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The Effect of Transformational Leadership on Organizational Change: Evidence from Chinese Manufacturing Firms

GAO Huan

Doctor of Management

Supervisors:
PhD Álvaro Augusto da Rosa, Associate Professor
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Gao Huan 高欢

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Abstract

Focused on the theme of the influence of transformational leadership on organizational change in Chinese private enterprises, this thesis identifies the paths of factors (transformational leadership, organizational learning, organizational innovative climate and organizational innovation) influencing organizational performance, and adopts survey and case study methods to verify them. Several conclusions are made. First, this thesis further confirms that transformational leadership positively and significantly affects organizational innovation. Second, organizational learning mediates the relationship between transformational leadership and organizational innovation. Organizational innovative climate does not moderate the relationship between organizational learning and organizational learning. Finally, organizational innovation has a positive impact on organizational performance, and it further plays a mediating role in the positive relationship between organizational learning and organizational performance.

Keywords: transformational leadership; organizational innovative climate; organizational innovation; organizational performance
JEL: M12; M14

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Resumo

Focada no tema da influência da liderança transformacional na mudança organizacional em empresas privadas chinesas, esta tese identifica os caminhos dos fatores (liderança transformacional, aprendizagem organizacional, clima organizacional inovador e inovação organizacional) que influenciam o desempenho organizacional e adota métodos de pesquisa e estudo de caso para verificá-los. Várias conclusões são feitas. Em primeiro lugar, esta tese confirma ainda mais que a liderança transformacional afeta positiva e significativamente a inovação organizacional. Em segundo lugar, a aprendizagem organizacional medeia a relação entre liderança transformacional e inovação organizacional. O clima organizacional inovador não modera a relação entre a aprendizagem organizacional e a aprendizagem organizacional.. Finalmente, a inovação organizacional tem um impacto positivo no desempenho organizacional e, além disso, desempenha um papel mediador na relação positiva entre aprendizagem organizacional e desempenho organizacional.

Palavras-chave: liderança transformacional; clima organizacional inovador; inovação organizacional; desempenho organizacional
JEL: M12; M14

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摘要

本研究围绕“中国情景下民营企业变革型领导对组织变革的影响”这一主题，基于问卷调查和案例研究方法，剖析了变革型领导、组织学习、组织创新氛围与组织创新、组织绩效的作用路径。首先，本研究结论进一步证实了变革型领导对组织创新存在积极显著影响。其次，组织学习在变革型领导与组织创新之间存在积极的中介作用。再次，组织创新氛围在组织学习与组织创新之间存在干扰型调节作用。最后，组织创新能够有效推动组织绩效的提升，而组织学习对组织绩效的积极影响需要通过组织创新间接来实现。

关键词：变革性领导; 组织创新氛围; 组织创新; 组织绩效

JEL: M12; M14

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Contents

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List of Abbreviation

IV	independent variable
DV	dependent variable
MV	mediating variable
CV	control variable
TL	transformational leadership
OL	organizational learning
OI	organizational innovation
MOI	management innovation
TOI	technological innovation
POI	planning innovation
OIC	organizational innovative climate
OP	organizational performance

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Chapter 1: Introduction

1.1 Research background

One of the challenges that Chinese companies are confronting with is that society has turned to digital and intelligent. The tremendous variation in the industry and market circumstance have led to a sudden change in competition (e.g., large-scale, core technology, platform, and cross-border competition)(Priem et al., 2011). In order to carry out technological innovation, firms not only face innovation risks, but also consider the improvement of long-term competitiveness, short-term performance pressure, potential major changes from global expansion and challenges. Meanwhile, many Chinese companies are undergoing organizational change and innovation management (Stouten et al., 2018), and are more convinced of the authority of the "government forecasting of the future", and believe the past performance is a reliable indicator for predicting the future. Quite a few companies fail to recognize the unpredictability of their environment in a timely manner (De Keyser et al., 2021), making them unable to recognize that the competitive condition or market environment is altering, and thus unable to make correct managerial decisions. To adjust to turbulent environments, maintain organizational vitality and keep competitive, organizational innovation and change have gradually become a heated issue in management practice and academic research (Oreg & Berson, 2019; Stouten et al., 2018). In addition, how companies remain competitive in an environment of continuous dynamics and chaos, flexible use of opportunities, avoiding threats, responding to the challenges of increasing complexity and rapid change, and transforming existing organizational systems needed to be addressed.

Organizations, especially those in the stage of transition, if they do not form an interactive relationship with others in the dynamic environment, they are extremely vulnerable to fail to adapt to changes(Flor et al., 2018; Lewandowska et al., 2016). In management practice, there are several cases illustrating the difficulties for organizational innovation and change (De Keyser et al., 2021; Kunert & Staar, 2018). Under the pressure of environmental dynamic change and innovation paradigm change, organizations must change the internal and external unit attributes and the relationship structure to generate variation and adjust to changing demand (Stock & Tatikonda, 2008). Whether organizational vitality strongly depends on

whether the exchange with the outside world can gain the driving force of metabolism. Hence, recognizing negative factors for innovation and change, breaking constraints of rigid knowledge and abilities, and finally realizing vitality is important (Anzola-Román et al., 2018). From the organizational level, enterprise innovation is defined as corporate activities, including generating new ideas, new product design, (trial and large-scale) production and marketization (Kahn, 2018). It is also a knowledge creation-transformation-application circle. Its essence is the generation and commercialization of new technologies and. Top managers are the main designer and planner of organizational strategy makers, corporate change, and innovation in management practice. With the complexity of technology, market, and industrial environments, it is difficult for a single senior manager to respond to dynamic changes, and he/she has to rely on a management team. The top management team is critical to business operations (West & Anderson, 1996). For example, as a Chinese enterprise giant, Huawei has been shining on the international stage through 5G technology due to its profound technology accumulation. Huawei's success contributes to the management style of the executive team (Guo et al., 2019; Wu et al., 2020). First, Huawei attaches great importance to learning and thinking. Huawei actively encourages executives to read books outside the professional field, such as literature and history, in addition to technical books. Senior executives believe that only learning and thinking can break away cognitive inertia, make flexible visions and smart strategies. Secondly, Huawei also attaches great importance to inspiring employees' struggle, creating an enterprise innovation atmosphere, encouraging employees to participate in technological innovation in the project, and encouraging all employees to share and update their knowledge through platform such as an internal online community.

Consistent with management practices, research about the effect of top manager on continuous promotion of corporate organizational innovation, change and sustainable management has made achievements (McCleskey, 2014). Upper echelon's theory highlights top management team (TMT) issues, which states that TMT will make highly personalized interpretations of the scenarios and choices they face and act on this basis (Hamstra et al., 2014; West & Anderson, 1996). That is, TMT injects many personalization features such as experience, cognition and values in their behavior (Soane et al., 2015). Previous studies around transformation leadership usually take process view, address effects of individual superiors, ignore executive teams and overlook the dynamic interaction between transformational leadership and dynamic environment and different scenarios. In order to make up this gap slightly, this thesis will focus on top management team and how leadership style (transformational leadership) explains firm-level transformation and firm-level innovation

outcomes.

1.2 Research problem and questions

To maintain a competitive advantage in a volatile market environment, companies need to constantly change and adapt to acquire new resource endowments. Leadership style, as an important variable, has become a factor that cannot be ignored and has a significant impact on organisational change. In practice, we find that many existing enterprises focus more on organisational structure and process management, neglecting the influence of leadership style or leadership behaviour on organisational behaviour. The change of enterprises needs to be truly transformed into a driving force for improving enterprise performance, and must be enhanced in terms of shaping the work scenarios of organisational members and promoting the behaviour of employees. Furthermore, we have found that the behaviour and attitudes of leaders play an important role in employee performance and job satisfaction in the process of change management. For example, the revolutionary leader can have an impact on the effectiveness of the organisation, such as establishing a common vision in the team through conceptual influence and spiritual inspiration, facilitating communication and resource sharing among team members, promoting rapport among members, and effectively releasing the creative energy of team members.

As a corporate strategy management developer and implementer, TMT exerts decisive influences on enterprise. There are many studies on the leadership styles. Transformational leadership describes that to what extent and how leaders influence and inspire subordinates through leaders' idealized influence, leaders' intellectual stimulation and leaders' individualized consideration (Bass, 1985), and encouraging subordinates to shift focus on personal gains and losses to organizational interests and organizational goals (Alrowwad et al., 2020). Transformational leadership studies not only address individual level transformation, but also highlight firm-level change, while stresses the interaction between leaders and subordinates (Khalili, 2016). TMT within an organization will be able to adopt transformational leadership behaviors (Kim & Yoon, 2015). Further, through its own charisma, transformational leader actively focuses on and guide subordinate needs to stimulate subordinates' pursuit of high-level and influence their work, in order to motivate subordinates' work enthusiasm and organizational commitment and break organizational rigidity and old-time practices (Cho & Dansereau, 2010). Research on how leadership behavior affects the organization's rigid practitioners' thinking and actions is rare. Following this line of logic, the core of this thesis

pour attention into the process mechanism of TMT to break rigidity and realize organizational change. To be more specific, this thesis is going to solve the following three questions:

- How transformational leadership (TL) explains the difference in organizational innovation?
- What's mediation mechanism between transformational leadership and innovation outcomes? How firm-level innovative climate moderates the mechanisms mentioned above?
- How transformational leadership (TL) affects firm's performance (OP)? What are the relationships between TL, OL, organizational innovation and OP?

This thesis is an empirical research at firm level in organizational behavior. There are some research difficulties in the analysis. To be more specific:

First, existing research at home and abroad have achieved a great deal of organizational innovation and organizational change and provides many perspectives to study. Many theories can explain the innovation and change behavior of enterprises, including organizational behavior theory and innovation management theory. A variety of perspectives and theoretical on the one hand offer many helps for analyzing the mechanism and opening the black box; on the other hand, it makes much confuses and difficulty in choosing which perspective and which theory to use, and what kind of analytical framework to construct. This is the first thing to be clarified in this thesis, and it is also the difficulty of research.

Second, this thesis systematically studies the mechanism of the transformational leadership behavior of TMT on firm-level innovation and change. The uncovering of the black box mechanism is the core difficulty of research. The leadership behavior of the top management team affects organizational goals (i.e., corporate innovation and corporate performance) via a variety of mechanisms. Therefore, what kind of mechanism is constructed is indeed the difficulty of this research.

Third, on the basis of analysis on leadership behavior of TMT, innovation activities, quantify transformational leadership, organizational innovation, organizational performance and proposes a scientific, rational and operational scale. It is very important for research, and it is also the research difficulty of this thesis.

1.3 Thesis contents and roadmap

1.3.1 Thesis contents

Previous research around TL has explored its' dynamic impacts from an organizational

behavioral and psychological perspective (Zineldin, 2017). At the organizational level, there is relatively little research addressing the impacts of TL on firm-level innovation and firm-level performance under Chinese business context. Meanwhile, in the dynamic environment (Alkhafaji, 2011), the outside world also puts forward new requirements for organizational change and adaptive development (Stouten et al., 2018), and also makes the research of transformational leadership gradually shift from micro to macro (Oreg & Berson, 2019). Consequently, this thesis is more about the organizational context and macro level. The whole research contents of this thesis are as follows:

Model 1: how transformational leadership (four dimensions) enhances firm-level innovation (three dimensions). To be more specific, first, based on Chinese context, how to measure and define transformational leadership is the primary consideration in this thesis. Based on theoretical research and literature review, this thesis defines and measures the dimensions of transformational leadership structure under the Chinese context. Thereafter, to answer key research question, this dissertation constructs a model including TL (independent variables), OL (mediator variables), and OI (dependent variable) and then make corresponding empirical tests.

(2) Model 2: focusing on OL (mediator) and moderator (OIC). To be specific, first, this dissertation explores the moderating effect on direct effect, then test the moderating effect by dimensions. Finally, test whether the mediating effect of organizational learning will be affected by the moderator.

(3) Model 3: focusing on the effect of TL on another outcome variable (organizational performance). Based on model 1 and model 2 (see Figure 3.1), the dissertation further constructs a framework including TL, OL, OI and OP. Then, this dissertation employed AMOS to analyze the path of above effects.

1.3.2 Method

From a method perspective, no method is perfect and fit to all studies. The solution to the problem includes both logical reasoning and empirical observation. For example, the qualitative research method follows the “inductive orientation” route, trying to understand the phenomenon and the nature and characteristics of the phenomenon by analyzing the source of a phenomenon and its characteristics. The quantitative research method adheres to the "empirical" route, transforms the theory into hypothesis through the method of logical deduction and tests hypothesis and explains the generality and general law of the phenomenon.

To answer theoretical questions, this dissertation plans to comprehensively adopt multiple research methods.

(1) Bibliometric research

Scientific bibliometric research help to understand a certain research field better and faster. There are three basis questions we have to address: How did it get started? What is the state of the art? What are the critical intellectual turning points as a research front evolves? (What are the paths in the way of evolution?). To address these questions, we have to know the research front and intellectual bases (e.g., highly cited literature, emergent trends, abrupt changes) of a research field. By using Citespace to identify and visualize, we find useful information from citation networks, co-citation networks and evolution path. To be more specific, based on the citation database, the bibliographic research help us visualize the knowledge structure, research dynamics, and vital documents of the current target domain through knowledge maps (Chen, 2006). First, it can effectively portray a systematic framework of a certain research field from different structural dimensions and time dimensions. This thesis will use Citespace analysis methods to conduct knowledge maps on the development status and trends of TL, OL, OI, OIC and OP.

(2) Empirical research

Narrowly speaking, empirical studies refer to the studies that not only offer theoretical model (hypotheses) but also examine the theoretical model (hypotheses) by collecting corresponding data. Typic empirical methods include the mathematical study and the case study. In our thesis, we mix integrated mathematical method and case study to examine our conceptual model.

Mathematical method can quantitatively observe and analyze the research objects through scientific measurement, and predict and interpret the causal relationship between variables. First, based on the abstract construction of the problem or object to be studied, the theory is combed, and the causality hypothesis between constructs is sorted out. Second, through the survey or second-hand data, the construct is transformed into an indicator that can be used for data measurement. Then, the hypothetical relationship between the constructs is verified by different statistics and measurement methods. Finally, based on empirical analysis of data results, have a discussion, and make conclusions. This dissertation will analyze the mechanism of TL on OI based on regression analysis with bootstrap method and structural equation model.

Case study is one of critical methods of social science. The case study researcher is

expected to choose one or several cases as the object, gather corresponding information and data (e.g. survey, interview), and then take a closer and deeper look at, analyze and explore the cases (Yin, 2011). This method is usually taken to solve *how*, *why* and *what* questions. Cases study method usually includes design logic, data gathering and data processing techniques. Data evidence from different channels have to be examined by triangulation test and gain similar conclusion. Generally, the researchers will offer pre-developed propositions to direct the data gathering and processing. Then, the researchers will parcel and inspect these cases. In doing so, the researchers will grasp a whole picture of the given research goals. With the careful observation and description of dynamic objects changes, it makes case study a great approach to answer how TL affects OI and OP.

1.3.3 Thesis organization

To solve the above research questions, this thesis intends to divide the whole thesis into nine chapters. Combining research contents with methods, the thesis draws a research roadmap as following (see Figure 1.1).

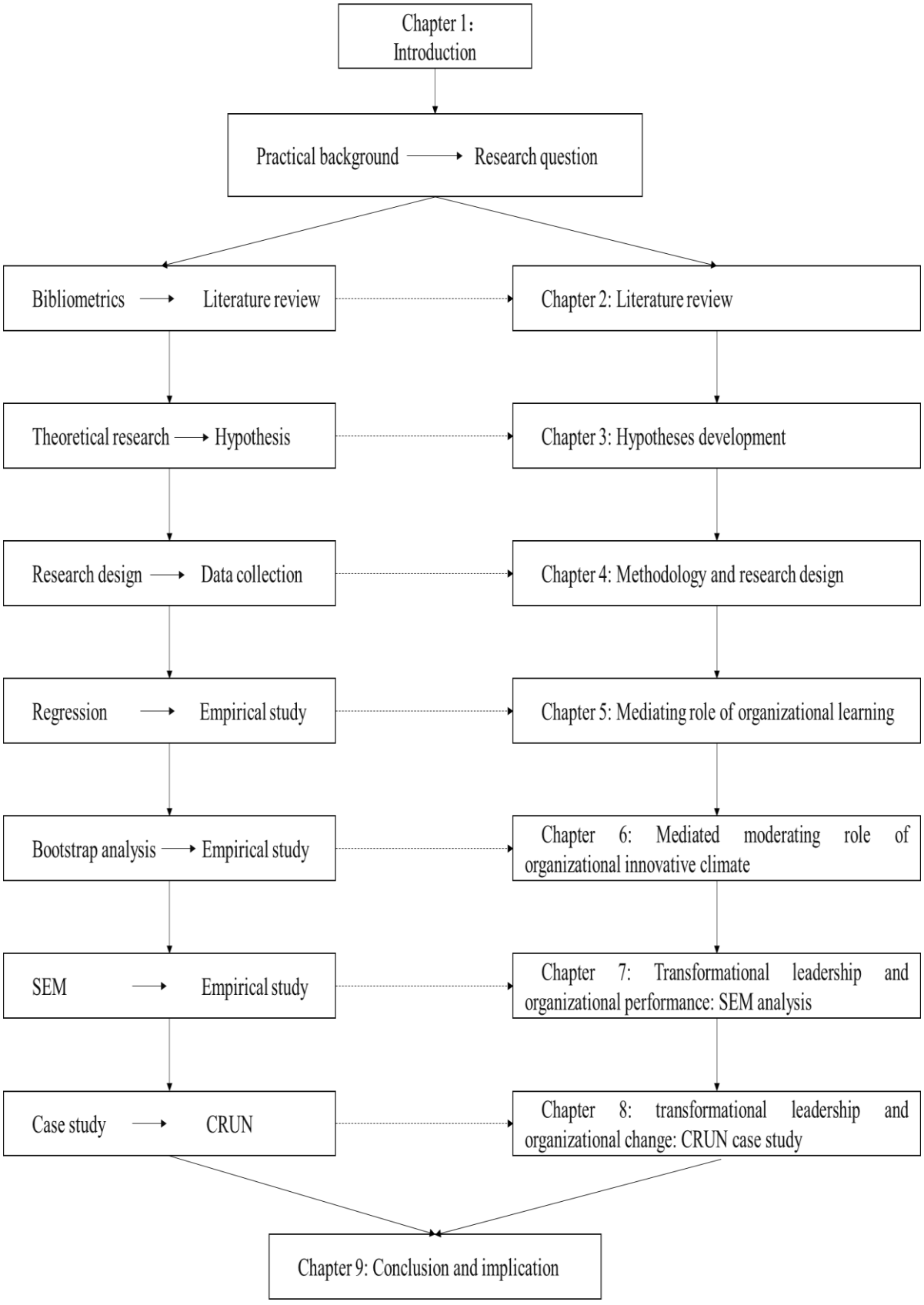

Figure 1.1 Roadmap of this thesis

Chapter One: introduction. Building on analyzing practical/business background and theoretical background, this thesis abstracts the scientific issues, and constructs research

framework and content, research design, research significance and theoretical contributions.

Chapter Two: literature review. Based on the bibliometrics method, the thesis analyzes research dynamics and trends of key variables, and then explores research gap, and lays a foundation for theoretical framework.

Chapter Three: hypotheses development. On the basis chapter one and chapter two, the corresponding theoretical hypotheses are proposed.

Chapter Four: research method and research design. Describe the methods that the thesis will employ at first and then describe the sample collection procedure and statistical tests including correlation test, reliability, and validity test.

Chapter Five: mediating effect analysis. Based on large samples, the dissertation conducts corresponding tests to assure data is valid and employs empirical study techniques (e.g., regression) to examine direct effects and mediation mechanism.

Chapter Six: mediated moderation effect analysis. Based on the chapter five, this chapter employ multi-regression by AMOS to test moderation effect and mediation effect.

Chapter Seven: transformational leadership and organizational performance: structural equation modeling. Based on theoretical framework, this chapter employs SEM by AMOS to test pathway of TL on OP.

Chapter Eight: transformational leadership and organizational change: CRUN case study. Based on the case of a listed company namely, CRUN, the chapter explores how a firm featured in transformational leadership influences its organizational change.

Chapter Nine: conclusions and implications. This chapter draw conclusions based on empirical studies and the case study and then summarize the implications, contributions, and limitations.

1.3.4 Contributions

Based on theoretical analysis, empirical studies and case study results, the thesis contributes to the literature on following three aspects.

First, previous research is based on the individual level to explore the leadership-subordinate relationship exchange, focusing on the dynamic binary relationship between subordinates and supervisors (Collinson et al., 2011; Menges et al., 2011; Zineldin, 2017). This thesis integrates innovation theory and organizational behavior theory, and incorporates the transformational leadership behavior of the TMT into the framework of organizational innovation and organizational change. Based on management practices and

localization of Chinese private enterprise's, this dissertation enriches organizational innovation and organizational change perspectives.

Second, previous studies about transformational leadership are more about organizational behavior and psychology (Getachew & Zhou, 2018; Jaiswal & Dhar, 2015). In the open innovation setting, there is relatively few studies looking at the relation among transformational leadership, innovation performance and corporate performance under Chinese business context (Alrowwad et al., 2020). Few studies directly discuss the impacts imposed by transformational leadership, especially its' impacts on organizational innovation and performance (Alrowwad et al., 2020; Schaubroeck et al., 2011). In addition, a dynamic environment, the environment also puts forward new requirements for organizational change, which also gradually transforms the research of transformational leadership from micro to macro and organizational contextual factors such as organizational innovative climate, organizational learning needed to be emphasized (Bos-Nehles & Veenendaal, 2019; Newman et al., 2020).

Third, this dissertation pours attentions to traditional Chinese Confucianism and explores how leadership style affects firm-level transformation under Chinese context, and analyze the commonalities and differences between transformational leadership research and Western scholars' research in the Chinese context. Scholars focusing on transformational leadership under Chinese context cares about combination of the specific elements of traditional cultural backgrounds and reconstruction of transformational leadership theories (Li & Yeh, 2017). Furthermore, for the measurement of variable, Chinese context will be considered. Confucian cultural thoughts such as medium thinking, dialectical thinking, and holistic thinking in Chinese culture may have a cognitive effect on the leadership behavior and leadership style of corporate leaders (Yang et al., 2021); additionally, these elements will also exert influences on organizational vitality and adaptation dynamically.

Chapter 2: Literature Review

2.1 Transformational leadership

Innovation is a crucial determinant for organization to survive and acquire sustainable competitive advantage (Byun et al., 2020). In today's dynamic environment, organizations need to be more flexible, adaptable, transformative, and innovative in order to adapt to changing needs. Organizational change and innovation often rely on teamwork and collaborative innovation (Smirnova et al., 2018). Previous research on leadership literature has emphasized that transformational leadership helps to shape a work environment that is conducive to organizational innovation and to organizational change (Eisenbeiss, 2009; Zuraik & Kelly, 2019). In comparison to transactional leadership, transformational leadership studies are inclined to address the process of social interaction (Andriani et al., 2018). By building a shared organizational vision and goals, it is conducive to creating a good organizational change climate, promoting flexible strategies, and driving organizational adaptive change. More and more research show that transformational leadership is committed to creating and constructing a good and trusting organizational climate, focusing on stimulating and encouraging subordinates' needs (Mahmood et al., 2019), and enabling followers to demonstrate performance beyond expectations and effectively improve followers' satisfaction and commitment to organizations (Getachew & Zhou, 2018).

2.1.1 Definition and related literature

The transformational leadership theory originated from the organizational context, which was first proposed by Burns (1978). Bass (1985) systematically constructed the theory in the book Leadership and Performance beyond Expectations. Transformational leadership is defined as leadership behaviors or ways that encourage or motivate followers to effectively implement and identify shared goals and interests of the organization, and that could motivate subordinates to exceed expectations for a given job. Subordinates can receive individual rewards by participating in work tasks, and increase job satisfaction and achieve extra work outcomes (Zineldin, 2017).

Transformational leadership as previous studies suggest is not a single dimension construct,

which actually consists of four dimensions: leaders' idealized influence, leaders' inspirational motivation, leaders' intellectual stimulation, and leaders' individualized consideration (Avolio et al., 1999; Yang et al., 2021). Idealized influence emphasizes that leaders can be recognized, admired, respected, and trusted by followers and can be an example for followers to follow. At the same time, leaders with a high degree of leadership are more likely to have high standards of ethics and codes of conduct and are willing to take risks and maintain consistency (Mahmood et al., 2019). Inspirational motivation emphasizes that leaders encourage followers to actively participate in organizational work and challenges by building high expectations to followers and demonstrating a commitment to the organization's shared goals and vision. Intellectual stimulation emphasizes that transformational leaders encourage followers to actively participate in innovation, inspiring subordinates to rethink problem-solving models by thinking out of the box, and to enlighten subordinates in thinking, consciousness, and values. Individualized consideration emphasizes that transformational leaders focus on the growth of each follower and the need for achievement (Yang et al., 2021). In addition, it can create new learning opportunities for different subordinates and provide differentiated and personalized support. It can help subordinates cope with new challenges like coaches or mentors.

Transformational leadership emphasizes the enthusiasm of the intrinsic motivation of followers, so as to better combine the personal interests of subordinates with the collective interests; encourages subordinates to make greater efforts to achieve group goals (Zuraik & Kelly, 2019). It is pointed out that transformational leadership and traditional transactional leadership are two different and independent leadership styles (Cho & Dansereau, 2010), which have great differences in leadership style, behavioral style and management mode. Non-transformational leadership (e.g. transactional leadership, task-based leadership) pays more attention to the status quo, emphasize supervision and control, and guide subordinates to achieve established performance goals under the premise of defining task requirements and job roles (Hamstra et al., 2014). Transformational leadership emphasizes change and the need to promote creativity (Khalili, 2016). The transformational leadership focuses on creating an individual-team organizational atmosphere between employees, organizations and leaders, promotes and supports individualized management and self-realization of subordinates (Arnold, 2017), and promotes organizational innovation, organizational change, and improves organizational performance. At the same time, many studies show that transformational leadership can become a culture of innovation and a promoter of knowledge dissemination and diffusion, and can motivate subordinates to seek optimal organizational performance. Transformational leadership also emphasizes the need for team members and organizations

should adapt to and innovate along with dynamic environments. In consequences, transformative leadership is more likely to drive organizational change and team innovation.

Figure 2.1 Surged terms on transformational leadership (2008-2018) based on WOS database

This thesis employs Citespace, a knowledge mapping and visualization tool, to fully review related studies. First, the thesis collects literatures in which title, topic or keywords include "transformational leadership" from WOS core collection database. The settings are following: time span=2008-2018, index= SCI-EXPANDED, SSCI, CPCI-S, CCR-EXPANDED, IC, and document type = ARTICLE (similarly hereinafter). Seven hundred and nineteen studies in English are obtained. Then, this thesis analyzes 719 studies in terms of co-citation and terms (see Figure 2.1), especially key words. The co-citation and the most frequent words in reveal that previous research in last 10 years are focused on leadership behavior or mode, leadership characteristics, job satisfaction, team performance, linking transformational leadership, team support, collaboration and social responsibility, and creativity (see more in Annex B.1).

The existing research on transformative leadership can be mainly organized into the following four aspects:

1. From the individual level, previous research discusses the leader-member exchange (LMX). Building on dynamic binary relationship between subordinates and their direct supervisors, leadership is widely regarded as a social interaction between leaders and followers and transformational leadership is described as the degree of leadership involvement in

organizational leadership (Eliyana & Maarif, 2019) and serves as an antecedent of employee behavioral performance (Alrowwad et al., 2020) that can have a positive impact on overall individual-level productivity, overall task performance behavior, and organizational citizenship behavior (Menges et al., 2011). The study of leader-member exchange focuses on the impact of transformational leadership on employee attitudes, performance, job satisfaction, and organizational behavior. Alrowwad et al. (2020) and Diaz-Saenz (2011) confirms that transformational leadership can positively influence subordinate and organizational performance. At the same time, Gundersen et al. (2012) explored the impact of transformational leadership and leadership effectiveness on international project teams in a dynamic work environment. Transformative leadership exerts positive effects to on employees, work teams, and organizational performance. For example, transformational leadership influences subordinates' job satisfaction (Eliyana & Maarif, 2019) , follower motivation and leadership efficiency, performance and organizational citizenship behavior; transformational leadership can also influence the attitudes and behaviors of subordinates by improving and lowering the quality of leadership-subordinate exchanges; The elements provide positive evidence for the study of the exchange relationship between subordinate members.

2. From individual and team level, the cross-level study, previous studies analyze the relationship between and the effectiveness of leadership style (Louw et al., 2018). The individual level mainly studies how the personality characteristics of subordinate members affect team effectiveness; the team level mainly studies the influence of leadership, team composition and structure on team effectiveness (Soane et al., 2015); and the organizational level mainly discusses: organizational culture, organizational heterogeneity, organizational support, organization climate on team effectiveness (Budur, 2020). For example, Cho and Dansereau (2010) explores how individualized consideration in individual level affects leadership-directed organizational citizenship behaviors (OCBs) through interpersonal justice; in team level, they analyze idealized influence on group-directed OCBs through procedural justice. The study found that the concept of justice at the individual and team level can play an important intermediary role between transformational leadership behavior and organizational citizenship behavior. (Wang & Zhang, 2020) simultaneously analyzes the impact process of transformational leadership behavior at the individual and team level based on cross-level analysis. Results show that at the individual level, the subordinate's individual identity to the leader can moderate the impact of individual-level transformational leadership behavior on individual performance and psychological empowerment. Similarly, team-level identity at the team level can also effectively influence the impact of transformational leadership behavior on

team performance and collective effectiveness. Braun et al. (2013) based on the cross-level analysis method, explores the influence of trust in the supervisor between transformational leadership and job satisfaction from the individual level; and explores the impact of trust in the team on transformational leadership and team performance and job satisfaction from the team level. The studies found that transformational leadership has a positive and significant impact on employee job satisfaction and team performance, and the relationship between individual transformational leadership and job satisfaction is moderated by trust in the supervisor and trust in the team.

3. Explore the mechanism between transformative leadership and organization. The most of studies on leadership behavior and team performance used a single functional approach to define leader behavior (Andriani et al., 2018; Getachew & Zhou, 2018). Few studies directly explore the impact of team leadership on team effectiveness, and how the leader's behavioral structure affects team performance (Tabassi et al., 2017). It is influenced by different factors such as leadership behavior and organizational climate, organizational trust, organizational support, and psychological empowerment (Schaubroeck et al., 2011). At the same time, Groves (2020) argues that research on transformational leadership often considers a contingency fators (e.g. organizational structure, organizational culture, and environmental uncertainty). Therefore, the analysis of the role of transformational leadership from a multi-disciplinary perspective is still the focus of research.

4. Combine localization studies with specific contexts. The study of transformational leadership in the Chinese context focuses on the specific elements of the Chinese context, such as traditional cultural backgrounds (e.g., Confucian culture), political backgrounds (e.g., executive political connections), and social networks (e.g., Guanxi) and on reconstruction of the localization of transformational leadership theory. Li and Yeh (2017) combined with the Chinese enterprise management culture background, based on the Bass's transformational leadership scale (MLQ), and constructed a transformational leadership survey scale under Chinese Confucian culture. The scale includes four dimensions: idealized influence, inspirational motivation, morale modeling, and individualized consideration (Yang et al., 2021). Among the scales, the individualized consideration dimension not only pays attention to the work and self-development of subordinates, but also stresses the individual family and life of employees. The morale modeling of the leader emphasizes that the leader's personal personality and moral virtue can play a role as a model which can set an example for subordinates and guide subordinates through subtle ways, so that subordinates can contribute to achieve organizational goals and missions (Li & Yeh, 2017).

2.1.2 Research summary and comments

Above research review shows that the existing research on transformational leadership is built on the process of organizational change (Groves, 2020). The study more emphasizes on the individual role of leaders, and neglects the interaction between transformational leadership behavior and organizational change in dynamic environments and under different contexts. China is a country with a higher power distance, high collectivism, and a focus on long-term outcomes (Farh et al., 2007). The structural dimensions of transformational leadership (i.e. morale modeling, vision, inspirational motivation, idealized influence, and individualized consideration) in the Chinese context needed more attention. When Chinese scholars and entrepreneurs learn the advanced management science concepts of the West, they gradually integrate the thought of *Yin* and *Yang*. Moreover, Confucian cultural thoughts such as "moderate thinking", "dialectical thinking" and "holistic thinking" may have a cognitive impact on the leadership behavior and leadership style of organizational leaders; and further will also generate a dynamic impact on process of change. In addition, China's transitional economic system and market orientation have a feature of change, innovation, and diversification. Based on the practical differences, this thesis focused on the Chinese context and explore the dynamic relationship between transformational leadership and organizational change of Chinese private enterprises. Especially, this thesis addresses the four dimensions of transformational leadership in Chinese context.

2.2 Organizational learning

2.2.1 Definition and related literature

Since Cyert and March (1963) pioneered research on organizational learning, organizational learning has been deemed as a critical strategic capabilities variable in explaining the reason that companies exceed their competitors' (Saadat & Saadat, 2016). Some studies suggest that organizational learning is the process of error checking and correction. Some studies suggest that learning can be expressed as changes in belief, cognition, or behavior (Argote, 2011; Basten & Haamann, 2018). Organizational learning mechanism allow the organization to transform individual-level knowledge into organizational-level knowledge (Basten & Haamann, 2018). Some define organizational learning as a special model of organizational culture promoted by the attention given to the change and the way in which it occurs (Antunes & Pinheiro, 2020). Some studies regarded it as a change in organizational knowledge that stems

from the accumulation of organizational experience that can manifest as cognitive or behavioral changes, including explicit, implicit, or blurred components. Building on market orientation, organizational learning is a dynamic ability to achieve superior customer value in the long run, so it enables firm continue to adapt to rapidly changing market and generates impacts on organizational performance (Azadegan & Dooley, 2010).

The existing research on organizational learning mainly analyzes the structure of firm-level learning based on psychological methods and organization theory. From the strategy point of view where organizational learning is a source of heterogeneous resources, the studies focus on the mechanism of organizational learning on organizational change and innovation (Chiva et al., 2014; Lau et al., 2019) and examine the relationship between organizational learning and the sustainable of the enterprise (Fernández-Mesa & Alegre, 2015), as well as the relationship of organizational learning and strategic change (Tamayo-Torres et al., 2016; Watad, 2019), organizational learning and service quality, organizational learning and innovation (Azadegan & Dooley, 2010; Santos-Vijande et al., 2012).

In a dynamic environment, firms need learning more than ever. Many firms end up failing or even bankruptcy, in large part because they are not good at learning (García-Morales et al., 2012). A firm's success depends on its ability to deliver new and superior customer value in existing markets, or to achieve a huge leap in customer value by creating new markets through new technology or business model (Kang et al., 2007). Antunes and Pinheiro (2020) propose that organizational learning is built on knowledge. As a source of value creation, March and Sutton (1997) creatively divides organizational learning into exploratory learning and exploitative learning. Exploratory learning pursues new knowledge that is not currently available in the enterprise to create new customer value or it replaces the company's existing knowledge system and enriches current customer value (Wang & Zhang, 2020). Exploratory learning emphasizes learning behaviors, including search, adventure, experimentation, innovation (Reyt & Wiesenfeld, 2015). It focuses on the search and development of new technologies, new ideas, and new knowledge. Exploitative learning involves the improvement and deepening of existing knowledge to expand or enrich current customer value (Ali, 2021). This learning behavior emphasizes refinement, efficiency, choice, execution, which focuses on the improvement and refine of existing resources. These two learning modes represent two different knowledge flow patterns, which can bring different benefits and costs to the enterprise (Li & Yeh, 2017). Moreover, different types of learning are also associated with innovation, and studies have demonstrated the relationship between organizational learning and innovation (Bueno et al., 2010). For example, generative learning is the most advanced form of

organizational learning. This form occurs when organizations are willing to question their mission, customers, capabilities, and values, and to change production practices, strategies, and values over time. This learning model is a necessary condition for the radical innovation of products, processes, and technologies (García-Morales et al., 2012).

In addition, some studies have shown that organizational learning and knowledge are the antecedents of innovation (Sutanto, 2017), and organizational learning plays a key role in the speed and flexibility of the organizational creation process (Jiménez-Jiménez & Sanz-Valle, 2011). A company that is good at learning are sensitive to market trends. Studies found that entrepreneurial leaders can build a learning organization (Nejad et al., 2012). Learning organizations are often more flexible than their competitors, which is able to quickly adapt to dynamic market and technological changes (Kumar et al., 2021), respond to new market challenges, and enable companies to maintain a sustainable competitive advantage (Fernández-Mesa & Alegre, 2015; Wang & Zhang, 2020). Thus, organizational learning is the foundation for a company's sustainable competitive advantage and a key element in improving organizational performance and driving organizational change (Brockman & Morgan, 2003; Fernández-Mesa & Alegre, 2015).

In order to fully review organizational learning studies, this thesis collects literatures in which title, topic or keywords include "organizational learning" from WOS core collection database, and the settings are similar to transformative leadership. Then, five hundred eighty-four studies in English are obtained. With the help of CiteSpace, this thesis analyzes 584 studies in terms of co-citation (Annex B.2) and terms (see Figure 2.2), especially key words. The co-citation in Annex B.2 and the most frequent key words in Figure 2.2 reveal that previous researches in last 10 years are focused on organizational governance, learning objectives, absorptive capacity, knowledge management, innovation, organizational leadership, departmental discovery, and team goals.

Figure 2.2 Surged terms on organizational learning (2008-2018) based on WOS database

The existing research on organizational learning can be mainly organized into following aspects:

1. The relationship between organizational learning and the dynamic environment. Organizational learning is a process that evolves over time. Organizational learning takes place in a dynamic environment that includes organizational environments and organizational embeddedness (Pu & Soh, 2018; Thoumrungroje, 2015). The technical ties, market environment, and social environment in which the organization is located will have a different impact on the learning process of the organization and the ability to acquire new technologies, new resources, and new knowledge (Hu, 2014). Due to the core rigidity and unity of the organization, organizational defense, and path dependence, it may be difficult to learn in each environment. It can be found from the existing literature that most organizational learning takes place in the context of social interaction (Adler & Kwon, 2002; Dyer & Nobeoka, 2000). Organizational learning stems from personal learning (Saadat & Saadat, 2016), but the development of organizational learning is not a linear accumulation of the knowledge or experience of different members of the organization (Saadat & Saadat, 2016) . Organizational learning is also seen as a knowledge-based dynamic development process (Denford, 2013),

which means that learning needs to move at different levels and environments, from the individual level, team level, organizational level, and then to the individual level. This is a constant reciprocation, enabling two-way knowledge transfer between individuals, teams, and organizations (Alegre & Chiva, 2008; Van de Ven et al., 2019). This process of transfer is mainly due to the acquisition and advancement of knowledge, as well as the exchange and integration of knowledge, and even embedded in organizational processes and culture. Organizational embededdness has been defined in a number of ways, especially in terms of how relationships promote knowledge flow and organizational learning, such as, social capital, social networks, relationship embededdness (Pu & Soh, 2018). Organizational learning will change with the dynamic changes of the organization's embedded environment. The relevant literatures on social network and social capital research also show that the strong and intensive embedded relationship between organizations can effectively promote the depth and breadth of knowledge sharing, and help improve the learning opportunities of employees.

2. The form and level of organizational learning. In many cases, companies often rely on existing knowledge bases to improve the value creation of knowledge. In this case, organizational learning is mainly derived from the localization and in-depth search of knowledge areas within a given space or scope, in order to find solutions to existing organizational knowledge and experience (Kang et al., 2007). From the perspective of organizational learning, organizational learning is divided into individual learning, team learning, organizational learning, and inter-organizational learning (Saadat & Saadat, 2016). From the perspective of organizational learning process, organizational learning is divided into single-loop learning, double-loop learning (Kantamara & Ractham, 2014; Matthies & Coners, 2018). At the practical level, learning and adaptability are critical to organizational performance and long-term success. To define and measure knowledge at the organizational level is a challenging task. Some scholars measure organizational knowledge by measuring the knowledge of organizational members (Huff & Jenkins, 2002). Other scholars show the occurrence of organizational learning by focusing on the knowledge embedded in practice or convention and measuring changes in knowledge by observing their changes (Gherardi, 2009). In addition, scholars measure knowledge by assessing the characteristics of an organization's products, services, and patent stocks, or by measuring changes in performance characteristics to represent knowledge and organizational learning (Argote, 2011).

3. The process of organizational learning. Organizational learning is a process of value creation, value diffusion, and value sharing. This process can be born within an organization or between organizations. Organizational learning is the process by which people with common

experience in the enterprise develop new knowledge or new methods, and may influence the impact of potential behaviors while improving corporate capabilities (Jiménez-Jiménez & Sanz-Valle, 2011). The process of organizational learning mainly covers knowledge creation, knowledge retention and knowledge transfer (Easterby-Smith & Lyles, 2011). Previous studies have suggested that organizational learning mainly includes four aspects (Huber, 1991): knowledge acquisition, the process of enterprise search and capture of information and knowledge. Knowledge distribution is the process by which employees share and spread knowledge within an enterprise. Organizational memory, which is the storage of knowledge for the current or future decisions of the enterprise. Some scholars believe that organizational learning is the ability to maintain and improve performance within the organization based on organizational experience (DiBella et al., 1996). It involves knowledge acquisition (technology, insight and relationship development or creation), knowledge sharing (distributing existing resources to others), knowledge utilization (integration of knowledge can be assimilated and widely applied, and can be tried in new situations). This model of four- or three-stage organizational learning based on linear or cyclical patterns. It can explain the internal process of organizational learning to varying degrees. Organizational learning involves changes in cognition and behavior. The construction of this model is based on the perspective of "process", ignoring the transformation of organizational learning. Moreover, organizational learning is also a process of individual member interaction and communication, which aims at searching, capturing, aborting, disseminating, and re-creating of knowledge, and by achieving the introduction-absorption-innovation, organizations ultimately the renew organizational knowledge and achieves innovation and change.

4. Focus on the study of organizational learning capabilities. Organizational learning is the tangible or intangible ability for enterprise to acquire competitive advantage. It acts as an important antecedents of organizational effectiveness and innovation (Altinay et al., 2016; Jerez-Gomez et al., 2005). Organizational learning capabilities require four prerequisites: (1) Business managers must provide the necessary support for organizational learning (Belle, 2016). Managers need to participate in and support the participation of all employees. (2) Build a sense of the group, establish a shared vision and goals of the organization, where employee is an important element of the participation of the enterprise organization system, promote the active participation of employees, and encourage employees to achieve self-value to achieve satisfactory results (Ortega et al., 2014). (3) Actively establish the organization's knowledge base. In the current competitive environment, individuals are unable to meet the needs of acquiring resources such as enterprise innovation knowledge, and therefore need to actively

promote the storage of organizational knowledge and the absorption of external knowledge (Ortega et al., 2014). (4) Establish a more innovative, flexible, and alternative knowledge innovation system.

2.2.2 Research summary and comments

According to bibliometrics analysis, several findings can be concluded. (1) Although the existing research has relevant conclusions on the study of organizational learning and corporate competitive advantage, there are still some aspects that have not been fully justified. On the one hand, many scholars generally believe that organizational learning is the basic element of successful business competition in the global market, but this conclusion contradicts the relevant empirical research (Jerez-Gomez et al., 2005); and various case studies also indicate that the structure of learning is complex, and the construction of its structural dimensions also needs to focus on multidimensionality or diversity. (2) Organizational learning studies has been from exploring the characteristics of the learning model (direct or indirect learning; experience or trial and error learning; impromptu or learning from learning) to analyzing the interaction or substitution effect between different learning processes (Lau et al., 2019), to explore problem-and-learning matching, and to focus on how to effectively organize or manage this learning process to achieve valuable outputs and provide new solutions. (3) previous organizational learning studies have not paid enough attention to the influences of firm's top management team, especially the leadership style of top management team. As noted, firm's top management team exerts great impacts on firm's resource allocation (West & Anderson, 1996). Under the conditions of dynamic environmental change and technology and market turmoil, when firm's top management team pay increasing efforts and persistence to firm's learning activities, organizational learning ability will vary. Thus, under the context of Chinese market, this thesis focuses on the influences of firm's leadership style (transformational leadership) on the organizational learning.

2.3 Organizational innovative climate

2.3.1 Definition and related literature

Ekvall and Ryhammar (1999) defines the climate as observed and recurring patterns of attitudes, feeling and behavior that symbolizes the firm's life. While climate is also defined as the common views of individuals on organizational policies, practices, and processes. Specifically,

the organizational climate is the assets of the organization itself, reflecting the organizations' strategic concerns or organizational functions. Studies show that members of the organization are very concerned about the certain organizational climate, such as security climate, service climate, organizational support climate, procedural justice, innovation climate (Lin & Liu, 2012). The organizational innovative climate derives from and extends the organizational climate study. Different from organizational culture, organizational innovative climate exists independently of the understanding and cognition of organizational members (Ehrhart et al., 2013). The organizational innovative climate focuses on employees' perceptions of the organization's work environment, for instance, allocating sufficient resources to those who are encouraged to try new things, providing a challenging work environment and using creative work methods at work (Jaiswal & Dhar, 2015).

The organizational innovative climate plays a vital role in shaping the creative behavior of organizational members (Bos-Nehles & Veenendaal, 2019). Černe et al. (2013) found that an organizational climate that supports the creative work is a key factor to effectively enhance employee innovation which can stimulate the creative behavior of organizational members. Furthermore, the organizational innovation climate is also seen as a core prerequisite for organizational innovation performance (Popa et al., 2017). At organizational at organizational level, consistent with the social exchange theory, previous literature studies have shown that innovative climate can effectively promote organizational knowledge sharing and transfer, as well as organizational work synergy; it can also facilitate communication between members of the organization, reduce the power distance of the organization. At the individual level, organizational innovative climate is beneficial for building of values and beliefs shared by members of the organization. Moreover, it can improve individual's innovation capability and creativity, increase the willingness of employees to take risks and promote self-growth.

Creativity, the ability to create and offer new products/service, is considered to be an important determinant and source of innovation (Andriani et al., 2018; Cardoso de Sousa et al., 2012). Previous research on creativity has focused more on individual features such as intelligence, cognition, personality, and ways to improve individual creativity. But beyond that, many studies are now focused on its' impact on innovation (Lin & Liu, 2012). Cognitive-based perspectives regard organizational innovative climate as the construction and structural representation of individuals' common cognition in the creative environment. This common cognition is derived from innovative environment of organizational members on organizational behavior, organizational strategy (Liu & Shi, 2009). Based on the theory of organizational attribute theory, the formation of organizational innovative climate is caused by the objective

environment. The structure, management and practice, strategic orientation and transformation of the organization will affect it's the formation (Song et al., 2011). Based on the clinician's attraction, selection, and attrition view, organizational members have certain characteristics and potential value identifications that contribute to the organization's common sense, and common experience, and promote a specific organizational climate (Schneider & Reichers, 1983). Based on the social point of view, the organizational innovation atmosphere is generated by the members of the organization in interaction with the external and internal environment. Although different perspectives have different definitions of organizational innovative climate, they all believe that organizational innovative climate is a cognitive behavior and has an impact on organizational members' innovation motivation, values, work attitudes and work behaviors. The organizational innovative climate is mainly reflected in the organization's willingness to make innovative attempts, support members to innovate, tolerance toward the diversity of members, offering corresponding resources and rewards to the one undertaking innovative task (Rode & Wang, 2010). In addition, research on the organizational innovation climate explores at the organizational level how the work environment or climate promotes individual creativity and corporate innovation. Many studies believe that organizational innovation requires not only material or human resource support, but also the encouraging-innovation- climate within the organization that can stimulate employees' self-achievement motivation and ultimately promote the organization's systematical innovation. Ekvall and Ryhammar (1999) argue that organizational innovative climate includes challenges, freedom, and support, and it encourages organizations to open and tolerate the uncertainty of innovation. Despite the perception of the climate coming from individual, the members of the organization are often affected by a common or similar work environment, and this common perception of the members of the organization will be influenced by organizational structure and organizational management and practice. Therefore, the innovative climate is a kind of environmental variables (Bos-Nehles & Veenendaal, 2019). A good organizational innovative climate allows the members of the organization to actively participate in the organizational tasks, and focus on innovative efforts to stimulate the members' work behavior. Hence, the organizational innovative climate includes the social environment and working environment that affect the organization's work. The organizational innovative climate is also the catalyst for innovation and change (Amabile et al., 2004; Lian et al., 2013).

In order to fully review organizational innovative climate studies, this thesis collects literatures in which title, topic or keywords include "organizational innovative climate" from WOS core collection database, and the settings are similar to the description of last section.

Then, one hundred seventy-six studies in English are obtained and the thesis analyzes 176 studies in terms of co-citation (Annex B.3) and terms, especially key words. The co-citation in Annex B.3 and the most frequent key words in Figure 2.3 reveal that previous research in last 10 years are focused on transformational leadership, innovation, performance, knowledge management, innovative behavior, top managers.

Figure 2.3 Surged terms on organizational innovative climate (2008-2018) based on WOS database

The existing research on organizational innovative climate can be mainly organized into following three aspects:

1. The dimensions and measurements of the innovative climate. The innovative climate is a multi-dimensional structural variable. Coming from the organizational climate, it is the collective perception or cognition of the members of the organization to the internal and external environment of the organization. It will influence individual's innovation motivation, behavior and attitude. Hunter et al. (2005) argues that organizational innovative climate includes several dimensions like positive leadership, management support, good organizational membership, risk attempts, flexible management system, organizational resource sharing or integration, clear organizational tasks or clear organizational processes, performance orientation, positive interpersonal interaction.

For the measurement of organizational innovative climate, the most important scales at

present is Siegel Scale of Support for Innovation (SSSI), which mainly includes leadership behavior, norms for diversity, consistency in organizational goals, support members in pursue of new ideas and risk experimentation, and support from superior managers. Whereas the "Assessing the Climate for Creativity" designed by Amabile et al. (2004) mainly covers incentives or rewards for innovation results, resource allocation support for innovation activities, giving individuals or organizations a range of innovative freedoms, and encouraging undertaking challenging work. West and Anderson (1996) developed group climate assessment scale, in which the main factors are supporting and encouraging innovation activities, creating a good interpersonal relationship, strengthening self-achievement motivation, advocating innovation attempts. Furthermore, the organizational innovative climate is also affected by social factors such as different background cultures and environments. In China, there are also many scholars who start from the reality of localization, building and developing an organizational innovative climate measurement scale that is in line with Chinese business management practice under the Chinese context. For example, Zheng et al. (2009) constructed a measurement scale based on the Chinese context. The main structural factors included incentive mechanism, leader exemplar behaviors, team collaboration, superior supports, resources guarantee, organizational promotion, and autonomous work. These seven dimensions shows proper reliability and high validity. Among them, the leader exemplar behaviors dimension highlights that managers need to practice and play an exemplar model. Overall, although different scholars above-mentioned have carried out different levels of research on the structural dimensions of the organizational innovation climate, their measurements shared value recognition in terms of encouraging risk, promoting organizational management support, promoting open sharing of organizational resources, and strengthening self-achievement incentives.

2. The interaction between the innovation climate and other organizational variables. Organizational innovative climate as the common and consistent interpretation of organizational innovation, organizational change, innovation characteristics and innovation support, is an important bridge between individual innovation and organizational collective innovation(Moolenaar et al., 2014; Sagnak et al., 2015). The formation and production of the organizational innovative climate is influenced by the organization's common goals, vision, leadership behavior, organizational resources, institutions and structure (Amabile et al., 2004; Zheng et al., 2009). For example, when members of the organization perceive that the organization fully supports and encourages the individual or the team's innovative activities, they can stimulate the pursuit of high performance in order to achieve more development, thus

enabling the organization to acquire and generate more innovations. The transformational manager will also stimulate the members of the organization to appeal to organizational innovation, which can build innovation commitment among the members of the organization, pay attention to the collective interests of the members, and shape a good innovation atmosphere (Kim & Yoon, 2015). In addition, Torokoff (2010) believes that a positive atmosphere of innovation plays an important role in promoting organizational innovation, because it effectively promotes organizational self-transformation and value adjustment, and realizes the value creation in market competition.

3. The impact of an innovative climate on individuals. Individual behaviors and motivations such as work attitude, behavioral performance, and psychological perception are directly or indirectly influenced by the organizational innovation climate. Zhu and Wang (2006) addresses that the organizational innovative climate is generated by the interpersonal interaction between the members of the organization. The interaction and role of the organization members and the organizational environment will be affected by the innovation atmosphere. Tierney and Farmer (2002) found that the individual effectiveness of the organization can perceive and predict the individual's innovative behavior in terms of innovation; the organizational innovation climate can empower the individual to act and influence, and then act on the individual's innovative behavior and innovation performance. When employees' intrinsic motivations are influenced by a positive innovation atmosphere, they are more creative and willing to accept innovation risks and take responsibility for their work (Sui et al., 2012). Moreover, many studies have found that innovation climate is a direct outcome of the personal characteristics and status characteristics of senior managers (Alas et al., 2011). The innovation behavior of organizational members depends to a large extent on their interaction with others in the workplace, and individual innovation contributes to the achievement of innovation and the transformation of innovation. Based on the theoretical perspective of leader-member exchange, leadership is a key factor driving the shaping of organizational innovation. When an organization actively supports and encourages employees to use exploitative or exploratory innovation, employee behavioral outcomes can effectively influence organizational innovation (Waheed et al., 2019). Newman et al. (2020) found that leadership style, especially transformational leadership, is an important antecedent of organizational innovation climate. In addition, through literature review, this study found the moderating role of innovation climate that strengthens (weakens) the impacts of team-level characteristics on innovation outputs at team levels.

2.3.2 Research summary and comments

Based on the previous research, the organizational innovative climate directly refers to the behavior of encouraging and stimulating new ideas in the team, providing group members with innovative resource support, and promoting a good atmosphere for innovation. However, the current research on innovative climate is based on different theoretical perspectives. The research objects are based on the analysis of the scope of organizational innovation. Moreover, there is no universal measurement model. In addition, due to influence of the psychological climate, most of the research on organizational innovative climate adopts the perception or cognitive point of view, paying attention to the role of individual perception. With the dynamic changes in technology and market environment, the organization breaks the hierarchical relationship of the original bureaucracy, achieves flat development, stimulates organizational self-change, and promotes rapid organizational change and structural adjustment (Yu et al., 2013). In the context of dynamic change, at the organizational level, there are two questions needed to be addressed (Liu & Shi, 2009). (1) How does the organizational innovative climate affect organizational creation? (2) In the Chinese context, what is the relationship between organizational innovation climate and organizational collective behavior? One of promising direction is from the system level to have a closer look at the effect of innovative climate on inter-organizational and intra-organizational completion and cooperation, governance, and intervention. Further, due to the obvious huge differences between Chinese and Western cultural backgrounds, the values and behaviors of Chinese employees and managers in the organization are also significantly different. Therefore, the research on organizational innovative climate needs to be in line with China's localized management practices.

2.4 Organizational innovation

Since Schumpeter first put forward that innovation is a new production function, a recombination of production factors. Innovation has attracted the attention of academia and industry. Organizational innovation is a means to change an organization, whether in response to changes in its internal or external environment, or as a preemptive action that affects the environment (Damanpour & Aravind, 2012). It is regarded as an important way for an organization to gain competitive advantage and promote regional and national economic development (Baregheh et al., 2009), which is closely related to products, services, operations, processes and human resources.

2.4.1 Definition and related literatures

Innovation is widely regarded as a key source of competitive advantage and a determinant for corporation's performance in a constantly changing dynamic environment (Kahn, 2018). Innovation can be seen as a new product or service, a new production process or technology, a new structure or management system, or a new plan or process associated with an organization's members (Kahn, 2018). For most companies, the lack of systematic innovative thinking, methods, and tools makes it difficult to turn valuable ideas into products, technologies, or services that create business value. Organizational innovation refers to the creation or adoption of a new concept or behavior that is successfully implemented within an organization (Crossan & Apaydin, 2010). Hence, organizational innovation can be measured by the speed at which innovation is applied. Organizational innovation is influenced by various types of factors: individuals, organizations, and the environment (Damanpour & Aravind, 2012). Studies show that the organizational transformation and innovation ability is affected by the internal and external factors of the organization. Only when the enterprise continuously carries out innovation, combines technology, organization systems with management system, and promotes the synergic development of individual and collective organizations can the organization achieve a long-term success (Noruzy et al., 2013). Gumusluoglu and Ilsev (2009) argues that organizational innovation is the process of developing or improving the value or usefulness of new products or services in an organizational environment, and then bring these products or services to market for commercial value. This approach based on market orientation is consistent with Damanpour and Aravind (2012) definition of product innovation, namely "new products or services introduced to meet external users or market needs" and also OECD definition which highlights successfully bringing new products or service to market. OECD (2005) emphasizes that organizational innovation is the introduction of new organizational management methods in the workplace within organization or between enterprises and external agents. Organizational innovation has a specific background nature and is the most important and continuous competition advantage of enterprises (Azar & Ciabuschi, 2017; Villar-López & Camisón, 2014). Armbruster et al. (2008) argue that organizational innovation is due to changes in organizational structure or processes resulting from the implementation of new management and work concepts and practices (such as teamwork in production processes, supply chain management, or total quality management). Battisti and Stoneman (2010) emphasizes organizational innovation involving new management practices, new organizations, new marketing concepts, and new corporate strategies. Damanpour and Aravind (2012) argues that

organizational innovation is a new process of implementing and managing new knowledge, new approaches to organizational work that lead to organizational change in organizational strategy, structure, management processes, or systems that finally facilitate organizational teamwork and information sharing, coordination, collaboration, learning and innovation (Gunday et al., 2011).

Some studies highlight the outcomes of innovation. Though not an exhaustive list, innovation as an outcome includes: product innovation, process innovation, marketing innovation and business model innovation (Kahn, 2018). Some studies divide organizational innovation into structural innovations and process innovations (Karim & Kaul, 2015; Park et al., 2018). It can be further differentiated into intra-organizational innovations and inter-organizational innovations. Structural organizational innovation emphasizes that organizations can make changes to one or more key department of the organization, such as changing or integrating scope of responsibility, adjusting of administrative orders and the level of information flow, improving functional division (e.g. R&D, production, human resources, finance), separating linear support functions. This structural organizational innovation focuses on the transformation of organizational structure from functional adjustment to multi-business, diversified, market- and customer-oriented approaches (Gatignon et al., 2002). Gunday et al. (2011) found that structural improvements brought about by organizational innovation, such as the introduction of new organizational structures to promote project cooperation among organizational members or different departments of the organization, and the introduction of new human resource management systems, will effectively strengthen coordination and cooperation mechanisms within the organization to create a new environment for process innovation. Process innovation affects the practices, processes, and operations of the enterprise (Von Krogh et al., 2018); this organizational innovation model focuses on changing the internal management model through management innovation, or implementing new management processes and new management measures within the enterprise, which can affect the production speed and flexibility (Amore & Bennedsen, 2016; Llach et al., 2011). Intra-organizational innovations mainly occur within the organization and may involve the adjustment of specific functions and affect the overall organizational structure and strategic layout of the entire enterprise by strengthening collaborative innovation, continuously improving the management according to quality certification. Inter-organizational innovations include new organizational structures and new innovative processes that go beyond the boundaries of the enterprise, for example, R&D activities between companies and customers and lean management of supply chains (Armbruster et al., 2008). In addition, according the degree of newness and novelty,

some studies put forward the division of incremental innovation and radical or breakthrough innovation (Duchesneau et al., 1979). Ettlie et al. (1984) believe that radical innovation is often expensive and risky because it embodies new knowledge and represents a significant deviation from the past technology. The incremental innovation is based on the transformation of old knowledge, and the cost is often low. If a technology is new to the importing party, or requires new input (process) and output (manufacturing or service) changes, then the extent of change or cost required by the organization ensures that rare and radical innovation is specified, rather than gradual innovation. Lantos (2006) regards incremental innovation and breakthrough innovation as two extremes of the innovation spectrum. The former is product improvement and product line expansion, which is usually designed to meet the needs of existing customers. The technical changes involved in them are very small, and there is almost no deviation from the company's current product market experience. On the contrary, the latter (breakthrough innovation) involves fundamental changes in the company's technology, which can usually meet the needs of emerging customers, is new to the company and industry, and can bring considerable new benefits to customers.

In order to fully review organizational innovation studies, this thesis collects literatures in which title, topic or keywords include "organizational innovation" from WOS core collection database, and the settings are similar to the description of last section. Four hundred ninety-seven studies in English are obtained. This thesis analyzes these studies in terms of co-citation (Annex B.4) and terms, especially key words. The co-citation in Annex B.4 and the most frequent key words in Figure 2.4 reveal that previous research in last 10 years are focused on knowledge management, firm performance, corporate structure, corporate learning, management innovation, exploratory and exploitative innovation.

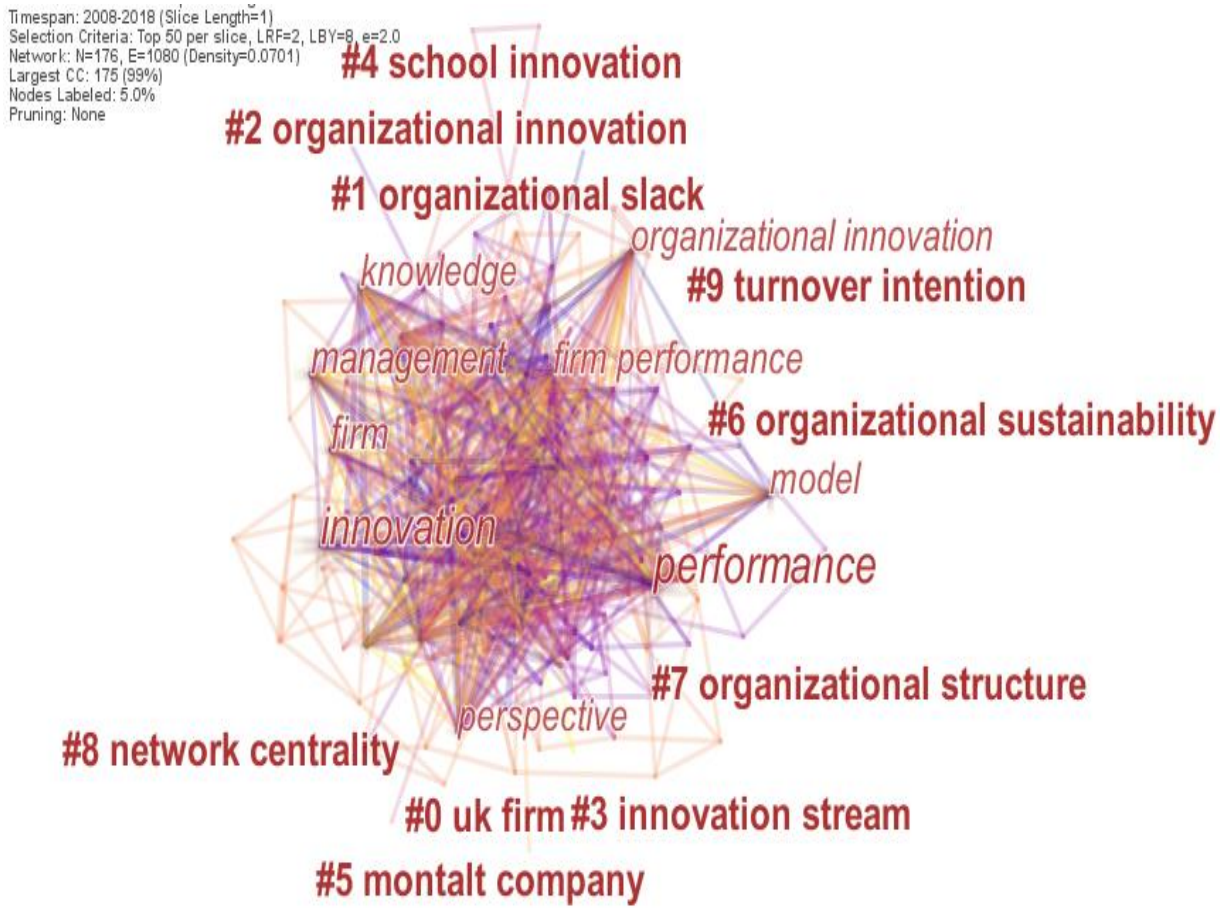

Figure 2.4 Surged terms on organizational innovation (2008-2018) based on WOS database

Existing studies on organizational innovation can be organized into following three aspects:

1. Focus on the definition of organizational innovation and its implications. The current major understanding of organizational innovation structure and measurement is the implementation and evaluation of advanced management concepts by enterprises. It is mainly carried out from the following four levels: (1) organizational innovation for business activities or practices; (2) organizational innovation in workplaces; (3) new approaches of organizational and external relationships; (4) product innovation capabilities (Camison & Lopez, 2010; Simao & Franco, 2018). Armbruster et al. (2008) proposed that organizational innovation can also be comprehensively measured from five aspects: work organization, production organization, standardization, and knowledge management, working time, compensation plan and human resource management. Although existing studies have explored the importance of organizational innovation, there are still differences in the definition and measurement of organizational innovation, and there are limitations in the use and effectiveness of existing indicators. Such differences in understanding and interpreting has made it difficult to design

and develop an indicator that can be widely accepted for measurement (Cantwell, 2005). According to the sociotechnical system approach, organizational innovation is a prerequisite for the full implementation and guarantee of technological innovation (Simao & Franco, 2018). Changes in the organizational technology system will have an impact on the organization's management system, which will dynamically change as the technology system generates demand.

2. The relationship between organizational innovation and organizational performance. Teece (2010) believes that if companies want to benefit from technological innovation, companies must adopt new organizational forms, new management methods, and new business models. Studies have shown that organizational innovation has an important impact on business performance and corporate competitiveness (Armbruster et al., 2008). Damanpour and Aravind (2012) emphasize that the organization's technical and operational systems should be combined with changes in social systems and administrative systems to achieve optimal organizational management. Organizational innovation improves organizational performance by creating a good environment and atmosphere that promotes members' participation in technological innovation (Azar & Ciabuschi, 2017). First, organizational innovation is a prerequisite and a facilitator for effective technological innovation and process innovation (Villar-López & Camisón, 2014). The success of enterprise technology innovation stems from the degree to which organizational structures and processes respond to the development and utilization of new technologies (Un & Asakawa, 2015). Second, organizational innovation is a direct source of competitive advantage for organizations because organizational innovation has a major impact on business operations and performance in terms of productivity, lead times, quality management, and strategic flexibility. Prajogo and Sohal (2006) found that the direct impact of enterprise's total quality management on enterprise technology innovation will be moderated by R&D management; organizational innovation will have an impact on process innovation and improve new product capabilities. However, the reality is that the impact of organizational innovation on product innovation is difficult to measure through direct methods. This impact may be reflected in the technological product and the process of production (Un & Asakawa, 2015) . This is also the limitation and bottleneck of current organizational innovation studies on innovation performance which needs to break.

3. The driving factors of organizational innovation. Organizational innovation is often overlooked in innovation theory, but organizational change has an impact on firm output (Laforet, 2013). Organizational innovation pays much attention on the change in organizational hierarchy, practices, and leadership that result from the introduction of new management

models, working methods, as well as employee motivation and inter-organization coordination. Organizational innovation mainly includes major changes in corporate strategy, management practices, organizational structure, and marketing. The influences of organizational innovation on enterprises is generated by (1) reducing transaction costs or reducing management costs, (2) improving labor productivity by improving workplace environment and employee satisfaction, (3) expanding enterprise resource and organization boundaries by constructing formal or informal ties with external parties, (4) and stimulating effective communication and interaction between organizational members, organizational managers and stakeholders through flat management to promote the creation of potential creative activities (Bhanugopan et al., 2015). The existing literature research found that organizational learning, culture, climate, structure, routines, and strategy will generate an important impact on organizational innovation in different context. In addition, in the setting of open innovation, external factors also matter. From example, from the perspective of network, network position, centrality, network tie strength, partnership are antecedents of organizational innovation (Dong et al., 2017; Kim & Yoon, 2015). From the perspective of knowledge, external knowledge sources, heterogeneous knowledge, knowledge recombination, knowledge couple are important antecedents (Anzola-Román et al., 2018; Arfi et al., 2018).

In general, organizational innovation can be a source of competitive advantage by improving the demand curve of technology, products, and services and potentially by through organizational change, for example, changing the synergy mode of organizational value chains, driving new model of customer value creation, and reducing cost per unit and improving quality.

2.4.2 Research summary and comments

Building on previous studies, this thesis defines organizational innovation as the change of organizational business practice from strategic management perspective, including new process and method. In the process of business practice, organizational innovation involves implementing organizational practices. In the workplace, organizational innovation involves new ways of implementing decisions or assigning tasks between organizational members and organizations; outside the organization, organizational innovation involves the new method implementation of new external relationship management between the organization and external partners, customers, and agents. Following this line of logic, organizational innovation is seen as the implementation of a new concept of the organization, and as an organizational

practice can spread and influence within the enterprise. It can not only depict whether the enterprise changes the organizational structure and process within a certain period, but also can explore the scope of application of organizational innovation in different context.

Second, organizational management is path-dependent, and traditional organizational management emphasizes the management within the organization. The technological and environmental changes will subvert the existing enterprise value chain and reshape the existing industry territory, forcing companies to rethink their own technology track, market structure, change the existing industrial structure and the nature of competition, and form disruptive innovation. In the dynamic environment, organizational highlights change in the external environment. The organizational external environment and organizational innovation are dynamically matched, and multi-perspective collaboration is carried out through environmental scanning, resource acquisition, strategic flexibility, and organizational coordination. In the realization and dynamic adjustment of organizational innovation, it is necessary to balance the static and dynamic strategy, combine different types of environmental elements, and analyze the mutual inhibiting (stimulating) relationship between organization innovation and organizational operation efficiency.

Third, previous studies indicate that intra-organizational and inter-organizational perspectives are two main perspectives to explore organizational innovation performance (Karim & Kaul, 2015). The research on internal factors affecting organizational innovation posits that the internal resources and capabilities of the enterprise, the CEO and the senior management team can influence the enterprise to achieve organizational innovation (García-Morales et al., 2012). Fundamentally speaking, organizational innovation is the systematic design and organic integration of relevant knowledge of technology, market, and services. The resources and capabilities of enterprises can help enterprises expand the boundaries of transactions, thereby providing possibilities for organizational model innovation. However, the attention paid to the firm’s top management team is still not enough, especially in the chinses business settings. Thus, this thesis following this line of logic, explore the antecedents of organizational innovation from the perspective of firm’s internal factors, especially the leadership of top management teams.

2.5 Organizational performance

2.5.1 Definition and related literatures

As Jenatabadi (2015) suggest, performance is one of the widely used concepts of management fields and the most argued constructs. In today's highly competitive technology and marketing environment, organizational performance becomes a key indicator for firm's long term and continuous survival and development. Organizational performance is determined by powers within the organization, as well as heterogeneous resources, organizational environment, strategic choices. Organizational performance is the result of the interaction process between organizational processes and participants. It is measured by identifying key organizational goals (Popova & Sharpanskykh, 2010). Strategic approach dominates the organizational performance research. March and Sutton (1997) made a meta-analysis of 439 studies within three years published in Strategic Management Journal, Academy of Management Journal and Administrative Science Quarterly. They found that 23% of the literature regards organizational performance as an indicator of the dependent variable. Due to highly competition in customer, inputs and capital, organizational performance has already been to a key indicator and core target activity for judging the survival and success of modern companies (Richard et al., 2009). Choudhary et al. (2013) emphasize that organizational performance is the actual result of the organization's goal based on market-orientation and financial orientation. Accordingly, financial and market indicators like return on investment, market share, sales profit, return on investment, overall market competitive position often are used to measure organizational performance. Muthuveloo et al. (2017) believe that organizational performance is the core target of all organizational activities, which includes financial performance and non-financial performance. The former mainly covers tangible or monetary gain, while the latter emphasizes customer satisfaction, growth rate and intangible gain. Bhanugopan et al. (2015) argue that the use of tangible or intangible resources to achieve revenue is the primary means of achieving organizational performance.

In order to fully review organizational performance studies, this thesis collects literatures in which title, topic or keywords include "organizational performance" from Web of Science core collection database, and the settings are following: time span=2008-2018, index= SCI-EXPANDED, SSCI, CPCI-S, CCR-EXPANDED, IC, and document type = ARTICLE. Six hundred forty-six studies in English are obtained. Then this thesis analyzes 646 studies in terms of co-citation (Annex B.5) and terms, especially key words. The co-citation in Annex B.5 and

the most frequent key words in Figure 2.5 reveal that previous research on organizational performance pay much attention to organizational behavior, operating ability, competitive advantage, organizational boundary, human resource, and innovation.

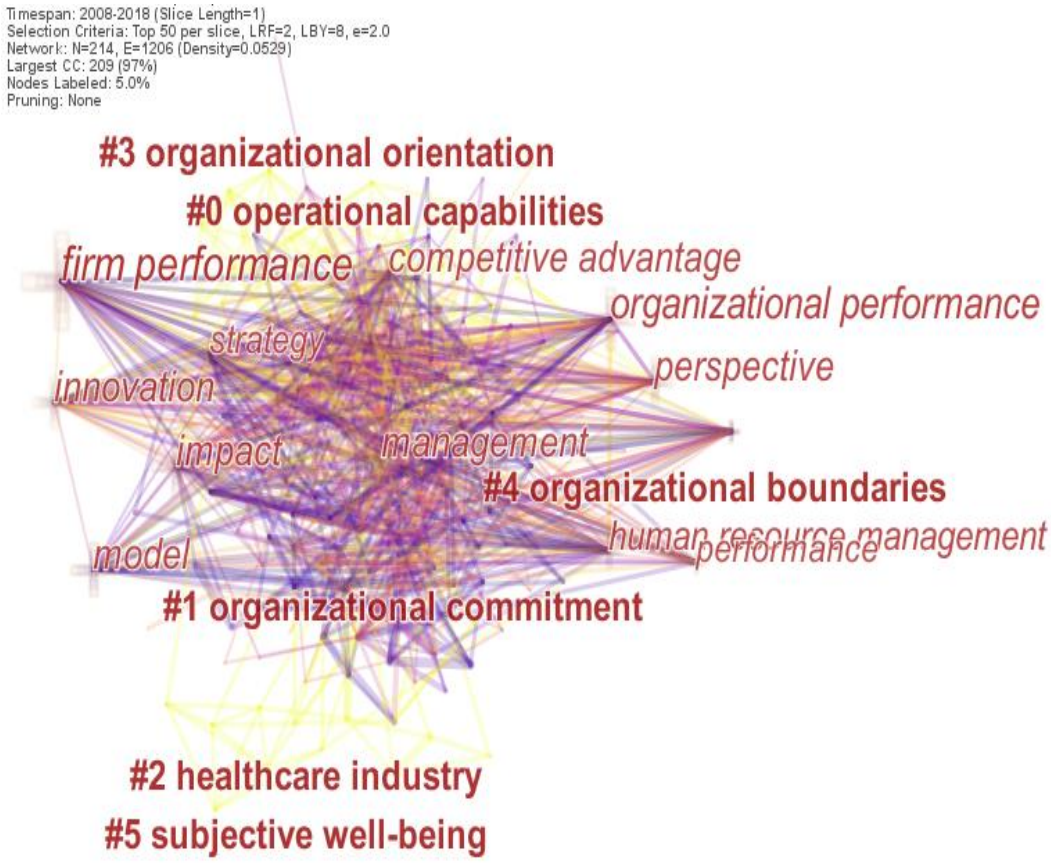

Figure 2.5 Surged terms on organizational performance (2008-2018) based on WOS database

Existing research on organizational performance can be mainly organized in three aspects:

1. Measurement of organizational performance. As Sangwa and Sangwan (2018) suggest, performance measurement is the way of evaluating outcomes and actions within the organization about its capability, competence, efficiency, and effectiveness to fulfill certain goals. Alagaraja (2013) reveals nine most frequently used performance measures, namely, organization-level, and individual-level productivity, organization-level and market performance, organizational turnover, corporate financial performance, profitability, sales growth, and quality. This study also provided some indicator for the human resource development setting, such as turnover intention, learning organization characteristics, and strength of HR orientation (Alagaraja, 2013). Other studies suggest that organizational performance mainly covers three types of specific indicators: financial performance (profit, return on investment, return on assets), product market performance (sales, market share), shareholder returns (total shareholder return, economic value added) (Richard et al., 2009). At present, there are three main methods for measuring organizational performance in the previous

literature: (1) a single dimension measurement method to analyze performance-related variables (Spanos et al., 2004); (2) different methods to measure same independent variable; (3) using correlation and effectiveness of convergence between variables (Cho & Dansereau, 2010). There are two ways namely objective and subjective measurement to evaluate organizational performance. Objective measurement of organizational performance mainly introduces accounting indicators, market financial indicators, the integration of accounting and market financial indicators, product, technology, service, and life cycle to assess. The subjective measurement mainly adopts interview and survey to estimate stakeholders and key information provider. The traditional view is that the results of the data measured by the supervisor will be affected by the factors such as respondent's cognition and values. Hence, the more detailed and precise the structure of the indicators is, the smaller the deviation of the range of the analysis results is. However, research on the Fortune Reputation Index found that for an abstract and multi-dimensional dependent variable, the subjective measurement method has advantages in data availability and measurement. In addition, Dess and Robinson (1984) also believes that in a certain situation, the supervisory measurement method (e.g., investment income, profit, product or service quality or satisfaction, organizational decision-making optimization process, market share growth) can also be used to evaluate the organizational performance (Waheed et al., 2019).

2. Driving factor of organizational performance. (1) Performance goal. The performance research literature argues that organizational performance tends to weaken the increase of organizational change when performance exceeds the society or history expectations. Following social expectations, organizational goals is made by comparison of industry's performance and market competitive position. Following historical approach, organizational goals is set by the performance records in the past business cycle (Jiang & Holburn, 2018). (2) Strategy orientation. The strategic orientation of the organization determines the development orientation of the enterprise. The strategy that matches the long-term development goals and dynamic environment of the enterprise can realize organizational change and value creation, thereby improving organizational performance. (3) The influence of individuals, groups, and organizations. Individual level factors including organizational member diversity, personality traits, individual behavior, and role expectations can have an impact on organizational performance (Dobre, 2013; Hammond et al., 2011). Group level factor like social identity, value orientation, and emotional cognition among members of the organization may lead to conflicts in the organization (Danişman et al., 2015; Marique et al., 2013). To be more specific, members of the organization tend to compare with others who have the same level or

characteristics as themselves, and thus similar characteristics may lead to conflict and cause negative impact on performance(Dick & Haslam, 2012). At organizational level, resource dependence, resource diversity and heterogeneity factors impact resource absorption and transfer and thus generate impact on performance. (4) Contextual factors of organization structure. Organizational absorptive capacity, dynamic capabilities, and synergy factors will also have a dynamic impact on organizational performance.

3. The interaction between organizational performance and dynamic environment. Dynamics environmental describe the impact of external environment complexity and uncertainty on organizational change (Wang & Zhang, 2020). Organizational performance is often a reflection of how companies can leverage existing knowledge assets, organizational management, and organizational capabilities (Abubakar et al., 2019). Previous research illustrated that companies often tend to develop activities within established organizational paths and practices, so that incremental innovations and positive financial performance can be achieved (Kobarg et al., 2019); however, in a dynamic environment, sticking to established paths and practices will reduce the flexibility and adaptability of the enterprise, which will lead to the mismatch between the existing capabilities of the enterprise and the dynamic environment and inhibit organization's survival and flourish, that is negatively affect organizational performance (Sirmon et al., 2007).

2.5.2 Research summary and comments

Organizational performance is key construct in the business, strategy, and management studies (Jenatabadi, 2015; Jiang & Holburn, 2018). Organizational performance is usually used to evaluate and measure an organization (Jenatabadi, 2015). The organizational performance of an enterprise is the overall manifestation of its operational effects, indicating that the enterprise has completed the target end. Therefore, performance has a very important impact on the success or failure of an organization. There are many factors that affect the organizational performance of an enterprise. Previous studies indicate that the manager's leadership style, values, and wisdom will all affect the organization's performance. Leadership behavior reflects intellectual motivation, charisma and caring for employees. It plays an important role in achieving goals and improving performance. Previous research show that the transformational leadership style will affect the financial performance of the enterprise and can change the individual's perception of leadership behavior (Louw et al., 2018). In short, the research on the evolution of leadership theory and its relationship with organizational performance will help us

understand how to improve organizational performance by improving leadership styles. However, the attention paid to organizational performance from the perspective of leadership style is not enough, especially the evidence from China, a great emerging market. Thus, this thesis explores the influences of leadership style of a firm (i.e., transformational leadership) on organizational performance and find out the path mechanism and moderation effect.

Chapter 3: Hypotheses Development

Previous transformational leadership studies have explored the dynamic effects on individual-level behavior from an organizational behavioral and psychological perspective. At the organizational level, there is a few researches investigating the relation between transformational leadership, organizational innovation, and organizational performance under an open innovation context. Dynamic environment also puts forward new requirements for organizational adaptive development and change, and makes the research of transformational leadership gradually shift from micro to macro.

Therefore, this thesis is grounded in macro organizational level, investigating the impact of contextual factors (i.e. organizational innovative climate, organizational learning) on transformational leadership and organizational innovation and analyze the dynamic role of transformational leadership on organizational change.

3.1 Transformational leadership and organizational innovation

Innovation, present days, is critical to organizational success and competitive advantage, and is also the basis for a corporate to improve corporate-level performance (Braun et al., 2013; Yang et al., 2021). Today, rapid iterations of technology, shrinking product lifecycles, and the dynamics of external business environments force organizations to act more creatively and innovatively than ever to survive, compete, grow, and gain leadership in a dynamic environment. Since innovation plays an important role in corporate performance growth and competition (Dong et al., 2017), organization needs to combine the individual and organizational innovation.

Studies related to transformational leadership have also consistently addressed the role of leadership change and innovation (Eisenbeiss, 2009). Strategic researchers also emphasize that leadership style exerts an important impact on organizational innovation; transformational leadership promotes organizational creativity and innovation (Hsieh et al., 2011). Many scholars have widely recognized that compared to transactional leadership, transformational leadership focuses on collaboration and participation among members of the organization (Tabassi et al., 2017), and is more effective in predicting the innovation of members within the organization.

Transformational leadership's features are, as suggested, closely connected to organizational innovation. Gumusluoglu and Ilsev (2009) found that transformational leadership exerts positive effects on corporate innovation; moreover, there are many theoretical and empirical studies prove that transformational leadership impacts organizational followers' value, recognition, and ethics. First, transformational leader has a vision to interact with members or support interaction within organization (Gumusluoglu & Ilsev, 2009); they cherish effective communication and value co-creation and are willing to create a friendly environment for innovation. They effectively improve subordinates' expectations on work performance, actively seek to change followers' values and self-achievement motives and raise individual needs and aspirations to higher level. Advocacy and behaviors for innovation behaviors reflect their support (Andriani et al., 2018). They encourage to go beyond the expected work objectives, actively promote followers to adopt new technologies to accomplish challenging tasks. Hence, highly intense work and performance increase organizational innovation.

Second, transformational leaders are willing to promote the collective learning process, trust as well as optimism when facing with innovative uncertainty and risk. Combining individual motivation and collective recognition and clarifying the organizational vision and mission, they strengthen the understanding and recognition of the value of the collective goals, improve followers' performance expectations and increase followers' willingness to excess job requirement.

Third, transformational leaders are generally charismatic, willing to provide intellectual support for organizational change and innovation. They create an innovative organization by share information and resource between members and then realize value co-creation. Through innovative intelligence, they encourage members to break the organization's established path dependence and inertia and core rigidity and to think creatively (Radzi et al., 2013). They will establish an example that is willing to innovate and dare to challenge to achieve organizational innovation and transformation (Paulsen et al., 2013).

Fourth, in addition to the impact on the internal organization, transformational leader also matters in the outside, such as the support of expansion and leap organizational boundaries (Mahmood et al., 2019). Social capital theory believes that the social ties between internal members within the corporate and its external actors provides important resources such as information, advice, social support, advance knowledge, skills and friendship which are important prerequisites for resource sharing, knowledge creation and value creation (Farahnak et al., 2020). Therefore, transformational leaders build social ties to exert positive impact on organization innovation by scanning the organizational environment, capturing group

connections between internal and external members of the organization, cross organizational boundaries, actively communicating with external participants, promoting cooperation between organizations, and establishing alliances with external parties (Azar & Ciabuschi, 2017).

Organizational innovation refers to a range of creative, valuable and useful new products or services in an organization, through the generation or adoption of a new concept or behavior, and successful implementation within the organization. Organizational innovation in this thesis is considered to be process of consciously introducing and applying new ideas, new products, new technologies or services of one individual and in one team or organization that benefits individuals, teams, organizations or a wider range of societies (Gumusluoglu & Ilsev, 2009).

The strategic aims of a corporate innovation are to create business value by novel, valuable and creative ideas into user-oriented, market-oriented products or services. For most organizations, the lack of systematic innovation methods and tools make hard to the adaptation to the dynamic environment, resulting in the difficulties in developing innovation capability. Existing research shows that the organization's innovation ability is often affected by organizational factors, including internal factors as well as the external ones. The long-term success of organizational innovation and change is mainly due to the continuous innovation of new products, services, and systems. Transformational leadership is just right a key factor in increasing the organization's drive to organizational innovation and the realization of innovative business value. Organizational managers can influence the innovation by shaping the working environment, work objectives, problem solving methods, and implementation methods of organizational members. By focusing on long-term goal orientation rather than short-term performance, leaders can combine the individual tasks with organizational collective goals to work together on innovation in workflow (Khalili, 2016). Creating and maintaining a good organizational climate and organizational culture, and nurturing the innovative thinking and innovative capabilities, as well as promoting the learning, sharing and dissemination of organizational resources, are beneficial for improving organizational creativity (Kandemir & Hult, 2005; Kim & Yoon, 2015). Moreover, building incentives related to compensation or human resources policies can increase followers' cravings for innovative work (Alagaraja, 2013; Waheed et al., 2019).

Although transformational leadership of top management teams can promote organizational innovation, there are differences in research results between Western and Chinese contexts. Therefore, this thesis will further analysis and investigate the relationship between transformational leadership and corporate innovation via a critical empirical study on the basis of Chines manufacturing firms. Overall, this thesis proposes the following hypothesis:

H1: Transformational leadership has a positive impact on organizational innovation.

3.2 Transformational leadership and organizational learning

In strategic management perspective, organizational learning is seen as one of the influencing factors to corporate competitive advantage (Noruzy et al., 2013). Continuous learning is a key factor in maintaining the organization's adaptability and flexibility (Wang & Zhang, 2020; Zhang & Zhu, 2019). It also ensures the organization's long-term success and effective competitiveness. Corporate learning implies the process as well as the outcomes of corporate-level creating, acquiring, and disseminating, sharing and applying knowledge (Antunes & Pinheiro, 2020). Organizational learning can improve business efficiency. Organizations that have a clear process for organizational learning can solve organizational problems faster, for example, organizational change, transformation and innovation, organizational competition and comparative advantage (Saadat & Saadat, 2016). It also can maintain the organization's position in the industry. In addition, a gradual and continuous learning mechanism has a positive impact on human resources and market reputation outside the organization (Imran et al., 2018). Prior research has also empirically demonstrated that corporate learning affects the firm-level competitive advantage, performance (finance and non-finance), cooperative benefits (tangible and intangible) in strategic alliances, and unit production costs and innovation (Zagoršek et al., 2009).

Organizational learning research focuses on different forms of learning, but less on who initiated this form of learning. Moreover, systematic research on leadership and organizational learning is limited (Antunes & Pinheiro, 2020). Many scholars argue that organizational learning is a social process that is influenced by other contextual factors (Abbasi & Zamani-Miandashti, 2013), for example, the shared vision, systemic thinking, and leadership behavior. Templeton et al. (2002) define organizational learning as a series of actions in the organization that intentionally or unintentionally positively influence organizational innovation or change, such as knowledge acquisition, information distribution, information understanding, and organizational memory. However, some scholars define organizational learning as a collective ability based on experience and cognitive processes, such as knowledge acquisition, knowledge sharing, and knowledge utilization (Zollo & Winter, 2002). All in all, the study on who initiated organizational learning is less and need to pay attention to (Antunes & Pinheiro, 2020).

Leaders act as designers, stewards, and trainers, and should be responsible for promoting

learning (Hambrick & Mason, 1984). Previous studies as we can reach, have demonstrated that transformational leadership do connect to a firm's learning activities and outcomes. Aragón-Correa et al. (2007) and García-Morales et al. (2012) suggest that investigating corporate learning from the perspective of firm's transformation leadership is a great direction. To be more specific, transformational leadership can effectively promote the establishment of a learning organization, and advocate organizational learning through exploration and communication. Vera and Crossan (2004) systematically combines strategic leadership with organizational learning. Research found that transactional leadership and transformational leadership both will promote the organization's exploratory and exploitative learning. On the one hand, transformational leader encourage follower to challenge themselves. On the other hand, transactional leader focuses more on learning reinforcement and practice based on the organization's existing experience.

Good leadership can innovate and integrate organizational knowledge and increase the flow and diffusion of organizational resources (Farahnak et al., 2020). Transformational leadership focuses on the management and innovation of organizational knowledge systems, promotes explicit and implicit knowledge dissemination by promoting knowledge flow among members, and transforms and reuses externally acquired knowledge through absorptive capacity, or existing knowledge development (Zuraik & Kelly, 2019). This flow of knowledge drives organizational learning and creates new knowledge and applications through various processes of change.

Specifically, first of all, transformational leadership is more forward-looking, capable of consciously influencing the status of organizational members and the function of organizations. Then, transformational leaders establish good moral standards in their organizations through their words and deeds, improve their members' awareness of organizational goals and tasks, and encourage members to think beyond their personal interests.

Second, transformational leader promotes the intelligence and rationality of organizational members through intellectual stimulation, and cultivates the problem-solving-ability. They encourage to jointly build learning group and share knowledge what follower have mastered and to create new products, technologies, and services (Jansen et al., 2006; Rode & Wang, 2010). Transformational leader can develop and establish a common mental model in the organization, develop and coordinate commonalities and differences among multi-functional teams, encourage risk, and involve organizational members in systemic thinking and stimulate organizational members' learning motivation(Mahmood et al., 2019).

Thirdly, transformational leader can effectively improve the awareness and acceptance of

organizational goals (Hamstra et al., 2014). It can provide direction and support for team positioning, promote the formation and shaping of shared visions, guide the participation in organizational change process (Sui et al., 2012). Moreover, transformational leaders are also pleased to focus on the team's job orientation and training and construction, advocating the learning commitment of leaders and follower, and are willing to provide all the resources needed to overcome internal suspicions and external difficulties (Eliyana & Maarif, 2019).

Fourthly, transformational leader can act as a catalyst in the organization, accelerating the flow, reconfiguration, and re-creation of knowledge. Transformational leader encourages the openness of information or resources among members of the organization, emphasizes timely and effective communication (Yang et al., 2021), and positive collaboration, and encourages the expression of different ideas to change organizational member cognition behavior. Consistent with previous studies (García-Morales et al., 2012), this thesis argues that transformational leadership can effectively promote organizational learning.

H2: Transformational leadership has positive impact on organizational learning.

3.3 Mediating role of organizational learning

Organizations must continue to learn in order to maintain their competitiveness. There is a literature on organizational innovation research that emphasizes the importance of organizational learning in explaining the questions related to corporate innovation. Organizational learning is considered to be a dynamic process based on knowledge that spreads and flows at different levels of behavior, from individual level, group level to organizational level (Crossan & Apaydin, 2010). Organizational innovation, as scholars widely accepted, is considered to be the application of new ideas and methods in products, processes, and management or marketing systems (Weerawardena & Mort, 2006). Learning and absorbing the resources of the organization's existing knowledge is the basis for the organization to carry out innovation activities. The organization's knowledge creation promotes the process of organizational innovation. Most studies present that there is a significantly positive relationship between organizational learning and innovation, for example the depth and breadth of organizational learning is closely related to breakthrough innovation and incremental innovation (García-Morales et al., 2012). The degree and level of organizational innovation depends on the organizational knowledge base and organizational learning promotes the accumulation and creation of this knowledge base (Cohen & Levinthal, 1990; Liao & Wu, 2010).

Knowledge creation in the beginning requires that members have access to existing knowledge and can share this knowledge within the organization. Access to knowledge within the organization depends on the existing knowledge base, and access to knowledge from the outside depends on organization's absorptive capacity which enable organization to absorb and apply external knowledge and to achieve business goals (Jiménez-Jiménez & Sanz-Valle, 2011). Organizational learning can strengthen the organization's absorptive capacity and creativity. First, organizational learning can drive organizational members to develop, acquire, transform, and reuse knowledge to promote organizational innovation. Organizational learning promotes the creativity of organizational members, stimulates the emergence of new ideas, knowledge, and ideas, improves the understanding and absorption of these ideas and ideas, and promotes the flow and diffusion of organizational resources which are beneficial to increase innovation. Organizational innovation increases through the sharing of organizational experience and the use of external information. Second, innovation often stems from research and design and absorption and use of resources of other organizational units. The learning ability increases the absorption and transformation of resources such as internal and external information, and also improves the efficiency of innovation activities. Chiang and Hung (2010) found that learning-oriented organizations can effectively scan the external environment, search for new technology paradigms that promote organizational innovation, and build alliances with external partners with complementary resources to develop new products which generate positive impact on new product development and innovation.

Third, organizational learning improves the ability to conduct cross-boundary search, cross-boundary cooperation, and cross-boundary innovation in uncertain technologies environments, empowering organizations to get rid of the core rigidity and achieve flexible organizational strategy. In a rapidly changing and unpredictable competitive environment, an organization's competitive advantage can disappear rapidly, and it is probably hard for an organization to maintain excellent performance on the basis of existing resources and capabilities. Based on the competitive advantage and resource-based view, the organization's unique value, scarce, non-replicable and irreplaceable resources and capabilities are the basis for the organization to develop and implement a difficult-to-replicate value creation strategy (Barney, 1991). As a result, organizations need to continually update their technology and resources to dynamically adjust operations to respond to changing market demands. Kandemir and Hult (2005) pointed out that organizational learning is the only capability that can produce superior customer value in the long-term market competition process. Because learning not only enables organizations to continuously deliver market products and services to different

market segments and respond effectively to changing market demands, but also drive resource investment for new strategic changes and make quick decisions to stop or reverse such resource commitments (Santos-Vijande et al., 2012).

Therefore, we propose that organizational learning is a key antecedent of organizational innovation. Organizational innovation relies on the creation, search, acquisition, and sharing of organizational knowledge; and the achievement of organizational innovation is the result of continuous evolution and implementation of organizational learning. In addition, most of the existing literature on innovation focuses more on "technical innovation", however, there are limits to the application of the idea of technological innovation in organizational innovation and theoretical interpretation (Liao & Wu, 2010). Hence, this thesis proposes the following hypothesis:

H3: Organizational learning has a positive impact on organizational innovation.

Moreover, entrepreneurship research believes that entrepreneurship includes creating new resources or integrating existing resources in new ways to develop new products and commercialize them, and enter new markets or serve new customers. In a learning organization, transformational leader focuses on the organization's learning and innovation capabilities, namely allow for the establishment and development of organizational learning capabilities, which enables better performance in the development and implementation of organizational innovation strategies (Aragón-Correa et al., 2007). Sirmon et al. (2007) argue that organizational learning is the most critical dimension of entrepreneurship orientation. In the process of organizational learning, transformational leadership behavior involves the search of innovation opportunities and resource, stimulation of organizational incentives, and resource support for innovation activities.

The literature on innovation research also addresses the importance of knowledge in the process of organizational innovation. The process of innovation improves or redevelops existing technologies, products or services which means that organizational learning such as adaptive learning, generative learning or single-loop learning, and double-loop learning is a catalyst for organizational innovation (Alegre & Chiva, 2008). Therefore, organizational learning is continuous extension and expansion of transformational leadership behavior. Organizational learning promotes the continuous improvement of the practical innovation capability through the acquisition and recognition, dissemination and use of organizational resources. First, transformational leadership plays an important role in organizational learning, for it creates resource that supports learning and knowledge-based innovation.

Secondly, the transformational leadership encourages the members to actively carry out

organizational innovation by bringing together innovative talents, promoting mutual trust between organizations, and building a climate of risk taking. Thirdly, organizational learning promotes the dissemination and diffusion of learning commitment among organizations, and empowers the members to innovate. Hence, this thesis proposes the following hypothesis:

H4: Organizational learning mediates the positive relationship between transformational leadership and organizational innovation.

Therefore, building upon the research hypothesis we propose, this thesis assume that top management team's transformational leadership will exert influences to firms' management. Meanwhile, organizational learning will have a direct impact on firms too. Later, this thesis will take a large-sample to empirically test the relationship of transformational leadership, organizational learning, and organizational innovation.

3.4 Moderating role of organizational innovative climate

In the dynamic competitive environment, one of the key factors to maintain organizational competitive advantage is to build and cultivate a good climate of continuous innovation, strengthen the internal workflow of the organization, improve, and re-create innovative capabilities, and encourage members of the organization to actively participate in creative thinking and work. By developing sound incentives, organization improves or replaces existing products, technologies, and services.

Organizational climate means that the organization follows common practices, beliefs, working atmosphere and value system, which will have a significant impact on the individual and collective human behavior of the members. Organizational climate is the overall objective cognition of organizational members on organizational attributes and characteristics. Organizational innovative climate is the derivative of organizational climate, which can form the common and consistent perception and experience of organizational members, and can influence individual and collective innovation behaviors (Zhu & Wang, 2006). Existing research emphasizes that the organizational climate can play an active role in organizational learning, because the organizational climate can promote communication, motivation and coordination between members and between members of the external organizations and affect the organization and collective knowledge management and application.

When organizations have a higher level of innovation climate, organizational members are more inclined to participate in challenging tasks. When encountering project dilemmas, they are more willing to regard innovation as the center of their analysis, and to obtain external

technologies across organizational boundaries. In addition, a well-organized innovative climate is also conducive to the construction of a consensus-based flat organizational innovation model, with a focus on horizontal and vertical communication channels for innovative knowledge interaction, which is very suitable for solving complex problems and indecomposable problems. Organizational innovative climate can effectively regulate the flow and diffusion of organizational resources, and encourage individual members to actively participate in innovation. Between organizational learning and organizational innovation, organizational innovative climate strengthens the social interaction between members of the organization and the construction of social relationships, which can have a positive impact on organizational innovation.

From an organizational perspective, the organizational innovative climate is mainly composed of challenges, freedom, and support. Organizational innovative climate also encourages openness and tolerance of uncertainty. Existing research believes that the organizational innovative climate will have an impact on the working environment and social environment; and organizational incentives, supervision and control, work support, freedom, sufficient resources and work challenges will influence organizational innovation capabilities (Lin & Liu, 2012). First, organizational innovative climate can create a good working environment and promote continuous improvement and exploratory creation of organizational learning. Secondly, the organizational innovative climate creates a good and safe psychological atmosphere for the members of the organization to carry out innovative activities and social interactions. Previous studies have found that active and psychologically safe working and social environments are more likely to improve the effectiveness of innovative activities, which can effectively prevent opportunistic behavior and help to ease negative free-riding and self-correction, and can smooth production and service and achieve organizational innovation. In addition, consistent with social exchange theory, organizational innovation can promote the innovation and creativity abilities, and encourage collaboration, resource sharing, and risk taking and self-growth of organizational members (Azar & Ciabuschi, 2017).

From an individual perspective, organizational innovation capabilities are driven by the innovation and creativity of organizational members. For members within an organization, the organizational climate describes the overall pattern of organizational activities by taking a series of value orientations and the formation of target expectations (Jaw & Liu, 2003). The innovation and creativity of organizational members is influenced by organizational shared values (Jaiswal & Dhar, 2015). The organizational innovative climate is an indispensable factor in supporting the improvement of organizational members' innovation and creativity. It can

help organizational members maintain innovative ways of development and maximize the innovation potential of their members (Williams & Foti, 2011). Specifically, an organizational innovative climate can positively influence the creative and innovative behavior of organizational members. Howell and Wang (2012) also emphasizes that strong organizational innovative climate can promote mutual learning among the members of the organization, and make the innovation behavior of the members of the organization more accessible to the organization's resources, and thus affect the organization's value creation. Hence, organizational innovative climate can effectively moderate the relationship between organizational learning and organizational innovation.

From an environmental perspective, organizational innovative climate is an important part of the organization's environmental variables. Organization members have a common perception of the climate that affects their creativity and innovation activities. The comprehensive understanding of the organizational environment (work environment and social environment) by the innovation team and the tacit understanding of each other will affect the innovation output. Amabile et al. (2004) found that the perception of the working environment by the members of the organization affects the individual's self-achievement motivation, which leads to differences between the individual behavior and the collective goals of the organization. Organizational innovative climate can play a guiding role in organizational members' self-awareness and behavioral norms; and it can encourage organizational members' innovative behavior by strengthening the psychological empowerment and organizational commitment of organizational members. For example, when members perceive that the organization promotes and encourages innovation, they are more inclined to participate in various innovation activities, and are also willing to try the challenges and risks in their work (Toshniwal et al., 2017).

In terms of previous study findings and corresponding analysis, this thesis proposes that when firm's innovative climate increases, employees' cognition, behaviors and emotions will correspondingly be changed in order to cater to firm's goals and call (Zuraik & Kelly, 2019). Thus, organizational members are more likely to be encouraged to learn and innovate for the purpose of firm's innovative climate (Ren & Zhang, 2015). That is to say, with higher level of innovative climate, employees are more likely to change their cognition, behaviors and emotions which positively facilitate organizational learning exerting impacts on innovation (Popa et al., 2017). Taken together, the organizational innovative climate can is a moderator in the pathway of organizational learning promoting innovation. Therefore, this thesis proposes this hypothesis:

H5: Organizational innovative climate will moderate the indirect relationship between

organizational learning and organizational innovation, namely, when organizational innovative climate is lower, the positive relationship between organizational learning and organizational innovation is weakened.

(1) Moderated mediation model

When mediating process between the independent variable and the dependent variable is influenced by the moderator variable, there is a moderated mediating effect. According to the existing theoretical hypothesis, this thesis first constructs a theoretical model of transformational leadership (independent variables), organizational learning (mediator variables), organizational innovation (dependent variables), and explores that transformational leadership will have an indirect relationship to organizational innovation through organizational learning. Furthermore, based on the assumption that H5, organizational innovative climate will positively moderate the relationship between organizational learning and organizational innovation. Therefore, transformational leadership indirectly influences organizational innovation via organizational learning. These indirect relationships depend on the level of organizational innovative climate. Hence, this thesis proposes the following hypotheses.

H5a: when organizational innovative climate increases, the positive mediation effect of organizational learning on the relationship of transformational leadership and organizational innovation will be stronger. Otherwise, when organizational innovative climate decreases, the mediation effect of organizational learning on the relationship of transformational leadership and organizational innovation will be weaker.

In summary, based on the model M1, this thesis further explores whether the potential mediating variables (organizational learning) between transformational leadership and organizational innovation will be influenced by the contextual factor (organizational innovative climate). Therefore, this thesis constructs a second-stage moderated mediation comprehensive model (see Figure 3.1) based on a mediator and moderator, and explores whether the mediating effect of organizational learning would be moderated.

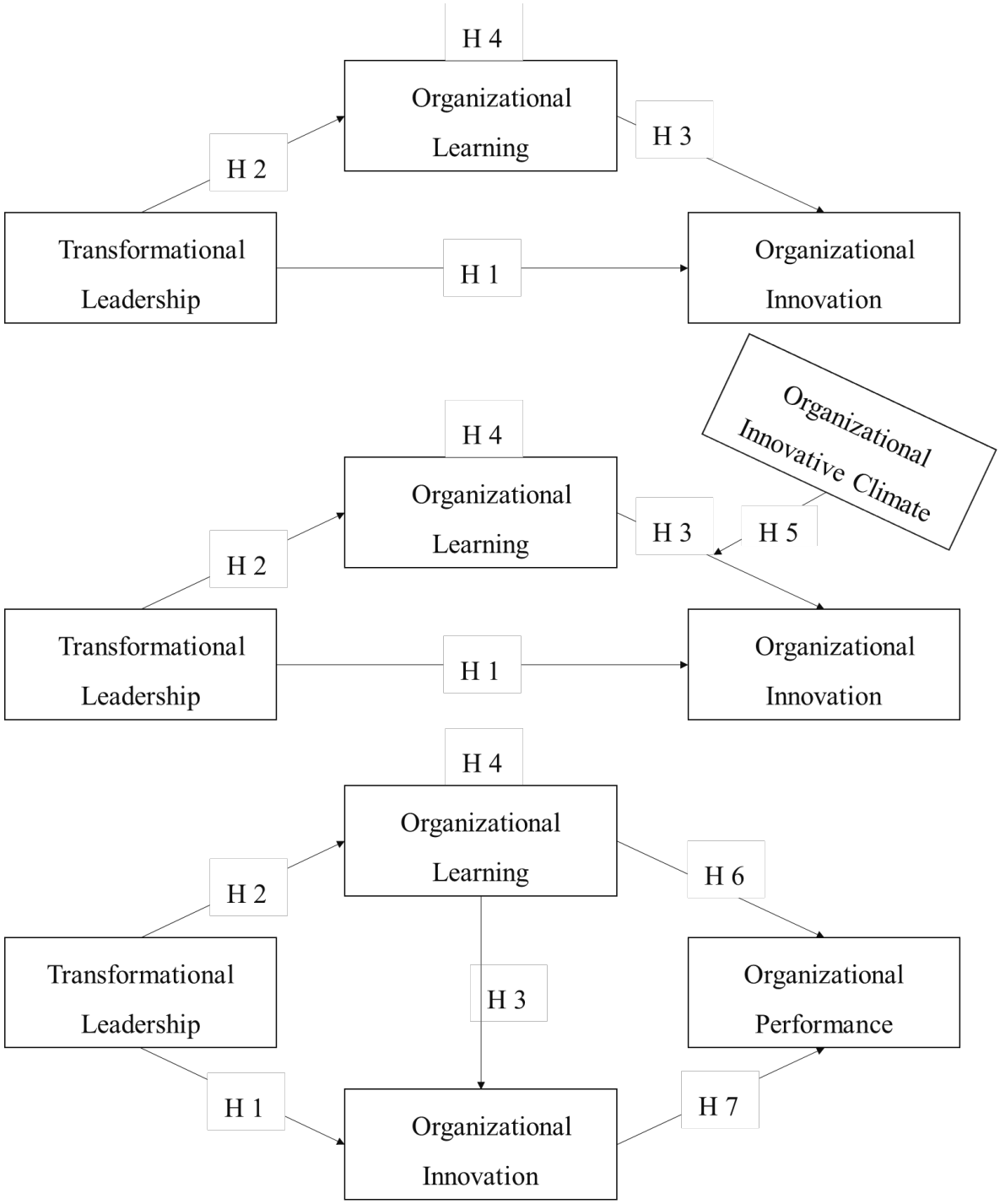

Figure 3.1 Framework of the thesis (hypothesis model 1, model 2 and model 3, from up and down)

3.5 Organizational learning and organizational performance

Organizational performance is used to measure the success or failure of a corporate business (Jenatabadi, 2015). It is the most important construct in organizational management and business research. It is of importance to investigate the connection between organizational

learning, organizational innovation, and organizational performance, when implementing organizational plans to practice.

3.5.1 Organizational learning and organizational performance

Organizational learning is the process by which an organization develops new knowledge new technologies and new services. based on the common experience of its members, and may have an impact on organizational behavior and enhance the organization's innovative capabilities (Jiménez-Jiménez & Sanz-Valle, 2011). Organizational learning is the foundation for an organization to gain a sustainable competitive advantage and is a key variable for improving organizational performance. Studies have shown that there is a positive correlation between organizational learning and organizational performance. Strategic theory emphasizes that learning organizations are usually faster and more flexible than competitors. Because adopting innovative organizations can create market barriers, and competitors can't gain innovation, these mechanisms can make organizations more profitable. Resource-based theory holds that organizations' resource capacity and exclusive technology that are difficult to imitate, enables organizations to maintain competitive advantage and obtain more organizational performance (García-Morales et al., 2012). From the perspective of organizational learning, innovation performance is promoted through the output and transformation of knowledge capabilities. With the learning ability increasing, the ability to absorb and utilize internal and external information resources is improved, as well as the efficiency of innovation activities and hence, generate impacts on new product development and innovation (Chiang & Hung, 2010). Various dimensions including exploration, empowerment and leadership contribute to organizational change and organizational performance.

Organizational learning includes the acquisition, dissemination, and utilization of explicit and tacit knowledge. Because learning contributes to organizational behavioral changes, it is closely related to organizational performance (Alegre & Chiva, 2008). For example, the depth and breadth of organizational learning and the speed of learning can promote high-level performance.

The main purpose of knowledge management and organizational learning is to improve the quality and quantity of performance, so that firms can improve the level of organizational innovation, obtain more resource support and innovative output. Organizations that can learn fast and iterative have more powerful strategic adaptability in the face of organizational innovation and change. The continuous dynamic and flexible adjustment of organizational

behavior and organizational learning strategies can enable organizations to maintain competitive advantage at any time and achieve superior market and innovation performance in a long run. Organizational innovation depends on the knowledge base of the organization, while the knowledge base is improved through organizational learning (Sheng & Chien, 2016). That is, organizational learning plays an important role in improving organizational innovation capabilities. In addition, innovation means new ideas, new processes or technologies, product development and implementation. Organizational success lies in its knowledge, innovation capabilities and technology. Therefore, organizational learning is a very important and complex resource pool that can realize the value innovation and competitive advantage of enterprises (Contractor et al., 2003). Organizational learning improves organizational performance by leveraging existing knowledge and exploring unknown knowledge or new methods. In the process of new product development, the growth of learning ability can effectively improve the performance of organizational knowledge innovation (Thoumrungroje, 2015), and further improve the organization's good performance in product innovation and technological innovation process (García-Morales et al., 2012). Organizations committed to learning can gain more market innovation opportunities (Radzi et al., 2013), capture more external resources, have more knowledge and ability to anticipate and understand market needs, and can also learn from the success or failure of innovation.

Therefore, this thesis argues that organizational learning can generate influence on individual, team and organizational behaviors and decisions, and further improve performance. In return, organizational performance can be seen as a measure of the effectiveness of organizational learning. Here, this thesis proposes the following hypothesis.

H6: Organizational learning has a positive impact on organizational performance.

3.5.2 Organizational innovation and organizational performance

Organizational innovation obviously dependents on environment and is one of the most crucial and sustainable sources of competitive advantage for the organization (Villar-López & Camisón, 2014). Organization is also an open system, and its vitality is whether the exchange with the outside world can gain the driving force of metabolism. Therefore, organizational innovation is also a process in which the organization actively adapts to environmental changes, including internal and external unit attributes and relationship structure, deconstructs resources, resets resources, and actively adapts to changes in technology and market demand (Azar & Ciabuschi, 2017). The deconstruction, renewal, and reorganization are the essence of

innovation.

Existing research reveals that organizational innovation has a positive impact on organizational performance from different perspectives (Bolaji Bello & Adeoye, 2018). Organizational innovation boosts organizational adaptability and change. Social technology systems usually emphasize that technology and social systems work together (Metcalf & Benn, 2012). Organizational innovation can promote the balanced development of technical systems and social systems, enabling organizations to adapt to changes in the external environment in a timely manner and work effectively to improve organizational performance (Damanpour & Aravind, 2012; Villar-López & Camisón, 2014). Resource-based theory explains the relationship between the heterogeneity of organizational strategy and organizational performance by focusing on the organization's internal characteristics. It emphasizes that the essence of organizational innovation is to maintain scare, irreplaceable and inimitable strategic assets (Medcof, 2001). In addition, the organization's sustainable competitive advantage depends on the organization's dynamic innovation capabilities. The sustainable competitive advantage determines the organization's ability to reconfigure resources, continually update its value of unique resources and continually promote innovation.

The mechanisms that organizational innovation positively influence performance are mainly relied on the effects of organizational change and reengineering (Ali, 2021). The main goal of organizational innovation is to improve organizational structure, workflow, shorten product delivery cycles and reduce operating costs, and achieve organizational strategic change and flexible reengineering. Organizational innovation can effectively promote the organization's response to environmental changes and uncertainties. By successfully catering to dynamic environment and uncertainty, organization improves the effective achievement of the organization's goals (Han et al., 1998). The traditional strategic theory mainly explains the sources of competitive advantages of diversified firms from the perspective of scale economy and explores the sources of competitive advantages of non-related diversified firms from the perspective of risk dispersion. However, few companies are able to maintain a sustainable competitive advantage in a dynamic environment where industry becomes more and more loose and unstable. To maintain a leading position, companies need to continuously develop new strategic changes and organizational reengineering (Oreg & Berson, 2019), while establishing and utilizing multiple instantaneous advantages to ensure that enterprises gain competitive advantage over a long period of time. Through effective organizational transformation and reengineering, firms effectively break tangible and intangible network locking-in, and innovation path dependence and behavior inertia, such that avoid the enterprise into the

dilemma of capability trap and core rigidity.

In addition, technological innovation is a highly uncertain process which can effectively integrate internal and external innovation resources (Flor et al., 2018), break the boundaries of organizational innovation resources, and realize the exchange and complementation of heterogeneous resources. Moreover, it can effectively promote the optimization of elements within the organization, and then realize sharing innovation risks, reducing innovation costs, improving innovation efficiency, and ultimately achieving continuous organizational performance.

Hence, this thesis argues that organizational innovation actively promotes the transformation and re-engineering of organizational structure, processes, and strategies. Effective organizational innovation realizes the combination of flexible organizational transformation and adaptability, and integration, construction, reconfiguration of internal and external resources and capabilities. Here, this thesis proposes the following hypothesis.

H7: Organizational innovation has a positive impact on organizational performance.

In summary, this thesis constructs the overall model composing of transformational leadership, organizational learning, organizational innovation, and performance (see Figure 3.1). This thesis will do statistics in next chapter, such as factor analysis and path analysis to test these direct and indirect effects of the overall model.

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Chapter 4: Research Method and Research Design

4.1 Research method

4.1.1 Literature research

As noted, quantitative methods are always used to identify, screen and track the bases of a research fields as it evolves over time. Understanding the dynamics of the research frontier and intellectual bases of a research topic is essential for scholars, analysts, and managers to be able to identify emerging trends and sudden changes in the scientific knowledge system. Thus, to answer these three basic questions are important: How did it get started? What is the state of the art? What are the critical intellectual turning points as a research front evolves? (what are the paths in the way of evolution?) (Chen, 2006). With rapidly development of a generic approach which are used usually to detect and visualize emerging trends and transient patterns in a certain research field, we can better to the above three basis questions. As Chen (2006) suggest, we adopted Citespace to detect research front and intellectual bases.

Based on the WOS database, this thesis collected related literatures on the theme of transformative leadership, firm's learning, corporate innovation climate, corporate innovation and organizational performance and then visualized the knowledge map where the law of knowledge structure, the status quo and dynamics were presented. Due to track of the research dynamics and development of transformative leadership and organizational change, the latest hotspot of key literatures was grasped. Through the logical deduction and connections between constructs, theoretical models are established.

4.1.2 Survey

To test the theoretical models in chapter three, this thesis collected the survey data from private enterprises in the Chinese context. Data collection procedure is organized as follows. First of all, the initial survey was formed on the basis of extensively summarizing relevant literatures, field research, in-depth interviews, as well as discussion within the project team. Next, after the pilot test (e.g., reliability test, validity test) results and the conclusions of the experts in the relevant research fields, the initial survey was modified and came to the final version. Finally, surveys were distributed through various channels, such as professional survey institution,

MBA/EMBA/DBA alumni network. The survey covered the top, middle, grassroots managers and general employees. Data collection and analysis schedule are as follows: (1) Survey design: from July to August 2018; (2) Survey distribution and collection: September-December, 2018; (3) Survey processing: September-December, 2018; (4) Survey analysis: January-February, 2019.

4.1.3 Empirical study

After data collection, the thesis employed regression analysis, bootstrap, and structural equation modeling method to test the hypotheses and the model M1, M2 and M3 in sequence (see Figure 3.1).

First, the relationship between transformational leadership (independent variables), organizational learning (mediator variables), and organizational innovation (dependent variables), namely the M1, is discussed, on the basis of SPSS and Bootstrap methods. By introducing the mediating variable, the thesis tries to explain the mechanism of transformational leadership's role in organizational innovation.

Second, the thesis empirically tested the mediated moderation model, exploring moderating effect of organizational innovation climate on organizational learning and organizational innovation through SPSS and Bootstrap methods.

Third, the thesis constructed a structural equation model through AMOS to explore the mechanism of transformational leadership on organizational learning, organizational innovation and organizational performance. Regression analysis can only explain the relationship between one dependent variable and several independent variables at a time. However, the structural equation model can simultaneously analyze the complex relationship between multiple dependent variables and the independent variables and can also explore the variable measurement problem of multi-dimension constructs through high-order factor analysis.

4.1.4 Case study

Although empirical study can quantify research questions and constructs through scientific measurement, and interpret the causal relationship between variables, empirical study cannot answer the question of why and how to achieve the corresponding results. Moreover, case studies help to understand the changes in organizational strategies in different periods of the case, help to describe and analyze a particular phenomenon and problem, and effectively

capture new phenomena emerging from management practices. It is necessary to give more detailed answers to the connections and effects between constructs through more specific cases. Hence, case study is a necessary. This thesis uses a typical firm CRUN to do case analysis. CRUN (stock code: 002272) was founded in 1992 and listed on the Shenzhen Stock Exchange in 2008. Focused on energy conservation, environmental protection, and new energy, CRUN is committed to becoming a global leader in clean energy equipment and solutions service. Its' main businesses include fluid machinery and intelligent control technology, energy-saving and environmental protection power equipment and distributed energy technology services and overall solutions.

In terms of case data collection, CRUN had sufficient available public data, which was conducive to the acquisition and mutual verification of diverse data resources. Moreover, the research team also collected first-hand data through interview with executives, middle management, and general employees of CRUN. In the process of interview and text collection, the project team identified and refined common themes from a large number of qualitative data.

By inductive analysis and concept comparison, the project team gradually links data to propositions and makes the analytic generation. Validation analysis was conducted on the principle of evidence triangle test, with the help of interview information, organizational publication (e.g., annual report), media reports, and research reports.

4.2 Research Design

This thesis draws data from survey. In order to ensure the reliability and validity, this thesis chooses widely using Likert 5 scale and selects mature scales supported by previous studies. In the scale, 1 represents the item that is "completely disagree" and 5 represents "completely agree". Before the formal investigation, structured interviews with the respondents were conducted and the scale was modified. Then, through a pilot survey, combined with the scale project analysis. Finally, the thesis collected 316 surveys. Descriptive statistics for the samples are shown in Table 4.1.

Table 4.1 Sample statistics

Item	Option	Number
Sex	Male	206
	Female	110
Education Background	Below high school	50
	Junior college	116
	Bachelor	86
	Master	49
	Ph.D.	15
Profession	General staff	160
	Middle manager	108
	Senior manager	48
Ownership	State-owned firm	63
	collective firm	12
	Private firm	225
	Sino-foreign joint venture	16

4.2.1 Measure

Transformational leadership (TL). In accordance with Li and Yeh (2017) definition and measurement, this thesis measures the transformational leadership in the Chinese context from four dimensions, including: idealized influence, moral modeling, individualized consideration and inspirational motivation, a total of 26 items.

Moral modeling for example, includes “my leader is morally clean and corruption-free”, “my leader embrace hardships, not material comforts”, which highlight that leaders can be dedicated and willing to be strict with themselves. Inspirational motivation includes “my leader will make subordinates understand the prospects of departments”, “my leader will paint a fascinating future for subordinate”, “my leader will give subordinates the goal and direction”, which mainly concerns that leaders can give their subordinates active support and are willing to explain the company’s vision and goals to the subordinates, as well as the direction of the company’s development. Individualized consideration includes, for instance, “my leader is willing to help employees solve life and family problems”, “my leader communicate a lot with employees in work, life and family”, which means that leaders can put their feet in other’s shoe, create a good environment for their work, and take care of employee’s growth and personal life. Idealized influence includes, for instance, “my leader has a strong sense of professionalism and initiative”, “my leader is committed to the work, always working with enthusiasm”, “my leader continues to learn something new to enrich himself”, which mainly reflect whether managers have the corresponding business abilities, whether their thinking is open-minded, and whether they have good personality and appeal. (The detailed items are shown in Annex A).

Organizational learning (OL). In accordance with March and Sutton (1997), Xie et al.

(2006), Yannopoulos et al. (2012), this thesis measures organizational learning form resource acquisition, learning methods/process. Take some items for examples, “My leader acquires new manufacturing technologies and skills for the company”; “My leader acquires new manufacturing technologies and skills for the company”; “My leader takes the lead in mastering new skills” (detailed items are shown in Annex A).

Organizational innovation (OI). In accordance with Xie et al. (2006) and García-Morales et al. (2012), the thesis measures from the perspective of organizational management functions such as control, planning, leadership, coordination, control and service. This research mainly measures from three aspects of management innovation, planning innovation and technological innovation, a total of 22 items. Management innovation includes, for example, “the company’s supervisors will adopt new management methods to effectively achieve the purpose of motivating the subordinates and improve employee morale”, “company executives use new leadership tools and successfully integrate the power of organizational members to complete tasks”. concerns innovations in systems, processes. Planning innovation includes, for example, “the company’s supervisors will adopt new management methods to effectively achieve the purpose of motivating the subordinates and improve employee morale”, “company executives use new leadership tools and successfully integrate the power of organizational members to complete tasks”, which mainly emphasizes that organizations should adjust organizational strategies and service strategies from time to time based on changes in the dynamic environment. Technological innovation includes for example, “the companies often introduce new technologies that improve processes”, “the company colleagues often use new product components or service projects to improve the company’s operational performance”, which mainly emphasizes the organization’s product innovation and process innovation (detailed items shown in Annex A).

Organizational innovative climate (OIC). In accordance with Zheng et al. (2009), Lian et al. (2013), organizational innovation climate is measured from the four dimensions of resource guarantee, organizational promotion, superior support, and autonomous work. For example, if the resource guarantee concerns whether the organization guarantees the material and other aspects of employee innovation; the organizational promotion addresses to actively create a good organizational innovation environment and encourage employees to actively participate in enterprise innovation. Superior support focuses on the ability of business managers to provide employees with appropriate innovation mandates and encourage subordinates to participate in innovation challenges. Autonomous work emphasizes whether employees can arrange for the corresponding free space and complete work plans (detailed items shown in

Annex A).

Organizational Performance (OP). In accordance with Choudhary et al. (2013), organizational performance is measured by operational performance and financial performance, including investment income, profit, product and service quality, customer satisfaction, and employee satisfaction and loyalty (detailed items shown in Annex A).

4.2.2 Scale analysis

Scale analysis are mainly to test the reliability of the survey. It mainly examines the discrimination between each item in the high and low groups.

First, summed up all score of all respondents, and calculated the total score of each surveyed person. Then measured total score of all respondents and calculated the 27% quantile both from descending order and ascending order. The 27% grouping method comes from the discriminant analysis method of test preparation. In the norm reference test, if the test scores were normally distributed, the degree of discrimination obtained with 27% as the group was the most likely. Through calculation 316 × 27%, the thesis got the threshold value 85. In ascending order, the score of 85th person is 374, and in descending order, the score of the 85th is 443 (see Annex C).

Then, according to the two scores, the total survey was sorted into three groups, namely a lower group below critical score 374, and a higher group above 443 and the middle group above 374 and below 434. The Visual Bander segment grouping by SPSS results in three groups.

Next, the independent sample T test was used to test whether the average score of each item in the high group and the low group is discriminate ($p<0.05$). Each item covers the number of high and low groups, the mean, the standard deviation, and the standard error. The criteria are as follow: if the variances of the two groups are equal, check the t-value with the same assumed variance; if the variances of the two groups are not equal, then check the significance of the variance which is not assumed to be equal. The Levene test with equal variance is used to test whether the two groups of variances are homogenous. Take TLQ1 for an example, the result of Levene's F-value test is $F=44.354$, $p=0.000<0.05$. Since it reaches a significant level of 0.05, then accepting the opposite hypothesis (null hypothesis is that variance of two group is equal) which indicates that the two groups of variances are not equal. So, T-test result in the second column assuming the variance not equal is $t= 13.845$, $p=0.000<0.05$, reaching 0.05 significant level, indicating that the critical ratio of this item is significant. The critical ratio of each item is significant and thus indicate the discrimination between the items of the scale is good. All in all,

scale analysis results show that the discrimination of each item in the high and low groups is in line with the requirements.

4.2.3 Factor analysis

In order to further test the validity of the construction, a factor analysis of was conducted. The purpose of factor analysis is to find the potential factor structure in the survey scale, reduce the number of redundant items.

(1) Transformational leadership

First, this thesis carried out KMO and Bartlett's test. When KMO approaches 1, the more common factors among items, the higher the correlation between items, the more suitable for factor analysis. Kaiser (1974) believes that the threshold value for factor analysis is at least above 0.6. The KMO coefficient of transformational leadership is 0.942, greater than 0.9, indicating that are suitable for factor analysis. Bartlett's spherical test = 6085.509, df=325, reached 0.5 significant level, that is, the net correlation matrix between items is the unit matrix. In addition, the measure of sampling adequacy (MSA) of Anti-image correlation matrix are all greater than 0.5.

Then, extracted common factor by principal component analysis. The rotation axis method is the maximum variation method of orthogonal rotation axis. There are four eigenvalues greater than 1, which is also the number of common factors extracted in factor analysis. Four common factors could explain 67.699% of the variance. Therefore, transformational leadership variables include four dimensions.

Table 4.2 is the result of the component matrix after the rotation axis. The internal Kaise normalization method is used to process the rotation axis. Five iterations are needed to convert the rotation axis. Factor loading selection standard is 0.400. Table 4.2 shows that, first factor (idealized influence) includes six items: TL21, TL22, TL24, TL23, TL25 and TL26; the second factor (moral modeling) is that TL1, TL2, TL3, TL4, TL5, TL6, TL7 and TL8. The third factor (individualized consideration) includes five items: TL15, TL16, TL17, TL18, TL19 and TL20. The fourth factor (inspirational motivation) includes six items: TL9, TL10, TL11, TL12, TL13 and TL14.

Table 4.2 Items and Component transformation matrix

Items		Factor Loading of Varimax with Kaiser Normalization				Comm-unality
		Factor 1	Factor 2	Factor 3	Factor 4	
TL23	My leader has a strong sense of professionalism and initiative	**0.849**	0.122	0.178	0.209	0.811
TL24	My leader is committed to the work, always working with enthusiasm	**0.809**	0.183	0.183	0.165	0.748
TL22	My leader is open-minded and innovative	**0.750**	0.195	0.199	0.322	0.744
TL25	My leader continues to learn something new to enrich himself	**0.710**	0.141	0.287	0.234	0.661
TL26	My leader takes immediate and firm actions to solve problems	**0.650**	0.265	0.349	0.218	0.662
TL21	My leaders display professional competence	**0.627**	0.196	0.279	0.225	0.560
TL5	My leader put collective interests beyond personal interests	0.046	**0.789**	0.197	0.003	0.664
TL3	My leader doesn't care about personal gains and losses	0.075	**0.776**	0.166	0.113	0.648
TL4	For the benefit of the department/unit, my leader can sacrifice personal interests	0.019	**0.775**	0.189	0.004	0.637
TL2	My leader embrace hardships, not material comforts	0.221	**0.677**	0.154	0.122	0.546
TL8	My leader doesn't make things hard for subordinate	0.428	**0.615**	0.181	0.292	0.681
TL6	My leader doesn't appropriate other's performance to himself	0.338	**0.595**	0.031	0.286	0.551
TL7	My leader share weal and woe with subordinate	0.341	**0.586**	0.214	0.351	0.629
TL1	My leader is morally clean and corruption-free	0.301	**0.576**	0.300	0.156	0.536
TL17	My leader is willing to help employees solve life and family problems	0.197	0.199	**0.816**	0.207	0.787
TL18	My leader communicates a lot with employees in work, life and family	0.309	0.234	**0.754**	0.241	0.777
TL16	My leader is willing to help subordinate's families	0.179	0.235	**0.729**	0.282	0.699
TL15	My leader considers subordinate's individual needs, abilities, and aspirations	0.243	0.342	**0.712**	0.176	0.714
TL19	My leader offers suggestion for subordinate's further development in work and life	0.313	0.205	**0.643**	0.32	0.655
TL20	My leader always coach subordinate.	0.371	0.25	**0.587**	0.368	0.680
TL10	My leader will make subordinates understand the development goals of their team/departments	0.249	0.265	0.164	**0.771**	0.753
TL9	My leader will make subordinates understand the development prospects of team/departments	0.274	0.254	0.161	**0.762**	0.745
TL11	My leader will explain to	0.233	0.121	0.244	**0.741**	0.678

	Items	Factor Loading of Varimax with Kaiser Normalization				Comm-unality
		Factor 1	Factor 2	Factor 3	Factor 4	
	subordinates the long-term significance of the work					
TL12	My leader will paint a fascinating future for subordinate	0.19	-0.054	0.282	**0.738**	0.663
TL13	My leader will give subordinates the goal and direction	0.222	0.154	0.374	**0.726**	0.740
TL14	My leader always works with subordinates to analyze the impact of their work on the overall goals of the unit/department	0.217	0.132	0.528	**0.54**	0.635

(2) Organizational learning

KMO of organizational learning is 0.931, greater than 0.9. Bartlett's spherical test = 2501.455, df=45, reached 0.5 significant level. And the measure of sampling adequacy (MSA) of anti-image correlation matrix are all greater than 0.5.

Total variance explained for organizational learning presents that there is only one eigenvalue, that is, only one common factor which explains 66.454% of the variance. Table 4.3 is result of the component matrix after the rotation axis. The specific factor loadings are as following:

Table 4.3 Component transformation matrix for organizational learning

	Items	Component Factor loading	Communality
OL31	My leader enhances knowledge and skills related to existing products	0.842	0.709
OL30	My leader improves existing product development process	0.840	0.705
OL33	My leader acquires new manufacturing technologies and skills for the company	0.838	0.702
OL32	My leader acquires new manufacturing technologies and skills for the company	0.826	0.683
OL35	My leader takes the lead in mastering new skills	0.819	0.672
OL34	My leader acquires new management methods to improve innovation efficiency.	0.811	0.657
OL27	My leader enhances knowledge and skills related to existing products	0.810	0.656
OL29	My leader improves existing customer problems step by step	0.798	0.637
OL36	My leader improves the skills of innovation in the unknown.	0.784	0.614
OL28	My leader puts resources into the application of mature technology to increase productivity.	0.782	0.611

(3) Organizational innovation

KMO of organizational innovation is 0.962, greater than 0.9. Bartlett's spherical test = 5656.31,

df =231, reached 0.5 significant level. The measure of sampling adequacy (MSA) of anti-image correlation matrix are all greater than 0.5. There are three eigenvalues greater than 1, that is, there are three common factor which explain 69.017% of the variance.

The internal Kaise normalization method is used to process the rotation axis. Six iterations are needed to convert the rotation axis. Table 4.4 shows that, first factor (management innovation) includes eight questions: OI37, OI38, OI39, OI40, OI41, OI42, OI43 and OI44. Planning innovation includes 8 items: OI45, OI46, OI47, OI48, OI49, OI50, OIQ51 and OI5; technological innovation includes 6 items: OI53, OI54, OI55, OI56, OI57 and OI58.

Table 4.4 Component transformation matrix for organizational innovation

	Items	Factor Loading of Varimax with Kaiser Normalization			Community
		Factor 1	Factor 2	Factor 2	
OI40	The employee benefit system adopted by the company has certain uniqueness and can effectively motivate employees	**0.820**	0.223	0.268	0.794
OI37	The salary system adopted by the company has certain originality and can effectively motivate employees.	**0.795**	0.215	0.235	0.734
OI39	The company has established a new performance appraisal method that enables supervisors to effectively understand the extent to which employees accomplish their goals	**0.789**	0.239	0.251	0.743
OI41	The company's supervisors will adopt new management methods to effectively achieve the purpose of motivating the subordinates and improve employee morale.	**0.742**	0.356	0.219	0.725
OI38	Company executives use new leadership tools and successfully integrate the power of organizational members to complete tasks.	**0.678**	0.375	0.195	0.639
OI42	The company adopts a new financial control system and can effectively achieve the purpose of motivating the subordinates and improving employee morale.	**0.673**	0.338	0.350	0.690
OI44	The company adopts a fairly good employee selection system	**0.582**	0.360	0.401	0.629
OI43	The company's current customer complaint handling solution can effectively resolve customer complaints	**0.444**	0.388	0.415	0.521
OI51	The company will adjust the work of colleagues in a timely manner to better achieve the company's goals.	0.260	**0.798**	0.295	0.792
OI48	The company will adjust functions of each department according to changes	0.304	**0.773**	0.237	0.747
OI50	The companies will try to adopt different workflows to accelerate the company's goals	0.284	**0.739**	0.243	0.685
OI49	The company will change the service project according to the customer's needs and improve the service method	0.416	**0.658**	0.226	0.657

	Items	Factor Loading of Varimax with Kaiser Normalization			Community
		Factor 1	Factor 2	Factor 2	
OI52	The company introduce new tools/equipment to the company to improve production or work efficiency	0.183	**0.631**	0.431	0.617
OI47	The company implements new policies that can improve organizational performance	0.499	**0.579**	0.327	0.691
OI45	The company adopts a new production operation system and can effectively check the gap between performance and target	0.462	**0.572**	0.409	0.708
OI46	The company uses a fairly unique performance assessment program and can properly assess the contribution of employees to the company	0.478	**0.547**	0.430	0.713
OI56	The companies often develop new products or services that are acceptable to the market.	0.294	0.225	**0.763**	0.720
OI55	The companies often introduce new technologies that improve processes.	0.131	0.423	**0.755**	0.766
OI57	The company colleagues often use new product components or service projects to improve the company's operational performance.	0.249	0.256	**0.754**	0.696
OI54	The companies often develop new products or services that are acceptable to the market.	0.256	0.281	**0.714**	0.654
OI53	The colleagues will often come up with many new ways to improve product processes or work processes	0.303	0.409	**0.653**	0.685
OI58	The company has a larger number of patents than its peers.	0.424	0.111	**0.621**	0.578

(4) Organizational innovative climate

KMO of organizational innovative climate is 0.949, greater than 0.9. Bartlett's spherical test = 6681.208, df =325, reached 0.5 significant level. And the measure of sampling adequacy (MSA) of anti-image correlation matrix are all greater than 0.5. There are four eigenvalues greater than 1, that is, there are four common factor which explain 69.071% of the variance.

The internal Kaise normalization method is used to process the rotation axis. Ten iterations are needed to convert the rotation axis. Table 4.5 shows that, first factor (resource guarantee) includes nine items: OIC64, OIC65, OIC66, OIC67, OIC68, OIC69, OIC72, OIC73, and OIC74. The second factor (organizational promotion) includes seven items: OIC59, OIC60 OIC61, OIC62, OIC63, OIC83, and OIC84. The third factor (organizational support) includes seven items: OIC70, OIC71, OIC75, OIC76, OIC77, OIC78, and OIC8. The fourth factor (autonomous work) includes three items: OIC79, OIC80, and OIC81.

Table 4.5 Component transformation matrix for organizational innovative climate

Items		Factor Loading of Varimax with Kaiser Normalization				Comm-unity
		Factor 1	Factor 2	Factor 3	Factor 4	
OIC67	The company estimates that employees learn and apply what they have learned in practice	**0.681**	0.35	0.161	0.182	0.645
OIC68	The innovative activities of the team can be rationally divided and cooperated in good faith	**0.672**	0.389	0.263	0.189	0.707
OIC66	The company regularly provides targeted lectures and training to its employees	**0.666**	0.431	0.127	0.138	0.665
OIC65	The company provides opportunities for employees to learn and encourage participation in learning activities	**0.659**	0.465	0.156	0.121	0.689
OIC73	Employees can apply for enough equipment to verify new ideas	**0.654**	0.18	0.326	0.228	0.618
OIC74	Employees can get enough information and materials to do creative work	**0.638**	0.269	0.391	0.244	0.692
OIC69	Colleagues in the company are willing to share their experiences and technologies with others	**0.568**	0.227	0.294	0.226	0.512
OIC72	The company provides the necessary resources to support innovation activities	**0.566**	0.362	0.437	0.204	0.684
OIC64	The company is able to give employees a fair and equitable evaluation of the innovations	**0.564**	0.423	0.305	0.202	0.631
OIC61	The company's vision is clear and pioneering, and it can inspire everyone's innovativeness	0.352	**0.775**	0.208	0.09	0.776
OIC60	The company continues to educate employees about the significance and importance of innovation	0.316	**0.732**	0.256	0.018	0.702
OIC62	The company's vision is clear and pioneering, and it can inspire everyone's innovativeness	0.402	**0.707**	0.2	0.16	0.728
OIC59	The company's core philosophy reflects the idea of innovation	0.312	**0.707**	0.134	0.122	0.631
OIC63	The company's reward system effectively promotes work innovation	0.434	**0.684**	0.197	0.181	0.727
OIC83	The company is able to give employees a fair evaluation of innovations	0.206	**0.539**	0.44	0.374	0.667
OIC84	The company advocates freedom, openness and innovation	0.11	**0.49**	0.439	0.477	0.673
OIC77	Senior leaders usually support and encourage subordinates to express their new ideas	0.276	0.211	**0.775**	0.166	0.749
OIC78	The superior leaders have good communication and coordination	0.266	0.335	**0.756**	0.105	0.766

	Items	Factor Loading of Varimax with Kaiser Normalization				Comm-unity
		Factor 1	Factor 2	Factor 3	Factor 4	
	skills					
OIC76	Superior leaders can respect and tolerate different opinions and disagreements from employees	0.302	0.113	**0.747**	0.25	0.725
OIC82	The superior leadership tolerate the subordinates to lose due to the failure of innovation	0.034	0.472	**0.577**	0.405	0.721
OIC70	Colleagues often discuss issues at work	0.464	0.246	**0.563**	0.243	0.652
OIC71	My team supports my innovation activities.	0.517	0.279	**0.54**	0.041	0.638
OIC75	The superior leadership tolerate the subordinates to lose due to innovation failure	0.359	0.039	**0.489**	0.482	0.602
OIC80	Under the general task requirements, employees are free to set their own work goals and progress.	0.15	0.13	0.103	**0.887**	0.602
OIC81	Employees can arrange their own tasks priority	0.162	0.191	0.159	**0.858**	0.824
OIC79	Employees are free to decide on work procedures or work methods.	0.355	0.042	0.282	**0.701**	0.698

(5) Organizational performance

KMO of organizational performance is 0.940, greater than 0.9. Bartlett's spherical test =3638.868, df=78, reached 0.5 significant level. The measure of sampling adequacy (MSA) of anti-image correlation matrix are all greater than 0.5. Results show that there are two eigenvalues greater than 1, that is, there are two common factor which explain 72.920% of the variance.

Factor loading cut-off value is 0.4. Table 4.6 shows that, first factor (operating performance) includes nine items: OP89, OP90, OP91, OP92, OP93, OP94, OP95, OP96 and OP97. Second factor (financial performance) includes 4 items: OP85, OP86, OP87 and OP88.

Table 4.6 Component transformation matrix for organizational performance

	Items	Factor Loading of Varimax with Kaiser Normalization		Community
		Factor 1	Factor 2	
OP96	The company has a competitive advantage in employee satisfaction.	**0.809**	0.33	0.764
OP92	The company has a competitive advantage in responding to customer needs.	**0.806**	0.274	0.725
OP93	The company has a competitive advantage in customer satisfaction.	**0.777**	0.25	0.666
OP97	The company has a competitive advantage in employee loyalty.	**0.765**	0.307	0.679
OP94	The company has a competitive advantage in customer loyalty.	**0.746**	0.332	0.667
OP95	The company has a competitive advantage in	**0.743**	0.379	0.696

	Items	Factor Loading of Varimax with Kaiser Normalization		Community
		Factor 1	Factor 2	
	terms of employee knowledge and skill.			
OP89	The company has a competitive advantage in the quality of its products or services.	**0.727**	0.402	0.689
OP91	The company has a competitive advantage in operational efficiency.	**0.68**	0.431	0.648
OP90	The company has a competitive advantage in terms of product or service costs.	**0.654**	0.464	0.643
OP86	The company has a competitive advantage in return on investment.	0.335	**0.872**	0.872
OP85	The company has a competitive advantage in profitability.	0.336	**0.865**	0.86
OP87	The company has a competitive advantage in ROE.	0.334	**0.859**	0.85
OP88	The company has a competitive advantage in new product development and market expansion.	0.556	**0.64**	0.719

4.2.4 Reliability test

The thesis uses SPSS to test reliability. The detailed reliability results are shown in Table 4.7.

Table 4.7 Reliability statistics results

	Cronbach's Alpha	Cronbach's Alpha based on standardized items	Number of items
Idealized influence	0.910	0.912	6
Moral modeling	0.887	0.891	8
Individualized consideration	0.919	0.920	6
Inspirational motivation	0.904	0.905	6
Total	0.951	0.954	26
Organizational learning	0.943	0.944	10
Management innovation	0.928	0.929	8
Planning innovation	0.933	0.933	8
Technological innovation	0.9	0.901	6
Total	0.963	0.964	22
Resource guarantee	0.928	0.929	9
Organizational promotion	0.912	0.912	7
Superior supports	0.903	0.904	7
Autonomous work	0.871	0.871	3
Total	0.961	0.963	26
Operating performance	0.941	0.941	9
Financial performance	0.925	0.924	4
Total	0.954	0.955	13

(1) Transformational leadership

The transformational leadership scale contains four dimensions, a total of 26 items. Cronbach's alpha of each dimension is above 0.8, indicating that the internal consistency of the construct is very good.

(2) Organizational learning

The organizational learning scale contains 10 items. Cronbach's alpha of total scale is above 0.9, indicating that the internal consistency of the construct is very good.

(3) Organizational innovation

The organizational innovation scale contains 22 items, 3 dimensions. Cronbach's alpha of three dimensions is above 0.9, indicating that the internal consistency of the construct is very good.

(4) Organizational innovative climate

The organizational innovative climate scale contains 26 items, 4 dimensions. Cronbach's alpha of four dimensions is above 0.8, indicating that the internal consistency of the construct is very good.

(5) Organizational performance

The organizational innovative climate scale contains 13 items, two dimensions. Cronbach's alpha of four dimensions is above 0.9, indicating that the internal consistency of the construct is great.

4.2.5 Correlation analysis

The following are mean, standard derivation and correlation matrix of every variable as shown in Table 4.8.

Table 4.8 Correlation analysis result

	1	2	3	4	5
1.Transformational leadership	1.00				
2.Organizational learning	0.713**	1.00			
3.Organizational innovation	0.638**	0.758**	1.00		
4.Organizational innovative climate	0.571**	0.631**	0.799**	1.00	
5.Organizational performance	0.400**	0.473**	0.644**	0.691**	1.00
Mean	110.484	41.731	90.494	106.864	52.427
SD	14.125	6.213	13.952	15.451	8.676
VIF	2.159	2.971	3.965	2.814	

Since correlation results shows that individual variables are highly correlated. Thus, the variance expansion factor (VIF) test is further used to diagnose the existence of multi-collinearity between independent variables. When VIF is greater than five, there will be a high correlation between the independent variables, and when VIF is greater than 10, a high linear coincidence will occur. Table 4.8 represents that the VIF of the variables is less than five; therefore, it can be considered that the correlation between the variables does not lead to serious multi-collinearity problems.

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Chapter 5: Transformational Leadership and Ogranizational Innovation: Mediating Role of Organizational Learning

The previous chapter gives a detailed introduction to the research method and research design. This chapter will conduct an empirical test on the theoretical model M1 (IV=transformation leadership, MV=organizational learning, DV=organizational innovation) through hierarchical regression with bootstrap. Thereafter, this chapter will test the direct relationship between the dimensions of transformational leadership(idealized influence, moral modeling, individulized consideration and inspirational motivation) and the dimensions of organizational innovations (management innovation, planning innovation and technological innovation).

5.1 Hierarchical regression results

According to research question, this thesis controls ownership of firms (state owned and private, dummy variable) and the level of respondents (general, middle, and top, dummy variable). Table 5.1 show the hierarchical regression results.

Table 5.1 Hierarchical regression results (control ownership)

	DV: Organizational innovation					
	M1	M2	M3	M4	M5	M6
state-owned	-0.154 (-1.701)	-0.087 (-1.265)	-0.042 (-0.729)			
private	-0.07 (-0.776)	-0.044 (-0.639)	0.005 (0.081)			
general						
middle				0.064 (1.073)	0.012 (0.275)	0.01 (0.258)
top				0.046 (0.769)	0.015 (0.343)	0.026 (0.687)
idealized influence		0.257 (4.134***)	0.024 (0.426)		0.261 (4.186***)	0.025 (0.444)
moral modeling		0.045 (0.8)	-0.009 (-0.182)		0.041 (0.738)	-0.01 (-0.204)
individualized consideration		0.197 (2.909**)	0.137 (2.374**)		0.2 (2.909**)	0.135 (2.313**)
inspirational motivation		0.26 (4.148***)	0.091 (1.656)		0.26 (4.091***)	0.094 (1.685)
OL			0.602 (11.175***)			0.603 (11.213***)
F	1.853	40.878***	66.928***	0.683	40.351***	66.506***
R^2	0.012	0.443	0.603	0.004	0.439	0.602
△F	1.853	59.695***	124.889***	0.683	59.927***	125.721***
$△R^2$	0.012	0.431	0.161	0.004	0.435	0.163

N=316,*** P<0.001,**P<0.01,*P<0.05; CV=control variable, IV= independent variable; DV=Dependent Variable; MV= mediating variable, the same below. T value in parentheses

In Table 5.1, M1 only includes controls. The F value of the overall M1 is 1.853, and the significance test shows a P value of >0.05. Hence, the overall model does not reach a significant level. M2 includes controls and independent variables. The F value of the overall M2 is 40.787 and the significance of the test P value <0.001, which means the overall model reaches a significant level. Hence, the regression model is meaningful and really explains the variation of organizational innovation. The transformational leadership can explain 44.3% variation of organizational innovation. At the same time, the beta coefficient of idealized influence (β=0.257, p<0.001), individualized consideration (β=0.197 p<0.001) and inspirational motivation (β=0.26, p<0.001) are significantly positive; that is to say, idealized influence, individualized consideration and inspirational motivation positively impact organizational innovation. M3 includes controls, independent variables, and mediating variable. The F value of the M3 is 66.928 and the significance of the test P value <0.001, which means the overall model reaches a significant level. The transformational leadership combining with organizational learning can explain the 60.3% variation of organizational innovation. Moreover, the overall model shows the variation increased by 16.1% (△R2).

In addition, while the beta coefficients of idealized influence, individualized consideration and inspiration motivation are significant in M2, which means that idealized influence, individualized consideration and inspiration motivation can somehow predict organizational innovation, the coefficients of idealized influence, inspiration motivation are not significant when organizational learning join the M3, which means idealized influence, inspiration motivation cannot significantly predict organizational innovation anymore. What's more, the explanatory power of idealized influence and inspiration motivation go down when the regression model considers organizational learning.

Similarly, Table 5.1 shows regression model with another control variable (manager level). The F value of M5 and M6 are respectively 40.351 and 66.506, reaching a significant level. In addition, M5 and M5 both show that idealized influence, individualized consideration and inspiration motivation have positive impact on organizational innovation.

5.2 Mediation test with bootstrap method

The mediation effect of model in chapter three is tested by Bootstrap method. Through the Process plug-in, the thesis selects modle4 for mediation effect test (IV= transformational leadership, MV=organizational learning, DV= management innovation, planning innovation and technological innovation), sets bootstrap=5000, and 95% confidence interval.

(1) Control Ownership

Table 5.2 present that the interval (LLCI=0.032; ULCI=0.119) in the M8 does not include 0, $p<0.001$, so the direct effect exists. In addition, the interval (BootLLCI=0.125; BootULCI=0.215) does not include 0, $p<0.001$, and thus the mediating effect exists. That is, organizational learning has a mediating effect between transformational leadership and management innovation. Due to the direct effect still existing when considering organizational learning, it is a partial mediation effect.

Table 5.2 Mediation analysis based on bootstrap (control ownership)

Model	variable	coeff	P	LLCI	ULCI
M7:	TL	0.313	0.000	0.278	0.347
DV: OL	SOE	-1.408	0.157	-3.360	0.544
	Private	-1.246	0.155	-2.966	0.474
	R=0.715; R-sq=0.512; F=109.015; P<0.001				
M8:	OL	0.539	0.000	0.440	0.638
DV: MOI	TL	0.075	0.001	0.032	0.119
	SOE	-1.305	0.141	-3.046	0.436
	Private	-0.925	0.236	-2.459	0.609
	R=0.738; R-sq=0.545; F=92.981; P<0.001				
	TL	0.244	0.000	0.208	0.279
	SOE	-2.065	0.046	-4.092	-0.038
	Private	-1.597	0.080	-3.384	0.190
	R=0.612; R-sq=0.374; F=62.770; P<0.001				
	Total	0.244		0.208	0.279
	Direct	0.075		0.032	0.119
	Indirect: OL	0.169		BootLLCI: 0.125	BootULCI: 0.215
M9:	OL	0.456	0.000	0.367	0.544
DV:POI	TL	0.086	0.000	0.047	0.125
	SOE	0.104	0.896	-1.459	1.666
	Private	0.632	0.367	-0.745	2.009
	R=0.740; R-sq=0.547; F=93.852; P<0.001				
	TL	0.228	0	0.196	0.260
	SOE	-0.538	0.555	-2.329	1.253
	Private	0.065	0.936	-1.514	1.643
	R=0.632; R-sq=0.399; F=68.97; P<0.001				
	Total	0.228		0.197	0.260
	Direct	0.086		0.047	0.125
	Indirect: OL	0.142		BootLLCI: 0.105	BootULCI: 0.180
M10:	OL	0.387	0.000	0.302	0.471
DV: TOI	TL	0.033	0.079	-0.004	0.070
	SOE	-0.450	0.553	-1.938	1.039
	Private	0.338	0.613	-0.974	1.649
	R=0.646; R-sq=0.417; F=55.709; P<0.001				
	TL	0.154	0.000	0.125	0.183
	SOE	-0.994	0.240	-2.656	0.668
	Private	-0.144	0.847	-1.609	1.321
	Total	0.154		0.125	0.183
	Direct	0.033		-0.004	0.070
	Indirect: OL	0.121		BootLLCI: 0.086	BootULCI:0.158
M11:	OL	1.382	0.000	1.154	1.609
DV: OI	TL	0.194	0.000	0.094	0.294
	SOE	-1.651	0.418	-5.656	2.354
	Private	0.045	0.980	-3.485	3.574
	R=0.772; R-sq=0.596; F=114.86; P<0.001				
	TL	0.626	0.000	0.541	0.710
	SOE	-3.596	0.142	-8.408	1.216
	Private	-1.677	0.437	-5.917	2.564
	R=0.642; R-sq=0.412; F=72.732; P<0.001				
	Total	0.626		0.541	0.710
	Direct	0.194		0.094	0.294
	Indirect: OL	0.432		BootLLCI: 0.327	BootULCI: 0.549

Note: N=316; *** P<0.001, **P<0.01, *P<0.05

In the M9, the direct effect exists, because the interval (LLCI=0.047; ULCI=0.125) does not include 0, and p<0.001. In addition, the meditation effect exists, because the interval (BootLLCI=0.105; BootULCI=0.180) does not include 0, and p<0.001. That is, organizational learning has a mediating effect between transformational leadership and planning innovation. Similarly, due to the direct effect still existing when considering organizational learning, it is a partial mediation effect.

M10 tests the mediating role of organizational learning on the direct effect of transformational leadership on technological innovation. The direct effect does not exist, because the interval (LLCI=-0.004; ULCI=0.070) includes 0, and p>0.05. However, mediation effect exists because the interval (LLCI=-0.004; ULCI=0.070) does not include 0 and p<0.001. That is to say it is a complete mediation effect.

In the M11, the direct effect exists, because the interval (LLCI=0.094; ULCI=0.294) does not include 0 and p<0.001. In addition, the meditation effect exists, because the interval (BootLLCI=0.327; BootULCI=0.549) does not include 0 and p<0.001. That is, organizational learning has a mediating effect on the pathway of transformational leadership influencing organizational innovation. Similarly, due to the direct effect still existing when considering organizational learning, it is a partial mediation effect.

Several conclusions can be draw from above models (control ownership of firms, namely, SOE and private). First, organizational learning can play a mediating role in transformational leadership and organizational innovation, and the dimensions of organizational innovation (management innovation, planning innovation, technological innovation). Secondly, because the transformational leadership has a direct effect on management innovation and planning innovation; therefore, organizational learning has a partial mediating role in transformational leadership and two dimensions. Third, because there is no direct effect of transformational leadership and technological innovation; therefore, organizational learning has a complete mediating role in transformational leadership and technological innovation. Finally, to look at systematically, this thesis finds that transformational leadership has a direct effect on organizational innovation; and organizational learning has a partial mediating role in transformational leadership and organizational innovation.

(2) Control the Level of Manager

General staff. Based on above methods, the thesis controls general staff and obtains the following results (see Table 5.3). According to model M13 (IV=transformational leadership, MV=organizational learning, DV=organizational innovation), M14 (DV=management

innovation), M15 (DV=planning innovation) and M16 (DV=technological innovation) show that the overall model is significant; that is, organizational learning has a partial mediating role between transformational leadership and organizational innovation. Moreover, the partial mediating role of organizational learning exists only when dependent variable are management innovation and planning innovation, while organizational learning plays a complete mediator in the relationship of transformational leadership and technological innovation.

Table 5.3 Mediation analysis based on bootstrap (control general staff)

Model	variable	coeff	P	LLCI	ULCI
M12:	TL	0.313	0.000	0.278	0.347
DV: OL	Ordinary	0.015	0.976	-0.956	0.986
	R=0.713; R-sq=0.508; F=161.736; P<0.001				
M13:	OL	1.386	0.000	1.158	1.613
DV: OI	TL	0.194	0.000	0.094	0.294
	Ordinary	-0.508	0.615	-2.490	1.475
	R=0.771; R-sq=0.594; F=152.360; P<0.001				
	TL	0.629	0.000	0.544	0.714
	Ordinary	-0.487	0.689	-2.880	1.906
	R=0.638; R-sq=0.407; F=107.444; P<0.001				
	Total	0.629		0.544	0.714
	Direct	0.194		0.094	0.294
	Indirect: OL	0.435		BootLLCI: 0.331	BootULCI: 0.552
M14:	OL	0.545	0.000	0.447	0.644
DV: MOI	TL	0.074	0.001	0.031	0.118
	Ordinary	0.055	0.900	-0.807	0.918
	R=0.736; R-sq=0.541; F=122.796; P<0.001				
	TL	0.245	0.000	0.210	0.281
	Ordinary	0.064	0.902	-0.947	1.074
	R=0.607; R-sq=0.368; F=91.208; P<0.001				
	Total	0.245		0.210	0.281
	Direct	0.074		0.031	0.118
	Indirect: OL	0.171		BootLLCI: 0.128	BootULCI: 0.218
M15:	OL	0.453	0.000	0.365	0.542
DV: POI	TL	0.086	0.000	0.047	0.125
	Ordinary	-0.378	0.337	-1.150	0.395
	R=0.739; R-sq=0.546; F=124.9726; P<0.001				
	TL	0.228	0.000	0.197	0.260
	Ordinary	-0.371	0.412	-1.259	0.517
	R=0.631; R-sq=0.398; F=103.418; P<0.001				
	Total	0.228		0.197	0.260
	Direct	0.086		0.047	0.125
	Indirect: OL	0.142		BootLLCI: 0.021	BootULCI: 0.035
M16:	OL	0.387	0.000	0.302	0.471
DV: TOI	TL	0.034	0.075	-0.003	0.071
	Ordinary	-0.185	0.622	-0.923	0.553
	R=0.642; R-sq=0.413; F=73.045; P<0.001				
	TL				
	Ordinary	-0.180	0.670	-1.006	0.647
	R=0.510; R-sq=0.260; F=55.005; P<0.001				
	Total	0.155		0.126	0.185
	Direct				

Model	variable	coeff	P	LLCI	ULCI
	Indirect: OL	0.121		BootLLCI: 0.088	BootULCI: 0.159

Middle Manager. Similarly, M18, M19, M20 and M21 control middle level staff as shown in Table 5.4.

Table 5.4 Mediation analysis based on bootstrap (control middle manager)

Model	variable	coeff	P	LLCI	ULCI
M17:	TL	0.313	0.000	0.279	0.348
DV: OL	Ordinary	0.227	0.663	-0.795	1.249
	R=0.713; R-sq=0.509; F=161.929; P<0.001				
M18:	OL	1.386	0.000	1.158	1.613
DV: OI	TL	0.196	0.000	0.096	0.296
	Middle	-0.013	0.990	-2.102	2.076
	R=0.771; R-sq=0.594; F=152.152; P<0.001				
	TL	0.629	0.000	0.545	0.714
	Middle	0.301	0.814	-2.219	2.822
	R=0.638; R-sq=0.407; F=107.356; P<0.001				
	Total	0.629		0.545	0.714
	Direct	0.196		0.096	0.296
	Indirect: OL	0.434		BootLLCI: 0.327	BootULCI: 0.554
M19:	OL	0.547	0.000	0.448	0.645
DV: MOI	TL	0.075	0.001	0.031	0.118
	Middle	-0.503	0.276	-1.410	0.404
	R=0.737; R-sq=0.543; F=123.649; P<0.001				
	TL	0.246	0.000	0.210	0.282
	Middle	-0.379	0.484	-1.442	0.685
	R=0.608; R-sq=0.369; F=91.584; P<0.001				
	Total	0.246		0.210	0.282
	Direct	0.075		0.031	0.118
	Indirect:OL	0.171		BootLLCI: 0.129	BootULCI: 0.217
M20:	OL	0.453	0.000	0.364	0.541
DV: POI	TL	0.087	0.000	0.048	0.126
	Middle	0.201	0.628	-0.614	1.015
	R=0.6738; R-sq=0.545; F=124.467; P<0.001				
	TL	0.228	0.000	0.197	0.260
	Middle	0.303	0.524	-0.632	1.239
	R=0.630; R-sq=0.397; F=103.196; P<0.001				
	Total	0.228		0.197	0.260
	Direct	0.087		0.048	0.126
	Indirect:OL	0.142		BootLLCI: 0.104	BootULCI: 0.182
M21:	OL	0.386	0.000	0.302	0.471
DV: TOI	TL	0.034	0.073	-0.003	0.071
	Middle	0.289	0.465	-0.488	1.066
	R=0.643; R-sq=0.413; F=73.211; P<0.001				
	TL				
	Middle	0.377	0.395	-0.493	1.247
	R=0.511; R-sq=0.261; F=55.372; P<0.001				
	Total	0.155		0.126	0.184
	Direct				
	Indirect:OL	0.121		BootLLCI: 0.086	BootULCI: 0.160

Top Manager. M23, M24, M25 and M26 control top manager as shown in Table 5.5.

Table 5.5 Mediation analysis based on bootstrap (control top manager)

Model	variable	coeff	P	LLCI	ULCI
M22 DV: OL	TL	0.314	0.000	0.280	0.348
	Top	-0.424	0.537	-1.771	0.924
	R=0.713; R-sq=0.509; F=162.124; P<0.001				
	OL	1.388	0.000	1.161	1.616
	TL	0.194	0.000	0.094	0.294
	Top	1.004	0.474	-1.751	3.758
	R=0.771; R-sq=0.595; F=152.573; P<0.001				
M23	TL	0.630	0.000	0.545	0.714
DV: OI	Top	0.415	0.806	-2.910	3.740
	R=0.638; R-sq=0.407; F=107.360; P<0.001				
	Total	0.630		0.545	0.714
	Direct	0.194		0.094	0.294
	Indirect: OL	0.436		BootLLCI: 0.324	BootULCI: 0.550
	OL	0.548	0.000	0.449	0.646
	TL	0.073	0.001	0.030	0.117
	Top	0.769	0.207	-0.428	1.965
	R=0.737; R-sq=0.544; F=123.946; P<0.001				
M24	TL	0.245	0.000	0.209	0.281
DV: MOI	Top	0.536	0.453	-0.867	1.940
	R=0.608; R-sq=0.369; F=91.643; P<0.001				
	Total	0.245		0.209	0.281
	Direct	0.073		0.030	0.117
	Indirect:OL	0.172		BootLLCI: 0.022	BootULCI: 0.038
	OL	0.454	0.000	0.366	0.543
	TL	0.086	0.000	0.047	0.125
	Top	0.380	0.487	-0.694	1.455
	R=0.738; R-sq=0.545; F=124.650; P<0.001				
M25	TL	0.229	0.000	0.198	0.260
DV: POI	Top	0.188	0.765	-1.047	1.423
	R=0.623; R-sq=0.397; F=102.932; P<0.001				
	Total	0.229		0.198	0.260
	Direct	0.086		0.047	0.125
	Indirect:OL	0.143		BootLLCI: 0.104	BootULCI: 0.183
	OL	0.386	0.000	0.302	0.471
	TL	0.035	0.068	-0.003	0.072
	Top	-0.145	0.781	-1.172	0.881
	R=0.642; R-sq=0.412; F=72.951; P<0.001				
M26	TL				
DV: TOI	Top	-0.309	0.597	-1.458	0.840
	R=0.510; R-sq=0.260; F=55.071; P<0.001				
	Total	0.156		0.127	0.185
	Direct				
	Indirect:OL	0.121		BootLLCI: 0.088	BootULCI: 0.159

Similar conclusions can be found that organizational learning can play a positive and significant mediator between transformational leadership and organizational innovation. To look it closer, and similar conclusion also can be draw that organizational learning plays a partial mediating role between transformational leadership and management innovation, planning innovation and organizational learning plays a complete mediating role between transformational leadership and technological innovation.

5.3 Conclusion

This chapter gives a detained empirical test results with Bootstrap method to test a mediating M1 in chapter three. Several conclusions can be draw.

First, hypothesis 1 (transformational leadership has a positive and significant positive impact on organizational innovation) is verified. When an enterprise faces development pressure in market competition and wants to have a long-lasting foundation, innovation is needed to lead the way in adapting to changes in the market environment and gaining a competitive advantage. Transformational leadership is regarded as a positive, developmental, and effective leadership style. Transformational leadership is more exemplary, adaptable, and applicable in organizational innovation. They can fulfill their responsibilities as an entrepreneur, give full play to their entrepreneurial spirit, and effectively stimulate the enthusiasm of enterprise employees to think strategically, participate in innovation, and take the initiative to form an organization's identity and sense of belonging, and proactively provide necessary innovation activities assistance to enterprise employees, improve the level of organizational innovation capabilities, and ultimately promote organizational innovation. At the same time, we also find that the different behaviors of transformational leaders also have an impact on the organizational innovation process. Just like the transformational leadership analyzed in section 5.1, leadership charm, personalized care, and vision incentives all have a significant positive impact on organizational innovation. This also shows that the more open and active the manager's leadership style in the enterprise, the easier it is to accept new things, the more actively they will support enterprise employees to participate in innovation activities, reduce the risk of communication between enterprise members, and provide necessary support for enterprise innovation.

Second, hypothesis 2 (transformational leadership has a positive and significant positive impact on organizational learning) is verified. Organizational learning is an effective way to promote organizational innovation and the sustainable development of enterprises. The new knowledge and ability enhancement required by enterprises for innovative activities and the enhancement of organizational effectiveness are inseparable from organizational learning. The leadership style of corporate managers is to create learning, which is the key to an organization. Transformational leadership can effectively promote the learning and development of team members, participate effectively in the process of organizational innovation and change, provide team support, motivation, and guidance, and provide a platform for organizational innovation and practice to allocate resources and communicate. Therefore, it is conducive to

promoting the diffusion of learning from individuals to the entire organization, thereby promoting the improvement of the overall learning ability of the organization. In addition, transformational leadership, as an advocate of organizational learning, can influence the learning tendency of organization members and effectively change the views of organization members on learning. Transformational leaders actively participate in organizational learning through their own behaviors and examples, can effectively create a positive and effective learning incentive mechanism, create a cohesive and centripetal learning organization, promote organizational identification among members, and enhance organizational learning capabilities to improve Organizational innovation output.

Third, hypothesis 3 (organizational learning has a positive and significant positive impact on organizational innovation) is verified. Organizational learning is the main factor for the organization to maintain innovation, and knowledge as a unique resource of an enterprise is an important driving force for the uniqueness of an enterprise. In the era of knowledge economy, knowledge is the foundation of innovation, innovation is the application result of knowledge, and learning is an important means of searching for knowledge, acquiring knowledge, using knowledge, and recreating knowledge. In order to maintain a competitive advantage in the market, an enterprise needs to continuously acquire the necessary knowledge in the process and development through organizational learning, and use its own ability to absorb resources to improve its own innovation level.

Fourth, hypothesis 4 (organizational learning has a mediating role in transformational leadership and organizational innovation) is verified. Transformational leadership to enhance organizational learning, promote organizational recognition, resource sharing, and focus on innovation attention of organization members, creating a learning organization for the organization to support and promote organizational innovation activities, and then promote organizational innovation. The positive effect of transformational leadership on organizational innovation is realized through organizational learning. In an enterprise, transformational leadership can effectively promote enterprise members to seek knowledge creation and carry out innovative activities. Organizational innovation is one of the reaction results of knowledge creation, and organizational learning plays the role of linking in this process. Specifically, organizational learning can promote the consistency of value recognition and goal orientation among members, promote the implementation of organizational strategic goals, and promote employees to search, integrate, optimize, and re-create knowledge in the organization, thereby promoting organizational innovation.

Chapter 6: Transformational Leadership and Ogranizational Innovation: Moderated Mediation Effect

The previous chapter (chapter five) empirically examines the M1 constructed in chapter three. Empirical results reveal that organizational learning does play a mediator between transformational leadership and organizational innovation. Thereafter, this chapter will empirically test the M2 built in chapter three and explore whether there is a positive interaction for organizational innovative climate with direct effect (transformational leadership and organizational innovation) and mediation effect.

6.1 Moderation effect

6.1.1 Moderation test controlled ownership

Bootstrap analysis is shown in Table 6.1 and several findings can be revealed. First, the overall model is significant (F=108.110, p<0.001). Second, organizational learning has a positive impact on management innovation (LLCI = 0.342; ULCI = 0.502, p < 0.001). Thirdly, although the interval value of interaction is (-0.009, -0.001) that does not contain 0 and ΔR2=0.007 (p=0.012<0.05), the coefficient of interaction term is negative, hence, organizational innovative climate has an interference interaction effect on the relationship of organizational learning and management innovation.

Table 6.1 Bootstrap moderate analysis (control ownership)

Model		coeff	P	LLCI	ULCI
	OIC	0.148	0.000	0.116	0.181
	OL	0.422	0.000	0.342	0.502
	OIC*OL	-0.005	0.012	-0.009	-0.001
	SOE	-0.774	0.330	-2.337	0.788
	Private	-0.795	0.256	-2.168	0.578
DV: MOI	R=0.797; R-sq=0.636; F=108.110; P<0.001; R2-chng=0.007, F=6.373, P=0.012				
	OIC	Effect	p	LLCI	ULCI
	-15.451	0.499	0.000	0.400	0.597
	0.000	0.422	0.000	0.342	0.502
	15.451	0.345	0.000	0.243	0.446
	OIC	0.154	0.000	0.125	0.182
DV: POI	OL	0.351	0.000	0.280	0.421
	OIC*OL	-0.003	0.133	-0.006	0.001

Model		coeff	P	LLCI	ULCI
	SOE	0.650	0.352	-0.723	2.022
	Private	0.772	0.209	-0.434	1.978
	R=0.808; R-sq=0.653; F=116.479; P<0.001				
	R2-chng=0.003, F=2.266, P=0.133				
	OIC	0.171	0.000	0.147	0.195
	OL	0.170	0.000	0.110	0.230
	OIC*OL	-0.002	0.126	-0.005	0.001
DV: TOI	SOE	0.101	0.866	-1.070	1.271
	Private	0.390	0.457	-0.639	1.419
	R=0.801; R-sq=0.642; F=111.152; P<0.001				
	R2-chng=0.003, F=2.358, P=0.126				
	OIC	0.474	0.000	0.408	0.539
	OL	0.943	0.000	0.781	1.104
	OIC*OL	-0.010	0.014	-0.018	-0.002
	SOE	-0.024	0.988	-3.182	3.135
	Private	0.367	0.795	-2.410	3.143
DV: OI	R=0.886; R-sq=0.751; F=186.543; P<0.001				
	R2-chng=0.005, F=6.110, P=0.014				
	OIC	Effect	p	LLCI	ULCI
	-15.451	1.095	0.000	0.896	1.294
	0.000	0.943	0.000	0.781	1.104
	15.451	0.790	0.000	0.585	0.995

Table 6.1 presents the interval values of the organizational innovative climate under different conditions: low (0.400, 0.597), medium (0.342, 0.502), high (0.243, 0.446). Any interval does not include 0 ($p<0.001$). According to mean and mean plus or minus standard deviation, the thesis draws a picture of moderating effect (Annex D.1). No matter under which level (low, medium high), the organizational innovative climate has a positive impact on the positive relationship of organizational learning and management innovation.

Several findings can be revealed by Table 6.1. First, the overall model is significant ($F=116.479$, $p<0.001$). Second, organizational learning has a positive impact on planing innovation (LLCI=0.280,ULCI=0.421, $p < 0.001$). Thirdly, the interval value of interaction is (-0.006,0.001) that includs 0 and $\Delta R2=0.007$ ($p=0.133>0.05$) but the coefficient is not as expected. Hence, organizational innovative climate does not moderate the relationship of organizational learning and planning innovation.

Table 6.1 shows that although the overall model is significant ($F=111.152$, $p<0.001$), the moderating effect on transformational leadership and technological innovation does not exist, because the interval (-0.006, 0.001) includes 0 and $\Delta R2=0.007$ ($p=0.133>0.05$). That is to say, organizational innovative climate does not moderate the relationship of organizational learning and technological innovation.

In order to verify the moderating role of organizational innovative climate between organizational learning and organizational innovation, this chapter makes use of bootstrap

method (bootstrap=5000, the confidence interval = 95%). Firstly the thesis centralized the interaction and then run the regression model.

Table 6.1 presents that firstly the overall model is significant (F=186.543, p<0.001) and then organizational learning significantly influences organizational innovation (LLCI=0.781, ULCI=1.104; p<0.001) and last but not least the interval of interaction (-0.018, -0.002) excludes 0 and R2-chng (ΔR^2=0.005, p=0.014<0.05) is significant but coefficient is negative. Therefore, organizational innovative climate has an interference interaction effect on the relationship of organizational learning and organizational innovation.

Table 6.1 also presents the interval values of the organizational innovative climate under different conditions: low (0.896,1.294), medium (0.781,1.104), high (0.585,0.995). Any interval excludes 0 (p<0.001). According to mean and mean plus or minus standard deviation, the thesis draws a picture of moderating effect (Annex D.2).

6.1.2 Moderation test controlled level of staff

6.1.2.1 Control general staff

Table 6.2 presents that firstly the overall model is significant (R=0.796; R-sq=0.634; F=134.677; p<0.001) and then the interval of interaction (LLCI=-0.009; ULCI=-0.001) excludes 0 and p=0.012<0.05, so moderation effect exists. Table 6.2 shows the interval values of the organizational innovative climate under different conditions: low (0.403, 0.600), medium (0.344, 0.504), high (0.245, 0.448). Any interval excludes 0 (p<0.001). The thesis draws a picture of moderating effect (Annex D.3). But the coefficient of interaction term is negative, so moderating variable has an interference interaction effect on the direct effect.

Table 6.2 presents that the overall model is significant (R=0.808; R-sq=0.653; F=146.134; p<0.001) and then the interval of interaction (LLCI=-0.006; ULCI=0.001) includes 0 and p=0.117>0.05, so moderation effect does not exist. Therefore, according to empirical results, the organizational innovative climate does not significantly moderate the relationship of organizational learning and planning innovation.

Table 6.2 presents that the overall model is significant (R=0.801; R-sq=0.641; F=138.970; p<0.001) and then the interval of interaction (LLCI=-0.005; ULCI=0.001) includes 0 and p=0.119>0.05, so moderation effect does not exist. According to empirical results, the organizational innovative climate does not significantly moderate the relationship of organizational learning and technological innovation.

Table 6.2 presents that the overall model is significant (R=0.867; R-sq=0.751; F=234.447;

p<0.001) and then the interval of interaction (LLCI=-0.018; ULCI=-0.002) excludes 0 and p=0.012<0.05, so moderation effect does exist. But the coefficient of interaction term is negative, so moderating variable has an interference interaction effect on the direct effect.

Table 6.2 shows the interval values of the organizational innovative climate under different conditions: low (0.896, 1.293), medium (0.578, 0.988), high (0.777, 1.100) excludes 0 (p<0.001). The thesis draws a picture of moderating effect (Annex D.4).

Table 6.2 Bootstrap moderate analysis (control general staff)

Model		coeff	P	LLCI	ULCI
DV: MOI	OIC	0.149	0.000	0.116	0.181
	OL	0.424	0.000	0.344	0.504
	OIC*OL	-0.005	0.012	-0.009	-0.001
	General	-0.031	0.937	-0.803	0.741
	R=0.796; R-sq=0.634; F=134.677; P<0.001				
	R2-chng=0.008, F=6.416, P=0.012				
	OIC	Effect	p	LLCI	ULCI
	-15.451	0.501	0.000	0.403	0.600
	0.000	0.424	0.000	0.344	0.504
	15.451	0.346	0.000	0.245	0.448
DV: POI	OIC	0.154	0.000	0.125	0.182
	OL	0.347	0.000	0.276	0.417
	OIC*OL	-0.003	0.117	-0.006	0.001
	General	-0.447	0.194	-1.124	0.230
	R=0.808; R-sq=0.653; F=146.134; P<0.001				
	R2-chng=0.003, F=2.477, P=0.117				
DV: TOI	OIC	0.172	0.000	0.148	0.196
	OL	0.168	0.000	0.108	0.228
	OIC*OL	-0.002	0.119	-0.005	0.001
	General	-0.187	0.525	-0.765	0.391
	R=0.801; R-sq=0.641; F=138.970; P<0.001				
	R2-chng=0.003, F=2.450, P=0.119				
DV: OI	OIC	0.474	0.000	0.409	0.539
	OL	0.939	0.000	0.777	1.100
	OIC*OL	-0.010	0.012	-0.018	-0.002
	General	-0.665	0.401	-2.222	0.891
	R=0.867; R-sq=0.751; F=234.447; P<0.001				
	R2-chng=0.005, F=6.361, P=0.012				
	OIC	Effect	p	LLCI	ULCI
	-15.451	1.094	0.000	0.896	1.293
	0.000	0.939	0.000	0.777	1.100
	15.451	0.783	0.000	0.578	0.988

6.1.2.2 Control Middle Manager

Similarily, according to empirical results (see Table 6.3), the thesis finds that first organizational innovative climate oderats the relationship of organizatioanl learing and managment innovation (see Annex D.5). Second, oranizatioanl innovative climate does not moderate the the relationship of organizational leaning and planning innovation (see Table 6.3) and technological innovation (see Table 6.3). Because the interaction coefficient of the

interaction term is negative, the moderation variable interferes with the relationship of the independent variable and the dependent variable. Last but not least, the hypothesis that predicts organizational innovative climate has a positive moderating effect between organizational learning and organizational innovation is not supported (see Table 6.3and Annex D.6).

Table 6.3 Bootstrap moderate analysis (control middle manager)

Model		coeff	P	LLCI	ULCI
DV: MOI	OIC	0.148	0.000	0.116	0.181
	OL	0.426	0.000	0.346	0.506
	OIC*OL	-0.005	0.011	-0.009	-0.001
	Middle	-0.425	0.303	-1.237	0.386
	R=0.797; R-sq=0.635; F=135.399; P<0.001				
	R2-chng=0.008, F=6.507, P=0.011				
DV: POI	OIC	0.154	0.000	0.126	0.183
	OL	0.347	0.000	0.276	0.417
	OIC*OL	-0.003	0.139	-0.006	0.001
	Middle	0.293	0.420	-0.421	1.006
	R=0.807; R-sq=0.652; F=145.390; P<0.001				
	R2-chng=0.003, F=2.201, P=0.139				
DV: TOI	OIC	0.172	0.000	0.148	0.196
	OL	0.167	0.000	0.107	0.227
	OIC*OL	-0.002	0.131	-0.005	0.001
	Middle	0.360	0.245	-0.248	0.967
	R=0.801; R-sq=0.642; F=139.633; P<0.001				
	R2-chng=0.003, F=2.298, P=0.131				
DV: OI	OIC	0.475	0	0.41	0.54
	OL	0.94	0	0.778	1.101
	OIC*OL	-0.01	0.014	-0.018	-0.002
	Middle	0.227	0.785	-1.413	1.867
	R=0.866; R-sq=0.750; F=233.813; P<0.001				
	R2-chng=0.005, F=6.095, P=0.014				
	OIC	Effect	p	LLCI	ULCI
	-15.451	1.092	0.000	0.893	1.291
	0.000	0.940	0.000	0.778	1.101
	15.451	0.788	0.000	0.582	0.993

6.1.2.3 Control top manager

Similarily, according to empirical results (see Table 6.4 and Annex D.7), the thesis finds that organizational innovative climate moderats the relationship of organizatioanl learing and managment innovation. In addition, oranizatioanl innovative climate does not significantly moderate the the relationship of organizational leaning and planning innovation (see Table 6.4) and technological innovation (see Table 6.4). Last but not least, the hypothesis that predicts organizational innovative climate positively moderates the relationship of organizational learning and organizational innovation (see Table 6.4 and Annex D.8) does not gain support.

Table 6.4 Bootstrap moderate analysis (control top manager)

Model		coeff	P	LLCI	ULCI
	OIC	0.148	0.000	0.115	0.18
	OL	0.426	0.000	0.346	0.505
	OIC*OL	-0.005	0.008	-0.009	-0.001
	Top	0.809	0.14	-0.266	1.884
DV: MOI	R=0.798; R-sq=0.637; F=136.170; P<0.001				
CV: top	R2-chng=0.008, F=7.188, P=0.008				
manager	OIC	Effect	p	LLCI	ULCI
	-15.451	0.508	0.000	0.409	0.606
	0.000	0.426	0.000	0.346	0.505
	15.451	0.344	0.000	0.242	0.445
	OIC	0.154	0.OO0	0.125	0.182
	OL	0.349	0.000	0.279	0.419
DV: POI	OIC*OL	-0.003	0.119	-0.006	0.001
CV:top	Top	0.357	0.459	-0.59	1.304
manager	R=0.807; R-sq=0.651; F=145.318; P<0.001				
	R2-chng=0.003, F=2.442, P=0.119				
	OIC	0.172	0.000	0.148	0.197
	OL	0.168	0.000	0.108	0.228
DV: TOI	OIC*OL	-0.002	0.147	-0.005	0.001
CV:top	Top	-0.268	0.514	-1.075	0.539
manager	R=0.801; R-sq=0.641; F=138.986; P<0.001				
	R2-chng=0.002, F=2.113, P=0.147				
	OIC	0.473	0.000	0.408	0.539
	OL	0.943	0.000	0.781	1.104
	OIC*OL	-0.010	0.011	-0.018	-0.002
	Top	0.898	0.417	-1.277	3.072
DV: OI	R=0.867; R-sq=0.751; F=234.400; P<0.001				
CV:top	R2-chng=0.005, F=6.480, P=0.011				
manager	OIC	Effect	p	LLCI	ULCI
	-15.451	1.100	0.000	0.901	1.299
	0.000	0.943	0.000	0.781	1.104
	15.451	0.785	0.000	0.580	0.990

6.2 Moderated mediation effect

Because the theoretical M2 constructed by the chapter three is the second-stage moderated mediation. Regression, mediation and moderation test demonstrate that (1) transformational leadership really impacts organizational innovation; (2) organizational learning significant mediates the relationship between transformational leadership and organizational innovation; (3) orgranizational innovative climate moderates the relationshio between organizational learning and organizational innovation. According to above findings, the second-stage moderated mediation model is formed. Transformational leadership (IV) has an indirect impact on organizational innovation (DV) through organizational learning (MV), and the strength of these indirect effects depends on the level of organizational innovative climate. This section

tests whether the medation effect will change when moderator is on the different level. Methodologically, this thesis employs bootstrap method (seting bootstrap=5000 and 95% confidence interval).

6.2.1 Moderated mediation test controlled ownership

The thesis plus standard derveration and minus standard derveration to get the higher and lower values of the moderator. If the confidence interval of the mediating effects exclude 0 when moderator is under different level, then the moderated mediating effect is significant.

Table 6.5 presents that the overall model is significant (R=0.867; R-sq=0.752; F=156.545; p<0.001) and then the interval of interaction excludes 0 and at three different levels, so moderation effect does exist. Nevertheless, the interval of the moderated mediation effect includes 0 (BootLLCI=-0.007; BootULCI=0.001), so moderated mediation does not exist. Therefore, the mediating effect of organizational learning on organizational innovation will not increase with the increasing effect of organizational innovative climate on organizational learning-organizational innovation.

Table 6.5 Moderated mediation test (controlled ownership)

Model		coeff	P	LLCI	ULCI
DV: OI CV: ownership	OL	0.858	0.000	0.664	1.052
	TL	0.063	0.123	-0.017	0.144
	OIC	0.462	0.000	0.395	0.529
	OL*OIC	-0.009	0.018	-0.017	-0.002
	SOE	-0.115	0.943	-3.269	3.039
	Private	0.262	0.852	-2.511	3.036
	R=0.867; R-sq=0.752; F=156.545; P<0.001				
DV: OL CV: ownership	TL	0.313	0.000	0.278	0.347
	SOE	-1.408	0.157	-3.360	0.544
	Private	-1.246	0.155	-2.966	0.474
	R=0.715; R-sq=0.512; F=109.015; P<0.001				
Conditional effect	OIC	Effect	BootSE	BootLLCI	BootULCI
OL	-15.451	0.314	0.064	0.196	0.443
OL	0.000	0.268	0.046	0.185	0.364
OL	15.451	0.222	0.047	0.135	0.316
Index of moderated mediation (controlled ownership)		Index	SE(Boot)	BootLLCI	BootULCI
	OL	-0.003	0.002	-0.007	0.001

6.2.2 Moderated mediation controlled level of staff

6.2.2.1 General staff

Table 6.6 presents that the overall model is significant (R=0.868; R-sq=0.753; F=188.795; p<0.001) and then shows that the interval of interaction excludes 0 and at three different levels, so moderation effect exists. Nevertheless, Table 6.6 shows the interval of the moderated

mediation effect includes 0 (BootLLCI=-0.007; BootULCI=0.001), so moderated mediation does not exist. Therefore, the mediating effect of organizational learning on organizational innovation will not increase with the increasing effect of organizational innovative climate on organizational learning-organizational innovation.

Table 6.6 Moderated mediation test (controlled general staff)

Model		coeff	P	LLCI	ULCI
DV: OI	OL	0.857	0.000	0.663	1.05
	TL	0.062	0.131	-0.019	0.143
	OIC	0.463	0.000	0.397	0.53
	OL*OIC	-0.01	0.016	-0.018	-0.002
	General	-0.598	0.45	-2.154	0.958
	R=0.868; R-sq=0.753; F=188.795; P<0.001				
DV: OL	TL	0.314	0.000	0.279	0.348
	General	0.015	0.976	-0.955	0.986
	R=0.713; R-sq=0.508; F=161.736; P<0.001				
Conditional effect	OIC	Effect	BootSE	BootLLCI	BootULCI
OL	-15.451	0.316	0.064	0.200	0.452
OL	0.000	0.269	0.047	0.188	0.372
OL	15.451	0.222	0.046	0.137	0.319
Index of moderated mediation		Index	SE(Boot)	BootLLCI	BootULCI
	OL	-0.003	0.002	-0.007	0.001

6.2.2.2 Middle staff

Similarly, Table 6.7 reveal that the overall model and moderaton model are significant although, the moderated model does not exist, for the interval includes 0 (BootLLCI=-0.007; BootULCI=0.001).

Table 6.7 Moderated mediation test (controlled middle manager)

Model		coeff	P	LLCI	ULCI
DV: OI	OL	0.856	0.000	0.662	1.049
	TL	0.063	0.122	-0.017	0.144
	OIC	0.463	0.000	0.397	0.530
	OL*OIC	-0.009	0.018	-0.017	-0.002
	Middle	0.190	0.820	-1.447	1.827
	R=0.867; R-sq=0.752; F=188.376; P<0.001				
DV: OL	TL	0.313	0.000	0.279	0.347
	Middle	0.227	0.663	-0.795	1.248
	R=0.713; R-sq=0.509; F=161.929; P<0.001				
Conditional effect	OIC	Effect	BootSE	BootLLCI	BootULCI
OL	-15.451	0.314	0.065	0.197	0.447
OL	0.000	0.268	0.047	0.185	0.372
OL	15.451	0.222	0.047	0.137	0.321
Index of moderated mediation		Index	SE(Boot)	BootLLCI	BootULCI
	OL	-0.003	0.002	-0.007	0.001

6.2.2.3 Top manager

For the same reseaon, Table 6.8 prove that moderated mediation does not exist (BootLLCI=-0.007; BootULCI=0.001).

Table 6.8 Moderated mediation test (controlled top manager)

Model		coeff	P	LLCI	ULCI
DV: OI	OL	0.860	0.000	0.666	1.053
	TL	0.062	0.128	-0.018	0.143
	OIC	0.462	0.000	0.396	0.529
	OL*OIC	-0.010	0.015	-0.018	-0.002
	Top	0.829	0.453	-1.342	3.001
	R=0.868; R-sq=0.753; F=188.790; P<0.001				
DV: OL	TL	0.314	0.000	0.280	0.348
	Top	-0.424	0.536	-1.771	0.924
	R=0.713; R-sq=0.509; F=162.124; P<0.001				
Conditional effect	OIC	Effect	BootSE	BootLLCI	BootULCI
OL	-15.451	0.317	0.064	0.203	0.451
OL	0.000	0.270	0.046	0.189	0.370
OL	15.451	0.222	0.048	0.136	0.320
Index of moderated mediation		Index	SE(Boot)	BootLLCI	BootULCI
(controlled top manager)	OL	-0.003	0.002	-0.007	0.001

6.3 Conclusion

This chapter uses the bootstrap method to exainmine the hypotheses (M2) that we proposed in chapter 3. According to the empirical test results, several findings can be drew. First, the organizational innovative climate has a moderating role between organizational learning and organizational innovation (management innovation). However, organizational innovative climate has an interference interaction effect on organizational learning and organizational innvation (management innovation). Thereafter, based on above findings, the moderated mediation effect is not significantly supported. In a conclusion, H5 and H5a fails to be verified.

The operation of an enterprise is a dynamic cycle and complex changing system. The organizational innovative climate is the subjective norms and manifestations of objective environmental factors in the organization in the specific context of innovative activities. Supervisory norms will have an impact on behavioral intentions, and behavioral intentions are the result of the behavior subject's expression of the behavior to be carried out. In a rapidly changing market environment, appropriate and continuous organizational learning is the main strategy for companies to build learning organizations (Kumar et al., 2021) and promote the career development of corporate employees, and the innovative capabilities and information exploration capabilities of the corporate organization will provide support for the innovative development of the company. The results in section 6.1 show that the moderating effect of the organizational innovative climate between organizational learning and organizational innovation is an interfere moderation. As the degree of organizational innovative climate increases, the positive impact of organizational learning on organizational innovation gradually

weakens. The reason for this phenomenon may be that, for companies, an appropriate organizational innovative climate can stimulate employees' sense of innovation and encourage employees to generate new ideas and try new things. However, there is a saying in philosophy that no good thing last forever. When things develop to the extreme, they will change in the opposite direction. Excessive encouragement of innovation can also cause market blockages for enterprises. Blind innovation in technology or over-innovation will make product improvement and optimization no longer have a positive correlation with market demand, leading to technological surplus in the industry, making it difficult for products to obtain optimal economic effects in the market.

Chapter 7: Transformational Leadership and Ogranizational Performance: Structural Equation Modeling

Chapter six has empirically tested the theoretical model M2 in Chapter three and revealed the mediation and moderation mechaism of interaction. Nevertheless, the relationship between transformational leadership and organizational performance has remained unknown. The chapter focuses on transformational leadership and organizational performance. Structural equation modeling (SME) has advantage in simultaneously processing multiple dependent variables, compared to normal regression model. Therefore, the chapter makes use of SME to test M3 which includes transforamtional leadership (idealized influence, inspiration motivation, individulized consideration and moral modeling), organizational learning, organizational innovation (management innovation, planning innovation and technological innovation) and organizational performance (operating performance and financial performance).

7.1 Structural equation modeling

This section builds a structural equation model based on Chapter three (see Figure 3.1). Structural equation model is a widely-used statistical method which based on the covariance matrix of variables to investigate, establish, estimate and test the causal relationship model, also known as covariance analysis. Compared with traditional analysis methods, structural equation modeling integrates factor analysis and path analysis, and can analyze the relationship between multiple independent variables and dependent variables at the same time. Therefore, this section adopts the structural equation model, and further analyzes the various variables by constructing a structural equation model between the four dimensions of transformational leadership (TL), organizational learning (OL), organizational innovation (OI), and organizational performance (OP) and analyze the impact of the above variables on organizational performance.

Figure 7.1 reports the fit results of the model 3 by AMOS. The Chi-square and degrees of freedom of overall model is 80.494 and 31, respectively. It can be found from Figure 7.1 that the standardized regression coefficients of transformational leadership for organizational learning and organizational innovation are 0.78 ($p< 0.001$) and 0.30 ($p< 0.001$), respectively. The

standardized regression coefficients of organizational learning for organizational innovation and organizational performance are 0.56 (p<0.001) and -0.15 (p=0.074>0.05), respectively. Hence, the direct effect of organizational learning on organizational performance was not significant. The regression coefficient of organizational innovation for organizational performance is 0.82 (p< 0.001).

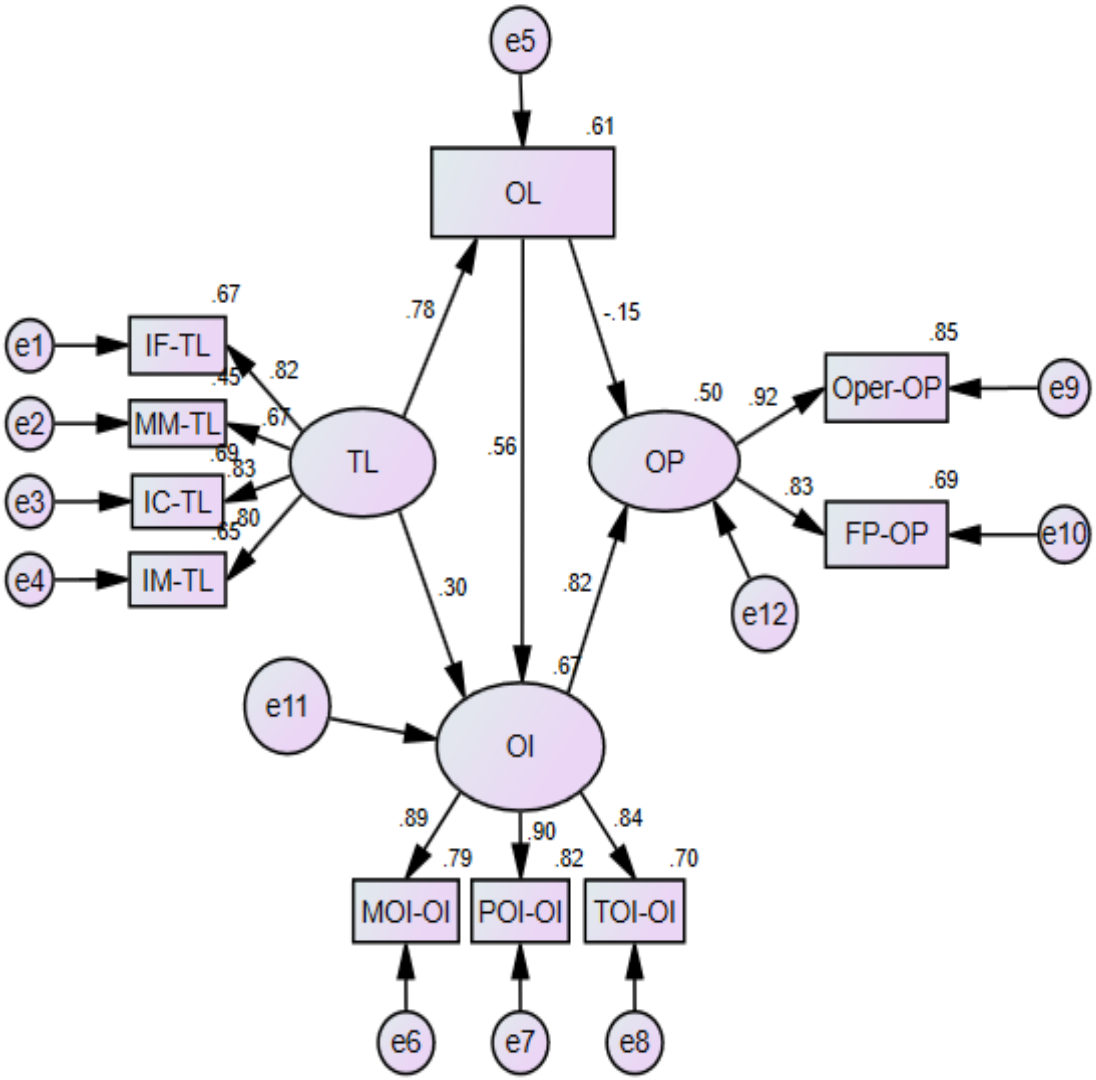

Figure 7.1 Structural equation modeling test

It is generally considered that the value of χ^2/df should be between 2 and 5. The χ^2/df is 2.597, which means the model is acceptable. Steiger and Lind (1980) proposed root-mean-square error of approximation (RMSEA) index and argued that RMSEA below 0.1 indicates a good fit; below 0.05 indicates a very good fit and below 0.01 indicates an excellent fit. The RMSEA of the model M3 in this thesis is 0.071, which is a good fit. Bentler and Bonett

(1980) proposed a non-normed fitting index (NNFI) and because NNFI exceed the range of 0 to 1 due to sample fluctuations, they further proposed a norm-fit index NFI ranging from 0 (worst fit) to 1 (best fit). The NFI of the model is 0.965, indicating a good fit index. Kano et al. (1990) proposed a comparative fitting index (CFI), which mainly reflects the comparative fitness between the model to be tested and the model whose variables are fully constrained. If CFI>0.9, the model is acceptable. The CFI of the model is 0.978, indicating a good fit.

The model fit indicators reporeted above briefly imply that the structural equation model highly interpretates of the data, and the difference between the model and the data is small, and the validity of the model is fully verified.

Table 7.1 shows the path coefficients. It can also be found that first, the transformational leadership has a positive impact on organizational learning (TL--->OL, β= 1.661, p<0.001) and organizational innovation (TL--->OI, β=0.373, p<0.001). Secondly, organizational learning has a positive impact on organizational innovation (OL--->OI, β=0.324, p<0.001), however, the path coefficient of organizational learning to organizational performance is not significant (OL--->OP, β=-0.135, p>0.05). Third, organizational innovation has a positive impact on organizational performance (OI--->OP).

Table 7.1 Regression Weights

	Estimate	S.E.	C.R.	P
TL--->OL	1.661	0.111	14.978	***
TL--->OI	0.373	0.089	4.195	***
OL--->OI	0.324	0.04	8.028	***
OL--->OP	-0.135	0.075	-1.786	0.074
OI--->OP	1.273	0.144	8.837	***
TL--->IC	1.158	0.072	16.116	***
TL--->MM	1.275	0.103	12.437	***
TL--->IF	0.991	0.062	15.906	***
OP--->FP	0.464	0.031	15.145	***
OI--->POT	1.287	0.063	20.561	***
OI--->MOT	1.407	0.07	20.04	***

7.2 Conclusion

This chapter examined the theoretical model 3 (M3) of chapter three through AMOS. According to empirical results, some findings can be summaried: first, the path for organizational learning to organizational performance is not significant. However, firm-level learning has a positive impact on firm-level innovation, and firm-level innovation has a positive impact on firm-level performance. Therefore, firm-level learning indirectly affects firm-level performance through corporate innovation. In other words, the H6 (firm-level learning

positively impact firm-level performance) is not validated, while the H7 (firm-level innovation positively impacts firm-level performance) is supported.

Taken tegther (results in Table 7.1), although the direct effect of firm-level learning on corporate performance is not significant, organizational learning can ultimately have a positive impact on firm-level performance through firm-level innovation. In the process of continuous innovation and acquisition of enterprises, organizational learning is a key factor in promoting organizational performance (Thoumrungroje, 2015). In addition, organizational learning requires a process of recognition and processing for knowledge processing, transformation, and re-creation, and the result-oriented manifestation of this process is the innovation output of the organization. Through organizational learning, companies can learn about the utilization of existing resources, promote the technological improvement of products, and promote the gradual innovation of products, thereby promoting the steady growth of organizational performance. At the same time, through organizational learning, enterprises can also explore the resources needed for future discoveries, which is very beneficial for the new product research and development, expansion of technical fields, creating new demands for the market, and opening up new product markets. Organizational innovation can promote the opening of new technologies, new products, and the expansion of new business areas. The increase in corporate innovation output will have a positive impact on the growth of corporate long-term profits.

Chapter 8: Transformational Leadership and Ogranizational Innovation and Change: A Case Study of CRUN

8.1 Brief introduction of the case

This thesis selects CRUN as a representative enterprise for case study, for the following reasons. First, CRUN is a general equipment manufacturing enterprise, bulit in September 1997, and became the a listed company in September 2008 (stock code: 002272). It has 9 shareholding companies, mainly engaged in R&D, production and sale of lubricating hydraulic equipment and its integrated systems. Second, CRUN has the China's largest production base of hydraulic lubrication fluid equipment, and builds five business systems: lubrication system, cooling system, high-end cylinder, intelligent control and intelligent operation and maintenance. CRUN has a major lubrication hydraulic technology equipment laboratory and has established a European R&D center, a North American service center and several domestic research centers to provide quality products and expert services to customers around the world. Third, in 2018, the board of directors of CRUN proposed the business strategy of "being strategically focus", concentrated on major business, increased and diversified prodcut R&D inputs and upgraded product.

8.2 Case data collection

To verify the therorecticl model, this chapter tries to use the typical private listed company (CRUN) as a case study object. In the field of mechanical industry products, lubrication and hydraulic equipment have basic component characteristics. At present, western countries like United States, Japan, Germany donminated the high-end technology in the industrial powers. About 60% of domestic high-end products rely on imports. The domestic hydraulic lubrication industry has a short development time and low industrial concentration. Most enterprises are small in scale and lack of independent innovation capability; most hydraulic products are at the low end of the value chain, and R&D investment accounts for less than 3% of sales; product concentration and brand influence are weak. Only few companies have high-end products and high technical capabilities. CRUN is the leader in the domestic hydraulic lubrication industry

and is the only listed company in the lubrication industry in China. The company's service capabilities and R&D investment are at the forefront of the industry.

In terms of data collection, CRUN public data is very sufficient, which is conducive to the acquisition and mutual verification of diverse data resources. At the same time, the research team also obtained first-hand data through field research, questionnaires. Throungh inductive analysis of interviews and texts data, the study identifies and extracts common constructs from a large number of qualitative data. Then public data such as interview, internal publications, and media reports is conducted to triangulation-validation analysis.

8.3 Case analysis

8.3.1 Background of CRUN

As the only listed company in the lubrication industry in China, CRUN is committed to becoming a "global fluid control technology leader". At the beginning of the business, the company was deeply aware of the importance of organizational leadership management to independent innovation. From gear oil pump to fluid system and digital control equipment, from power generation boiler parts processing to distributed power station overall solution, CRUN has completed the first domestic 10,000 tons of large-scale cement vertical grinding fluid lubrication equipment, the first UHV transmission and distribution and the first set of 450,000 tons of synthetic ammonia heat exchanger have successfully solved a number of national key projects and scientific research projects. From a manufacturer of hydraulic lubrication equipment accessories, Chuanrun has an innovative research and development platform with academician expert workstations, high-tech enterprises and provincial enterprise technology centers. As a national standard setter for lubrication systems, it has compiled the Mechanical Lubrication Design Manual and Set, with more than 80 valid patents, more than 50 patents are being filed. Throughout the development of CRUN, we have found that transformational leadership has an important impact on the innovation and development of enterprises. At the beginning of CRUN's founding: The company always puts the employees' sense of innovation in the first place of enterprise development; through continuous independent innovation and technological innovation, the company's business is promoted from simplification to diversified cross-border operation.

8.3.1.1 Transformational leadership of CRUN

In 2018, the board of directors of CRUN first proposed the strategic transformation and upgrading direction “be strategically focus”. CRUN has developed a high-end development route for fluid technology and extended it to the industrial service sector. Luo Yongzhong, chairman of the board of directors, said that CRUN should actively deploy high-end industries, focusing on establishment of R&D and marketing platforms. A combination of independent R&D, cooperative introduction, and cooperative development, CRUN builds key laboratories, strengthens cooperation between industry, universities and research institutes, and achieves complementary resources. At the same time, CRUN’s business development direction is oriented to the fields of energy conservation, environmental protection and new energy, aiming for being the promoters and leaders in the field of energy technology.

(1) Focuse on customers and expanding product market. First, the company strengthens cooperation with international customers such as GE and ANDRITZ, expands overseas customers, and accelerates the process of internationalization. Second, it cultivates quality customers and creates customer value. Third, it also develops service market, improves product services by the use of consumer data, increase high value-added services. Fourth, relying on core equipment and core technology, it actively provides customers with core high-end equipment, system solutions, engineering services, operation and maintenance services, financial investment and to improve customer adhesiveness.

(2) Optimize organizational structure and serve customers. First, focus on customer value-added, the company builds four platforms namely technology marketing, production delivery, financial management and strategic investment. Second, the company establishes independent business divisions to provide customers with accurate and efficient services and products.

(3) Strengthen R&D and innovate technology development path. The company, at first, increases investment in product innovation, cooperates with other market actors on technologies extensively for collaborative innovation, and reduce R&D costs and risks. Secondly, it builds a new R&D platform, a learning organization, actively promotes employees to participate in product innovation, and effectively promotes firm’s core technology capabilities. Finally, it strengthens the purposeful technical cooperation between scientific research institutions, universities and companies, pays attention to the needs of leading users, and continuously improves the technological and product innovation.

(4) Improve quality and delivery capability. The company adheres to the concept of the

ultimate product quality, pursues excellence, establishs a product production and delivery center, vigorously promotes agile manufacturing, lean management, pays close attention to product quality and implementation, improves product delivery capacity, product inventory management level, and reduces enterprise operating costs.

(5) Strengthen innovation management and exquisite operation. First, the company optimizes information management, gradually realizes industrialization 4.0, improves operational production efficiency, and reduces internal operation management costs; second, the company deepens company institution innovation and management innovation, and realizes value sharing; third, the company optimizes human resources, actively introduces excellent talents, increases the knowledge and internationalization of young managers, continues to implement decentralization, further achieves flat management.

(6) increase economic scale with internal and external linkage. focusing on energy conservation, the company deepens the company's brand image and asset management, actively explores the company's new development model, and enhances the company's efficiency scale.

8.3.1.2 Organizational change of CRUN

First, CRUN has developed a variety of formal and informal institutions that encourage employees to actively innovate. At the enterprise level, CRUN has made the Best Practice Management System and the Scientific and Technological Progress Award were formulated, and these regulations were adopted to encourage employees to carry out technological innovation and management innovation. At the team level, there are also some informal institutions to encourage members to innovate. For example, if the department reduce 30% cost and then can apply for rewards.

Then, CRUN clarifies the guidelines for each functional team. (1) sales team. CRUN fully investigates the market and customer needs and insists on understanding and verifies it from multiple channels, and guarantee no misunderstanding. CRUN pays attention to customer communication and business details and technical details. CRUN establishes customer profile information, summarizes sales skills, sales standards, and continuously improves marketing. (2) R&D team. The R&D team makes full use of design calculations, experimental verification, technical process review and other methods to demonstrate technical solutions, and do not subjectively make the conclusions. The technical drawing is global and forward-looking, reducing the error rate. Continuously summarizing the sharing of technical methods, refining work standards and requirements, improving product standardization rate, and not leaving any

technical details in the design process. R&D analyzes technical improvement suggestions from customers, sales teams, and production teams, actively pursues excellence. (3) production-delivery team. The team scientifically and rationally arranges production plans, material demand plans, procurement plans, multi-channel procurement sources, and explores cost-effective raw and auxiliary materials. The team also standardizes production process requirements, pays attention to safe production and material saving, reduce waste in production, and reduce the production of defective products. (4) Functional support team. The team continuously improves their business capabilities and service levels to business units, accepts the suggestions from the business department, responds quickly to the needs and then actively solve the problem. Everything in response to the needs ahead of the service is the starting point for work. (5) Management team. The team goes deep into the front line, listens carefully to the work information and appeals of the team members, accepts the suggestions and mistakes made by the subordinates humbly, and importantly admits and corrects mistakes.

8.3.1.3 Organizational learning of CRUN

Talent strategy is the enterprise development strategy that CRUN has always adhered to. CRUN has established a number of measures such as Management For Employee Benefit, Compensation Management, Internal Trainer Management, Human Resources Management Guidelines and Performance Management Assessment to encourage employees to innovate and self-improve. CRUN firmly believes that the way to accelerate the growth of the company is to develop together with the employees. Through investing in talents, cultivating talents, and creating talents, the company will plow the market in all aspects of the entire industry chain to ensure to provide customers with more high-quality and accurate products and services.

(1) The company actively establishes innovative talent teams, and fully takes advantage of leading role of team leader in technology. Through in-depth investigation of worker at the production line, the team collects technical problems, establishes a database of independent core R&D data, conduct training course of R&D researchers, builds learning opportunities with industry leading experts, and achieves innovative talent training. For example, in 2016, the problem that how to deal with sludge made Li Junlin teams struggling in the Sewage Treatment Project. With the help of the company's innovative talent leadership team, the team of experts in wastewater treatment was introduced, and the Li Junlin team finally completed the sludge treatment system. This system can turn the sludge into a microbial-rich planting soil for environmental protection, which has made outstanding contributions to agriculture.

(2) The company establishes an Internal Trainer Plan through which aims to upgrade

internal employees, and establish a learning organization. The implementation of the elite talent development strategy selecting the backbone of the business, integrate the corporate culture and spirit into their own curriculum, using systematic ideas to help the professional skills of employees. In the training, the employees will rely on the advantages of CRUN resources to receive systematic professional training; and the internal trainers will also stimulate their own creativity to achieve optimal allocation of management, industry and talent resources. As far as corporate development is concerned, the internal trainer plan will have a positive impact on the CRUN talent strategy and then on achieving the goals and requirements of the new era.

8.3.1.4 Innovative cliamte of CRUN

In terms of innovative climate, CRUN is committed to intelligent, safe and efficient fluid control technology, determined to become a industry leader, and to take the industry's technological innovation progress as the mission, to become a favorite brand, an innovative and respected company. Innovation is the soul of the progress of human society, and it is also a true portrayal of CRUN employees who not trapped in the status quo, brave to challenge, and constantly developing and growing. Innovation makes CRUN employees often have a sense of urgency, staying at risk and forging ahead. It enables CRUN people to constantly surpass and improve themselves, achieve excellence, and realize the lofty vision of becoming a global leader in fluid control technology, and harmonize the relationship between human and nature.

CRUN is committed to customers-oriented, truth-seeking, open-minded, and win-win cooperation. The company is customer-oriented, market-oriented, and through continuous technological innovation, service improvement, product optimization and TQC refinement to understand market trends, respond quickly to customer needs, provide customers with quality and efficient products and services, create customers' value. In the enterprise, the company adheres to the principle of solving the problem first, providing customers with "exceeding expectations" and cooperation, and achieving coordination and cooperation between departments. With the pursuit of corporate quality, product quality, the company maintains and promotes the spirit of craftsmanship, and constantly enriches and improve themselves. With an open mind, the company actively explores, learns, introduces advanced technologies and management experiences, and realizes technological innovation, operational efficiency, and management efficiency changes in a manner to enhance competitiveness. In the spirit of open-mindedness and cooperation, the company work for mutual benefit and common progress to achieve customer value, lead the industry innovation and development, to promote the ecological development of supply chain, to achieve employee growth and improve

stakeholder's capital efficiency.

8.3.2 Case discussion

Dynamic market changes brings new challenges to enterprise innovation. Through transformational leadership, CRUN effectively promotes enterprise organizational change and technological innovation, enables the company to be a learning organization, stimulates employees' innovation vitality, promotes organizational innovation, and improves organizational performance.

8.3.2.1 Transformational leadership and organizational innovation

Transformational leadership improves organizational innovation and team outputs. For example, bacground information in 8.3.1.1 tells that the director board of CRUN constructed a "strategic focus and business refocus" policy and then has formulated the development route of firm's technological innovation to promote the business expansion. At the same time, through the promotion of industry-university-research cooperation, CRUN creates a technological innovation platform. Based on the needs of business development, CRUN constantly promotes the dynamic adjustment of enterprise organizational structure, which lays a good foundation for enterprises to continuously obtain sustainable development advantages in the market competition.

Through case information analysis, we found that, first, CRUN's transformational leadership effectively improves the team's cognitive level and enhances the team's innovation ability. CRUN's transformational leadership help the firm establish a common belief in accomplishing specific tasks and goals in the organization through collective effectiveness. For example, through the board of directors, CRUN conveys the signal of promoting organizational innovation and change to all organizational departments and employees of the enterprise, and promotes the combination of the internal development mode and the change of market demand, so as to improve the collective efficacy, effectively stimulate the innovation and change of enterprise members, and promote the renewal of organizational structure. Thus, the whole enterprise is more willing to carry out organizational process upgrading, technological innovation and management innovation through new perspectives and new methods.

Second, CRUN's transformational leadership improves its' innovation by building a team interaction mechanism. Transformational leaders at one hand establish an effective path of organizational interaction, and timely transmit and share ideas, suggestions and other information about organizational goals to the organization. At other hand, transformational

leadership motivates employees to perform better in their work. CRUN through optimizing the organizational structure, established a customer value-added oriented platform model, reshaped the enterprise department structure, and usually combined the work role of employees with the enterprise's future innovation and development path. It effectively promotes the resource sharing among enterprises, breaks the organizational boundaries between internal departments, promotes the explicit and implicit knowledge sharing among departments, promotes the mutual learning among employees, stimulates the internal incentive potential and enthusiasm of employees to participate in knowledge creation, improves the self-efficacy level of employees, and further enhances the creativity.

Third, transformational leadership effectively promotes the innovation of organizational structure and management system. CRUN's technology and information technology has gradually realized industrialization 4.0, has reduced internal operating costs, and realized intensive and decentralized management. At present, the market development environment of enterprises in the field of manufacturing industry has become more open, more diverse and more changeable. In the dynamic competitive market environment, the internal management reform of enterprises is more complex and diversified. Transformational leadership can effectively promote the ability of enterprises to cope with market changes. Through the optimization and integration of enterprise resource elements, CRUN can take more efficient and effective measures, more flexible management mode, to establish quick response mechanism, break the path-dependence inertia, improve firm's ability to deal with the uncertain changes of the external market, timely analyze, identify and obtain user needs, and carry out dynamic and flexible management according to market changes and user needs, so as to provide more efficient solutions for customers and create more value.

8.3.2.2 Transformational leadership and organizational change

At present, firm's production and operation are always faced with the dynamic changes of the environment. In order to enhance the production and sustainable development of enterprises in the uncertain environment, firm's organization and management need to become more adaptive, flexible and creative. It is very important for enterprises to obtain sustainable competitive advantage by promoting organizational innovation through organizational change. The transformational leadership can just right help a firm directly promotes the management reform and innovation.

Through case information (in 8.3.1.2) analysis, we found that CRUN's transformational leadership can promote the integration of internal and external resources. Through the

establishment of various formal and informal management systems, CRUN clarifies the division of responsibilities of the team, creatively identifies problems, clarifies problems, analyzes problems and outputs solutions to problems, and reshapes the whole process of knowledge creation, process management, service innovation and industrialization in the process of enterprise management.

Second, we found that CRUN's transformational leadership can effectively promote organizational change, so as to enhance the adaptability and flexablitiy to the market. From the perspective of CRUN's change, CRUN's enterprise executives (the boards) are the leading force to promote organizational change and process reengineering to a large extent, so that the organizational structure, organizational philosophy, organizational culture, and organizational operation mode can effectively adapt to the changes of the external market environment. It effectively guarantees the smooth and orderly progress of the enterprise's organizational change, and avoids the adverse factors that may appear in the organizational change for the development of the enterprise.

8.3.2.3 Transformational leadership and organizational leanring

"Development is the first priority, talent is the first resource, and innovation is the first driving force." The previous empirical analysis also shows that organizational learning is the mediating variable between transformational leadership and organizational innovation. Transformational leadership promotes enterprise employees to actively participate in the collective decision-making, technological innovation and operation management activities of the enterprise, so that the enterprise can quickly set up a team, and make the goal of the team more directional, which is conducive to building a learning organization and promoting more innovation output of the enterprise. A leanring CRUN (in the section 8.3.1.3) creates a good development environment of "respecting knowledge, talents and innovation" within the enterprise by constructing the enterprise's talent development strategy, innovatively establishing "innovative talent group", promoting the implementation of "internal trainer plan", and mobilizing the enthusiasm and initiative of enterprise employees to participate in organizational innovation.

Thus, through case data processing, we found that CRUN's transformational leadership can promote firm's exploratory and exploitative learning. For example, in the process of technological innovation, CRUN once faced the problem of sewage treatment. At that time, the project team did not have the relevant knowledge of the sewage treatment, and with the help of the enterprise's innovative talent leading group, it finally promoted the solution of the sewage

treatment by introducing external experts. From the process of dealing with this problem, we can find that when CRUN needs to explore and innovate in new business areas, transformational leadership can effectively help enterprise employees search, identify and acquire new knowledge, and promote the absorption, digestion and re-innovation of new knowledge within the enterprise, so as to realize the continuous expansion and improvement in the field of technology. The internal trainer plan established by CRUN also effectively help enterprise employees to learn the knowledge of existing business areas, promote enterprise employees to deepen the application and secondary innovation of existing resources within the organization, and ensure the business stability of the enterprise.

Second, we found that CRUN's transformational leadership help establish the concept of organizational learning. Talent strategy as a long lasting development stratrgy of CRUN has established the concept of building a learning organization in the enterprise, promoted the resource learning, exchange and information sharing in the organization, and effectively stimulated the innovation vitality of talents, through the introduction, cultivation, incentive and use of enterprise technical talents. At the same time, transformational leadership can help CRUN break away from the traditional inertia of organizational thinking, get rid of organizational path dependence, encourage enterprise members to question the existing path and thinking, actively participate in organizational learning and enterprise innovation activities through business work process, and continuously improve the ability of finding and solving problems in the process of learning and participating in innovation.

8.3.2.4 Transformational leadership and organizational innovative climate

Transformational leadership can reshape the working environment of organizational innovation. Generally speaking, transformational leadership is regarded as the value transmitter of openness, tolerance and co-creation. From the perspective of CRUN's organizational innovation climate, transformational leadership can create an organizational atmosphere that encourages innovation and tolerates failure, and then effectively stimulate the internal innovation motivation and independent innovation motivation of employees. For example, CRUN is committed to intelligent, safe and efficient fluid control technology, customer-oriented, and market-oriented. It constantly creates value for customers and realizes customer value-added. At the same time, the concept of "problem-solving first" and the mechanism of tolerating innovation failure are set up in the enterprise, which constantly improves the innovation self-efficacy of enterprise employees.

Through case data analysis, we first found tha CRUN's transformational leadership can

create a working atmosphere and environment to encourage innovation. Transformational leadership effectively creates a good development environment, such as management authorization, resource guarantee, innovation support, performance incentive, which can affect the work attitude, values and beliefs of employees and stimulate their innovation potential. At the same time, CRUN's transformational leadership optimizes the organizational structure, promotes the enterprise from bureaucracy to flat management, promotes decision-making efficiency, promotes the rapid spread of information, and reduces the uncertainty of work. It is easier to stimulate the innovation consciousness of enterprise employees, and promote the transformation of innovative ideas according to scientific and effective working methods, which is conducive to organizational innovation.

Second, we found that CRUN's transformational leadership plays an important role in the sustainable development of innovation climate. In the Chinese context, transformational leadership includes such dimensions as charisma of leadership, exemplary morality, personalized care, and vision motivation. Transformational leadership show firm's the attitude to help employees develop themselves and to support their innovative behavior, encourages innovation and intellectual stimulation, and solves the problems existing in the process of enterprise development with innovative methods and ideas. In addition, in the CRUN's process of technology development, the boards has established an organizational culture with reform and innovation, constantly bringing forth new ideas, so as to enhance the innovation consciousness, team cohesion and create a pleasant innovation environment.

8.4 Case conclusions

On the way to be a global leader in fluid control technology, CRUN adheres to a high sense of ownership and responsibility, builds harmonious labor relations, and promotes the reform of the industrial workers' team. After ten years of listing, CRUN proposes a strategic transformation policy, namely "strategic focus", and maintains the core business, and promotes the business operations to extend horizontal and vertical industrial services. The industrial chain layout has been strengthened, and the sustainable competitive advantage and ecological advantages of the company have been improved. Transformational leadership plays an important role in organizational innovation and change in the process of enterprise development. Transformational leaders have exemplary effect, personalized care, and the responsibility. They can fully stimulate the sense of ownership of employees, promote their courage to undertake work responsibilities, and promote the continuous innovation and development of the

organization. At the same time, for private enterprises, the top manager's awareness, market insight, and strategic direction of decision-making play a crucial role in the enterprise.

Chapter 9: Conclusion and Implication

This thesis focuses on transformation leadership, organizational innovation and organizational performance and forms 8 chapters. Chapter 1 analyzes the theoretical and practical background, proposes the research questions, and clearly provide the research design and research contents.

Based on extensive literature review and bibliometric analysis, the thesis systematically reviews relevant literatures in chapter two, namely research status and dynamics of transformational leadership, organizational learning, organizational innovation, organizational innovative climate and organizational performance. Then, the thesis summaries the previous research findings which lay a solid foundation for subsequent hypotheses and finds out research gaps. Furthermore, the thesis develop three research models and 8 corresponding hypothese. The thesis describes how to designs survey items, collect sample data, case data and process data in chapter four. Thus, the thesis presents the empirical results of mediation effect of transformational leadership, organizational learning and organizational innovation with help of hierarchical regression with bootstrap in chapter five, the results of moderated mediation effect in chapter six and the results of structural equation modeling in chapter seven. Next, the thesis takes CRUN company as an example to conduct a case study of the transformational leadership and organizational innovation, organizational change in chapter eight. Finally, this chapter refines and summarizes the major results, theoretical contribution, managemerial implications, limitations and future prospects.

9.1 Major conclusions

For the purpose of improving the enterprise's ability to respond to organizational innovation and change, this thesis explores the core issue: how does the TMT (top management team) break the rigidity, achieve organizational innovation and improve organizational performance. This thesis closely follows the idea of combining qualitative and quantitative research, and designs an empirical study and case study based on a large sample survey. The following three questions are gradually studied and analyzed.

What impact does transformational leadership have on organizational innovation? In the Chinese context, what are the differences between managerial transformational leadership and the West?

2. What's the medation mechansim for transformational leadership exerting impacts on ogranizational innovation? How does organizational innnovative climate moderate the relationship between organizational learning and organizational innovation?

3. How does transformational leadership affect organizational performance? What's the dynamic relationship betweem transformational leadership, organizational learning, ogranizational innovation and ogranizational performance?

It has studied how to improve the frontier issues of firm's innovation ability and performance through the integrative model, including transformational leadership, organizational learning, organizational innovative climate, and organizational performance. To be more specific, we first constrcuted a mediation effect model to explore the mediating role of organizational learning in the relationship of transformational leadership and ogranizational innovation. Based on this mediation model, we further constructed a moderated medation model to explore whethere the mediation mechanism of organizational learning on the relationship of transformational leadership and organizational learning will be moderated by organizational innovative climate. Then, we constructed a structural equation model to analyze the interaction between transformational leadership, organizational innovation and organizational change of Chinese private enterprises based on a dynamic change environment. In addition, we further analyze how different enterprise ownership and job types affect organizational innovation and organizational change. Our research framework balanced the development of ogrnizational innovation and organizational change, promoted the continuous improvement of the sustainable innovation ability and competitiveness of the enterprise. The research conclusions have also enriched the theory and practice of organizational governance and organizational innovation management. In addition, on the basis of theoretical and model analysis, we select a typical case compan, namely CRUN, for case studies, and explore the specific practices of transformational leadership, organizational innovation and change in the actual process of the company. The results of the study can be used as a reference for business management organizational innovation and organizational change. It also provides significant practical guidance and strategic reference for the corporate governance and innovation management. This research empirically examines the research hypotheses, H1, H2, H3, H4, H5, H5a, H6, and H7.

H1: Transformational leadership has a positive impact on organizational innovation.

H2: Transformational leadership has positive impact on organizational learning.

H3: Organizational learning has a positive impact on organizational innovation.

H4: Organizational learning mediates the positive relationship between transformational

leadership and organizational innovation.

H5: Organizational innovative climate will moderate the indirect relationship between organizational learning and organizational innovation, namely, when organizational innovative climate is lower, the positive relationship between organizational learning and organizational innovation is weakened.

H5a: when organizational innovative climate increases, the positive mediation effect of organizational learning on the relationship of transformational leadership and organizational innovation will be stronger. Otherwise, when organizational innovative climate decreases, the mediation effect of organizational learning on the relationship of transformational leadership and organizational innovation will be weaker.

H6: Organizational learning has a positive impact on organizational performance.

H7: Organizational innovation has a positive impact on organizational performance.

Taken together, the empirical results show that H1, H2, H3, H4, and H7 are all verified, while hypotheses H5, H5a, and H6 are not supported.

9.1.1 Impacts of transformational leadership on organizational learning

Our findings further demonstrate that transformational leadership has a positive and significant impact on organizational innovation. Transformational leadership strengthens organizational innovation and increases awareness of organizational innovation (Gumusluoglu & Ilsev, 2009; Zuraik & Kelly, 2019). Idealized influene, individualized consideration and inspirational motivation of Chinese managers are critical to organizational innovation. By promoting innovative ideas in the organization, leaders motivate followers to use innovative methods to solve innovative problems in their work (Farahnak et al., 2020). Moreover, the manager's personal strong willingness to innovate and the pursuit of enterprise technology innovation reflects the manager's support behavior for organizational innovation, which can better support the innovation activities across functions. In Chinese context, individualized consideration also has a significant impact on management innovation and technological innovation (Yang et al., 2021). This is because individualized consideration can reduce the power distance between leaders and members of the organization, effectively promote trust and cooperation among members, provide cooperation and social support, and then generate corresponding regulatory power, which is good for collaborative governance. Moreover, mutual respect, trust, and close interaction between leaders and members are conducive to the formation of long-term, stable cooperation dependence, organizational identity and network practices, and to the sharing and

diffusion of explicit or implicit resources among members, and then achieve collaborative innovation and organizational change (Li & Yeh, 2017).

9.1.2 Mediating role of ogranizational learning

Like previous studies (Berson et al., 2006; Watad, 2019), this thesis also suggests organizational learning is the foundation for the organization to continuously achieve sustainable innovation (Bolaji Bello & Adeoye, 2018; Sutanto, 2017), and it is also an important way for enterprises to acquire and accumulate innovative resources. Organizational learning can improve the efficiency of the explicit or implicit knowledge resources among organizational members, achieve creative collaboration, greatly improve the fit of innovation and cooperation among members, reduce cognitive bias, and promote the generation of new resources and technologies so as to enhance innovation capabilities (Villar-López & Camisón, 2014). Resource-based view suggests that competitive innovative advantage of an enterprise stems from the possession of knowledge, skills, resources and core competencies that are difficult to imitate (Alexy et al., 2018; Wernerfelt, 1984). The long-term competitive advantage and the construction of innovative advantages need to be completed through organizational learning (Saadat & Saadat, 2016), such as, developing and learning new capabilities, strengthening existing capabilities. In addition, firms must be brave enough to break organizational ridility and resource boundaries (Chadwick & Raver, 2015), and overstep their tangible networks and intangible networks, and that has been a unanimous choice for firms to caputure comlementary resource, and then achieve ecological advantages.

9.1.3 Moderating role of ogranizational innovative climate

Furthermore, our findings show that the positive moderating role of organizational innovative climate between organizational learning and organizational innovation has not been verified, however, our findings show that organizational innovative climate can directly and significantly affect organizational innovation. Since a good organizational innovation atmosphere can create an organizational atmosphere of mutual respect and trust (Ehrhart et al., 2013), it plays a direct and active role in promoting the innovation and creation of organizational members (Newman et al., 2020). A good organizational innovative climate is conducive to the establishment of organizational identity and overall organizational values, and can effectively promote the sharing and transfer of organizational knowledge, as well as the collaboration and cooperation of innovation tasks among organizational members (Jaiswal &

Dhar, 2015). At the same time, the organizational innovative climate can also contribute to the collective vision and perception of identity that can generate the organization's common language and psychological support, promote open communication among organization members, reduce the power distance of the organization (Lian et al., 2013) and exert a great influence on the consistency of individual-level and group-level perception of innovation environment and other common cognition (Popa et al., 2017). Therefore, the organizational innovative climate can promote the common characteristics and potential value recognition among the members of the organization, help to form the common consciousness and common experience of the organization, and promote specific organizational learning and innovation, so as to maintain the behavior of individual members of the organization and keep consistency and unity with collective action.

9.1.4 Impacts of organizatioanl innovation on ogranizational performance

Finally, our findings demonstrate that organizational innovation can effectively promote organizational performance, and the positive impact of organizational learning on organizational performance are mediated by organizational innovation. The purpose of innovation is to expand and enhance the company's innovation opportunities and market opportunities (Braun et al., 2013; Byun et al., 2020), effectively improve the company's financial performance and operational performance, and continuoulsy create value (Phene et al., 2006). In the context of increasingly fierce global competition, continuous shortening of technology and product life cycles on which put unprecedented pressure on innovation, firms have to continuously strengthen internal R&D and fully use, integrate external and internal technology and resources (Dong et al., 2017). In addition, because enterprise innovation activities face the dynamics and uncertainties of the innovation environment (Byun et al., 2020), as well as the integration of technological resources and knowledge required for innovation, as well as the complexity of resource reorganization, the penetration rate of organizational boundaries is increasing (Anzola-Román et al., 2018). Therefore, enterprises need to be opener and spends more time and efforts to communicate and interacts with its external environment and external stakeholders, searches for resources, and expands organizational boundaries. From the perspective of risk and uncertainty management, transformational leaders can better respond to and support enterprises to participate in multi-faceted competition caused by drastic changes in the environment, and encourage and promote organizational learning among individuals and inspire organizational members . The synergy effect and the willingness to

innovate between the two can effectively promote the enterprise to better face various risks and potential uncertainties in the process of organizational innovation and organizational change (García-Morales et al., 2012).

9.2 Managerial implications

Our findings also privides valuable implications and shed some lights on business management. Organizational innovation and change include at least two major bodies: organizational actor and the internal and external environment in which the organizational actor is embedded. Previous research on transformational leadership and organizational innovation and change is more focused on a micro perspective (individual or team level). However, how firm leadership behavior of top management team and the environment interact within the organization and affect organizational innovation and performance remains less concerned (Zuraik & Kelly, 2019). Then, how the behavior of top management team in the Chinese context dynamically influences organizational innovation and organizational change is also a topic of concern. The following are practical implications.

First, the results imply that managers' behavior and cognition will influence managers' ability to identify, grasp, and reconstruct organizational innovation and change. The ability of corporate executives to perceive, recognize, and understand the external environment will have an impact on the construction and adjustment of organizational innovation strategy, and will also alter organizational structure design and change. If a top manager keep a flexible perception of external dynamic environment, the organization can grasp innovative oppertunitites, take more innovative actions, push resource share and diffusion and finnally improve innovation capability and performance. For example, in the development process of CRUN, the general code of conduct has been customer achievement, hard-working, open and enterprising, advocated struggle spirit, non-conformity, learning and improvement and innovation in the corporate management team. CRUN also encourages team members to continuously surpass themselves, improve themselves, actively cultivate innovative awareness and ability, seek new methods to improve and improve work, actively learn new knowledge, new ideas, new methods, new tools, and continuously improve work efficiency and effectiveness. In addition, senior executives, as leaders and promoters of technological innovation, will have an important impact on the organizational innovation activities of corporate team members. In the context of traditional Chinese culture, there is often a phenomenon of respecting authority and respecting the top leader, and executives have more

discourse power in corporate development (Davis & Eisenhardt, 2011). Therefore, the behavior and cognition of enterprise managers have more influence on the development of enterprises, and transformational leadership helps enterprises to break the problem of excessive power distance in traditional organizations, encourage compliance with changes in the enterprise, encourage flat management, and create priority. The environment that encourages innovation can break the path dependence of the organization and stimulate the innovation vitality of the enterprise.

In addition, the members of the organization are often embedded in the team and influenced by organizational innovative climate. The organizational innovative climate can effectively promote interaction, communication and coordination among members. With a clear vision of the organization, members who participate in organizational innovation actions will get a sense of security and support, which are more effective to enhance organizational creativity and innovation. CRUN is adhering to the mission of "making mankind and nature more harmonious" to provide customers with more intelligent, efficient, safe, energy-saving and environmentally friendly products and services. At the same time, with the development goal of "becoming a global leader in fluid control technology", the company established the CRUN Hydraulics Best Practice Improvement Management System and Science and Technology Progress Award Management to commend the annual "quality improvement and efficiency promotion" labor competing advanced collectives, rewarding the technical team, creating an atmosphere of encouraging innovation within the company, and laying a solid foundation for strengthening the company’s technological innovation capacity building, and continuously promoting the company’s technological progress, product technology upgrades and new product development. These institutions and actvities, firstly, have a positive effect on the society, for instance, continuous improvement of the environment, solving the employment of people, and leading the development trend of the industry. hese institutions and actvities, secondly, are to promote the continuous improvement of the economic effects of enterprises, such as: new benefits of enterprises, improvement of product quality, conservation of energy and resources, improvement of production efficiency, and reduction of costs.

Moreover, the individualized consideration of managers can stimulate the innovation consciousness of the members and encourage the integration of novel ideas, needs and perspectives. Since the implementation of organization’s innovation strategy and managerial leadership behavior needs to be lived by team or individual of the organzation, more individualized consideration can facalitate the percepation of organizational value and strategy orientation and help to the implementation of organizational innovation and change. In the core

values of CRUN, it always advocate "hand in hand and win-win". Win-win cooperation is the core goal and fundamental pursuit of the company, customers, and employees for mutual achievement and value sharing. In the development process of the enterprise, CRUN managers always adhere to the value of creating a win-win situation with customers, peers, suppliers, employees, and shareholders. It always adhere to the concept of shared values, listens to and discover team defects in management, creates a supportive atmosphere in the organization team, treats employees with sincerity, and continues to provide support to achieve product or service delivery and meets customer needs.

Finally, business managers need to focus on the positive impact of organizational learning and organizational innovation on organizational performance. Organizational learning lays the foundations for innovation and change. The organizational learning ability of firms can positively adjust resource integration and re-creation. To integrate complementary knowledge of different channels is good for knowledge re-creation, however itis moderated by organizational context. Hence, firms need to create an innovative astmosphere to share innovation risks, cost and increase innovation efficiency. For example,, enlightenment wisdom is one of the business philosophy of CRUN. In the process of technological innovation and business development of enterprises, CRUN advocates continuous business exploration in work practice, continuous summarization and accumulation of success and failure experience, continuous learning and openness, dare to question and challenge, and continuously promote the company’s product innovation, process innovation, service innovation and management innovation.

9.3 Limitation and future research

Despite the theoretical contributions of this thesis, the empirical analysis emoloyed here is subject to limitations obviously. The limitation of the cross-section data may not fully explain the relationship between the constructs in more detail. Hence, the dynamic mechanisms between the constructs can not be captured completely. In terms of variable selection, limited to the multidimensionality of variables and data availability, this thesis selected the most universal variables for research. In addition, in view of the data collection, this thesis issue and collect surveys in specific industries. Therefore, future academic research could investigate a wilder range of sample firms.

With regard to transformational leadership and organizational innovation and organizational change, future research could more specifically (1) integrate organizational

creativity and organizational innovation, analyze the perception of business managers behavior on the external environment, and explore how to construct innovative organizations; (2) explore how industry and innovation characteristics influence transformational leadership and organizational innovation.

Furthermore, the following studies could also consider how other managers' characteristics and risk aversion affect managers' own management behavior, which indirectly shapes the organizational innovation strategies; and pay more attention on how transformational leader evolutes with organizational innovative strategy in the long run and then improve transformational leadership in the Chinese context.

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Annex A：Scale

Dear Sir/Madam:

Thank you for helping us fill out this academic questionnaire. The main purpose of this questionnaire is to investigate the impact mechanism of transformational leadership of private enterprises on organizational change in China and its influencing factors. Your assistance is an important part of our research work and a prerequisite for our research results. We promise you that the materials and data are only used for scientific research, and your personal information will be kept strictly confidential. Please feel free to fill it out. Once again, sincerely thank you for your help in your busy schedule, thank you!

Best Regards,

Gao Huan

Transformational Leadership

Please evaluate and judge the person in charge of your department/team according to your actual experience, and select the most suitable option. The criteria for evaluation and judgment are as follows: 1 = very disagree; 2 = disagree; 3 = uncertain; 4 = agree; 5 = strongly agree.

	1	2	3	4	5
1. My leader is morally clean and corruption-free					
2. My leader embrace hardships, not material comforts					
3. My leader do not care about personal gains and losses					
4. For the benefit of the department, my leader can sacrifice personal interests					
5. My leader put collective interests beyond personal interests					
6. My leader do not appropriate other's performance to himself					
7. My leader share weal and woe with subordinate					
8. My leader do not t make things hard for subordinate					
9. My leader will make subordinates understand the prospects of departments					
10. My leader will make subordinates understand the goals of their departments					
11. My leader will explain to subordinates the long-term significance of the work					
12. My leader will paint a fascinating future for subordinate					
13. My leader will give subordinates the goal and direction					
14. My leader always work with subordinates to analyze the impact of their work on the overall goals of the unit/department.					
15. My leader consider subordinate's individual needs, abilities, and aspirations					
16. My leader is willing to help subordinate's families.					
17. My leader is willing to help employees solve life and family problems					

18. My leader communicate a lot with employees in work, life and family					
19. My leader always coach subordinate.					
20. My leader offers suggestion for subordinate's further development in work and life					
21. My leaders display professional competence					
22. My leader takes immediate and firm actions to solve problems					
23. My leader has a strong sense of professionalism and initiative					
24. My leader is committed to the work, always working with enthusiasm					
25. My leader continues to learn something new to enrich himself					
26. My leader is open-minded and innovative					

Organizational Learning

Please evaluate and judge the person in charge of your department/team according to your actual experience, and select the most suitable option. The criteria for evaluation and judgment are as follows: 1 = very disagree; 2 = disagree; 3 = uncertain; 4 = agree; 5 = strongly agree.

	1	2	3	4	5
1. My leader enhances knowledge and skills related to existing products					
2. My leader puts resources into the application of mature technology to increase productivity.					
3. My leader improves existing customer problems step by step					
4. My leader improves existing product development process					
5. My leader increases knowledge and technology to increase the efficiency of existing innovation activities					
6. My leader acquires new manufacturing technologies and skills for the company					
7. My leader learns new ways and processes of product development in the industry					
8. My leader acquires new management methods to improve innovation efficiency.					
9. My leader takes the lead in mastering new skills					
10. My leader improves the skills of innovation in the unknown.					

Organizational Innovation

Please evaluate and judge the person in charge of your department/team according to your actual experience, and select the most suitable option. The criteria for evaluation and judgment are as follows: 1 = very disagree; 2 = disagree; 3 = uncertain; 4 = agree; 5 = strongly agree.

	1	2	3	4	5
1. The salary system adopted by the company has certain originality and can effectively motivate employees.					
2. Company executives use new leadership tools and successfully integrate the power of organizational members to complete tasks.					
3. The firm has established a new performance appraisal that enables supervisors to effectively understand the extent to which employees					

accomplish their goals.					
4. The employee benefit system adopted by the company has certain uniqueness and can effectively motivate employees					
5. The supervisors will adopt new management methods to effectively achieve the purpose of motivating the subordinates and improve employee morale.					
6. The company adopts a new financial control system and can effectively motivate the subordinates and improving employee morale.					
7. The company's current customer complaint handling solution can effectively resolve customer complaints					
8. The company adopts a fairly good employee selection system					
9. The company adopts a new production operation system and can effectively check the gap between actual performance and target					
10. The company uses a fairly unique performance assessment program and can properly assess the actual contribution of employees to the company					
11. The firm implements new policies that improve organizational performance					
12. The firm will adjust the functions of each department according to changes in the environment					
13. The firm will change the service project according to the customer's needs and improve the service method					
14. The firm will adopt different workflows to accelerate the company's goals.					
15. The firm will adjust the work of colleagues in a timely manner to better achieve the firm's goals.					
16. The firm introduces new tools/equipment to improve work efficiency.					
17. Colleagues will often come up with new ways to improve product processes/work processes.					
18. The company has a high profit from newly developed products or services.					
19. The companies often introduce new technologies that improve processes.					
20. The firm often develop new products/services that are acceptable to the market.					
21. Colleagues often use new product components or service projects to improve the firm's operational performance.					
22. The company has a larger number of patents than its peers.					

Organizational Innovative Climate

Please evaluate and judge the person in charge of your department/team according to your actual experience, and select the most suitable option. The criteria for evaluation and judgment are as follows: 1 = very disagree; 2 = disagree; 3 = uncertain; 4 = agree; 5 = strongly agree.

	1	2	3	4	5
1. The firm's core philosophy reflects the idea of innovation.					
2. The firm continues to educate employees about the significance and importance of innovation.					
3. The firm's vision is clear and pioneering and inspire innovativeness.					
4. The company reward system makes employees innovative.					
5. The company's reward system effectively promotes work innovation.					
6. The firm is able to give employees a fair evaluation of the innovations.					
7. The firm provides opportunities for employees to learn					
8. The firm regularly provides targeted lectures and training.					
9. Employees learn and apply what they have learned in practice.					
10. The innovative activities can be cooperated in good faith.					
11. Colleagues in the firm are willing to share their technologies with others.					

12. Colleagues often discuss issues at work					
13. My team supports my innovation activities.					
14. The firm provides the necessary resources to support innovation					
15. Employees can apply for enough equipment to verify new ideas.					
16. Employees can get enough information/ materials to do creative work.					
17. The superior tolerate the subordinates to lose due to innovation failure					
18. Superior leaders can respect and tolerate different opinions					
19. Senior leaders usually encourage subordinates to express their new ideas.					
20. The superior leaders have good communication and coordination skills.					
21. Under the general task requirements, employees are free to set their own work goals/ progress.					
22. At work, employees are free to decide on work procedures/ methods.					
23. Employees can arrange their own tasks priority					
24. The firm recognizes employees who are innovative and enterprising.					
25. Companies often reward employees for their innovative ideas.					
26. The company advocates freedom, openness and innovation.					

Organizational Performance

Please evaluate and judge the person in charge of your department/team according to your actual experience, and select the most suitable option. The criteria for evaluation and judgment are as follows: 1 = very disagree; 2 = disagree; 3 = uncertain; 4 = agree; 5 = strongly agree.

	1	2	3	4	5
1. The company has a competitive advantage in profitability.					
2. The company has a competitive advantage in return on investment.					
3. The company has a competitive advantage in ROE.					
4. The company has a competitive advantage in new product development and market expansion.					
5. The company has a competitive advantage in the quality of its products or services.					
6. The company has a competitive advantage in terms of product or service costs.					
7. The company has a competitive advantage in operational efficiency.					
8. The company has a competitive advantage in responding to customer needs.					
9. The company has a competitive advantage in customer satisfaction.					
10. The company has a competitive advantage in customer loyalty.					
11. The company has a competitive advantage in terms of employee knowledge and skill.					
12. The company has a competitive advantage in employee satisfaction.					
13. The company has a competitive advantage in employee loyalty.					

6. Sex: male; female

7. Education background： High school and below; junior college; undergraduate; master; doctor

8. Your position: Ordinary staff; middle manager; senior manager and above

9. Enterprise ownership: State-owned firm; Collective firm; Private firm; Sino-foreign joint firm; foreign investment firm

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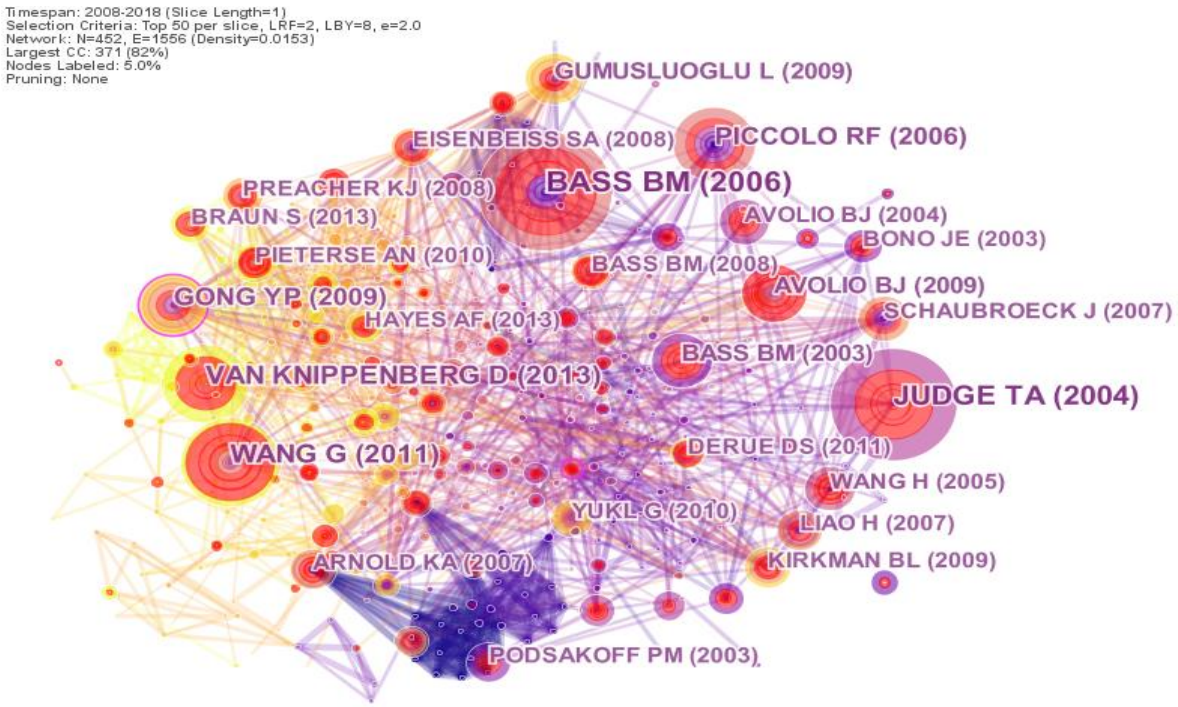
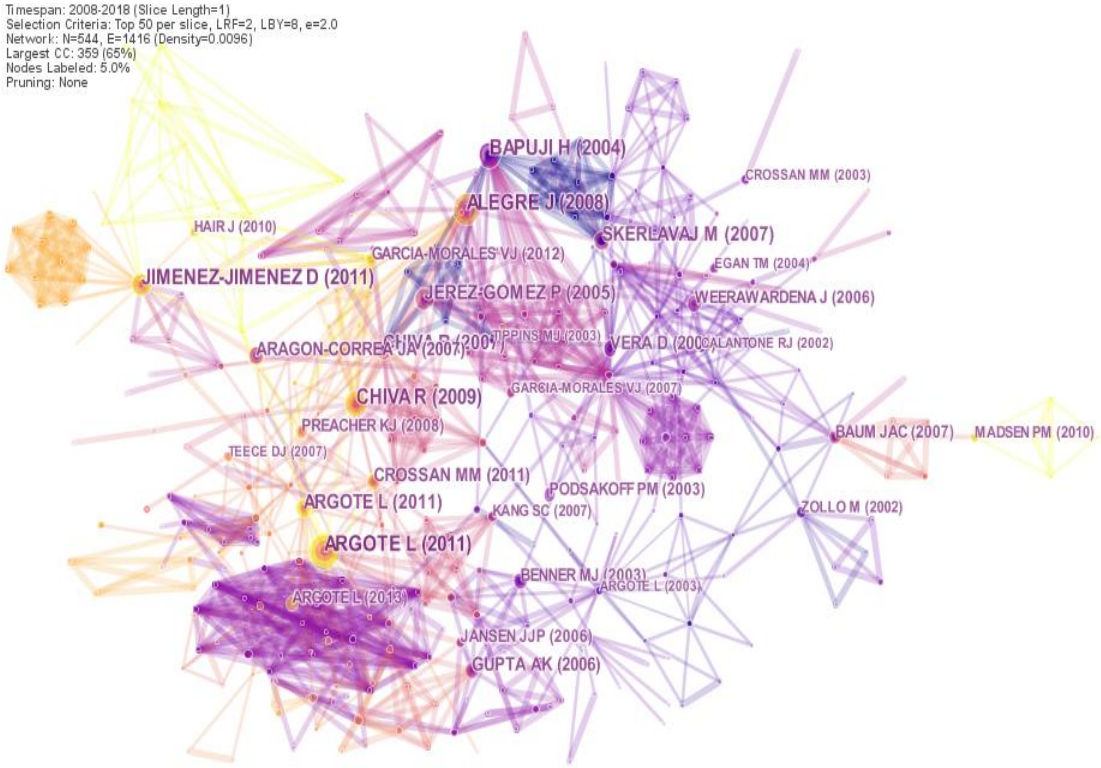
Annex B：Co-cited network

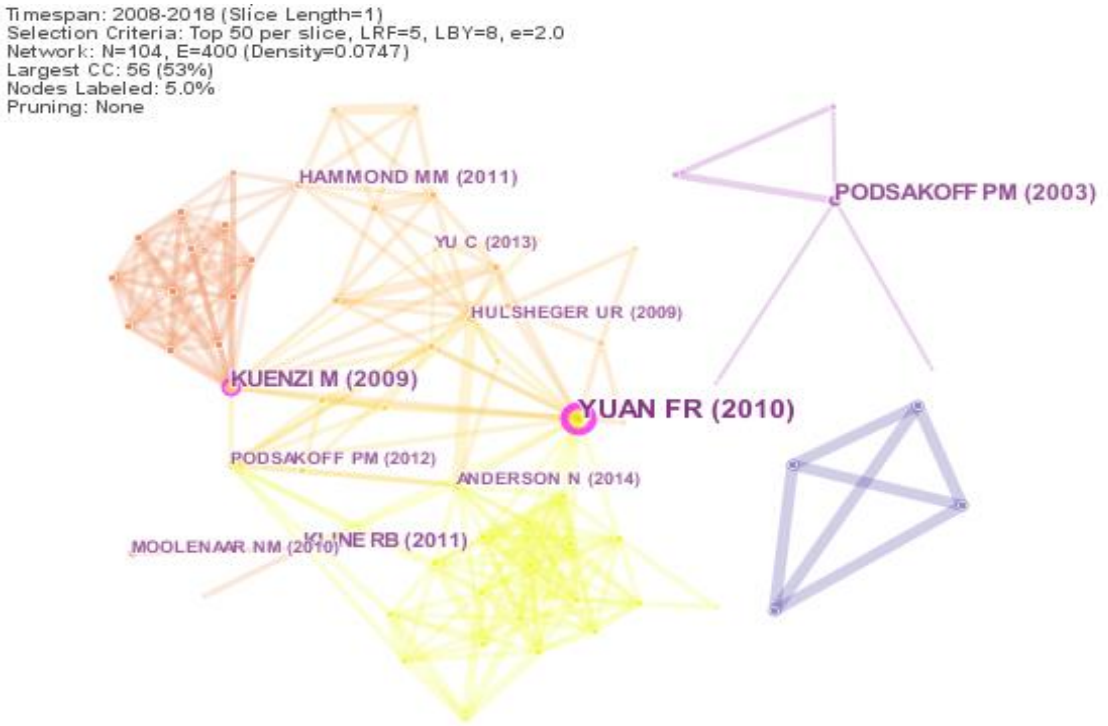


Annex B.1 Co-cited network on transformational leadership (2008-2018) based on WOS database

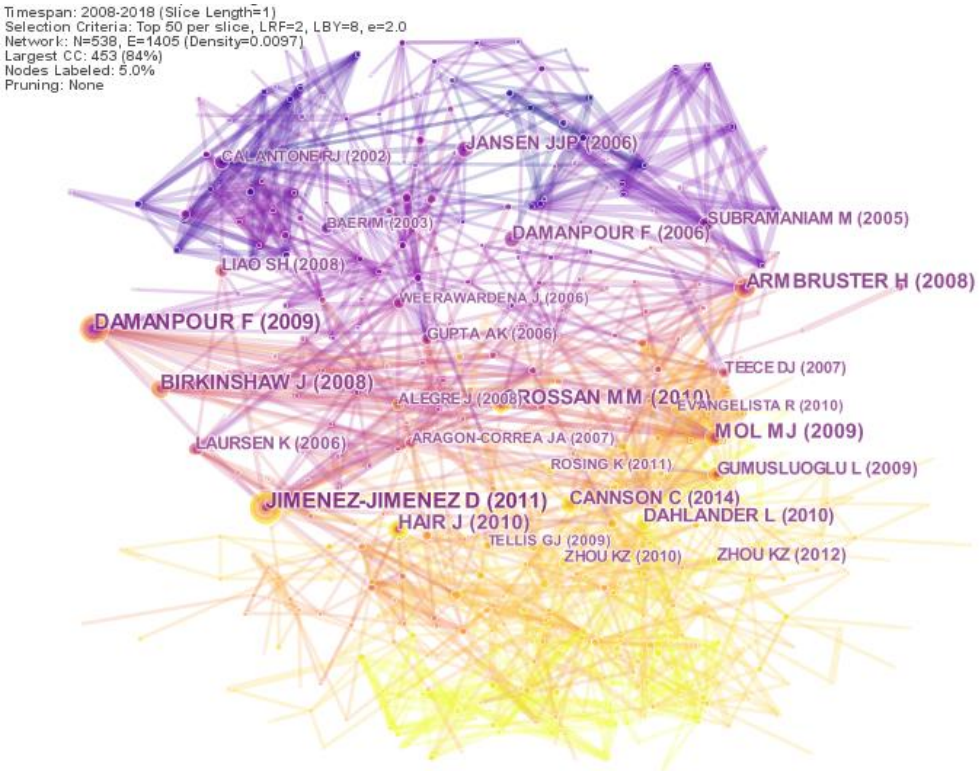


Annex B.2 Co-cited network on organizational learning (2008-2018) based on WOS

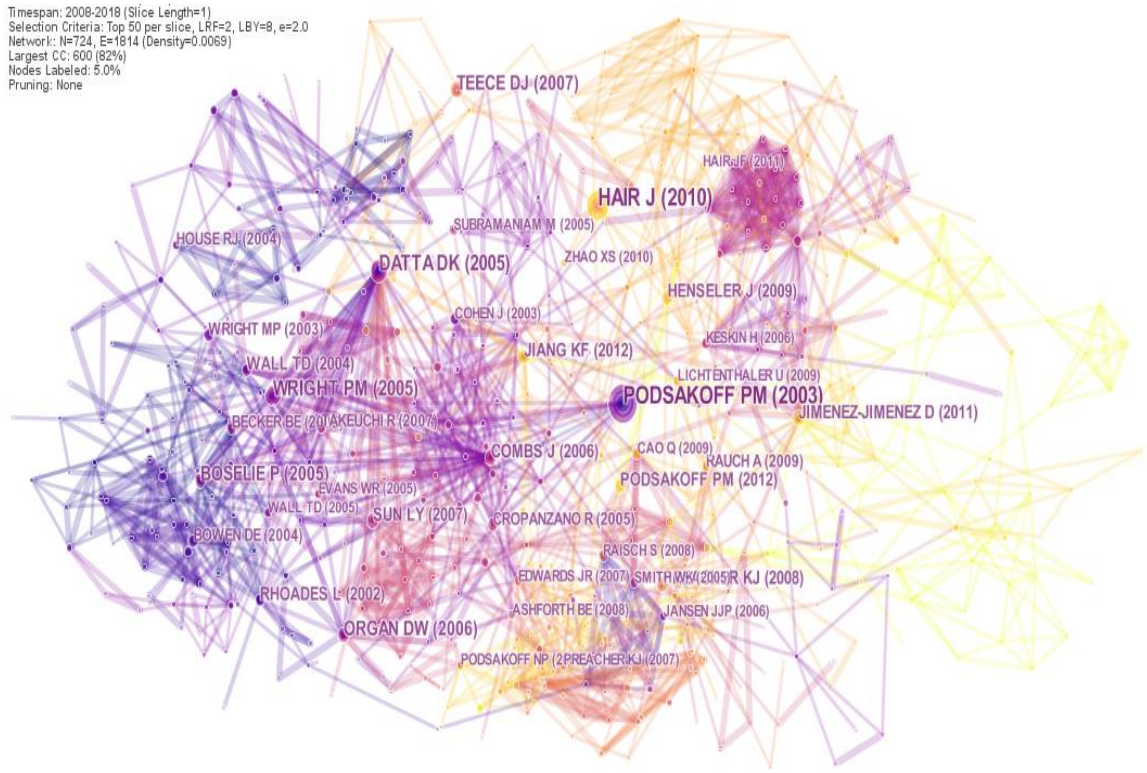
databas



Annex B.3 Co-cited network on organizational innovative climate (2008-2018) based on WOS database



Annex B.4 Co-cited network on organizational innovation (2008-2018) based on WOS database



Annex B.5 Co-cited network on organizational performance (2008-2018) based on WOS database

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Annex C：Visual bander segment result

Annex C Visual bander segment result

		Frequency	Percentage	Effective percentage	Cumulative percentage
Effective	<= 374	85	26.9	26.9	26.9
	375 - 442	146	46.2	46.2	73.1
	>434	85	26.9	26.9	100.0
	N	316	100.0	100.0	

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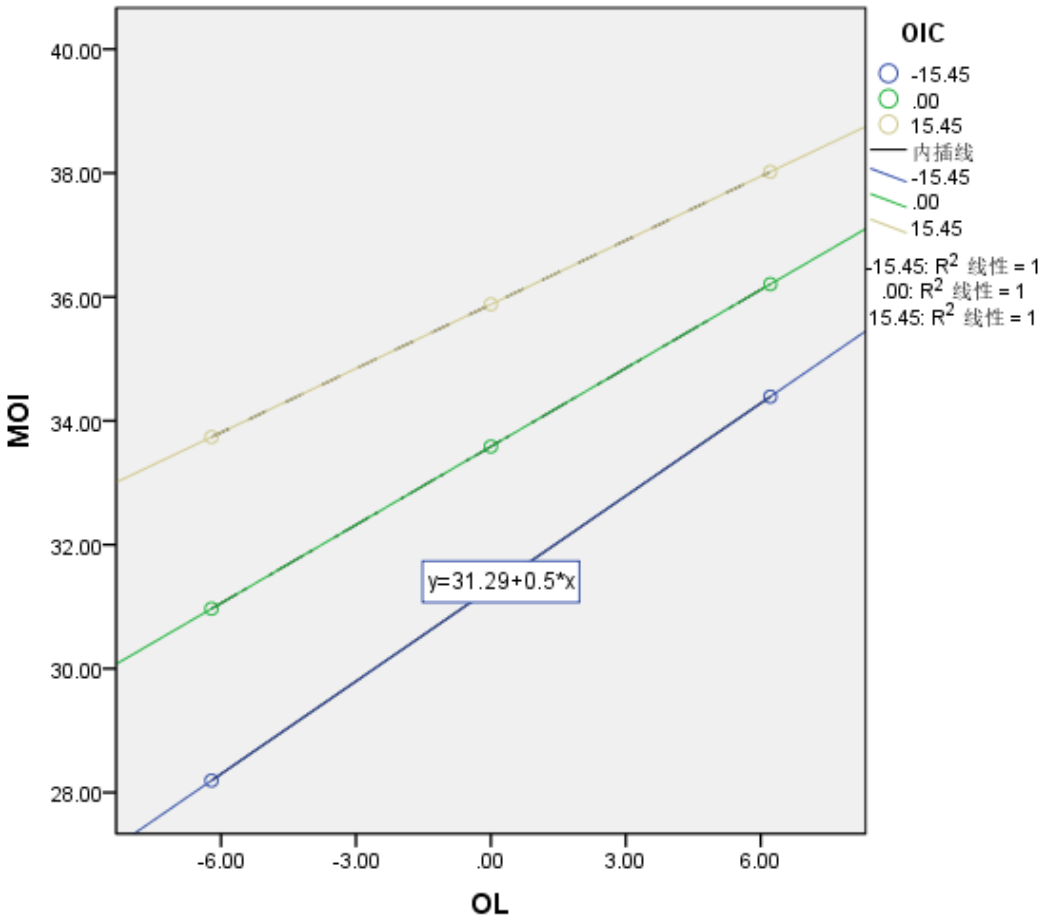
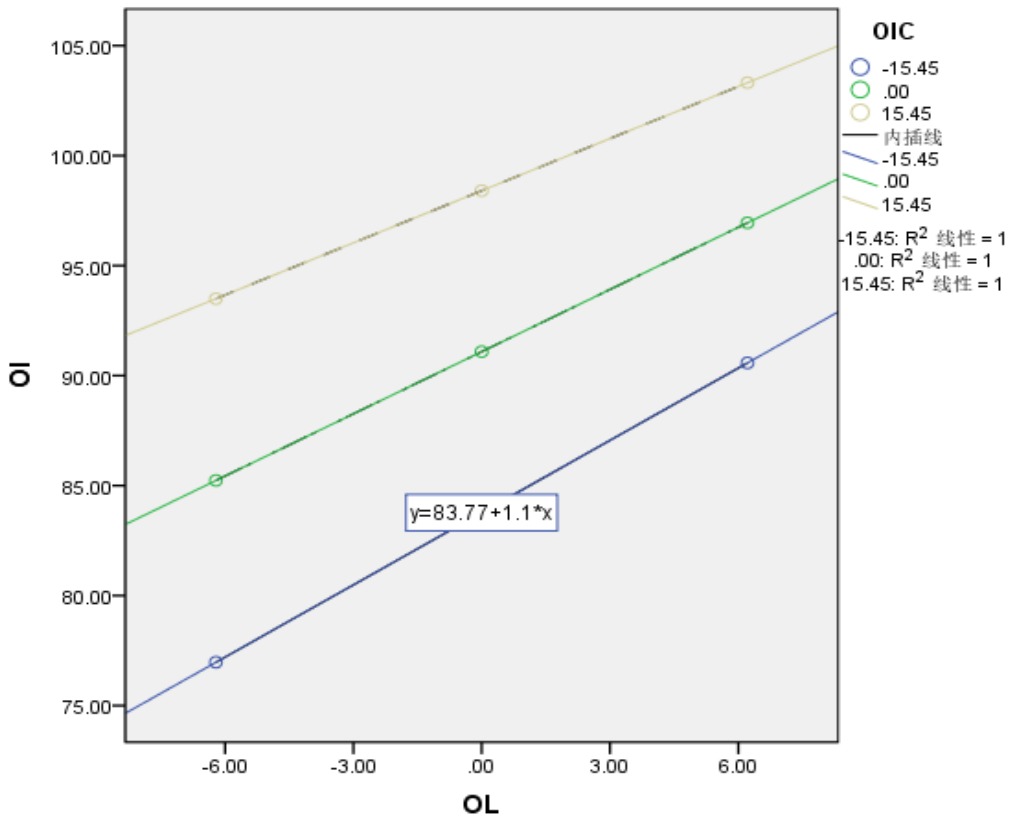
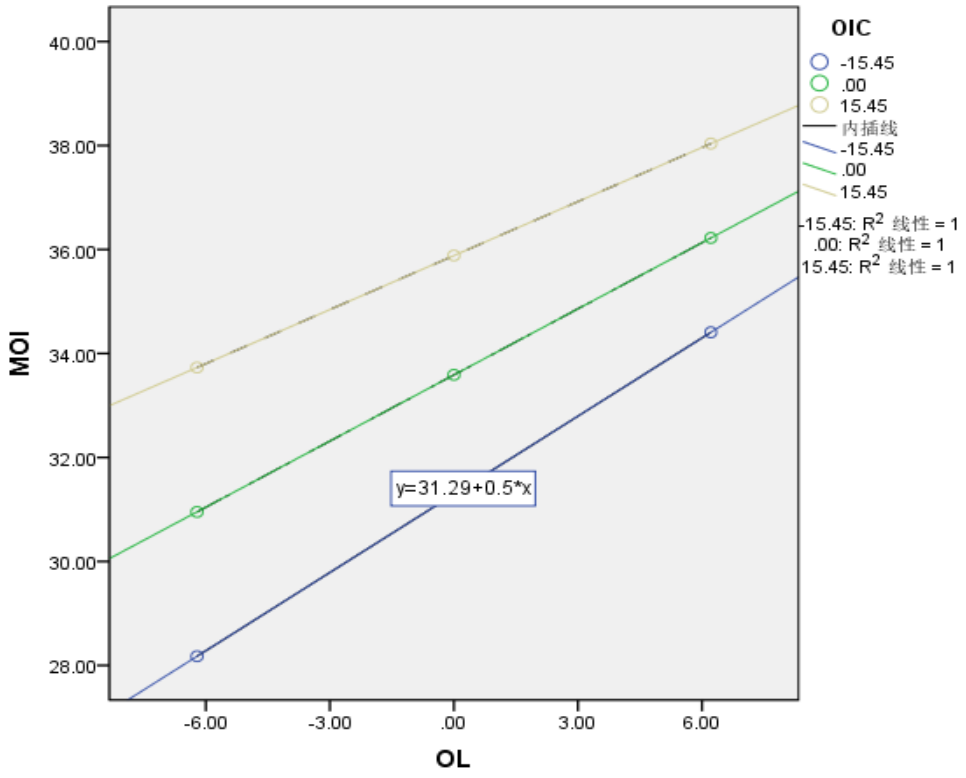
Annex D：Interaction plot



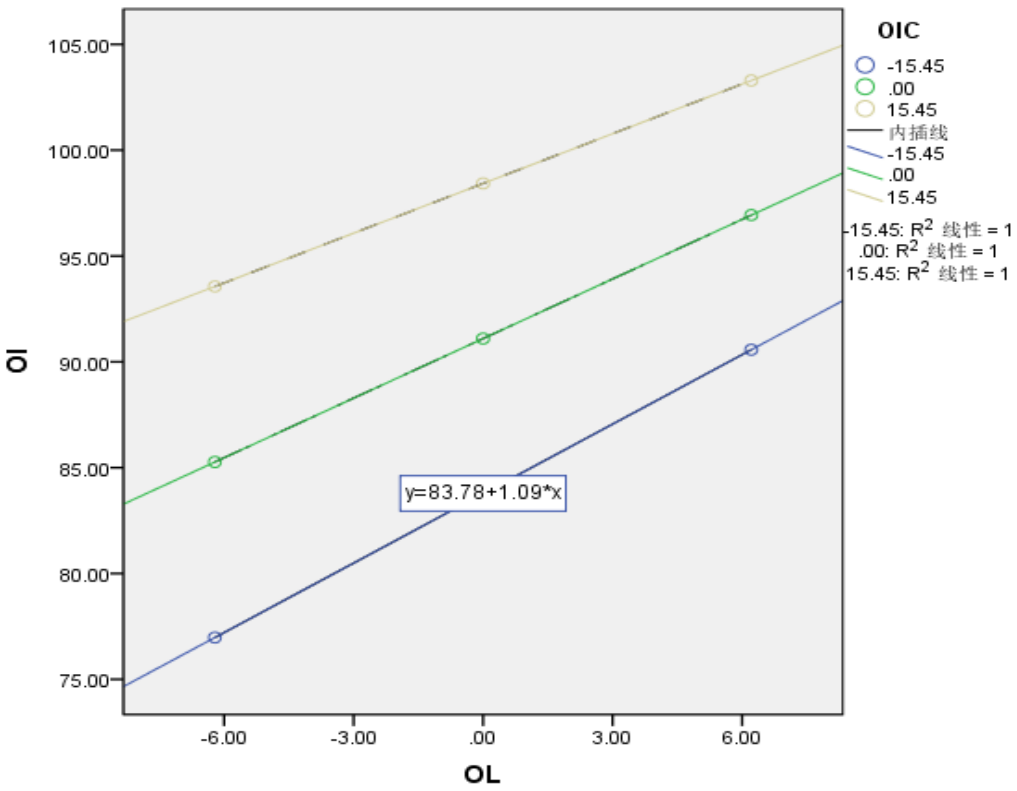
Annex D.1 Graph/scatterplot=OL with MOI by OIC (DV=MOI, control ownership)



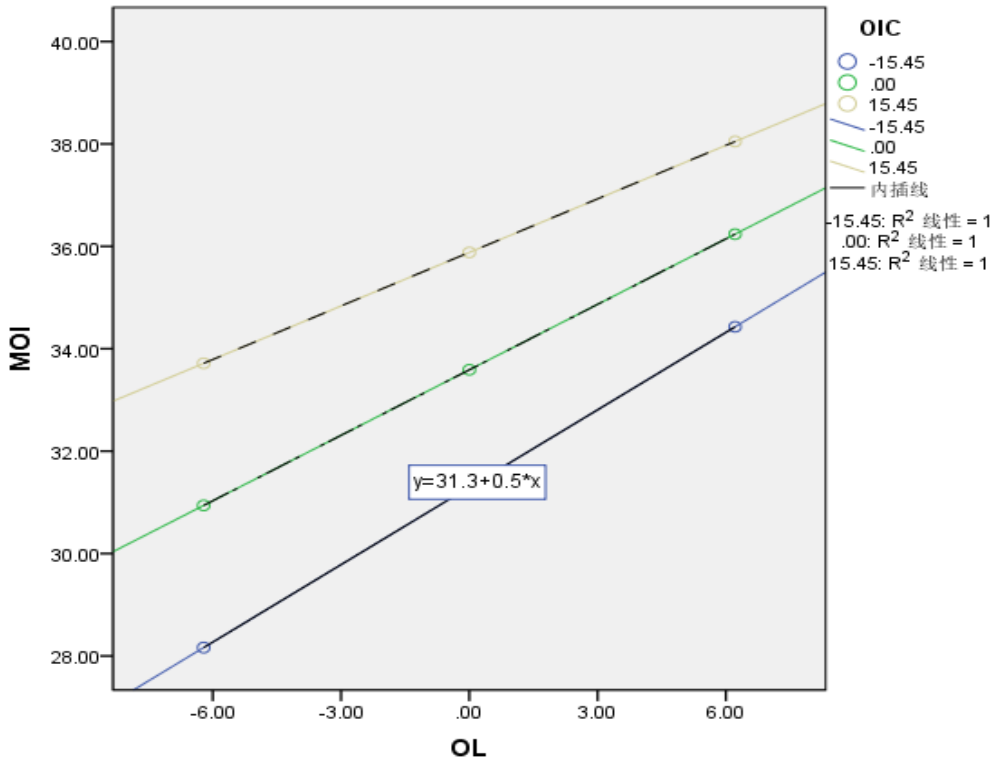
Annex D.2 Graph/scatterplot=OL with OI by OIC (DV=MOI, control ownership)



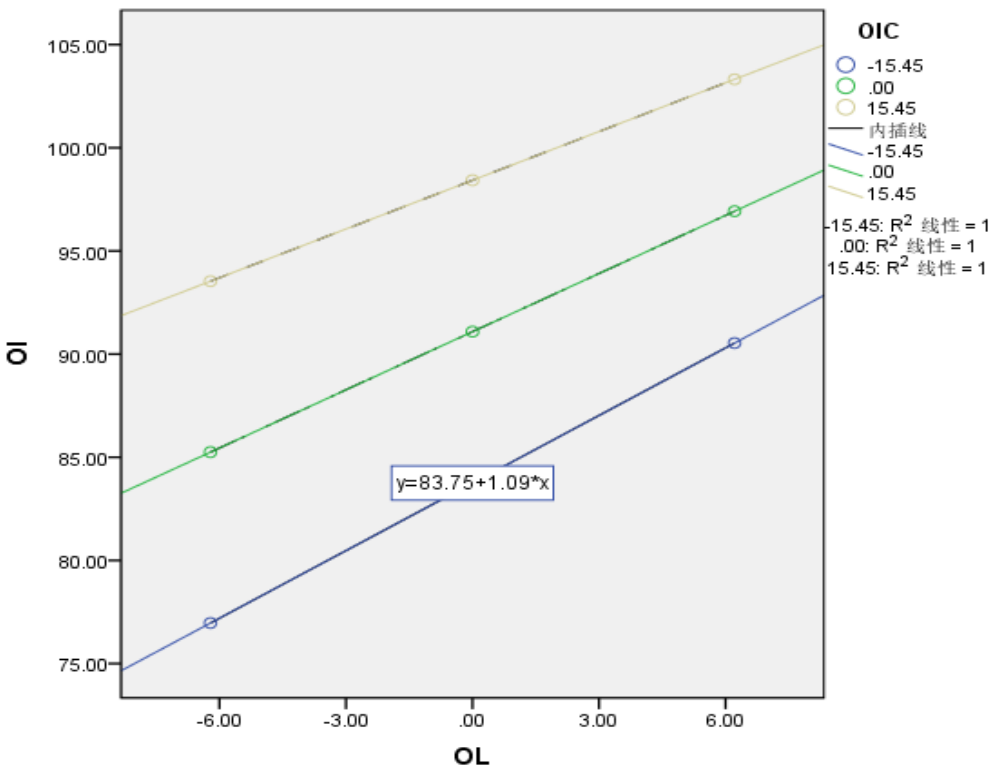
Annex D.3 Graph/scatterplot=OL with MOI by OIC (DV=MOI, control level of staff)



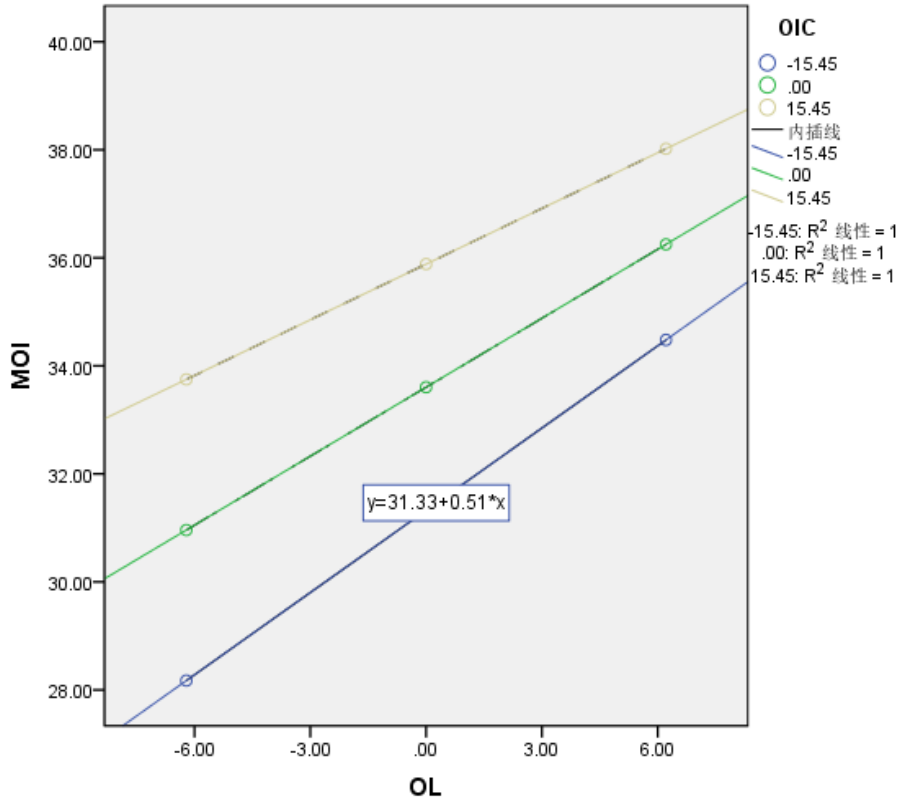
Annex D.4 Graph/scatterplot=OL with OI by OIC (DV=OI, control level of staff)



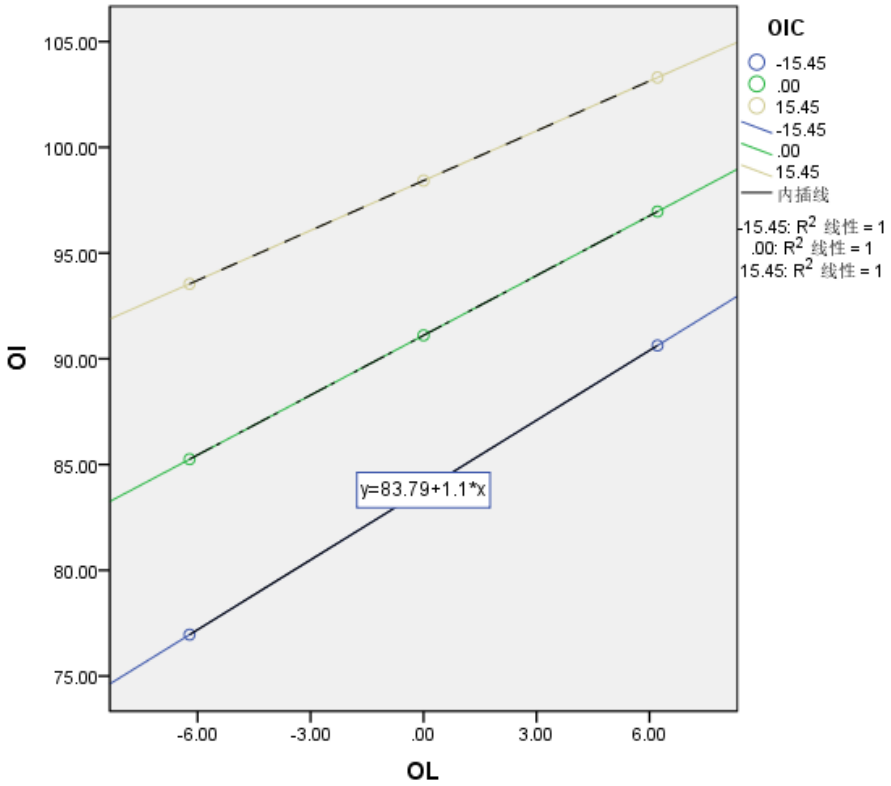
Annex D.5 Graph/scatterplot=OL with MOI by OIC (DV=MOI, control middle manager)



Annex D.6 Graph/scatterplot=OL with OI by OIC (DV=OI, control middle manager)



Annex D.7 Graph/scatterplot=OL with MOI by OIC (DV=MOI, control top manager)



Annex D.8 Graph/scatterplot=OL with OI by OIC (DV=OI, control top manager)