiang	Top management	101-200 people	Poor
12	Shan dong	Top management	50 people or less	Poor
13	Bei jing	Top management	201-500 people	Poor
14	Shan dong	Top management	101-200 people	Poor
15	Jiang xi	Top management	51-100 people	Poor
16	Jiang xi	Top management	101-200 people	Poor
17	Shang hai	Top management	101-200 people	Poor
18	Zhe jiang	Top management	201-500 people	Poor
19	Zhe jiang	Top management	50 people or less	Poor
20	Jiang xi	Top management	51-100 people	Poor

4.5.2 Interview Data Collection and Analysis Methods

All 20 subjects participated in the interview voluntarily with full understanding of this study. The interview data collection method is mainly interview recording, supplemented by notes recorded during the interview. At the beginning of the interview, the opinions of the interviewees were sought to ensure that the recording was only used for this study. After obtaining the consent of the interviewees, the interview data was recorded by recording. During the interview, carefully record the answers, reactions and problems of the interviewees, and improve them with the recording after the end.

The analysis methods of interview data are category analysis and content analysis. Due to the fact that the interview outline of this study was designed based on previous literature analysis, the category analysis method was first used. According to the interview outline, all materials were divided into two major themes, and the interview materials were divided into blocks according to the major themes. Then, the content analysis method was used to interpret the content of each major theme word by word, line

by line, and to identify "useful" information units from the original interview materials for summarization and organization, Ultimately, the interview research results were formed.

4.5.3 Interview Results

Through semi-structured interviews with the 20 executives mentioned above, we fully grasped their views, opinions, and insights on the connotations and relationships of various variables such as corporate social capital, knowledge integration ability, and enterprise performance. We further clarified the relationship between research variables and validated the theoretical research model. The main results are as follows:

First, the relationship between corporate social capital and enterprise performance of technology-based SMEs has been clarified. 17 respondents stated that, like other types of capital, corporate social capital has become an important factor in improving enterprise performance. In today's economic environment, the driving factors for enterprise value creation are showing a diversified trend. The three aspects of corporate social capital can help establish connections between enterprises and external organizations, thereby continuously obtaining the material, business, and administrative resources required for enterprise development, and thus playing a positive role in promoting enterprise performance. Among these 17 respondents, 10 are representatives of managers with good performance within the company itself. Among the representatives of managers with poor performance in the enterprise itself, one interviewee stated that although innovation is crucial and indispensable for technology-based SMEs, the contribution of corporate social capital to technological innovation is not very significant. The key to the success of innovation lies in the guidance of relevant government policies and the cultivation of the enterprise's own technological capabilities. Another two respondents stated that the relationship between corporate social capital and enterprise performance is not significant, and companies mainly focus on areas that can directly improve enterprise performance.

In interviews where corporate social capital affects enterprise performance, respondents generally believe that there is a positive relationship between them.

For example, the second interviewee stated that their company often maintains contact with suppliers and important customers, including holiday condolences; He often

maintains contact with government departments or managers of other companies to stabilize the external relationships established by the company. Interviewee 15 stated that due to the international economic situation and the impact of the epidemic, the company's efficiency has decreased significantly compared to before. However, the company still focuses on internal communication and learning, as well as maintaining trust in other affiliated companies. From the overall interview results, companies with good performance themselves pay more attention to the impact of corporate social capital. The 10 managers with good performance in this interview unanimously believe that corporate social capital is an important channel for enterprises to obtain various information, knowledge, and resources required for innovation. By strengthening the breadth and depth of connections, enterprises can enhance internal and external trust, save transaction costs, and effectively promote the improvement of enterprise performance.

In companies with poor enterprise performance, some managers believe that the relationship between corporate social capital and enterprise performance is not significant because in practical practice, it depends on how company leaders make decisions. For example, in terms of innovation, the decision-making level of the company will consider the actual situation of enterprise performance. This year, the task target should be completed first, and the specific proportion of investment in innovative products should be combined with relevant government policy support. Therefore, in this case, the hidden advantages of corporate social capital are difficult to exert, and if there is an impact, there should also be other factors driving it.

Among the two respondents with good and poor performance, both consistently stated that the impact of corporate social capital on enterprise performance exists, either directly or indirectly, and discussed the factors that may have an impact. Therefore, the content of question 4 and question 1 was repeated, and this question was deleted in subsequent interviews.

Secondly, the mediating role of knowledge integration ability is clarified. In the interview on the mediating role of knowledge integration ability, 18 respondents said that the performance of technology-based SMEs would be affected by knowledge integration ability, among which 9 respondents with poor enterprise performance believed that knowledge integration ability mediated the relationship between corporate social capital

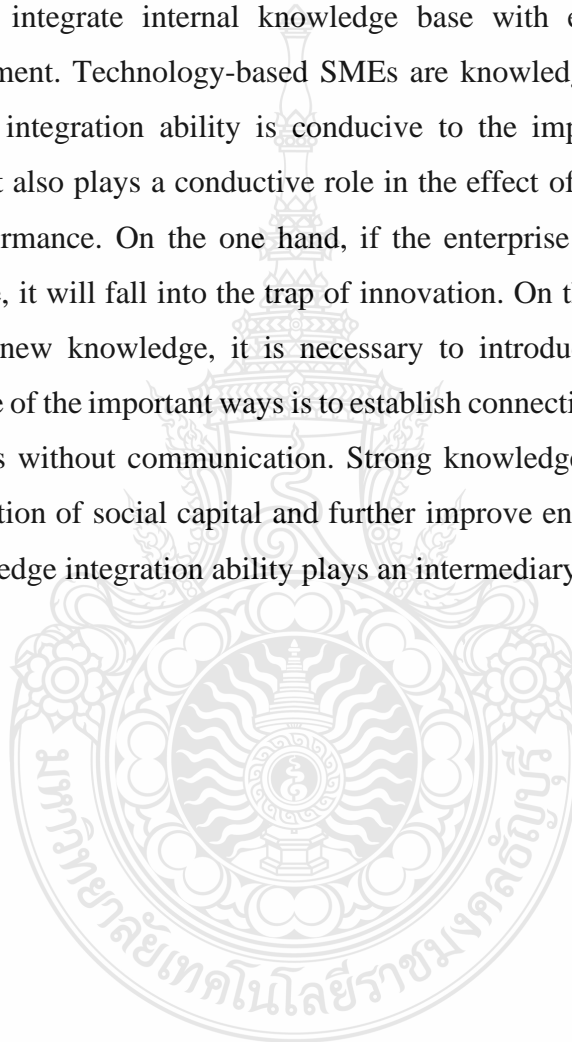
and enterprise performance. Another respondent said that knowledge integration ability does not play a mediating role in enterprise performance practices. Nine respondents with good enterprise performance indicated that knowledge integration ability played an intermediary effect on the relationship between the two. Another respondent said that corporate social capital is an effective way to accumulate knowledge integration capabilities, and knowledge integration capabilities will positively affect enterprise performance, but whether knowledge integration capabilities will play an intermediary role in the process of corporate social capital's impact on enterprise performance is not very clear, and it is difficult to explain the logical relationship between them. As to whether the mediating role of knowledge integration ability will be different due to the performance of enterprises, the investigation team all said that it should not be affected.

The interview results on the mediating role of knowledge integration ability are explained as follows:

Respondents 2, 10, 15, 17, and 20 clearly stated that knowledge integration ability plays a mediating role between the two. For example, Interviewee 2 stated that the company will often send people out for communication and learning, and will conduct frequent seminar activities to continuously expand the connection between the company and external organizations through external communication and learning, in order to better obtain various resources required for the development of the enterprise. Through effective knowledge integration of fragmented, dispersed and separated cross-departmental knowledge, enterprises can promote the interaction, sharing, transmission and transfer of knowledge between and within organizations, and improve the internalization effect of external knowledge, so as to improve enterprise performance; Interviewee 10 stated that companies are more capable of sending employees out to learn, thereby expanding their network resources, establishing strong connections and partnerships, and fully accessing various resources to improve enterprise performance; Interviewee 15 stated that the trust relationship between enterprises will help them continuously acquire relevant knowledge from external sources, and then the company's R&D department will hold seminars to transform and utilize the knowledge in the development of new products; Interviewee 20 stated that companies mainly innovate product development through learning and utilizing knowledge during economic

downturn, rather than developing new products themselves, in order to improve enterprise performance.

The test results of the intermediary effect show that knowledge is a static resource, which itself does not mean ability or advantage. Enterprises need to integrate and manage knowledge and information from different sources, so that the knowledge after operation can play an advantage in the fierce market competition. Therefore, it is very important to integrate internal knowledge base with external knowledge for enterprise development. Technology-based SMEs are knowledge-intensive enterprises. Strong knowledge integration ability is conducive to the improvement of enterprise performance, and it also plays a conducive role in the effect of corporate social capital on enterprise performance. On the one hand, if the enterprise relies too much on the existing knowledge, it will fall into the trap of innovation. On the other hand, to realize the integration of new knowledge, it is necessary to introduce more "intermediary" knowledge, and one of the important ways is to establish connections between the original knowledge subjects without communication. Strong knowledge integration ability can promote the utilization of social capital and further improve enterprise performance. In this process, knowledge integration ability plays an intermediary role.



CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

Based on the basis of learning relevant theories such as corporate social capital and knowledge integration ability, consulting a large number of relevant literature and making a systematic analysis, the theoretical model of "corporate social capital -- knowledge integration ability -- enterprise performance" was proposed to explore the relationship between variables and investigate the mediating role of knowledge integration ability, along with the moderating effect of enterprise performance: well-performing enterprise and poorly-performing enterprise. This chapter will summarize the previous research content, elaborate the main conclusions, theoretical and practical contributions, the limitations and shortcomings of this study, and indicate the direction for further study.

5.1 Conclusion

This dissertation aimed to investigate: (1) the mediating role of knowledge integration ability on the relationship between corporate social capital and enterprise performance, and (2) the moderating effect of enterprise performance itself, namely well-performing enterprise and poorly-performing enterprise, on the impact of corporate social capital on enterprise performance.

5.1.1 Research Question and Hypotheses

This dissertation aimed to answer the research questions as follows.

1. How does corporate social capital affect enterprise performance?
 - 1.1 To what extent corporate social capital affect enterprise performance.
 - 1.2 To what extent corporate social capital affect knowledge integration ability.
 - 1.3 To what extent knowledge integration ability affect enterprise performance.
 - 1.4 To what extent knowledge integration ability mediating the effect of corporate social capital on enterprise performance.

2. Would the difference of enterprise performance change the impact of corporate social capital on enterprise performance?

According to the above research questions and objectives, the five hypotheses were proposed as follows.

H1: Corporate social capital has a positive effect on enterprise performance.

H2: Corporate social capital has a positive effect on knowledge integration ability.

H3: Knowledge integration ability has a positive effect on enterprise performance.

H4: Knowledge integration ability has a mediating role between corporate social capital and enterprise performance.

H5: The impact of corporate social capital on enterprise performance, the performance of enterprise itself has a moderating effect.

5.1.2 Research Methodology

Since the technology-based small and medium-sized enterprises (technology-based SMEs) play an important role on the current rapid economic development, especially in China. Hence, the samples used in this study comprised 300 technology-based SMEs in China. The instrument used to collect data was a questionnaire that passed assessment in terms of content validity and reliability. Structural equation model was used to analyze the relationship between the variables and the mediating role of knowledge integration ability. Multi-group analysis was used to analyze the moderating effect of well-performing enterprise and poorly-performing enterprise on the impact of corporate social capital on enterprise performance. Data were analyzed using SPSS Statistics for Windows and Mplus Software. Moreover, this study applied a qualitative analysis of semi-structured interviews from 20 informants to verify whether the qualitative analysis results were consistent with those of quantitative analysis.

5.2 Research Results and Discussion

The main conclusion was that for well-performing enterprises, corporate social capital positively affected the ability to integrate knowledge and thereby improved enterprise performance. Knowledge integration ability played a partial mediating role in

the effect of corporate social capital on enterprise performance. Contradictory, for poorly-performing enterprises, corporate social capital showed no direct and positive effect on enterprise performance; but it indirectly affected enterprise performance through knowledge integration ability, which plays a full mediating role in the effect of corporate social capital on enterprise performance. Moreover, this study was confirmed by qualitative analysis based on semi-structured interviews. The results are consistent with those of quantitative analysis. The specific conclusions were as follows.

The significant findings and discussion of this study are given as follows.

(1) Corporate social capital was beneficial in improving the performance of technology-based SMEs.

The quantitative analysis results indicated that corporate social capital had a significant positive impact on the performance of technology-based SMEs. In the full sample analysis, corporate social capital had a significant direct impact on enterprise performance ($\beta=0.154$), in addition, corporate social capital could also notify the ability to integrate knowledge, which indirectly affected enterprise performance, with an indirect effect of 0.427. In case of well-performing enterprises, this impact revealed as a direct positive impact ($\beta=0.397$), in addition, corporate social capital could also notify the ability to integrate knowledge, which indirectly affected enterprise performance. The indirect effect was 0.385, indicating that better enterprise performance was achieved, and management paid more attention to the role of corporate social capital in improving enterprise performance. In the case of poor-performing enterprises, the impact of corporate social capital on enterprise performance was mainly achieved through knowledge integration ability, with an indirect effect of 0.328.

In qualitative research, it was concluded through semi-structured interviews with 20 respondents from 20 companies that 10 managers with good enterprise performance and 10 managers with poor enterprise performance unanimously believe that corporate social capital was an important channel for companies to obtain various types of information, knowledge, and resources needed for innovation. By strengthening the breadth and depth of connections, enterprises can enhance internal and external trust, save transaction costs, and effectively promote the improvement of enterprise performance.

Therefore, the research shows that corporate social capital has a positive impact on enterprise performance under any circumstances, and H1 is supported.

Many researchers have studied the impact of corporate social capital on enterprise performance from different perspectives. For example, Maskell (1999) found that corporate social capital can effectively reduce transaction costs between internal departments and between enterprises, thereby improving the innovation performance of the enterprise itself. It can be said that to some extent, corporate social capital is an important channel for enterprises to obtain various information, knowledge, and resources required for innovation. By strengthening the breadth and depth of connections, enhancing trust within and outside the enterprise, strengthening knowledge sharing through various connections, and striving to improve the level of social capital in three dimensions, enterprises can effectively promote the improvement of enterprise performance. First of all, corporate social capital can enhance the cooperation and mutual trust between enterprises and various stakeholders, thus improving the production efficiency and innovation ability of enterprises. Secondly, corporate social capital can improve the reputation and brand image of enterprises, and obtain more opportunities and advantages in market competition. In addition, corporate social capital can also help enterprises establish good employee relations, improve employee job satisfaction and loyalty, and thus improve corporate performance.

Therefore, in practice, technology-based SMEs should pay attention to the development and management of corporate social capital, establish good cooperative relations with various stakeholders, and continuously improve corporate performance to obtain better performance.

2□ Corporate social capital had a significant positive impact on knowledge integration ability and knowledge integration ability had a significant positive impact on enterprise performance.

This study concludes through empirical analysis that there is a positive relationship between variables. In the full sample analysis, corporate social capital had a significant positive impact on knowledge integration ability (β= 0.649), H2 was supported; Knowledge integration ability had a significant positive impact on enterprise

performance $\beta = 0.658$), H3 was supported. In the case of well-performing enterprises, corporate social capital had a significant positive impact on knowledge integration ability ($\beta = 0.619$); knowledge integration ability had a significant positive impact on enterprise performance ($\beta = 0.622$). In the case of poor-performing enterprises, corporate social capital had a significant positive impact on knowledge integration ability ($\beta = 0.517$); knowledge integration ability had a significant positive impact on enterprise performance ($\beta = 0.634$). So H2 and H3 were supported.

Corporate social capital is a long-term asset that can be invested in establishing external relationship networks and developing internal relationships. By doing so, companies can better access information, gain trust, strengthen collective consistency, and improve their knowledge integration abilities. The three dimensions of corporate social capital can promote the acquisition, transformation, and utilization of corporate knowledge. For example, enterprise members engage in social interactions with external knowledge sources by participating in academic or industry conferences, visiting customers and suppliers, and providing channels for knowledge transfer. In addition, enterprises themselves can also acquire desired new knowledge through social interaction with internal and external new knowledge owners (individuals or organizations), and social interaction at this level mainly provides formal channels for knowledge transfer. It can be seen that both within and between enterprises generally involve the exchange of economic benefits. Driven by these benefits, all parties involved in knowledge supply and demand are willing to make efforts to promote the smooth completion of the process of knowledge transformation and utilization. The acquisition of new knowledge cannot be separated from the connection between the enterprise and the external environment, while the digestion and utilization of knowledge cannot be separated from the connection between various functional departments within the enterprise.

The theory of knowledge management believes that knowledge is the core resource for enterprises to obtain competitive advantages. How to improve enterprise performance through effective knowledge management has attracted the attention of many scholars. With the rapid development of knowledge management theory, more and more scholars find that the knowledge in the knowledge base usually does not exist alone,

but to connect with each other through some dependent relationships . The process of scholars transferring old ideas to new contexts is called "restructuring innovation". Most of technology-based SMEs are knowledge intensive, but the knowledge they acquire initially is mostly scattered and disordered. These scattered and disordered knowledge cannot have a direct impact on enterprise performance. Only integrated and systematic knowledge can have a positive impact on enterprise performance.

Guo R.P and Cai L. (2017) found that the integration of dual knowledge promotes the performance of enterprises by influencing entrepreneurial ability, based on the knowledge foundation view and organizational dual view. The validation results of this study are consistent with this result. The improvement of knowledge integration ability makes technology-based SMEs more inclined to break through path dependence, introduce more new technological fields, expand product markets, and obtain more excess profits. For enterprises, knowledge integration is not a simple addition of existing knowledge elements, but it is a process of knowledge creation and regeneration (Mehrabani & Shajari, 2012). The integration of new knowledge means acquiring new knowledge in multiple technological fields at the same time, which helps to accelerate the improvement of knowledge diversification in technology-based SMEs and thereby improve enterprise performance. Therefore, the cultivation of knowledge integration ability plays a crucial role in improving the performance of technology-based SMEs.

(3) Knowledge integration ability played a mediating role between corporate social capital and enterprise performance.

The study found that in the theoretical model of corporate social capital→knowledge integration capability→enterprise performance, knowledge integration ability played a mediating role.

In the full sample analysis, corporate social capital had a significant direct and positive impact on enterprise performance ($\beta= 0.154$), and also played an indirect role through knowledge integration ability on enterprise performance, with a significant indirect effect of 0.427. Knowledge integration ability played a partial mediating role in the impact of corporate social capital on enterprise performance.

In the case of well-performing enterprises, corporate social capital had a significant direct positive impact on enterprise performance ($\beta=0.397$). In addition,

corporate social capital also indirectly affected enterprise performance through knowledge integration ability. The indirect effect size was 0.385, and the total effect size was 0.782. Knowledge integration ability played a partial mediating role in the influence of corporate social capital on enterprise performance.

In the case of poorly-performing enterprises, the impact of corporate social capital on enterprise performance was mainly achieved through knowledge integration abilities, and the indirect effect was 0.328. Corporate social capital showed insignificant direct effect on enterprise performance. Thus, knowledge integration ability played a full mediating role in this model.

Through empirical analysis, it is not difficult to see that the management of well-performing enterprises is increasingly paying attention to the role of corporate social capital in improving enterprise performance, actively utilizing corporate social capital to promote knowledge integration abilities, further address the resource constraints faced by technology-based SMEs, and achieve their goals of improving enterprise performance. Therefore, enterprises can establish a diversified collaborative research and development (R&D) relationship with external organizations, and obtain new ideas for technology research and development through multiple channels, so that the R&D results brought by knowledge integration are more innovative, more advantageous in market competition, and ultimately increase the economic benefits of enterprises.

Corporate social capital is conducive to establishing a strong connection partnership between alliance enterprises based on trust, commitment, and communication. However, in the process of knowledge transfer between enterprises, the strong connection relationship only provides a knowledge transfer platform and external knowledge resources. Internal members of the enterprise need to complete the knowledge transformation process by fully absorbing knowledge, which can then be utilized in the development of new products. Therefore, if there is no strong knowledge integration ability, the direct impact of corporate social capital on enterprise performance is limited. Especially in the case of poorly-performing enterprises, the excavation of strong connections and dependencies between enterprise alliances requires large investments and human resources. Enterprises that do not increase investment in human resources; therefore, the trust between enterprises will be weakened. Moreover, the direct impact of

corporate social capital on enterprise performance will be weakened or even disappear. However, the development of enterprises requires the injection of new knowledge into vitality. Enterprises can integrate dispersed and disordered knowledge fragments obtained through different low-cost channels by enhancing their knowledge integration abilities, accelerate the speed of learning, transformation and utilization, improve enterprise performance, and explore the hidden advantages of corporate social capital, forming a virtuous cycle. In this process, knowledge integration ability plays a completely mediating role to indicate a full mediation model.

(4) The performance of the corporate itself plays a moderating role in the relationship between corporate social capital and enterprise performance.

Corporate social capital refers to the resources and capabilities that an enterprise possesses in terms of social relationships, networks and reputation. It includes the interaction relationship, trust relationship and cooperation relationship between enterprises and various stakeholders (such as employees, customers, suppliers, social organizations, etc.). Corporate social capital can help enterprises to obtain better market position, resource acquisition and business development, which has an impact on enterprise performance. The performance of the corporate itself refers to the performance of the enterprise in the process of operation and management, including the performance of profit, operating income, market share, product quality and so on.

According to chapter 4, multi-group analysis was used to prove that the performance of the corporate itself has a moderating effect on the relationship between corporate social capital and enterprise performance.

Specifically, the impact of corporate social capital on enterprise performance is played by increasing access to resources, enhancing knowledge sharing, and enhancing partnerships. Good performance will increase the reputation and credibility of the enterprise, enhance the recognition of the enterprise in the society, and then increase the corporate social capital. This social capital can bring more business opportunities and resources to the enterprise, thus promoting the further development of the enterprise. If the performance of the corporate itself is good, that is, the enterprise performs well in the aspects of operation efficiency, financial condition and market competitiveness, then the impact of corporate social capital on the performance of the enterprise will be more

significant. This is because the excellent performance of the enterprise itself will increase its trust and goodwill in the eyes of external stakeholders, enhance its reputation and brand value, and then attract more resources and partners' investments, increasing the possibility of achieving excellent performance. On the contrary, if the performance of the corporate itself is poor, that is, the performance of the enterprise is poor in the aspects of operation efficiency, financial condition and market competitiveness, then the influence of corporate social capital on the performance of the enterprise is weak. This is because the poor performance of the enterprise itself will reduce the trust and goodwill of external stakeholders to the enterprise, reduce the investment of resources and partners. It then affects the possibility that the organization will achieve good performance.

Therefore, the influence of corporate social capital on enterprise performance is complex and moderated by the performance of the enterprise itself. The moderating effect of enterprise performance is of great significance to the development and operation of the corporate. It can promote the development and progress of enterprise, improve the management effectiveness within the enterprise, increase employee motivation and enthusiasm, and play a positive role in promoting the enterprise competitiveness and sustainable development.

5.3 Contributions of the Study

5.3.1 Theoretical Contributions

With the acceleration of global economic integration, enterprises have gradually begun to attach importance to seeking collaborators in order to enhance their competitiveness. Therefore, the mutually beneficial cooperation between enterprises and the external environment, as well as the communication and coordination between relevant departments within the enterprise, have an undeniable role in the development of the enterprise. Practices have proven that effective integration of resources through internal and external connections is the key to improving enterprise performance by acquiring and utilizing knowledge. How to improve enterprise performance has been a research topic widely studied by scholars for a long time. Thus, this study aims to examine the influence mechanism of corporate social capital on enterprise performance, especially the mediating role of knowledge integration ability in the relationship between corporate

social capital and enterprise performance. This study makes the following theoretical contributions to the current literature.

Firstly, corporate social capital has a positive direct effect on enterprise performance, and also has an indirect effect through knowledge integration ability on enterprise performance. Therefore, knowledge integration ability plays a partial mediating role in the impact of corporate social capital on enterprise performance. Secondly, corporate social capital has a positive impact on enterprise performance, but the impact differs between well-performing and poorly-performing enterprises. In the case of well-performing enterprises, corporate social capital has both direct positive effect on enterprise performance and indirect effect through knowledge integration ability on enterprise performance. Thus, knowledge integration ability plays a partial mediating role in the influence of corporate social capital on enterprise performance. According to the case of poorly-performing enterprises, corporate social capital does not have direct effect on enterprise performance, but corporate social capital has indirect effect on enterprise performance through knowledge integration ability only. Therefore, knowledge integration ability plays a full mediating role in the influence of corporate social capital on enterprise performance. Lastly, the study also contributes to the literature that the impact of corporate social capital on enterprise performance varies depending on the performance of the enterprise itself, that is, the performance of the enterprise plays a moderating role on the impact of corporate social capital on enterprise performance.

5.3.2 Practical Contribution

The practical contribution of this study are as follows:

(1) Technology-based SMEs should actively cultivate and develop corporate social capital. Based on the positive correlation between corporate social capital and enterprise performance verified by this study, from the perspective of improving enterprise performance, it is necessary to actively cultivate and develop corporate social capital, so that rich capital can better serve the improvement of enterprise performance.

In order to enhance the level of structural dimension of corporate social capital, enterprises should continuously strengthen the connection with customers, suppliers and other enterprises, establish good social relations, and obtain more knowledge and information from them. At the same time, enterprises should strengthen the connection

between industry associations and intermediary organizations, and obtained strong support for capital, technology and other aspects of corporate development. In order to enhance the level of relational dimension, enterprises should strive to promote effective communication between departments, increase the trust of the internal and external parts of the enterprise, and minimize the transaction costs of the enterprise. Technology-based small and medium-sized entrepreneurs should actively adapt to the trend of changes in the times and social transformation, and strive to promote social capital to "trust". In order to enhance the level of cognitive dimension, enterprises need to strengthen knowledge sharing with external contact objects, and obtain more valuable resources to improve enterprise performance by organizing effective mutual learning between relevant departments within the organization.

(2) Enterprises should broaden the channels of knowledge integration and get a move on the speed of knowledge integration.

With the continuous progress of technology, the speed of knowledge growth and diffusion is accelerating, and scattered and disordered knowledge is difficult to play its role. Knowledge integration ability has gradually become an important way for enterprises to obtain innovative ideas and knowledge. Knowledge integration ability has gradually become an important channel for enterprises to acquire innovative ideas and knowledge. The knowledge integration ability verified in this study plays an important role in improving enterprise performance. It plays a partial mediating role in the case of good enterprise performance and a full mediating role in the case of poor enterprise performance. Therefore, enterprises should improve knowledge integration ability to improve enterprise performance.

Enterprises should broaden knowledge integration channels and speed up knowledge integration as follows.

Enterprises should establish a knowledge sharing platform and create an online platform for employees to share and exchange knowledge and experience, such as internal blogs, forums, social media, etc.

(1) Enterprises should provide facilities for employees to share and discuss relevant knowledge at any time. This can promote communication and cooperation

between departments and employees, and promote the integration and dissemination of knowledge.

(2) Inter-departmental cooperation is advocated within the enterprise. Regular inter-departmental meetings are held to encourage cooperation and collaborative work between different departments to promote knowledge transfer and integration. Through cooperation, enterprises can gain knowledge and share experience in various fields, promote knowledge integration and innovation, and share each other's knowledge and resources.

(3) Enterprises should create an expert network that brings together professionals and domain experts within the organization so that employees can contact and consult quickly.

(4) Enterprises should also establish open innovation platforms to attract outside experts and entrepreneurs to participate in the company research and development and innovation activities, so as to gain more knowledge.

(5) The expert network uses a mentorship system and conducts regular knowledge sharing and training activities, where experts share knowledge and experience with new employees or other employees. This accelerates the process of knowledge acquisition and integration, as well as facilitating communication and collaboration among employees.

(6) Enterprises need to promote a culture of knowledge sharing and learning that encourages employees to actively participate and contribute knowledge. Enterprise should establish a mechanism to reward employees who actively share and integrate knowledge and encourage their participation and contribution.

(7) In the era of big data, enterprises should use various digital tools to broaden knowledge integration channels, such as internal online collaboration tools, knowledge management systems and virtual team platforms. This can promote collaboration and knowledge sharing between different departments and employees, and promote the integration and dissemination of knowledge.

In short, to broaden the channels of knowledge integration and accelerate the speed of knowledge integration, enterprises need to attach importance to knowledge management, establish corresponding platforms and mechanisms, and promote

employees to actively participate in and contribute knowledge. Through the expansion of the above channels, enterprises can integrate knowledge from different sources. Enterprises should pay attention to the update of knowledge, make full use of various channels to acquire knowledge, accelerate the speed of knowledge transfer, improve the ability of knowledge integration, and then enhance their competitiveness and innovation ability.

5.4 Limitations and Future Research

Although this study has drawn some meaningful conclusions, there are still some limitations in the research process that need to be improved and further deepened in future research. These limitations or content worthy of further study in the future mainly include:

(1) Cross industry comparative research

Due to limitations in manpower, material resources, and time, the survey sample for this study is limited to technology-based SMEs. Thus, further research is needed to determine whether the conclusions can be applied to other fields. Therefore, under possible conditions, subsequent research can conduct comparative studies by industry, which is conducive to discovering the characteristics of each industry and providing more valuable guidance for enterprises in different industries.

(2) The impact of corporate social capital on enterprise performance may be a dynamic process.

The data used in this study is cross-sectional data, and the empirical analysis is relatively static. Therefore, future research may consider designing longitudinal studies to examine whether the relationship between corporate social capital, knowledge integration ability, and enterprise performance would change over time.

(3) This study did not explore the impact of control variables. For example, the impact of corporate social capital on enterprise performance may vary depending on the size or age of the enterprise. In future research, this aspect should be analyzed.

List of Bibliography

- Adler, P. S., & Kwon, S. W. (2002). Social capital: Prospects for a new concept. *Academy of management review*, 27(1), 17-40.
- Al-Omoush, K. S., Simón-Moya, V., & Sendra-García, J. (2020). The impact of social capital and collaborative knowledge creation on e-business proactiveness and organizational agility in responding to the COVID-19 crisis. *Journal of Innovation & Knowledge*, 5(4), 279-288.
- Anirud Krishna. (2005). Creating and Utilizing Social Capital. Translated by Zhang H.D. et al. Beijing: *China Renmin University Press*, 93.
- Ao J.Z. (2013). Research on the Impact of Social Capital on the Performance of Agricultural Enterprises. *Soft Science*, 9, 117-121.
- Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models.
- Baker, W. E. (1990). Market networks and corporate behavior. *American journal of sociology*, 96(3), 589-625.
- Bian, Y.J., & Qiu, H.X. (2000). Corporate Social capital and its effects. *Chinese Social Sciences*, 2, 87-99.
- Bourdieu, P. (2011). The forms of capital. (1986). *Cultural theory: An anthology*, 1(81-93), 949.
- Bourdieu, P., & Richardson, J. G. (1986). Handbook of Theory and Research for the Sociology of Education. *The forms of capital*, 241, 258.
- Cacioppo, J. T., & Patrick, W. (2008). *Loneliness: Human nature and the need for social connection*. WW Norton & Company.
- Cai Y.H. et al. (2013). Research on the relationship between industrial cluster network, knowledge integration capability and innovation performance: Based on the empirical analysis of three manufacturing clusters in Fujian Province. *Journal of Fuzhou University (Philosophy and Social Sciences Edition)*, 27 (O2), 21-28.

- Caridi-Zahavi, O., Carmeli, A., & Arazy, O. (2016). The influence of CEOs' visionary innovation leadership on the performance of high-technology ventures: The mediating roles of connectivity and knowledge integration. *Journal of Product Innovation Management*, *33*(3), 356-376.
- Carmeli A, Azeroual B. (2009). How relational capital and knowledge combination capability enhance the performance of work units in a high technology industry. *Strategic Entrepreneurship Journal*, *3*(1), 85-103.
- Chen J., & Li F.Y. (2001). Social Capital: A Sociological Interpretation of Technological Innovation. *Science Research*, *19*, 3103-107.
- Chen J.X. (2008). Internal Social Capital, Knowledge Integration and Core Competence. *Soft Science*, *6*, 16-21.
- Chen J.X.et al. (2009). The impact of external social capital on the core competence of enterprises: the regulatory role of knowledge integration. *Scientific Research*, *27*(02), 244-249.
- Chen L.& Lu R.Y. (2003). Research on Enterprise Knowledge Integration. *Scientific Research Management*, *24*(3), 32-38.
- Chen X.M. (2000). *Qualitative Research Methods and Social Science Research*. Beijing: Education Science Press.
- Chen, D. N., & Liang, T. P. (2016). Knowledge diversity and firm performance: an ecological view. *Journal of Knowledge Management*, *20*(4), 671-686.
- Chen, M. H., Chang, Y. C., & Hung, S. C. (2008). Social capital and creativity in R&D project teams. *R&d Management*, *38*(1), 21-34.
- Collins C J, Smith K G. (2006). Knowledge exchange and combination: The role of human resource practices in the performance of high-technology firms. *Academy of Management Journal*, *49*(3), 544-560.
- Collins, C. J., & Clark, K. D. (2003). Strategic human resource practices, top management team social networks, and firm performance: The role of human resource practices in creating organizational competitive advantage. *Academy of management Journal*, *46*(6), 740-751.

- Cooke, P., & Clifton, N. (2002). Social capital, and small and medium enterprise performance in the United Kingdom, entrepreneurship in the modern space-economy: Evolutionary and policy perspectives. *Tinbergen Institute, Keizersgracht, 482*.
- De Boer, M., Van Den Bosch, F. A., & Volberda, H. W. (1999). Managing organizational knowledge integration in the emerging multimedia complex. *Journal of management studies, 36*(3), 379-398.
- Deng X.L. (2010). *Research on the correlation between Social capital and credit level of small and medium-sized enterprises*. Master's thesis, Harbin Institute of Technology.
- Durlauf, S., & Fafchamps, M. (2003). Empirical studies of social capital: a critical survey.
- Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of management review, 23*(4), 660-679.
- Feng, C. L., & Cheng, Y. (2020). Meta-analysis of Open Innovation and Enterprise Performance. *Scientific Research Management, 12*(01), 108-118.
- Florida, R., Cushing, R., & Gates, G. (2002). When social capital stifles innovation. *Harvard Business Review, 80*(8), 20-20.
- Francis Fukuyama. (2016). *Trust: Social Virtue and Creating Economic Prosperity*. Translated by Guo Hua. Guilin: Guangxi, Normal University Press, 29.
- Fukuyama Francis. (1995). *Trust: The social virtues and the creation of prosperity*, New York: The Free Press.
- Fukuyama, F. (1996). *Trust: The social virtues and the creation of prosperity*. Simon and Schuster.
- Gao W., & Ni W.B. (2005). Research on knowledge integration of learning organizations. *Journal of Harbin Institute of Technology (Social Science Edition), 3*, 86-91.
- Gardner H., Gino F., & Staats B. (2012). Dynamically integrating knowledge in teams: Transforming resources into performance. *Academy of Management Journal, 55*(4), 998-1022.

- Gong H.Q., & Lin J. (2007). Relationship cognition, relationship operation and enterprise performance: an empirical study from private SMEs in Guangdong Province. *Nan kai Management Review*, 45-53.
- Gorsuch, R. L. (1988). Exploratory factor analysis. *In Handbook of multivariate experimental psychology* (pp. 231-258). Boston, MA: Springer US.
- Grant, R. M. (1996). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization science*, 7(4), 375-387.
- Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic management journal*, 17(S2), 109-122.
- Gulati, R., & Gargiulo, M. (1999). Where do interorganizational networks come from? *American journal of sociology*, 104(5), 1439-1493.
- Guo R.P., & CAI L. (2017). Dual knowledge integration, entrepreneurial ability and high-tech new enterprise performance. *Scientific Research*, 35(2), 264-271.
- Hargadon A B, Sutton R I. (1997). Technology brokering and innovation in a product design firm. *Administrative science Quarterly*, 42(4), 716-749.
- Hong D.C. (2011). *Research on the impact of social networks on tacit knowledge integration and its process of action*. Unpublished doctoral/master dissertation. Fudan University.
- Hongyun, T., Kankam, W. A., Appiah-Twum, F., & Akolgo, I. G. (2019). Effect of social capital on firm performance: The role of entrepreneurial orientation and dynamic capability. *International Review of Management and Marketing*, 9(4), 63.
- Hou G.H., & Zhang J.G. (2013). Whether corporate Social capital can improve technological innovation performance: An empirical study based on the moderating effect of absorptive capacity. *Contemporary Finance and Economics*, 2, 74-86.
- Hou G.W., & Xue H.F. (2017). Cluster network relationship, knowledge acquisition and collaborative innovation performance. *Scientific Research Management*, 38(04), 1-9.

- Hou J.T. (2004). *Structural equation model and its application*. Beijing: Education Science Press, 166-173.
- Iansiti, M., & Clark, K. B. (1994). Integration and dynamic capability: evidence from product development in automobiles and mainframe computers. *Industrial and corporate change*, 3(3), 557-605.
- Inkinen, H. (2016). Review of empirical research on knowledge management practices and firm performance. *Journal of knowledge management*, 20(2), 230-257.
- Inkpen, A. C., & Tsang, E. W. (2005). Social capital, networks, and knowledge transfer. *Academy of management review*, 30(1), 146-165.
- Ji C.et al.(2007). Research on knowledge integration of enterprise M&A based on knowledge integration value chain. *Research and Development Management*, 19(6), 78-84.
- Jian Z.Q. et al. (2008). Research on the impact of absorptive capacity and knowledge integration on organizational innovation and organizational performance. *Scientific Research Management*, 29(1), 80-86.
- Jian Z.Q.et al.(2008). Research on the impact of absorptive capacity and knowledge integration on organizational innovation and organizational performance. *Scientific Research Management*, 1, 80-96.
- Jiang T.Y. (2013). The formation mechanism of competitive advantage of small, medium-sized and micro enterprises based on market orientation - knowledge integration and organizational innovation as intermediaries. *Scientific Research Management*, 6, 17-24.
- Kamuriwo, D. S., & Baden-Fuller, C. (2016). Knowledge integration using product R&D outsourcing in biotechnology. *Research Policy*, 45(5), 1031-1045.
- Ke J.L. (2007). An Empirical Study on the Relationship between Social Capital and Team Effectiveness of R&D Team: Knowledge Sharing and Knowledge Integration as Mediating Variables. *Management World*, 3, 89-101.
- Knoke, D. (1999). Organizational networks and corporate social capital. *In Corporate social capital and liability* (pp. 17-42). Boston, MA: Springer US.
- Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization science*, 3(3), 383-397.

- Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization science*, 3(3), 383-397.
- Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization science*, 3(3), 383-397.
- Kogut, B., & Zander, U. (1993). Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of international business studies*, 24, 625-645.
- Kraaijenbrink, J., Wijnhoven, F., & Groen, A. (2007). Towards a kernel theory of external knowledge integration for high-tech firms: Exploring a failed theory test. *Technological forecasting and social change*, 74(8), 1215-1233.
- Landry, R., Amara, N., & Lamari, M. (2002). Does social capital determine innovation? To what extent?. *Technological forecasting and social change*, 69(7), 681-701.
- Lawson, B., Tyler, B. B., & Cousins, P. D. (2008). Antecedents and consequences of social capital on buyer performance improvement. *Journal of Operations management*, 26(3), 446-460.
- Li H.B. & Yang X.D. (2000). *Social Capital and Social Development*. Beijing: Social Science Literature Press.
- Li H.L. et al. (2005). Effective Tools for Performance Appraisal of Operators. *Enterprise Economics*, 6, 65-66.
- Li J L, & Huang M Z. (2018). Research on the relationship between intellectual capital, economic environment and firm performance: Based on the survey data of enterprises in industrial parks in Jiangxi Province. *Journal of Nanchang Hangkong University: Social Science Edition*, 20(3), 47-55.
- Li J. (2013). Research on the evolution process and structural characteristics of China's collaborative R&D network based on the perspective of R&D internationalization. *Science of Science and Management of Science and Technology*, 34(9), 27-36.
- Li J.Y. (2018). The Impact of Virtual Team's Social Capital and Knowledge Integration on Innovation Performance: An Empirical Study in the Context of Chinese Culture. *Social Scientist*, 1, 91-97.

- Li L. & Yang H.Z. (2019). Research on the influence of knowledge integration mechanism on new service development performance of content providers. *Industrial Engineering and Management*, 24(2), 81-87.
- Li P.Y. (2012). *Research on the impact of corporate social capital on enterprise performance in the Chinese context*. Unpublished doctoral dissertation. Zhejiang University of Technology and Industry.
- Li X. (2016). *A study on the relationship between intellectual capital and firm Performance*. Master's thesis, Shandong University.
- Li Y. (2020). *A study on the impact of Intellectual Capital on Enterprise Performance from the Perspective of Enterprise Life Cycle*. Master's thesis, Northwest A&F University.
- Li Z. & Yang H.T. (2012). Research on the impact of absorptive capacity, relational learning and knowledge integration on enterprise innovation performance: an empirical study from technology-based SMEs. *Scientific Research Management*, 33(01), 79-89.
- Lichtenthaler, U. (2009). Absorptive capacity, environmental turbulence, and the complementarity of organizational learning processes. *Academy of management journal*, 52(4), 822-846.
- Liu L. & Yang H.X. (2008). An Exploratory Study on the Factors and Effects of Chinese Enterprises' Absorption Capacity. *Industrial Economic Review*, 7(2), 68-91.
- Liu L.P. (2006). Social capital of enterprises: conceptual reflection and measurement approach: also comment on Bian Yanjie and Qiu Haixiong's "Social capital of enterprises and its effectiveness". *Sociological Research*, 2, 204-216.
- Liu S.X. (2008). *Research on the relationship between corporate social capital and technological innovation: the perspective of organizational learning*. Unpublished doctoral/master dissertation Jinan: Shandong University.
- Liu Y.F. & Xu J.Z. (2017). Research on the Mechanism of Organizational Knowledge Integration in the Social Network Environment. *Information Science*, 35(08), 84-88.

- Liu Z.H. & Du R.X. (2018). Research on the relationship between entrepreneurial teams' knowledge heterogeneity, knowledge integration ability and team creativity. *Science and Technology Management Research*, 38(08), 159-167.
- Lu H.D & Zhu B.Y. (2000). A Study on the Relationship between Knowledge Integration, Innovation Strategies and Knowledge Transfer Performance. "Symposium on Science and Technology Management in the Republic of China", Jiaotong University.
- Luo H.Y. & Zhang Q.P. (2015). Research on the Breakthrough Technological Innovation Process of New Technological Small Enterprises from the Perspective of Knowledge Management. *Science and Technology Management*, 36(03), 143-151.
- Lv L. (2019). Analysis on the Application of Balanced Scorecard in Enterprise Performance Management. *Economic Research Guide*, 31, 111 - 112.
- Ma Chao. (2012) *Study on the relationship between corporate Social Capital and innovation Performance*. Master's thesis, Xidian University.
- Madhok, A. (1995). Opportunism and trust in joint venture relationships: An exploratory study and a model. *Scandinavian Journal of Management*, 11(1), 57-74.
- Mehta, N., Byrd, T., & Hall, D. (2006). Knowledge integration in software teams: An assessment of team project and it-related issues.
- Mishra, A. K. (1996). *Organizational Responses to Crisis: The Centrality of Trust*. Appears in Kramer, Roderick M. & Thomas Tyler (eds.) Trust in Organizations.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of management review*, 23(2), 242-266.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of management review*, 23(2), 242-266.
- Pan Wen'an. (2012). Research on Relationship Strength, Knowledge Integration Capability and Knowledge Efficiency Transfer of Supply Chain. *Scientific Research Management*, 33(1), 147-153.

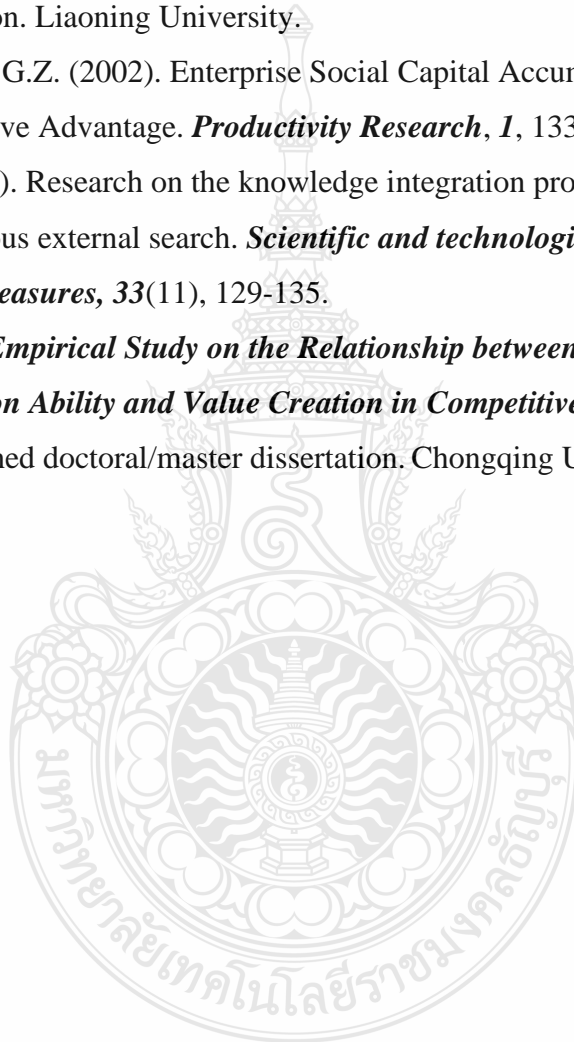
- Parts, E. (2003). Interrelationships between human capital and social capital: implications for economic development in transition economies. *University of Tartu Economics and Business Working Paper*, (2003-24).
- Pollitt, M. (2002). The economics of trust, norms and networks. *Business Ethics: A European Review*, *11*(2), 119-128.
- Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual review of sociology*, *24*(1), 1-24.
- Qiu H.Z., & Lin B.F. (2009). *Principle and Application of Structural equation Model* (Vol. 17). China Light Industry Press.
- Ren H., & Deng S.H. (2002). Knowledge Integration is an important step in knowledge management. *Information Science*, *20*(6), 650-653.
- Robert D. Patnam. (2014). Democratic Regime in Mobility: Evolution of Social Capital in Contemporary Society. Translated by Li Junet al. Beijing: *China Social Sciences Press*, 183.
- Rui M.J.& Liu M.Y. (2006). Knowledge division and innovation of modular networked industrial chain. *Contemporary Finance and Economics*, *4*, 83-86.
- Shen C. (2013). Empirical Research on Enterprise Capital Structure and Enterprise Performance: Based on SME Board Data. *Statistical Science and Practice*, *5*, 42-44.
- Shen Q.H.& Feng K.D.(2002). Selection of organizational capacity, institutional environment and knowledge integration model: Case study of technology integration in China's power automation industry. *China Soft Science*, *12*, 82-88.
- Shen Z.D. (2013). Using Analytic Hierarchy Process to Construct the Performance Evaluation System of State-owned Enterprises. *Audit Research*, *2*, 106-112.
- Shi W.G. &Jiang T.Y. (2012). Research on the relationship between social capital, knowledge management ability and core competence. *Scientific Research Management*, *33*(04), 62-72.
- Sui M. (2012). *Research on Corporate Social Capital. Qingdao: Doctoral Dissertation of Ocean University of China*. Unpublished doctoral/master dissertation ,85.
- Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: The role of intrafirm networks. *Academy of management Journal*, *41*(4), 464-476.

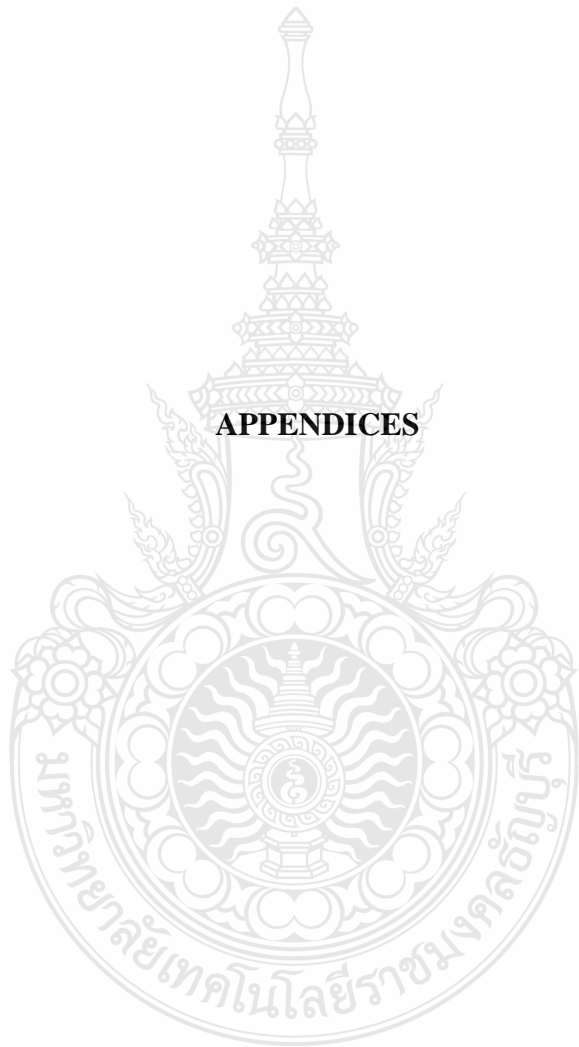
- Van den Bosch, F. A., Volberda, H. W., & De Boer, M. (1999). Coevolution of firm absorptive capacity and knowledge environment: Organizational forms and combinative capabilities. *Organization science*, *10*(5), 551-568.
- Wang S.Y., & He F.L. (2007). Research on the influence path of social capital's cognitive dimension on knowledge transfer. *Statistics And Decision Making*, *233*(3), 122-123.
- Wang, Q. E., Zhao, L., Chang-Richards, A., Zhang, Y., & Li, H. (2021). Understanding the impact of social capital on the innovation performance of construction enterprises: Based on the mediating effect of knowledge transfer. *Sustainability*, *13*(9), 5099.
- Wei J., & Xu L. (2014). Double Embedding of Knowledge Network, Knowledge Integration and Innovation Ability of Clustered Enterprises. *Journal of Management Science*, *17*(2), 34-47.
- Wei Y. (2005). *The impact of corporate social capital on technological innovation performance: from the perspective of absorptive capacity*. Hang State: doctoral dissertation of Zhejiang University.
- Wei Y. (2006). *The Impact of Corporate Social Capital on Technological Innovation Performance*. Unpublished doctoral dissertation. Zhejiang University.
- Wei Y. (2007). Corporate social capital and technological innovation: an empirical study based on absorptive capacity. *China Industrial Economy*, *9*, 119-126.
- Westlund, H. (2003, March). Implications of social capital for business in the knowledge economy: theoretical considerations. *International Forum on Economic Implication of Social Capital “, held by the Economic and Social Research Institute, Cabinet Office, Japan, in Tokyo on (Vol. 24)*.
- Wu J.J., & Dai Y. (2013). Entrepreneurs' social network, organizational capacity and growth performance of cluster enterprises. *Journal of Management*, *10*(4), 516-523.
- Wu T. (2018). *Research on the path of improving enterprise knowledge integration ability from the perspective of network governance*. Unpublished doctoral/master dissertation. Shanxi University of Finance and Economics.

- Wu T.T. (2018). Research on the relationship between knowledge sharing and innovation performance: based on the intermediary role of knowledge integration capability. *China National Knowledge Infrastructure*, 24-27.
- Wu Z.W. (2003). Research on the Connotation and Function of Corporate Social Capital. *Soft Science*, 5, 19-21.
- Xie H.M. et al. (2006). Knowledge Integration: The Role of Internal Social Capital and Organizational Culture: An Empirical Study of Enterprises in South China . *Scientific Management Research*, 4, 65-77.
- Xie H.M. et al. (2007). Research on the Relationship between Learning, Knowledge Integration and Innovation. *Nan kai Management Review*, 10(2), 105-112.
- Xie H.M. et al. (2007). Research on the relationship between organizational learning, knowledge integration and core competence. *Science of Science Research*, 25(2), 312-318.
- Xie X.M., & Zuo L.L. (2013). Characteristics of enterprise collaborative innovation network and innovation performance: research on intermediary effect based on knowledge absorption capacity. *Nan kai Management Review*, 16(03), 47-56.
- Xing X.Q. & Quan Y.H. (2004). Analysis of knowledge activities based on enterprise internal knowledge network. *Science of Science and Science and Technology Management*, 25(7), 44-47.
- Xu L., & Liu R.Y. (2004). Enterprise Performance Evaluation Method. *Economic Management*, 5, 51-53.
- Xu Ping. (2007). Corporate Social Capital and Environmental Adaptation. *Economic Research*, 3, 51-52.
- Yan J.R. (2015). *Social capital and community governance*. Beijing: Peking University Press, 4.
- Yang J. et al. (2006). Research on Knowledge Integration in Supply Chain Process Management. *Science and Technology Progress and Countermeasures*, 23(12), 120-122.
- Yang K. (2011). *Research on the Impact of Social Capital and Absorption Capacity on Enterprise Innovation Performance*. CNKI Doctoral Thesis, 71-72.

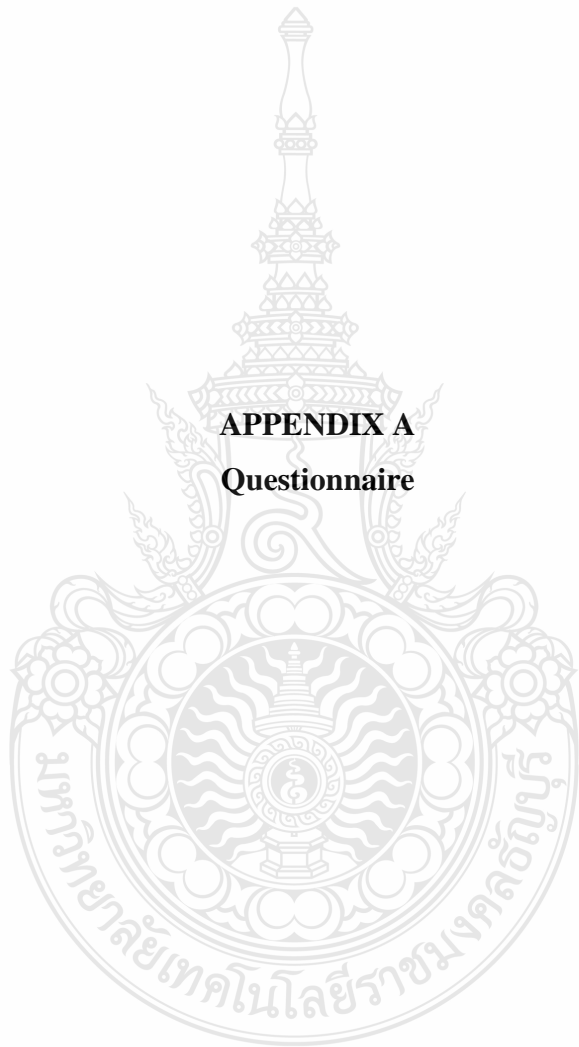
- Yi D.H. (2008). *Data analysis and Eviews application*. Beijing: China Renmin University Press, 146-154.
- Yli-Renko, H., Autio, E., & Sapienza, H. J. (2001). Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms. *Strategic management journal*, 22(6-7), 587-613.
- Yu H. (2006). Trust and Entrepreneur Social Capital. *Social Science Series*, 5, 49-53.
- Yue J.J. (2020) *A study on the impact of intellectual Capital on the performance of Manufacturing enterprises: Taking institutional environment as the moderating Variable*. Master's thesis, Jilin University.
- Zahra S. A., Ireland R. D., & Hitt M A. (2000). International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance. *Academy of Management Journal*, 43(5), 925-950.
- Zahra, S. A., Nielsen, A. P., & Bogner, W. C. (1999). Corporate entrepreneurship, knowledge, and competence development. *Entrepreneurship theory and practice*, 23(3), 169-189.
- Zeng P. et al. (2013). Empirical Study on the Relationship between Social Capital, Dynamic Capacity and Enterprise Innovation. *Scientific Research Management*, 4, 50-59.
- Zeng P. et al. (2017). Enterprise social capital and business model innovation: mechanism and path research. *Finance and Economics*, 2, 85-94.
- Zhang J.M. (2013). Frontier and Future of Knowledge Integration Theory Research. *Economic Issues Exploration*, 7, 15-19.
- Zhang P. (2009). *Research on corporate social capital, organizational learning and technological innovation performance*. Unpublished doctoral/master dissertation. Jinan: Shandong University Doctoral Dissertation, 132-135.
- Zhang Q.Z. (2000). Research on Social Capital and SOE Performance. *Contemporary Finance and Economics*, 1, 53-58.
- Zhao D. (2012). *Research on the intermediary effect of R&D investment on the relationship between ownership structure and enterprise performance*. Inner Mongolia University of Finance and Economics.

- Zhao R. (2013). Corporate social capital, Investment opportunities and investment efficiency. *Journal of Macroeconomic Research*, *1*, 65-72.
- Zheng M.Q. et al. (2005). Analysis of the Effect of Social Capital on the Performance of High-tech Enterprises. *Industrial Technology Economics*, (02): 73-74,
- Zheng N. (2012). *Empirical Study on the Impact of Corporate Governance on Performance of GEM Listed Companies*. Unpublished doctoral/master dissertation. Liaoning University.
- Zheng S.L. &Chen G.Z. (2002). Enterprise Social Capital Accumulation and Enterprise Competitive Advantage. *Productivity Research*, *1*, 133-135,
- Zhong J.et al.(2016). Research on the knowledge integration process of team members' spontaneous external search. *Scientific and technological progress and countermeasures*, 33(11), 129-135.
- Zhou J.Q. (2006). *Empirical Study on the Relationship between Knowledge Integration Ability and Value Creation in Competitive Strategic Alliances*. Unpublished doctoral/master dissertation. Chongqing University.





APPENDICES



APPENDIX A
Questionnaire

Dear Madam/Sir:

How are you?! This questionnaire is used for writing the doctoral dissertation of RMUTT. The purpose of this research is to investigate the impact of corporate social capital on corporate performance and the intermediary role of knowledge integration ability. The questionnaire is mainly used for writing the doctoral dissertation and will not be used for any commercial purposes. This survey is conducted anonymously, and the information you provide will be kept strictly confidential. Please fill in this questionnaire in your busy schedule. There is no distinction between right and wrong answers. Accurate survey data is the basis of research. So your true expression of ideas is a great help to my research.

Figures 1-5 in the questionnaire indicate the transition from complete disagreement to complete agreement: 1.Strongly disagree; 2. Disagree; 3.indicates uncertainty; 4. Agree; 5.Strongly agree. Please answer the following questions one by one according to the current situation of your company, and tick "√" in the box that meets your opinion. Please do not select more than one.

Thank you very much for your cooperation and valuable time!

Part 1: Demographic data of the respondents

Company name

Gender

- Male
- Female

Age

- 18-25
- 26-35
- 36-45
- 46 and more

Education Level

- High school or equivalent
- Bachelor's degree
- Master's degree
- Doctor's degree and above (Ph.D.)

Position of respondent

- Top management
- Middle management
- Grassroots management
- Other

Employment period

- 1-5 years
- 6-10years
- 11-15years
- More than 15 years

Enterprise Size

- 50 people or less
- 51-100 people
- 101-200 people
- 201-500 people



Part 2 Corporate Social Capital

Please tick the option that best describes your answer.

Variable	Dimension	Question of measurement	Strongly agree 5	Agree 4	Neutral 3	Disagree 2	Strongly disagree 1
Corporate social capital	Structural dimension	A1 We often contact, exchange visits or meet with customers, suppliers and other enterprises;					
		A2 Our department often sends personnel to other departments in the company to learn about the situation;					
		A3 We often discuss and solve problems existing in the company's operations with colleagues from other departments in the company;					
		A4 The degree of connection between the production department of the enterprise and the R & D, sales and other departments.					
	Relational dimension	B1 If I encounter problems in my work, colleagues from other departments in the company will give me care and advice;					
		B2 In the work interaction with colleagues in other departments of the company, we always worry about the interests of each other being damaged;					
		B3 We trust that affiliated enterprises can successfully fulfill their responsibilities;					
	Cognitive dimension	C1 We communicate effectively with related enterprises through common knowledge;					
		C2 We communicate effectively with affiliated enterprises through common language;					
		C3 We have similar value orientation when communicating with others, and have consistent collective goals in the process of communication;					
		C4 When we communicate with customers, suppliers and other enterprises, both parties can clearly understand each other's technical terms or jargon.					
		C5 We have confidence in the expertise of our partners;					

Part 3: Knowledge Integration Ability

Please tick the option that best describes your answer.

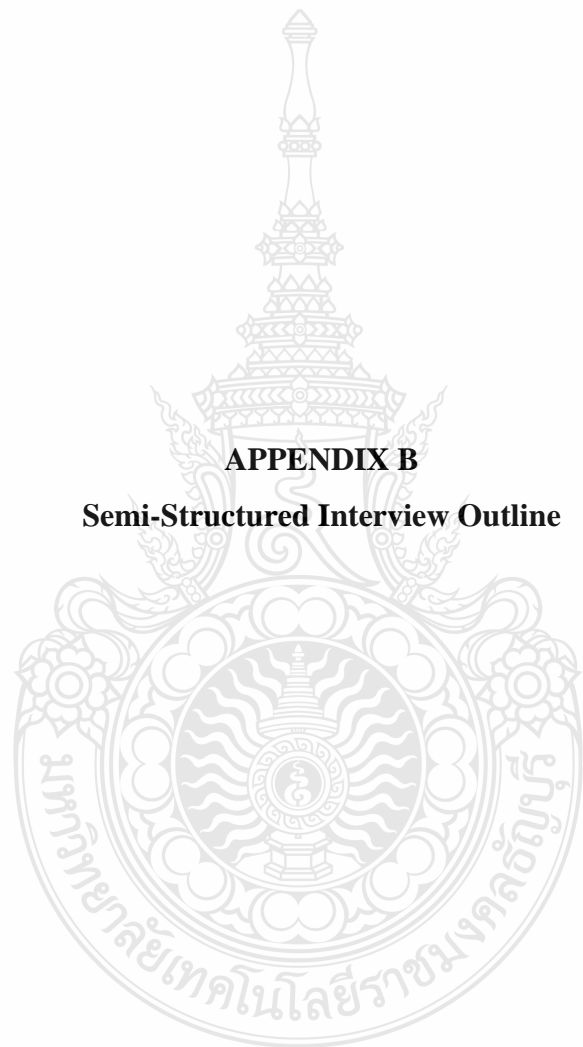
Variable	Dimension	Question of measurement	Strongly agree 5	Agree 4	Neutral 3	Disagree 2	Strongly disagree 1
Knowledge integration capability	Knowledge acquisition ability	D1. We often carry out market research activities;					
		D2. The company has specialized personnel and systems for acquiring external knowledge;					
		D3. We collect industry information through informal channels (such as lunch and small talk);					
		D4. We often contact with accountants, law firms and intermediary agencies of consulting companies;					
		D5. The company regularly organizes special meetings with customers or suppliers to acquire new knowledge;					
		D6. We often visit other enterprises;					
		D7. The company will explore opportunities to develop new products or services in other institutions.					
	Knowledge transfer ability	E1 Enterprises can effectively transfer the external innovative knowledge to internal enterprises;					
		E2 enterprises can effectively process and summarize technical and market knowledge and transfer it to internal employees;					
		E3 There is a mature communication mechanism between different departments of the enterprise;					
		E4 The internal communication of the enterprise is timely and frequent;					
	Knowledge utilization ability	F1 Employees can quickly use knowledge to meet the competitive demand;					
		F2 Information sharing within enterprises can stimulate new insights and creativity;					
		F3 Enterprises use newly acquired knowledge to solve problems through standardized processes and mechanisms;					

		F4 Company has a clear responsibility and division of labor in the implementation of various production and operation activities, with a high level of cooperation;					
		F5The compensation of a company's research and development staff is related to the degree of their contribution to innovation.					

Part 4: Enterprise Performance

Please tick the option that best describes your answer.

Variable	Dimension	Question of measurement	Strongly agree 5	Agree 4	Neutral 3	Disagree 2	Strongly disagree 1
Enterprise performance	Financial performance	Q1 The company's profit is higher than that of its main competitors;					
		Q2 Compared with the main competitors, the company's sales grew rapidly;					
		Q3 Company's ROE is higher than that of its main competitors;					
		Q4 The company has a high market share compared with its main competitors;					
		Q5 Companies have a high return on investment relative to their competitors;					
	Innovation performance	H1 The company develops more new products than its main competitors;					
		H2 The profit growth rate of the company's new products is faster than that of its competitors;					
		H3 The company's market share of new products has increased rapidly compared with it's major competitors;					
H4 Compared with the main competitors, the company has a faster reaction to the use of new information.							



APPENDIX B

Semi-Structured Interview Outline

Dear Madam/Sir:

How are you?! This questionnaire is used for writing the doctoral dissertation of RMUTT. The purpose of this research is to investigate the impact of corporate social capital on enterprise performance and the intermediary role of knowledge integration ability.

In quantitative research analysis, it was found that the impact of corporate social capital on enterprise performance varies depending on the performance of the enterprise itself. Therefore, in order to further verify the results of this quantitative analysis, this interview was conducted. Please express your personal views and opinions on the following issues based on your actual situation. We will strictly keep the information you provide confidential. Thank you very much for your support and cooperation!

I. Basic information

1. Your name;
2. Your position in the company;
3. Your business scale;

II. Main questions

Corporate social capital is mainly divided into three dimensions. The structural dimension of corporate social capital is mainly studied from the level of interaction between enterprises, suppliers, customers, departments, and department members. Choose trust as an indicator to measure the dimensions of corporate social capital relationships. The higher the level of social capital relationship maintenance in enterprises, the easier it is for them to exchange and transfer information and knowledge from internal and external connections. Select the language and knowledge platforms shared by enterprises and similar values as indicators to measure the cognitive dimension of corporate social capital.

Knowledge integration ability: mainly divided into knowledge acquisition ability, knowledge transfer ability, and knowledge utilization ability.

Enterprise performance: mainly divided into two dimensions: financial performance and innovation performance. Financial performance reflects the main financial situation of the company's operations; Innovation performance reflects the

company's evaluation of the development results of technology, new products, or new markets.

Do you think corporate social capital will affect enterprise performance? If there is an impact, is it mainly a direct impact or an indirect impact? How do they influence corporate performance?

2. To what extent do you think corporate social capital affects enterprise performance when the performance of enterprises is good?

3. To what extent do you think corporate social capital affects enterprise performance when the performance of enterprises is poor?

4. Do you think knowledge integration ability plays a mediating role in the influence of corporate social capital on enterprise performance? How do they function? To what extent?

5. To what extent do you think knowledge integration ability plays a mediating role in the influence of corporate social capital on enterprise performance when the performance of enterprises is good?

6. To what extent do you think knowledge integration ability plays an intermediary role in the influence of corporate social capital on enterprise performance when the performance of enterprises is poor?

Biography

Name-Surname	Mrs. Zhu Qingjuan
Date of Birth	November 8, 1982
Address	2-203, Block 3, Nanhu Renjia, Gongqingcheng, Jiujiang City, Jiang xi Province, China, 332020
Education	Master of Business Administration NanChang University (2017)
Experiences Work	Lecturer, Gongqing College, Nanchang University (2008 - Present)
Telephone Number	(+86)13755229631
Email Address	Zhu_q@mail.rmutt.ac.th

