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A Review of Service Supply Chain and Future Prospects

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Abstract

Service supply chain, the new research tendency of supply chain management, is considered to be the most effective tool for enterprises to retain competitive advantages. It has attracted the attention of scholars and practitioners in the field of different disciplines. Based on bibliometric methods and the data of CNKI and Web of Science™ from 2000 to 2014, the paper makes a statistic analysis on service supply chain from the amount, subjects and methods. It also makes a summary of the subjects (definition, modeling, service capability, the relationship between management and performance, application, measurement, and coordination mechanism), providing references for the further study.

Keywords

Service Supply Chain, Bibliometric Method, Future Prospects

1. Introduction

The competition in 21st century will switch from the competition between enterprises to the competition between supply chains. Recently, Service industry has become the "engine" of the world economic growth. And along with increasing levels of global competition, labor force evolved in a majority transformation from manufacturing to service sector. More and more manufacturing companies achieved more revenue from their service units, such as GM and IBM. Furthermore, the increasing high quality and personalized demands of the customers pushed suppliers to provide more and better services. Thus, *service supply chain* (SSC) has become a new research hotspot in academia. The researches started to evolve into the studies of SSC in the late 1990s, and the prelude of research was officially opened by [1] that published *Understanding and Managing the Service Supply chain*, in which SSC is defined as an integrated management of service information, service processes, service capacity, service performance and service funds from the earliest suppliers to the ultimate customers. The do-

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mestic scholars have been exploring this field since 2000, and their studies are almost synchronously developed with studies abroad. The purposes of this paper are to review the related documents from two aspects of domestic and abroad, to identify the gap with foreign countries, and to provide a reference for domestic scholars in the field hereafter.

2. Methods and Data Sources

The citation frequency helps us to quickly focus our attention on high-quality and high influential papers. This paper adopts bibliometric method to probe into the research findings of SSC referenced by China National Knowledge Infrastructure (CNKI) and Web of Science™ from 2000 to 2014. We choose the two databases because of their larger amount of documents published with high authority and influence. With "Service Supply Chain" as keywords, we preliminary draw relevant 596 domestic documents and 481 foreign documents by fuzzy querying. And we finally get 378 domestic journal articles and 383 foreign journal articles with identification (updated as of 14/25/11).

3. Research Status of SSC at Home and Abroad

3.1. The Amount of the Citations

Although studies abroad on SSC start earlier than that at home, they on the overall are consistent, whereas they have clear phased characteristics and developing trend. On this basis, the development process of SSC at home and abroad can be divided into three stages.

The first stage: Groping stage (2000-2003). Studies on the service supply chain in this period are quite limited. As shown in **Table 1**, the rate of cited papers is only between 2.65% and 5.22%. Researches on physical transfer insights gained from 'product' to service supply chains which play a fundamental role, are relatively insufficient and immature.

The second stage: Developing stage (2004-2008). Service supply chains attracted the ever-growing attentions from both academia and practitioners, especially after the conception of Service Science was proposed by IBM in 2004. And with the pace of researches abroad, domestic researches increase steadily at a speed of 17 articles per year, and the amount of its citations is more than 10 every year. Although SSC has drawn great attention of domestic scholars, it still has much space of ascension.

The third stage: Deepening stage (2009-2014). Born in the field of foundational theory and industrial application, researches on SSC grow rapidly at this stage. The amount of domestic citations is up to 74.6% of the total, and the peak of the citation was as much as 789 times in 2012. This shows that domestic scholars are gradually deepening studies of SSC, and they also have the new progress and significant achievements.

It should be pointed out that, papers cited in 2013-2014 are much less because of its peak range has not arrived yet.

3.2. Subject Distribution and Development Trend of SSC

The statistical analysis of subject distribution of citations can reveal the status quo of the field, and help to put emphasis on further research. To avoid repeating calculation, more topics of literature are categorized into the core subject as shown in **Table 2**.

The researches have started to evolve into real studies and practices of SSC since 2004. Domestic scholars

Table 1. Time distribution of the citations.

Year	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	Total	Average
Amount of Domestic Papers	1	2	2	5	8	16	17	19	26	47	55	59	62	40	19	378	25.2
Cited Frequency	0	1	2	4	10	25	61	135	169	209	473	543	789	678	647	3746	9.91
Amount of Abroad Papers	5	4	4	7	12	13	16	20	32	56	37	46	48	46	37	383	25.5
Cited Frequency	0	7	8	19	21	43	58	75	150	176	223	205	312	415	503	2215	5.78

Table 2. Research subjects and methods.

Subject	First Year Published		Amount of Articles		Amount of Qualitative		Amount of Quantitative	
	Domestic	Abroad	Domestic	Abroad	Domestic	Abroad	Domestic	Abroad
Definition	2003	2000	26	24	24	20	2	4
Modeling	2005	2004	56	36	33	12	23	24
Service Capability	2009	2000	10	10	4	2	6	8
Performance Management	2006	2001	4	14	0	2	4	12
Application	2000	2000	172	189	144	81	28	108
Measurement	2005	2006	31	16	11	2	20	14
Coordination Mechanism	2003	2002	79	94	29	21	50	73
Total			378	383	245	140	133	243

early attach great importance to the introduction of foreign advanced achievements, or only a topic in the field of study of specific industries. With the passage of time, the research topics further broaden but uneven distributed. Such as applied research and coordination mechanism is lord of the academic circles study hotspots, which is respectively 66.4% and 73.9%. Moreover, the proportion of articles' quantity has been increasing year by year, even up to 30 per year in 2011 as shown in **Table 3** and **Table 4**. Connotation, model study, the evaluation index system and measurement are also research hotspots, which deepen gradually but still at the low thermal period. Scholars need to pay more attention to the research on service ability, the relation between management and performance study. In addition, quantitative research is far behind foreign researches.

3.2.1. Definition of SSC

According to the related literature review, we found that there is no uniform and specific definition of SSC. White, Mont, Spring and Araujo pointed out that SSC is Product-Service System that a set of common marketable products and services to meet the needs of users. Scott, Anderson and Morrice, Henk defined SSC as the supply chain that transfers resources into serviced products delivered to and received by the customers in service industry around the service production process. [2] identified the bidirectional supply chain structure in the service organizations and first proposes the practical and managerial implications of customer-supplier duality, which is the essential nature different from the traditional manufacturing supply chain, where a unidirectional flow of materials from suppliers to customers is met by a unidirectional flow of demand information in the other direction, as Lusch and Constantin indicated that the dual role of customers as both operand resources and operant resources, Vargo and Lusch put forward *service-dominant logic* (SDL) namely from the perspective of value network, where his approach can be used as a starting point for discussion. Domestic scholars pay more attention to the specific industry of SSC, which more concentrated in logistics service as in [3], port service,aviation services, tourism service [4], financial services, exhibition service, etc. The analysis shows that most scholars adopt qualitative research methods to study the connotation of SSC from different perspectives as shown in **Table 5**. It generally can be divided into four categories as follows.

3.2.2. Modeling of SSC

There are two trends in the current researches on building model of SSC. One is the expansion from a traditional goods-centric supply chain to servitised supply chain. The most remarkable contributors maybe Ellram, *et al*., who put forward a general framework appropriate for SSC with comparing the *global supply chain forum* (GSCF) model, the *supply chain operations reference* (SCOR) model and *Hewlett-Packard*'s supply chain management model, especially as they focus on the professional service supply chain and the purchasing of professional services. Basing on SCOR model, Giannakis subsequently developed a reference framework for the service organization as having bidirectional flows of both information and tangibles with suppliers and customers, which can improve the overall performance of delivery systems by means of synchronization and coordination for different supporting services in the supply chain. More recently, [12] emphasized managerial factors such as

Table 3. Subject distribution of domestic articles.

Year \ Subject	Definition	Modeling	Service Capability	Performance Management	Application	Measurement	Coordination Mechanism
2000					1		
2001					2		
2002					2		
2003	2				2		1
2004					8		
2005	3	3			7	2	1
2006	2	3		1	10	1	
2007	1	2		1	11	1	3
2008	3	7			8	3	5
2009	2	13	3		18	1	10
2010	1	13	1		19	7	14
2011	4	3	2	1	30	6	13
2012	4	8	2	1	28	6	13
2013	4	3	2		15	4	12
2014		1			11		7
Total	26	56	10	4	172	31	79

Table 4. Subject distribution of abroad articles.

Year \ Subject	Definition	Modeling	Service Capability	Performance Management	Application	Measurement	Coordination Mechanism
2000	2		1		2		
2001				1	3		
2002				1	2		1
2003	1		1	1	2		2
2004	4	1		1	3		3
2005			1		11		1
2006		1	1		12	1	1
2007		3			12		5
2008	1	3	1	1	20	3	3
2009	4	5	2		27	3	15
2010	3	4	1	1	16	1	11
2011	3	8		1	23	1	10
2012	3	4	1	3	22	2	13
2013	2	3	1	2	20	4	14
2014	1	4		2	14	1	15
Total	24	36	10	14	189	16	94

Table 5. Scholars' different understanding of the connotation of SSC.

Research perspectives	The specific definition of SSC	Representative	Application of the industry
Product servicing	Service supply chain is a series of service activities like setting of service plan, allocation, distribution, recycling, decomposition, repair, recovery of resources involved in the process of product servitization. It emphasizes that after-sale product SSC played a more prominent role in enhancing company's competitive advantages and profit.	[5] [6] [7] Frank Quinn Fu Ye	Manufacturing car industry
Service outsourcing	Service supply chain is service flow formed in the process of service outsourcing. Service supply chain management is the integrated management of information flow, service flow, cash flow, service process and service performance from the earliest service suppliers to the ultimate end customers in service delivery process. The view integrates with service process and service delivery processes.	[1] [3] [4] [8]	Professional service Logistics services
Product supply chain in service industry	With the increasing competition of enterprises, service enterprises must draw lessons from manufacturing supply chain management model, used service to pull supply chain management and operations, to improve the ability of forecasting service demand, to deal with the diversification of customer needs efficiently, and to achieve long-term competitive advantages. The essence of service supply chain is to enhance customers' value by integrating resources.	Andrea Klein Richard Metters [9] Yang M & ingming [10] Jack S. Cook	Financial sector Hospital care Aviation industry Hotel industry Tourism services Port services
Evolution from factory to global service network	Service supply chain is a service-driven global supply chain that manufacturing plants provide service products to global customers through information technology, including service provider or service enterprises provide professional services to manufacturing factory and the end customers in the supply chain services. It underscores the management of multiple cooperation organization with global networks in controlling creation and delivery of the specific ability.	[11] Freeman, *et al*. Wilkinson, *et al*. Baine, *et al*. Pawar, *et al*. Lin & Shi, *et al*.	Manufacturing Information integration services

customer dual sexual, service quality chain and internal service supply, and extended model of SSC is put forward, which is combined Ellram's model and IUE-SSCMODEL.

And the other is focusing on the existing application of the SCM model for service industry [13]. Based on SCOR model and Ellram's model, [14] built a new service model of supply chain in the health care industry. Chen Xinping, Xie Shengtao and Peng Yue, Zhang Yi put the IUE-SSCMODEL respectively applied this model to the information service industry, modern logistics services, training service industry. Domestic scholars began to study service supply chain model since 2005, including Liu Huawei, Cheng Jiangang and Li Congdong on logistics service industries; Xu Hong and Xiao Li, Chen Yangle, *et al*., Zheng Siwei on tourism service supply chain; Chen Xiaofeng and Li Congdong on property services supply chain; and electronic manufacturing services as in [15], telecom value-added service supply chain, leasing service supply chain, air cargo service supply chain, digital education service chain, the rural vocational education and agricultural technology extension service supply chain, IT service supply chain, professional integration service supply chain.

3.2.3. Service Capability of SSC

Service capability which refers to the service process under the normal operating conditions can maximize the value in a period of time. [16] at the earliest found that pure services cannot be stored and transmitted as products, only by adjusting the service capability to manage the problem of orders accumulation. [2] also recognized that service capacity is analogous to inventory, whereas production speed has a much more direct impact on product quality in the absence of inventory. [17] proposed that the method of weakening bullwhip effect of supply chain has only partially suitable for service supply chain. [18] adopted system dynamics to design the Mortgage Service Game that deal with the bullwhip effect in service-oriented supply chains. Gui Shouping and Ding Guoyin attempted to simulate the product inventory management with service capacity management and clearly confirm the effectiveness of a bullwhip effect. In addition, Disney, *et al*., Wadhwa and Bibhushan, Fu Qiufang and Zhao Shuxiong, Wang Kangzhou, *et al*. were also concerned about the bullwhip effect.

Domestic scholars have focused on the study of logistics service capacity, such as Gao Zhijun, *et al*. argued that LSSC is a value-added chain of logistics capability, which can help node enterprises on LSSC realize win-win through the integration of logistics capability. However, the study of service capacity on tourism service

supply chain is relatively small. Tao Chunfeng, *et al*. analyzed the mechanism of bullwhip effect resulted in the tourism industry, and proposed the solutions used to weaken the bullwhip effect, for example, optimization structure of tourism service supply chain, strengthening the consumers' right to know, and establishing contracts to form a coalition. In summary, scope and depth of the research in this field at home and abroad are still not enough, only 20 articles. The service ability of transfer, distribution, control and execute are also lack of systematic study.

3.2.4. The Relationship between Management and Performance of SSC

Researches about the relationship between management and performance of SSC are still remain unfathomed. [19] investigated the relationship between the integration strategy on SSC and performance by applying information integration thought of product supply chain management. Field and Meile, Zybell discussed the relationship between partner management of service supply chain and overall performance. Forslund explored the three famous logistics service providers of supply chain performance management process and its obstacles in Swedish. [20] explored *high performance work systems* (HPWS) how to affect the performance of professional service supply chain, and tested the relationship between professional service supply chain performance and the organizational performance. He found that staffs motivated and supported by service supply chain management and human resource management can improve company's professional efficiency of SSC and organizational performance. This is the first research of the relationship between human resources management and professional service supply chain performance in the professional services firm.

[9] examined SSCM model of customer satisfaction and business performance in China's civil aviation services. [13] found that service supply chain management has great relevance with corporate performance and service supply chain function is the key to using service to pull the supply chain management and operation to meet customers' diversified demand by service integration. Cheng Fei built the corresponding relation of service supply chain strategy and organizational performance. He and Lai put forward a conceptual model to describe the relationship between the strategy of supply chain integration, operation integration, services provided by industrial manufacturers basing on product and customer behavior, and enterprise performance. The study found that operational integration of the supply chain and services based on the product have a positive correlation, and strategic integration and services based on customer behavior also have a positive correlation. In addition, services based on the product are transformation strategy of manufacturing enterprise, which have indirect effects on business performance through the directly affect of services basing on customer behavior.

3.2.5. Application of SSC

Applied research, which has drawn attention of most scholars, increases at a speed of 15 to 20 articles every year, And there are 172 domestic articles and 189 foreign articles accounting respectively for 45.50%, 49.35% of the total. [21] showed that domestic researches about the industry are not relatively uniform but rich in logistics service supply chain. Gao Zhijun and Liu Wei put forward service-dominant logic of LSSC and the mechanism of value creation basing on the research of enterprise logistics network. Scholars mainly focus on the industries of tourism, port [22], e-commerce, and healthcare, etc. Other industries including property, financial securities service, IT services, the library information service, community service, pension services, after-sales service [23] and agricultural products also increasingly enrich the application of service supply chain.

Researches abroad mainly focus on industries like healthcare, information, finance, knowledge, after-sales and industry distribution presented diversity. Cook and DeBree first applied the traditional supply chain management to the medical service industry. Chapman and Cook developed an innovative data management system basing on web to optimize hospital blood service supply chain. Since then, Johnson, Mustafee and Taylor, Rahimnia and Moghadasian, Lillrank and Groop also studied the blood service supply chain model. In other industries, basing on XML web application Ho and Trappey provided a flexible, scalable, extensible, and suitable for distributed network environment of *Business-to-Business Integration* (B2Bi) that the solutions for small and medium-sized enterprises in the global aviation service supply chain. Goul and Corral put forward *web service supply chain*, which contains the seamless integration and automated relationships of B2B, as well as procurement responsibility, monitoring ability, benchmark, cost allocation and the new hybrid organization structure of infrastructure. Anderson, *et al*. built a two-phase linear model for employee allocation on petroleum services, and discussed the dynamic behavior of customized service supply chain. Saccani studied the configuration of the driver on after-sales service supply chain. Fellenz and Brady adopted RFID technology to build customer-ori-

entated global service supply chain for all supply chain partners to complete real-time synchronization, and to update the response. Heikkurinen, *et al*. focused on the service supply chain for cross-border trade. Lopez and Zuniga discussed the judicial service supply chain model basing on system dynamics.

3.2.6. Measurement of SSC

Researches of evaluation index system and measurement are of great significance for the implementation of service capacity and service quality control, and it is a rather new field regard to SSCM. Firstly, analysis shows that the document of performance evaluation is the most abundant. [24] proposed the reduction method of index basing on fuzzy-rough sets at the first time for performance evaluation on LSSC. Liu Juan adopted the frequency statistics, theory analysis and the improved grey correlative method for performance evaluation index of SSC. [25] designed performance evaluation index system consisting of result-layer, operations level and strategic level on LSSC. The second is the evaluation of service integrator selection. Song Danxia and Huang Weilai combined analytic hierarchy process and entropy value method and put forward productive service supplier selection and evaluation system on SSC, including service quality, service price, service flexibility, service capability, cooperation ability and development potential of 6 second-level indicators, and 18 third-level indicators. Chen Hu, *et al*. put forward a more comprehensive and objective evaluation index system of logistics service providers, such as customer satisfaction, service quality, service cost, enterprise qualification, interoperability and green competitiveness. The third is the evaluation of SSCM model. [8] from execute region, hierarchical-domain, composing field these 3 attribute domains, using the entropy technology and analytic hierarchy process, proposed the evaluation index system of LSSC model. The final is the evaluation index system of customer value. The value evaluation index system of internal customers on SSC, consisting of three-dimensional description model like profit contribution, resource properties and the core business correspondence, is proposed by [26] with the method of grey relational analysis.

Jim Morgen argued that the performance evaluation should focus on activity and process. Until now, most of the evaluation index system without considering the potential for development, social responsibility and environmental protection index, can't solve the problem of the dynamic or real-time business process and has not been broadly agreed. Subjective methods include analytic hierarchy process (AHP), analytic network process (ANP), fuzzy comprehensive evaluation (FCE), Delphi method (Delphi), etc. Objective methods include principal component analysis (PCA), entropy method, multi objective programming approach, grey relational analysis (GRA), TOPSIS (technique for preference by similarity to ideal solution) evaluation method, etc. Scheme evaluation methods are mainly as follows: linear weighting method, European norm method, synthetically ordering of TOPSIS, grey comprehensive evaluation, fuzzy analytic hierarchy process (FAHP) and data envelopment analysis (DEA), etc. The theoretical basis include game theory, the system dynamics, utility theory, extension theory, balanced score card (BSC) and complex network theory, etc.

3.2.7. Coordination Mechanism of SSC

Service supply chain coordination is that supply chain members share resources dynamically for business activities of interdependent relationship with integrated management and decision making, improving supply chain performance between supply chain members in the process of project operation. Coordinate mechanism research on SSC becomes an active research subject and the amount of literature focused on relationship coordination has been rising steadily. [27] discussed the coordination problems of membership in platform and e-commerce service chain, such as moral hazard problem in indirect services and service failure problem in communication deviation caused by the subjective intention. And she put forward the coordination mechanism from the perspective of ecology.

Secondly, contract coordination. Cui Aiping and Liu Wei, Liu Weihua, Meng Lijun and Huang Zuqing established contract coordination mechanism dominated by logistics services integrator under the Stackelberg. Wang Fatao analyzed coordination mechanism of decentralized, centralized decision-making, and united contract mode on supply chain. And joint contract of coordination mechanism includes E-commerce-product suppliers with wholesale price contract, and E-commerce-logistics service providers with revenue sharing contract.

Finally, benefit coordination. Boyaci and Gallego, Bernstein and Federgruen, Wang Xiaoli and Ma Shihua, Yan and Guo explored compensation coordination mechanism of service supply chain basing on revenue sharing theory. Chen and Wang discussed service supply chain contract model that consists of service requester, service integration suppliers, service providers and contract service providers and some temporary suppliers, and they

proposed a mathematical model of the joint compensation contract and revenue sharing.

However, studies above mostly focused on micro-level of internal coordination and found that coordination studies were lack of long chain, multi-level among enterprises from the perspective of macro-level.

3.3. Research Methods of SSC

The initial studies of SSC can be divided into normative analysis, case analysis and empirical analysis basing on the manufacturing supply chain. For articles using multiple research methods is counted according to its main method. As shown in **Figure 1** and **Figure 2**, we take five years as a period for a detailed classification.

In comparison, foreign articles using three research methods basically present a synchronous increasing trend, which suggests that foreign scholars have a rigorous logic system and lays emphasis on the combination of theory and practice. Most of domestic researches are for the introduction of foreign ideas or theory summary, and documents using the normative analysis method also increased rapidly to 276 since 2000, with comparing those using the case analysis and the empirical analysis is very scarce and only 95 papers. Thus domestic researches are still in the theoretical discussion, groping stage, and it also fails to form a set of conform to the practice of service supply chain theory for domestic enterprises.

In order to facilitate further research, the case analysis classified as empirical research that is analyzed basing on methods classification of Alavi and Carlson. As shown in **Table 6**, the mainstream of domestic research methods is empirical research, whose proportion is 74.87% comparing with 40.99% abroad and quantitative ratio is 35.19%, less than 63.46% of the foreign researches. Foreign scholars pay attention to the combination of theory and practice with quantitative research since 2005, including the mathematical model derived, such as [28] using mixed non dominated sorting genetic algorithm, to develop a model to solve the problem of real-time delivery SSCM. Qualitative researches mainly include the case analysis like Fleischmann, Louwers, Toyasaki and Mostard, Chou and Yuan adopted exploratory case study, a combination of qualitative and quantitative modeling technology to study service supply chain. Zsidisin, Jun, *et al*. adopted a case study to investigate a language school that provide service to upstream and downstream customers (students) of SSC and determine the relationship between service quality and information technology.

Research using reasoning method can be divided into theoretical research and empirical research. Theoretical

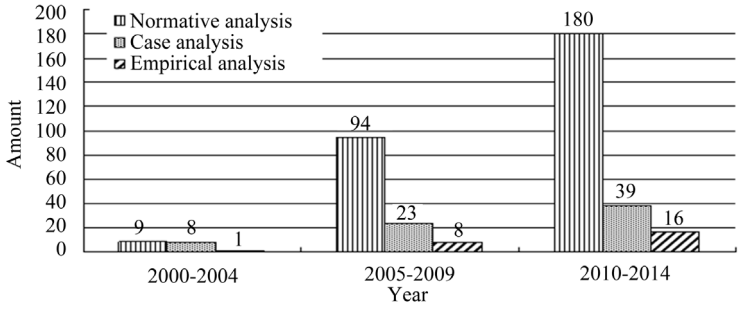

Figure 1. Classification graph based on the research method of domestic documents.

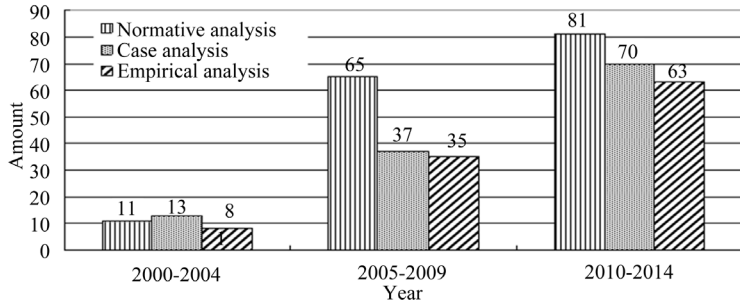

Figure 2. Classification graph based on the research method of foreign documents.

Table 6. Research methods and qualitative and quantitative analysis.

Research methods		Qualitative analysis		Quantitative analysis		Total		Proportion (%)	
		Domestic	Abroad	Domestic	Abroad	Domestic	Abroad	Domestic	Abroad
Empirical analysis	Laboratory experiments	8	41	5	49	13	90	3.44	23.50
	Case study	37	27	33	93	70	120	18.52	31.33
	Research framework	12	16	/	/	12	16	3.17	4.18
	Subtotal	57	84	38	142	95	226	25.13	59.01
Normative analysis	Technology, method, model application	67	24	32	37	99	61	26.19	15.93
	View (supported by experience case)	18	/	8	15	26	15	6.88	3.92
	Conceptual framework and application	54	7	55	49	109	56	28.84	14.62
	Review of the concept	10	2	/	/	10	2	2.65	0.52
	The conceptual model	24	11	/	/	24	11	6.35	2.87
	Theoretical interpretation	15	12	/	/	15	12	3.97	3.13
	Subtotal	188	56	95	101	283	157	74.87	40.99
Total		245	140	133	243	378	383	100	100
Proportion (%)		64.81	36.55	35.19	63.46	100	100	/	/

research refers to the pure theory of conceptual and reasoning, literature review or modeling, etc. Jian Zhaoquan, *et al*. studied the integration problem of SSC, and built a conceptual model of SSC integration and service innovation. Empirical researches mainly have mathematical statistics and Case study, such as Hisashi adopted case studies to explore the feasibility of using delaying tactics on SSCM with data from interviews, observation, documents, and data processing using the number of statistics. Others include experimental method, Enterprise survey method, depth interview method, secondary data analysis and questionnaire, etc.

In contrast, based on management, management science and engineering, economics for theoretical generalization and case verification, most of the domestic researches using system simulation laboratory research of computer simulation output, have rigorous thought and precise calculation. However, domestic quantitative models only remain simulated, and theoretical research is still significantly lagging in the enterprise practice. The reason can be summarized as follows: 1) the empirical research of insufficient resources like funding restrictions; 2) the practice don't cooperate; 3) different value judgment and accepting degree of academia, which leads to low skills of empirical study; and 4) the theoretical researches lack of originality and repetitive phenomenon is very serious.

4. The Comparison of Research at Home and Abroad

First, in terms of research topic, there is a significant gap between researches at home and abroad in terms of time, content and quality. Studies abroad have entered on the stage of interdisciplinary penetration, and on how to establish a mature research system, while the domestic researches are still at the stage of theory development and validation. Therefore, the scope and depth of research need to be improved.

Second, as to the object of study, studies abroad have been extended to emerging service industries, such as green services, healthcare and nonprofit organizations, and to the system studies of industry association at the same time, compared with the domestic researches focusing on tourism, logistics, port and other traditional service industry and individual enterprises.

Third, when it comes to the research ideas, we can find that domestic academia lack of systemic thinking. For example, most of them focus on the problems and response based on the conceptual level. In addition, due to the lack of large sample data, it is difficult to summarize the research results with promotional value. In contrast,

foreign scholars have a rigorous logic system and emphasize constant innovation and application, including multi-disciplinary, multi-method, systematic analysis, focused research, theoretical research, case analysis, qualitative research, and quantitative analysis.

Finally, research methods at home and abroad are diverse, including synergetic, game theory, mathematical model and neural network, multi-agent theory and system dynamics, etc. However, the domestic research seriously lacking of empirical study is given priority to with static analysis, dynamic analysis is complementary, which cannot meet the needs of the complex service supply chain problem.

5. Suggestions for Further Research at Home

First, on the research topic, we need to strengthen the study of the problems that need to be solved urgently, such as building quantitative analysis models of profit distribution and inventory management like product supply chain. And we can improve the diverse content and systematic theory by the means as follows: 1) Putting forward the evaluation index system of service capability based on the enterprise or supply chain level, and 2) Revealing the relationship between SSCM and enterprise performance based on the perspective of interdisciplinary penetration.

Second, on the object of study, we should raise concerns about researches on emerging service industry like e-commerce, finance, communications, engineering and technical services, management consulting. At the same time, we can draw lessons from perspectives of complex network theory, service-oriented architecture (SOA), value chain theory, total quality management, fractal theory, the customer value innovation theory, trust equilibrium, knowledge management and core-competence theory, etc.

Third, on the research idea, 1) strengthen service supply chain in the individual and overall dimensions of deep research; 2) strengthen service supply network of research at home and abroad, as well as the longitudinal study of large-scale enterprise complex cases; and 3) combine the mathematical analysis and empirical research.

Finally, on the research methods, we can increase the proportion of research in motion such as system dynamics, and learn from the foreign experience associated with data statistics, case analysis and experimental study by continuous innovation and applications for fully demonstrates the research problem.

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References

[1] Ellram, L.M., Tate, W.L. and Billington, C. (2004) Understanding and Managing the Service Supply Chain. *Journal of Supply Chain Management*, **40**, 17-32. http://dx.doi.org/10.1111/j.1745-493X.2004.tb00176.x

[2] Sampson, S.E. (2000) Customer-Supplier Duality and Bidirectional Supply Chains in Service Organizations. *International Journal of Service Industry Management*, **11**, 348-364. http://dx.doi.org/10.1108/09564230010355377

[3] Tian, Y. (2003) Research on Supplier Selection in Building Logistics Service Supply Chain. *Systems Engineering-Theory & Practice*, **23**, 49-54.

[4] Shen, C.L. and Wang, B. (2005) Decision-making Approaches on Choice of Logistics Service Supplier. *Journal of Nanjing Forestry University* (*Humanities and Social Sciences Edition*), **5**, 72-75.

[5] Poole, K. (2003) Seizing the Potential of the Service Supply Chain. *Supply Chain Management Review*, **7**, 54-61.

[6] Hu, Z.H. and Ning, X.X. (2003) Service Chain Concept, Model and Application. *Commercial Research*, **7**, 111-114.

[7] de Waart, D. and Kemper, S. (2004) 5 Steps to Service Supply Chain Excellence. *Supply Chain Management Review*, **1**, 30-35.

[8] Yan, X.X., Sun, L.Y. and Wang, K.C. (2005) Research on Performance Evaluation and Characteristics in Logistics Service Supply Chain. *China Mechanical Engineering*, **16**, 969-975.

[9] Jin, L.Y. (2006) Service Supply Chain Management, Customer Satisfaction and Business Performance. *Chinese Journal of Management Science*, **14**, 100-106.

[10] Fu, Q.F. and Lin, C.W. (2008) Study on the Systematic Structure of Securites Service Supply Chain in China. *International Economics and Trade Research*, **11**, 45-49.

[11] Youngdahl W.E. and Loomba A.P.S. (2000) Service-Driven Global Supply Chains. *International Journal of Service Industry Management*, **11**, 329-347. http://dx.doi.org/10.1108/09564230010355368

[12] Shan, M.Y. and Wu, Y.T. and Ren, B. (2011) Study on the Construction of Extending Model on Service Supply Chain. *Science & Technology Progress and Policy*, **28**, 10-16.

[13] Sengupta, K., Heiser, D.R. and Cook, L.S. (2006) Manufacturing and Service Supply Chain Performance: A Comparative Analysis. *Journal of Supply Chain Management*, **42**, 4-15. http://dx.doi.org/10.1111/j.1745-493X.2006.00018.x

[14] Baltacioglu, T., Ada, E., Kaplan, M.D., And, O.Y. and Kaplan, Y.C. (2007) A New Framework for Service Supply Chains. *The Service Industries Journal*, **27**, 105-124. http://dx.doi.org/10.1080/02642060601122629

[15] Yu, K.K. (2007) The Construction of Service Supply Chain Model. *Modern Business*, No. 27, 156-158.

[16] Anderson, E.G. and Morrice, D.J. (2000) A Simulation Game for Teaching Service Oriented Supply Chain Management: Does Information Sharing Help Managers with Service Capacity Decisions? *Production and Operations Management*, **9**, 40-55. http://dx.doi.org/10.1111/j.1937-5956.2000.tb00322.x

[17] Akkermans, H. and Vos, B. (2003) Amplification in Service Supply Chains: An Exploratory Case Study from the Telecom Industry. *Production and Operations Management*, **12**, 204-223. http://dx.doi.org/10.1111/j.1937-5956.2003.tb00501.x

[18] Anderson, E.G. and Morrice, D.J. and Lundeen, G. (2005) The "Physics" of Capacity and Backlog Management in Service and Custom Manufacturing Supply Chains. *System Dynamics Review*, **21**, 217-247. http://dx.doi.org/10.1002/sdr.319

[19] Vickery, SK., Jayaram, J., Droge, C. and Calantone, R. (2003) The Effects of an Integrative Supply Chain Strategy on Customer Service and Financial Performance: An Analysis of Direct versus Indirect Relationships. *Journal of Operations Management*, **21**, 523-539. http://dx.doi.org/10.1016/j.jom.2003.02.002

[20] Fu. N., Flood, P.C., Bosak, J., Morris, T. and O'Regan, P. (2013) Exploring the Performance Effect of HPWS on Professional Service Supply Chain Management. *Supply Chain Management*, **18**, 292-307.

[21] Xing, W.F. and Li, Z.J. (2007) How to Establish the Port Logistics Service SC in Tianjin Dongjiang Bonded Zone. *Logistics Technology*, **26**, 88-90.

[22] Yang, M.M. (2006) Port Service Supply Chain in Hong Kong. *China Logistics & Purchasing*, No. 10, 56-60.

[23] Kim, S.-H., Cohen, M.A. and Netessine, S. (2007) Performance Contracting in After-Sales Service Supply Chains. *Management Science*, **53**, 1843-1858. http://dx.doi.org/10.1287/mnsc.1070.0741

[24] Guo, M. and Zhu, J.F. (2007) The Performance Evaluation in Logistics Service Supply Chain Based on Fuzzy-Rough Sets. *Systems Engineering*, **25**, 48-52.

[25] Liu, W.H. and Zhou, L.Z. and Liu, C.L. and Ge, M.Y. (2011) ANP-Based Comprehensive Performance Evaluation of Logistics Service Process. *Industrial Engineering Journal*, **14**, 52-57.

[26] Yu, L. (2010) Evaluation of the Internal Customers with Core Value Based on Service Supply Chain. *Journal of Wuhan University of Technology* (*Information & Management Engineering*), No. 5, 853-856.

[27] Fu, Y. (2013) Structural Features and Coordination Mechanisms of the Platform-Type E-Commerce Service Chain. *Journal of Northwest University* (*Philosophy and Social Sciences Edition*), No. 2, 103-106.

[28] Farahani, R.Z. and Elahipanah, M. (2008) A Genetic Algorithm to Optimize the Total Cost and Service Level for Just-in-Time Distribution in a Supply Chain. *International Journal of Production Economics*, **111**, 229-243.