

Gearing Up the Product Innovation in China's Apparel Industry through Modified Business Networks: Role of Innovative Synergistic Capabilities and Technology and Market Orientation

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Abstract: Synergistic capabilities of firms are developed through deep and broad business networks which facilitate innovative product development. Market orientation and technology orientation of the business plans in firms of apparel industry in China can enhance the effects of network dimensions over synergistic capabilities and have been studied in this research. For the purpose of conducting this cross-sectional study, 1000 firms of Chinese apparel industry were selected and their senior managers were sent specially designed questionnaires in which CMV has been reduced by taking efficient steps. However, 447 usable responses were obtained at the end of data collection step and these responses were then coded and tested through various statistical testing methods. All the hypotheses formulated in this study were proved to be accepted and the mediation of synergistic capabilities came out to be positive while moderation results were significantly negative. This study has several theoretical and practical implications that have been summarized by the author. Moreover, future research directions and opportunities have also been highlighted.

Henceforth the above study showed that moderation effects of market and technology orientation are significant and negative and reduce the effects of business network dimensions over synergistic capabilities and therefore on product innovation in firms.

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I. Introduction

The product innovation processes allow the firms to redefine the prevalent product markets by enabling them to innovate the old products and introduce new products that can capture the newly emerging opportunities in the market. This makes product innovation a key driver for survival and sustenance of a firm and its competitive advantage. These innovations are driven by the new emerging technologies, changes in customer preferences in the market, globalization and increase in the competitiveness in the markets [1, 2]. The figure no. 1 shows product innovation platform constituents. These include discovery of need of product, the insight of a firm, the firms' business community or networks and the ability to adapt and reuse product resources. Over a sustained period of time, product innovation has been considered one of the main drivers of value creation for a business. Technological changes in the industry strengthen the product innovation and lead the firms to the embracing of risks in the market [3]. Time and effort has been invested in the search for the factors that help firms in the acquirement and development of technological capabilities [4-6]. Moreover, innovation process development has also been studied that can lead to production and development of innovative products and services [4, 7, 8].

Synergetic innovative capability is the capability of a firm to combine the new and existing knowledge and to exploit it to form new products and services that are innovative and use latest techniques and technologies [9, 10]. These capabilities can be divided in two categories named as "internal innovative synergy" and "external innovative synergy". The internal innovative synergy of a firm is the synergetic innovation of its internal elements and factors while the external innovative synergy refers to the synergetic innovation achieved through external collaborations [11]. These capabilities were studied by Anderson and Li [9] who suggested that the knowledge gained through networks embedded in terms of both depth and breadth, can help in enhancing the capacity and capability of innovation of businesses. Chen, Vanhaverbeke [12] suggested that a firm's R & D and the external sources of knowledge contribute to the creation of potential of innovativeness of a firm. Moreover, several elements lead a firm to build synergetic innovative capability e.g. market orientation, interactions and collaborations among knowledge sources, technological capacity, and some other important organizational capabilities [13-18]. The market orientation is an important predictor of synergetic innovative capability because when the firms have latest knowledge about market conditions, they can modify their existing offering and processes and can develop new products and procedures in order to bring enhancement and innovations in the firm. The technological orientation also serves the synergistic capability development in similar ways.



Figure No.1: Product Innovation

The Chinese apparel market is developing day and night. These firms both distribute these products nationally and export these apparels to developing countries as well as the developed counterparts. The apparel industry is highly customer oriented in the global terms and the marketing orientation is important for developing customer oriented products. Moreover, technology plays a vital role in quick and accurate product deliveries in this industry. These factors are not specific to the apparel industry only and have an effect over the synergistic abilities of other industrial firms in general as well. In addition, the business networks play a key role in product innovation but the competitive market in China leads to low level of breadth and depth in networks of businesses. This issue persists all over the world in different industries. Many previous studies have been conducted in this area of research [19-22] but these researches have not studied the impacts of technological orientations in the apparel industry. Moreover, none of these studies reviewed the effects synergistic capabilities of the industry between product innovation and business networks. The objectives of this research paper are as follows:

1. To assess the effects of network breadth on the product innovation in China's apparel industry
2. To assess the effects of network depth on the product innovation in China's apparel industry
3. To evaluate the mediating role of synergistic innovative capabilities between network breadth and product innovation.
4. To evaluate the mediating role of synergistic innovative capabilities between network depth and product innovation.
5. To assess the moderating role of marketing orientation between network depth and breadth and the synergistic innovative capabilities.
6. To assess the moderating role of technology orientation between network depth and breadth and the synergistic innovative capabilities.

The scope of this research paper lies in finding the impact of business networks' depth and breadth on the product innovation in apparel industry in China by studying the mediation role of synergistic innovative capabilities and the moderation of market and technical orientations between network and synergistic capabilities is studied. The previous studies in this area [19, 23-27] have led to practical, theoretical and policy making implications. The theoretical implications were in terms of literature volume increase on the topics of market orientation, technological orientation, synergistic capabilities and their effects on product innovation in markets. In practice, these studies have contributed by allowing the businesses to enhance their policies regarding synergistic capabilities. The policy oriented implications in terms of governmental innovations have led to formation of laws that help the businesses improve their networks. The rest of this paper has been divided into a literature review, methodology, results and analysis and discussion and conclusion.

II. Literature Review

Theoretical Background

Diffusion of Innovation (DOI) Theory was developed by E.M. Rogers in 1962 [28] and it is one of the oldest social science theories. This theory arose in the field of communication for the purpose of explaining how a product diffuses or spreads through a specific population or social system overtime [29]. The result of this diffusion is that the new idea, product or behavior is adopted in the specific social system. Diffusion is possible only if the new product is adopted and adoption occurs only if the people perceive the pitched idea, behavior, or product as new or innovative [30]. This is not a simultaneous event, instead adoption process varies for individuals and some people show more speed of adopting an innovation than others. Research has shown that the people who show a tendency to adopt an innovation earlier have varying characteristics from those who adopt the innovation later [31].

Adopters can be classified into five classes and while most people fall in the middle category, it is important to appeal to all the classes with different strategies to promote the adoption of an innovation [32]. Innovators are the group that are always the first ones to try an innovative product. They are risk takers by nature and very little effort is needed to appeal to them [33]. Early adopters are leaders by nature and they like to play leadership roles, and welcome any opportunities of change. They have awareness of the need for innovation and the strategies that appeal to them only include the information sheets and how-to manuals that can guide them regarding usage of product. They do not need information that can help to convince them to change but instead only the information related to usage [34]. The majority of population falls in the group of early majority, who typically need to see evidence of the workability through strategies like success stories of users of the innovation before they are willing to adopt it [33, 35]. The late majority group is skeptical of change. The need to be appealed with information about usage from other people and the success ratios of usage [36]. Laggards are very conservative and consider themselves bound by tradition. They are the hardest group to bring on board. Peer pressure, statistics and fear appeals are the ways that can persuade them to get on board with the innovation [37]. Main factors that influence adoption of an innovation include compatibility (consistency of innovation with the values, experiences, and needs of the potential adopters), relative advantage (the extent to which an innovative product is seen as an improvement over its replacement), complexity (the level of difficulty of understanding the innovation), triability (extent to which the innovation can be tested before making a commitment) and observability (tangibility of innovation results) [38-40].

Effects of Network Breadth and Depth on Product Innovation

Business network structures can be divided into two dimensions, breadth and depth. These dimensions of the business network are responsible for revealing the scope of resources related to networks that can be accessed by a firm. Network breadth means having diversity in relations i.e. having more number of relations and business links [41] whereas network depth means that the intensity of relationships is more focused as compared to making more relations i.e. having few relations that are more invested and deep [42]. Past studies have shown that businesses need to invest and search in depth or broadly in their business networks for the adoption of change and acceptance and usage of innovation [42-46]. The breath of networks capture the horizontal dimension of business networks by forming a resource base of heterogeneous origins. They are constituted of multiple link formation in businesses that help provide the opportunities of usage of these links for innovative idea generation. The variety of business associates come together for the formation and generation of new ideas and new product designs. The limitations faced by one of the firms can be offered a solution by any other of the business associates. In this way, the breadth of business networks helps in creation of new and innovative products, therefore the following hypothesis is generated:

H1: Network breadth has a significant effect on the product innovation.

On the other hand, the depth attribute captures the vertical dimensions of a business network and results in the achievement of unique resources that are rare in the market and are hard to obtain and replicate [21]. It is important to engage in business networks for the maintenance of a firm's competitive capabilities vital information gains occur through deep relation in business as well as new network resources can be gained. Network depth enables a firm to engage in exchange of resources and incorporate the rare resources of business partners in their own product development. This helps in creation of innovative products. This leads to the following hypothesis.

H2: Network depth has a significant effect on the product innovation.

Past studies have not given much thought to the effects of business networking on driving capabilities in terms of their response on product innovation [47]. Differentiating the business network on the basis of breadth and depth helps in the clarification of the mechanisms that are used by businesses for the generation of resources and advantage development in term of dynamic and innovative synergistic capabilities [19].

Mediating Role of Innovative Synergistic Capabilities

Innovative capability of a firm can be defined as its absorptive capacity which can be evaluated by a firm's ability to collect, organize and use knowledge while the innovative capabilities are the ability of a firm to fathom something of use from the gathered knowledge [48, 49]. Innovation enhances the success and growth of firms and the innovation capabilities are dependent on the interaction of groups, individuals and organizations in a business network because these networks become the source of knowledge needed for development of innovation capability [50, 51]. For example, if a firm has close association and interactions with its business associates, then, it comes in a better position to have knowledge about their resources and they can utilize these resources for the conversion of the knowledge into innovation. By doing so, the innovation capability of a firm is developed. Synergy means interaction and it deals with the outcomes of some cooperative action that a firm cannot individually accomplish. Synergetic innovative capability is the capability of a firm to combine the new and existing knowledge and to exploit it to form new products and services that are innovative and use latest techniques and technologies [9, 10]. These capabilities are enhanced by the breadth and depth of the business networks. The breadth of business relations results in a variety of links and increased resources while the depth of relations reveals rare resources of business associates. These resources enhance the synergistic innovative capabilities [52, 53]. These enhanced capabilities improve the product innovation of firms and according to the theory of diffusion of innovation the new and innovative products will lead to adaptation strategies to be enhanced. The following hypotheses are therefore generated.

H3: Innovative synergistic capabilities play a mediating role between network breadth and product innovation.

H4: Innovative synergistic capabilities play a mediating role between network depth and product innovation.

The synergetic innovative capability leads the firms to achieve various positive outcomes in the firm and it enhances the innovativeness and firm performance. Synergetic innovative capability is not restricted to financial benefits for a firm but in fact there are several market benefits of innovation that have been examined by many past researchers [54-58] and these lead to innovativeness and new product creations for a firm.

Moderating Role of Technological Orientation

Technological capabilities of a firm can aid in exploiting the organizational innovation, which is developed from previous experience [26]. Good technological capabilities are developed due to the knowledge of technology in the organization and helps the organization to exploit the technical resources it has on disposal [59]. According to the theory of diffusion of innovation, the innovators in the market will adopt the technically new products readily and the business associates in the business networks can lead to enhancing the synergistic capability by allowing the adaptability of new techniques and technologies. Technical proficiency of a firm is the measure of its ability to develop new products and services using latest technologies [60, 61]. The commitment of a firm to innovation can be judged by its internal technology policies. Firms that aim to acquire new technologies proactively are more innovation driven. The extent of technical and technology orientation of a firm has a significant impact on its ability to create innovative products. The technology orientation however, plays a negative moderating role between business network dimensions and the synergistic capability of a firm. The more networks that the firm has i.e. the broader its networks are, the more opportunities the firm will have of coming up against new technologies. However, a myriad of options lead to confusion and slows down the process of learning and adoption. Similarly, the deeper the network of a firm, i.e. the more the intensity of collaboration between firms exists, the more the firm becomes set in a particular pattern, reducing its adaptability of technology. Therefore, it can be concluded that technological orientation plays a significant moderating role in this relation. This is summarized in the hypotheses below.

H5: Technological orientation plays a moderating role for enhancing effects of network breadth on innovative synergistic capabilities.

H6: Technological orientation plays a moderating role for enhancing effects of network depth on innovative synergistic capabilities.

Moderating Role of Market Orientation

The main definition of market orientation lies in the launching of new and latest products, services and goods according to the demands of the customers [62]. The dynamics forces associations are related to thinking about the connections with suppliers and customers' agreement to higher business performance. Another definition of market orientation claims that market orientation can be defined as a form of organizational culture where employees are committed in a process of manufacturing superior culture and customer value that may lead to better performance. [63]. Firms that have successful market oriented approaches can easily focus on the desires and wants of their customers. According to Cacciolatti and Lee [64], market orientations have a strong and compatible relation between marketing strategies and organizational power. These concepts work side by

side to play their role in the success of a firm. According to the present researches, market orientation can help in generation of quality products and can produce increased profit as compare to the product orientated market. In light of DOI theory, the market orientations will lead to different kinds of strategies adopted for different groups of customers.

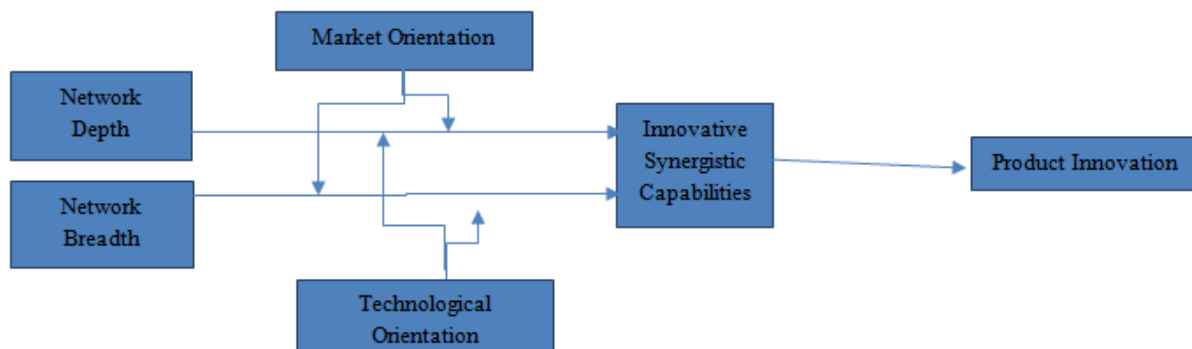
Market orientation can moderate the impact of network breadth or depth on synergistic capabilities. The market oriented firms focus on collection and analysis of existing and future demands of the dynamic markets offering the potential competitive advantages in respect to competitors. These firms invest a lot of time and effort for gaining information from various sources and the additive information generated from the network breadth lead to decline. Increased market orientation, therefore leads to decreased breadth in network value. Similarly, low levels of orientation of marketing leads to the reduction of the ability of a firm to transmit rare and unique resources to convert them into innovative solutions. Thus, marketing orientation's increase leads to reduced synergistic capabilities. This leads to positing the following hypothesis.

H7: Market orientation plays a moderating role for enhancing effects of network breadth on innovative synergistic capabilities.

H8: Market orientation plays a moderating role for enhancing effects of network depth on innovative synergistic capabilities.

Research Model:

The hypotheses that have been generated in this chapter have led to the formation of the following research model, which will serve as the basis of this research.



III. Research Methodology

Sample and data collection

For this study, the author has selected apparel industries in China as their study context for several reasons. The first and foremost reason lies in the fact that product innovation lies at the root of moving upwards in the global market for the Chinese manufacturers. Secondly, they use the business networks widely for the purpose of accelerating product innovation and the reduction of risks that can lead to slowdown of economic development [11, 65]. Thirdly, the Chinese apparel industries have been emerging as a popular context to investigate synergistic capabilities of a firm due the prevalence of dynamism in the market environment and the rapid evolution of innovation [66, 67]. This study was conducted in three phases. The first phase comprised of 20 interviews that were conducted with managers of apparel industries so that the research model can be modified and refined. Another purpose of this step was the identification of any relevance in the constructs. The second step involves creating a questionnaire which was first written in English and then translated. A pretest was then conducted with 10 managers and 2 academics from China who had knowledge of this research area. After the pretest participants had fully read through and responded to the questionnaires, interviews were conducted with them in detail that led the author to recognize any conflicts and issues and which were used to make some modifications in the questionnaire. Lastly 3000 firms were selected from the apparel industry in China using the Directories of Local Associations. The selected firms all had above 50 full-time employees. The senior managers of these selected firms served as the key informants in this research. Out of these firms, random sampling was used to select 1000 firms and their senior managers were sent the questionnaires along with a two page long introductory letter which explained the purpose of this research and confirmed the respondents that their privacy and secrecy will be maintained. Three weeks after the first mail, the questionnaires were resent and email reminders were also sent for improving the response rate. About 600 firms responded and only 447 of the responses obtained were usable after the collection through the second wave of questionnaires. Non-response bias was ruled out because the obtained results did not reflect any significant differences in the pattern of responses.

Measures

The conceptual work of Sun and Cai [68] and Persaud [69] to develop a six-item measure scale for the synergistic capabilities and the product innovation in firms. This scale can measure the ability and activities of a firm that it uses to observe, gain and reuse the existing and new resources to manage its product innovation for meeting the market demands. The measure scale for evaluating how deep and broad a business network is was developed based on the work of Ritter, Wilkinson [70] and Zhou and Li [71]. Network breadth is measured in terms of variety and diversity in a firm's business links and networks while network depth measures the collaborative intensity of these relationships and links. The measure scale of market orientation and technological orientation has been adopted using the research work of Narver and Slater [72] and [8]. Lastly, the measure of product based innovation in a firm is measured on the basis of several items that are the number of newly created products, the effectiveness of commercialization processes being used, the profit value of the products, and the technological and technical benefits that these products provide to their users.

Common Method Variance

Cross-sectional studies are often faced with the issues of self-reported data such as data on the personality of a respondents, their behaviors or perceptions on various issues like the success of firm or its environment etc. the survey which is based on a questionnaire usually provide issue of common method variance because the estimated impact of one variable on another is at risk of biasness. CMV is mostly introduced by the measurement methods instead of any theoretically introduced constructs represented by the measures [73-75] i.e. CMV is the systematic variance which is introduced into the measures by the measurement technique [76]. To reduce the CMV to a minimum value in the results obtained in this research, several steps were taken. The first step, for the removal of any bias on the basis of improving the social desirability in their responses, the respondents were given the guarantee that their responses will remain confidential and the cover letter of the questionnaire reinforced the fact that their anonymity will be maintained at any cost. The second step that was taken to remove the bias was creation of a psychological divide in the survey which had the intention of hiding the relationships between the constructs from the participants. This was done by creating various instruction sets and placing a number of dummy items or filler items between the different sections. The third step taken in this regard was to make the survey short so that the respondent does not fall prey to mental fatigue and pressure while responding. Lastly, the potential common method variance was tested statistically and a proxy marker was selected which. These steps lead to suggest that CMV is not a key concern in this study.

IV. Results and Analysis

In this chapter, the results and analysis is presented for the tests that have been conducted for this research. For the purpose of this study a total of 447 participants from China were selected out of which the male ratio was dominant, 55.7%, while the rest 44.3% were females. Education-wise, most of the sample was highly educated, i.e. 50.6% had graduate degrees and 27.7% had master's degrees. The prominent age group in the sample was 26-30 with 31.1% respondents lying in this group and 31-35 with 30% respondents. The demographic details, as mentioned, helped enhance the validity of results since the majority of the sample was mature in both age and education aspects.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
NetwBr	447	1.00	5.00	3.3848	1.13598	-.558	.115
NetwDep	447	1.00	5.00	3.5667	1.14123	-.492	.115
TechOri	447	1.00	5.00	3.4890	1.16751	-.632	.115
MarkOri	447	1.00	5.00	3.4078	1.16941	-.629	.115
InnSyC	447	1.00	5.00	3.4989	1.13969	-.664	.115
ProdInn	447	1.00	5.00	3.5570	1.11626	-.640	.115
Valid N (listwise)	447						

Table 1 shows the descriptive statistics for this study. There are no outliers in the data which is proven by the minimum and maximum statistics. The mean statistics show an average of 3.5, depicting that the respondents revolved around neutrality to agreement about the statements given in the questionnaire. The normality of the data has been proven by skewness testing, as all the results lie in between the threshold range of -1 to +1.

Table 2: Factor Loading and Convergent Validity

	Component						CR	AVE
	1	2	3	4	5	6		
NB1			.799				0.960	0.799
NB2			.793					
NB3			.805					
NB4			.803					
NB5			.791					
NB6			.772					
ND1				.714			0.917	0.830
ND2				.759				
ND3				.747				
ND4				.699				
ND5				.752				
ND6				.741				
TO1					.737		0.928	0.857
TO2					.766			
TO3					.743			
TO4					.754			
TO5					.743			
MO1	.837						0.929	0.876
MO2	.688							
MO3	.688							
MO4	.664							
MO5	.709							
MO6	.857							
MO7	.857							
MO8	.860							
MO9	.851							
MO10	.849							
MO11	.857							
MO12	.846							
MO13	.851							
ISC1		.735					0.924	0.861
ISC2		.724						
ISC3		.753						
ISC4		.794						
ISC5		.772						
ISC6		.771						
ISC7		.751						
ISC8		.792						
ISC9		.785						
ISC10		.781						
PI1						.752	0.933	0.837
PI2						.712		
PI3						.758		
PI4						.738		
PI5						.686		

Table 2 shows factor loading and convergent validity for this study. Results for the rotated component matrix, which is a part of CFA, have been given in this table. All the components carry factor loading greater than 0.7 and no issue of cross loading is seen. This table validates the accuracy of data. Output of convergent validity tests are represented by CR and AVE which are indicators for convergent validity, having low threshold values of 0.7 and 0.5 respectively. Results show that there is convergent validity in data.

Table 3: Discriminant Validity

	ISC	NB	ND	TO	MO	PI
ISC	0.928					
NB	0.691	0.894				
ND	0.523	0.627	0.911			
TO	0.688	0.593	0.647	0.926		
MO	0.525	0.609	0.670	0.683	0.936	
PI	0.501	0.623	0.551	0.614	0.676	0.915

Table 3 shows results for the discriminant validity for this study. Results given in the diagonal portion of table show discriminant validity results. Each variable is more associated with itself as each of the values are larger than the values preceded by them. This is a confirmation that discriminant validity exists in the data taken for this research.

Table 4: Confirmatory Factors Analysis and KMO

CFA Indicators	CMIN/DF	GFI	IFI	CFI	RMSEA	KMO
Threshold Value	≤ 3	≥ 0.80	≥ 0.90	≥ 0.90	≤ 0.08	0.6 – 1.0
Observed Value	2.538	0.817	0.960	0.960	0.059	0.976

For confirming the fitness of the selected model, confirmatory factor analysis is carried out, results of which have been depicted in Table 4. The indicators included in the table, CMIN, GFI, CFI, IFI and RMSEA all need to have values according to the described thresholds. Fitness of the model is confirmed by the results since all the values are within the threshold mentioned in the table. Moreover, this table also depicts the results of KMO Test. The purpose of this test is to confirm that sample size of data is accurate and value should lie between threshold range of 0.6 and 1. The result of KMO testing show the value of .976, thus for this study the sample is adequate. Figure 2 shows the CFA simulation results.

The table 5 summarizes the hypothesis testing, done through structural equation modeling. The results clearly show that all the hypotheses were accepted. There is a direct significant effect between network breadth and depth and product innovation. However, the indirect effect through mediator is significant and positive, showing increase of 9% in case of breadth and 11% in case of depth. The results of moderation are negative in all variables. This means that market orientation and technological orientation exert negative moderation between network breadth and depth and the synergistic innovative capabilities.

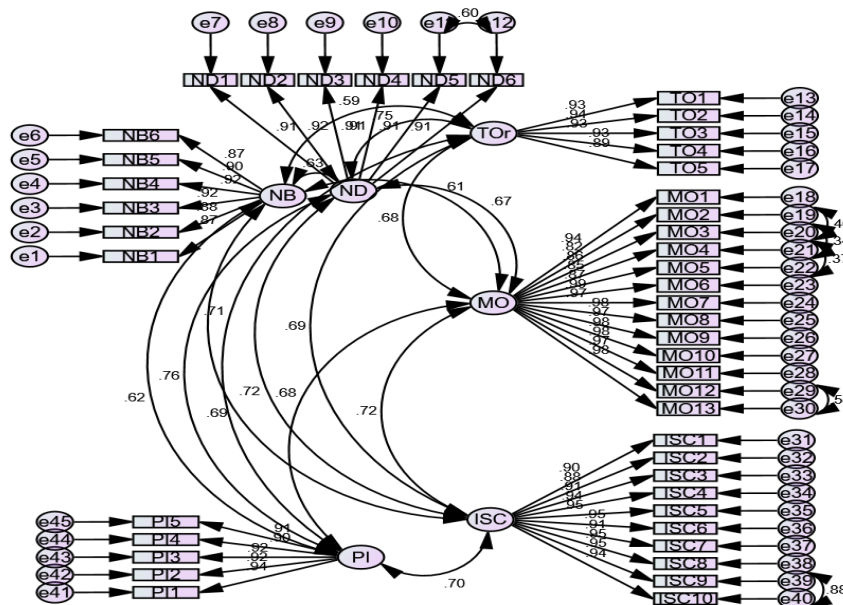


Figure 2: CFA

Table 5: Structural Equation Modeling

Hypothesis	B-Value	SE	P-Value	Decision
NB→PI	.149	.041	.000	Accepted
ND→PI	.468	.042	.000	Accepted
NB→ISC→PI	.098	.019	.010	Accepted
ND→ISC→PI	.119	.027	.010	Accepted
NB*TO→ISC	-.165	.030	.000	Accepted
ND*TO→ISC	-.220	.035	.000	Accepted
NB*MO→ISC	-.119	.029	.000	Accepted
ND*MO→ISC	-.153	.031	.000	Accepted

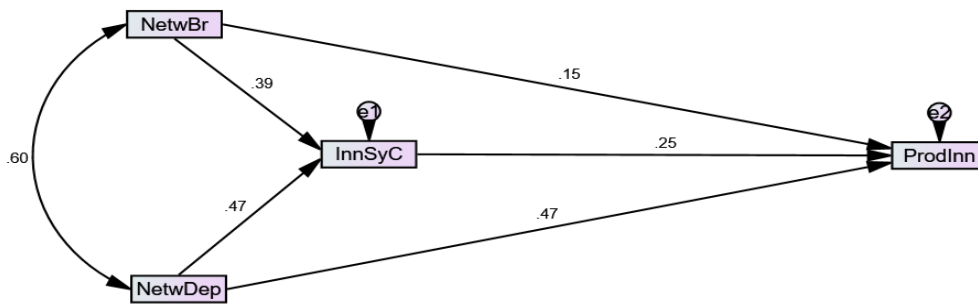
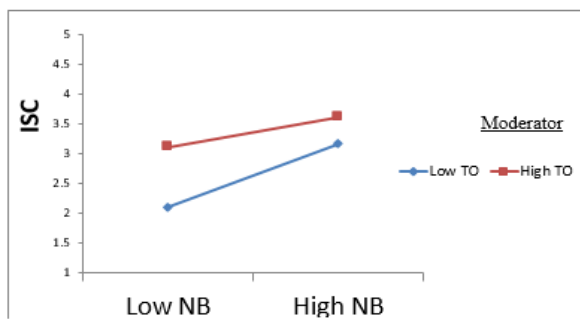
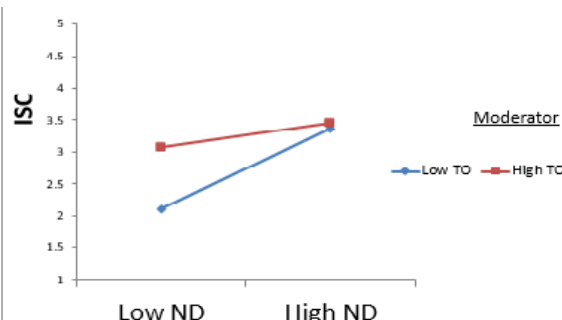


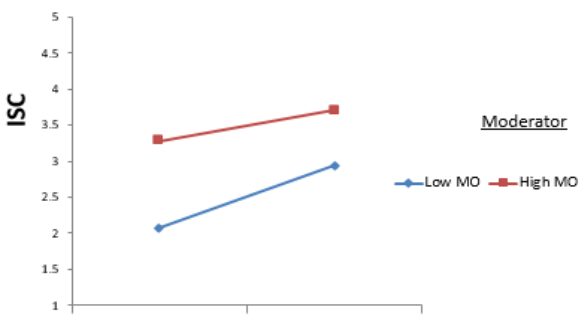
Figure 3: SEM



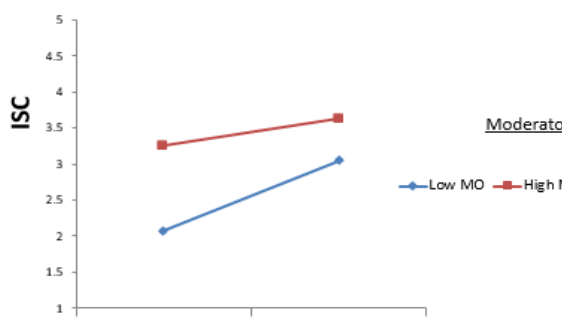
Graph 1: Moderation of TO between ISC and NB



Graph 2: Moderation of TO between ISC and ND



Graph 3: Moderation of MO between ISC and NB



Graph 4: Moderation of MO between ISC and ND

The graphs 1 till 4 show the results of moderation effects. It has already been established in table no 5 that these moderation affects are all significant. The figure 1 shows the moderating effects of technology orientation between innovative synergistic capabilities and the network breadth and figure 2 shows the same between network depth and ISC. These figures explains that the network dimension's impact on ISC has negative moderation through TO. Similarly, the figure 3 shows the moderating effects of market orientation between innovative synergistic capabilities and the network breadth and figure 4 shows the same between network depth and ISC. These figures explains that the network dimension's impact on ISC also has negative moderation through MO.

V. Discussion and conclusion

Discussions

This study focused on how business network dimensions, network depth and network breadth, in the Chinese apparel industry, affected the product innovation in firms. To study this impact, mediation variable of synergistic innovative capabilities was used while the moderation effects of market orientation and technology orientation were applied between the network dimensions and innovative synergistic capabilities. The major aim was to discuss the how the network dimensions can help to improve the synergistic capabilities in a firm. During this study, the author generated eight major hypotheses that were used to test the said effects of variables on each other. The first hypothesis proposed that network breadth directly effects the product innovation in the

Chinese apparel industry's firms. This hypothesis was accepted by the SEM testing steps, as depicted in table no.5 given in the last chapter. The second hypothesis proposed that network depth directly effects the product innovation in the Chinese apparel industry's firms. This hypothesis was also accepted by the SEM testing steps. The results showed that both these variables had a significant and positive effect on product innovation. Increase of one unit in ND increased the product innovation by 14% units while increasing one unit of NB increased the product innovation by 46% units. A number of previous studies follow this result [21, 77-79]. The hypotheses three and four show the mediation of innovative synergistic capabilities and both were accepted. Mediation of ISC between NB and PI was 9% and between ND and PI was 11% and both were significant. Similarly, the hypotheses five and six show moderation effects of technology orientation and seven and eight show the moderation effects of market orientation. All these hypotheses were tested and proved to be significant but they show negative significance over the relation between network dimensions and innovative synergistic capabilities. Moderation of TO between NB and ISC is negative 16% and that between ND and ISC is negative 22%. Similarly, moderation of MO between NB and ISC is negative 11% and that between ND and ISC is negative 15%. These results are similar to results by Jiang, Mavondo [21], whose study formed the basis of the research model of this paper. The analysis conducted in this research helped in deducing that if the ISC is improved, the effects of network dimensions on product innovation can also be enhanced.

Conclusions

Despite the rapidly increasing interest in product innovation in today's dynamic business market, the studies that can relate the networking dimensions to innovation are limited in number. Moreover, none of the previous studies have researched the impact of innovative synergistic capabilities of a company between these variable. Based on the DOI theory, this study examines how NB and ND impact ISC of a firm and in turn its product innovation. The market orientation and technology orientation have been selected as the variables of strategic orientation in this study to see the moderation effects. The selected sample had 447 respondents. Statistical analysis, estimation techniques and root unit testing were some methods using which this data was analyzed. This is a cross-sectional study in which the data has been collected through questionnaire survey technique and the common method variance was reduced to a minimum level by various techniques. Results have been summarized in the analysis and results section of this paper. The results showed that increase in innovative synergistic capabilities of a firm can increase the effects of the network dimensions of depth and breadth over the product innovation in the Chinese apparel industry. This study has several policy making, theoretical and practical implications as well as few limitations. These implications, limitations and future recommendations have been outlined in the sections below.

Implications

Since this study discusses the impact of innovative synergistic capabilities for the improvement of product innovation through business network dimensions under the moderating role of strategic orientations of market and technology, it has several implications in theoretical, practical and policy making contexts. Deep relational literature review has been presented that can be used by fellow researchers for clarifying their concepts for their own researchers. In addition, it provides theoretical relation between the selected variables. In practical applications, this study has provided the firms a facility to develop plans for enhancing their synergistic capabilities by showing its significance and allowing them to devise mechanisms for improvement of their business networks in both dimensions. The government officials can also use this study to guide policy designs for effective innovation and communication laws for the businesses in a country.

Limitations and Future Research Recommendations

No research work is free from constraints. This study too has a few boundaries and limitations that can be used to improve future research in similar research areas. The first limitation is the size of sample taken. The Chinese apparel industry was selected as the zone of study and the results can be biased based on socio-cultural factors, thus for the future, researchers can consider to use similar variables for testing data in other countries or other region-level data can also be used. In addition, research can be conducted on these variables in other kinds of industries such as pharmaceuticals, cosmetics, petroleum, etc. This was a cross-sectional study and has its associated limitations, so in the future testing can also be done in longitudinal approaches. In addition, effect of other factors like the level of education of employees, the level of tolerance and commitment of the employees to innovation, the internal atmosphere of firms and the can also be taken as drivers of overall product innovation. Moreover, these variables should be explored for other kind of innovation capabilities such as service innovation and process innovation in firms.

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