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Research on SCF Model under Financial Crisis

--An integrated SC project in China based on financing

(With Three Cases from Enterprises, China)

By

LIU RUI

China

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DECLARATION

I certify that all the material in this research paper that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this research paper reflect my own personal views, and are not necessarily endorsed by the University.

(Signature): ....

(Date): ....

Supervised by
Professor Liu Wei
Shanghai Maritime University

Assessor
World Maritime University

Co-Assessor
Shanghai Maritime University

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ABSTRACTS

Title of Dissertation: **Research on SCF Model under Financial Crisis: An integrated SC project in China based on financing (With Three Cases from Enterprises, China)**

Degree: **MSc**

Due to the coming of new financial crisis, lots of enterprises lose money in their businesses. Some of them go into liquidation. Through investigations based on studies of previous scholars, the writer argues that the stabilization of SC could avoid these risks and make benefits as usual. To stabilize SC, she attempts to build SCF model with abundant experiences from both international and domestic. Additional, most of them are financial businesses provided by banks. Meanwhile, she institutes the Golden Rule and Objective and Principia for building the SCF model. Furthermore, she makes the questionnaire survey in order to be close to practices. Combined these resources, she builds the basal SCF model and extends it into three cases which came from Chinese enterprises recently. By analyzing and comparing the differences between the SCF model and their own plans which are done at present of these three cases, she argues that the SCF model could avoid risks from financial crisis and it could obtain more benefits. As a result, she makes concludes of the dissertation and suggestions for further scholars in order to promote the launching of the supply chain financing business which is one of the best methods to eave the situation of the new financial crisis for Chinese enterprises.

KEYWORDS: Financial crisis, China, SC, Financing, Questionnaire, Case study

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LIST OF ABBREVIATIONS

BC	Bank of Communication
BOC	Bank of China Limited
B/L	Bills of Lading
CCB	China Construction Bank
CEB	China Ever-bright Bank
CEIBS	China Europe International Business School
CMB	China Merchants Bank
CRP	Continuous Replenishment
CSCMP	Supply Chain Management Professionals Council
ECR	Efficient Consumer Response
GDB	Guangdong Development Bank
GDP	Gross Domestic Product
HXB	Hua Xia Bank
IB	Industrial Bank
ISM	Institute for Supply Management
JIT	Just In Time
JMCV	JP Morgan Chase Vastera model
NYSE	New York Stock Exchange
PAF	Pacific Assets Funding
PE	Private Equity
P. & I.	Protection and Indemnity Clubs
POF	Privately Offered Fund
P2P	Peer-to-Peer
ROI	Return on Investment

SC	Supply Chain
SCB	Standard Chartered Bank
SCF	Supply Chain Financing
SCM	Supply Chain Management
SDB	Shenzhen Development Bank
SLBs	Sub-logistics Bills
SMEs	Small- and Medium-sized Enterprises
VMI	Vendor Managed Inventory
WLB	Whole Logistics Bill
WM	Warehouse Mortgage

LIST OF TABLES AND FIGURES

1. INTRODUCTION

1.1 Background of the Dissertation: New financial crisis

Since 2007, a new financial crisis has been emerged. On 13th February in America, the Countrywide Financial Corporation and the New Century Financial became aware of risks. On 9th August in France, BNP Paribas announced Queer Street owing to the sub-prime mortgage crisis in USA. Moreover, the share index, the futures and spot price of gold dove much in a single trading day. On 20th in Japan, the Central Bank has been involved. On 13th December, the new alliance has been aligned by the America and the Europe in order to deal with the credit crisis.

During the period of 2008, the impact of financial meltdown has been expanding. September, Fannie Mae, Freddie Mac and AIG were taken over and Lehman Brothers Holdings Inc. was bankruptcy. October, The USA, the U. K. , Japan, countries in Europe and some areas such as Hong Kong launched out into a series of activities to face up the global economic crisis.

The financial crisis, which means that the financial markets speared to be in disarray, has triggered a world panic. Some large companies which has centuries-old culture had disappeared from the world due to the financial crisis. At the same time, billions of companies have tended to avoid risks such as bankruptcy through certain of innovations related to business process. However, this is a very difficult problem without definitive solutions.

1.1.1 Historical Focus of Financial Crisis: Stabilization of SC

In this section, the writer lists and concludes some important arguments which focus on the financial crisis people suffered.

Davidson (2008) explained a famous financial term[1] and argued that "the solution for such an insolvency problem is large direct infusions of new capital in these institutions or removing nonperforming loans from their books." In the same paper, he explained insolvency problems[2]. From Davidson's view, the sub-prime crisis does not meet the criteria of a Minsky moment. The writer understands current financial market through the research of Davidson and argues that the insolvency problem should be considered with prior attention.

Gros (2004) analyzed the financial crisis in Bulgaria occurred in 1996 and argued that "variations in foreign exchange reserves were a key factor in the timing and magnitude of the crisis". Then "the rapid growth in monetary aggregates and acceleration of inflation led to a flight for quality, further pressures in the foreign exchange market, and possibly, expectations that the government would have to inflate its growing domestic debt away". After these studies, Gros found that:

> The principal link between the banking crisis and the currency crash is indirect: most of

[1] Davidson, P., (2008, Summer), Is the current financial distress caused by the sub-prime mortgage crisis a Minsky moment? Or is it the result of attempting to securitize illiquid noncommercial mortgage loans?, Journal of Post Keynesian Economics, Vol. 30, No. 4 669-676.
The path to a Minsky moment is due to more and more investor-borrowers committing themselves, via debt contracts, to specified dates of future cash outflows that cannot be met by expected future cash inflows on those specified contractual dates, even though, in the long run, the investment is expected to generate enough cash inflows to ultimately pay for itself and earn a respectable profit.

[2] Davidson, P., (2008, Summer), Is the current financial distress caused by the sub-prime mortgage crisis a Minsky moment? Or is it the result of attempting to securitize illiquid noncommercial mortgage loans?, Journal of Post Keynesian Economics, Vol. 30, No. 4 669-676.
The current financial market problem was set off by insolvency problems of large financial market underwriters who attempted to transform illiquid noncommercial mortgages into liquid assets. ... If there is a systemic insolvency problem of financial institutions, then steps to increase the net worth of insolvent entities are required to prevent this insolvency problem from creating instability in the economy.

> the costs of the banking crisis were fiscal in a first step, buying few months; the mounting domestic debt became unsustainable in a crisis environment (with considerable political uncertainty, fragile depository institutions, and limited foreign-IMF-support), leading to a rapid deterioration of expectations, an acceleration of money printing, and a burst of inflation and depreciation.

Furthermore, Gros provided a simple model of the Bulgarian experience to help understand the currency and asset substitution and made the impact of bank in financial crisis definitude. Base on Gros's view, the writer considers that bank business is one of the key points for the financial crisis.

Kaza (2007) summed up several viewpoints of differences scholars in paper related to a great financial crisis. McAdoo (as cited in Kaza, 2007) provided the viewpoint on the day of the New York Stock Exchange (NYSE) closed3. Silber (as cited in Greg, 2007) made researches on the financial crisis of 1914 and argued that:

> The actions McAdoo took in 1914; including flooding the market with emergency authorized by the Aldrich-Vreeland Act, enacted in response to the Panic of 1907; led to New York replacing London as the world's financial center: "American capital, by itself, could not buy the credibility needed to challenge sterling as international money-only the gold standard could" (p. 168). The gold standard was the foundation

[3] Kaza, G., (2007, November), When Washington shut down Wall Street: The great financial crisis of 1914 and the origins of America's monetary supremacy by William L. Silber, Quarterly Journal of Austrian Economics (2007), 10: 333-227.
The breaking-out of World War in the last week of July, 1914, caused an immediate crisis in American financial circles. ... Morgan assured me that they would do whatever I thought was best. … "If you really want my judgment, it is to close the Exchange." He said it would be done, and it was done that day. (McAdoo 1931)

> that allowed New York City to emerge as the world's financial center, and the US dollar to supplant the British pound sterling as the international reserve currency.

Rothbard (as cited in Greg, 2007) described viewpoints as follow:

> Federal Reserve scholarship should be cognizant of any relationships between financial elites and central bank policymakers. Silber's book is week on this issue, but is still noteworthy for the important light it casts on the role of gold and the politically motivated meddlesome policies in follows.

These scholars above appeared their arguments summarized by Kaza. The writer considered that there are certain of relationship among the financial circle, the gold stand and central bank policies. In other words, we could change the financial circle through the gold stand changing and central bank policies making.

For financial crisis, the problem of capital account and the reform of exchange rate are the key points now. Luo and Tang (2007) argued that "how to shield China from the risk of financial crisis with the opening of the capital account and the reform of the exchange rate system is a key issue".

In the previous study, Marino, Lohrke, Hill, Weaver and Tambunan (2008) focused on the business of small- and medium-sized enterprises (SMEs) in emerging economies and they wrote:

> How SMEs contend with sudden environmental shocks represents a critical research question, particularly for firms competing in emerging economies where such shocks

> are more prevalent. … Results provide critical insights in SME strategic actions in emerging markets particularly in terms of key motivations for SME alliance formation.

According to previous researches, scholars studied financial crisis from the view of supply chain (SC) in order to strengthen SC and protect SMEs to survive. In addition, they paid more attentions on financial problems in the SC.

1.1.2 Key of SCs' Stabilization: Cash flow management

Focus on SC, Stewart (2004), from the view of e-commerce, stated arguments[4]. Under costs station, Guiffrida (2005) and Jeffery (2005) had differences opinions. Guiffrida presented a cost model to estimate and promote the performance of SC. Jeffery discussed the service level related to the inventory and customer services in order to "improve supply chain agility and determine how to satisfy customers in the most cost-effective manner". In addition, the variety costs happened on different networks of SC. Hu (2006) compared the hub-and-spoke, point-to-point and others. Wakolbinger (2007) introduced the super-network model integrating social networks and financial networks. Ke (2004) recommended the financial network model in the dynamic SC. Due to the complicated environment for competing, risks should be one thing considered at the top. Johnson (2008) built the peer-to-peer (P2P) file-sharing networks to examine this problem. On finance field, many scholars such as Mun (2008), Jiangli, Unal and Yom (2007), Ravallion & Lokshin (2007),Farkouh (2007), Chen & Wang (2007), Rousseau & Kim (2006), Bunyasrie

[4] Stewart, H., (2004), E-commerce participation in an extended supply chain: The case of the financial intermediary, Journal of Financial Services Marketing, Vol.9, 110-112.
In an e-enabled supply chain members are able to form digital links to share information, buy, sell and distribute products or services and to transfer cash flow. An e-enabled supply chain is, consequently, perceived as having many advantages, such as increased business efficiency, enhanced information flows, improved transaction speed, wider geographical spread, increased temporal reach, cost reduction and differentiation.

(2005) and Lap (2001) had disquisitions from differences views.

Based on investigations of previous scholars, it is havoc for partners in SC which ruptured due to any accident. If there is enough fund/cash, the SC might not be broke. However, the financial crisis is coming. A large trouble related to cash follow has occurred on many enterprises during this period. Thus the supply chain financing is an efficiency method to solve the problem. The writer attempts to introduce certain some concepts and supply chain financing modes. In addition, she advises and builds her argument and model - supply chain financing (SCF) model. She argues that the SCF model is an important method suitable for preventing and dealing with the financial crisis, in particular Chinese enterprises.

1.2 Research Objectives: Build and apply SCF models to stabilize SC

Many financial scholars transferred study topics from financial issues to SC field while many SCM experts investigated from SC field to the financial domain. There is a consanguineous relationship between SC and finance. Based on the previous scholars' work, the writer presents attend to build an effective model which would have certain of functions of the banks, the insurers and the logistics companies should emerges to operate and control the daily business in order to adjust the main activities in the SC. Under this situation, accidents happening in companies due to financial crisis in the SC would be disappeared or the percent of these would be reduced. Then she attempts to apply SCF model in practice in order to make SCs stable. Finally, she proves that the SCF model is an important way for preventing and dealing with the financial crisis by enhancing the vitality of companies in the SC.

1.3 Structure and Organization of the Dissertation

The writer draws Figure 1.3.1 to describe the structure of this dissertation. Chapter 1 is the introduction of the dissertation where comprises the background of dissertation, research objectives, organization and structure of dissertation and research methods. Chapter 2 is current research and comments related to current research on theories and current applying in practice. Chapter 3 is to build the SCF model which discusses the golden rule and the objective and principia firstly. Furthermore, the writer builds the basal SCF model in same chapter. Chapter 4 is the application and extending of the basal SCF model with three cases in practice and the benefits of SCF model is proved by comparing. The writer concludes the investigation of dissertation and makes suggestions for further studies and practices.

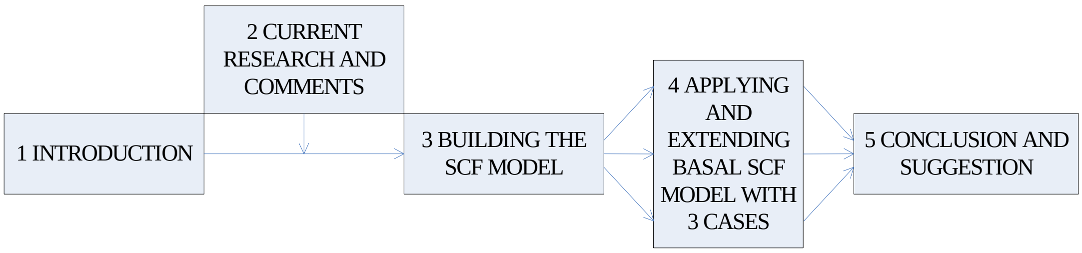

Figure 1: 1.3.1 - Structure of the Dissertation
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In addition, Figure 1.3.1 shows how the writer organizes the dissertation. Firstly, the writer researches and studies on a great deal of literatures about the financial crisis, financing management and financing in supply chain. She concludes that keeping a healthy cash flow and steady SC are very important to withstand the financial crisis. Additional, she studies the current research both on theories and in practice on the topic. Then, she found that the current methods to manage financing in supply chain could be innovated. Secondly, she makes the golden rule and objective and principia for building the SCF model. According to these, she builds the basal SCF model. Thirdly, she succeeds to apply and extend the basal SCF model on three cases from Chinese enterprises. Finally, she makes a conclusion for the dissertation and some suggestions for further studies and practices. These processes could be showed by Figure 1.3.2.

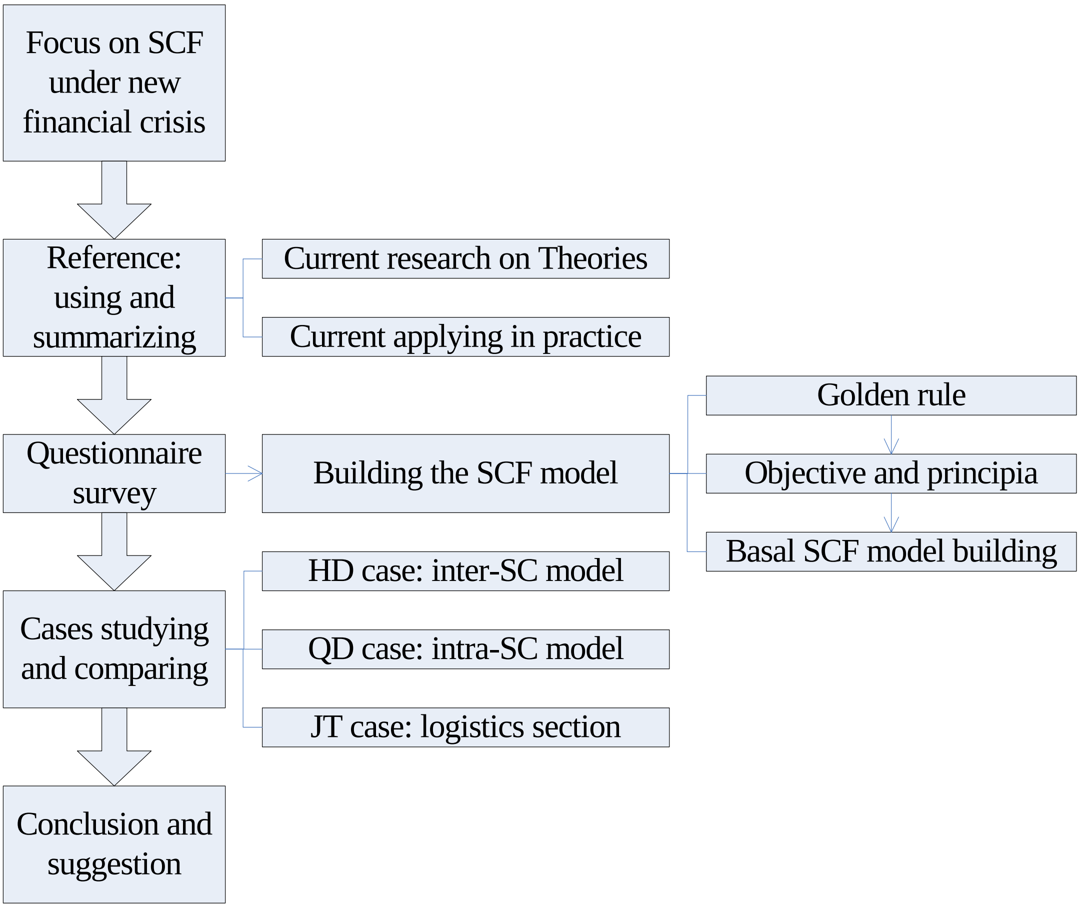

Figure 2: 1.3.2 - The way to research

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1.4 Research Methods

1.4.1 Reference: Using and summarizing

The writer reads and researches pervious investigations as many as possible. She summaries both advantages and disadvantages of the concepts and the models put forward by pervious scholars in the field. Furthermore, under her academic background - the shipping field, she designs her theory system and builds model framework based on the harvest from pervious scholars.

1.4.2 Questionnaire Survey

The questionnaire is an effectual way to realize problems in practice. Due to the lack to enough experiences in practice, the writer designs and makes a questionnaire to enhance the efficiency of her theory and model. Additional, she modifies sequentially them during the period of questionnaire investigating. Finally, she shows her theories, basic model and its extending and applications.

The English version of the questionnaire is attached in the Appendix. The informants are from logistics enterprises, manufacturing, finance market and supply chain investigated institution, etc. The most of them are members of Institute for Supply Management (ISM) China. In addition, the writer summaries the basic conditions as follow. Figure 1.4.2.1 shows that main industry is the manufacture, Figure 1.4.2.2 shows that main enterprises are foreign companies in China, Figure 1.4.2.3 shows that main position is the department manager and Figure 1.4.2.4 shows that main attitude is dimness in the questionnaires. The writer argues that the questionnaire proves that there are definite significations in her theories and models.

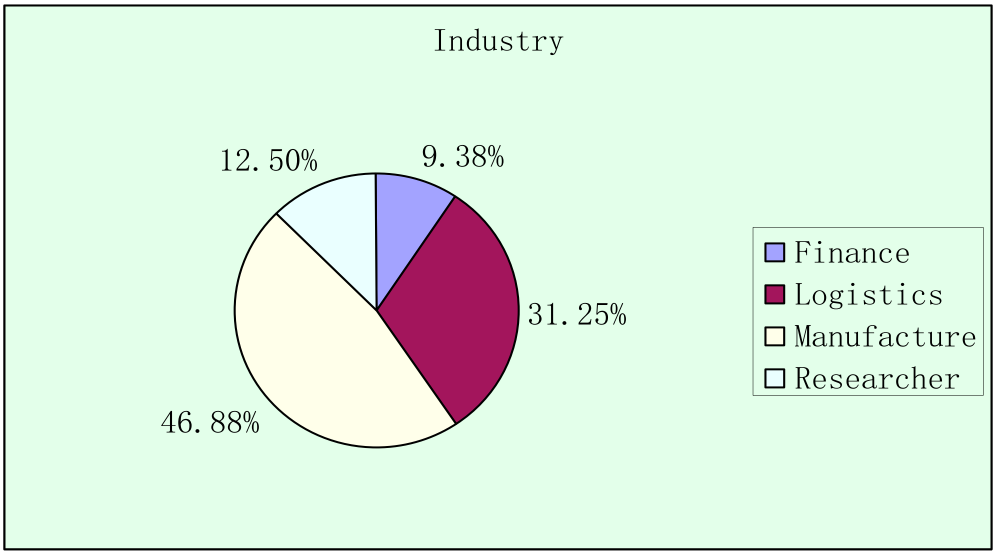

Figure 3: 1.4.2.1 - Industries involved

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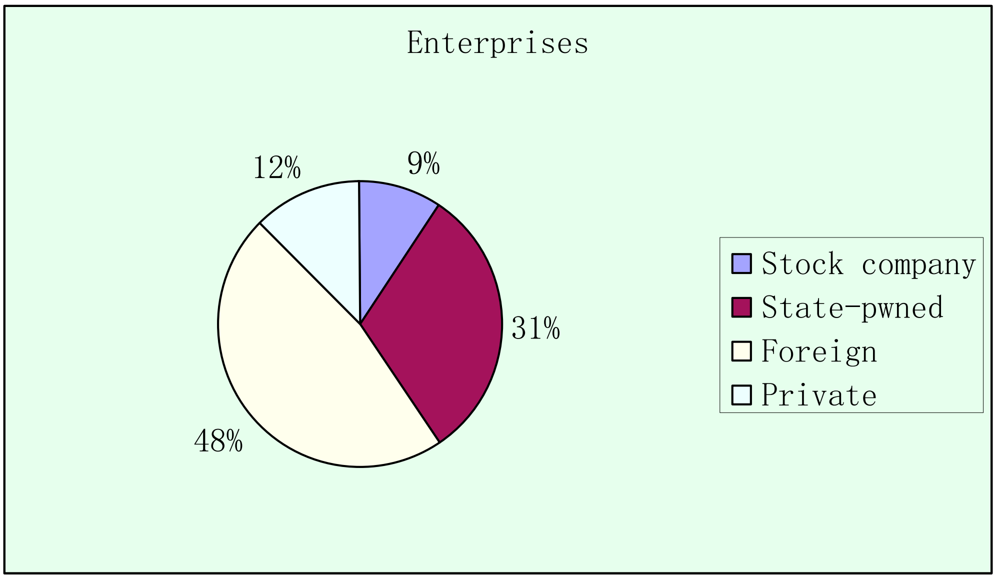

Figure 4: 1.4.2.2 - Enterprises involved

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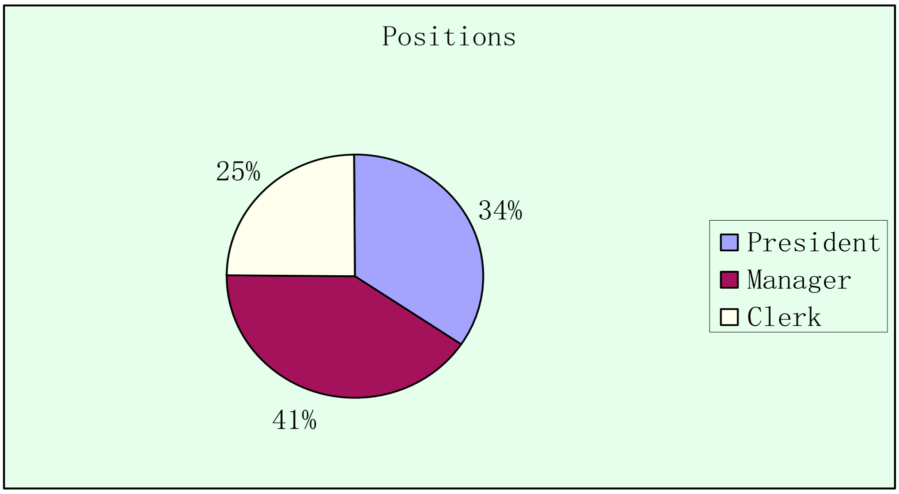

Figure 5: 1.4.2.3 - Positions involved

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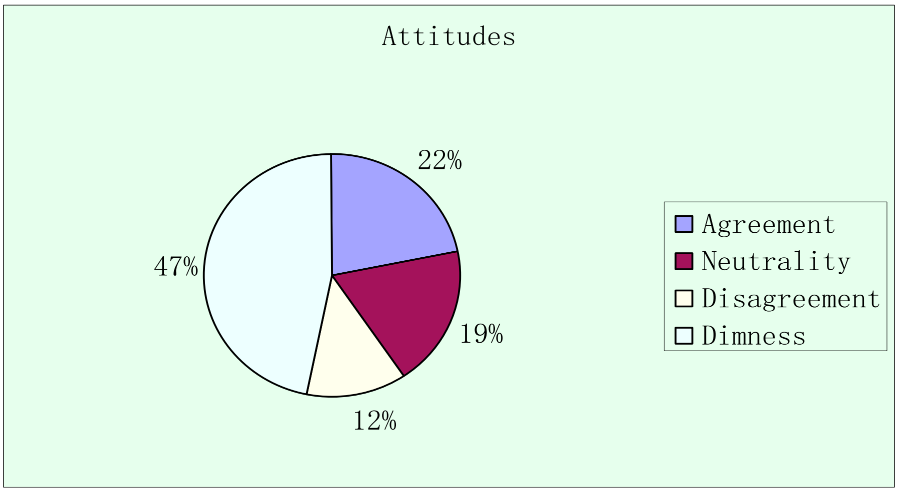

Figure 6: 1.4.2.4 - Different attitudes

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1.4.3 Cases Studying and Comparing

There are three realized cases in the dissertation. The writer introduces the cases and actual plans, analyses them, applies her models and makes comparisons. As a result, she concludes that models could be applying in practice with more benefits.

2. *CURRENT RESEARCH AND COMMENTS*

2.1 Current Research on Theories

2.1.1 Current Research on SCM

There are many definitions and argument of SC and/or SCM from pervious scholars. The writer tries her best to list and summary them. In section 2.1.3, she expresses her arguments about these studies on SC and SCM.

Terms "Logistics" and "SC/SCM" are usually confused in practice. The Institute of Logistics and Transport (as cited in Waters, 2003) gave definitions[5]. Handfield and Nichols (as cited in Jespersen and Larsen, 2005) define SC and supply chain management (SCM)[6]. Christopher (as cited in Jespersen and Larsen) defines SC management as "The management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole". In additional, according to Supply Chain Management Professionals Council (CSCMP, as cited in Jespersen and Larsen):

> SCM encompasses the planning and management of all activities involved in sourcing

[5] Waters, D. (2003), Global logistics and distribution planning strategies for management (4th ed.), London: The Institute of Logistics and Transport.
Logistics is the time related positioning of resources or, the strategic management of the total supply-chain. The supply-chain is a sequence of events intended to satisfy a customer. It can include procurement, manufacture, distribution and waste disposal, together with associated transport, storage and information technology.

[6] Jespersen, B.D. & Larsen, T. S., (2005). Supply chain management-in theory and practice, Copenhagen, Copenhagen Business School Press.
The Supply chain encompasses all organizations and activities associated with the flow and transformation of goods from the raw materials stage, through to the end user, as well as the associated information flows. Material and information flows both up and down the supply chain. Supply chain management (SCM) is the integration and management of supply chain organizations and activities through cooperative organizational relationships, effective business processes, and high levels of information sharing to create high-performing value systems that provide member organizations a sustainable competitive advantage.

> and procurement, conversion, and all Logistics Management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers.

Cooper, Lambert and Pagh (as cited in Jespersen and Larsen) define SC management as "The integration of business processes from end user through original suppliers that provides products, services and information that add value for customers". From the view of Jespersen and Larsen, the definition of SCM is "the management of relations and integrated business processes across the SC that produces products, services and information that add value for the end customer".

There are many types of definitions of SCM offered by previous scholars. However, it is a hard assignment to collect the definition of financing supply chain management. Chopra and Meindl (2004) introduced the pricing and revenue supply chain management rather then financing supply chain management. Other scholars also researches and studies some certain parts of financing supply chain management, not the whole financing supply chain management. It means that the field of financing supply chain management is a virgin soil.

With the development of science, too much betterment happened on the logistics technology. However, the more social welfare expected by people did not appear. The social welfare should be created by a series of enterprises rather than one company. Thus, the writer introduces conceptions of SC. Coyle, Bardi and Langley (2003) argued that "the supply chain can be viewed as a series of integrated enterprises that must share information and coordinate physical execution to ensure a smooth, integrated flow of goods, services, information, and cash through the pipeline". In other words, there are four core factors in SC and the more social welfare might depend on higher effective SC services in a large extent. In addition, the figure - integrated supply chain - drew by Coyle, Bardi and Langley showed the three coordinated, two-way flows such as goods/services, information and financials (especially cash). The dissertation focuses on financials flow.

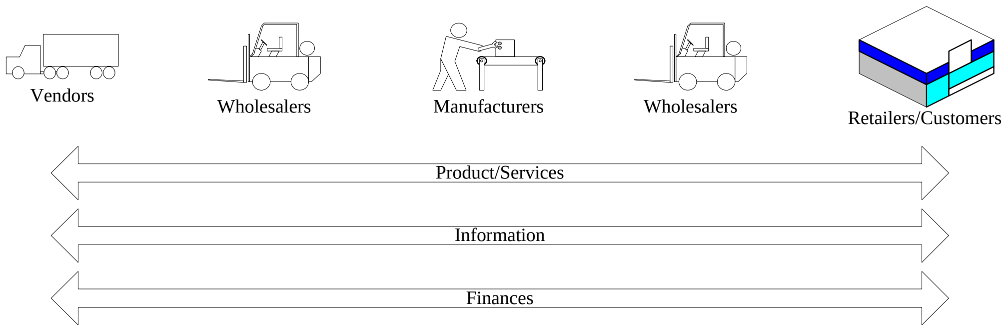

Figure 7: 2.1.1.1 - Integrated supply chain
Source: Coyle, J., Bardi, E. & Langley, C. (2003). The management of business logistics: a supply chain perspective (7th ed.), Quebec: Transcontinetal Louiseville, P18.

More scholars paid attentions on co-operation around upstream and downstream companies. Christopher (2005) illustrated that SCM (Figure 2.1.1.2) is "a wider concept than logistics". He discussed differences between logistics and SCM[7].

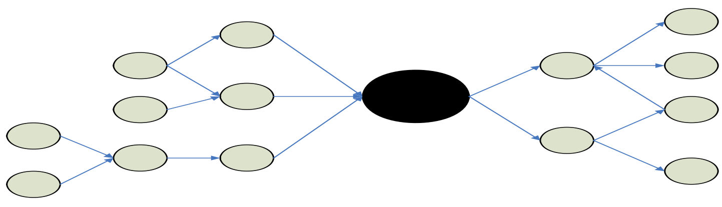

Figure 8: 2.1.1.2 - The supply chain network
Source: Christopher, M. (2005), Logistics and supply chain management: creating value-adding networks (3rd ed.), UK: Biddles Ltd, King's Lynn, P5.

[7] Christopher, M. (2005), Logistics and supply chain management: creating value-adding networks (3rd ed.), UK: Biddles Ltd, King's Lynn.
Logistics is essentially a planning orientation and framework that seeks to create a single plan for the flow of product and information through a business. Supply chain management builds upon this framework and seeks to achieve linkage and co-ordination between the processes of other entities in the pipeline, i.e. suppliers, customers, and the organization itself.

The development of SCM theory and practice could be showed by the supply chain framework model. Waters researched future trends in SCM and advanced the supply chain framework model (Figure 2.1.1.3).

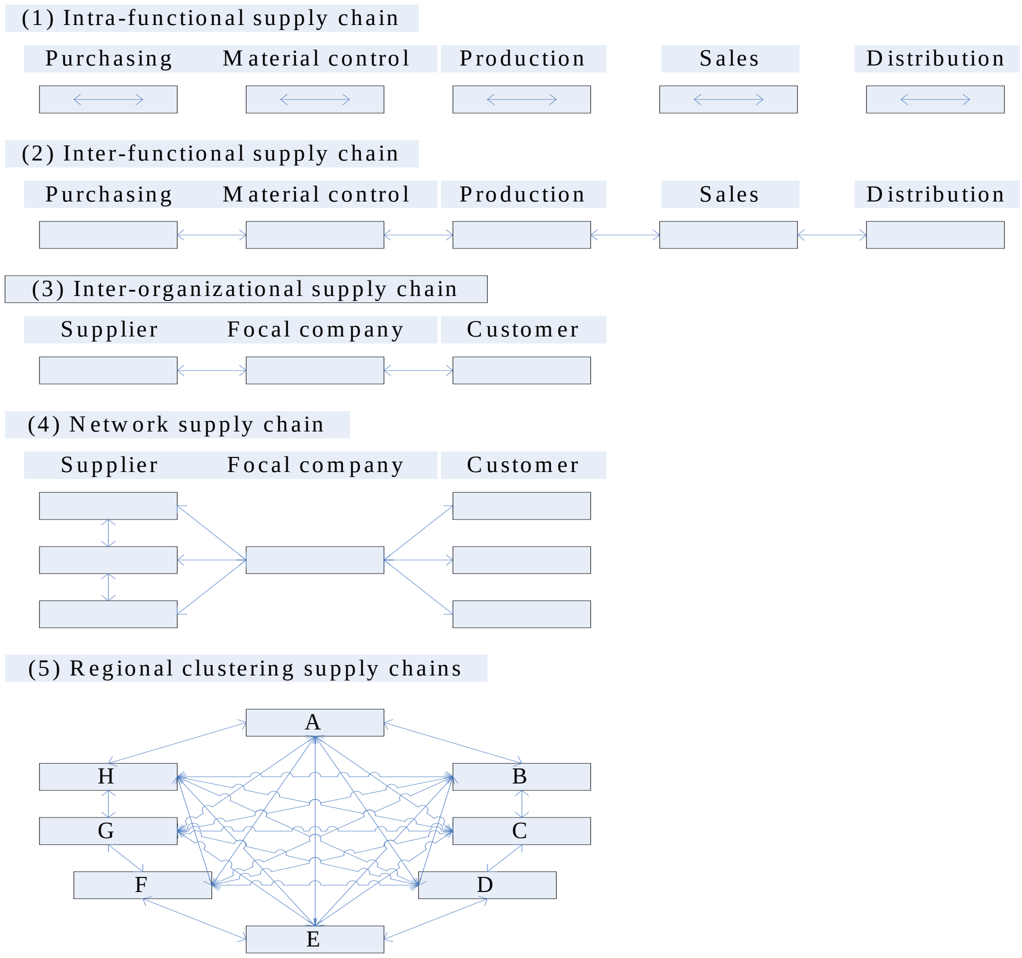

Figure 9: 2.1.1.3 - The supply chain framework model

Source: Waters, D. (2003), Global logistics and distribution planning strategies for management (4th ed.), London: The Institute of Logistics and Transport, P39.

These above express many scholars' arguments. However, there are different arguments from other scholars. They looked forward to make diversity strategy for dealing with future challenges. Coyle, Bardi and Langley researched and summarized strategic planning for SCM. There are four strategies such as time-based strategies, asset productivity strategies, technology-based strategies and relationship-based strategies.

Reducing cycle time is a key in time-based strategies. There are three important factors - processes, information and decision making – during cycle time. Inventory reduction and facility/equipment utilization are two factors in asset productivity strategies. Technology-based strategies focus on shifts in technology such as e-Marketplaces, Extranets, Email, EDI, Phone and Fax. Figure 2.1.1.4 shows vertical, horizontal and full collaborations in relationship-based strategies. These three collaborations occur on all kinds of enterprises.

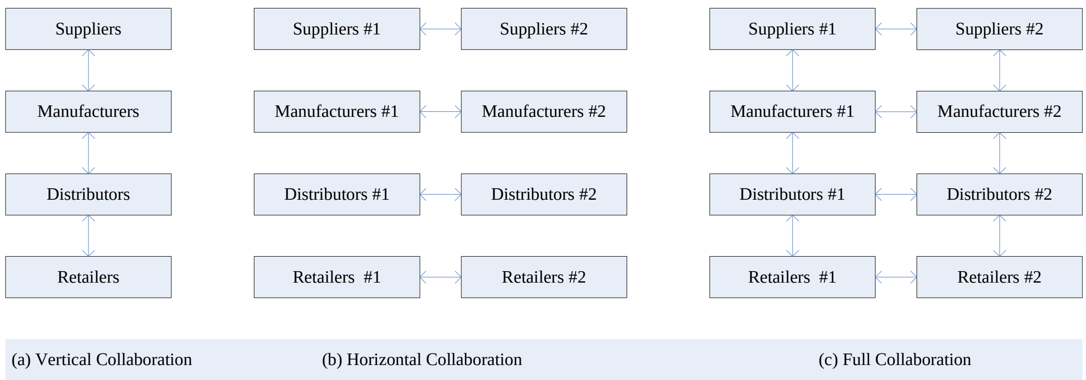

Figure 10: 2.1.1.4 - Types of collaboration
Source: Coyle, J., Bardi, E. & Langley, C. (2003). The management of business logistics: a supply chain perspective (7th ed.), Quebec: Transcontinetal Louiseville, P589.

2.1.2 Current Research on SCF

In this section, the writer summaries studies on SC financing. Additional, she expresses her arguments about these studies on SC financing in section 2.1.3.

Several centuries ago, Hesperian factoring businesses operated by banks are the earliest SC financing mode in the world. But these businesses got profits like a robber. In 1916, America enacted Warehousing Act. It was a rule for warehouse receipt hypothecation. The inchoation of modern SC finance is in 1980s. The basic framework of SC financing (Figure 2.1.2.1) is summarized by CGI Group (2007). Approval-to-pay, importing credit record, importing collection financing and importing future financing are four basic types of buyer-backed financing; exporting credit record, exporting collection financing and exporting future financing are three basic types of exporting financing. In Addition, the ways of approval-to-pay, credit financing and buyer-backed seller export finance are three types of buyer financing based on invoices.

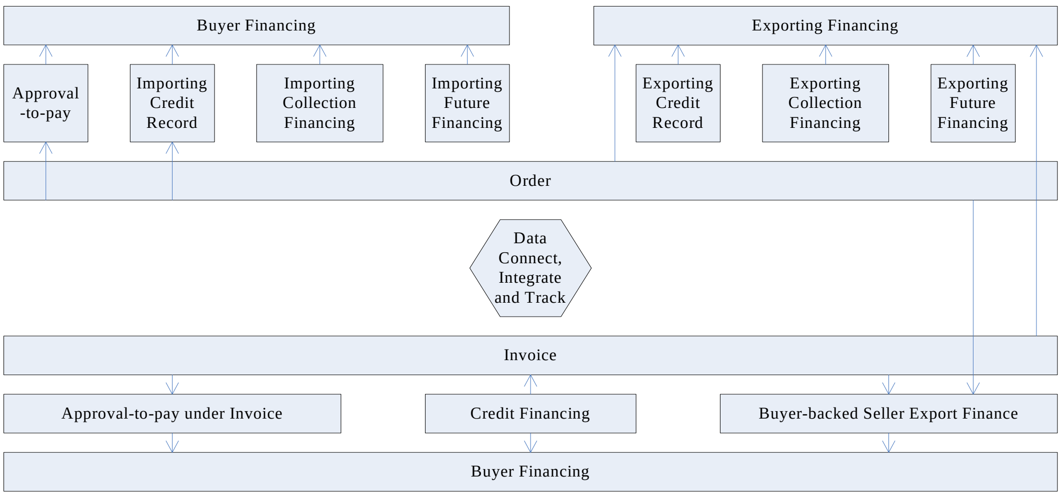

Figure 11: 2.1.2.1 - Basic framework of SC financing
Source: CGI Group, 2007, Supply Chain Finance: a new way for trade banks to strengthen customer relationships, White Paper (as cited in SDB and CEIBS).

Aberdeen Group (as cited in SDB and CEIBS) made a report for these methods included both present and future services. Figure 2.1.2.2 shows that methods of period delay, open account and advance payment with discount are main buyer financing models now. In 18 months, financed businesses by VMI and advance payment with discount would be increased. More important, supplier financing model businesses increase more than buyer financing model businesses. These are showed in Figure 2.1.2.3 as follow:

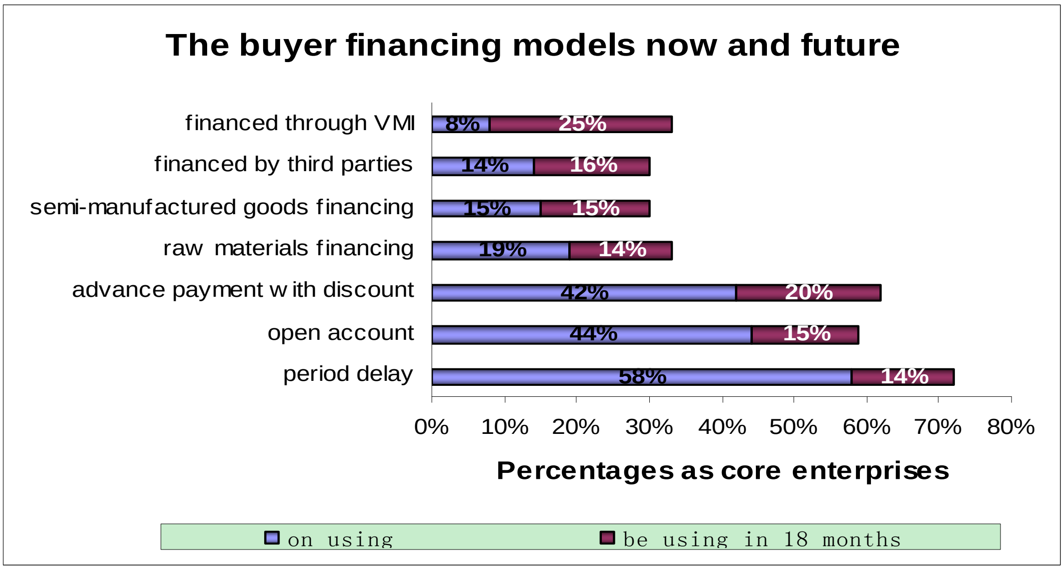

Figure 12: 2.1.2.2 - Buyer financing models now and future

Source: Aberdeen Group, Supply Chain Finance Benchmark Report, 2006, (as cited in SDB and CEIBS).

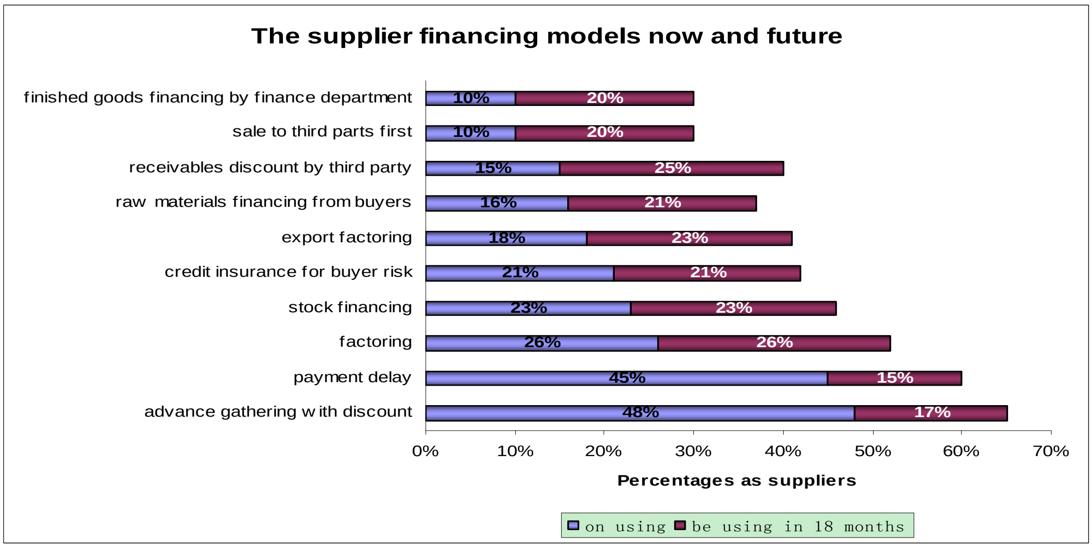

Figure 13: 2.1.2.3 - Supplier financing models now and future

Source: Aberdeen Group, Supply Chain Finance Benchmark Report, 2006, (as cited in SDB and CEIBS).

2.1.3 Comments

Based on research from pervious scholars, the writer tends to build a mode or search out a group to implement certain a “strategic management of the total supply-chain” (quoted from the term “Logistics”). In addition, the strategic management bases on a sequence of events such as procurement, manufacture, distribution and waste disposal. Each activity must depend on transport and storage besides information technology. Furthermore, transport and storage could be transformed each other from specifically view detailed in 3.2.3.

As the chapter 1 showed, more and more previous scholars had deep studies in supply chain finance due to the winter of world economy. In 2007, SDB launch finance business through ten years experiment. More interesting, the framework of SDB’s SC finance business and that of the supply chain network (Figure 2.1.1.2) are the same. Moreover, SDB’s services are the first one based on financial supply chain in china. SDB and China Europe International Business School (CEIBS) (2009) achieved a study on supply chain finance, and that they took “1+N” mode of SDB finance business as a key example. The core theories can be described well by the figure - The supply chain network - which was drew by Christopher. More interesting thing is the fact that it also could describe “1+N+1 mode” which is a finance business launched by HXB. Nearly all finance businesses based on SC of Chinese bank which means the main bank businesses in China work around 1 core enterprise. But these businesses’ customers are suppliers and/or customers of the 1 core enterprise. Additional, suppliers’ suppliers and/or customers’ customers are not these businesses’ customers. The writer considers that the new model should involve them (detailed in later chapter).

The writer argues that the research on SCM follows the model step by step (Figure 2.1.1.3). First of all, both in theory and practice, people studied intra-functional supply chain. Different departments/companies improved on themselves. Secondly, both upstream and downstream departments/companies shifted their attentions on inter-functional from intra-functional supply chain. Thirdly, more people have been starting businesses through inter-organizational supply chain model. From industry's view, Just In Time (JIT) is a typical model; from inventory's view, the typical model is Vendor Managed Inventory (VMI); from finance's view, "1+N"/"1+N+1" businesses focus on inter-organizational supply chain model. These three steps are foundational researches and practices. The fourth and fifth steps will be the future trends in SCM. In addition, the dissertation attempts to build a model (detailed in chapter 3) in these steps.

As Figure 2.1.1.4 showed, many successful concepts such as Cross-docking, JIT, VMI, Continuous Replenishment (CRP) and Efficient Consumer Response (ECR) could not be classified definitely by four strategies above. For example, JIT and VMI both are time-based and asset productivity strategies; VMI and ECR both are time-based and relationship-based strategies. These mean that a mature SC model might be involved dissimilar steps and/or strategies.

As figure 2.1.2.1 showed, the supply chain finance is a new way for strengthening relationships between participators in SC. Based on the framework, there are many simple models adopted by core enterprises. In contrast with buyer financing models, the main supplier financing models are payment delay and advance gathering with discount at that period. Then in 18 months, the businesses of factoring and receivables discount by third party would be increased sharply.

2.2 Current Applying in Practice

In this part, the writer tries to analyze existent financing models included international and domestic and make comments on them. Furthermore, the SCF model would be established based on them in Chapter 3.

2.2.1 International SCF Models

2.2.1.1 The factoring business of banks

In September 2001, Nafin which is National Development Bank in Mexico launched a project named “productive chains” plan (Figure 2.2.1.1.1). The objective is to build business chains between large buyers and small suppliers on the condition of low deal costs and high liquidity. The productive chain makes small suppliers with financing troubles could finance easily by account receivable from large buyers. Additional, it declines financing costs of small suppliers by low credit risks of large buyers rather than their own high credit risks.

From September 2001 to the middle of 2004, Nafin made deals with 190 large buyers and 70,000 above SMEs due to the productive chains. Meanwhile, the share of the factoring market of Nafin increased from 2% in 2001 to 60% in 2004. In the productive chains, the main role of Nafin is re-loaner. It means there are 90% businesses based on re-financing of factoring financing for banks and/or financial departments. The rest, 10% businesses, is financing directly for customers (as cited in SDB and CEIBS). Usually, the total process takes 80 days and was showed as follow (S, B, F and N means suppliers, buyers, factors and Nafin separately):

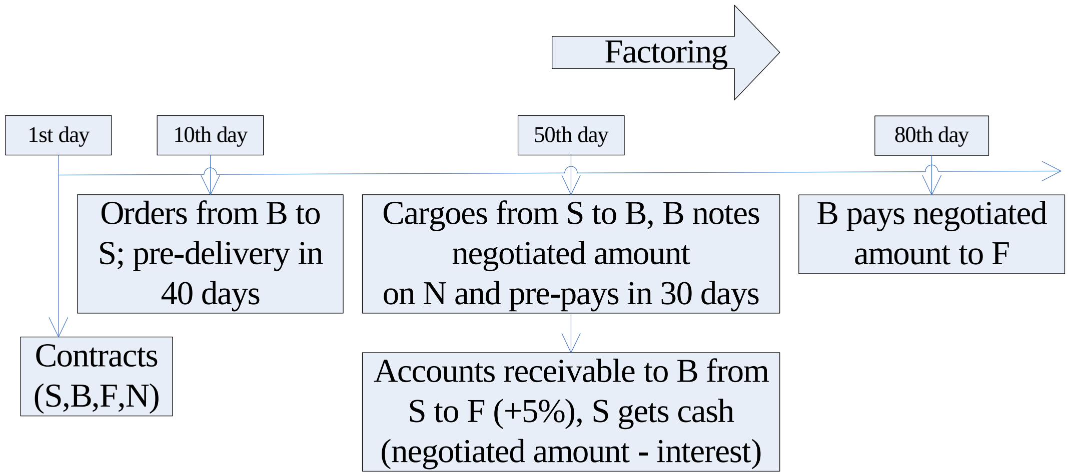

Figure 14: 2.2.1.1.1 - The factoring framework of Nafin

Source: Leora Klapper, 2005, the role of “reverse Factoring” in Supplier Financing of Small and Medium Sized Enterprises, Development Group, The World Bank (as cited in SDB and CEIBS).

The main reason for Nafin’s success is the fact that it decreases costs and increases efficiency of making deals by the operation of e-business. All deals are completed in 3 hours. More important, cashes would be on suppliers’ account before the deals over. It means productive chains provide high liquidity for suppliers. Meanwhile, the costs of productive chains operation are lower than other financial businesses.

2.2.1.2 Integrated management of process documents

The development of information technology brings changes in all of businesses such as financing businesses. Nafin gets a large success due to the e-business, the Holland bank does owe to the MAXTRAD system. Let me take an example with Figure 2.2.1.2.1 to express the running process of the MAXTRAD system. There is a buyer in Europe. Its suppliers are in Asia such as China. Every year, it buys merchandises from Asia with thousands of documents issued by banks. The time and capital took are great clogs. Holland bank saves the time and costs by the MAXTRAD system. It starts an offshore business to deal with mass documents.

Both Holland bank in Europe and Asia have the same system - the MAXTRAD system. The dates from both buyers in Europe and suppliers in Asia could be shared in the system. That means less paper documents and shorter running time. Furthermore, the Holland bank does outsourcing of offshore businesses through running of the MAXTRAD system. That is a larger success for inter-SC financing.

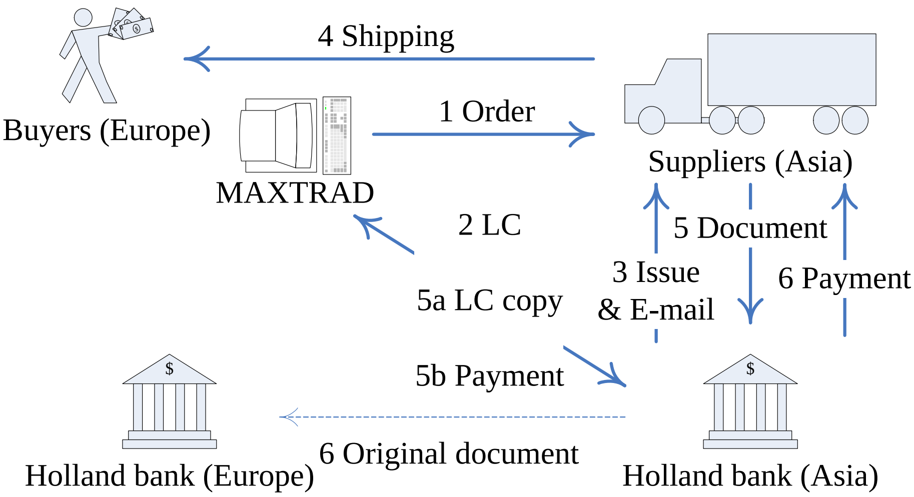

Figure 15: 2.2.1.2.1 - The MAXTRAD system
Source: Holland bank (as cited in SDB and CEIBS).

For the Holland bank businesses, ABN AMRO Group (as cited in SDB and CEIBS) compared the different between non-MAXTRAD and the MAXTRAD system. Table 2.2.1.2.1 illuminates that the average capital turnover decreased almost 50% and the percentage of unconformity jumped down sharply. The Holland bank succeeds when it runs the MAXTRAD system.

Table 1: 2.2.1.2.1 - Different between non-MAXTRAD and MAXTRAD system

non-MAXTRAD system						
	Asia			Europe		
	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
Average capital turnover (day)	31	136	45	49	45	61
Unconformity as percentage	7%	90%	85%	-	-	-

the MAXTRAD system						
	Asia			Europe		
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Average capital turnover (day)	18. 5	38	23	37	33. 5	30
Unconformity as percentage	0	25%	9%	25%	25%	17%

Source: ABN AMRO Group (as cited in SDB and CEIBS).

Although there are other financing models in the world such as the inventory - ownership solutions, the JP Morgan Chase Vastera model (JMCV) detailed later and the Rosenthal & Rosenthal model, these two models - Nafin model and MAXTRAD system - introduced previously are the most typical inter-SC financing model.

2.2.1.3 The intra-SC solution

- JP Morgan Chase Vastera model

J.P.Morgan Co. Incorporated purchased a logistics company, Vastera, in 2005 and built a new logistics organization in Asia. Under this condition, on the one hand, JP could obtain all kinds data of trades and manage documents by automation system; on the other hand, the process and technology of Vastera supports goods flow. The purchasing plan combines factories, logistics companies and banks.

- GE inventory-ownership solutions

GE inventory-ownership solution is a new SC finance solution which could help supplier gets loans with a low interest. The good example is the VMI model. In addition, GE provides trade distribution services. It buys suppliers' inventory on the way include warehouse. Under this condition, it could sell inventory it owned due to its services. Other example is Pacific Assets Funding (PAF) which provides transport, storage and clearance services. The difference between GE and PAF is that GE requires high investment-grade of suppliers and PAF does not.

2.2.2 Domestic SCF Models

2.2.2.1 Financial services of banks

In china, most of existent methods in SC finance are built by banks (Table 2.2.2.1.1) such as Shenzhen Development (SDB), Guangdong Development (GDB), China Construction Bank (CCB), Bank of China Limited (BOC), and Communication (BC), China Ever-bright (CEB), China Merchants (CMB), Industrial (IB), Standard Chartered (SCB) and Hua Xia Bank (HXB).

Table 2: 2.2.2.1.1 - Different Chinese banks and their SC finance businesses

Chinese banks	SC finance business
BC	“Yuntong” supply chain
BOC	Financing and freight
CCB	Supply chain financing
CEB	Sunshine supply chain
CMB	Logistics financing
GDB	Logistics bank
HXB	Win-win financing chain
IB	Gold sesame
SCB	Financing in supply chain
SDB	Pool financing

Source: www.bankcomm.com, www.boc.cn, www.ccb.com, www.cebbank.com, www.cmbchina.com, www.gdb.com.cn, www.hxb.com.cn, www.cib.com.cn, www.standardchartered.com.cn, www.sdb.com.cn, 2009

There are some different between the international SC finance/financing services and Chinese SC finance services, but providers are banks. The writer lists and introduces typical models adopted by Chinese banks, which are improved, extended and combined to provide SC finance services for the companies working in SC. In addition, she takes SDB and HXB as examples. Their theories such as “1+N” model and “N+1+N”model have certain some exiguous differences, but basically speaking, they are same. The SDB’s services followed.

The SC finance practices in China started in 1920s on Shanghai Bank. However, in the middle of 1990s, some business banks tried to focus on certain some financing businesses related to SC because of the hot competition between business banks. In 2005, the SDB, as the first provider of SC finance businesses, summarized and put forward the concept and mode of SC finance. In addition, it launched in 2006. After that, business banks in China outspread SC finance businesses.

- The static mortgage credit

The static mortgage credit (Figure 2.2.2.1.1) is a based product of credit businesses related to chattel and ownership mortgage. It means customers with chattel owned by themselves or the third party obtain credit businesses from banks through mortgaging. Meantime, banks entrust the third party logistics companies, as conservators, to monitor merchandise mortgaged which must be redeemed by cash rather than trade by other merchandise.

The working process of the static mortgage credit is (as the Figure 2.2.2.1.1),

[1] Customers delivery merchandise to conservators under management agreements subscribed by three parties included banks, customers and conservators;

[2] Banks provide the credit to customers;

[3] Customers give the recognizance to banks;

[4] Banks send the order to conservators for the consignment;

[5] Conservators deliver the merchandise under the order.

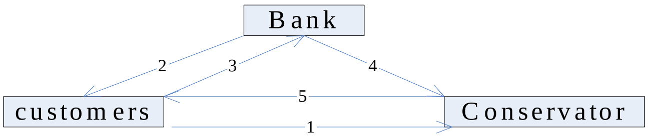

Figure 16: 2.2.2.1.1 - The static mortgage credit

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- The dynamic mortgage credit

The dynamic mortgage credit is an extended product of the static mortgage credit. It means customers with chattel owned by themselves or the third party obtain credit businesses from banks through mortgaging. Meantime, banks make the smallest limitation for the value of merchandise mortgaged by customers. Additional, it would be allowed to delivery if the goods' value is higher than the value limitation. More important, customers could redeem merchandise by others.

The working process of the dynamic mortgage credit is (as the Figure 2.2.2.1.2),

[1] Customers delivery merchandise to conservators under management agreements subscribed by three parties included banks, customers and conservators;

[2] Banks provide the credit to customers;

[3] Conservators who usually are warehouse operators allow merchandise of customers in the smallest limitation to pass in and out;

[4] Customers give the recognizance which is lower than the smallest limitation;

[5] Banks send the order to conservators for the consignment;

[6] Conservators deliver the merchandise under the smallest limitation.

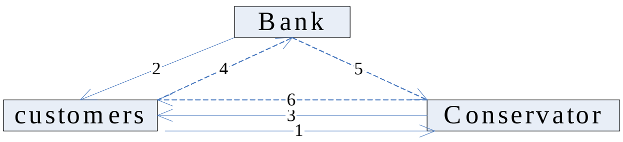

Figure 17: 2.2.2.1.2 - The dynamic mortgage credit

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➢ The document first and payment second

The document fist and payment second is a development of stock financing services. It means customers - buyers - obtain credit from banks under some percentage of the recognizance. Then they give the whole payment for goods to sellers. In addition, sellers finish the goods consignment followed the agreements related to the trade and cooperation. The merchandise arrived are hypothecated goods for banks' credit.

The process of the document first and payment second is (as the Figure 2.2.2.1.3),

[1] Customers pay recognizance as a ratio to banks;

[2] Customers get credit provided by banks for the purchasing payment;

[3] Sellers finish the goods consignment and delivery at warehouses of conservators;

[4] Customers give the recognizance to banks according to their needs;

[5] Banks send the order to conservators who usually are warehouse operators for the consignment according to the recognizance;

[6] Customers get the merchandise as a ratio from conservators.

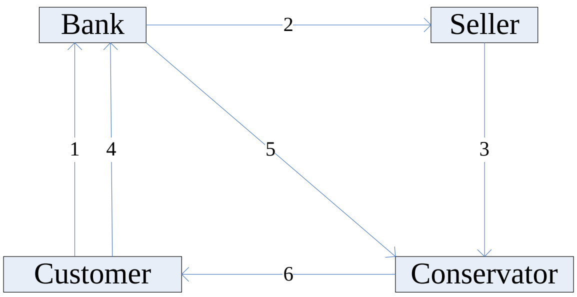

Figure 18: 2.2.2.1.3 - The document first and payment second
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These models above are the most basic SC finance services provided by banks.

Moreover, they could be combined in one SC and/or around one core enterprise. Based on that, SDB has their idea on these and provides the SC finance services, named “1+N” model (Figure 3.1.2.4: The “1+N” SCF).

The “1+N” SC finance means the banks focus on one core enterprise. Meanwhile, the SC finance would be working between the one and lots of other parties such as international raw material producers, domestic raw material producers, importers, suppliers, parties’ processors, offshore agencies, international buyers, marketing operators, retailers and the end producers. In addition, the L - logistics - in Figure 2.2.2.1.4 plays an important role in the SC finance services. Most of time, it is both participant supported and the conservators in figures mentioned previously.

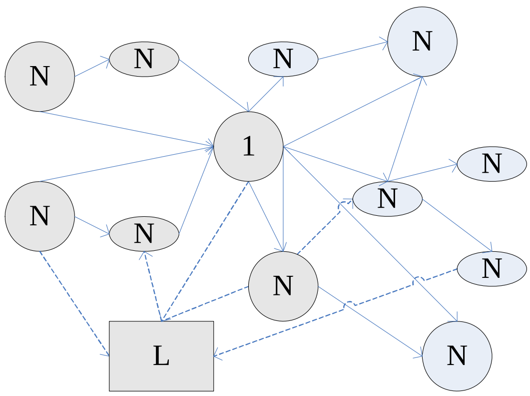

Figure 19: 2.2.2.1.4 - The “1+N” SC finance

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To launch the “1+N” SC finance services, the SDB integrates different functions services, included cash management and enterprises financing (Figure 2.2.2.1.5). There are three rough types of financing plan in the integrated plan. They are suppliers financing plan, core enterprises financing plan and sellers financing plan. According to two types basic businesses - cash management and enterprises financing, core enterprises financing plan comprises a series of SC finance services, so both suppliers and sellers financing plans do. However, all of these SC finance businesses are established and/or combined the basic models mentioned previously.

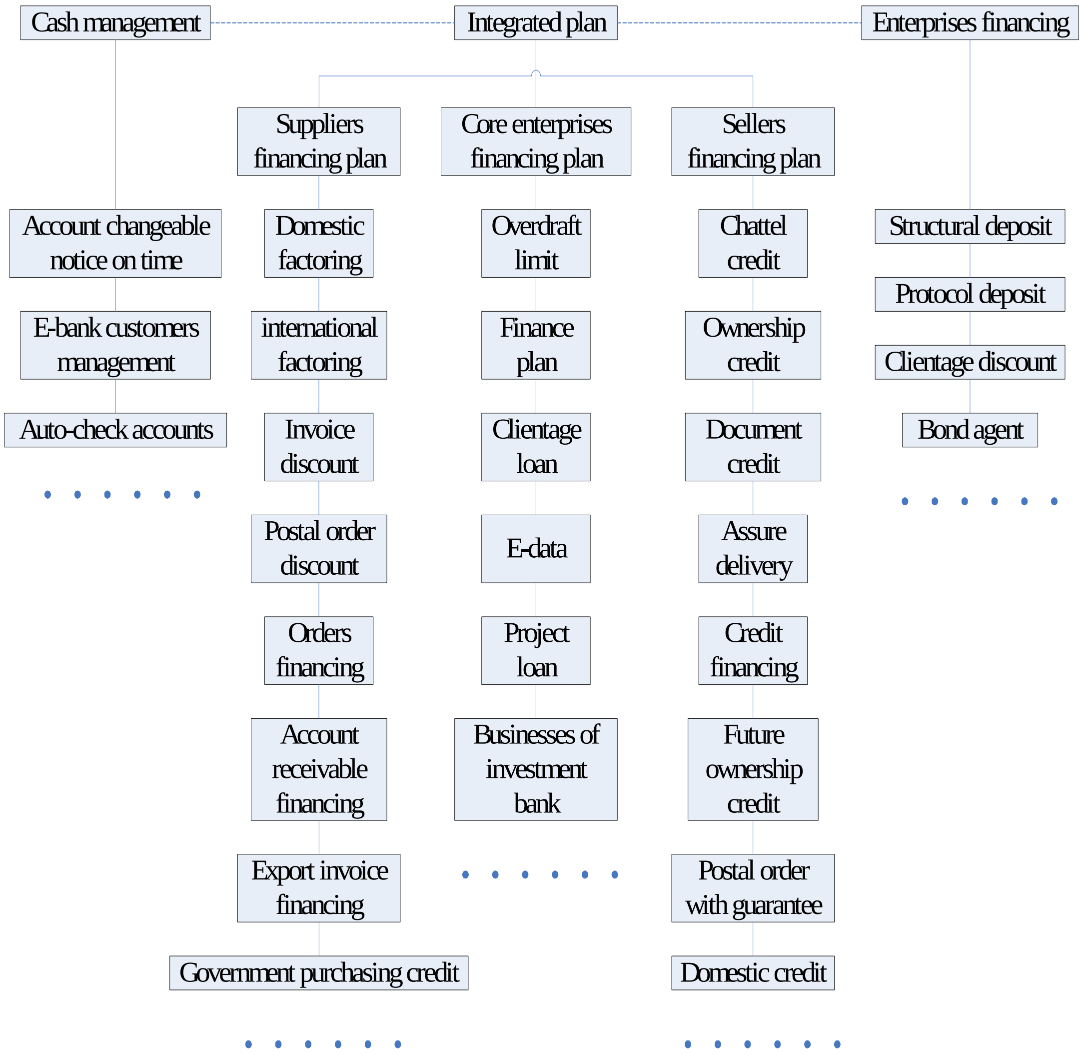

Figure 20: 2.2.2.1.5 - The integrated plan of SDB SC finance
Source: SDB, 2003 (as cited in SDB and CEIBS)

More interesting thing is the SC finance idea from HXB, “N+1+N” model - Win-win financing chain (as the Figure 2.2.2.1.6). The writer argues that there are not too obvious differences between the “1+N” model and the “N+1+N” model except their aspects. It proves that the key ideas of Chinese bank about SC finance businesses are the same - the inter-SC financing model mentioned previously. Meanwhile, there are several small differentiae. For example, they adopt different process to solve a basic homolog. Certainly, these processes have an analogical function.

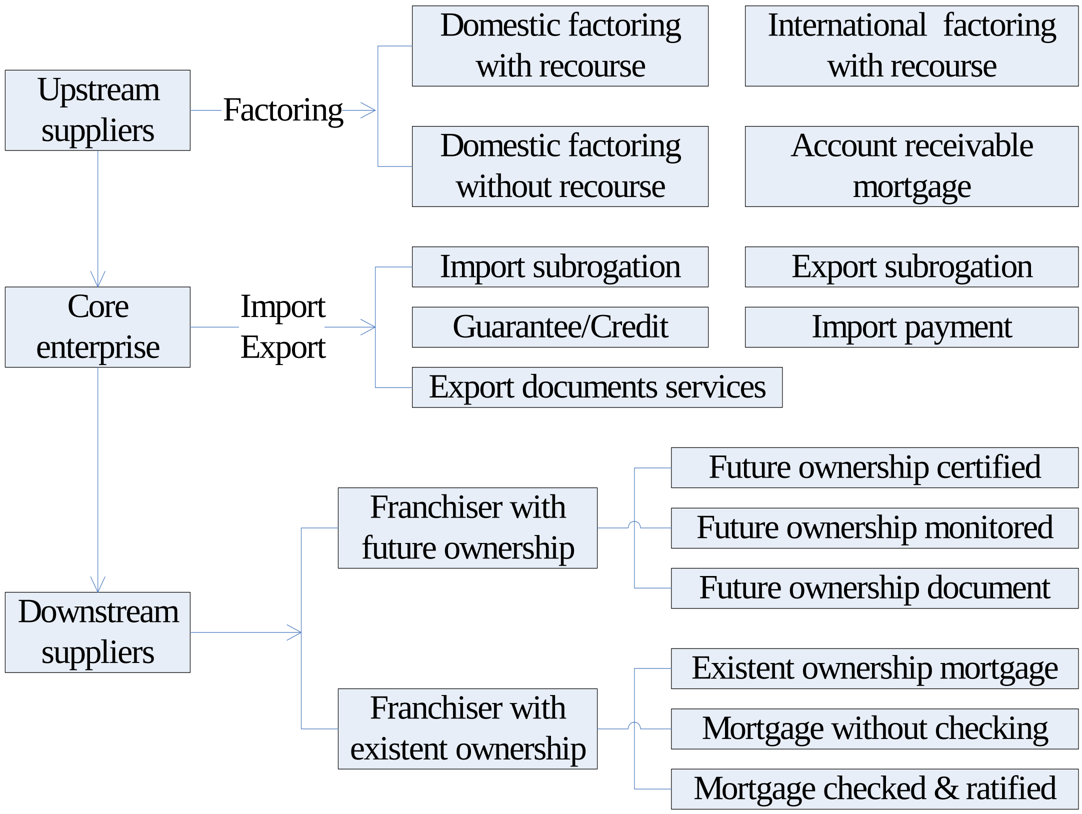

Figure 21: 2.2.2.1.6 - The "N+1+N" model - HXB SC finance

Source: Liu, X. C., 2008, Supply Chain Finance Theories and Practices, HXB

2.2.2.2 Private equity (PE) financing

Privately Offered Fund (POF) has particular meanings in the dissertation due to the particular situation in China. In the dissertation, POF means that funds offered by certain of person and/or organizations except banks are invested on certain some projects such as financing services for SMEs.

There are mass troubles in applying process when SMEs' need supports from banks although some banks have SC finance services. Then POF works when the trouble happens. Usually, the POF would be the partner or shareholder of these SMEs after it offered funds to SMEs. Most of time, the POF and the boss of enterprise are friends. So there are not one and only rule during these activities.

Compared with SC finance services provided by banks, the SC financing offered by the POF could be got easily with higher interests. Furthermore, the POF would be a boss of the SME while the banks would be creditors after deals. So the POF could make some decision in the SME, but banks could not.

2.2.3 Comments

Both international and Chinese typical SC finance models has been introduced and summarized. Almost all of SC finance models in the world are provided by banks. Additional, most of them are inter-SC financing businesses. In other words, unfortunately, the intra-SC financing model has not been set up.

There are two key points which should be noticed on studying international models. One is the factoring business, the other one is the IT system with no/less paper work. These two findings mean that activities and capital in SC should be security and the processes following SC activities should be simplified through the development of technologies included IT. In addition, as the literature review mentioned, there are some kinds of types finance services working in SC provided be finance companies. They integrate finance activities in SC. However, these services and/activities are inter-SC financing businesses. Although certain several large non-finance companies expand businesses to finance, they have not been integrated well the whole process of SC, included finance and logistics. They are just expanded businesses rather than optimization.

For the domestic's services, the SC financing services are only provided by business banks. This is the first character in China. Meanwhile, the other important role is the conservator. Most of time, it is a logistics company such as a transport provider and a warehouse provider. There is a common argument compared international businesses in domestic. It is the security of activities and capital in SC. Furthermore, professional person in China summarized and designed basic model to operate the SC financing services, one core enterprises model. The reason for this situation appeared is the fact that the policies from the Chinese government. One is that financing services could not be provided by other parties such as logistics companies but banks, fund organizations and investment companies while the other is that banks could not be allowed enter some industries such as logistics industry.

During the period of writing the dissertation, some policies in China have been changing owing to the financial crisis. Therefore, the writer would update SCF model according to new policies in Chapter 4. From the writer's view, other parts such as logistics companies should play more important roles in SC although the bank would be useful factors for promoting the financing supply chain management.

3. BUILDING THE SCF MODEL

3.1 Golden Rule: Distinguish two types of SC financing models

According to investigations on previous concepts and models of SC financing in Chapter 2, the writer argues that building SC financing model should be distinguished between inter- and intra-SC financing models. The SC financing has two types in the dissertation. One is intra-SC financing, the other is inter-SC financing. The inter-SC financing is a financing business provided by an organization which works out of SC, while the intra-SC financing is a financing service afforded by enterprises run businesses in SC. Figure 3.1.1 shows intra- and inter-SC financing. SC 1 is the core SC. The merchandise follow is from a company who has raw materials to focal company. That is the key business. Additional, SC 2 is the assistant SC, the capital SC. The capital is from banks to companies who have raw materials.

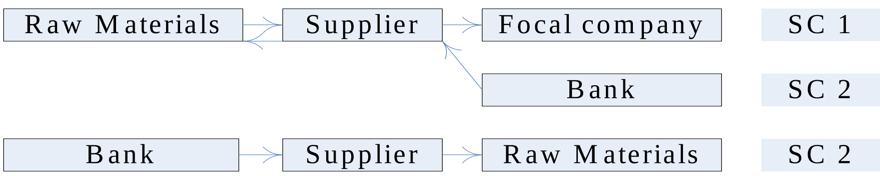

Figure 22: 3.1.1 - Intra- and inter-SC financing
Source: Drew by author: ©Copyright Liu, R., WMU-ITL Shanghai, 2009

3.1.1 Inter-SC Financing

In inter-SC financing model (SC2 in Figure 3.1.1) the organizations which could provide financing businesses might be companies, banks or capital market (bond or stock), etc. These organizations provide financing services. There are much sameness between the financing services and some project investments. The organizations (the projects investors) take care of security, liquidity and profitability for using capital. If the companies short on funds could prove security, liquidity and profitability of their operation, the organizations can lend funds with high accruals. However, these projects could not solve SC troubles unless furious competitions around the organizations.

3.1.2 Intra-SC Financing

In intra-SC financing model (SC1 in Figure 3.1.1) enterprises which could provide financing service might be suppliers, manufacturers, distributors and retailers, etc. For example, both account receivable and account payable are two of financing services. These enterprises pay more attentions on solidity of SC. However, these services also could not solve SC troubles. For example, a manufacturer short on funds obtains cashes through account payable from suppliers. The manufacturer could operate businesses while suppliers have lots of account receivable. It may lead to troubles on suppliers. It might also lead to rupture on SC.

3.1.3 Conclusion

Generally speaking, the suppliers are SMEs short on funds in SC 1 (Figure 3.1.1). How to strengthen the core SC? Make cash flow of suppliers unbreakable. Suppliers need find abundant capital to operate businesses. Usually, banks afford capital to suppliers. That is inter-SC financing service for SC 1. If focal companies would offer capital to suppliers, the SC 1 is also security. This activity is the intra-SC financing service. Both buyers and suppliers pay more attentions on SC financing services. Meanwhile, there are certain some basic types in SC financing businesses. However, some troubles exist in both inter- and/or current intra-SC financing services. Based on abundant conceptions of SC and existed financing troubles, a new SC financing conception and model should be conceived and built by combining advantages both inter- and intra-SC financing model. The writer builds the SCF model which is innovations on the topic.

3.2 Objective and Principia: Multi-win

The objective and principia of SCF model is that making every participator in SC beneficial. In other words, each role played in SC should obtain more profits after the SCF model working. Based on the objective and principia, from different participators' views, the writer explains their benefits due to running SCF model.

3.2.1 Core Enterprises in SCF Model

On the one hand, core enterprise should not be neglected in both inter-SC financing and intra-SC financing. There are two different roles of core enterprises between inter-SC financing services and intra-SC financing services. In the current inter-SC financing services, the factor of core enterprises could decide SMEs' lending rates and loan limits with banks at an extent. If a core enterprise had a good credit record, the SMEs in the SC which includes the core enterprise are operating well and the SC is a strong one. If not, the SMEs go to dead and the SC disappears. In other words, the core enterprise decides the destiny of SCs both theirs and many SMEs'.

On the other hand, as Chapter 1 expatiated, the steady SC is the core competitive capability of large enterprises. In particular, the world faces the largest financial crisis. Under this condition, the SCF model which could make sure the SC steady might be supported by core enterprises such as raw materials providers and large enterprises in manufacturing. Furthermore, core enterprises are hinges of the SC for both logistics and cash flow while they might be hypocenters of the risks in SC.

To sum up, there are consanguineous relationships between core enterprises and their SCs. Meanwhile, the core enterprises are the largest beneficiaries. So to make sure benefit of core enterprises is a sub-objective and principia to build SCF model.

3.2.2 SMEs in SCF Model

According to Chinese SMEs Yearbook (2007) as cited in SDB and CEIBS, there are 4,200 SMEs in China. The amount is 99.8% of total number of SMEs in China. The value of both end-products and services created by SMEs is 58% of gross domestic product (GDP); the amount of goods produced by SMEs is 59% of the saleroom of the whole society; the tax paid by SMEs is 50.2% of the amount. Meanwhile, SMEs provide 75% above job opportunities in total and the total export and import is 68% of that in China. However, the finance services got by SMEs are disproportional deeply with the SMEs' strategic status. According to World Banks (as cited in SDB and CEIBS), about 29% cash flow of large enterprises are from banks loan while about 12% cash flow of SMEs, even that only 2.3% cash flow of SMEs which has less 20 employees are from banks loan. In a word, more than 80% SMEs lack of capital and the cash flow in 30% SMEs ruptures easily.

So most important roles in SC are the SMEs. If they were in trouble, the SCs might rupture. Under this condition, the SCF model should protect them to operate their business as usual. In other words, the SCF model should provide funds to SMEs. That also is a sub-objective and principia for building SCF model.

3.2.3 Logistics Section in SCF Model

There is a difference between the writer's argument about logistics and previous scholars' arguments about logistics. She attached importance to the logistics section. Usually, there are two parties in the logistics section. They are warehouses providers and carriers. There is a common character between storing and transporting. The writer argues that storing might be regarded as transporting while transporting might be regarded as storing. The common character is the fact that merchandises are controlled by the third party who has not any proprietorship of the merchandises during these periods included storing and transporting. Moreover, these two periods are indispensability parties in SCs and both warehouses providers and carriers gain benefits through service charges. These arguments above are basic theories. Nowadays, these two parties have a second function in banks services. They, the logistics section, are conservators/monitors. In the current inter-SC financing services provided by business banks, the logistics section is one and only right party to supervise and manage. But it increases costs of financing and risks in the SC due to complicated relationships between multi-parties. Additional, there are many different types of carriers such as airline companies, shipping companies, railway departments and highway transport operators. To simplify the complicated transport segment, the writer attempts to introduce a concept from transport and logistics industry. It is the multi-modal transport operator. Moreover, based on the common character between storing and transporting mentioned previously, she considers that an organization which arranges and manages the whole logistics section should appear in the SC. So she brings these concepts into the SCF model.

To explain logistics section in SCF model, the writer drew Figure 3.2.1.1 to express her blueprint. The basic logistics section includes storage, line-haul, in-city distribution and cargo delivery. The value added logistics section includes dealing with orders, quality affirming, re-producing, gathering insurance, and reverse logistics. The advanced logistics section is report analysis, inventory management, logistics network and IT system.

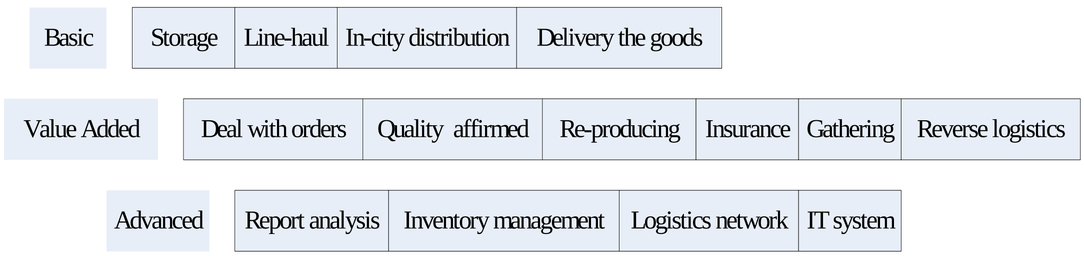

Figure 23: 3.2.1.1 - The logistics section

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With development of society and technology, the SC needs an advanced logistics section. As the MAXTRAD system showed (Chapter 2), the process of report (documents) analysis and IT system are very important to promote efficiency of SC. As Chinese banks model and GE inventory-ownership solutions showed (Chapter 2), the warehouse owner (inventory management), as the conservator, plays a vital role in SC finance services provided by Chinese banks. Focus on logistics network, JP Morgan Chase Vastera model showed that the transportation section is an indispensable role both in SCM and SC finance services. In addition, the concept of multimodal transport and combined transport documents should be introduced. According to the writer's assumption, the storage and transport could be integrated. So the person and/or organization which operates/operate the logistics section could issue combined logistics documents and should take charge the multimodal logistics section included transportation and storage with report analysis and IT system. Under this condition, enterprises in logistics section could charge more fee than the sum of freight fee and storage fee. So these also are sub-objective and principia for building the SCF model.

3.2.4 Financial Institutions in SCF model

The financial crisis is a large mischance for the bank industry. As introduction of Chapter 1 mentioned, world-class banks are in troubles. However, the SC finance businesses have an increase rather than a decrease. Because SMEs have more demands about SC financing than the period before financial crisis coming. Meanwhile, other participators included core enterprises need more supports relating to financing in order to enhance their competitions. So banks play the vital role in SC financing services at present. Furthermore, with the development of the bank industry, there are more and more competitions between business banks both international and domestic. Therefore, the business bank expands its services into SC and pays attentions to SMEs. But there are some different conditions happened on international and domestic. In China, the bank could not be allowed to involve into practical businesses in other industries. For some banks in other countries, they could (mentioned in Chapter 2). There is a long way for Chinese banks to launch intra-SC financing services although the new policy which allows them to start insurance businesses. Standing from the present, the writer argues that the Chinese banks are not right participants to launch the intra-SC financing services due to some restrictions from policies. In brief, Chinese banks operate SC finance businesses, as inter-SC financing services, and obtain considerable benefits in the financial crisis.

However, there are potential risks in SC finance businesses provided by Chinese banks. Chapter 2 showed that there is a vital role in the SC finance service models of Chinese banks. It is the logistics section the writer defined. It is the conservator played by certain of organizations rather than banks. In other words, Chinese banks invest projects, but the third parties operate the projects out of control of the Chinese banks due to the restrictions from the government. So the writer expects that Chinese banks join in the SCF model when the policies allowed. Additional, she makes her suggestion in Chapter 5 with a good wish.

3.2.5 SCs in SCF Model

For any company in SC, the cash turnover period is key factor to survive in financial crisis and clean up during any period. To simplify, the cash turnover period is an amount that inventory transition period plus account receivable switchover period minus account payable protracted period. In other words, these three factors should be considered in to the SCF model. Furthermore, minimizing inventory transition period and account receivable switchover period and maximizing account payable protracted period. But there is a trade-off in SC. For example, the A company maximizes an account payable protracted period. It must lead to a maximum account receivable switchover period for the B company which might be A's supplier. Additional, if A's customer maximizes account payable protracted period, the A company will face a maximum account receivable switchover period. It must lead to an execrable repetition in the SC. By contraries, if each participator in SC minimized its account payable protracted period, the cash turnover period of each participator would be minimized. It is an optimization SC. So it also is sub-objective and principia for building the SCF model.

3.2.6 Conclusion

As pervious sections expatiated, the writer summaries the objective and principia for building the SCF model in order to the fact that every participator in SC gets more benefits when the SCF model working. They are,

[1] Make sure core enterprises having stronger competitive with opportune costs;

[2] Make sure SMEs having suited cash to operate their businesses;

[3] Re-recognize and exploit the logistics section in SC;

[4] Leave an important place for financial organization such as banks;

[5] Keep speedy and steady cash turnover in SC.

3.3 Basal SCF Model Building

As the objectives and principia showed previously, the writer argues that the main task of the SCF model (Figure 3.3.1) is the capital pool building. The writer with systemic shipping background holds that there are some resemblances between the capital pool and the Protection and Indemnity Clubs (P. & I. Clubs). However, the capital pool is the cash and management pool involved each participant in the SC rather than an industry club. The objective of establishing the capital pool is making sure the security of businesses operating in SC.

There are more or less seventeen phases in SC process in the SCF model. In the figure, the 1 is raw materials affording, the 2, 4, 6, 8 and 11 are warehouses services, the 3 and 7 are transportations, the 5 and 9 are manufacturing processes, the 10 is a distributing section, the 12 is a consuming segment and the 13 is a callback part. Additional, the 14 is the cargo flow, the 15 is the IT flow, the 16 is the cash flow and the 17 will be introduced later. There are three logistics segments - the 2, 3 & 4; the 6, 7 & 8 and the 10, 11 & 11 in the SC as follow. Additional, the writer makes an assumption that sections of the 1 and 9 have stronger capacities than other sections.

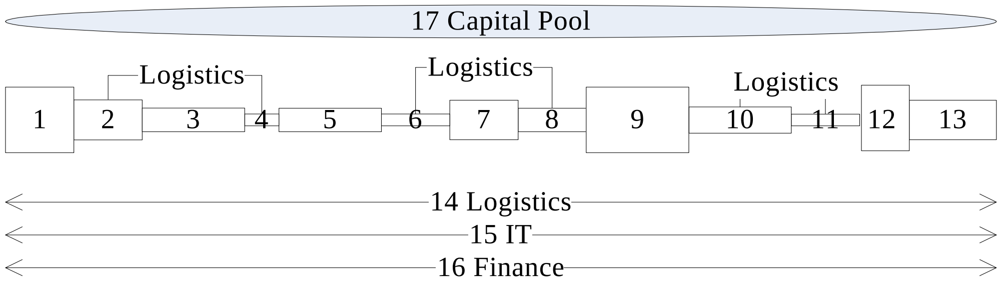

Figure 24: 3.3.1 - The SCF model

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According to introductions and the assumption above, the sections 2, 4, 5, 6, 8, 10 and 13 are easily to face finance issues. Meanwhile, the businesses in the sections 3, 7 and 11 follow the main businesses happened in the section 9. The writer would take an example in chapter 4. If any section has any tiny trouble, the SC in the example above might break. For each party in SC, it makes profits when the SC is healthy. If not, every party in the SC would be loss. To solve it, certain some banks included both international and domestic provide financial businesses for them, SMEs in particular. These models have been introduced and analyzed previously.

Back to the substance of businesses operating, the turnover of cash is the key factor for any enterprise. There are three main factors in the cash turnover. They are inventory, account receivable and account payable (Figure 3.3.2). There is no query about inventory management, but there is the trade-off on dealing with account receivable and account payable. Take one company as example. The A company tend to delay the period of its account payable. Certainly, it gets certain financing service in short-term. Meanwhile, its supplier, the B company would have to accept a longer period of the account receivable from the A company. In other words, the B' cash turnover would have been delayed. Focus on the whole SC, the cash turnover would not shorten. Furthermore, it might be longer than before due to the malice from participators in SC such as the A company.

Inventory	Account receivable	Account payable
Cash		

Figure 25: 3.3.2 - The operating cash in enterprises

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Under this condition, the writer argues that making the account payable and account receivable disappearing is an effective way to shorten the cash turnover of whole SCs. She designs the SCF model to achieve it. The SCF model means that there is a capital pool built by all parties in the SC. It is the 17 (Figure 3.3.1), the capital pool. Meanwhile, it is working for every party in the SC and it could annihilate accounts payable and accounts receivable. More important, the SCF model is working in the SC whatever banks appearing or disappearing. The five objectives and principia for building the SCF model have been satisfied with the capital pool. The key points in the SCF model are the capital pool building (expanded in Chapter 4), the logistics section integrating (introduced previously) and nicer relationship keeping (to optimize SCs). However, how to deal with these problems and how to carry out them? The writer settles these questions through three cases study in Chapter 4.

4. APPLYING AND EXTENDING THE BASAL SCF MODEL

The capital pool building, nicer relationship keeping and logistics section integrating are three tasks for applying the SCF model the dissertation innovated. In this chapter, the writer introduces three cases and their own plans, applies the SCF model into three different conditions combined cases and makes analysis on these cases. Additional, these three cases are happening in China. So the writer is required to secrete the companies' actual name and adopts some symbols instead.

4.1 Case 1: Inter-SCF-1 Model Applied on HD Case

4.1.1 Introduction of the HD Case

The HD SC plan is designed by NF Industrial Development Co. Ltd. in March, 2009. There are three partners in the SC project. They are HD, GT and NF. The HD is a steel group related to steel smelted, transportation, logistics, energy sources and port facilities. Annual output is 1,800,000 tons above steel products. Every month, it purchases 15,000-50,000 tons. The raw materials transport by ships firstly and trucks secondly. The GT is an investment company focused on logistics industry. It is able to provide integrated steel SC services and multi-model steel logistics services. The NF is an integrated company. It provides SC services and invests industrial projects. Additional, it keeps a good relationship with banks.

The motive of the project is based upon these three parties' strategies. The HD has the needs of the SC services. The GT and the NF, as a group, provide a series of integrated SC services such as purchase agent, trade financing and logistics services. The basic flow chart of this project followed.

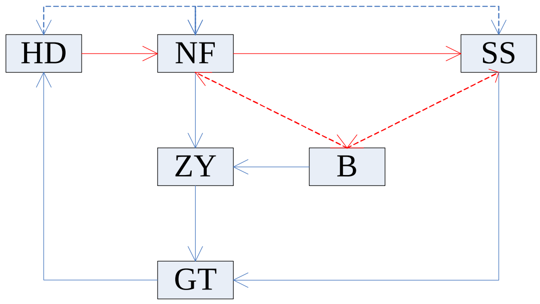

Figure 26: 4.1.1.1 - The basic flow chart of the HD SC plan

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Figure 4.1.1.1 showed four processes, included logistics operation, capital operation, goods monitoring and insurance operation. During the logistics operation, HD makes steel contracts with suppliers (SS), advances deposits and informs NF which evaluates SS, products, prices and delivery terms according to purchasing terms. After that, SS issue invoices of value-added tax. ZY checks and accepts goods and sends copies of document to both banks (B) and NF. ZY consigns shipping services to GT and issues documents according to orders from B. Then ZY consigns rest logistic services to GT and has duties to monitor the whole logistics process. During the capital operation, HD pays 30% deposits to the account designated by NF and issues 70% P. O. to NF which advances 20% payment to SS. B assigns P. O. of 70% amount of goods' value. After goods checking and accepting, NF pays 80% goods' value. HD does installments for getting goods when the goods ship at warehouse and pays the rest and vicegerent fees before the last batch. During the goods monitoring, the ZY issues cargo transportation documents, consigns cargo shipping to GT and monitors total process. GT makes feedback both on way and in warehouse on time. Additional, GT delivers the goods according to orders issued by ZY. During the insurance operation, the policy-holder is ZY. The insurance premium is afforded by HD. The priority beneficiary is B.

For risks of the HD SC plan, the participators undertake risk assignments as follow:

- Risks form fulfilling the contract for HD are controlled and undertook by NF;
- Risks from balancing capital are controlled and undertook by NF;
- Risks form fulfilling the contract for SS and quality of steel products are controlled and undertook by HD;
- Risks of logistics operation are controlled and undertook by both ZY and GT;
- Risks of monitoring products are controlled and undertook by both ZY and GT.

The other information should be considered as followed:

- HD pays 30% deposits and assigns 70% invoices when the contracts are issued;
- HD pays total values when the contract are fulfilled;
- The minimal quantity is 2,000 tons per batch;
- The turnover is controlled in 30 days;
- The value of financing commission equals to 70% payments of goods * 1.2%.

The words above have explained the HD plan clearly. In section 4.1.2, the writer re-settles the HD case by applying SCF-1 model. In section 4.1.3, she analyzes both the HD plan and the SCF-1 model and argues that the SCF model is better.

4.1.2 Comparative Applying: Inter-SCF-1 model vs. HD SC plan

The previous expatiations are the whole actual case. However, the writer argues that there are insufficiencies in the HD SC plan. On the one hand, the number of participators in the HD SC plan is much more than that in the physical SC. It means the HD SC plan could be simplified. It also means certain some charges could be saved. It also means certain some delays due to redundancy participators could be prevented. On the other hand, these participators in the HD SC plan had not integrated well their own resource. In other words, the writer attempts to apply the SCF model to optimize the HD case.

In the HD case, HD and SS are two main roles in SC. Meanwhile, neither HD nor SS cares the logistics section. They only care sending cargoes and receiving cargoes at right time and right places. So there is an opportunity for the third party to operate integrated SC businesses. It is an inter-SC financing service, the SCF-1 model (Figure 4.1.2.1). There is a pool in the model operated by the third party such as the bank. The writer thinks that banks are able to play well the role of the third party. Because they are good at running cash flow. In the model, banks provide funds to manage the process of logistics section. As the two main parties, HD and SS make trade deals with consanguineous relationship with banks, the funds operators. Meanwhile, logistics section included transportation and storages, is arranged by banks. The operating costs only are financing cost with low interests.

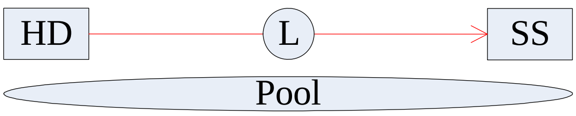

Figure 27: 4.1.2.1 - The SCF-1 model

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Under this condition, the main roles could build the financial bridge, a cash flow highway, between them. It will shorten the cash turnover. In addition, there were lots of documents related to cash flow operating during the whole process in the HD SC plan (introduced previously). However, in the SCF-1 model, the banks could manage integrated pool businesses and they are good at these. Meanwhile, they organized and controlled the logistics section. That means the safer financing businesses than that in the HD SC plan. For the logistics section, it avoids the non-logistics risk, lightens the supervisory burden and ensures the freight revenue.

4.2 Case 2: Intra-SCF-2 Model Applied on QD Case

4.2.1 Introduction of the QD Case

The QD Company is a second largest one manufacturing company in Chinese beer industry. It divides the whole SC (Figure 4.2.1.1) into three parts, included materiel SC, production SC and distribution SC. From the writer's view, its understanding on SC relates to inbound logistics and outbound logistics. The concept of production SC is based on the theory of inbound logistics. The concepts of materiel SC and distribution SC are based on the theory of outbound logistics. The periphery management of the QD SC model is the materiel supplier. The core management is logistics operators which compose a virtual organization. Between periphery and core, the operating process involves many parts such as factory, operating department, technology department and strategy department. The writer argues that the most valuable point of QD model is an integrated plan. In addition, the QD company gains larger profits than before as it has not changed its SC strategy.

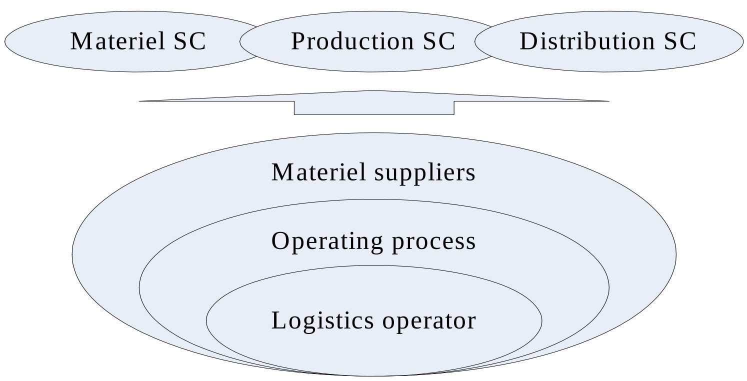

Figure 28: 4.2.1.1 - The QD SC model

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4.2.2 Comparative Applying: Intra-SCF-2 model vs. QD SC model

There are both advantages and disadvantages in the QD SC model. It integrates its SC process and builds bridges between materiel SC, production SC and distribution SC. That is the largest advantage of the QD SC model. However, it only focuses on physical materiel flow. As arguments of the writer mentioned previously, the SC concept includes materiel flow (logistics), information flow, human resource flow and cash flow. With the development of information and technology, the SC turnovers are more and more quick. But it has developed to certain an extent and slowed down. It is a common rule in the world. Take shipping market as an example. Many years ago, the documents such as bills of lading (B/L) delivered are much quicker than the cargoes delivered. With the development of shipping technology, the delivering of B/L between China and Japan is much slower than the shipping of cargoes from China to Japan. So the seaway bill is adopted.

In the QD SC model, the theories and technology of physical materiel flow has been developed well. The benefits increasing might be in a small extent. For cash flow, the QD SC model does not consider. The writer designs the SCF-2 model (Figure 4.2.2.1) to enhance the QD SC model. For the QD (1 in the SCF-2 model), there is a large supplier (1S in the SCF-2 model) who might be the QD’s suppliers’ supplier and/or a large customer (1C in the SCF-2 model) who might be the QD’s customers’ customer. Meanwhile, there are many SMEs operating between 1S and 1 and/or between 1C and 1. That is a strong SC. However, it would be brittle and broken when the financial crisis is sweeping the world. Most of these conditions, the SMEs are primers to destroy the whilom strong SC. Furthermore, both 1S and 1 and/or both 1C and 1 prefer enhancing their SC and/or distribution system. The security of the SMEs is the most important task for them. In other words, the competitions among core enterprises are the competitions among their SC and/or distribution system. From this point, the core enterprises such as 1S, 1 and 1C should provide financing services for SMEs in their SC and/or distribution system. In order to control SC, the core enterprises attend to manage logistics section. Most of large companies have their own transport system and their own warehouses.

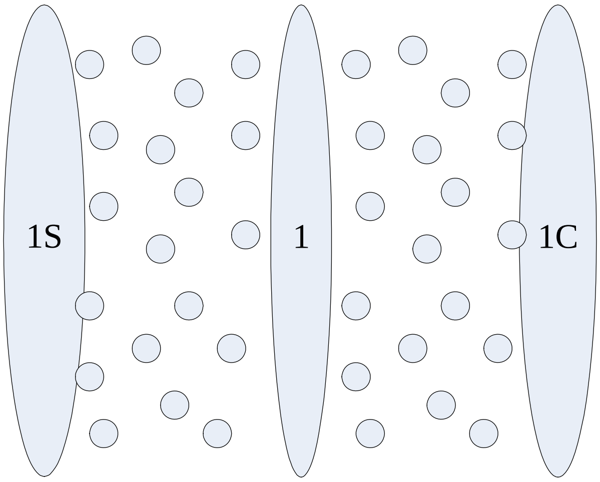

Figure 29: 4.2.2.1 - The SCF-2 model

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Through applying intra-SC financing model (the SCF-2 model), core enterprises could have stronger competitive with opportune costs due to SC control; the SMEs could obtain capitals provided by core enterprises to operate their business and the SC could not be attacked; well integrated logistics section only is one of key tasks of some large companies; the financial organization in the SCF-2 model is the core enterprises and they also get financing charges from the intra-SC financing businesses; more important, the SCF-2 model could keep speedy and steady cash turnover in SC. That means the concepts of “unitization” and “de-unitization”. Figure 3.3.2 showed the operating cash in enterprises and the writer argues that making the account payable and account receivable disappearing is an effective way to keep speedy and steady cash turnover in SC.

Back to the SCF-2 model, the process of operating (Figure 4.2.2.2) funds in the SMEs should be analyzed. First of all, operating cash of SMEs should more than sum of advance to supplier, logistics fees, manufacture costs and account receivable. If not, businesses could not run. The account payable and the account receivable appear from the power of core enterprises such as 1S, 1 and 1C in the SCF-2 model.

Advance to supplier	Logistics	Logistics	Manufacture	Account receivable
Operating funds				

Figure 30: 4.2.2.2 - The operating funds in SMEs

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Secondly, the SMEs work between two large enterprises such as 1S and 1 and/or 1 and 1C in the SCF-2 model. Additional, the advance to supplier and the account receivable of SMEs appear from the power of core enterprises such as 1S, 1 and 1C in the SCF-2 model. From the point of businesses value-add, the account receivable (Figure 4.2.2.3) is regarded as a sum of advance to supplier, logistics charges and manufacture revenues. The SMEs usually have to pay cash which equal advance to supplier twice to keep businesses and these businesses are not related to their main businesses. Under this condition, only the manufacture is their main businesses.

Advance to supplier	Logistics	Manufacture
Account receivable		

Figure 31: 4.2.2.3 - The businesses value-add

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In the SCF-2 model, the market powers of core enterprises (1S, 1 and 1C) are parallel, but much stronger than the SMEs. So the two main companies such as 1S and 1 or 1 and 1C could apply the SCF-2 model to abate traditions about advance to supplier and account receivable. Take QD case as an example. The QD (1) could abate advance to supplier of its suppliers' supplier which is 1S and account receivable to customers of its customers' customer which is 1C. Additional, as a large company, the QD attend to control the logistics section related its raw material and distribution of its products. In other words, the logistics section could be taken on by core enterprises such as the QD. So the SMEs could do their main businesses with lower funds. It makes sure speedy and steady cash turnover in SC. After applying the SCF-2 model, the QD would has stronger competitive with opportune costs; the SMEs could only care manufacture costs which means that the SMEs have abundant capitals to operate their businesses; the logistics section is an extension business of the core enterprises to control both raw materials and products flows; more interesting, the core enterprises could obtain the financing charges.

4.3 Case 3: Logistics Section Intra-SCF-3 Model Applied on JT Case

4.3.1 Introduction of the JT Case

The GT is a logistics investment company. One of its subsidiary company is an oil warehouse company. The GT charges investment and management fee through mortgaging businesses. The process of these businesses (Figure 4.3.1.1) is that:

[1] Customers pledge oil products in warehouses belonging to warehouse owners;
[2] GT provides capital to customers according to ratios of the pledge value;

[3] GT sends orders as the ratios which are decided by ratios of returning money;

[4] The warehouse sends oil products according to the orders from the GT.

During this process of mortgage, inspecting and pledging oil products are born by both customers and the GT through operating ERP system. Meanwhile, information in ERP system is shared by the GT, the finance department, the organization of oil inspected and pledged and the oil warehouse. The risks in the business are controlled and tracked by ERP system.

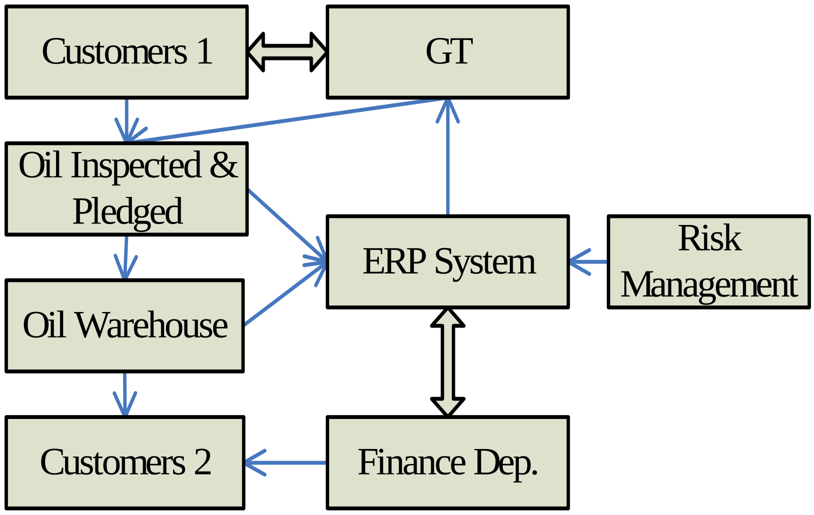

Figure 32: 4.3.1.1 - The warehouse mortgage (WM) model

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4.3.2 Comparative Applying: Intra-SCF-3 Model vs. WM Model

The writer argues that the JT case is a good innovation because the logistics section plays an important role in the whole process. However, on the one hand, there are many risks in the business process; on the other hand, the GT does the service without a high profits. If oil qualities change a little, the GT and the warehouse would bear a large risk. If oil prices in market have some changes, the GT would also bear large risks. There is much risk, but less profit. As section 3.2.3 mentioned previously, the writer attempt to introduce some concepts from shipping to the SCF model. For JT case, she designs the SCF-3 model (Figure 4.3.2.1) relating to shipping concepts. The C and the C' in the SCF-3 model are customers 1 and customers 2 in the WM model. The main difference is that the logistics section works in the SCF-3 model instead of many interrelated parties such as the GT, ERP system operator, the risk manager, the finance officer, the oil inspected and pledged officer and the oil warehouse in the WM model. Meanwhile, there are three flows in the logistics section. They are cargoes flow, IT flow and funds flow. The SCF-3 model (Figure 4.3.2.1) works by ten steps and with a repetition:

[1] C and C' have a trade deal;

[2] C and Logistics section operator have a total logistics contract and Logistics section operator gets charges prepaid or account receivable for the services;

[3] Logistics section operator signs the whole logistics bill (WLB) to C;

[4] Logistics section operator arranges and implements the whole logistics plan;

[5] C transfers the WLB to C' according to the trade contract between C and C', C' endorses the WLB to logistics operator for financing, then C and logistics operator make a balance account based on total logistics charges;

[6] Logistics section operator signs the sub-logistics bills (SLBs) by stages to C' and gets revenues according to the financing contract when the financing happened;

[7] Logistics section operator deliveries cargoes according to the SLB the C' held;

[8] Logistics section operator makes realization of cargoes according to the cargoes market with risk management whatever arguments from C';

[9] The notice of deal finished issued by logistics section operator to C';

[10] The new trade deal could be signed by C and C' and turn to step 1.

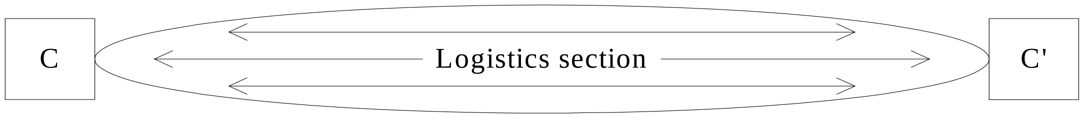

Figure 33: 4.3.2.1 - The SCF-3 model

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The benefits after applying the SCF-3 model are:

[1] C could get revenues without account receivable;

[2] C’, as the SME, could avoid risks of capitals and changes of merchandise;

[3] Logistics section operators get charges of both whole logistics section services and financing services;

[4] Logistics section operators have two roles in the SCF-3 model such as both the WLBs and SLBs signer and the cargo owner;

[5] SCs turnovers are speedy and steady due to the simplex control from the Logistics section operator based on the SCF-3 model.

The benefit 4 needs to explain. This argument comes from shipping industry. The role of logistics section operators is similar as a carrier such as a contract carrier and a multi-modal transport operator (introduced in chapter 4) and a creditor who holds the property of cargoes. Under this condition, the logistics section operator releases its obligations and protects its rights and interests, especially the financial crisis coming. Meanwhile, the C needs not beer any risks and the C’ also does not. Furthermore, the C’ avoids risks both in logistics section and of prices decrease of merchandise under the SCF-3 model and it gets funds to maintain its businesses.

5. CONCLUSION AND SUGGESTION

The competitions between enterprises in 21 century are the competitions among SCs of enterprises, in particular financial crisis coming. The most important factor which influences SCs is to control cash flow. Too many companies have closed down due to finance issues, especially SMEs. More companies try to find out an effectual solution to face bad condition. Nowadays, banks play a vital role on the solution, the SC finance business. Based on the writer's investigation, she argues that a new model should be built. It is the SCF model. The golden rule for building the SCF model is to distinguish two types of SC financing models included inter- and intra-SC financing models. Additional, the objective and principia is to make every participator gets more benefits than before. In other words, it is a multi-win project. After building the basal SCF model, it attested to benefits of three types of the SCF model to analyze and compare three cases in practice. In a word, the SCF model could be applied variedly among different enterprises under different conditions such as financial crisis coming to achieve multi-benefits.

However, focus on Chinese enterprises which run in China, there are some restrictions during the process of launching the SCF model. Some of them attribute to policies, some of them attribute to consciousness of enterprises in SC and the rest attribute to different expectations of Return on Investment (ROI) from certain some companies such as private funds companies and large size transport providers. Under these situations, the writer makes several suggestions. Furthermore, there are certain some aspects out considered in the dissertation. The writer wishes to submit following suggestions and non-involved aspects to improve SCF businesses.

[1] Policy aspect: allow banks holding shares of companies which operate businesses in other industries and intervening management and operation of their businesses.

[2] Consciousness aspect: encourage every participator involved in SC paying attention on both itself and the healthy SC which it involved.

[3] Dissension aspect: adopt intermediation and/or arbitration rather than litigation to shorten these processes and the SC turnover.

[4] Opportunity aspect: set foot in financing field for logistics section according to policies such as the plan of prospering logistics industry from the government.

[5] Human resource aspect: train professional integrated person in SCM and financing field and provide suitable positions for them.

[6] Modernization aspect: design system and/or use technology in reason.

[7] Credit aspect: constitute right credit system both core enterprises and SMEs.

APPENDIX: Questionnaire

Questionnaire on Supply Chain Financing

Honorific Ladies/Sirs:

This questionnaire is held by the Master of World Maritime University, majoring in International Transport & Logistics, in order to research on my dissertation (Research on SCF Model under Financial Crisis: An integrated SC project in China based on financing). Thank you for your any support during your busy life. Although contents of the questionnaire do not relate to any classified information, I promise to keep secret of any contents you choose.

The questionnaire expects information form logistics enterprises, manufacturing, finance market and supply chain investigated institution, etc. Therefore, not any question might be suited you due to my deficient designs. If it happened, please neglect. I really appreciate your earnest attitude and agile choices.

Part One: Basic Information

1. You are working in _______ industry（Others_______________）.
   A. Manufacture B. Logistics C. Finance D. Investigation
2. You are working in ________ department（Others_______________）.
   A. Core B. Finance C. Investigation D. Support
3. Your position is _______ （Others_______________）.
   A. Principal B. Assistance C. Executants D. Investigator
4. The value your company created is the _______ of the total value.
   A. 10% below B. 10%~30% C. 30%~60% D. 60% above
5. Is there any cash flow trouble in your company? Y or N
6. Do payments and/or charges delayed happen in your company? Y or N
7. If need financing, your company will（**1~9 means weightiness down**）:

1	Source	Bank	Private	Share	Delay X	Mixed	Others______
	Sequence						

2	Model	Mortgage	Credit	Share	Project	Bargain	Others______
	Sequence						
3	Mortgage	F assets	R materials	On process	Contract	Product	Others______
	Sequence						

Part Two: Position & Model

Figure 2.1: Position in supply chain

Please line out your businesses and/or interests on Figure 2.1.

Step 1	S1	S2	SS1	SS2	SS3	P	D1	D2	C1	C2	C3

Step 2	S	P	T1	RS	T2	P	PS	T3	PD	T4	C	T5

Position in Supply Chain

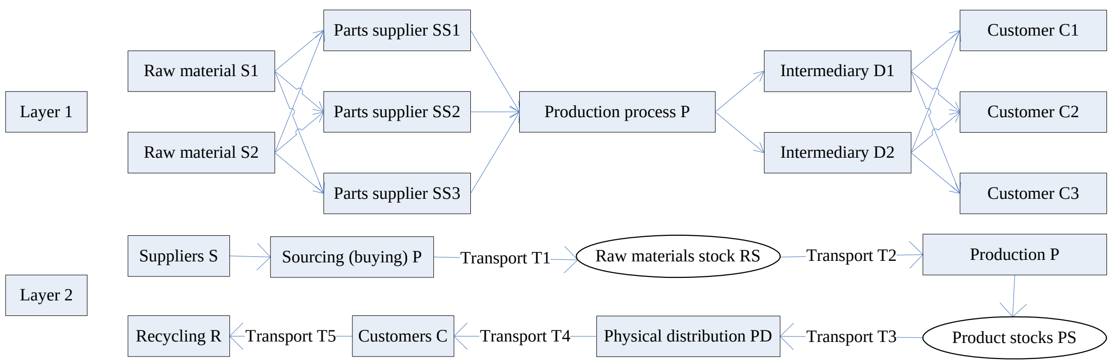
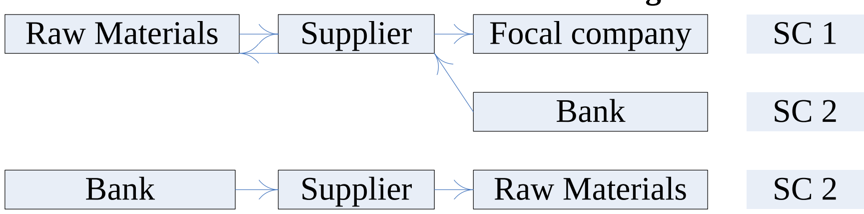


Figure 2.2: The inter- & intra-SC financing

SC1 is a main SC. If enterprises in SC1 need money to run businesses, banks could provide funds. That is SC2. The focus is money.

Inter- & Intra-SC Financing



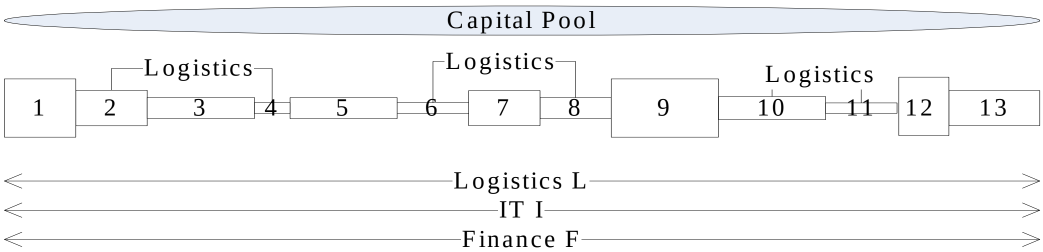
SC2 is an important way to support activities of SC1:

1. How about your opinion on inter-SC financing businesses? ________________。
2. If enterprises in SC1 could solve fund problem by themselves - the intra-SC financing businesses, how about your opinion on that? ____________________。

Figure 2.3: Simulation of intra-SC financing

The weakest segment in SC might be the most pivotal segment for the stabilization of the SC. If it breaks, the SC might be in trouble.

Simulation of intra-SC financing



1. Please line out your businesses and/or interests in the table combined Figure 2.3.

	1	2	3	4	5	6	7	8	9	10	11	12	13
L													
I													
F													

2. Suppose there is a capital pool built by enterprises in SC. Which factors are important? What are your opinions?（**1~9 means weightiness down**）:

1	Source	Bank	Private	Share	Delay X	Mixed	Others______
	Sequence						
2	Model	Mortgage	Credit	Share	Project	Bargain	Others______
	Sequence						
3	Mortgage	F assets	R materials	On process	Contract	Product	Others______
	Sequence						
4	Shares	Capital	Period	Value-add	Power	Property	Others______
	Sequence						
5	Motive	ROI	Competitive	Transition	Security	Obligation	Others______
	Sequence						

Thank you for your time!

Thank you for your attention!

Thank you for your support!

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