

A theory of multi-dimensional organizational innovation cultures and innovation performance in transitional economies

The role of team cohesion

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Abstract

Purpose – This study aims to construct a theory of multi-dimensional organizational innovation cultures and innovation performance in transitional economies and explore the moderating effect of team cohesion on this theoretical relationship.

Design/methodology/approach – Using data collected from 175 manufacturing firms in transitional economies, this study constructs a new theory framework of multi-dimensional organizational innovation cultures (knowledge sharing, organizational innovation atmosphere, team decision-making and organizational change) and firms' innovation performance and also explores the moderating effect of team cohesion on this theoretical relationship.

Findings – The findings show that there are positive relationships between knowledge sharing, organizational innovation atmosphere, team decision-making, organizational change and innovation performance of firms. Furthermore, team cohesion plays a positive moderating role in this relationship.

Practical implications – It extends the general understanding of multi-dimensional organizational cultures management in the context of transition economies by exploring the differences between the Chinese and Vietnamese firms in terms of the impact of organizational innovation culture on innovation performance.

Originality/value – This study constructs a new theory framework of multi-dimensional organizational innovation cultures along the four dimensions of knowledge sharing, organizational innovation atmosphere, team decision-making and organizational change. These factors together have rarely been examined before. Hence, the findings extend existing research on organizational cultures management. Moreover, a new idea for this study is that the authors consider team cohesion as a moderating variable between organizational innovation culture and innovation performance of firms,



hence providing both theoretical discussion and empirical validation of the impact of team cohesion on this relationship. It thus extends existing research on the team theory.

Keywords Innovation performance, Transitional economies, Team cohesion, Organizational innovation cultures

Paper type Research paper

1. Introduction

As innovation is seen as the key source of competitive advantage for firms, there is considerable research interest in identifying its main determinants from the perspective of organizational culture (Tsang and Park, 2013; Yang *et al.*, 2012). Some researchers define organizational culture as a cognitive framework consisting of attitudes, values, behavioral norms and expectations shared by members (Greenberg and Baron, 2003; Pettigrew, 1979; Schein, 1988). Baird *et al.* (2007) argue that organizational culture refers to underlying and shared values which provide employees with a set of behavioral norms. This is in line with the idea of Webster and White (2010) that organizational culture can be conceptualized and quantified in terms of the widely shared and strongly held values of a firm's employees. Moreover, it exerts significant influence on individuals, organizational processes and performance and effectiveness (Greenberg and Baron, 2003; Hofstetter and Harpaz, 2015; Wei *et al.*, 2011). Accordingly, it is necessary for firms to shape their organizational culture with and for employees.

Innovative culture which emphasizes on a behavioral pattern in which all members of the organization mobilize positive factors to innovate and collaborate is a new type of culture which emerged at the beginning of the information age. An innovative culture can make it easy for senior management to implement innovation strategies and plans (Ahmed, 1988). A recognition of firm culture as a critical source of innovativeness has led to increased research attention being paid to this phenomenon (Tellis *et al.*, 2009; Xie *et al.*, 2014).

Team cohesion is the degree to which team members work together to pursue collective goals (Salas *et al.*, 2015). It is defined as a dynamic process that is reflected in the tendency of a group to come together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of members' affective needs (Carron *et al.*, 1998; Mach and Baruch, 2015). It is expected that high team cohesion will play a significant role in innovation performance. In this sense, an organization which has performed very strongly one year may not repeat its success the following year, or vice versa. How is it that, against all logic, a team whose members seem less capable can become champion performers? How can we explain these contrasting results? Can differences in a team's performance be explained by the cohesion between its members? The literature is not completely clear as to whether performance affects cohesion or the reverse.

Previous research provides a comprehensive review of organizational culture and performance. However, we also need to ask:

- Q1. How does innovative culture affect organizational performance?
- Q2. Does team cohesion moderate the relationship between an organizational culture of innovation and innovation performance?

These questions still lack appropriate answers. In addition, few studies have yet explored the issue of the organizational innovation culture from the perspective of developing countries. The characteristics of industries in such countries are different from those found in the developed countries, so this uneven focus invites further investigation in the context of the emerging economies.

As the transitional economies, China and Vietnam have a rapid growth in the manufacturing industry after many years of market-oriented reform. For example, China has made significant efforts to change from a highly centralized planned state to the current near-market economy since the implementation of the policy of openness in 1978. Although the two countries have undergone a similar shift, they differ in some regard, such as cultural settings and institutional environmental conditions. Particularly, the institutional policies in the two countries are different. Thus, it is possible that the effects of the relationship between organizational innovation culture and firms' innovation performance are not uniform on these two nations. Hence, it is necessary to explore the roles of organizational innovation culture and team cohesion in the processes governing firms' innovation in transitional economies to help improve their industrial competitiveness.

Therefore, building on the theory of multi-dimensional organizational innovation cultures, a research model is proposed to examine the relationships between organizational innovation cultures and innovation performance. First, this study aims to explore the relationships between multi-dimensional organizational innovation cultures including knowledge sharing, organizational innovation atmosphere, team decision-making, organizational change and innovation performance. Furthermore, as team cohesion in one firm is quite different from that found in others, this study is also designed to examine the moderating effects of team cohesion on this relationship. Finally, this work identifies the different impacts of organizational innovation culture on the performance of firms in China and Vietnam, even though they have many similarities in terms of both conditions and cultures.

2. Literature review

There are some studies that explore the definitions of organizational innovation culture. As [Buckler \(1997\)](#) suggests, innovation culture is an environment, and a culture is an almost spiritual force that exists within a company and drives value creation. [Thornherry \(2003\)](#) proposes that organizational innovation culture is a synthesis of values, attitudes, beliefs and ideas within the company, which aims to reward innovation, encourage risk-taking and engage flexibly with a complex environment. [Dobni \(2008\)](#) argues that an innovative culture in an organization can be broadly defined as ranging from the intention to be innovative to the capacity to introduce some new products, services or ideas through the introduction of processes and systems which can enhance performance. Overall, organizational innovation culture consists of values, ideas, systems, environmental advocacy, encouragement, safeguarding of technology innovation and the tolerance of failure. Regardless of the different emphases placed on the various definitions by scholars, the core concept can be summarized as the intention of excitation, encouraging innovation and improving performance.

Research shows that organizational innovation culture exerts a strong influence on innovation performance. For example, [Hurley \(1995\)](#) shows that the characteristics of organizational innovation culture (such as power-sharing, support and cooperation,

career development and participation in decision making) demonstrate a significant impact on an organization's innovation rate. Claver *et al.* (1998) conclude that organizational innovation culture is the premise of technological innovation behavior and innovation performance. Khazanchi *et al.* (2007) also propose that organizational innovation culture within an enterprise has a significant impact on processes. Similarly, Deshpandé *et al.* (1993) and Kleinschmidt *et al.* (2007) indicate that an innovation-oriented firm's culture provides a competitive advantage by increasing the emphasis on innovation and fostering receptiveness to new ideas. O'Cass and Ngo (2007) note that organizations with a strong innovative culture appear to recognize that building a successful brand depends on organizations' ability to develop new and unique ways of delivering superior value to customers and further that having an innovative culture is important to organizational performance. In addition, Stock *et al.* (2013) show that a company's innovation-oriented culture positively affects business performance by increasing product program innovation.

Team cohesion, which is seen as a key factor for innovation, and its link with organizational performance has been widely discussed (Salas *et al.*, 2015). Slater and Sewell (1994), for example, concluded that cohesiveness and success are mutually dependent and that the cohesion–performance relationship should be examined by means of a circular model in which the two variables are interdependent. However, team cohesion affects organizational performance indirectly through other factors, which provides a new perspective for us to explore the relationship between team cohesion, organizational innovation culture and innovation performance.

On the whole, the literature provides an overall theoretical framework for studying the relationship between organizational innovation culture and innovation performance. However, to our knowledge, there remains a paucity of empirical studies of this relationship and the potential moderating effects of team cohesion. This gap invites further investigation into this topic.

3. Theory and hypotheses

Prior studies indicate that organizational innovation culture can stimulate creativity and innovative thinking to promote organizational innovation behavior and further improve innovation performance (Hofstetter and Harpaz, 2015). Hence, organizational innovation culture stimulates innovative behavior, which itself is a process of resource combination.

Numerous studies examine the characteristics or dimensions of an organizational innovation culture (Ceylan, 2013; Christensen and Raynor, 2003; Hammer, 2004; Govindarajan and Trimble, 2005). Culture in organizations as the deep-seated values and beliefs are shared by employees at all levels (Schein, 1984). Accordingly, an organizational innovation culture epitomizes the expressive character of employees and is communicated and reinforced through symbolism, feelings, relationships, language, behavior, physical settings and artifacts (Schein, 1984). Hurley (1995) shows that organizational innovation culture includes four characteristics, namely:

- (1) power-sharing;
- (2) support and cooperation;
- (3) career development; and
- (4) participation in decision-making.

Lemon and Sahota (2004) develop a set of conceptual models of organizational culture, including the firm's environment, values, technology, knowledge structures, organizational structure, individuals and the collective and organizational memory. In addition, Dobni (2008) argues that an innovation culture can be defined as a multi-dimensional context including the intention to be innovative, the infrastructure to support innovation, the operational-level behaviors necessary to influence a market and value orientation and the environment required to implement innovation.

Based on previous studies (Bhatti *et al.*, 2011; Haveman, 1992; Isaksen *et al.*, 2007; Miller and Lee, 2001), combining the special characteristics of Chinese firms, we construct a new theory framework of multi-dimensional organizational innovation cultures including knowledge sharing, organizational innovation atmosphere, team decision-making and organizational change and argue that four dimensions of organizational innovation cultures may influence innovation of firms. This following section details each dimension, developing related hypothesis focused on the context of open innovation.

3.1 Knowledge sharing

It is generally agreed that knowledge sharing denotes the willingness of individuals in an organization to share with others the knowledge they have acquired or created (Gibbert and Krause, 2002). Many studies demonstrate the important role of knowledge-sharing behavior plays in promoting firms' innovation. According to Nonaka (1994), knowledge sharing has a major impact on knowledge creation, organizational learning and organizational performance. Many empirical studies also confirm that knowledge sharing makes a substantial contribution to enhancing innovation capability and performance (see for example Spencer, 2003; Hu *et al.*, 2009; Vaccaro *et al.*, 2010). The lack of knowledge sharing can be one of the most important reasons why organizations fail to achieve their innovation goals. The more sharing a firm can achieve, the greater efficiency and performance it should achieve (Gray, 2001). Moreover, a sharing culture should be developed to maintain and create competitive advantage so as to improve organizational performance (Bhatti *et al.*, 2011). Thus, it can be seen that knowledge sharing, as a means of effective access to acquiring knowledge, can influence innovation (Spencer, 2003; Vaccaro *et al.*, 2010). Sharing knowledge internally so as to enable acquisition of the necessary resources will improve an organization's innovation ability and, hence, its performance.

3.2 Organizational innovation atmosphere

Firms' innovation performance is usually affected by the overall organizational atmosphere. James and Jones (1974), and Ashforth (1985) conceptualize the organizational atmosphere as individuals' constructive representations or cognitive schema of their work environment. This is principally operationalized through attempts to uncover how individuals make sense of their proximal work environment. If such an atmosphere is poor, the innovation behavior of the entire enterprise will be suppressed and hindered. Amabile *et al.* (1996) conclude that the innovation capacity and performance of an organization requires a correspondingly supportive atmosphere which stimulates innovation thinking and activity. Similarly, focusing on improving both the psychosocial work environment and organizational efficiency in providing a

comfortable and positive atmosphere might contribute to reducing employee stress and improving firm performance (Arnetz *et al.*, 2011).

Studies on the relationship between organizational innovation atmosphere and innovation performance have two perspectives. From the individual innovation standpoint, atmosphere has a positive effect on innovation performance. It also significantly affects the individual innovation abilities which, as the basis and power source of innovative behavior, will significantly affect performance (Anderson and West, 1998). On the other hand, organizational innovation atmosphere interacts not only with individual capability but also with individual psychological processes, thus affecting performance (Isaksen *et al.*, 2007).

Based on the above analysis, organizational innovation atmosphere provides a suitable environment for theoretical, institutional and technological innovation and, so, further affects the innovation performance of organizations.

3.3 Team decision-making

Team decision-making is the core of business management. According to the team theory, the level of organizational development is determined by organizational decision-making. In the fast-changing and increasingly complex global environment, knowledge workers are the main components of organizational human resources, and decision-making has changed into a process involving collaborative teamwork. Miller and Lee (2001) argue that an organization will enhance its performance when it is able to improve the quality of a team decision-making process that emphasizes on ample information, processing, collaboration and initiatives. Kerr and Tindale (2004) suggest that team decision-making plays an important role in organizational performance. As team decision-making is a process of interdependent activities, including the collection, interpretation and exchange of information (Sukthankar and Sycara, 2010), members of a team should communicate, evaluate and interact with each other at the right times to arrive at the most favorable decision for the organization. In doing so, they will enhance organizational innovation performance.

3.4 Organizational change

Organizational change has been a hot topic in recent years, along with the changes in the global environment. To survive in a competitive market, organizations must face changes and challenges without delaying their response. Moreover, organizations with suitable innovation cultures can grasp market dynamics and make internal adjustments so as to remain ahead of the competition (Zhu *et al.*, 2012). McAfee and McMillan (1987) indicate that organizational change is a deliberate attempt to improve efficiency by reforming overall functions. According to Newstrom (2007), organizational change denotes any alteration in the work environment that affects the ways in which employees must act.

Organizational change can be of great benefit for organizational performance and survival chances if it takes place in response to a dramatic restructuring of the environmental conditions and is built on established routines and competences (Haveman, 1992; Tey and Idris, 2012). Pelletiere (2006) notes that organizations that are proactive about change can gain remarkable advantages relative to their competitors. Deshpande (2012) suggests that organizational change is the process by which organizations move from their current state to some desired future state to increase their

effectiveness. It follows that organizational change can improve operations such that the firm can adapt to flexible conditions and be dynamic and innovative in adjusting toward environmental change. Based on the above analyses, the question is:

Q1. Does organizational innovation culture, including knowledge sharing, organizational innovation atmosphere, team decision-making and organizational change, have a positive influence on the innovation performance of organizations?

This leads to the following hypotheses:

- H1.* Organizational innovation culture (as defined in *H1a*, *H1b*, *H1c* and *H1d*) is positively associated with the innovation performance of organizations.
- H1a.* Knowledge sharing has a positive influence on the innovation performance of organizations.
- H1b.* Organizational innovation atmosphere has a positive influence on the innovation performance of organizations.
- H1c.* Team decision-making has a positive influence on the innovation performance of organizations.
- H1d.* Organizational change has a positive influence on the innovation performance of organizations.

3.5 Team cohesion

Team theory is the application of the statistical decision theory to “team” settings, where different agents have different information and control different actions but share a common objective (Gibbons, 2003). Team cohesion, as an important topic of team theory, is seen as the cornerstone of team innovation and competitiveness and is one of the key factors determining success. Since the 1950s, the topic of team cohesion has been widely analyzed. Festinger (1950) was first to propose the concept and define it as the attraction force which brings team members together. Based on Carron (1982), this paper defines team cohesion as a dynamic process in which staff cooperate to pursue common goals to contribute to the success of a firm. In an open innovation context, team cohesion complements the organizational innovation culture (Hogg, 1992; Man and Lam, 2003).

The relationship between team cohesion and organizational performance has also been widely studied (Salas *et al.*, 2015). Mullen and Copper (1994) note that team with high cohesion perform better than those with low cohesion. Similarly, Man and Lam (2003) also show that the efficiency of teamwork and organizational performance can be improved by strengthening team cohesion. Overall, highly cohesive teams perform significantly better (Carron *et al.*, 2002; Mach *et al.*, 2010; Salas *et al.*, 2015).

Team cohesion may moderate the impact of organizations’ innovation cultures by reinforcing or contradicting their messages (Tung and Chang, 2011). More cohesive teams will be more inclined to share tasks, participate in team decision-making and cooperate to achieve goals (Hogg, 1992). Moreover, team members in an organization with strong team cohesion will prefer to cooperate with and support each other in completing tasks (Wech *et al.*, 1998).

In summary, team cohesion is an integral part of the collaboration process of members in firms. The stronger it is, the more harmoniously and collectively members

will share information and make decisions. Moreover, if the team cohesion in one firm becomes stronger, the organizational innovation atmosphere will be more harmonious, and resistance to organizational change will reduce. All these factors will improve organizational innovation performance. Hence, we propose that:

H2. Team cohesion will positively moderate the relationship between organizational innovation culture and innovation performance (as defined in *H2a*, *H2b*, *H2c* and *H2d*).

H2a. The stronger the team cohesion, the greater role will be played by knowledge sharing in the innovation performance of organizations.

H2b. The stronger the team cohesion, the greater role will be played by organizational innovation atmosphere in the innovation performance of organizations.

H2c. The stronger the team cohesion, the greater role will be played by team decision-making in the innovation performance of organizations.

H2d. The stronger the team cohesion, the greater role will be played by organizational change in the innovation performance of organizations.

4. Methods

4.1 Case study

Xiaomi Company was founded on April 6, 2010, which was a mobile internet company that focuses on independent research and development of intelligent products. Xiaomi officially launched “MiTalk” community in April 2010, and the registered users exceeded 300 million within six months. In August, 2011, Xiaomi officially released MI phone. Since then, they started to create a mobile phone sales “frenzy”. [Table I](#) shows the sales profile of Xiaomi phone.

The success of Xiaomi Company depends on its organizational innovation culture, which improves its new product performance. In terms of knowledge sharing, Xiaomi adopts the concept of “user innovation”, which uses the internet to link with its customers. In addition, in the process of after-sales service, Xiaomi fully collects the

Time	Sales model	No. of sale
2011.09	Online booking	300,000
2011.12.18	Limited open purchase	3 h, sold 100,000
2012.14	Limited open purchase	3.5 h, sold 100,000
2012.01.11	Limited open purchase	500,000
2012.02.27	MI phone Telecom version booking	30 min, reserved 150,000
2012.04.06	Limited open purchase	6 min, sold 100,000
2012.04.24	Limited open purchase	12 min, sold 150,000
2012.05.09	Limited open purchase	28 min 5 s, sold 100,000
2012.05.18	Limited open purchase (youth version)	150,000
2012.06.07	Fully open purchase	No limited, the use of 7 × 24 h online sales
2012.08.23	The first round of open purchase MI phone 1S	200,000

Table I.
Sale of Xiaomi phone

users' information on new product innovation so as to improve its knowledge accumulation and innovation outputs. In terms of organizational innovation atmosphere, members in Xiaomi Company are willing to share their information and learning with each other so as to form a good innovation atmosphere to produce more new knowledge. In terms of team decision-making, Xiaomi Company holds a meeting for 1 h every week to make team decisions. The core of team decision-making is the innovation and development based on internal employees' responsibility. In terms of organizational change, Xiaomi Company uses a flat organizational structure, which is divided into three levels: the founder, department leaders and employees. This flat organizational structure can facilitate employees to focus on providing products and services for customers. Moreover, Xiaomi Company can make flexible strategic adjustment based on the context of the market. This kind of organizational change promotes the success of innovation in Xiaomi Company. In terms of team cohesion, Xiaomi Company makes team members with different professional background work together via a shared vision "make the phone replace the computer, and do the top smart phones", which inspires the entrepreneurial passion of team members. Thus, Xiaomi Company forms strong team cohesion. In a word, the organizational innovation culture of Xiaomi Company plays an important role to improve firms' innovation performance.

4.2 Measures

4.2.1 Independent variables

4.2.1.1 Organizational innovation culture. On the basis of the prior studies, knowledge sharing (Hu *et al.*, 2009; Vaccaro *et al.*, 2010; Liu *et al.*, 2011), organizational innovation atmosphere (Hunter *et al.*, 2005; Isaksen *et al.*, 2007; Arnetz *et al.*, 2011), team decision-making (Miller and Lee, 2001; Sukthakar and Sycara, 2010) and organizational change (Newstrom, 2007; Meaney and Pung, 2008; Deshpande, 2012) were selected to measure organizational innovation culture. Each factor was measured using four indicators. Survey respondents were asked to indicate the presence of these practices for each of the sixteen total indicators in relation to their firms' innovation processes. Each item was assessed using a five-point Likert scale ranging from 1 = very low to 5 = very high.

4.2.2 Dependent variable

4.2.2.1 Innovation performance. Numerous studies explore the choice of innovation performance measures (Ceylan, 2013). Drawing on previous work (Romijn and Albaladejo, 2002; Zeng *et al.*, 2010), this study measured this variable using three indicators: proportion of annual turnover of new products, new products index and modified products index. Respondents were asked to indicate the extent to which their firms had changed in respect of each indicator over the past three years. Each item was assessed using a five-point Likert scale ranging from 1 = <0 per cent to 5 = >50 per cent.

4.2.3 Mediating variables

4.2.3.1 Team cohesion. Drawing on findings from previous studies (Man and Lam, 2003; Mach *et al.*, 2010; Tung and Chang, 2011), team cohesion was measured in this study using five indicators: knowledge sharing among departments, mutual support and cooperation between employees, good innovation environment, respect for employees from senior managers and atmosphere of tolerance of failure. Respondents were asked to indicate the presence of these practices for each of the five indicators in relation to

their firms' innovation processes. Responses were collected using a five-point Likert scale ranging from 1 = very low to 5 = very high.

4.2.4 Control variables. We also incorporated country- and firm-level control variables that can influence the innovation performance of firms:

- Country was coded with Vietnam as 0 and China 1.
- Firm age measured the number of years the company had been listed in the local Industrial and Commercial Bureau as at the end of the reporting year.
- R&D intensity, including the intensity of personnel and expenditure, was measured using the number of R&D employees divided by total number and the annual R&D expenditure divided by total sales, respectively.

4.3 Sample and data

The survey data were collected by sending questionnaires to manufacturing firms located in China and Vietnam. All firms were selected according to their size and industrial sector (four manufacturing industries[1]). A total of 500 questionnaires were sent out, of which 175 were returned, including 116 Chinese and 59 Vietnamese firms. This gave a response rate of about 35 per cent.

As the samples in this paper were drawn from two countries, it was necessary to test the indicators of differences between the sources to determine whether the subsamples could be merged. A *t*-test for the two sources yielded a *t*-value of 0.31, which is greater than the critical value of 0.05 and means that there is no significant difference between the two samples. Thus, it was appropriate to merge these samples in the analysis. Moreover, a *t*-test of valid and invalid questionnaires indicated that none of the *t*-values were significant, so non-response bias is not a concern.

Tables II and III show the basic characteristics of the sample. It can be seen that about 33.79 per cent of respondent firms had been in operation in related industries for more

Firm age (years)	(%)	No. of employees	(%)	Annual turnover (RMB Yuan million)	(%)
<5	17.50	<50	18.11	<1	20.02
5-10	28.11	50-300	34.45	1-3	17.58
10-15	20.60	301-2000	26.85	3-30	31.33
>15	33.79	>2,000	20.59	>30	31.07
Total	100.00	Total	100.00	Total	100.00
R&D personnel intensity ^a		R&D expenditure intensity ^b		Manufacturing sectors	
<5	35.01	<5	29.41	Food manufacturing	17.71
5-10	24.37	5-10	20.56	Textile and garments	20.57
10%-15%	18.12	10-15	23.82	Chemical products	26.86
15-20	10.60	15-20	13.11	Electronic and telecommunications	34.86
>20	11.90	>20	13.10		
Total	100.00	Total	100.00	Total	100.00

Notes: ^a = number of R&D employees/total number of employees; ^b = annual R&D expenditure/total sales

Table II. Characteristics of the sample

than 15 years. About 34.45 per cent had 50-300 employees, and 31.33 per cent had an annual turnover from 30m-300mRMB Yuan. In addition, the ratio of R&D personnel to total employees was over 5 per cent for about 64.99 per cent of the firms, and the same ratio of R&D expenditure to total sales was found for 70.59 per cent. In addition, four industrial sectors were represented in the sample, the largest being the electronic and telecommunications sector (about 34.86 per cent), followed by chemical products (about 26.86 per cent), textile and garments (about 20.57 per cent) and food manufacturing (about 17.71 per cent) (Table II).

Table III shows the characteristics of the respondents. Among the 175 participants, 14.86 per cent were senior managers, 17.71 per cent were middle managers, 27.43 per cent were lower managers and 16.00 per cent were involved in R&D. Around 68 per cent of respondents reported having more than three years of experience in their professional function.

5. Results

Summary statistics for the measurement scales including means (M), standard deviations (SD) and internal consistencies (Cronbach's alpha) are shown in Table IV. It can be seen that all alpha values for individual constructs are greater than 0.8, indicating acceptable levels of reliability (Nunnally, 1978).

All 24 items were then analyzed using a confirmatory factor analysis. The covariance matrix for the 24 items was used, and parameter estimates were made under the maximum likelihood method. The results are shown in Table V, which indicate that the factor loadings are all greater than 0.70 and the cumulative factors explaining variance are all more than 60 per cent. It can be concluded that the validity of the individual items shown in Table V are within acceptable levels (Nunnally, 1978). The Kaiser-Meyer-Olkin values for the constructs in this model are all greater than 0.70, suggesting high construct validity in the scales (Tabachnick *et al.*, 2007). In addition, the average variance extracted coefficients are all greater than 0.5, which suggests that the items are well able to explain the variance in the constructs (Fornell and Larcker, 1981).

Table VI reports the results of the correlation analysis between firm age, R&D intensity, team cohesion, the four major factors of organizational innovation culture and innovation performance. It can be seen that there are significant positive relationships among the four major factors of organizational innovation culture and innovation performance. Organizational innovation atmosphere, team decision-making and organizational change all have a significant positive impact on innovation performance, whereas knowledge sharing is less closely correlated. In addition, R&D intensity and

Functions			Experience level (years)			
	No.	(%)	No.	(%)	No.	(%)
Senior manager	26	14.86	<3	56	32.00	
Middle manager	31	17.71	3-5	57	32.57	
Lower manager	48	27.43	6-10	27	15.43	
R&D staff	28	16.00	>10	35	20.00	
Others	42	24.00				
Total	175	100.00	Total	175	100.00	

Table III.
Characteristics of the respondents

Latent variables	Observed variables	Means	SD	Cronbach's α
Team cohesion (TC)	Knowledge sharing among departments (TC ₁)	3.76	0.874	0.805
	Support and cooperation between employees (TC ₂)	3.89	0.744	
	Good innovation environment (TC ₃)	3.69	0.761	
	Respect for employees from senior managers (TC ₄)	3.77	0.771	
	Atmosphere of tolerance of failure (TC ₅)	3.33	0.915	
Knowledge sharing (IC ₁)	Information exchange between employees (IC ₁₋₁)	3.79	0.745	0.870
	Encouragement from managers for employees' knowledge-sharing behavior (IC ₁₋₂)	3.83	0.757	
	Willingness to share new ideas with others (IC ₁₋₃)	3.70	0.716	
	Channels to facilitate employees' communications (IC ₁₋₄)	3.76	0.828	
Organizational innovation atmosphere (IC ₂)	Staff spirit of adventure (IC ₂₋₁)	3.28	0.786	0.771
	Freedom of work (IC ₂₋₂)	3.64	0.722	
	Employees' realization of the importance of innovation to the firm (IC ₂₋₃)	3.76	0.716	
	Innovation regarded as important element of firm's strategy (IC ₂₋₄)	3.79	0.786	
Team decision-making (IC ₃)	Employees' rights in the process of decision-making (IC ₃₋₁)	3.65	0.779	0.852
	Senior managers attaching importance to staff decision-making (IC ₃₋₂)	3.23	0.933	
	Employees' willingness to participate in decision-making (IC ₃₋₃)	3.23	0.893	
	Communication between employees and managers (IC ₃₋₄)	3.66	0.800	
Organizational change (IC ₄)	Changes in organizational structure or processes (IC ₄₋₁)	3.33	0.887	0.860
	Frequency of change (IC ₄₋₂)	3.43	0.829	
	Novel or original thinking of employees (IC ₄₋₃)	3.69	0.816	
	Focus on new product development and service innovation (IC ₄₋₄)	3.85	0.762	
Innovation performance (IP)	Proportion of annual turnover of new products (IP ₁)	3.45	0.983	0.865
	New products index (IP ₂)	3.43	0.949	
	Modified products index (IP ₃)	3.43	0.962	

Table IV.
Internal consistency
of scale constructs

team cohesion also show significant positive relationships with innovation performance. Thus, the variables of country, firm age and R&D intensity can be regarded as the control variables in the subsequent analyses.

To explore the impact of organizational innovation culture on firms' innovation performance, a hierarchical regression model of knowledge sharing (IC₁), organizational innovation atmosphere (IC₂), team decision-making (IC₃), organizational change (IC₄)

CMS 10,3	Items						
	IP	TC	IC ₁	IC ₂	IC ₃	IC ₄	
	KMO	0.738	0.816	0.815	0.686	0.743	0.775
	Cumulative factors explaining (%)	78.701	56.771	72.106	59.493	69.462	70.786
470	Factor loadings	IP ₁ 0.887	TC ₁ 0.774	IC ₁₋₁ 0.860	IC ₂₋₁ 0.740	IC ₃₋₁ 0.809	IC ₄₋₁ 0.842
		IP ₂ 0.885	TC ₂ 0.739	IC ₁₋₂ 0.797	IC ₂₋₂ 0.728	IC ₃₋₂ 0.854	IC ₄₋₂ 0.829
		IP ₃ 0.889	TC ₃ 0.789	IC ₁₋₃ 0.858	IC ₂₋₃ 0.819	IC ₃₋₃ 0.825	IC ₄₋₃ 0.814
			TC ₄ 0.773	IC ₁₋₄ 0.879	IC ₂₋₄ 0.795	IC ₃₋₄ 0.846	IC ₄₋₄ 0.879
			TC ₅ 0.687				
Table V. Validity analysis	AVE	0.787	0.567	0.721	0.595	0.695	0.708

Variables	Country	FA	R&D	TC	IC ₁	IC ₂	IC ₃	IC ₄
Country								
FA	-0.216**							
R&D	-0.372**	0.093						
TC	-0.374**	-0.049	0.366**					
IC ₁	-0.241**	-0.037	0.279*	0.427**				
IC ₂	-0.312**	-0.075	0.315**	0.499**	0.472**			
IC ₃	-0.191*	-0.061	0.240**	0.485**	0.452**	0.472**		
IC ₄	-0.269**	0.003	0.307**	0.590**	0.445**	0.469**	0.590**	
IP	-0.086	0.085	0.282**	0.444**	0.240**	0.417**	0.490**	0.481**

Notes: ** $p < 0.01$ level; * $p < 0.05$ level (two-tailed)

and innovation performance (*IP*) was constructed. A second hierarchical regression model of team cohesion and organizational innovation culture was developed by building the models $TC \times IC_1$, $TC \times IC_2$, $TC \times IC_3$, $TC \times IC_4$ and *IP* in testing the moderating role of team cohesion.

The results of the hierarchical regression analysis are presented in Table VII. *H1* predicts the paths from knowledge sharing, organizational innovation atmosphere, team decision-making and organization change to innovation performance (*H1a*, *H1b*, *H1c* and *H1d*, respectively). As the path coefficients of *H1a*, *H1b*, *H1c* and *H1d* are positive and significant, *H1a*, *H1b*, *H1c* and *H1d* are supported. The results show that there are significant positive relationships between organizational innovation culture and innovation performance. Furthermore, organizational change is seen to constitute an overall systemic reform throughout the whole organization to adapt to changes in the internal and external environment. It is not only the transformation of enterprise technology, structure and processes but also changes in the psychology, behavior and thinking of employees. If organizational change is successful, large improvements will result, leading to sustainable competitive advantage through the innovation adaptability of managers and employees. However, in China, rooted in China's Confucianism as the backbone of Chinese culture, top managers often take a conservative attitude to organizational change to guarantee their profits. As an interdependent process of organizational activities, a high-quality team decision-making process is important to achieve because of the increasingly complex and dynamic operating environment. Success on this front may further enhance the positive

Variable	Innovation performance											
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	β	t-value	β	t-value	β	t-value	β	t-value	β	t-value	β	t-value
Control												
Country	0.036	1.956	0.115	1.707*	0.133	1.743*	0.132	1.721*	0.133	1.728*	0.130	1.658*
FA	0.065	2.651	0.111	1.697*	0.117	1.696*	0.117	1.690*	0.118	1.698*	0.117	1.680*
R&D	0.289	3.251***	0.188	2.543***	0.174	2.350**	0.176	2.324**	0.178	2.330**	0.174	2.241**
Explanatory variable												
IC ₁			0.241	2.539**	0.467	2.576**	0.528	1.082	0.559	1.111	0.522	0.006
IC ₂			0.088	0.718*	0.041	0.330*	0.103	0.218*	0.024	0.043	0.098	0.161
IC ₃			0.359	2.939***	0.325	2.617***	0.326	2.612***	0.457	0.889	0.544	0.926
IC ₄			0.259	2.134**	0.208	1.653*	0.207	1.644*	0.200	1.535*	0.002	0.003
Interactions												
TC × IC ₁					0.347	1.460*	0.467	0.511	0.525	0.557*	0.452	0.464
TC × IC ₂							-0.123	-0.135	0.034	0.031	-0.117	-0.097
TC × IC ₃									0.230	0.264*	0.366	0.374*
TC × IC ₄											0.366	0.309*
Number of observations	175		175		175		175		175		175	
F	0.223		0.332		0.341		0.341		0.342		0.342	
F-statistic	11.052***		10.795***		9.783***		8.641***		7.736***		6.999***	

Notes: *** $p < 0.01$ level; ** $p < 0.05$ level; * $p < 0.1$ level (two-tailed)

Table VII.
Results of the
hierarchical
regression analysis
and moderating
effects of team
cohesion

effect of team decision-making on innovation performance. However, in China, team decisions in many firms are made by a few of coercive leaders. A democratic team decision-making has been achieved completely until now. In addition, knowledge sharing and organizational innovation atmosphere also play an important role in promoting innovation activities within the organization and in providing an atmosphere that will improve innovation performance. This finding is consistent with previous studies which show the positive relationships between knowledge sharing, organizational innovation atmosphere, team decision-making, organizational change and innovation performance (Liu *et al.*, 2011; Arnetz *et al.*, 2011; Sukthankar and Sycara, 2010; Deshpande, 2012).

We then tested the moderating effect of team cohesion, as can be seen in Models 3, 4, 5 and 6 as reported in Table VII. It can be seen that team cohesion positively affects the relationship between knowledge sharing and innovation performance. Thus, *H2a* is supported. Likewise, we find that the relationships between team decision-making, organizational change and innovation performance are moderated by team cohesion, so *H2c* and *H2d* are supported. Therefore, as suggested by *H2*, team cohesion intensifies the relationship between organizational innovation culture and innovation performance. However, *H2b*, which predicts that team cohesion will enhance the relationship between organizational innovation atmosphere and innovation performance, is not supported, because the path coefficient is not statistically significant. This indicates that team cohesion has no significant moderating role in the relationship between organizational innovation atmosphere and innovation performance. There are two possible explanations for this. First, the constructs of team cohesion and organizational innovation atmosphere are, to some extent, difficult to define and, thus, more susceptible to the different perceptions of respondents. Second, innovation atmosphere may be somewhat inflexible and more resistant to the influence of other factors. For example, many Chinese firms lack the passion to innovate, because they are still perceived many barriers to resources. These factors may, to a certain extent, weaken the role of team cohesion.

In conclusion, a high level of team cohesion is more likely to promote innovation performance by helping to establish an organizational innovation culture. The results indicate that the stronger the team cohesion, the greater role played by knowledge sharing, team decision-making and organizational change in the innovation performance of firms. Accordingly, firms need to take measures to enhance their team cohesion so as to improve their innovation performance. Currently, high performance is difficult to achieve in the fast-changing and increasingly complex global environment, so innovation performance is highly susceptible to innovation culture and team cohesion. Team cohesion also has a vital role in enhancing the impact of team decision-making on innovation performance. This is in line with the findings of Man and Lam (2003) and Wech *et al.* (1998), who note that team cohesion affects innovation performance through variables which promote the efficiency of teamwork.

In addition, the results indicate that firms in China and Vietnam experience differences in the impacts of organizational innovation culture on innovation performance. China and Vietnam are not only transitional countries in Asia but also socialist nations. Their market economies have developed from the basic premise of a socialist system. Both countries also have similar national conditions and cultures. Thus, it is understandable that an innovation culture plays an important role in promoting the innovation performance of firms in both countries.

However, it is also worth noting that this mechanism operates slightly differently in the two countries. There are some underlying reasons for it. First, this may be because of the fact that Vietnam began the transition to a market economy after China, and its enterprise system is still in its initial stage. China and Vietnam have chosen different paths from central planning of the economy to a market-oriented approach. China has pursued a more stable economic transition to the market mechanism and a gradual approach in its institutional reform (Child and Tse, 2001). However, organizational change, or the systemic reform of the whole organization to adapt to changes in the internal and external environment, is very difficult to achieve, leading to different situations in Chinese and Vietnamese firms. Second, Vietnam has difficulties in balancing the relationship between central political control and operation of the market mechanism, whereas the Chinese Government's implementation ability ensures the stability of economic development. China has a relatively stable and supportive political environment (Child and Tse, 2001). Accordingly, differences in institutional environments of the two countries have effects on how firms develop their organizational innovation culture and create team cohesion and consequently affect firms' innovation performance. Third, to some extent, the organizational innovation atmosphere of the firms in these two countries may be different because of differences in social, cultural and ethical factors. For example, In China, "Guanxi" culture is a special phenomenon. Reflected in organizational innovation cultures, "Guanxi" culture means "human face", informal relationships and informal organizational behavior. Many commercial activities in China conducted by firms focus on the "Guanxi" than in Western countries because of deep-rooted Confucian culture, which affects firms' innovation activities to a large extent.

6. Discussion and conclusions

Using a team theory, on the basis of a sample of 175 manufacturing firms in China and Vietnam, this study has empirically examined the relationships between organizational innovation culture, team cohesion and innovation performance. The findings show significant positive relationships between organizational innovation culture and innovation performance. Perhaps, more importantly, they also indicate that team cohesion plays a positive moderating role in this relationship, strengthening it when it is high and weakening it when it is low. In addition, the findings also show that the impact of organizational innovation culture on the innovation performance of firms differs between China and Vietnam.

6.1 Contributions

This study has explored the impact of organizational innovation culture on innovation performance and examined the moderating effects of team cohesion. In doing so, it makes three main theoretical contributions. First, going beyond the traditional view, the most important contribution for this study is that we construct a new theory framework of multi-dimensional organizational innovation cultures. To the best of our knowledge, it is the first endeavor to construct the theory frameworks of organizational innovation culture along the four dimensions of knowledge sharing, organizational innovation atmosphere, team decision-making and organizational change. These factors together have rarely been examined before. Some work has focused on the construct of firms' environment (Lemon and Sahota, 2004; Dobni, 2008) or communication (Schein, 1984;

Damanpour, 1991; Arnetz *et al.*, 2011), while others have referred to the context of developed countries (Baird *et al.*, 2007; Deshpandé *et al.*, 1993; Webster and White, 2010; Mach *et al.*, 2010; Stock *et al.*, 2013; Dobni, 2008). Hence, our findings extend existing research on organizational cultures management.

Second, a new idea for this study is that we consider team cohesion as a moderating variable between organizational innovation culture and innovation performance of firms, hence providing both theoretical discussion and empirical validation of the impact of team cohesion on this relationship. Our findings show how focusing on organizational innovation culture and team cohesion may significantly advance our understanding of the cultural drivers behind innovation in firms. It, thus, extends existing research on the team theory.

Third, in response to the request for more attention to be paid to organizational culture in the emerging and transition economies, based on a sample of Chinese and Vietnamese firms, this study has explored the differences between the two countries in terms of the impact of organizational innovation culture on innovation performance. In doing so, it has confirmed the findings of research conducted in developed countries (Kleinschmidt *et al.*, 2007; Deshpandé *et al.*, 1993; Stock *et al.*, 2013) and generated new findings from two transition economies. Therefore, our findings extend our understanding of organizational cultures management in the context of transition economies.

6.2 Managerial implications

The contributions of this study also have important implications for practitioners concerned with the management of organizational culture. Firms need to understand better the impact of organizational innovation culture and team cohesion on the process of innovation. From a managerial viewpoint, these findings indicate that having an innovative organizational culture and fostering team cohesion will improve innovation performance. In particular:

- Managers should place more emphasis on creating a suitable innovation culture in the firm and develop policies to facilitate and reward employees for performing innovative activities. This can be done by encouraging employees to participate in decision-making, establishing an atmosphere where failure is tolerated, enabling cooperation among departments and promoting knowledge sharing among employees.
- Firms should establish a stable platform or informal gathering to enable employees to achieve unhindered communication across the whole firm, including the exchange of information and new ideas, encouragement of knowledge sharing and the establishment of various information channels to facilitate employees' communications.
- Managers should try to act at the right time to promote organizational change and pay attention to information indicating that such change is required or imminent.
- Although China and Vietnam have similar national conditions and culture, it should be noted that policy initiatives may be more effective when they focus on the different cultural contexts of firms in each country.

6.3 Limitations and future research

Despite the contributions discussed above, this study also has several limitations which need to be addressed and which may give rise to future research. First, the sample was derived from firms in only four manufacturing sectors, and so the findings might be industry-specific. Caution should be exercised in generalizing them to other industries. Future studies could draw on samples of firms from other industries to test and extend the generalizability of these findings. Second, because of a lack of available data, the effects of external environmental factors on organizational innovation culture and innovation performance have been ignored in this paper. Some interesting issues, such as the degree of competition or the stage of development of the market in China and Vietnam, should be explored in future research. Third, to enhance accuracy and simplicity, this study focused on four dimensions of organizational innovation culture. Future research may incorporate other dimensions, such as the nature of the top management team and psychological factors of employees.

Note

1. Four representative manufacturing industries for both China and Vietnam were chosen for this survey, including food manufacturing, textile and garments, chemical products and electronic and telecommunications.

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