



**RESEARCH ON THE EFFECTS OF RELATIONAL
EMBEDDEDNESS AND MARKET TURBULENCE ON
DYNAMIC CAPABILITY - AN EMPIRICAL STUDY
ON SMES IN CHINA'S FASHION INDUSTRY**

CHEN Yu-jie 

Glorious Sun School of Business and Management, Donghua University,
Shanghai, 200051, People's Republic of China
694050342@qq.com

ZHAO Hong-yan

Glorious Sun School of Business and Management, Donghua University,
Shanghai, 200051, People's Republic of China
zhaohongyan@dhu.edu.cn

Abstract

Based on the value-added chain, this paper divides the dynamic capability of fashion SMEs into design dynamic capability, production dynamic capability and market dynamic capability. Then, using 379 survey samples targeting SMEs, the effects of relational embeddedness on the above three dynamic capabilities are analyzed with regression models. The study found significant inverted U effects of the relational embeddedness on the three dynamic capabilities. Given the high market sensitivity of fashion SMEs, market turbulence was added as a moderator. As the empirical results revealed, market turbulence has a positive, significant role in moderating between relational embeddedness and production, market dynamic capabilities, while showing an insignificant role in moderating between relational embeddedness and design dynamic capability. The theoretical contributions of this work are as follows: Dynamic capability of fashion SMEs is classified precisely, and the direction and extent of influences between these variables are

clarified. These are of profound significance for properly understanding the dynamic capability classification and the influencing mechanism of relational embeddedness for fashion SMEs.

Keywords: Fashion Industry; Relational Embeddedness; Dynamic Capability; Market Turbulence

INTRODUCTION

With the rapid progress of global integration and the comprehensive establishment of market economic system, the productivity and quality of life have improved greatly in China, and people's pursuit of fashionable life has become a normal trend gradually. As a result, the fashion industry is growing at a fast pace in China (Zhao, 2007). Due to intensifying competition, shortened life cycle of fashion products and accelerating rate of technological revolutions, however, today's fashion companies are facing a more turbulent market environment. The fashion industry in China started late, which has enormous potential and space for development. A huge challenge is how to maintain a competitive advantage in a rapidly iterating market environment. To this end, the fashion industry urgently needs to integrate and reconfigure existing resources in response to the dynamically changing market, i.e. the dynamic capabilities (Teece, and Pisano, 1994; Teece, Pisano, and Shuen, 1997), so as to maintain, enhance and create the dynamic competitive advantage continuously (Eisenhardt, and Martin, 2000).

Despite an increasing scholarly attention to dynamic capabilities, with areas involving high-tech industries like information services, semiconductors and software, there remain few relevant discussions around the fashion industry. The unique features that distinguish the fashion industry from others are its creativity, symbol consumption, market orientation, high added value and high risk (Zhao, 2007). Accordingly, the dynamic capabilities of fashion firms must not only reflect the common elements, but shall also comply with the intrinsic characteristics of fashion enterprises. In recent years, scholars have explored the dynamic capabilities of fashion firms from diverse perspectives, including the cultural creative value system (Zhang, Chen, 2013; Wu, Zheng, 2007; Gilles, 2007), the knowledge carrier concept (Teece, and Pisano, 1994), the quick response capability (Gong, Shuang, 2015; Christopher, Lowson, Peck, 2004), etc. Nevertheless, relevant systematic research is still absent.

Regarding the impact mechanism of corporate dynamic capabilities, the scholarly focus has shifted from "endogenous effects" gradually to "exogenous effects". The

exogenous effects mean that the operation and maintenance of network ties by firms is the key to building and sustaining a competitive edge, in consideration of the inherent limitation of resources and the maximization of resource utilization. For fashion SMEs with limited resources, network relations are the primary means to enhance dynamic capabilities. In the opinion of some researchers, network ties have a significant positive impact on the corporate dynamic capabilities (You, Liu, Zhang, 2016; Guercini, Runfola, 2012), although excessive reliance on partners may reduce the network flexibility and weaken the innovation incentives (Paul, Kwon, 2002). Some scholars have demonstrated an inverted U relationship between the network ties and the corporate dynamic capabilities (Macchion, Moretto, Caniato et al., 2015; Geng, Zhang, 2010).

Given the market sensitivity of fashion industry, the impact of market turbulence produces a non-negligible impact on the dynamic capabilities of fashion firms. Due to the exacerbated uncertainty and competitiveness caused by the volatile environment, firms can hardly predict the future market trend, which has stimulated their need for enhancing corporate capabilities (Kovach, Hora, Manikas et al., 2015). From the perspective of coordinating external social resources, the greater the risk of market environment, the stronger the motivation for firms to seek external partnerships, which in turn improves their capabilities (Johanna, Neil, 2007). Another study has also found that the turbulent environment plays a significant, positive role in regulating external resource cooperation and corporate dynamic capabilities, especially in a fiercely competitive context (Christopher, Lawson, Peck, 2004).

Clearly, the exploration on dynamic capabilities of fashion enterprises has gained gradual attention, and the resource-based view about the effects of social network and market volatility on dynamic capabilities have also received growing recognition. In spite of these, currently there lacks systematic research on the dynamic capabilities of fashion firms, and the studies involving the impact of social network and market environment issues on the dynamic capabilities of fashion firms are even scarce. To this end, this paper divides the dynamic capabilities of fashion firms into design dynamic capability, production dynamic capability and market dynamic capability based on the value-added industrial chain, and builds corresponding index system by incorporating extant literature. Meanwhile, the impact of social network on the dynamic capabilities is explored in a turbulent market environment. Starting from the hypothesis formulation, the correlation models between network ties and dynamic capabilities are developed, in order to examine the mechanism whereby the network ties and market turbulence affect the three major dynamic capabilities of fashion firms.

LITERATURE REVIEW

Dynamic capabilities of fashion firms

As a unique industry formed by deep integration of traditional industrial resource elements, the fashion industry is an industry combination that crosses the boundaries of advanced manufacturing and modern service industries (Li, Liu, Cao et al., 2018), which better meets the creative, literary and aesthetic value demands of contemporary social development. It possess some characteristics of both the cultural and creative industries (Zhao, 2007; Guercini, Runfola, 2012), with a high scientific and technological content and a high cultural added value. In terms of operational mode, it integrates high-tech means of business, intermediary, media and design, with an aim of directly serving to bring a better life for people (Macchion, Moretto, Caniato et al., 2015). The scope of fashion industry can be defined in broad and narrow terms (Gao, 2014). In a narrow sense, fashion industry refers to the industry that decorates and beautifies the human body, which is the core content of the term. In a broad sense, fashion industry covers not only the decoration and beautification of people's living and working environments, but also the decoration and beautification of things and situations that are related to people's survival and development.

The concept of dynamic capabilities was initially proposed by Teece and Pisano in the 1990s. It refers to a firm's ability to integrate, build and reconfigure the internal and external competences to address rapidly changing environments, which is also a key factor for maintaining corporate competitive advantage (Teece, Pisano, 1994). Diversified views have been put forward regarding the research dimensions of dynamic capabilities (Teece, Pisano, 1994; Teece, Pisano, and Shuen, 1997; He, Li, Fang, 2006). According to Amit and Schoemaker (1993), dynamic capability was a firm's ability to dynamically improve the completion of various functional activities, which included the product/process innovation capability, the flexible manufacturing capacity and the adaptability to market trends. Based on the hierarchical characteristic of capabilities, Danneels (2008) claimed that dynamic capabilities should be higher-order competences (mainly second-order marketing competence and second-order R&D competence) that determine the upgrading speed of corporate regular capabilities, which separately reflects the firm's capacity levels in opening new markets and developing new technologies. Based on the analogy with "reactivity" in biology, Subba Narasimha (2001) defined organizational dynamic capability as a kind of diversified knowledge generation capacity, and classified the dynamic capability into two major dimensions of market and technology. Besides, Qin, Liu, et al. (2017) considered that the dynamic capability comprised technological innovation capability, marketing capability and advanced manufacturing capability.

After taking into consideration the hierarchical nature of dynamic capabilities, the characteristics of fashion industry, and consulting extant literature, this paper classifies the dynamic capabilities of fashion firms into three dimensions: Design dynamic capability, production dynamic capability and market dynamic capability.

Design dynamic capability springs from the dynamic heterogeneity requirements of a fashion firm's resources, such as the innovative concepts, trendy elements and cultural values (Danneels, 2008). It reflects the firm's ability to build new cultures and establish new design concepts, or the meta-order of the firm's cultural creative input ability (Subbanarasimha, 2001). Relevant studies have shown that some SMEs in the fashion industry lack the advantage of design resources (Christopher, Lowson, Peck, 2004; Kovach, Hora, Manikas et al., 2015), which develop unique competitive edges often through a combination of existing ideas and concepts in the market (Chiva, Alegre, 2010). However, to attain the goal of sustainable development, they also need to foster the design dynamic capability. Through review of researches on fashion firms, we find a close correlation of design dynamic capability with the corporate culture and innovation (Volonté, 2012). Given its decisive effect on creating independent brands, it is not only a key strategic asset for fashion SMEs to strengthen their competitive advantage, but also the cornerstone for their transition from fashion followers to independent fashion makers.

As the ability to establish a novel production operation network, the production dynamic capability mainly refers to a firm's dynamic ability to gather new partners efficiently, to achieve fast production with new technologies and processes, to coordinate supply chains, and to manage inventory (Zeng, Zhou, 2009). For fashion firms, it is the meta-order of ability to transform cultural knowledge to products. Given the volatility of fashion industry, large fluctuations are often caused in its production and income. As Jain N and Paul A (2001) claimed, "the manufacturing of fashion products is full of changes due to the uncertainty of consumption". Accordingly, they designed a fashion product market model that was based on customer heterogeneity and customer preference unpredictability. A series of supply chain control strategies were proposed by Gao (2005) for avoiding the uncertainties brought to the garment industry by the inventory risk. Christopher M and Lowson R (2004) put forward the concept of "flexible supply chain", believing that the fashion market should cater to market changes. "Traditional organizational structures and prospective supply chains are no longer able to meet the variable needs of typical fashion markets. Flexible organizations, in contrast, adapt to such needs". The "flexible supply chain" here is reflected not only in the retailers' ability to adjust sales inventory timely based on the market information, but also in the effective collaboration between retailers and manufacturers (Gong, Shuang, 2015).

Market dynamic capability refers to a kind of abilities to create new marketability, which emphasizes the dynamic abilities of identifying market positioning, developing new customers and establishing relationships with them, expanding marketing networks and operating brands (Mei, Nie, 2007). For fashion firms, it is the meta-order of abilities to output and spread cultural knowledge. According to GUENZI et al. (2006), market dynamic capability is the most relevant corporate competent to the organizational performance. Guercini S et al. (2012) pinpointed that the essence of fashion industry is to influence or accommodate the public's ideologies, values and lifestyles through the culture advocated or embodied by the products. Actually, consumers' pursuit of fashion can, to a large extent, be regarded as a favor for brands. Sellers transfer their cultural and brand values to consumers via marketing models, which is the basis for brand promotion and profitability (Zhao, 2007). By creating a benign interaction between common consumer groups through humanitarian marketing, the firms convey unique cultural concepts and brand appeals to consumers, so as to target new consumer audiences (Gao, 2014).

Network relations

Network organization is a kind of innovation-friendly organizational model that was born in conformity with the knowledge economy society. Its operating mechanism and flexible structure provide space and guarantee for organizational innovation. By embedding the corporate network, firms can acquire more useful information and knowledge, integrate resources, and enhance their capabilities (Guercini, Runfola, 2012), thus gaining a sustainable competitive edge. Network embeddedness is constituted by attributes like the position and status of a firm in the network, as well as its relationship with other firms (Zeng, Deng, Song, 2013; Dong, 2012). Meanwhile, relational embeddedness is an indicator of relational elements for network embeddedness, which represents the degrees of trust, information sharing and problem solving between the firms and the network participants (Liu, Li, Li et al., 2010). It affects the corporate dynamic capabilities, since it determines the quantities of high-quality information, resources and tacit knowledge that firms can acquire in the network (Liu, Li, 2013).

RESEARCH HYPOTHESES

Relational embeddedness and corporate dynamic capabilities

Based on the social capital theory, an increasing number of firms have established strategic alliances for acquiring resources and improving their capabilities, in consideration of the inherent limitation of resources and the maximization of resource utilization (Zeng, Deng, Song, 2013). In terms of size, China's fashion industry is dominated by SMEs, which tend to encounter

plentiful obstacles in the course of development. Through establishment of a relational network with partners, firms can strengthen the inter-firm trust (Christopher, Lowson, Peck, 2004), cut the cooperation risks and transaction costs, improve the capability of acquiring key knowledge and resources, enhance knowledge sharing, and resolve difficulties together (Kovach, Hora, Manikas et al., 2015). Thus, the operation and maintenance of network relations are critical for building and sustaining a competitive edge of firms, and the relational embeddedness has a significant positive effect on the corporate dynamic capabilities (You, Liu, Zhang, 2016). According to the resource-based view, firms integrate the key resources they have acquired effectively, in order to maximize the value of resources, which in turn facilitates the improvement of their dynamic capabilities (Christopher, Lowson, Peck, 2004).

Excessive network embedding, however, brings adverse consequences to firms. On the one hand, excessive embedding of network leads to firms' over-reliance on partners, which reduces the network flexibility, harms the communication of non-redundant information, knowledge and resources, hinders the flow of new ideas and views into the network, and weakens the innovation incentives (Guercini, Runfola, 2012). On the other hand, establishing and maintaining network relations require consumption of time, labor and capital costs, so excessive embeddedness increases the operating costs of firms (Geng, Zhang, 2010).

H1: There exists an inverted U relationship between the relational embeddedness and the dynamic capabilities of fashion SMEs.

Relational embeddedness and design dynamic capability

Relational embeddedness can broaden the cooperation between designers in the industry, promote mutual knowledge exchange and information sharing, and encourage rapid learning, as well as generation of fashion inspiration. Through resource sharing and establishment of close ties with suppliers and rivals, fashion firms can get new product ideas, discover new design concepts, and improve their design management capability (Gilles, 2007). In a word, good relational embeddedness can enhance the design and R&D capabilities of firms. Excessive relational embeddedness, however, reduces the differentiation of fashion products. Over-reliance on partners hinders the inflow of new design concepts into the network, and exacerbates the homogeneity of designed products (Volonté, 2012). Based on the above analysis, this study formulates the following hypothesis.

H1a: There exists an inverted U relationship between the relational embeddedness and the design dynamic capability of fashion SMEs.

Relational embeddedness and production dynamic capability

Suppliers play a central role in the production network, since they bring new resources to the firms to raise their response speed. For this reason, corporate network is often regarded as a key element of quick reaction. In the fashion world, such supply partnership is particularly important. In view of the limited internal capabilities of most fashion firms, agility depends to a large extent on the flexibility of extensive supply network, and highly collaborative and integrated suppliers enable the operation of agile supply chain (Gligor, Holcomb, 2012). Thus, the relational embedding with partners can improve the agility of supply chain.

Nevertheless, given the volatile and uncertain features of the market, current suppliers may not be equipped with the skills and capabilities required for long-term strategic cooperation, so excessive relational embeddedness with suppliers will lower the supply chain agility (Christopher, Lawson, Peck, 2004). Meanwhile, if a firm is overly embedded in network relations, its operating cost will increase, thus making the agile supply chain a paradox.

H1b: There exists an inverted U relationship between the relational embeddedness and the production dynamic capability of fashion SMEs.

Relational embeddedness and market dynamic capability

Through frequent informal contact and communication between partners within the network, firms establish mutual trust relationships and share cooperative norms. These are conducive for the firms to gain more resources and capabilities for market expansion. First of all, establishing network ties with partners helps SMEs acquire the key knowledge required for market expansion at a lower cost, thereby enhancing their such marketing capabilities as market sensing and customer relationship management (Wu, Zhang, 2014). Besides, with the assistance of network partners, it is possible to for SMEs to establish credibility in the market and build distribution channels, thereby lowering the risk of developing marketing networks (Yang, Li, Fan, 2013). This also helps better respond to market changes during the exploitation of new network ties. Lastly, relational network can promote the growth of corporate brands. On the one hand, in a fiercely competitive market environment, brand enterprises can hardly develop relying solely on their own resources. Brand growth is increasingly dependent on the relational network resources, and it is of great significance to focusing on firm clusters, organizational ecosystems, supply chains and marketing networks, in order to achieve brand growth (Aaker, 2006). Tapping market with the assistance of partners enhances a firm's marketing effect, which in turn improves its brand reputation and image (Pan, Ye, Wang, 2015). On the other hand, during market expansion, firms share brand resources and reputation

mutually through the competition and synergy between various brands of the network entities, thereby attaining the synergistic growth and expansion of brands (Yao, Zhou, Wei, 2009).

However, excessive embeddedness will trigger a domino effect if the firms in the relational network fail. It will also cause collective blindness when the market environment changes, and will increase the cost of additional obligations. A relatively closed relational network hinders firms from getting new market information, impacts their timely response to changes in the market environment (Wu, Zhang, 2014), and affects their market expandability. H1c: There exists an inverted U relationship between the relational embeddedness and the market dynamic capability of fashion SMEs.

Moderating role of market turbulence

Firms can hardly predict the future market trend in the scenarios of high market turbulence (Kovach, Hora, Manikas et al., 2015). Accordingly, it is necessary for companies to cultivate and improve their dynamic capabilities continuously, and more importantly, to rely on network relations, in order to obtain the knowledge and resources required for capability improvement. Since high environmental volatility leads to aggravated asymmetry of market information (Shen, Li, 2010), firms need to establish ties with partners, so that they can acquire valuable resources and information for improving their dynamic capabilities. On the other hand, high volatility intensifies the inter-firm competition, and firms explore markets in cooperation with rivals, thereby achieving a virtuous "co-opetition" cycle. Liu (2010) found through research that the market turbulence is significantly positive in moderating the relationship between network ties and corporate innovation performance. To sum up, the higher the environmental volatility, the tighter the relationship between network relations and dynamic capabilities of firms.

H2: Market turbulence plays a positive role in moderating the curvilinear relationship between relational embeddedness and dynamic capabilities of fashion SMEs.

In a turbulent market environment, the market demands are diverse and changing, and the products and services are updated at faster paces. To facilitate the fast generation of fashion ideas and inspirations, the communication and sharing between designers in the industry become more imperative. Establishment of close ties and sharing of resources with suppliers and rivals enable the fashion firms to discover new design concepts faster (Chiva, Alegre, 2010), so as to handle the market pressures of ever-shortening fashion cycles.

H2a: Market turbulence plays a positive role in moderating the curvilinear relationship between relational embeddedness and design dynamic capability of fashion SMEs.

Fast production is emerged as a comprehensive response to the commercial environment that is dominated by rapidly changing market and environmental uncertainties.

With the increase of environmental volatility, the intensification of market competition, the quickening of technological reforms and the acceleration of changes in customer demand (Christopher, Lawson, Peck, 2004), firms need to maintain their agile responsiveness through close collaboration and integration with the suppliers and other network members.

H2b: Market turbulence plays a positive role in moderating the curvilinear relationship between relational embeddedness and production dynamic capability of fashion SMEs.

In a fiercely competitive context, market dynamic capability is a vital guarantee for firms to establish differentiated competitive edge and achieve remarkable market performance (Davies, Walters, 2004). It allows firms to have an accurate and comprehensive grasp of customer demands and industry trends, and thus they can develop marketing networks and realize brands growth. With the intensification of market volatility, the importance of marketing ability has become more prominent. Firms are more prone to cultivate market expandability by acquiring relevant resources from the outside, in order to adapt to changes in the market environment (Wu, Zhang, 2014). Accordingly, the fiercer the market competition is, the greater the dependence of market dynamic capability on resources outside the network will be.

H2c: Market turbulence plays a positive role in moderating the curvilinear relationship between relational embeddedness and market dynamic capability of fashion SMEs.

Based on the above hypotheses, a conceptual model describing the relationship between relational embeddedness, market turbulence and dynamic capabilities of fashion SMEs is built.

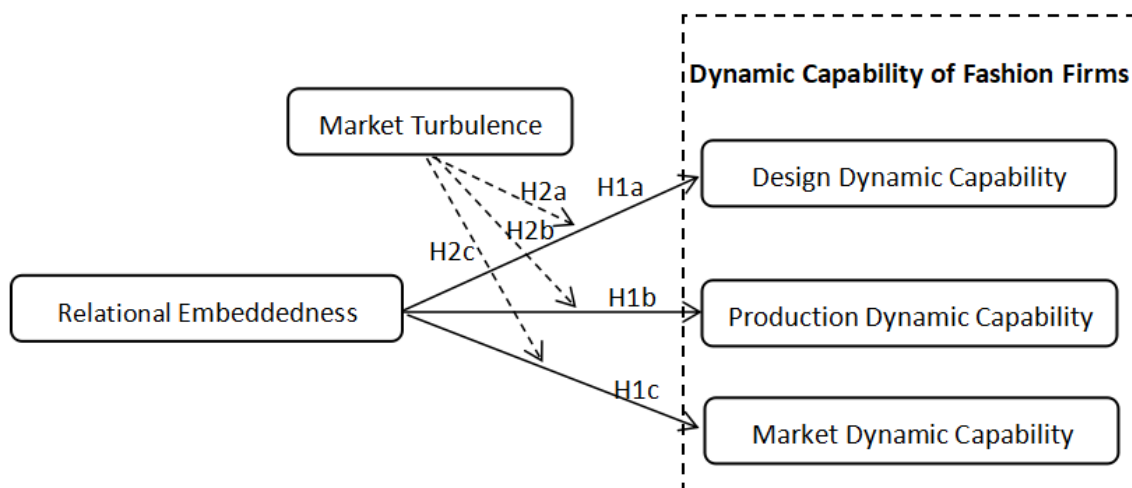


Figure 1 Conceptual model

RESEARCH METHOD

Samples and data

In this study funded by the National Natural Science Foundation of China, a large-sample survey was employed for data collection. From March to June of 2018, our team conducted relevant surveys in Shanghai, Suzhou, Hangzhou, Shenyang and Jinan. The primary reasons for choosing these five cities were, on the one hand, Shanghai was the most fashionable city according to the 2017 China urban fashion index survey results published at the 2017 China (Ningbo) Cultural Industries Fair, followed by Hangzhou and Suzhou, which had good fashion quality. Meanwhile, Shenyang and Jinan exhibited low fashion indexes, so the samples collected from these regions were highly representative. On the other hand, most of the research team members come from the above cities, suggesting an advantage in data collection. In consideration of the data availability and representativeness, this paper studies the fashion industry from a narrow perspective, which includes fashion clothing, jewelry accessories, shoes, hats and bags, hair styling, body health, etc. The subjects of research were fashion SMEs that have participated in fashion fair activities in the past three years. Depending on the presentation form of fashion products, the fashion SMEs were classified into the fashion manufacturing and fashion service industries (Gao, 2014).

The questionnaires were filled in by the senior managers or founders of the SMEs. A total of 1,000 questionnaires were distributed in this study, and 379 valid questionnaires were received, with an effective recovery rate of 37.9%. Tab. 1 details the basic characteristics of survey samples.

Table 1 Description of sample characteristics (Number of Distributed Questionnaires 200)

Sample Characteristic	Measurement Index	Number of Recovered Samples	Sample Recovery Rate/%
Region	Shanghai	127	33.509
	Suzhou	75	19.789
	Hangzhou	67	17.678
	Shenyang	59	15.567
	Jinan	51	13.456
Firm age	Below 5 years	80	21.053
	5~10 years	181	47.632
	11~30 years	90	23.684
	Over 31 years	29	7.632

	Less than 100	83	21.842	Table 1...
Number of Employees	101~200	206	54.211	
	201~500	74	19.474	
	More than 500	17	4.474	
Industry	Fashion manufacturing	210	55.263	
	Fashion services	170	44.737	

Initially, the questionnaires were subjected to non-response bias test. The samples were divided into two aliquots according to the order in which the questionnaires were collected. Independent sample t-test was performed on the firm age, firm size and industry variables of the two sample groups, which showed insignificant results. This indicates no significant non-response bias in the present surveys. Next, the questionnaires were subjected to a common method bias test, and an exploratory factor analysis was performed on all the variables by Harman's single factor analysis. As the results revealed, there was no common factor in the unrotated factor analysis, and the first factor explained only 30.4% of total variance. Hence, the present study would not be affected by common method biases.

Variable measures

Relational embeddedness

Targeting the mid-to-high end women's apparel industry, Brian Uzzi (1997) investigated the effect of network relational embeddedness on the corporate performance, and measured the network embeddedness from the aspects of trust, information sharing and joint problem solving. The study has been cited up to 8,502 times. Later, scholars perfected the measuring tool based on Brian Uzzi's study. Liu, Li, et al. (2013) measured the relational embeddedness by consulting this reference. The reasons for choosing the above scale were firstly, the scale was initially proposed for studying the clothing industry, the core industry of fashion. Secondly, the scale has been applicable to Chinese business scenarios after continuous modification by scholars. Multiple surveys have been conducted with the modified scale, which exhibited good measurement effect.

Dynamic capabilities of fashion SMEs

Based on the characteristics of fashion industry and extant research findings, and after reviewing relevant theories of dynamic capabilities and consulting advices from experts, the dynamic capabilities of fashion SMEs were divided into the design dynamic capability, the production dynamic capability and the market dynamic capability in this study. Referring to the

views of Danneels (2008), Subba Narasimha (2001), Chiva R (2010), Hertenstein (2005) and Hafeez (2002), the design dynamic capability variables were divided into three categories: designer ability, design R&D investment and design R&D management. The production dynamic capability indices were classified into three categories of efficient production, response time and supply chain management, mainly with reference to the views of Zeng (2009), Gong (2015) and Hafeez (2002). As for the design of market dynamic capability variables, the views of Danneels (2008), Subba Narasimha (2001) and Hafeez (2002) were consulted mainly, which comprised the dimensions of market agility, marketing channels, customer relation management and brand awareness.

Market turbulence

Environmental volatility was first measured in 1987 by MILLER (1987). The study has been cited up to 891 times. Subsequently, scholars have made continuous supplementations and improvements to the MILLER's measurement scale. Shen et al. (2010) and others carried out relevant measurements of corporate environments in China all based on this scale. Hence, taking into consideration the views of aforementioned scholars and the characteristics of fashion industry, we measured the environmental volatility from several aspects, including the updating speed of core products, the replacement speed of marketing strategies and the variation frequency of consumer demands.

Control variables

In this study, firm age, firm size and industry were selected as the control variables. The age and size of firms are the major factors affecting the dynamic capabilities of fashion SMEs. In general, the earlier the establishment of a firm, the richer the experience and resources it accumulates, and the stronger its dynamic capabilities. Similarly, there is a certain correlation between the size of a firm and its dynamic capabilities. To achieve measurability, the firm size was represented by the number of employees in this study. In view of the differing dynamic capabilities among fashion SMEs in different industries, the industries were subjected to control herein.

Table 2 Reliability and validity of questionnaire

Variable	Measuring Item	Factor Load	T value	AVE	Composite Reliability	α value
Design	Ability to recruit high-quality designers	0.663	10.811			
Dynamic Capability	Higher proportion of output values of new products or services in total sales	0.721	11.392	0.525	0.859	0.818

	Getting more design awards and patents	0.785	12.223			
	Ability to recognize new external fashion trends	0.771	12.042			
	Huge investment in design and R&D	0.762	11.935			
	Ability to recruit new teams and create new internal operating models	0.685	10.910			
Production Dynamic Capability	Ability to shorten production lead time	0.705	11.885			
	Ability to assess the feasibility of new technologies	0.677	9.659			
	Ability to introduce novel production and supply chain managements	0.757	11.885	0.509	0.822	0.801
	Strong ability to flexibly produce product assortment	0.799	12.396			
	Ability to improve supply flexibility index	0.723	11.441			
Market Dynamic Capability	Ability to analyze and assess the potential of new markets	0.709	13.224			
	Ability to adjust existing business development strategies and quickly establish connections with new market	0.786	14.890			
	Quickly integrating resources and timely establishing new distribution channels once upon discovery of a potential new market	0.797	15.173			
	Capable of effectively studying the rivalry behaviors and new customer needs in the face of potential new markets, and timely launching new advertising, promotion and pricing strategies	0.813	15.535	0.585	0.841	0.810
	Capable of timely integrating existing brands and corporate reputation in the face of potential new markets, which can be used in the course of market expansion	0.505	7.878			
Relational Embeddedness	Both parties can keep their promises	0.787	13.251			
	Will not gain improper profits by exploiting the weakness of the other party	0.706	13.907	0.520	0.844	0.826

Table 2...

	Will strive to fulfill responsibilities in cooperation	0.665	12.476			
	Frequent information exchange between firms, not just limited to established agreements	0.647	12.098			
	Reminding each other of possible problems and changes	0.567	10.401			
	Providing required information to each other as much as possible	0.707	13.386			
	Sharing responsibility for task fulfillment	0.694	13.103			
	Helping solve each other's problems	0.724	13.805			
	Working together to overcome difficulties	0.806	15.724			
	Core products in the industry are updated rapidly	0.721	13.210			
Market turbulence	Corporate marketing strategies are replaced quickly	0.620	10.220	0.503	0.824	0.825
	Consumer demands change frequently	0.778	12.541			
	Market activities of a firm's main rivals are hardly predictable	0.812	15.665			

Table 2...

Initially, reliability test was performed on the questionnaires. According to the results shown in the table, the Cronbach's α coefficients were all greater than 0.7, indicating that the questionnaire measures were reliable.

The convergent and discriminant validities were used to verify the questionnaire validity level. During the convergent validity test, a confirmatory factor analysis was made on the relational embeddedness, the dynamic capabilities of fashion SMEs and the market turbulence. Tab. 2 details the data results. Overall, the factor load values of all variables were higher than 0.5, the average variances extracted (AVEs) were greater than 0.5, and the composite reliabilities were higher than 0.8. Thus, all variables were determined to have good convergent validities. Regarding the discriminant validity between analysis variables, Tab. 3 lists the descriptive statistics and correlation coefficients of various variables. As can be seen, the correlation coefficients between variables were all less than 0.4, and the square roots of AVE values at the diagonal were all greater than the correlation coefficients of the variable with other variables. This suggests good discriminant validity of the present questionnaire.

Table 3 Descriptive statistics and correlation coefficients

Variable	Mean	SD	Relational Embeddedness	Market Turbulence	Design Dynamic Capability	Production Dynamic Capability	Market Dynamic Capability
Relational Embeddedness	4.101	1.276	0.721				
Market Turbulence	3.915	1.596	0.066*	0.709			
Design Dynamic Capability	3.836	0.621	0.296***	-0.01	0.724		
Production Dynamic Capability	4.120	0.646	0.330***	0.386***	0.162***	0.713	
Market Dynamic Capability	3.130	0.599	0.329***	0.379***	0.184***	0.387***	0.764

ANALYSIS AND HYPOTHESIS TESTING

The theoretical hypotheses were verified by employing hierarchical regression. Initially, the variables were centralized for ensuring scale robustness and reducing multicollinearity. Next, the variables were placed sequentially into the regression models. Tab. 4 presents the detailed regression results.

Models 1, 6 and 11 were the basic models, which were added with control variables only. Models 2, 7 and 12 were added with relational embeddedness on the basis of the control variables. On the basis of the previous models, the models 3, 8 and 13 were added with the squared relational embeddedness. Meanwhile, models 4, 9 and 14 were added with market turbulence variables on the basis of the previous models; and models 5, 10 and 15 were added with the product term between relational embeddedness and market turbulence and that between squared relational embeddedness and market turbulence on the basis of the previous models.

Regarding the effect of relational embeddedness on the design dynamic capability of fashion SMEs, a significant negative correlation was found from Model 3 between the squared +relational embeddedness and the design dynamic capability ($\beta = -0.103$, $p < 0.05$). This proves

that the squared relational embeddedness has an inverted U relationship with the design dynamic capability, thus verifying the H1a. Further, it can be seen from Model 5 that insignificant correlations were found for the product term between relational embeddedness and market turbulence and the product term between squared relational embeddedness and market turbulence. This suggests that the market turbulence has no regulating effect between the relational embeddedness and the design dynamic capability. Hence, H2a was failed to be verified.

Regarding the effect of relational embeddedness on the production dynamic capability of fashion SMEs, a significant negative correlation was found from Model 8 between the squared relational embeddedness and the production dynamic capability ($\beta = -0.196$, $p < 0.05$). This proves the presence of an inverted U relationship between the squared relational embeddedness and the production dynamic capability, thus verifying the H1b. According to model 10, the product term between relational embeddedness and market turbulence had a significant positive effect on the production dynamic capability ($\beta = 0.123$, $p < 0.05$); and the product term between squared relational embeddedness and market turbulence had a significant positive effect on the production dynamic capability ($\beta = 0.145$, $p < 0.05$). Moreover, the regression coefficient for the two product terms was larger than that for the squared relational embeddedness, indicating that the relational embeddedness and the production dynamic capability were in a U curvilinear relationship in a highly turbulent market environment. The high environmental turbulence also led to a closer correlation between relational embeddedness and production dynamic capability. Hence, H2b was verified.

Regarding the effect of relational embeddedness on the market dynamic capability of fashion SMEs, a significant negative correlation was found from Model 13 between the squared relational embeddedness and the market dynamic capability ($\beta = -0.151$, $p < 0.05$). This proves the presence of an inverted U relationship between the two, thus verifying the H1c. According to model 15, the product term between relational embeddedness and market turbulence produced a significant positive effect on the market dynamic capability ($\beta = 0.125$, $p < 0.05$); and the product term between squared relational embeddedness and market turbulence produced a significant positive effect on the market dynamic capability ($\beta = 0.167$, $p < 0.05$). Similar to the case of production dynamic capability, this indicates that the relational embeddedness and the market dynamic capability were in a U curvilinear relationship in a highly turbulent market environment. The high environmental turbulence also led to a closer correlation between relational embeddedness and market dynamic capability, thus verifying the H2c.

Table 4 Regression analysis results for network relation,
market turbulence and dynamic capabilities

Variable	Design dynamic capability					Production dynamic capability					Market dynamic capability				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15
<i>Control variable</i>															
Firm size	-0.115**	-0.167***	-0.174**	-0.174**	-0.175**	-0.110*	-0.162***	-0.140***	-0.129***	-0.137**	-0.067	-0.138**	-0.149**	-0.128**	-0.125**
Firm age	0.147***	0.134**	0.123**	0.123**	0.134**	0.136**	0.123**	0.124**	0.097	0.110**	0.127**	0.110**	0.094*	0.107**	0.093*
Fashion manufacturing & fashion services	0.120**	0.101*	0.103**	0.103**	0.101**	0.074	0.055	0.051	0.050	0.054	0.070	0.044	0.048	0.042	0.046
<i>Independent variable</i>															
Relational embeddedness		0.249***	0.252***	0.252***	0.244***		0.250***	0.257***	0.206***	0.241***		0.342***	0.348***	0.319***	0.355***
Squared relational embeddedness			-0.103**	-0.102**	-0.099**			-0.196***	-0.103**	-0.055			-0.151**	-0.098**	-0.045
Environmental turbulence				0.044	-0.013				0.599***	0.505***				0.341***	0.233***
Relational embeddedness x Environmental turbulence					-0.058					0.123**					0.125**
Squared relational embeddedness x Environmental turbulence					0.035					0.145**					0.167**
R ²	0.018	0.099	0.115	0.114	0.110	0.008	0.065	0.102	0.352	0.373	0.011	0.113	0.134	0.246	0.268
F value	2.567	11.243***	11.078***	10.159***	8.986***	13.136***	12.390***	12.916***	15.390***	15.332***	0.586	14.359***	15.053***	15.678***	15.049***
R ² variation		0.081	0.016	-0.001	-0.004		0.057	0.037	0.250	0.021		0.102	0.021	0.112	0.022

CONCLUSIONS AND IMPLICATIONS

Most of prior researches on the corporate dynamic capabilities have focused on high-tech industries, while the fashion industry has rarely been analyzed in depth. There are even less discussions on the effects of network relations and market turbulence on the dynamic capabilities of fashion firms. The results of this study demonstrate that for fashion SMEs, network relations are a vital factor affecting their dynamic capabilities. Moreover, network relations produce significantly varying effects on the three dynamic capabilities of fashion SMEs. Next, the characteristics presented by the effect of network relations on organizational dynamic capabilities vary by the market competition environment where firms are positioned. The theoretical contributions of this study are as follows:

Firstly, previous researches and measurements of corporate dynamic capabilities focused primarily on high-tech industries, while the fashion industry has little been discussed. On the one hand, as China's emerging strategic industry, the fashion industry urgently needs to restructure its competence system to cope with the dynamically changing market. On the other hand, the fashion industry has characteristics that distinguish it from other industries, so researching the dynamic capabilities of fashion firms has a profound significance. After a review of extant literature, this paper identifies the dynamic capabilities of fashion SMEs in China based on the value-added industrial chain as the design dynamic capability, production dynamic capability and market dynamic capability. Meanwhile, a corresponding index system is built taking into consideration the characteristics of fashion industry, which expands the research system related to the corporate dynamic capabilities (Teece, and Pisano, 1994; You, Liu, Zhang, 2016; He, Li, Fang, 2006; Zeng, Deng, Song, 2013).

Secondly, although numerous scholars have discussed the antecedent influencing factors of organizational dynamic capabilities from different perspectives, the researches taking social network as a point of departure are still scarce. According to Teece D, without the support of social resource network, firms will be unable to integrate and reconfigure existing resources effectively for responding to dynamically changing markets (Teece, and Pisano, 1994; Teece, Pisano, and Shuen, 1997). Looking over the existing literature, most discussions on the impact of social network on corporate dynamic capabilities remain in a theoretical stage, which lack support by empirical data. The present study attempts to fill such theoretical gap. As the empirical results show, the relational embeddedness has a significant inverted U relationship with all three types of dynamic capabilities of fashion SMEs. Its connotation is that the fashion firms can neither evade cooperation, refuse to share information and resources with other firms, nor fall into the "relational embeddedness paradox" because of over-reliance on network ties

(Uzzi, 1997). By performing an in-depth exploration from a multi-dimensional perspective of corporate dynamic capabilities, this paper further expands the view of Brian Uzzi (1997), i.e. moderate network embedding promotes the optimization of corporate performance.

Thirdly, contextual factors are introduced in this paper. That is, a preliminary exploration is made as to in which circumstances and to what extent the network relations affect the corporate dynamic capabilities. The exploration finds that the network relations exhibit varying degrees of influence on the organizational dynamic capabilities depending on the level of market turbulence. Specifically, in terms of production and market dynamic capabilities, the higher the level of market turbulence, the stronger the influence of relational embeddedness, the relationship between the relational embeddedness and the dynamic capabilities show a significant positive U relationship. Regarding the design dynamic capability, there is no significant change in the effect of market turbulence on the relational embeddedness. The results suggest that regardless of whether it is the improvement of production or market dynamic capability, the role of network relations is restricted by the degree of market volatility. This once again verifies the claim that the competitive environment strengthens the closeness between network relations and dynamic capabilities (Kovach JJ, Hora M, Manikas A, et al, 2015). Additionally, the results of this study also indicate that despite the impact of network relational embeddedness on the establishment of design dynamic capability, such effect is unrestricted by environmental volatility. For fashion R&D design, the rareness and distinction are required, as well as the low dependence on network resources. Further future research is needed concerning how to improve the design dynamic capability in a highly turbulent market environment.

Based on the empirical results, this study puts forward practical suggestions for further improving the dynamic capabilities of fashion SMEs. That is, fashion enterprise managers must keep maintenance of network resources, in order to establish a competence system that adapts to the dynamically changing markets. Sustaining a broad, modest embedded relationship with related firms helps the fashion SMEs grasp information and knowledge in specific areas, which will offer considerable support for enhancing the design, production and market dynamic capabilities at the organizational level, especially for those in a highly volatile environment. According to the research results, market turbulence somewhat strengthens the closeness of relational embeddedness with the production and market dynamic capabilities, enabling firms to promote the cultivation and establishment of organizational dynamic capabilities at higher levels of embedded relations. As for the design dynamic capability, its independence and heterogeneity must be maintained consciously by firms in the course of strengthening relational embeddedness. This helps reduce the inhibitory effect of high relational embeddedness on the

design R&D while developing other resources, thereby promoting the capability improvement effectively.

LIMITATIONS

This study has the following limitations: First of all, since the questionnaires for fashion SMEs are difficult to obtain, non-random samples are used herein, which are small in size and narrow in coverage. In the future, a larger random-sample study can be attempted, in order to increase the credibility. Secondly, there may be certain one-sidedness, since the network resources are measured from the relational embeddedness perspective only. Future research can probe deeper into the corporate network relations from the aspects of type, structure and position of networks. Thirdly, cross-section data are used in this study. If the time-series data of these firms can be acquired, it will be beneficial for studying the evolutionary building process of the corporate dynamic capabilities.

AUTHORS

CHEN Yu-jie :

(1990-), female, Yantai, Shandong, Ph.D., research field: Creative Industrial Economy, Glorious Sun School of Business and Management, Donghua University, Shanghai, 200051, Email: 694050342@qq.com

ZHAO Hong-yan :

(1963-), female, Hubei Huangpo, Ph.D., professor, research field: industrial cluster and industrial chain upgrade, Glorious Sun School of Business and Management, Donghua University, Shanghai, 200051, Email: zhaohongyan@dhu.edu.cn

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