

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Management



Bachelor Thesis

**Influence of Supply Chain Management on Enterprise
Performance**

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

BACHELOR THESIS ASSIGNMENT

Qianlu Yin

Economics Policy and Administration
Business Administration

Thesis title

Influence of supply chain management on enterprise performance

Objectives of thesis

The aim of the thesis is to explore the situation of supply chain management (SCM) of Chinese manufacturing enterprises. The thesis also aims to determine the influence of SCM on enterprise performance. The thesis will select four factors: supplier relationships, customer relationship, information sharing, and supply chain integration. The thesis will propose several hypotheses about the relationship between the four factors and enterprise performance. On the basis of multiple hypotheses, the thesis will establish the structure model.

Methodology

The theoretical part will be based on a review of current literature to determine current thinking on Supply Chain Management.

The practical part will be based on the hypotheses and model. A questionnaire survey will be used to collect primary data from employees in manufacturing enterprises and a statistical analysis will be conducted on the data, so as to compare the results of the validation with the assumptions model.

The outcome of the thesis should determine the influence of SCM on enterprise performance.

The proposed extent of the thesis

Approx 40-50 pages

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KAYE, D. *Managing risk and resilience in the supply chain*. London [England]: BSI Business Information, 2008. ISBN 9780580607264.

MULLINS, L J. *Management and organisational behaviour*. Harlow: Financial Time Prentice Hall, 2010. ISBN 9780273728610.



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Declaration

I declare that I have worked on my bachelor thesis titled "Influence of Supply Chain Management on Enterprise Performance" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break any copyrights.

In Prague on _____3/19/2020_____

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Influence of Supply Chain Management on Enterprise Performance

Abstract

Modern manufacturing enterprises are facing with increasingly fierce market competition and therefore SCM is increasingly important for the survival and development of manufacturing enterprises. This research summarized the literature in the field of SCM and found that the previous research on SCM practices has not formed a theoretical system, most of which were limited a specific aspect. Therefore, this research explored the situation of SCM practices of Chinese manufacturing enterprises and selected strategic supplier relationships, customer relationship, information sharing and supply chain integration as four dimensions of SCM practice, so as to understand the influence of SCM practices on enterprise performances.

In this research, 129 valid questionnaires were collected from Chinese manufacturing enterprises. Through empirical analysis, including factor analysis, correlation analysis and regression analysis, this research tested the internal consistency of each factor and verified the rationality of the theoretical model. This research demonstrated that SCM practice has significant positive influence on enterprise performance. This research also confirms the influence path and size of strategic supplier relationship, customer relationship, information sharing and supply chain integration on enterprise performance.

Keywords: supply chain management, SCM practices, supplier management, customer relationship, information sharing, supply chain integration, manufacturing enterprise performance

Vliv řízení dodavatelského řetězce na výkonnost podniku

Abstrakt

Moderní výrobní podniky stále čelí tvrdější konkurenci na trhu, a proto je SCM stále důležitější pro přežití a rozvoj výrobních podniků. Tato práce shrnula literaturu v oblasti SCM a poznamenal, že předchozí výzkum postupů SCM nevytvořil teoretický systém, z nichž většina byla omezena na specifický aspekt. Tato práce proto zkoumala situaci praktik SCM v čínských výrobních podnicích a vybrané strategické vztahy se dodavateli, vztahy se zákazníky, sdílení informací a integraci dodavatelského řetězce čtyři dimenze praxe SCM, aby bylo možné pochopit vliv postupů SCM na výkony podniků.

V této práci se shromáždilo 129 platných dotazníků od čínských výrobních podniků. Prostřednictvím empirické analýzy, včetně faktorové analýzy, korelační analýzy a regresní analýzy, tento výzkum testoval vnitřní konzistentnost každého faktoru a ověřil racionalitu teoretického modelu. Tento výzkum prokázal, že praxe SCM má významný pozitivní vliv na výkonnost podniku. Tento výzkum také potvrzuje vliv cesty a velikost strategických dodavatelských vztahů, vztahů se zákazníky, sdílení informací a integrace dodavatelského řetězce na výkonnost podniku.

Klíčová slova: Klíčová slova: řízení dodavatelského řetězce, příklady SCM, řízení dodavatelů, vztahy se zákazníky, sdílení informací, integrace dodavatelského řetězce, výkonnost výrobního podniku

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List of abbreviations

SCM (supply chain management)
CNY (Chinese Yuan)

1. Introduction

1.1 Background of Thesis

Previously, most of enterprises adopted the vertical integration management mode, such as self-built investment, holding shares or overall merge and acquisition, to participate in other enterprises which provided raw materials, semi-finished products or parts for the enterprises (Johnson, 2006). The purpose of such ‘vertical integration’ management is to enhance their control of the core enterprises on the whole operation process, including raw material supply, product manufacturing, distribution and sale. Thus, enterprises ensured a stable environment and further obtain the market competition initiative (Gurnani et al., 2012).

However, with the development of economy and the progress of technology, the market environment faced by enterprises is becoming more and more complex, and the operating environment of enterprises has changed greatly. The first change is shorter product development cycles and lifecycles. In order to better meet the market demand, modern enterprises have to constantly develop new products, which grew much faster than hat of demands and therefore brought great pressure and challenges to enterprises in marketing, production, development and design (Seuring, 2013).

The second change in in technology. The network communication technology represented by Internet/Extranet eliminates the regional and time limitations, making the transmission of information more rapid and accurate. This not only provides the technical guarantee and tool support for the change of enterprise management mode, but also provides the possibility for the realization of cooperative innovation among modern enterprises (Stentoft & Lüthje, 2012).

The third change is economic globalization and market internationalization. Modern enterprises face a global competitive environment. Enterprises organize production, conduct marketing activities, and compete with competitors worldwide. The trend of globalization not only brings unprecedented opportunities, but also requires enterprises to develop different production and operation ways for different markets (Beske, 2012).

Furthermore, consumer demands also become more diversified. Buyer’s market is one reason leading to diversification of demands. With the increasing abundance of commodity supply, oversupply appears. In the past, customers had to adjust and restrain their needs to accommodate the standardized products. But now, the market environment changed from seller's market to buyer's market, and customers have high bargaining power (Walker & Jones, 2012). Manufacturers have to understand and meet customer preferences to win and retain customers.

As a result, the traditional ‘vertical integration’ management mode failed to respond to the changeable market demand with agility, which could not bear the risks brought by huge investment and too long production cycle further. In current market environment, the relationship between enterprises and upstream and downstream enterprises is no longer a conflict of interest, but a partnership. When facing with fierce competition from raw material supply to end consumer, enterprises are required to achieve win-win and maximize the profit of the overall supply chain through cooperation. Thus, ‘the horizontal integration’ management mode gradually replaced the ‘vertical integration’ management mode (Carter & Rogers, 2008).Global supply chain and the resulting supply chain management (referred as SCM) is a typical representative of the ‘horizontal integration’

management model. International enterprises, such as IBM, Wal-Mart, and P&G and so on, have established cooperative partnerships with suppliers and distributors around the world, forming a long-term strategic alliance. These enterprises form a community of interests surrounding the core enterprises, forming a logistics and information flow network from suppliers, manufacturers, distributors to end users, namely, supply chain (Boström et al., 2015). In order to benefit all enterprises in the supply chain and make each enterprise have its corresponding core competitiveness, it is necessary to strengthen the operation of the supply chain, thus forming the supply chain management (SCM).

China now has become the world's manufacturing centre. In order to adapt to the above changes in the market environment, Chinese manufacturing enterprises need to coordinate both internal departments and the upstream and downstream enterprises, so as to work together to meet the needs of consumers. Therefore, Chinese manufacturing enterprises need to profoundly transform their management mode.

This research will understand the current situation of SCM in Chinese manufacturing enterprises and conduct empirical research to determine the influence of SCM practices on Chinese manufacturing enterprises performances.

1.2 Significance of the Thesis

SCM provides a systematic management idea for modern enterprises to obtain sustainable competitive advantages in the new competitive environment. The implementation of SCM is to connect all business links of all nodal enterprises in the supply chain for optimization, so as to realize the reasonable flow of logistics, information flow and capital flow. Furthermore, the production materials can be transformed into value-added products through the optimized supply chain at the fastest speed to meet the needs of customers.

This research will verify the impact of SCM on Chinese manufacturing enterprises from the four aspects of strategic supplier relationship, customer relationship, information sharing and supply chain integration, mainly by defining variables in these four variables.

On the basis of empirical research, the author will find out the critical path of SCM to influence the enterprise performance, and establishes the theoretical model of supply chain management suitable for Chinese manufacturing enterprises. Therefore, the research on the application of supply chain management in manufacturing industry is not only of theoretical significance, but also of practical significance.

1.3 Structure of the Thesis

The thesis consists of six parts. The first part is introduction. This part introduces the research background of SCM, and expounds the theoretical and practical contributions of this research. The first part also introduces the structure and main content of the thesis.

The second part is objectives and methodology. In this part, the research purpose and objectives to be achieved are firstly described. According to the research purpose and contents, the second part also introduces the research process, as well as the philosophical basis of empirical research, research methods, the specific implementation of questionnaire survey.

The third part is the literature review. This part first reviews the definition, development, and classical theories of SCM. This part also reviews previous studies on the impact of SCM on enterprise performance, building the theoretical basis.

The fourth part will make a statistical analysis of the primary data collected through the questionnaire survey, and determine the statistical relationship between variables through a series of statistical analysis methods.

The fifth part will discuss the results of data analysis and determines the influence of SCM on Chinese manufacturing enterprises

The sixth part is the conclusion, which will summarize the important findings and main conclusions. This part will also point out the limitations of this research and make recommendations.

2. Objectives and Methodology

2.1 Objectives

In the context of global economic integration, it is important for enterprises to improve their competitiveness to consider their business activities from the perspective of supply chain management and form the core capabilities of SCM.

This research will be conducted mainly based on the SCM implementation status of Chinese manufacturing enterprises. This research aims to understand the four important aspects of SCM practices, including strategic supplier relationship, customer relationship, information sharing and supply chain integration, and hopes to extract variables. These variables should comprehensively cover the upstream and downstream strategic supplier relationships and customer relationships of the supply chain, as well as information sharing and supply chain integration. Based on this, the main purpose of this research is to determine the influence relationship and influence mechanism of SCM practices on Chinese manufacturing enterprise performance.

Therefore, this research further hopes to achieve the following objectives in the research process:

- 1) To fully understand the current status of SCM practices of Chinese manufacturing enterprises;
- 2) To establish a theoretical model of the influence of SCM practices from the aspects of supplier relationship, customer relationship, information sharing, and supply chain integration;
- 3) To determine the influence of SCM practices on Chinese manufacturing enterprise performance;

2.2 Methodology

2.2.1 Research philosophy

The method of this research is quantitative and the research logic is deductive, and the philosophical basis of the method is positivism.

In social science research, positivism is defined as an organized method for discovering and proving a set of probabilistic causal laws that predict general patterns of human activity (Holden & Lynch, 2004). Positivism thus combines deductive logic with precise empirical observations of individual behaviour.

Positivism is based on the ontology of objectivism (Tuli, 2010). The ontology of objectivism holds that human society exists objectively, their existence and change are the result of their own development (Tuli, 2010). The world perceived by human is an objective world. Therefore, positivism also holds that human society is observable. In order to understand the society, we must obtain quantitative data through observation. The objective analysis of these data can lead to the understanding of society. At the same time, positivism emphasizes that this knowledge can form a universal general law.

Quantitative method is based on positivism and its logic is deductive. In quantitative methods, researchers use standardized measurement tools to transform research problems

into quantitative indicators, and use statistical analysis methods to analyse and discuss the data. In quantitative research based on deductive method, specific research hypotheses and research questions are usually set first. Research tools include scales, questionnaires or experiments. Therefore, the data obtained are also quantifiable and measurable. By using relevant statistical tools, researchers build mathematical models and use them to analyze indicators and their relationships. Finally, objective, repeatable, and universal results are obtained (Tuli, 2010).

Based on positivism and deductive logic, this research will firstly review the literature on SCM practice, enterprise performance and the relationship between the two, and summarize the research model and put forward the research hypothesis. According to the research model, this research will design a questionnaire, which will include a series of measurable questions about SCM practices and enterprise performance. This research will collect primary data on SCM practices and enterprise performance in manufacturing industry through questionnaires, and analyse and discuss them through statistical methods.

2.2.2 Research design

The purpose of this research is to explore the relationship between SCM practice and enterprise performance. A questionnaire survey will be conducted to investigate the implementation status of four dimensions of SCM practice and seven indicators of enterprise performance of Chinese manufacturing enterprises.

This section mainly designs the research variables involved in the research model and hypothesis, which will be the basis for the survey and data collection. Accurate design and measurement of the concepts in the research model is very important for the results of empirical research (Slevitch, 2011). Psychometrics, such as Michell (2003) and Wrench (2017), propose that the measurement of a concept should not rely on a single item, but should use multiple items to measure a concept. On this basis, the indicators involved in the research model will be measured using the method of multiple items. On the basis of empirical studies discussed in the part of literature, this research will design the questions in the questionnaire.

For the measurement of strategic supplier relationships, at present, scholars have a unified definition of strategic supplier relationship, and most scholars regard it as a single-dimensional concept (Slevitch, 2011). This research will summarize the measurement items of strategic supplier relationship variables in the empirical study. Strategic supplier relationship focuses on the establishment of long-term strategic cooperative relationship with important suppliers, and on the participation and cooperation. The specific questions of strategic supplier relationships are shown in appendix 1.

For the measurement of customer relationship, scholars have a unified definition of customer relationship, and most scholars regard it as a single-dimensional concept. This research will summarize the measurement items of customer relationship variables in the empirical study. SCM practices also emphasize customer participation and cooperation and the questions are also shown in appendix.

For the measurement of information sharing, scholars have different understandings of information sharing from different perspectives and theories. Based on the empirical research of Chatfield et al. (2004) and Zhou & Benton (2007), this research designs the related problems of "information sharing", which are shown in appendix 1. The design of

supply chain integration is based on Chang et al. (2012) and Wolf (2011); and the design of questions about corporate performance is measured on the basis of Li et al. (2005) and Liao et al.(2010), as detailed in appendix 1.

2.2.3 Data collection

The sample subjects of this research are employees and managers of Chinese manufacturing enterprises. The sampling method is simple random sampling. The survey period is from October 25th, 2019 to December 1st, 2019.

The author selected Beijing Shunyi industrial zone, Beijing Daxing industrial zone, and Shenzhen Bao-an industrial zone to conduct the survey. The reason for choosing these three regions is that there are a large number of manufacturing enterprises concentrated in these regions. Conducting surveys in these regions can improve the research efficiency. In addition, manufacturing enterprises in these three places have different industries, such as electronics, chemical industry, machinery, garment processing, etc., which can fully understand the actual situation of SCM practice.

In the implementation of the survey, the author first designed the survey on www.surveymonkey.com, which then automatically generated a link to the online survey. In the actual survey, the author firstly selected the respondents by random sampling method and introduces the purpose and research process of this research to the respondents. After obtaining the consent of the respondents, the author sends the link to the respondents by email or text message. After completing the online questionnaire by selected respondents, there will be feedback the results automatically generated on Survey Monkey website. A total of 180 questionnaires were distributed in this research, and 129 were completed and valid.

2.2.4 Data analysis

According to the purpose of the research and the need of hypothesis testing, SPSS 25.0 software will be used to analyse the survey data. The analysis methods adopted include descriptive statistical analysis, reliability analysis, validity analysis, factor analysis and regression analysis.

The descriptive statistical analysis of this research is mainly to calculate the mean and standard deviation of the variables. This research will use it to describe supply chain management practices, including strategic supplier relationship, customer relationship, information sharing and supply chain integration, and measurement items of enterprise performance, to understand the general level of enterprises in these variables.

Reliability analysis is mainly to test whether the scale has stability and consistency when measuring related variables. Since the questionnaire designed in this research is a ‘multi-option scale’, reliability analysis is particularly important to ensure the quality of the questionnaire. Cronbach's alpha coefficient is the most commonly used in Likert scale. The larger the value, the higher the internal consistency of the variables. The reliability coefficient above 0.9 indicates that the reliability of the scale is very good; a range between 0.7 and 0.9 is very reliable; and coefficient below 0.7, the item of the scale should be excluded.

The content design of this research is based on previous empirical studies, so it has a high content validity, that is, the content of the scale is highly subject relevant. In addition, this research will measure the structural validity of indicators through factor analysis. The main

evaluation method of factor analysis is KMO value and factor loading of each index. The larger the KMO value, the more common factors among variables, which should be above 0.5. In addition, the load of the index item in a dimension should be higher than 0.5, otherwise the index is considered to have no outstanding contribution to the measurement factor and should be removed.

Regression analysis is a predictive modelling technique that studies the relationship between dependent and independent variables. This research will take dimensions of SCM practices as the independent variables and enterprise performance as the dependent variable, so as to determine the influence of SCM practices on enterprise performance through regression analysis.

3. Literature Review

3.1 Supply chain and supply chain management (SCM_

3.1.1 Supply chain

The concept of supply chain first appeared around the 1980s, however, there is still not a unified definition so far. Lin et al. (1999) made a definition of supply chain to an enterprise network system involving logistics capital flow and information flow, including suppliers, manufacturers and sellers. Then from the perspective of static and topological structure, scholars further believe that supply chain emphasizes a network, including the enterprise itself, suppliers, vendors and other partners, and customers (Chatfield et al., 2009). Chatfield et al. (2009) defined the supply chain as a functional network chain that performs the procurement of raw materials, converts them into intermediate products and finished products, and sells the products to users. While emphasizing that supply chain is a functional network, Chatfield et al. (2009) also revealed the strategic partnership of supply chain.

Some scholars also defined supply chain from the perspective of dynamic process and operational mechanism, emphasizing supply chain to be a process of coordinated planning, organization, coordination and control of commercial flow, capital flow, logistics and information flow. Stevens & Johnson (2016) indicated that supply chain is the process of controlling the whole process from suppliers' suppliers to users' users through the value-added process and distribution channels. It starts at the source point of supply and ends at the end of consumption. According to Medlin (2004), a supply chain is an organizational network that involves organizations from upstream to downstream, generating value for products or services delivered to end users in different processes and activities.

Another third point, represented by the research results of Michigan State University, put forward the definition of supply chain in a broad sense (Melnik et al., 2000). Melnik et al. (2000) emphasize that supply chain is not only a functional network chain, but also a process. At the same time, supply chain is an integrated supply chain for multi-company 'relationship management', including the whole process from the purchase of raw materials to the delivery of products and services to the end consumers. The collaborative value results of enterprises at each node in the supply chain are derived from the five 'flows', including information flow, product flow, service flow, capital flow and knowledge flow. The innovation of this view lies in the integration of service flow and knowledge flow into the supply chain process.

Through the review of the definition of supply chain, this research believes that the concept of supply chain mainly includes the following aspects: 1) supply chain participants: suppliers (raw material suppliers, parts suppliers), manufacturers, sellers, transporters, etc.; 2) supply chain activities: raw material procurement, transportation, processing and manufacturing, and delivery to customers; 3) several types of supply chain flows: logistics, capital flow and information flow and so on; and 4) topology of supply chain: such as network, chain and network chain. Thus, this research proposes its own definition of supply chain: supply chain can be regarded as a network chain structure

consisting of a series of value-added activities from the purchase, transportation, processing and manufacturing of raw materials to the delivery to customers. Among the suppliers, producers, distributors, and transporters, all of which provide these activities, logistics, cash flow and information flow pass through all links.

3.1.2 Supply chain Management(SCM)

Scholars have also studied SCM from various aspects and there is not a unified definition of SCM yet.

According to Croom et al. (2000), supply chain management is not another name for supplier management, but a new management strategy. SCM integrates different enterprises and effectively manages them to enhance the efficiency of the whole supply chain. SCM focuses on the cooperation among enterprises, so that all links of the supply chain work together to improve customer satisfaction and the overall benefit of the supply chain (Croom et al., 2000).

Johnson et al. (2006) indicated that SCM is a systematic approach that comprehensively manages the flow of information, materials and services from raw material suppliers to factory warehouses and then to the end users, emphasizing all aspects of product delivery to customers. Johnson et al.'s point of view is based on the integration of management ideas and methods. At the same time, Johnson et al. (2006) also emphasized that SCM not only meets the needs of customers, but also effectively integrates suppliers, manufacturers, distributors and retailers to produce products, so as to minimize system costs and ensure that the right quantities of goods are delivered to the right place at the right time.

Differently, Prajogo & Olhager (2012) focus on the information flow when defining SCM. Prajogo & Olhager (2012) indicated that SCM connects suppliers, manufacturers, distributors, retailers, and the end users through the feed-forward information flow (flow from the demanders to the suppliers, such as contracts, processing orders, purchase orders, etc.) and feedback of the material flow and information flow (flow from the suppliers to the demanders, such as the bill of lading, warehouse receipts, completion report, etc.).

CLM (Council of Logistics Management of the US) also publishes its definition of SCM: SCM includes all planning and management activities and all logistics management activities involving procurement, outsourcing, transformation and other processes (Mentzer et al., 2009). More importantly, SCM also includes coordination and collaboration between enterprises and their channel partners, involving suppliers, intermediaries, third-party service providers, and the end customers.

In essence, SCM is the integration of supply and demand management within and between enterprises. This research also provides its own definition of SCM: SCM is modern management technology and management mode that integrates, plans, controls and coordinates the logistics, capital flow and information flow on the whole network chain structure formed from suppliers' suppliers to customers' customers.

3.2 SCM practice

3.2.1 Dimensions of SCM practice

SCM practices are a set of activities undertaken to promote the effective management of supply chains (Li et al., 2006). With the purpose of improving enterprise performances, scholars determined the composition of SCM practices from different perspectives. Alvarado & Kotzab (2001) focused on the core competencies, the use of systems (e.g. EDI, Electronic Data Interchange) within the organization, and the use of custom deactivation strategies to eliminate excess inventory at the end of the supply chain in their list of practices. Wisner & Tan (2000) selected six aspects of SCM practices through factor analysis: supply chain integration, information sharing, supply chain characteristics, customer service management, geographical advantages and JIT capabilities. Chen & Paulraj (2004) measured supply chain partnerships in terms of supplier reduction, long-term partnerships, communication, cross-functional teams, and supplier involvement. Min & Mentzer (2004) determined that SCM practices in the supply chain should include consistent vision and goals, information sharing, risk and benefit sharing, cooperation, production integration, long-term partnership and consistent supply chain leadership, on the basis of the partnership of the whole supply chain. Robb et al. (2008) studied the specific practice of SCM in enterprises and summarized three modules that have practical significance and can represent SCM practice in enterprises: advanced manufacturing technology, advanced manufacturing system and human resource development. Li et al. (2006) proposed and confirmed five significant measurement dimensions that SCM practices should include based on their research on manufacturing enterprise in the US, including strategic supplier relationship, customer relationship, information sharing level, information sharing quality, and delayed manufacturing.

The above literatures described SCM practices from different theoretical perspectives, with the ultimate goal of improving enterprise performances and supply chain performance. This study selects the measurement dimension included in SCM practice also from the purpose of improving the performance of manufacturing enterprises in supply chain. From the above literatures, this research believed that SCM practices primarily rely on the mutual cooperation rather than competition among enterprises in the supply chain, so SCM practices should first include the partnerships with suppliers and with customers. In addition, partnerships with customers can also bring benefits to manufacturers, such as increased customer loyalty. As mentioned above, the essence of SCM is to obtain the maximum value through the management of information flow, logistics and capital flow between nodes of the supply chain (Hong et al., 2018). Also, supply chain integration is the core of SCM. Only through the integration of supply chain can the core competitiveness of enterprises at each node be fully utilized, so as to optimize the coordination of various supply chain activities and maximize the performance of supply chain.

In summary, this research selects four dimensions of SCM practice, including strategic supplier relationship, customer relationship, information sharing and supply chain integration.

3.2.2 Strategic supplier relationship

Li et al. (2006) indicated that the strategic relationship with suppliers enables enterprises to cooperate more closely with a few important suppliers, and both sides share the responsibility for product success. At present, research of strategic supplier relationship

focuses on two fields: supplier selection and evaluation, and supplier relationship management.

Supplier selection and evaluation is an important decision in SCM. A good supplier can enable enterprises to save costs, improve quality, enhance market capacity and strengthen supply chain flexibility (Prajogo et al., 2012). The earliest and most influential study on supplier selection was by Dickson, who obtained 23 supplier evaluation criteria by analysing 170 survey results of purchasing agents and purchasing managers (Kim & Boo, 2010). Weber et al. (1991) reviewed 74 literatures related to supplier selection since 1966, focusing on the criteria and analytical methods used in the supplier selection process. Weber et al. (1991) found that price was the most discussed criterion. From the above literatures, the contents of the indicator system for supplier selection are basically the same; while for the methods of supplier selection, different studies have adopted a variety of different methods, such as AHP method, neural network method, fuzzy evaluation method, etc. (Deshmukh & Chaudhari, 2011; Li et al., 2005; Xiao-dong & Jian-hua, 2009). Research in this area is still continuing, and new means and methods are constantly emerging, which is very beneficial for supplier management.

Strategic supplier relationship management is a contractual and long-term dependent cooperative relationship, which benefits both parties. Lamming et al. (2001) divided the relationship management between enterprises and suppliers into several stages, including the traditional stage, the tension stage, the improvement stage and the partnership stage, through the longitudinal observation of the manufacturing industry in the US and the horizontal comparison with the manufacturing industry in other Asian and European countries. At the same time, Lamming et al. (2001) believed that a large part of the reason for the change of the relationship between enterprises and suppliers is the change of market structure, and the external pressure forces enterprises to re-examine the relationship between enterprises and suppliers. According to Sako (2006), the development of the cooperative relationship mainly depends on the degree of trust of both parties and the length of interaction. Sako (2006) proposed two concepts of 'trust in goodwill' and 'trust in capacity'. During the period of 'contractual relationship with safe distance', companies were careful about how they interacted with each other, reflecting the fact that companies are not keen to accept favours they thought would not be returned in the future; while during the period of 'obligatory contractual relationship', companies believe that it is normal to receive benefits from each other or assume obligations from each other (Sako 2006; Sako & Helper, 2018).

From the above literature, when manufacturing enterprises develop strategic supplier relationship, some aspects should be fully considered, such the shortened lead time and improved supply flexibility, higher control of production process, information sharing, the improvement in customer satisfaction and so on. The summary of these aspects of supply relationship will be of great guiding significance for the design of the follow-up questionnaire.

3.2.3 Customer relationship

Customer relationship, including dealing with customer complaints, establishing a long-term relationship with customers, and improving customer satisfaction, ultimately aims to maximize the long-term performance of enterprises (Li et al., 2006). With the growth of mass customization and personalized services, customer relationship management is crucial to the survival of enterprises. Riley et al. (2003) indicated customer relationship has

become an intangible asset, which is the key and even decisive element of shareholders' assets. Leonidou et al. (2004) confirmed that good customer relationship could improve the repeat purchase rate of customers, explore new business opportunities, and reduce the loss rate of customers. Wang et al. (2006) indicated that close customer relationship can distinguish an organization's products from its competitors, maintain customer loyalty, and greatly enhance the value provided to customers. Li et al. (2005) also pointed out that establishing and maintaining customer relationships can effectively reduce market risks, improve information flow inside and outside the enterprise, increase customer satisfaction and customer loyalty, and thus maximize enterprise profits. Jayaram et al. (2010) regarded customer relationship management as an important part of SCM practice.

The value of customer relationship to the enterprise is not only directly reflected in the increase of the total amount of products purchased by customers, but also reflected in other aspects. For example, Cao & Zhang (2010) discusses the advantages of scale brought by customer management. If an enterprise establishes a good customer relationship with its customers, it will have a large number of loyal customers. The increase of loyal customers enables the enterprise to occupy a relatively large market share, thus forming a scale advantage and reducing the cost of the enterprise. Ozalp et al. (2010) studied the value of information. According to Ozalp et al. (2010), customer information is the most important value for the enterprise, which directly affects the enterprise's business behaviours, as well as its understanding of customer consumption behaviour. Good customer relations will encourage customers to give more personal information to the enterprise, thus increasing the probability of the enterprise to provide more personalized services; On the other hand, a good customer relationship will make customers pay close attention to the enterprise, thus providing more Suggestions and opinions on improving products and services (Ozalp et al., 2010).

3.2.4 Information sharing

Information sharing is the communication level of key and specialized information between an enterprise and its supply chain members (Zhou & Benton, 2007). Many researchers have emphasized the importance of information sharing in SCM practices.

Information sharing among members of the supply chain is very important for SCM practices and the improvement of enterprise performance. According to Chatfield et al. (2004), information sharing can effectively reduce the impact of the bullwhip effect. Under the bullwhip effect, information distortion is amplified when it is transferred from one enterprise to another in the supply chain, and small changes in end-user demand lead to large changes in the order quantity of upstream enterprises. actually, the bullwhip effect is a major factor in reducing efficiency and information sharing is one effective way to reduce the bullwhip effect (Chatfield et al., 2004). By concentrating customer demand information, the uncertainty of the whole supply chain can be effectively reduced, thus effectively reducing the bullwhip effect and improving the efficiency (Chatfield et al., 2004).

Lotfi et al. (2013) also confirmed that information sharing is important in SCM. Through information sharing, supply chain enterprises could effectively reduce the bullwhip effect in the upward transmission of final market demand information along the supply chain, control inventory, reduce costs, and improve the satisfaction of end customers. Zhao et al. (2002) conducted simulation experiments and confirmed that information sharing significantly influenced supply chain performance: when an enterprise shares customized

information on future demand with its suppliers, the total cost of the enterprise and its suppliers will be reduced and the service level will be improved. Zhou & Benton (2007) confirmed that effective information sharing significantly improved the effectiveness of SCM practices through data analysis of more than one hundred north American manufacturers, and that effective information sharing is crucial to corporate performance.

Based on the above literature, this research suggests that information sharing can make the supply chain partners to work together. Through the query and analysis of the information such as inventory, purchasing, production, and sales, enterprise accurately understand the customer demand in the shortest time and understand the supply, inventory and production situation along the supply chain, so as to shorten the delivery time, improve product quality and variety, reduce various costs, and improve customer satisfaction (Sezen, 2008).

3.2.5 Supply chain integration

Supply chain integration refers to the operation and management activities that take the core enterprise as the core, and optimize the process, organization, process and management related to the supply chain, so as to improve the performance of the core enterprise and other enterprises in the supply chain (Flynn et al., 2010).

Wolf (2011) argued that the problems faced by manufacturers, such as parts shortage, delivery and quality problems, and cost growth, are rooted in the lack of effective supply chain integration. Wolf (2011) further indicated that through supply chain integration, many enterprises can concentrate their production power, which not only eliminate excess inventory, but also improve customer satisfaction and thus increase sales. In addition, supply chain integration effectively reduced the market risks, so that all partners obtain core competitiveness and create more competitive advantages.

Narasimhan et al. (2010), by comparing the effects of supply chain integration and diversification on performance, confirmed that the coordinated use of supply chain integration strategy and diversification strategy had a significant impact on enterprise performance. Childerhouse & Towill (2003) also found through investigation that when faced with the competitive pressure of low cost and high quality from Southeast Asian countries, the US garment textile industry integrated upstream and downstream manufacturers, thus effectively shortening the time to market and saving \$12.5 billion annually.

From the above literature, this research believes that supply chain integration emphasizes the coordination of all links of the supply chain and integrates all links together with information technology. The integration can speed up the logistics, but also avoid many unnecessary inventory costs. After the integration of supply chain, more links have their own core capabilities. In addition, the integration of supply chain can realize reasonable and optimized division of labour, so as to improve management efficiencies.

3.3 Enterprise performance

3.3.1 Definition

Different scholars have different understandings of the meaning of performance. One view holds that performance is the result. Bernardin & Wiatrowski (2013) defines performance

as the record of results produced in a specific time frame, in a specific job function or activity. They believe that a results-centred approach is preferable for performance management because it links individual efforts to organizational goals. Another view is the behavioural view of performance. Parsons & Murphy (2008) pointed out that performance is defined as a set of behaviours related to the goals of the organization or organizational unit, while the organization or organizational unit constitutes the working environment of individuals. In this research, performance includes both results and behaviours. Performance reflects the process by which employees achieve certain results in certain ways over a certain period of time.

In the performance evaluation of the company, a set of enterprise performance evaluation index system with financial indicators as the main and non-financial indicators as the auxiliary has been formed. Financial and market criteria are used to measure corporate performance, including return on investment, market share, sales margin, ROI growth, sales growth, market share growth, and overall competitive position (Li et al., 2005; Liao et al., 2010; Tracey et al., 2005). Based on the above literature, this research will adopt these dimensions to measure enterprise performance.

3.3.2 Influence of SCM practices on enterprise performance

Scholars have studied the impact of SCM practices on enterprise performance from an empirical perspective, and different scholars focus on different aspects of SCM practices.

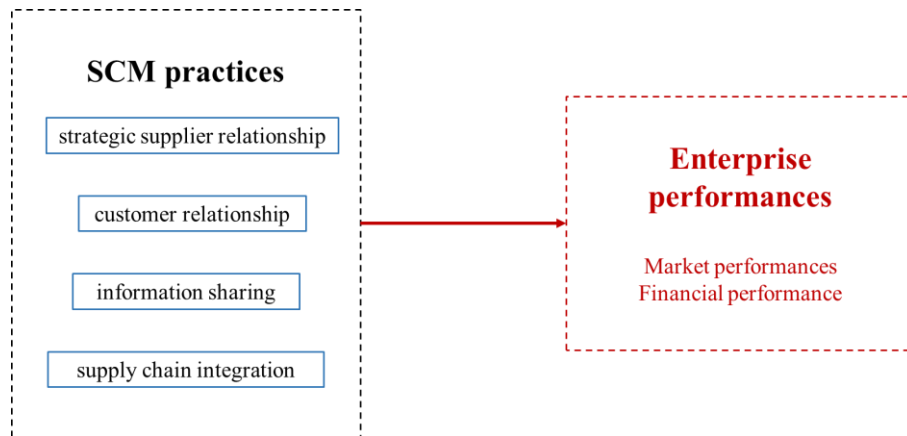
Li et al. (2005) verified that high-level SCM practice significantly improved the market and financial performance of enterprises through the investigation on the SCM practice status of enterprises. Lee et al. (2007) studied the cooperative relationship between enterprises and suppliers and customers, and confirmed that both have an impact on enterprise performance. Holland & Sodhi (2004) found that information sharing reduced the bullwhip effect caused by insufficient information sharing among supply chain partners. In addition, higher level of information sharing can bring lower total cost, higher order completion rate and shorter production cycle. Chang et al. (2012) pointed out that the close partnership made the mutual knowledge and other key resources shared by enterprise and its suppliers and customers develop beyond their organizational boundaries, which may be embedded in the manufacturer's production, research and development process. This is favourable to strengthen the standardization of technology or product, provide knowledge, and improve the utilization rate of key resources.

3.4 Summary

Based on the literatures above, this research proposed its own research model, as shown in figure 1. The four aspects included in SCM practices include strategic supplier relationship, customer relationship, information sharing and supply chain integration. And the performances of manufacturing enterprise will include both market performances and financial performances. This research also proposes following hypotheses:

- H1: strategic supplier relationship has positive influence on enterprise performances;
- H2: customer relationship has positive influence on enterprise performances;
- H3: information sharing has positive influence on enterprise performances;
- H4: supply chain integration has positive influence on enterprise performances;

Figure 1 Research model



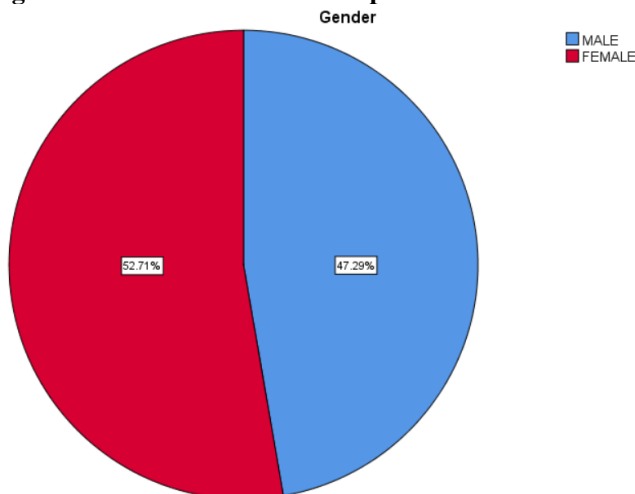
4. Data analysis and findings

4.1 Descriptive analysis

4.1.1 Basic features of the sample

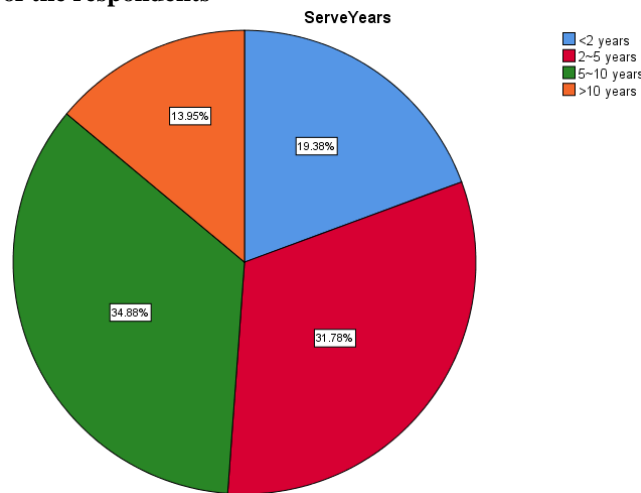
At first, this research conducted a descriptive statistical analysis of the basic characteristics of the respondents. In this questionnaire survey, there are 61 male respondents, accounting for 47.3%; and there are 68 female respondents, accounting for 52.7%, as shown in figure 2.

Figure 2 Gender structure of sample



Among all the respondents, it can be seen that most of them have served enterprises for 5 to 10 years, accounting for 34.9%, and for 2 to 5 years, accounting for 31.8%. In addition, nearly 20% of respondents have served for less than two years, and 14% of respondents have served for more than 10 years, as shown in figure 3.

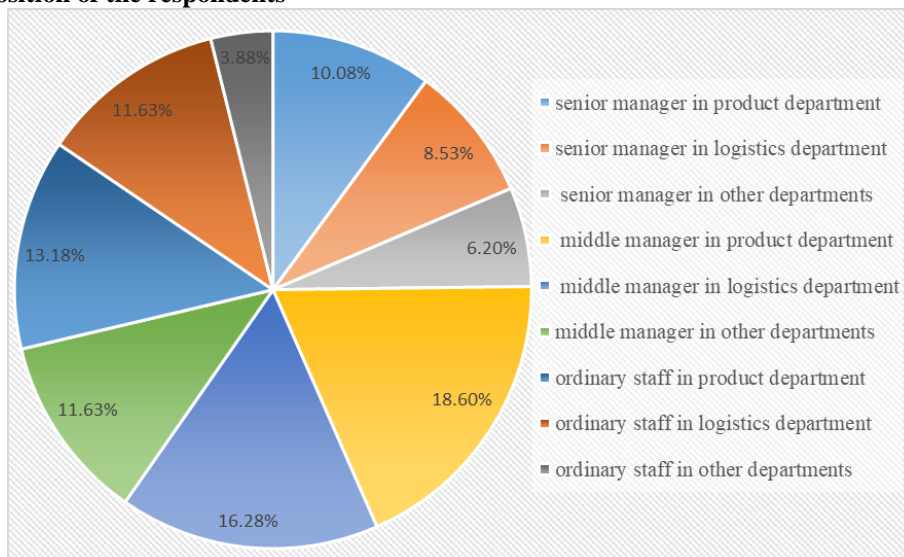
Figure 3 Serving years of the respondents



In the position survey of respondents, it can be seen that there are more middle managers in the production department and in the physical department, accounting for 18.6% and 16.3% respectively. Followed is the general staff of production department and logistics department, accounting for 13.2% and 11.6% respectively; fewer respondents are employees in other departments, such as sales, logistics, administration, etc., as shown in figure 4.

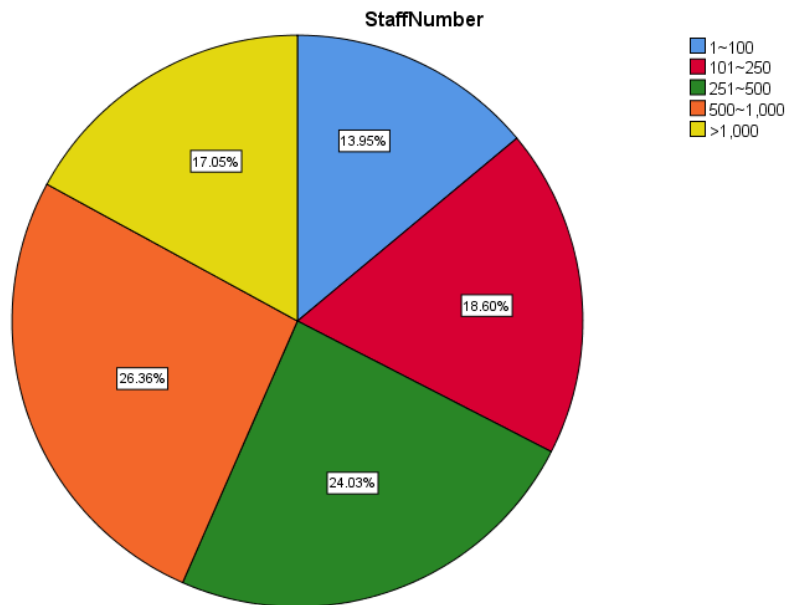
It can be seen from the above data that most of the respondents are middle managers and employees of manufacturing and logistics departments. They have worked in the enterprise for a certain number of years and have a clear understanding of the basic situation of the enterprise, who can objectively reflect and evaluate the SCM practice in the manufacturing enterprises.

Figure 4 Position of the respondents



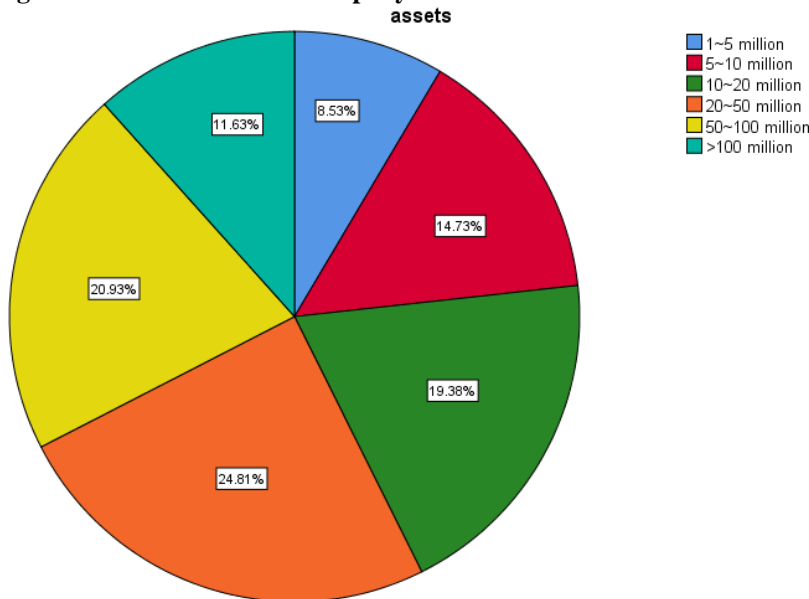
After a preliminary understanding of the characteristics of the respondents, this research also conducted a survey on the basic situation of the enterprise. According to figure 5, the number of employees in most enterprises ranges from 250 to 1,000, accounting for 50%. There are also some small and medium-sized enterprises with less than 100 employees, accounting for 14%.

Figure 5 Staff numbers



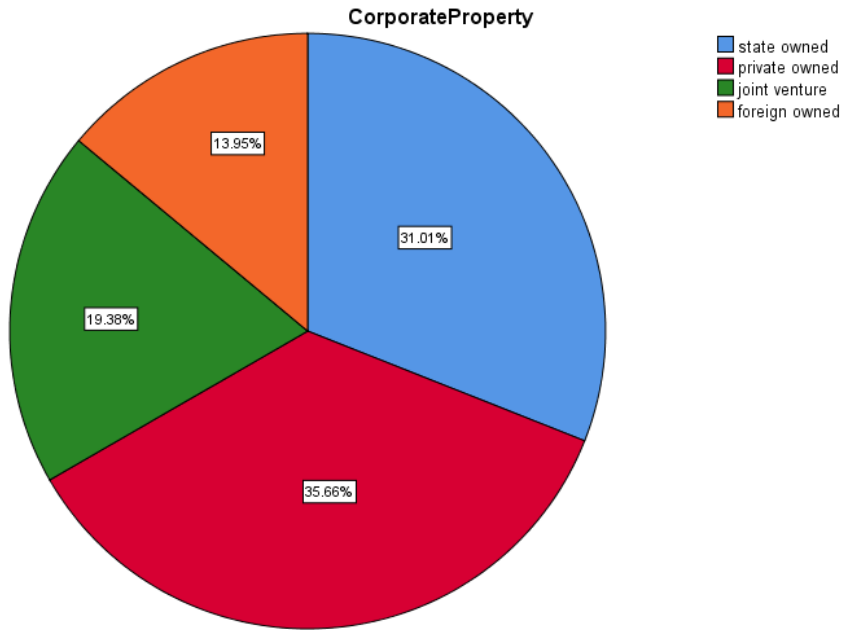
In addition, in terms of the total assets of enterprises, more enterprises have total assets ranging from 20 to 50 million CNY, accounting for about 25%, followed by enterprises with total assets of 50~100 million CNY, accounting for about 21%, as shown in figure 6. Similar to the size of the enterprise, small and medium-sized enterprises, with total assets less than 5 million CNY, have a small number, accounting for 8.5%.

Figure 6 Total assets of the company



In terms of enterprise ownership, private enterprises and state-owned enterprises account for 35.7% and 31% respectively, as the majority. Joint ventures and foreign-owned enterprises accounted for 14% and 19.4% respectively. The ratio of state-owned enterprises and private enterprises is larger, in line with the current reality in China.

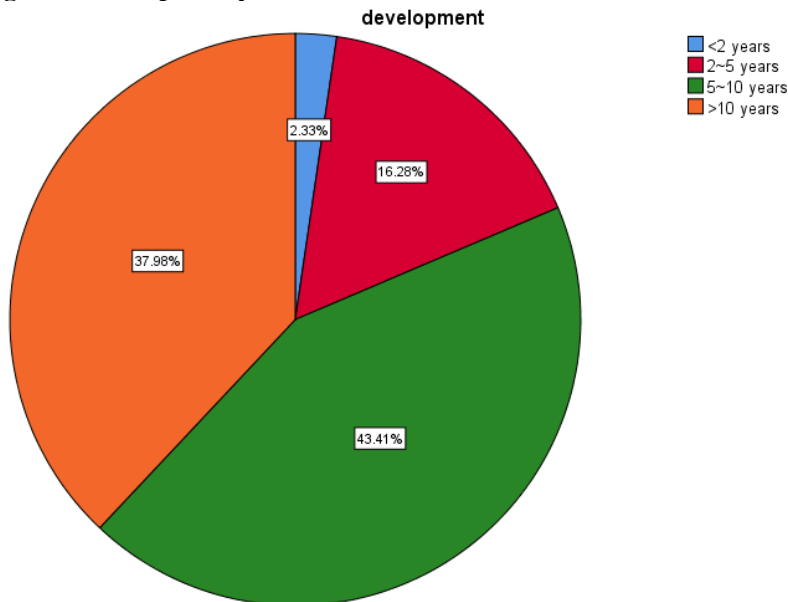
Figure 7 Corporate property



From figure 8, most of these enterprises have developed for 5 to 10 years, accounting for 43.4%, or even more than 10 years, accounting for 38%. Newer manufacturers make up just 2.3% of the total.

According to the above data, it can be seen that most enterprises belong to medium and large enterprises with a certain length of development history, which is beneficial for this study to investigate the SCM practice and its influence on enterprise performance.

Figure 8 Development years



4.1.2 Descriptive analysis on SCM practices and enterprise performances

Descriptive statistical analysis mainly uses general statistical methods such as mean value and standard deviation to conduct descriptive analysis on SCM practices and enterprise performance, so as to understand the actual situation of SCM practices and enterprise performance of Chinese manufacturing enterprises. The overall situation of the four

aspects of SCM practices and enterprise performance of the sample enterprises are shown in table 1-5.

First of all, table 1 shows the descriptive analysis of the strategic supplier relationship of surveyed manufacturing enterprises. Among the seven measurement indexes of strategic supplier relationship, S1 and S2 have the highest scores, both above 3.6, indicating that quality is still the first criterion for most domestic manufacturing enterprises to choose suppliers. Meanwhile, enterprises also attach great importance to solving problems together with suppliers. However, S6 has the lowest score of 3.11, while S3 and S4 also have low scores of 3.16 and 3.18 respectively, indicating that the product development process and subsequent improvement process of the surveyed enterprises are relatively independent and lack the effective participation of its strategic suppliers. From the literature review, scholars have demonstrated that the comprehensive participation of suppliers in product development can improve the production process, help design products and bring many other benefits. Therefore, Chinese manufacturing enterprises should consider strengthening cooperation with their strategic suppliers.

Table 1 Strategic supplier managment

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
Strategic supplier relationship 1	129	1.00	5.00	3.6434	1.09543
Strategic supplier relationship 2	129	1.00	5.00	3.6124	0.94629
Strategic supplier relationship 3	129	1.00	5.00	3.1628	1.08102
Strategic supplier relationship 4	129	1.00	5.00	3.1860	1.06630
Strategic supplier relationship 5	129	1.00	5.00	3.4186	1.02848
Strategic supplier relationship 6	129	1.00	5.00	3.1163	1.06528
Strategic supplier relationship 7	129	1.00	5.00	3.2713	1.07349

Among the six measurement indexes of customer relationship, as shown in table 2, C4 and C6 have higher scores, both above 3.7, indicating that the surveyed enterprises attach more importance to building customer trust and acquiring and tracking customer feedback on quality service, which is indeed in line with the current reality of China.

And C2 scored lowest, which is only 3.08. This is because it is quite difficult to measure customer satisfaction, and there is no unified standard of customer satisfaction scale. Particularly, the surveyed enterprises are in various industries, it is difficult to design a universal scale for the surveyed enterprises.

Table 2 Customer relationship

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
Customer relationship 1	129	1.00	5.00	3.3488	1.10150
Customer relationship 2	129	1.00	5.00	3.0853	1.09709
Customer relationship 3	129	1.00	5.00	3.2791	1.00760
Customer relationship 4	129	1.00	5.00	3.7597	1.10238
Customer relationship 5	129	1.00	5.00	3.3721	1.09737
Customer relationship 6	129	1.00	5.00	3.7829	1.09659

Table 3 shows the six measures of information sharing. I1 has the highest score among the six dimensions, reached 4.29. This is because the evaluation of I1 is highly subjective, and there is an information asymmetry problem between enterprises and suppliers. Therefore, most of the respondents believed that in the event of a requirements change, they will inform

supply chain partners. The high score of I1 also suggests that enterprises still attaches great importance to its credibility in the cooperation.

However, I4 and I6 have low scores of 3.07 and 3.11. Currently, cooperation forms such as strategic alliances are still in initial stage. Moreover, in China, the credibility guarantee system is not sound, so even when there are cooperative relationships with supply chain partners, enterprises rarely share their core business knowledge with their partners. This explains why I4 and I6 have lowest scores.

Table 3 Information sharing

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Information sharing 1	129	2.00	5.00	4.2868	0.83098
Information sharing 2	129	1.00	5.00	3.4884	1.06152
Information sharing 3	129	1.00	5.00	3.4961	1.09061
Information sharing 4	129	1.00	5.00	3.0698	1.15370
Information sharing 5	129	1.00	5.00	3.5736	1.02145
Information sharing 6	129	1.00	5.00	3.1085	1.12667

In the five indicators of measurement of supply chain integration, as shown in table 4, SC3 and SC4 have reached more than 4.0, and S1 and S5 also have score more than 3.5. The results shows that Chinese manufacturing enterprises have achieved good results in the supply chain integration, mainly through the introduction of new methods and new technologies, so as to enhance the business enterprise inside the supply chain process integration. With the concept of supply chain competition, the number of cooperation between supply chain partners is also gradually increasing.

In addition, the score of S2 is the lowest, but it also reaches 3.4, indicating that the production system in Chinese manufacturing enterprises has not yet achieved entire flexible production and timely response, so the response time needs to be improved.

Table 4 Supply chain integration

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Supply Chain integration 1	129	1.00	5.00	3.5736	1.08091
Supply Chain integration 2	129	1.00	5.00	3.4031	1.10056
Supply Chain integration 3	129	1.00	5.00	4.0155	1.13182
Supply Chain integration 4	129	1.00	5.00	4.0930	1.01120
Supply Chain integration 5	129	1.00	5.00	3.8217	1.17560

Table 5 shows the evaluation of the enterprise performance by the respondents on the manufacturing enterprises they work in. Among the seven measures of enterprise performances, the score of EP7 is the highest, reaching 3.55. Since most of the surveyed enterprises belong to large manufacturing enterprises, the competitive position of enterprises in the industry is relatively high.

EP5 has the lower score, which is 3.07. This is due to the fact that the background of the surveyed enterprises belong to the manufacturing industry. At present, most manufacturing enterprises still mainly adopt cost leadership strategy, so the growth of investment return is generally low.

Table 5 Enterprises performance

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
EP1	129	1.00	5.00	3.4496	1.11075

EP2	129	1.00	5.00	3.2853	1.13214
EP3	129	1.00	5.00	3.2481	1.13214
EP4	129	1.00	5.00	3.4031	1.15596
EP5	129	1.00	5.00	3.0698	1.14691
EP6	129	1.00	5.00	3.1240	1.13198
EP7	129	1.00	5.00	3.5504	1.12473

4.2 Reliability analysis

The reliability of SCM practice scale and enterprise performance scale is mainly judged by Cronbach's Alpha coefficient. According to the methodology, Cronbach's Alpha should be greater than 0.6. The results of the reliability test are shown in figure 6.

Table 6 Reliability test

Summary Item Statistics						
	Mean	Variance	Minimum mean	Maximum mean	N of Items	Cronbach's Alpha
SCM practices						
Strategic supplier relationship	3.344	0.047	3.116	3.643	7	0.860
Customer relationship	3.438	0.077	3.085	3.783	6	0.902
Information sharing	3.504	0.193	3.070	4.287	6	0.867
Supply chain integration	3.781	0.085	3.403	4.093	5	0.925
Enterprise performances						
Supply chain integration	3.276	0.037	3.070	3.550	5	0.802

As shown in figure 6, the measurement scales of enterprise performance scales and various dimensions of SCM practice meet the standards, and the mean and variance values are also ideal, indicating that the internal consistency of the two scales is high and the reliability is good.

4.3 Validity test and factor analysis

For SCM practice variables, 24 indicators measuring the four dimensions of SCM practice were used for factor analysis. For the enterprise performance scale, 7 indicators measuring enterprise performance were used for factor analysis. According to the discussion in the methodology section, the KMO value of the scale is required to be greater than 0.5, and the standard factor load value of the index is required to be greater than 0.5. The results of factor analysis are shown in the table below.

Table 7 KMO and Bartlett's Test on SCM practices

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.873	
Bartlett's Test of Sphericity	Approx. Chi-Square	1745.169
	df	15
	Sig.	0

Table 8 Principal Component analysis on SCM practices

Component	Total Variance Explained	
	Initial Eigenvalues	Extraction Sums of Squared Loadings

	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.138	42.243	42.243	11.138	37.413	42.243
2	8.521	28.171	70.414	9.862	29.77562977	67.189
3	4.338	16.409	86.823	5.867	18.84028828	86.029
4	1.251	10.044	96.867	1.518	10.83782357	96.867
5	0.618	0.490	97.357			
6	0.102	0.427	97.784			
7	0.079	0.327	98.111			
8	0.070	0.291	98.402			
9	0.063	0.263	98.666			
10	0.047	0.195	98.860			
11	0.039	0.164	99.024			
12	0.038	0.157	99.180			
13	0.033	0.137	99.318			
14	0.026	0.108	99.426			
15	0.022	0.093	99.519			
16	0.021	0.087	99.606			
17	0.019	0.078	99.684			
18	0.017	0.072	99.756			
19	0.013	0.055	99.810			
20	0.012	0.052	99.862			
21	0.011	0.046	99.909			
22	0.010	0.040	99.949			
23	0.007	0.030	99.979			
24	0.005	0.021	100.000			

Extraction Method: Principal Component Analysis.

Table 9 Component Matrix of SCM practice

Component Matrix

item	Factor load
S1	0.523
S2	0.476
S3	0.773
S4	0.772
S5	0.644
S6	0.716
S7	0.765
C1	0.745
C2	0.626
C3	0.669
C4	0.633
C5	0.625
C6	0.578
I1	0.640
I2	0.679
I3	0.598
I4	0.569
I5	0.616
I6	0.658
SC1	0.595

SC2	0.626
SC3	0.674
SC4	0.671
SC5	0.597

It can be shown from table 7 that the KMO value is 0.873, far more than 0.5, and the significance value (sig. value) is 0, far less than 0.05, indicating that the 24 indicators of SCM practice have good structural validity and suitable for further factor analysis. The author then conducted principal component analysis on the 24 dimensions of SCM practices and the results are shown in table 8. There are 4 principal component factors extracted, with the Eigenvalues greater than 1. For the total variance, the cumulative proportion of the four extracted common factors was up to 96.87%, that is, the four factors could represent most information of SCM practices. Then according to table 9, 24 indexes of SCM practice are extracted into 4 common factors, and the factor load value of each index is greater than 0.5. The four factors are Strategic supplier relationship, customer relationship, information sharing, and supply chain integration, based on above literature review.

Table 10 KMO and Bartlett's Test on enterprise performances

KMO and Bartlett's Test	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.917
Bartlett's Test of Sphericity	Approx. Chi-Square
	2117.428
	df
	21
	Sig.
	0.000

Table 11 Component Matrix of enterprise performances

Component Matrix	
	Component
EP1	0.871
EP2	0.724
EP3	0.774
EP4	0.718
EP5	0.580
EP6	0.574
EP7	0.610

It can be shown from table 10 that the KMO value is 0.917, far more than 0.5, and the significance value (sig. value) is 0, far less than 0.05, indicating that the 7 indicators of enterprise performance have good structural validity. According to table 11, 7 indexes of enterprise performances are extracted into 1 common factors, and the factor load value of each index is greater than 0.5.

4.4 Correlation analysis

Correlation analysis Correlation analysis refers to the correlation between variables, and the degree of linear correlation between variables is shown as correlation. The absolute value of the correlation coefficient between variables is between 0 and 1. When the two variables are negatively correlated, the coefficient is negative; and when the two variables

are positively correlated, the coefficient is positive. To understand the correlation between SCM practice dimensions and enterprise performance dimensions, this research adopted Pearson analysis to explore the degree of significant influence and correlation between these variables so as to understand the internal correlation between these variables and further verify the hypotheses proposed in chapter 3.

Table 12 Correlation analysis on the internal dimensions of SCM practices

		Correlations			
		ssr	cr	is	sci
ssr	Pearson Correlation	1	.990**	.986**	.976**
	Sig. (2-tailed)		0.000	0.000	0.000
cr	Pearson Correlation	.990**	1	.987**	.984**
	Sig. (2-tailed)	0.000		0.000	0.000
is	Pearson Correlation	.986**	.987**	1	.982**
	Sig. (2-tailed)	0.000	0.000		0.000
sci	Pearson Correlation	.976**	.984**	.982**	1
	Sig. (2-tailed)	0.000	0.000	0.000	

** . Correlation is significant at the 0.01 level (2-tailed).

The author first conducted correlation analysis of the variables of SCM practices, and the results are shown in table 12. All the four factors of SCM practices are correlated with each other, with the sig. value much smaller than 0.01 and the coefficient higher than 0.9. The results indicate that these dimensions are interrelated with each other.

Table 13 Correlation analysis on SCM practices and enterprises performances

		Correlations				
		ssr	cr	is	sci	ep
ep	Pearson Correlation	.892**	.791**	.719**	.878**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	

** . Correlation is significant at the 0.01 level (2-tailed).

Then, the author used SPSS to analyse the correlation between the influencing factors of SCM practices and enterprise performance, and further tested whether there was a correlation between SCM practice and enterprise performance. The results are shown in table 13. At the level of 0.01, the four SCM practices, including strategic supplier relationship, customer relationship, information sharing and supply chain integration are all positively correlated to enterprises performances, with the coefficient value of 0.892, 0.791, 0.719, and 0.878, respectively. The results indicate that the four influencing factors of SCM practices have significant positive correlation with enterprise performance (when $P < 0.01$, the correlation coefficient between variables is greater than 0.5).

The above correlation analysis refers to the results of analyzing the correlation between two variables separately. On this basis, regression analysis is also needed to test the theoretical hypothesis proposed in this research.

4.5 Regression analysis

The author will use the linear regression method to test the research hypothesis on SCM practices and enterprise performances proposed in chapter 3. In the regression analysis, this research will take the enterprise performance as the dependent variable and the four dimensions of SCM practices as the independent variables to test the research hypothesis.

Firstly, the author took the four common factors of SCM practices, ‘strategic supplier relationship’, ‘customer relationship’, ‘information sharing’ and ‘supply chain integration’, as the horizontal axis and enterprise performance as the vertical axis to draw scatter charts, so as to observe the trends between the dimensions of SCM practice and enterprise performance, as shown in figure 9-12. Based on the four scatter charts, it is preliminarily shown that the four factors of SCM practices, ‘strategic supplier relationship’, ‘customer relationship’, ‘information sharing’ and ‘supply chain integration’, all show a significant positive correlation with the performance of the surveyed manufacturing enterprises.

Figure 9 Strategic supplier relationship and enterprise performances

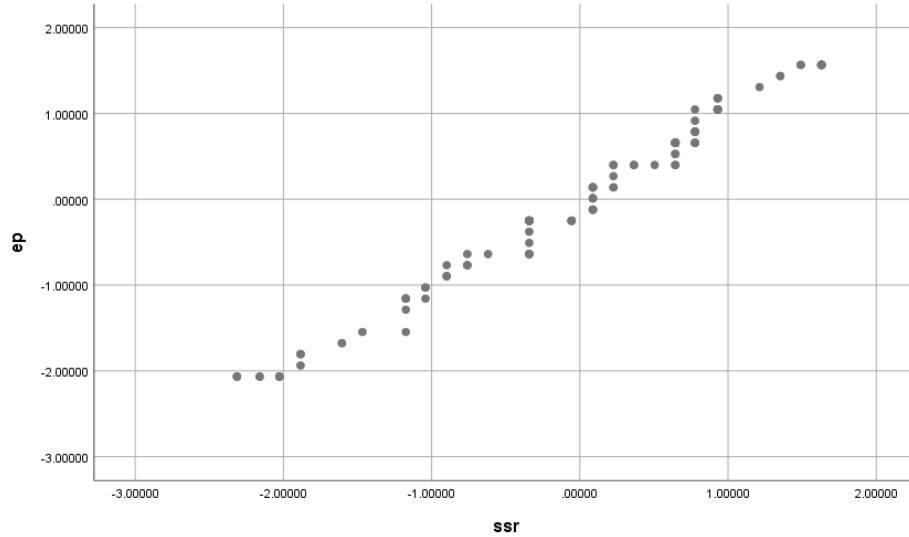


Figure 10 Customer relationship and enterprise performances

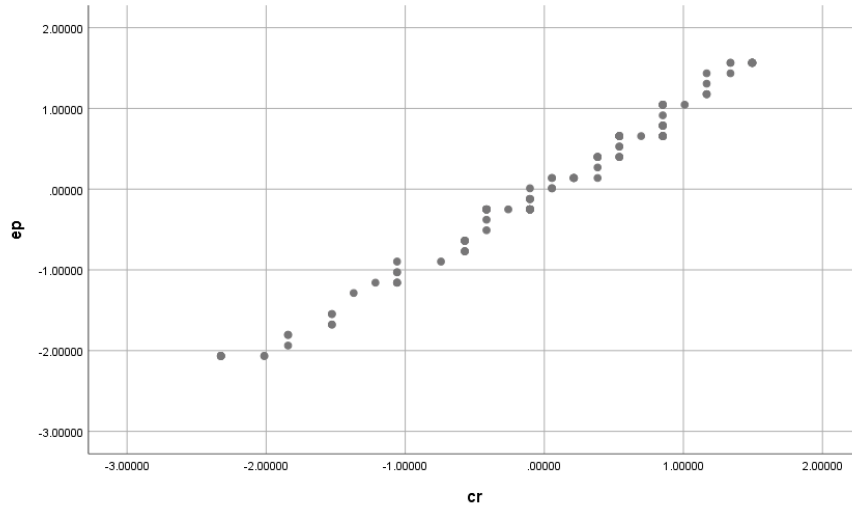


Figure 11 Information sharing and enterprise performances

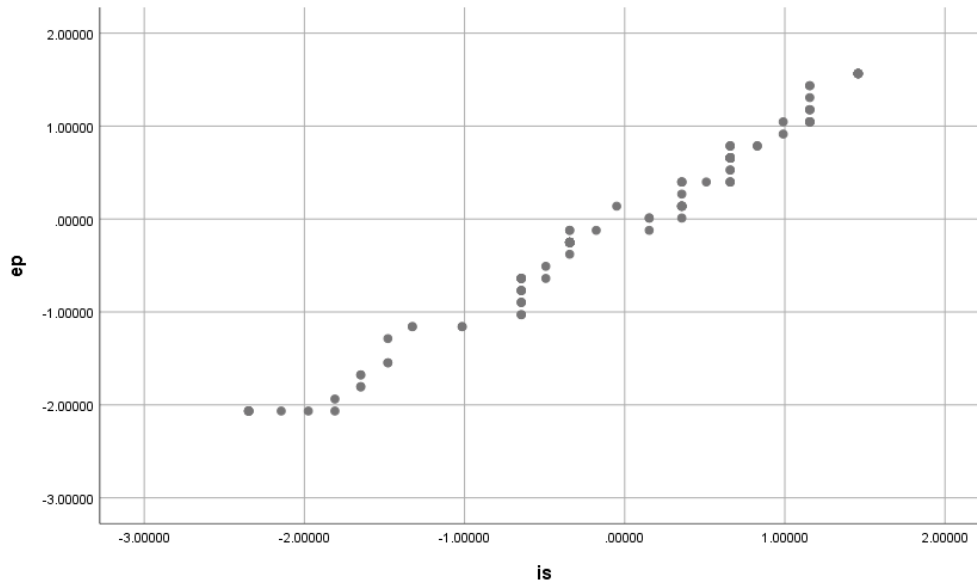
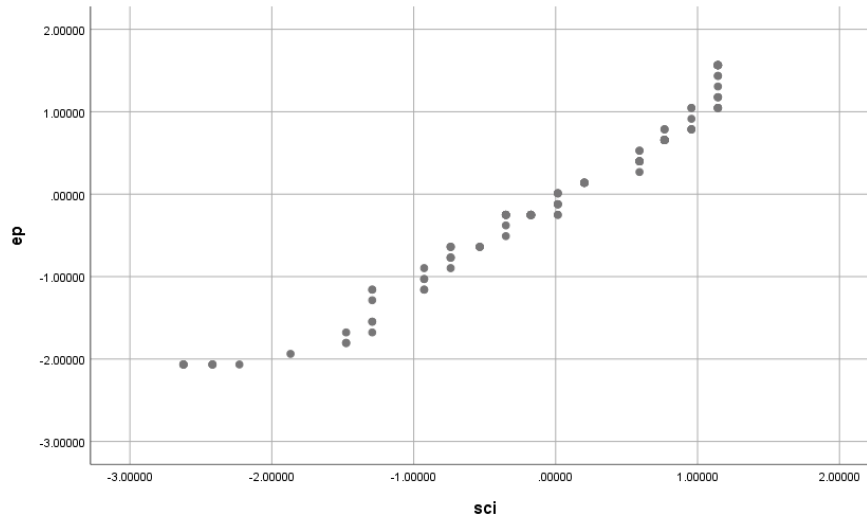


Figure 12 Supply chain integration and enterprise performances



Then, in this part, linear regression was used to analyse independent and dependent variables.

First, table 14 shows the independent variables that enter the regression model. According to table 14, the four dimensions of SCM practices, ‘strategic supplier relationship’, ‘customer relationship’, ‘information sharing’, and ‘supply chain integration’, all entered into the regression model.

Table 14 Regression – variable entered

Variables Entered/Removed ^a			
Model	Variables Entered	Variables Removed	Method
1	sci, ssr, is, cr ^b		Enter

a. Dependent Variable: ep
b. All requested variables entered.

Table 15 shows the model fit. It can be seen from table 15 that the multiple correlation coefficient (R) of the model is 0.995, the Coefficient of determination (R Square) is 0.990, and the Adjusted R Square is 0.990. R Square is used as an important index to judge the

goodness of fitting of linear equations, which reflects the ability of the regression model to explain the variation of dependent variables, so it can be determined that the model in this research has a good fitting effect.

Table 15 Regression – model summary

Model Summary ^b										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change	Durbin-Watson
						F Change	df1	df2		
1	.995 ^a	0.990	0.990	0.10108738	0.990	3100.526	4	124	0.000	1.455

a. Predictors: (Constant), sci, ssr, is, cr

b. Dependent Variable: ep

Table 16 shows the variance analysis results of the model. As can be seen from table 16, the observed value of F statistic of the model is 3100.526, and the probability p (Sig.) value is 0.000. In the case that the significance level is 0.05, it can be considered that the four dimensions of SCM practices, including strategic supplier relationship, customer relationship, information sharing and supply chain integration, have linear relationship with performances of the surveyed enterprises.

Table 16 Regression - ANOVA

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	126.733	4	31.683	3100.526	.000 ^b
Residual	1.267	124	0.010		
Total	128.000	128			

a. Dependent Variable: ep

b. Predictors: (Constant), sci, ssr, is, cr

Figure 17 shows the list of coefficients for multiple linear regression. Meanwhile, the regression analysis results in figure 17 also indicate that the final model is obtained in this research. The four SCM practice dimensions, including strategic supplier relationship, customer relationship, information sharing and supply chain integration, all have significant linear relationship with enterprise performance, which supports the proposed hypotheses, including H1, H2, H3 and H4.

Table 17 Regression – coefficients

Coefficients ^a							
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	-6.322E-16	0.009		0.000	1.000		
ssr	0.417	0.068	0.417	6.136	0.000	0.573	1.745
cr	0.335	0.079	0.335	4.236	0.000	0.814	1.228
is	0.319	0.064	0.319	4.942	0.000	0.917	1.090
sci	0.072	0.055	0.072	1.298	0.020	0.455	2.198

a. Dependent Variable: ep

The multiple linear regression equation established according to the model is as below:

$$\text{Manufacturing enterprise performance} = -6.322\text{E-}16 + 0.417 * \text{Strategic supplier relationship} + 0.335 * \text{customer relationship} + 0.319 * \text{information sharing} + 0.072 * \text{supply chain integration}$$

According to table 17 and the above models, the four hypotheses proposed in chapter 3 are verified, as shown in table 18. The empirical results show that four SCM practice dimensions, including strategic supplier relationship, customer relationship, information

sharing and supply chain integration, are all the key factors influencing the performance of Chinese manufacturing enterprises, and the influence of the above factors is decreasing successively.

Table 18 Summary of hypothesis test results

Hypothesis	Results
H1: strategic supplier relationship has positive influence on enterprise performances;	√
H2: customer relationship has positive influence on enterprise performances;	√
H3: information sharing has positive influence on enterprise performances;	√
H4: supply chain integration has positive influence on enterprise performances;	√

In addition, according to table 15, the statistical value of Durbin-Watson is 1.455, which is close to 2, indicating that the residuals are independent of each other. It can also be seen from the normalized residual histogram in figure 13 and p-p plot in figure 14 that the data points are basically consistent with the theoretical line, so the residual in this research follows a normal distribution.

Figure 13 Histogram of the variable

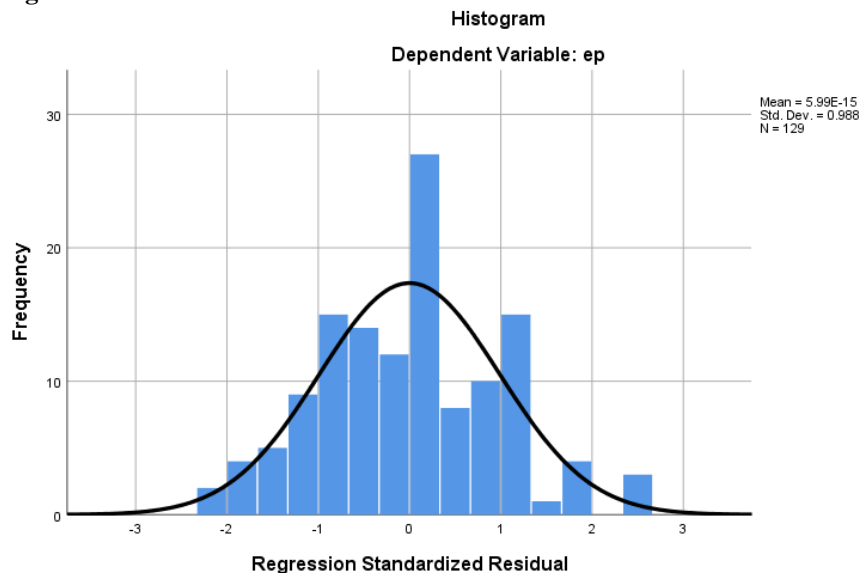
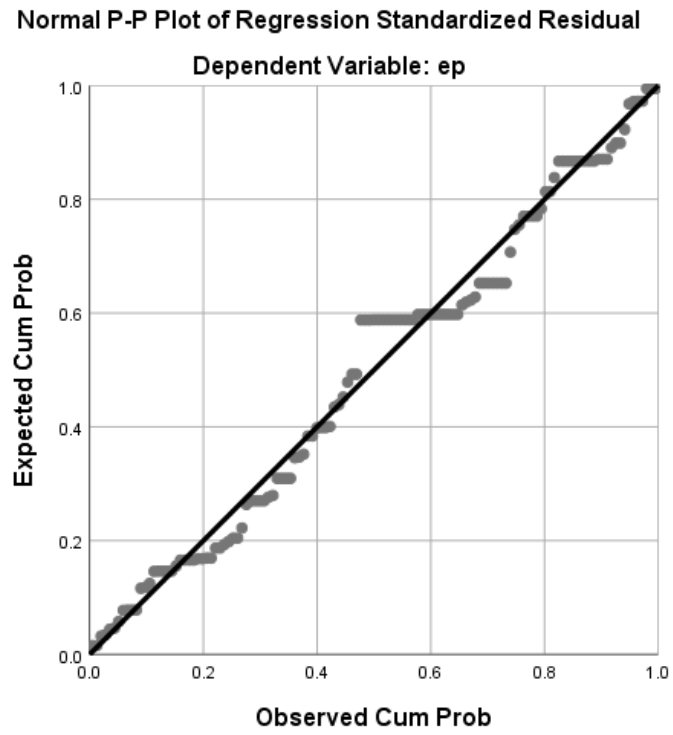


Figure 14 P-P plot of the variable

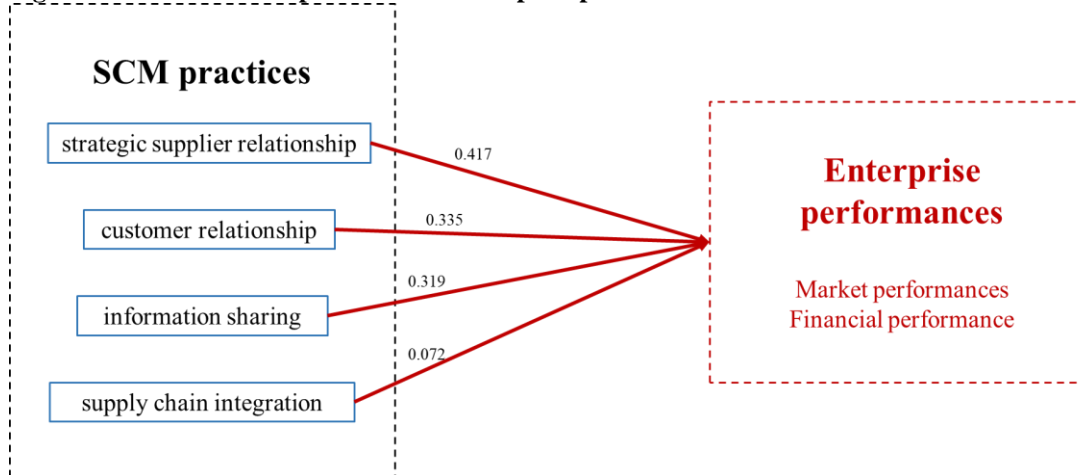


5. Results and Discussion

5.1 Discussion of the results

According to the results of regression analysis, the model established in this research is valid, as shown in the figure 15. The results indicate that the four measurement dimensions selected in this study, strategic supplier relationship, customer relationship, information sharing and supply chain integration, are significant measurement dimensions of SCM practices, and SCM practices composed of these four measurement dimensions can have a significant positive impact on enterprise performance. In the process of SCM practices, Chinese manufacturing enterprises should pay attention to the effective implementation of the four important aspects of strategic supplier relationship, customer relationship, information sharing and supply chain integration, so as to improve the market performance and financial performance of enterprises.

Figure 15 Model of SCM practices and enterprise performances



5.1.1 Strategic supplier relationship in SCM practices

According to the results of the regression analysis, strategic supplier relationship in SCM practices has a significant positive influence on enterprise performance. Therefore, the first hypothesis 'strategic supplier relationship has a positive influence on enterprise performance' has been verified, and the coefficient of strategic supplier relationship is the largest, up to 0.417. The results obtained in this research are consistent with the research on the importance of strategic supplier management by Li et al. (2005) and Lee et al. (2007).

At present, in terms of product and service requirements, customers expect shorter and shorter delivery times, and at the same time they also value the agility of suppliers to meet customer needs quickly. In order to improve agility, it is impossible for a single organization to do so. The SCM concept must be applied to enable organizations at each node of the supply chain to focus on one or two core competencies, maximize the competitive advantage of other node organizations, and quickly adapt to changing markets. Manufacturing enterprises need to control the resources through establishing strategic supplier relationship.

In addition, as argued by Lamming et al. (2001), the quality of the supplier's products is the component of the production quality and R&D quality of the manufacturing enterprise. As a result, the supplier's quality management system is also the quality management system of the manufacturing enterprise. Furthermore, from the perspective of cost, the supplier's cost is also the cost of the manufacturing enterprise to a certain extent. If the supplier's cost increases, the additional cost will eventually be transferred to the manufacturing enterprise. Therefore, it is of positive significance to strengthen the supplier management, select the right supplier, and keep the supplier in a competitive environment to improve product quality and reduce cost.

Therefore, the empirical results of this research on supplier relationship under SCM are also quite consistent with both previous literatures and the actual situation. In terms of productivity, competitive advantage and enterprises performance, strategic supplier partnership can bring specific benefits to the organization, thus improving the enterprise performance.

5.1.2 Customer relationship in SCM practices

According to the results of regression analysis, customer relationship management in SCM practice has a significant positive impact on the performance of manufacturing enterprises.

This result confirms the second hypothesis, 'customer relationship has positive influence on enterprise performances'; meanwhile, the coefficient of customer relationship dimension is also high, up to 0.335. The empirical results of this research are consistent with those of Leonidou et al. (2004), Jayaram et al. (2010), and Ozalp et al. (2010).

In the whole process of supply chain operation, the purpose is to reduce the total cost and improve the competitiveness. The management principle of SCM is to ultimately create higher value in the market at the lowest overall supply chain cost through the relationship management with upstream suppliers and downstream customers. As the leading role in the supply chain, the customer affects the operation of the whole supply chain. Customer demand is also the core premise of supply chain management. Manufacturing enterprises should realize that customer demand plays a guiding role in the whole production process of the enterprise, which is conducive to the operation of the enterprise centring on the purpose of 'customer-centred'. A good relationship with customers can win more customers (customers) for the enterprise. Therefore, the empirical results of this research are also quite consistent with the actual situation. Good customer relationship management in SCM practice effectively reduces market risks and increases customer satisfaction, and maximizes enterprise profits is the most important reason to measure customer relationship. Customers' high attention to the enterprise can form a good customer relationship, and can also put forward more valuable Suggestions and opinions for the enterprise to improve the product and service quality (Li et al., 2005; Lee et al., 2007).

In fact, in both the empirical results of this research and the literature review, strategic suppliers and customers are considered as the two most important supply chain partners of enterprises. As argued by Ozalp et al. (2010), strategic supplier relationships and customer relationship are important for enterprise to share information between supply chain partners, many large manufacturing enterprises have also respectively set up particular supplier relationships and customer relationship departments, and build the supplier information and customer information system module, so as to strengthen the communication with suppliers and customers and sharing. Particularly, as mentioned in the literature review, supply chain integration is focused on domestic enterprises. One the one

hand, manufacturing enterprises organize production and intra-enterprise activities by understanding the quality, quantity and timing of raw materials supplied by suppliers and customer orders; on the other hand, through the integration of the processes and processes in the enterprise supply chain, manufacturing enterprises can better provide customers with high-quality and personalized products and services, so as to reduce the uncertainty of the demand for raw materials, reduce unnecessary losses of suppliers, and better form a long-term cooperative relationship with suppliers.

Therefore, manufacturing enterprises should ensure the strategic suppliers and customers to participate in the process of enterprise supply chain integration, fully tap and absorb their useful advice, applied in the integration of enterprise supply chain.

5.1.3 Information sharing in SCM practices

The results of regression analysis show that information sharing has significant positively impact on corporate performance of Chinese manufacturing enterprises. Therefore, the third hypothesis, ‘information sharing has positive influence on enterprise performances’, has been verified. Many scholars have proved that effective information sharing is crucial for enterprises to obtain high performance (Chatfield et al., 2004; Zhou & Benton, 2007; Lotfi et al., 2013). Such results are also in line with the reality. Information flows through the whole supply chain. Timely acquisition of favourable information and timely adjustment can save the financial cost incurred in the transaction for the manufacturing enterprise. At the same time, it is also possible for enterprises to monitor the actual sales and inventory of its products to determine whether it needs to carry out timely replenishment, and arranges its own production and sales planning accordingly, so as to improve operating performance and response time to a greater extent, thus improving its market share.

However, at the same time, it can also be seen that although the respondents believed that their enterprise has the highest degree of information sharing according to mean value 3.504 of ‘information sharing’; while among the four SCM practice dimensions, the impact of information sharing on enterprise performance is not the highest, with a coefficient of only 0.319. This reflects the fact that the current Chinese manufacturing enterprises and other node enterprises in supply chain cooperation most established on the basis of the contract, both parties according to the chapter, according to their demand for information transmission and communication, the sharing of information is also very selective and asymmetry, and transfer more, less feedback, information distortion occur more often. Therefore, in the future implementation process, enterprises should focus on enhancing the depth and timeliness of information sharing with supply chain partners, and reduce some vague or even unnecessary information transmission.

5.1.4 Supply chain integration in SCM practices

The results of regression analysis show that supply chain integration has a significant positive impact on enterprise performance. The empirical results obtained in this research confirmed the third hypothesis, ‘supply chain integration has positive influence on enterprise performances’. The conclusions of this study are consistent with the research results of Chang et al. (2012), Wolf (2011) and others on supply chain integration. Such results are also in line with the reality. The optimal combination of value activities and individual characteristics is the core purpose of supply chain integration. In the process and results of value, effective integration ability is not only reflected in higher utilization of

resources, but also reflected in reducing costs and improving quality, which has a stronger advantage than competitors, thus occupying a larger market.

5.2 Recommendation for manufacturing enterprises

According to the empirical research results, SCM practices directly affect the performance of nodal enterprises in the whole supply chain. With the rapid development of information technology and e-commerce, the focus of supply chain enterprises is network-based SCM. In order to improve performance, manufacturing enterprises must strengthen their SCM practices. The higher SCM practices the enterprises conducted, the better the enterprise performance will be. Based on the status quo and characteristics of the development of SCM practices in manufacturing enterprises observed in this research, there are several recommendations for manufacturing enterprises to enhance their SCM practices from the following aspects:

5.2.1 Establish strategic partnership with suppliers

It is the principle of supply chain management to seek a long-term and stable relationship. Therefore, strategic alliance with core suppliers should be established after the evaluation of suppliers. In order for both sides to benefit, strategic alliances need to be decided at the top of the supply and demand sides, and mutually beneficial, stable and long-term relationships need to be established at all stages of the value chain. In order to achieve just-in-time production and reduce costs, strategic partnerships remove organizational obstacles in the supply process and lay the foundation for improving enterprise competitiveness.

The traditional supply relationship is no longer suitable for the market environment with increasing global competition and ever-changing product demand. In terms of product quality, on-time delivery, inventory management and innovative product design, the impact on enterprises is growing. It is crucial for enterprises to select suppliers with good reputation and establish a good cooperative relationship with them, so as to give full play to the competitive advantage of the whole supply chain and achieve the goal of low cost and good quality. In order to ensure the quality of suppliers, it is necessary to improve the management of suppliers and improve the level of suppliers. Manufacturing enterprises should not only evaluate the cooperation and development ability of suppliers, but also formulate appropriate assessment plans and quantify the indicators of assessment in terms of price, delivery period, quality and other important indicators of products, so as to assess suppliers regularly.

5.2.2 Attach importance to customer relationship management

Customer relationship management is a systematic project. To establish a proper customer value management system, an enterprise needs to consider its own customer types, select valuable customers and establish a lasting and valuable relationship with such customers, which is of great significance to the enterprise. Enterprises can provide personalized products or services to customers, which is one of the reasons why customer relationship management can bring value. According to the needs of customers, in order to improve customer satisfaction, enterprises must know which products or services are what

customers need, so that both enterprises and customers get higher value, forming a win-win situation. Therefore, by increasing the channels of interaction and improving the quality of interaction, enterprises invest more resources in customer interaction. The most direct manifestation of the implementation effect of customer relationship is the direct communication between enterprises and customers.

5.2.3 Improve the degree of information sharing among enterprises

Information sharing is the foundation of the strategic cooperative relations, in the supply chain environment, information sharing of supply chain partners is refers to the cooperation between enterprises of supply chain operation, such as customer orders, sales data, production scheduling information and delivery and inventory status and other information, on the whole supply chain, they are the enterprise information resources can be Shared, and be able to free and effective flow from one enterprise to another enterprise. Therefore, strengthening information sharing among supply chain partners can provide a basis for enterprises to quickly respond to the market and improve quality. Information sharing includes two aspects: responsiveness and flexibility. Improving these two aspects can realize enterprise information sharing. In terms of flexibility, it is necessary to improve the flexibility of supply chain enterprises, so as to adapt to the complex and changeable competitive market in time, reduce the time of information transmission and the probability of errors, ensure the real-time reception of market information, and finally realize information sharing. In terms of responsiveness, the supply chain can improve its ability to respond quickly to market changes, and quickly complete customized orders based on the real-time information sent to relevant enterprises by the information platform, so as to realize the unique information sharing among enterprises.

5.2.4 Strengthen enterprise supply chain integration

Supply chain optimization and integration is the comparative advantage of manufacturing enterprises in obtaining product cost and quality. Based on internal and external resources and business integration, business process management model should be reconsidered regardless of the current situation of business process reengineering. In addition, after the business process reengineering among enterprises in the supply chain, the functional departments among enterprises should strengthen information sharing, so that enterprises can communicate, coordinate and cooperate with each other, so as to give play to the core competitiveness of the supply chain, thus improving the performance of enterprises.

Enterprise informatization is the introduction of advanced management ideas and management system. Through optimizing the operation process of enterprises and strengthening enterprise management, in order to improve the level of enterprise construction informatization, it is necessary to make scientific and planned adjustments to the organizational structure and management system, in order to give full play to its comprehensive economic benefits.

6. Conclusion

6.1 Conclusion of major findings

In this research, the respondents of Chinese manufacturing enterprises were surveyed by means of questionnaires and primary data were collected. Through statistical analysis methods, especially regression analysis, the relationship between measured variables was verified, which is consistent with the scholars' inferences cited in the literature review. According to the results of the research, through the investigation of manufacturing enterprises, this research uses the method of structural equation model to demonstrate the relationship between supply chain management implementation and enterprise performance from an empirical perspective, and draws the following conclusions:

First of all, in this research, four dimensions including customer relationship, strategic supplier relationship, information sharing, and supply chain integration were selected to measure the implementation of supply chain management, and seven dimensions including return on investment, market share, sales margin, ROI growth, sales growth, market share growth, and overall competitive position were selected to measure enterprise performance. And the measurement dimension implemented by supply chain management has a positive effect on enterprise performance. Therefore, in order to improve the financial performance and market share of Chinese manufacturing enterprises in the process of SCM practice, effective implementation of customer relationship, strategic supplier relationship, information sharing, lean manufacturing and supply chain integration should be strengthened.

Second, strategic supplier relationship and customer relationship are the guarantee of supply chain management, so we should strengthen internal communication with suppliers and customers. Control production according to the information provided by suppliers, so as to better provide customers with high-quality and personalized products and services, thus reducing unnecessary losses for suppliers and customers, and ensuring long-term cooperation with suppliers.

Third, information sharing is the cornerstone of enterprise supply chain management, and information transmission and communication are carried out according to their own needs, so information distortion and information asymmetry often occur in the process of transmission. Therefore, in the future implementation of supply chain management, enterprises should pay attention to the timeliness and depth of information sharing with supply chain partners.

In the end, the core and highest level of supply chain management implementation is supply chain integration, which has achieved good results in the application of Chinese manufacturing enterprises investigated. Enterprises should strengthen their own supply chain integration, through the integration of internal and external resources of enterprises, quickly respond to the market, in order to reduce opportunity cost and production cost. The implementation of supply chain management can effectively improve the level of enterprise performance.

Through quantitative analysis, it is verified that each dimension of supply chain management has direct and significant positive influence on enterprise performance. Furthermore, it is proved that the implementation of supply chain management has a direct and significant positive impact on enterprise performance. Therefore, the effective

implementation of supply chain management can improve the performance of enterprises, which is consistent with the qualitative analysis results of many theories.

6.2 Research limitations and recommendations for future research

Based on a great deal of literature reading, as well as the establishment of the research framework, the design of the questionnaire, and empirical analysis and other research process, this research has made great efforts to ensure rigorous and scientific data collection, analysis, and research process. However, due to the objective reality in the survey the author could not control, and some limited conditions of time and resource, this research has several limitations and need to be improved in the future research.

First of all, this research mainly adopts random sampling method on the selected areas and send the link of online questionnaire through emails and SMS. At the same time, it is required that the respondents should be the managers and ordinary employees in manufacturing enterprises. Therefore, the identity of the respondents who were selected to fill in the questionnaire is a difficult factor to control in this research. However, if the research hopes to better investigate the impact of supply chain management practices on enterprise performance, it is important to expand the scope of samples when conditions permit, so as to make a more comprehensive analysis of the collected data. In the future work, it is suggested to collect more data, expand the sample size, analyse the data and continue the research.

Secondly, this research does not take into account the industry, scale and other situational factors involved in the enterprises. In order to truly reflect the impact of SCM practices on enterprise performance, it is necessary to research the impact of these situational factors on enterprise performance, so as to obtain a more objective conclusion. However, the acquisition of the above samples not only requires long-term tracking, investigation, sampling and analysis of various industries, but also requires a large amount of manpower and material resources. Therefore, to obtain such a difficult sample, it needs to be further carried out, and the research on the influence of enterprise situation factors on enterprise performance is also the direction of further research.

In the end, the conceptual framework established in this research is not a complete index system. In the follow-up research, it is highly recommended to consider some more dimensions ignored by this research, such as location advantage, cross-sectoral and cross-industry cooperation, so as to expand the field of supply chain management practices, and better measure index system of SCM practices.

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8. Appendix

Questionnaire

Individual information

- 1 what is your gender? Male female
- 2 how long have served the company?
 < 2 years 2~5 years 5~10 years >10 years
- 3 what is the staff number of the company?
 1~100 101~250 251~500 500~1,000 >1,000
- 4 total assets of the company
 < 1 million 1~5 million 5~10 million 10~20 million 20~50 million
 50~100 million > 100 million
- 5 what is nature of business?
 state owned private owned joint venture foreign owned
- 6 how long have the company developed?
 < 2 years 2~5 years 5~10 years >10 years
- 7 what is your position in the company?
 senior manager in product department senior manager in logistics department
 senior manager in other departments middle manager in product department
 middle manager in logistics department middle manager in other departments
 ordinary staff in product department ordinary staff in logistics department
 ordinary staff in other departments

SCM practices

1, totally disagree; 2, partly disagree; 3, not sure; 4, partly agree; 5, totally agree

- 1 Quality is the first criterion in choosing suppliers
 1 2 3 4 5
- 2 Work with suppliers to resolve problems
 1 2 3 4 5
- 3 Help suppliers improve the quality of their products
 1 2 3 4 5
- 4 Key suppliers participate in our continuous improvement program
 1 2 3 4 5
- 5 Include key suppliers in planning and goal setting
 1 2 3 4 5

- 6 Involve key suppliers in the development of new products
 1 2 3 4 5
- 7 Establish long-term relationships with suppliers
 1 2 3 4 5
- 8 Enable customers to develop product quality, response time and other standards
 1 2 3 4 5
- 9 Measure and evaluate customer satisfaction
 1 2 3 4 5
- 10 Determine future customer expectations
 1 2 3 4 5
- 11 Strive to build customer trust
 1 2 3 4 5
- 12 Periodically assess the importance of our relationship with our customers
 1 2 3 4 5
- 13 Obtain and track customer feedback about quality and service
 1 2 3 4 5
- 14 We will inform our supply chain partners in advance if demands changed
 1 2 3 4 5
- 15 Share proprietary information with supply chain partners
 1 2 3 4 5
- 16 Supply chain partners will fully inform us of issues affecting our business
 1 2 3 4 5
- 17 Supply chain partners share knowledge with us about the core business
 1 2 3 4 5
- 18 Exchange information with supply chain partners to help build business plans
 1 2 3 4 5
- 19 Communicate with supply chain partners about big events or changes
 1 2 3 4 5
- 20 Look for new ways to integrate activities in the supply chain
 1 2 3 4 5
- 21 Efforts to reduce response times along the supply chain
 1 2 3 4 5
- 22 Enhance the integration of various processes in the supply chain
 1 2 3 4 5

23 Strive to establish frequent contact with members of the supply chain

1 2 3 4 5

24 Strive to establish a coordinated communication and information system

1 2 3 4 5

Enterprise performance

Compared with the main competitors, how does your company perform in the following aspects? (1, poor; 2, slightly poor; 3, not sure; 4, slightly excellent; 5, excellent)

1 Market share

1 2 3 4 5

2 Growth in market share

1 2 3 4 5

3 Sales growth

1 2 3 4 5

4 Return on investment

1 2 3 4 5

5 Growth in investment returns

1 2 3 4 5

6 Marginal profit on sales

1 2 3 4 5

7 The overall competitive position of the companies

1 2 3 4 5