



INSTITUTO
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On the Relationship between Personality Traits of Private Entrepreneurs and Innovation Performance of Businesses - A Case Study of Tianjin

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Doctor of Management

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University of Electronic Science and Technology of China

August, 2022



BUSINESS
SCHOOL

Marketing, Operations and General Management Department

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of Private Entrepreneurs and Innovation
Performance of Businesses - A Case Study of
Tianjin**

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Abstract

The way to enhance the innovation level and improve the innovation performance of enterprises has become an urgent problem for many private enterprises. This thesis will, based on Upper Echelons Theory, Dynamic Management Capabilities Theory and Dynamic Management Theory, tap the influence of private entrepreneurial traits on business innovation performance with industry environment as moderating variable and dynamic management capability as mediating variable. In this thesis, data were collected by interviewing private entrepreneurs and distributing research questionnaires, and the research hypotheses were tested using regression analysis, mediating effect and moderating effect tests. The research findings suggest: (1) Entrepreneurial resilience has a significant positive impact on innovation performance of private businesses; (2) Such traits as narcissism and entrepreneurial resilience have a significant positive impact on the dynamic management capabilities of private entrepreneurs; (3) Dynamic management capabilities have a significant mediating effect between narcissism level and entrepreneurial resilience and innovation performance of private firms; (4) Industry environment has a significant moderating effect between narcissism level and entrepreneurial resilience and dynamic management capabilities. The findings of this thesis have important implications for the future business activities of private enterprises.

Keywords: Entrepreneurial traits; dynamic management capabilities; innovation performance; industry environment

JEL: M1; D21

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Resumo

A maneira de aumentar o nível de inovação e melhorar o desempenho de inovação das empresas tornou-se um problema urgente para muitas empresas privadas. Com base na Teoria dos Altos Escalões, na Teoria das Capacidades de Gestão Dinâmica e na Teoria da Gestão Dinâmica, explorar a influência das características empresariais privadas no desempenho da inovação empresarial com o ambiente da indústria como variável moderadora e a capacidade de gestão dinâmica como variável mediadora. Nesta tese, os dados foram coletados por meio de entrevistas com empresários privados e distribuição de questionários de pesquisa, e as hipóteses de pesquisa foram testadas por meio de análise de regressão, efeitos mediadores e efeitos moderadores. Os resultados da pesquisa sugerem: (1) A resiliência empreendedora tem um impacto positivo significativo no desempenho de inovação das empresas privadas; (2) Traços como o narcisismo e a resiliência empresarial têm um impacto positivo significativo nas capacidades dinâmicas de gestão dos empreendedores privados; (3) As capacidades de gestão dinâmica têm um efeito mediador significativo entre o nível de narcisismo e a resiliência empreendedora e o desempenho de inovação das empresas privadas; (4) O ambiente da indústria tem um efeito moderador significativo entre o nível de narcisismo e a resiliência empresarial e as capacidades de gestão dinâmicas. Os resultados desta tese têm implicações importantes para as atividades futuras de negócios das empresas privadas.

Palavras-chave: Traços empreendedores; capacidades de gerenciamento dinâmico; desempenho de inovação; ambiente da indústria

JEL: M1; D21

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摘 要

本文以行业环境为调节变量，以动态管理能力为中介变量，探讨民营企业家特征及其对民营企业创新绩效的影响。研究表明：（1）企业家韧性特质因素对民营企业创新绩效存在显著的正向影响；（2）自恋水平和企业家韧性等特质因素会对民营企业家动态管理能力水平产生显著正向影响；（3）动态管理能力在自恋水平和企业家韧性等特质因素和民营企业创新绩效间发挥显著的中介作用；（4）行业环境在自恋水平和企业家韧性等特质因素与动态管理能力间发挥显著的调节作用。本文研究结论对于民营企业今后经营活动开展具有重要的借鉴意义。

关键词：企业家特质；动态管理能力；创新绩效；行业环境

JEL: M1; D21

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After twenty-four years of schooling, my dream has come true today. I will work harder and use my knowledge to make the world a better place!

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二十四载求学路，今朝梦圆奔前程。日后我定会加倍努力，用我的所学，为这个世界增添一份美好！

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Chapter 1: Introduction

1.1 Research background

The practice of private economy stems from the generation and development of private economy micro-actors. The 1980s saw the appeal for the economic restructuring and the gradually explicit objective of market-oriented reform, which had contributed to the resurgence and growth of private economy players, including individual business and private business. In the last four decades upon reform and opening up, particularly, Chinese private economy has grown out of nothing and expanded from small to large, and now has served as a mainstay for national economy development. In Tianjin, for example, the private economy grew by RMB505.391 billion, an increase of 0.3%, accounting for 35.9% of the total economic value in Tianjin in 2020, according to the Statistical Communiqué of Tianjin on the National Economic and Social Development. Upon outbreak of COVID-19, Chinese economic development has been severely hit. Amid the complicated and changeable economic landscape both at home and abroad, our private economy has played a huge role in such aspects as maintaining stable economic development, safeguarding, and improving social people's livelihood, creating more employment opportunities and making resource allocation more efficient. According to the statistical data of China Statistical Yearbooks Database, in 2020, the sales revenue of private economy embraced the year-on-year growth of 8%, higher than 2% - the average level of businesses nationwide and showing obvious leading edge. According to the data released by General Administration of Customs, through 2020, the import-export volume achieved by private businesses amounted to RMB14.98 trillion with growth rate as 11.1% and accounted for 46.6% of total exports and imports of China, up 3.9% compared with that in 2019. According to said data, the private economy in Tianjin saw the added value of RMB505.391 billion with its proportion to the gross value as 35.9%, which, compared with the added value achieved last year, increased by 0.3%. Despite those remarkable achievements, private economy, during its rapid development process, is also exposed to diversified problems and challenges, including but not limited to backward management mode, blocked financing channels, unsound corporate governance mechanism and poor capacity of independent innovation. Worse still, the new dual economic structure with state-owned economic sector independent of the private one prevents

private economy entities from undertaking major strategies dominated by the state and government, because private businesses are of lower entry threshold and concentrate upon the labor-intensive industry of lower technical requirements (Shi, 2021). In this connection, reinforcing innovation ability and improving innovation performance are approaches to diversified issues that quite a few private businesses now face.

Of existing research on innovation performance of businesses, traits of entrepreneurs have received increasingly more attention of scholars. Upper Echelons Theory (Hambrick & Mason, 1984) holds that, due to the bounded rationality of human beings, the personality traits and experiences of senior managers are likely to influence their opinions, selections and actions, and eventually change corporate performance (Neely Jr et al., 2020). The growth of private entrepreneurs is the key for achieving the sustainable development of private businesses and market-driven economy. The survival and development of a business or organization hinges on the scientific management of its leaders. For private businesses, private entrepreneurs boast absolute resource allocation capability and right of speech. By formulating business strategies, they decide on the realization mode and operation pattern of businesses' innovation system mechanism, and directly influence the ultimate innovation performance of businesses to a certain degree. In the meantime, private entrepreneurs play the role of making decisions and issuing orders on behalf of businesses, through which their personality traits and behavioral patterns may exert a subtle effect on internal employees. From the perspective of psychology, management behaviors of leaders can result in changes of employees' behaviors via influence on their mentality, and further remarkably contribute to the enhancement of business competitiveness as well as improvement of economic benefits. In this connection, leaders may affect the organizational commitment and employees' mentality and behaviors by virtue of leader behavior, and then improve the business performance.

Now many research have been made by scholars on the relationship between personality trait and business innovation performance, and have gained certain research achievements. However, the following problems are not yet resolved. First, the mode and path that entrepreneurial traits influence business innovation performance are unclear and the formation mechanism of its function system is to be further tapped. Second, the definition of entrepreneurial traits is extensive, including gender, age, physical condition, educational background and other demographic characteristics as well as five major personality traits, namely, nervousness, responsibility, extroversion, agreeableness and openness to experience. Therefore, the research on the relationship between different traits and business innovation performance should be further refined.

Apart from traits of entrepreneurs, their own management capacity also makes a difference to business innovation performance. The Dynamic Management Capabilities Theory holds that, managers dominate key positions of businesses, and have their personal capability influence strategic choices and performance of organizations. Dynamic capability has been classified by scholars into dynamic management capability, human capital management capability and managerial social capital capability (Adner & Helfat, 2003; Badrinarayanan et al., 2019b) and refer to resource development, integration and reconfiguration, which promote businesses to maintain their competitive strength in the dynamic environment (Hunt & Morgan, 2017). The present entrepreneurial behaviors of businesses take on such new characteristics as reform and innovation. In order to make business development directions more explicit, entrepreneurs have to perceive, detect, accommodate to and leverage opportunities arising from environment change, perform thorough reform via resource integration and resource medley, and double their efforts to put an end to the originally backward management mode. Against the background of high uncertainty, the dynamic management capability of managers, i.e. pooling and allocating internal resources and technologies, must be applied to widen, create and improve survival modes of businesses, to bring innovative impetus to businesses, and to reform strategies and innovation performance of business (J. H. Block et al., 2017). In this regard, dynamic management capability of entrepreneurs is of the utmost significance for business innovation performance. In the market of increasingly fierce competition, private businesses are surrounded by diversified restrictions and barriers, for which private entrepreneurs are expected to pay due attention to their dynamic management capability and to respond to changes and challenges by strengthening internal management and identifying external risks. That is how to make their businesses embrace long-term development momentum.

Influence factors of business innovation performance are further explained from different theoretical perspectives. Upper Echelons Theory holds that, age, gender, occupational history, education background and other demographic variables of entrepreneurs have great influence in affecting business innovation performance and can be essentially applied to measure the cognitive competence and level of entrepreneurs. Strategic Management Theory holds that, business innovation performance relies on the following two factors. The first is the selection of business strategies, which is closely related with business innovation performance and remains ongoing throughout business operation and development; the second is whether entrepreneurs match with business strategy selection, which rests with personality traits and capability of entrepreneurs. Being business decision-makers, it is inevitable for entrepreneurs to integrate their thoughts and volition with business development strategies, for which

entrepreneurs of different traits may lead to various business innovation performance. In other words, traits of entrepreneurs represent the accurate measurement of their management capability. Dynamic management can be regarded as the dynamic capability developed by entrepreneurs throughout business management, and acts on the formulation and implementation of strategies. Due to the dynamic management capability of entrepreneurs, it is likely for entrepreneurs to influence business innovation performance via their personality traits. Being an important carrier of quality and experiences, traits of entrepreneurs not only reveal their personal character and behavioral pattern, but also exert influence on businesses in terms of resource access capacity, strategy formulation and business performance. And dynamic management capability of entrepreneurs concerns the development and integration of business resources and may exert immediate impact on business innovation performance. Therefore, dynamic management capability of entrepreneurs is inferred as available to be the mediating variable of entrepreneurial traits for business innovation performance.

On the other hand, innovation is also vital to the long-term development of private businesses (G. Y. Zhang et al., 2021), which is underpinned by policies and systems. To respond to the slogan of “startups and innovation” put forward in 2014, government and relevant departments have issued a lot of policies and provided financial support for Chinese private businesses. It is pinpointed under the *Opinions on Supporting the Reform and Development of Private Businesses* rolled out by the Central Committee of the Communist Party of China and the State Council in 2019 that a fair competitive market environment oriented at policies and based on the rule of law should be created to ensure the fair competition among market entities, and that the government should back up reform and innovation, encourage and lead private businesses to facilitate transformation and upgrading, and deepen the supply-side structural reform as a way to unceasingly reinforce the technological innovation capacity and core competence of private businesses. Obviously, industry factor is a significant antecedent variable of innovation performance. However, characteristics like increasingly fierce industry competition and industry blur also pose challenges on the development of private businesses.

In order to open the “black box” between entrepreneurs’ personality traits and business innovation performance and unveil the function system of innovation performance of private businesses, this research will, based on Upper Echelons Theory, Dynamic Management Capabilities Theory and Dynamic Management Theory, in line with industry characteristics and development features of businesses and in combination with the management environment of Chinese private businesses, tap the influence of private entrepreneurial traits on business innovation performance with industry environment as moderating variable and dynamic

management capability as mediating variable.

1.2 Research significance

1.2.1 Theoretical significance

First, the study of the internal formation mechanism between private entrepreneurial traits and business innovation performance hereunder makes further explanation of the internal formation mechanism and performs helpful exploration subject to the logic of “traits – competence - performance”, in addition to enriching and verifying the existing conclusions concerning business innovation performance. According to relevant research on entrepreneurial traits, scholars from different fields have made attempts to define entrepreneurial traits. Particularly, scholars major in management, economics and sociology have carried out qualitative research and empirical research oriented at the relationship between entrepreneurial traits and business performance from different perspectives and obtained substantially identical conclusions. However, most of their research directly checks the influence of entrepreneurial traits on business innovation performance, rather than tap and explain the internal formation mechanism between them. In this connection, this research introduces dynamic management capability of entrepreneurs as mediating variable and industry environment as moderating variable on the basis and tries to open the “black box” that how private entrepreneurs influence innovation performance of private businesses via their traits. As the industry environment is tolerant, dynamic, competitive and heterogeneous by its nature, private entrepreneurs with limited rationality tend to suffer cognitive bias when they are exposed to the influence of external factors, which in turn affects the direction and strength of strategy implementation. And private entrepreneurial traits determine the formation of their dynamic management capability. The research conclusions developed hereunder are of great guiding significance for the future study of the relationship among personality traits, dynamic capability and enterprise performance.

Second, this research further enriches Upper Echelons Theory and Dynamic Management Capabilities Theory. As to Upper Echelons Theory, it takes age, gender, occupational history, educational background and other demographic variables of entrepreneurs as independent variables to directly verify the influence on various dependent variables yet neglects embedded situation. In the new era that China experiences economic transition and rapid development (Zhu & Li, 2018), entrepreneurs are playing diversified roles. In light of the development realities of China, this research expands and verifies the applicable scope of Upper Echelons

Theory, and thus is of the utmost significance for improving its applicability against different cultural backgrounds. Then, Dynamic Management Capabilities Theory is not equal to dynamic management capability; dynamic capabilities prioritize the quick adaption and change of an organization to constantly acquire and apply resources to be more competitive, whereas dynamic management capabilities, starting from the individual and group point of view, emphasize managers' cognitive change and use of interpersonal relationship and social resources to fuel an organization's steady development. A few studies have been made with priority given to the influence of dynamic management capability on business performance. This research adopts the dynamic vision, instead of limiting to the individual level, and deems the dynamic management capability of entrepreneurs as mediating variable, for which it is able to explain the relationship between private entrepreneurial traits and business strategy selection and innovation performance against the background of dynamic changes in a reasonable manner and improves the research framework of dynamic management capability. Eventually, existing studies pay more attention to the macro level, and few studies have been made to analyze dynamic management capabilities like management cognition, human capital management and managerial social capital. In addition to analyzing the influence of private entrepreneurs on private businesses' innovation performance, this study further analyzes the regulatory role of industry environment for the relationship between entrepreneurial traits and dynamic management capability and consider the external impact brought by environmental factors in a relatively comprehensive manner while analyzing the impact of private entrepreneurs on private businesses' innovation performance.

Third, this research focuses on the internal relationship between entrepreneurial traits and business innovation performance in China and enriches the research achievements in the Chinese localization context. Amid current literature in relation to entrepreneurial traits and business innovation performance, the majority refers to Western theories in terms of theoretical basis selection, concept connotation definition or measuring tool development, despite the significant difference in thinking mode, management pattern and other aspects of business management between China and Western countries. As situational characteristics of different countries vary – for example, Western management prioritizes contract and law whereas Chinese management stresses kindness and morality – quite a few Western theories fail to offer a reasonable explanation for management issues confronting Chinese businesses. In China, private entrepreneurs are vital to business management and development, because strategy formulation and decision implementation relate to enterprise survival and advancement. Besides, the industry environment and social culture confronting private businesses enjoy

distinctive characteristics (Jiao et al., 2021). In this connection, this research, based on the industry environment in the Chinese market, analyzes the relationship between private entrepreneurial traits and private businesses' innovation performance in China and is conducive to enriching the localization research on enterprise performance.

1.2.2 Practical significance

First, this research intends to open the “black box” of the influence mechanism between private entrepreneurs' personality traits and private businesses' innovation performance. Although the existing research has classified entrepreneurial traits into an antecedent variable of enterprise performance, there is no explicit analysis on their influence modes and patterns. And the further explanation of influence factors of business innovation performance may reinforce the opportunity recognition capability of senior managers and enable them to grasp and leverage all the possible opportunities to improve business innovation performance. Above all, entrepreneurial traits take on the dynamic characteristics under the specific situation, and usually accommodate to the changes of external environment either actively or passively. The adjustment of entrepreneurs not only refers to their behavior pattern and cognitive style, but also relates to the formulation of business decisions and selection of strategies, thus closely linked to business innovation performance. Apart from the individual spirits and personality traits of entrepreneurs, then, the survival and development of businesses also hinges on whether entrepreneurs' capability matches with resources and environment due to the relevance with business strategy formulation and implementation. From the Dynamic Management Capabilities Theory, the dynamic management capability of private entrepreneurs may deliver sustainable competitive edge to businesses and improve the innovation performance of private businesses.

Secondly, the external industry environment also determines whether a business can carry out normal and orderly operation. Through the transformation and upgrading of Chinese economic system, businesses are taking on the characteristics of diversity due to the influence of industry environment. The present entrepreneurial industry environment appears mandatory, analog and normative, for which private businesses cannot go beyond the bottom line of the environmental institution framework, and must comply with laws, regulations and industry standards while formulating strategies or taking actions for innovation performance. It relies on private entrepreneurs' grasp and judgment of changes in market environment and institutional policies, whose cognitive competence is closely linked with own traits. Therefore, innovation performance of private businesses is the comprehensive result of multiple factors like private

entrepreneurial traits, dynamic management capability and industry environment.

Second, this research may enlighten private entrepreneurs in practice. As the sound development of private businesses holds the key for achieving the sustainable advancement of locally small and medium enterprises and market economy, how to maintain the stability of private businesses has come to the foreground of private entrepreneurs. No business or organization can survive or develop in the absence of the management of entrepreneurs. The management behavior of entrepreneurs is thus regarded as an integral part of business organization environment and is able to remarkably improve enterprise competitiveness and economic benefits. It initially exerts influence on organizational commitment and employees' mentality and behaviors, and then improves business performance. In this regard, the improvement of entrepreneurs' dynamic management capability is of the utmost significance for boosting business innovation performance. Simultaneously, the development strategies of private businesses are expected to match with the environmental institution, which requires private entrepreneurs to timely grasp the market trends, strengthen their opportunity recognition capability and risk identification awareness, and fully leverage opportunities arising from economic structure transformation and upgrading. So private entrepreneurs, while enhancing their own capacity, must timely catch changes in environment development information, comprehensively consider both internal and external influence factors, and drive private businesses to improve innovation performance under the complicated and changeable situation.

Third, this research taps the function system of private entrepreneurial traits and industry environment for private businesses' innovation performance, which is of certain referential significance for businesses on strategy formulation or for relevant departments on policy making. On the one hand, the selection of business strategies is exposed to the mandatory, analog and normative binding effect of industry environment framework as the framework sets a clear limit to business operations and their scope. And individual traits lead to the different cognitive patterns. By virtue of their dynamic management capability, private entrepreneurs judge the constraint effect of such formal and informal organizations and have the recognition results further affect the formulation and selection of ultimate strategies. On the other hand, private businesses play an important role in reducing the pressure of employment, boosting brisk market, facilitating technology innovation and propelling economic development, thus holding a dominant position in domestic economic development. As downward pressure on the Chinese economy continues to increase (Jia & Lv, 2020), the management and development of private businesses has suffered obstacles, and the investment confidence of private entrepreneurs has been severely hit due to the outbreak of COVID-19. In this context, relevant

departments should double their efforts to create a platform system of favorable business environment, lead and help Chinese private businesses to strengthen their independent innovation capability and facilitate the improvement of innovation performance. Therefore, this research may be further referred to by relevant government authorities as a way to fully play the role of “service-oriented government” and roll out efficient back-up policies.

1.3 Research objectives and research questions

1.3.1 Research objectives

The first is to study the relationship among “traits of private entrepreneurs, dynamic management capability and private businesses’ innovation performance”. Entrepreneurial traits remain significant throughout the generation, development, maturity and recession of businesses (Qazi et al., 2020). Although the considerable impact of entrepreneurial traits on business performance is widely accepted in the academic circle, the impact on patterns and formation mechanism is relatively less studied. As revealed by existing research, most scholars prefer to directly verify the relationship between personality traits and enterprise input and output. Some research explored the influence of variables like entrepreneurs’ self-efficiency, opportunity recognition capability, achievement needs and risk-taking capability on entrepreneurship intention (Karabulut, 2016), business growth (Olivari, 2016) and business innovation (Beattie, 2016). And some attempted to open the “black box” of the relationship between entrepreneurial traits and business innovation performance by adding such mediating variables as entrepreneurial learning ability and government-enterprise relationship. The foregoing research has gained relatively substantial achievements and provided helpful guidance for this thesis. However, the present research on the formation patterns of business innovation performance is still at the exploration stage, and research conclusions are to be further verified. By introducing the industry environment perspective, combining with Upper Echelons Theory and Dynamic Management Capabilities Theory, and proceeding from the development situation of Chinese private businesses, this research, with entrepreneurs’ dynamic management capability as a mediating variable, aims to make exploration on the function system of private entrepreneurial traits for private businesses’ innovation performance, and performs verification for the mediating effect of entrepreneurs’ dynamic management capability.

The second is the analysis on the influence of industry environment on the function system of “traits of private entrepreneurs, dynamic management capability and private businesses’

innovation performance”, i.e., studying the moderating effect of environmental institution in the formation patterns of private businesses’ innovation performance. Industry environment is the foundation for the normal operation of the society, and represents all the laws, regulations and order rules formulated to govern and restrain behaviors of the people from all social strata. The human society is ever-changing, so do industry environment for business development. In the context that China is experiencing economic transformation and upgrading, business development will face growing numbers of uncertain factors, for which production and management activities of private businesses must accommodate to the industry environment better and managers must work out reasonable decisions to access competitive edges. In addition, the formulation of business strategies is also exposed to the influence of industry environment, for which fully recognizing changes in industry environment is conducive to the selection and formulation of business strategies and will eventually act on business performance. Underpinned by theories like Upper Echelons Theory and Dynamic Management Capabilities Theory, and proceeding from the national situation of China, therefore, this research holds that industry environment plays a moderating effect in the chain function system of “traits of private entrepreneurs, dynamic management capability and private businesses’ innovation performance”, and verifies the moderating mechanism of industry environment for private entrepreneurial traits and dynamic management capability. Besides, this research attempts to further study whether industry environment can moderate the mediating effect of dynamic management capability for private entrepreneurial traits and private businesses’ innovation performance.

1.3.2 Research questions

1. Why traits of private entrepreneurs affect the innovation performance of private businesses?

Will the traits of private entrepreneurs affect the innovation performance of private businesses? Traits of private entrepreneurs have effects on innovation performance of private businesses. Traits constitute not only a resource superiority of private entrepreneurs, but also the key for the sound development and entrepreneurship success of private businesses. Facing business management and development problems, private entrepreneurs featuring different traits usually adopt different opportunity recognition and resource medley strategies, develop business strategies highly adaptable to existing problems upon their sorting and integration, and eventually improve the performance of private businesses. Given the relatively extensive scope of entrepreneurial traits, this research mainly explores the influence of private entrepreneurs’

personality traits on private businesses' innovation performance from two perspectives, namely, demographic characteristics of entrepreneurs and mental traits of entrepreneurs, among which the former includes age, gender, education background and occupational history of entrepreneurs, while the later includes narcissism level and resilience of entrepreneurs.

2. What is the relationship between dynamic management capabilities & private businesses' innovation performance?

Business innovation performance is related to entrepreneurs' competence in addition to their traits. Amid dynamic capability, dynamic management capability grows out of the practical business management by entrepreneurs. The hypothesis of "rational man" holds that, entrepreneurs, acting as the principal part of business decision-making, are always rational, feature independent thinking and rational judgment, and have all of their acts serving the ultimate goal of optimizing own benefits. However, this hypothesis is hardly to be established in the actual business management, because thinking mode, cognitive pattern, previous experience, social network relationship and other factors of private entrepreneurs all exert influence on their dynamic management capability and the continuous change of cognitive range, human capital and social capital may procure the internal capability building model and resource optimal allocation mode to witness changes. It means that, business decisions, strategy development directions and business innovation performance will be eventually affected. As a result, this research lays emphases on the influence of the three-dimensional dynamic management capability (i.e., managerial cognition capability, human capital management capability and managerial social capital capability) of private entrepreneurs on innovation performance of private businesses.

3. How the private entrepreneurial traits affect the dynamic management capabilities?

Upper Echelons Theory takes bounded rationality of human beings as theoretical premise and highlights the role of top managers' traits for cognitive patterns. Private entrepreneurial traits may exert influence on their value judgment and be manifested as changes in dynamic management capability.

Medley and integration of organizational resources, and link and construction of network ties all reveal dynamic management capability, which is further divided into managerial cognition capability, human capital management capability and managerial social capital capability by different dimensions. As to private entrepreneurs, managerial cognition capability represents their mental and cognitive level; human capital management capability includes their career experience and personal skills; managerial social capital capability means the comprehensive network relations. Due to the relevance between each aspect and private

entrepreneurial traits, the relationship between private entrepreneurial traits and their dynamic management capacities needs to be further tapped. Therefore, this thesis checks the relationship between private entrepreneurial traits and their dynamic management capacities.

4. How the dynamic management capability plays a mediating role between private entrepreneurial traits & private businesses' innovation performance?

Upper Echelons Theory incorporates demographic characteristics into its model to highlight the influence of traits on organization performance. On this basis, taking the traits of private entrepreneurs as independent variables will have an impact on private business's innovation performance. And the dynamic management capability of private entrepreneurs determines both content and direction of strategic decisions and exerts direct influence on private businesses' innovation performance. Featuring different traits, entrepreneurs take on various cognitive modes and behavioral patterns, have their dynamic management capability vary from each other, and thus create diverse business innovation performance. It is a chain transfer process from traits to capability and to performance. As independent variable is linked with dependent variable via dynamic management capability, this thesis attempts to verify the mediating mechanism of dynamic management capability for private entrepreneurial traits and private businesses' innovation performance.

5. How the industry environment plays a moderating role?

Psychologists found that, environmental factor serves as the foundation and impetus for the mental development of human beings. Individuals develop their traits and capability in different environments and tend to respond to changes of environment in a proper way. Confronted with the external industry environment of high risks and drastic changes, private entrepreneurs featuring stronger adaptive capacity to industry environment have access to higher opportunity recognition and risk recognition capability, are easier to detect market opportunities, and appear more calm in their thinking way and problem solving mode; on the contrary, the weaker the adaptive capacities of private entrepreneurs to industry environment is, the more restless and worrying they appear to be in case of any emergency. It can be observed that, the individual capability shaped by individual traits is exposed to the influence of external industry environment. Therefore, this research takes industry environment as a moderating variable, and attempts to verify the moderating effect of industry environment for private entrepreneurial traits and private businesses' innovation performance.

6. How the industry environment moderates the mediating role in the model?

As a moderating variable, industry environment plays a moderating effect for private entrepreneurial traits and their dynamic management capability. And dynamic management

capability, as a mediating variable, plays a mediating effect for private entrepreneurial traits and private businesses' innovation performance. It can be guessed that industry environment as a moderating variable is likely to further affect private businesses' innovation performance via dynamic management capability. Alternatively, the moderating effect of industry environment may exert influence on the mediating effect of dynamic management capability. Thus, this thesis tries to verify the moderating and mediating effect of industry environment, to further explain the role of environmental institution in private businesses' innovation performance formation mechanism.

1.4 Research method and research roadmap

1.4.1 Research method

According to the Upper Echelons Theory and Dynamic Management Capabilities Theory, this research put forward research hypotheses and theoretical models, obtained relevant data via field survey, and integrated qualitative analysis with quantitative analysis to perform data analysis and hypothesis testing. Research methods applied in this research are listed as below:

(1) Literature Analysis

This research detected deficiencies of existing research by systematically analyzing and reading relevant literature pertaining to entrepreneurial traits, dynamic management capability and business innovation performance in fields like management and psychology. It performed literature collecting oriented at entrepreneurial traits, dynamic management capability, business innovation performance, industry environment and other variables, collected and sorted out existing policies issued to boost the development of private businesses, and combined with literature review and comment to define relevant concepts hereunder. Furthermore, the development situation and trends of Chinese private businesses were taken into consideration, so as to further build theoretical models and research hypotheses of this research.

(2) Logical Deduction

The method of logic deduction was applied to explain relevant theories involved in this research. According to the Upper Echelons Theory and Dynamic Management Capabilities Theory, this research developed the theoretical framework model, and then deduced the relationship among research variables and put forward research issues and hypotheses. This research launched logic deduction for the relationship among entrepreneurial traits, dynamic management capability, private businesses' innovation performance, industry environment.

(3) Interview and Questionnaires

This research initially designed a questionnaire in combination with mature scales for the purpose of performing subjective evaluation for private entrepreneurs. Then, it referred to literature and relevant constructs, and adopted the semi-structured interview method for communication with private entrepreneurs, to deepen the comprehension of the development and management status of private businesses. With the purpose of revealing the management issues in China more efficiently, problems on the questionnaire were properly amended in light of the realities. Finally, the questionnaire was developed and issued to collect and verify data, and to provide data foundation for subsequent empirical research.

(4) Statistical Regression

In addition to collecting and sorting out principal questionnaire data, this research applied such mathematical statistics software as SPSS 26.0 and AMOS 22.0 to carry out empirical analysis and verification oriented at reliability and validity level, the relationship among variables, mediating and moderating effect of variables, and goodness of fit of model. Along with the realities of China, exploration of data analysis results will make the research conclusion more universal.

1.4.2 Research roadmap

Upon consideration of both theoretical background and realistic background, relevant research literature pertaining to entrepreneurial traits, dynamic management capability, innovation performance and industry environment was collected and read for literature review. Then, this research built the function system model of influence of private entrepreneurs for private businesses' innovation performance based on Upper Echelons Theory and Dynamic Management Capabilities Theory, put forward the research hypotheses in the way of logic deduction, and measured relevant constructs through questionnaire survey. The distribution of questionnaires comprised two stages, namely, pre-test and formal distribution. After collecting and sorting out questionnaire data, this research applied such mathematical statistics software as SPSS 26.0 and AMOS 22.0 to carry out empirical analysis and verification oriented at reliability and validity level, the relationship among variables, mediating and moderating effect of variables, and goodness of fit of model, and finally obtained the research conclusions. The specific technology roadmap of this research is as shown in Figure 1.1:

On the Relationship between Personality Traits of Private Entrepreneurs and Innovation Performance of Businesses

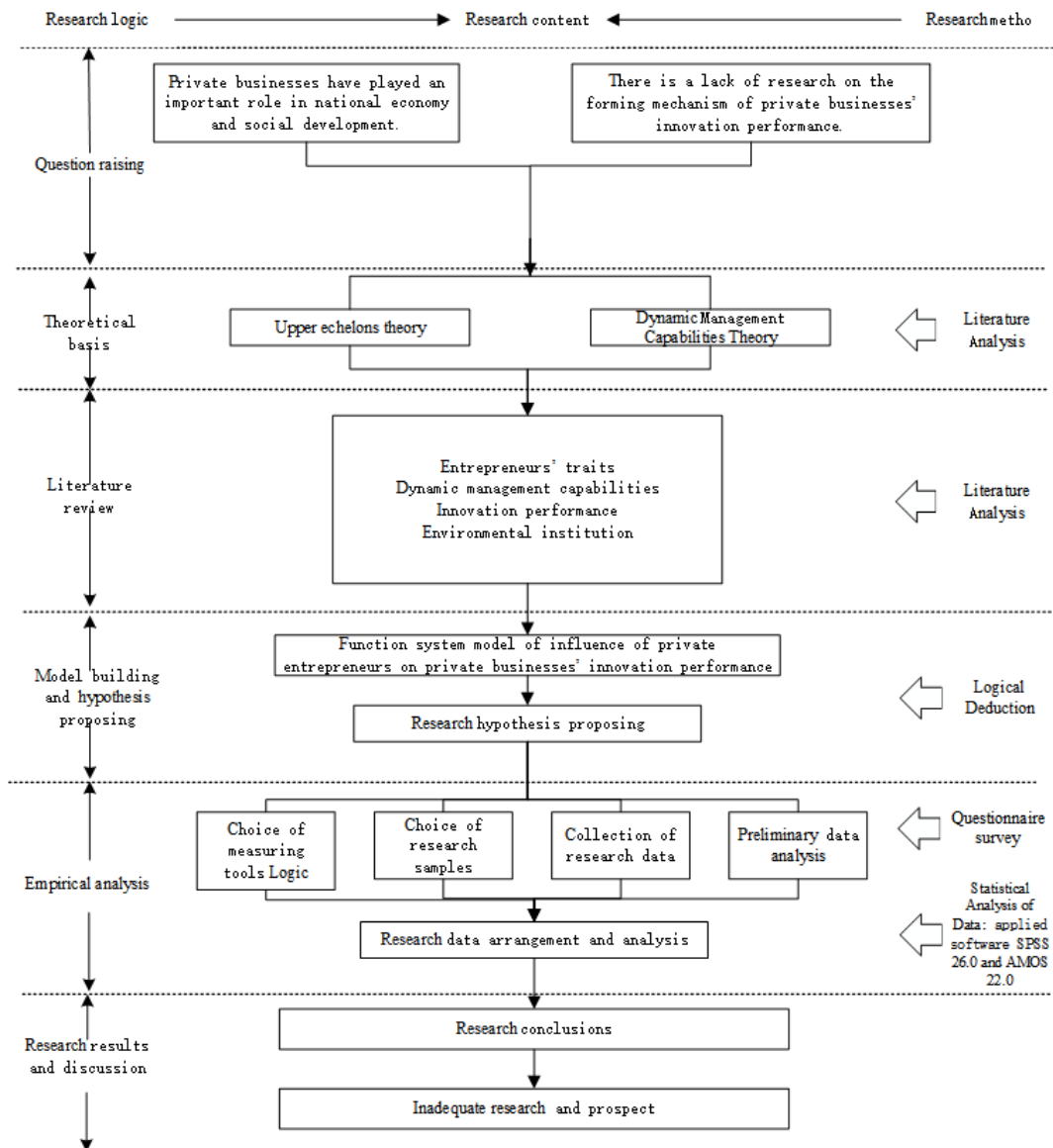


Figure 1.1 Research Roadmap

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Chapter 2: Literature Review

2.1 Entrepreneurial traits

Entrepreneurs have a variety of traits, including risk-taking, innovation, determination, perseverance, crisis awareness and lifelong learning. When faced with difficult situations, in particular, entrepreneurs can demonstrate their ability to fearlessly rise to the challenge. Given the broad scope of entrepreneur traits, this study starts with the psychological traits of entrepreneurs in terms of narcissism level and entrepreneurial resilience. This section is a literature review of the two entrepreneurial traits – narcissism and resilience – from the perspectives of concept definition and measurement approaches.

2.1.1 Concept of entrepreneurial traits

Concept means the form of thinking that shows the abstract ability and reveals attributes of counterparts. It enjoys the ability of generalization and synthesis and represents the summarizing statements of the most universal opinions on matter. Connotation and extension constitute two distinctive attributive characters of concept, among which the former means the special attributes exclusive for particular object, while the latter means matters or objects enjoying unique properties.

Derived from French, entrepreneur means pioneers and organizers with strong adventurous spirit. The concept of entrepreneurial traits can be elaborated in terms of connotation and extension. The connotation of entrepreneurial traits means the attributes exclusive for entrepreneurs, rather than other groups. Allport (1961) defined traits to be a relatively stable character feature that takes personality foundation formed by individual psychology as basic unit and held that actions and activities are subject to the direction of core traits. Besides, traits are also summarized to be the unique behavioral pattern individuals take on while responding to environmental changes and represent the relatively enduring psychological characteristics of individuals. The connotation of entrepreneurial traits includes the unique quality of entrepreneurs as well as their capability of leading businesses to achieve rapid development and performance improvement. Therefore, entrepreneurial traits may be defined to be a series of central traits that distinguish entrepreneurs from other groups.

Due to the difference in environment and culture, the extension of entrepreneurial traits is relatively extensive and is still experiencing continuous development and changes, instead of forming uniform definition standards. Against the background, the extension of entrepreneurial traits shall be defined in a systematic and technical manner. In accordance with the meaning of concept extension, the extension of entrepreneurial traits is certainly a collective concept and includes mental traits, behavioral traits and social traits, among which mental traits mean the attitudes, emotion, thinking and willpower of entrepreneurs, behavioral traits the capability, behaviors, tendency and learning of entrepreneurs, and social traits the interpersonal communication, social capital and resources access of entrepreneurs. Besides, demographic features of entrepreneurs such as age, gender, education background and occupational history also fall into the scope of extension of entrepreneurial traits and mean the specific description of any common feature of entrepreneurs and other groups.

Specifically, mental traits of entrepreneurs underline the transformation of thoughts and ideas arising from the entrepreneurs' change in mentality and ideas while managing businesses as managers. Compared with other occupational groups, entrepreneurs feature unique mental traits, such as risk taking, sense of responsibility, achievement needs, narcissism levels, resilience and internal control, while positive, stable and unchangeable psychological characteristics can stimulate their job morale and propel them to be aspiring (Liang et al., 2012), behavioral traits of entrepreneurs mean the practical activities adopted by entrepreneurs in line with the behavior rules against the environment and background of business management. On the one hand, behavioral traits of entrepreneurs are dynamic. As the capability of entrepreneurs varies under different environments, their behavioral traits also change to respond thereto, such as risk awareness and aggressive mind of entrepreneurs. On the other hand, entrepreneurs may set themselves an example to employees, thus changing their behavioral patterns and exerting influence on their working attitudes and working modes (Hisrich & O'Kinneide, 1996). Social traits of entrepreneurs mean the distinctive personality characteristics developed amid working, learning and social interaction, rather than be natural-born. Being an important element of entrepreneurs' social traits, prior experience can be further classified into working experience, management experience and career experience. On the contrary, entrepreneurs' social traits are of the utmost significance and vital to resources access, risk perception and many other capabilities that determine business survival and development.

Given that entrepreneurial traits are of relatively extensive scope, this research mainly focuses on mental traits of entrepreneurs, and carries out study in terms of narcissism level and entrepreneurs' resilience.

2.1.2 Narcissism

2.1.2.1 Concept of narcissism

Narcissism is frequently used to describe the irresistible state. It comes from a Greek myth about in which Narcissus, the protagonist of the story, fell in love with someone in the pool without realizing that it is his own shadow and finally drowned himself and became narcissus while embracing his shadow.

Narcissism appeared in the noology-related literature at the earliest, and was raised by the British scholar Ellis (1898) to describe the clinical status of “abnormal” self-love (i.e. automatic lust) in the medical field. They seem confident, calm and even extremely arrogant. Narcissists take on the self-aggrandizement feature, and the majority of subsequent definition of narcissism is concluded based on this research. Thereafter, Kernberg (1974) put forward the theory of personality disorder ascribed to narcissism upon summary of opinions of foregoing scholars. Throughout social interaction, people are individuals with varying degrees of self-reference, and suffer the contradiction between the over-inflated self-concept and the excessive demand for others’ compliment, for which they enjoy strong personal emotion, are likely to encounter envy psychology and inclined to belittle others with extreme and exploitative language and seem relentless and unsympathetic. Such personality disorder of narcissists later gradually become morbid as a result of native trait and growth environment and is even accompanied with the enhancement of aggression against others in serious cases. The criteria for narcissistic personality disorder judgment worked out by American Psychiatric Association (APA) include 9 specific standards, namely, excessive arrogance, fantasy of the access to infinite success or power, confidence in the acquisition of “special” or distinctive position, demand for being over-worshiped, unreasonable consciousness and expectation for power, exploitation of others, lack of sympathy, envy psychology and insolence.

The present research holds that, exaggeration and vulnerability are two critical components in the definition of narcissism (J. D. Miller et al., 2017; A. G. Wright & Edershire, 2018). Exaggeration of narcissism is defined to be the arrogant self-awareness, excessive highlight of oneself and lack of the due respect for others’ rights (Cain et al., 2008). Individuals with the tendency of exaggeration of narcissism enjoy performing self-promotion and self-emphasis and appear to be immodest (J. D. Miller et al., 2017), which are positively related to such fundamental personality traits as antagonism, extroversion and self-esteem (Paulhus & Williams, 2002; R. Raskin & Terry, 1988; Rhodewalt & Morf, 1995). On the contrary, fragility

of narcissism manifests itself in freedom from embarrassment and shame, namely, lack of self-confidence, defensive social withdrawal and situational self-esteem (Cain et al., 2008). Different from exaggeration of narcissism, vulnerability of narcissism is a type of negative emotion and usually related with common negative moods (J. D. Miller et al., 2018). The aspiration for power and the pursuit for confrontation inconsistent with self-cognition are regarded as the core of exaggeration and vulnerability of narcissism (Krizan & Johar, 2015; J. D. Miller et al., 2018).

2.1.2.2 Measurement of narcissism

The measurement of narcissism degree has received ongoing concern from scholars. The existing research mainly measured the narcissism degree of research objects by developing narcissism measurement scales or distributing questionnaires. As the concept of narcissism now has been accepted by growing numbers of disciplines, the measurement thereof has experienced continuous development. Currently, representative scales include Diagnostic Narcissism Scale (DMS), Narcissistic Personality Inventory (NPI), Minnesota Multiphasic Personality Inventory (MMPI), improved NPI and California Psychological Inventory (CPI).

The addition of the new type - NPI by R. N. Raskin and Hall (1979), according to the standards of existing scale DSM-111, directly results in the rapid development of the study on narcissism measurement scales. As a forced choice questionnaire with 54 items, it aims to measure the individual difference of narcissism as a personality trait. With undergraduates as experimental subjects, R. N. Raskin and Hall (1979) adopted strategies like consistence of internal and item to overall correlation to measure dichotomous items with narcissism characterization, and asked subjects such questions as “Being the focus of others’ attention is what I enjoy” or “Being the focus of others’ attention makes me embarrassed”. Although this list is in accordance with standards of DSM-III, it includes the extreme manifestations of those behaviors that form pathological narcissistic personality.

The 28-item scale created by Phares and Erskine (1984) seeks to quantify the development of egoism under the social learning framework. Phares and Erskine (1984) substituted narcissism with egoism as they held that egoism is a kind of attitude, rather than motivation structure. However, a pure cognitive construct ignores the emotion, motivation and interpersonal process behind narcissism. Emmons (1984) verified the 54-item NPI and extracted 4 components via principal components analysis rotation method, namely, leadership / authority, self-absorption / self-worship, superiority / arrogance and exploitation / power. Due to the possible existence of extreme items, however, there are errors and the results based on

dichotomous items are deemed as unstable.

In order to further verify the stability of NPI, Emmons (1987) carried out the second research via principal axis factor analysis of different samples yet concluded the same four factors. As to the factor of leadership / authority, choices of narcissism include: “I am an excellent leader”, “Being the focus of others’ attention is what I enjoy” and “I like to label myself as someone with strong personality”. As to the factor of self-absorption / self-admiration, choices of narcissism include: “I prefer to appreciate myself via mirror”, “I am unparalleled” and “I will grow to be great”. As to the factor of superiority / arrogance, choices of narcissism include: “I am able to dominate any dialogue”, “People may learn a lot from me” and “I am always clear of what I do”. As to the factor of exploitation / power, choices are closely linked with accommodation to misconduct and psychopathology. After reviewing the factor analysis process of Emmons (1984), R. Raskin and Terry (1988) detected that, multiple items of the same factor seem to be able to solve the issue of different concept dimensions, and 4-dimension correlation is likely to provide a clearer perspective for potential project structure. And the internal validity and external validity of NPI were further checked.

Wink and Gough (1990) classified narcissism into four themes. The first is inflated self-esteem and fantasy of power and talents; the second is to belittle others, possess strong competitive desire and be jealous of others’ achievements; the third is consciousness of right, namely, the demand for surmounting common social customs; the fourth is dissatisfaction with the current situation or the feeling of being underestimated. Based on the examination of the self-report project data of 152 adults and 198 undergraduates, Wink and Gough (1990) compiled new CPI and MMPI. Through analysis of factors within the scale, the following five themes were confirmed, namely, catharsis of power, inclination to seek risks, demand for attention, lack of respect for others, and impatience and caprice. The new 49-item CPI and 39-item MMPI satisfy the reliability and validity requirements for self-report scales.

As the narcissism concept now is applied to more fields, there are stricter requirements for scale application. The improved NPI was raised by Kubarych et al. (2004) based on the previous research. Del Rosario and White (2005) verified the stability and internal consistency of NPI, and reliability coefficient is deemed higher as narcissism is recognized as a stable and everlasting personality characteristic. Ames et al. (2006) developed a new tool for the expansion of narcissism research, i.e., withdrawing items from NPI-40 item sets, building and verifying a shorter one-dimension measurement scale NPI-16. The shorter NPI-16 is substantially similar to NPI-40 in terms of the measurement of other traits and the relationship among dependent variables. NPI-16 features significant convergent validity, internal validity, discriminative

validity and predictive validity, and can be used as an alternative method for narcissism measurement if longer questionnaires are not allowed. As the concept of narcissism is continuously granted with new definition, the measurement thereof should be updated from time to time. Now narcissism measurement scales in different fields need to be further developed, enriched and perfected.

2.1.3 Entrepreneurs' resilience

2.1.3.1 Concept of resilience

The concept of resilience grew out of the research on how to deal with pressure. Originating from “Resilire” in Latin, resilience is frequently used in the physics research field. In physics, resilience means the capacity of physical materials to gain energies throughout plastic deformation and rupture. Generally, the greater the resilience of an object is, the lower the probability of the object to suffer brittle rupture will be. Another explanation of resilience in physics means the counterforce against the strength for deformation. The resilience of an object is the proportion of all the energy absorbed by the object prior to its plastic deformation or rupture to own volume. In psychology, resilience means the mental mechanism of spontaneous recovery and ability enhancement under the pressure environment, such as effective adaptation to loss, difficulty and other predicaments. This definition highlights the significance of predicaments for individual growth, as individuals may restore to the original state upon major trauma and make progress via perseverance. Meyer (1982) studied the phenomenon where hospitals responded to environmental changes to maintain their operation and made the introduction of resilience in management, thus initiating the research on resilience in different fields. Thereafter, the research on resilience is always ongoing.

In China, the existing research also translates resilience to mental elasticity, restoring ability, mental toughness and resistance, which demonstrates the flexible adaptation of individuals to changes in pressure experience requirement and means the capacity to cast off pessimistic and negative moods (J. Block & Kremen, 1996; J. H. Block & Block, 1980; Lazarus, 1993; Tugade & Fredrickson, 2004). Under normal circumstances, the stronger the adaptive capacity of individuals is, the higher the possibility of keeping optimistic in face of difficulties and remaining positive and open for new experience shall be (Sels et al., 2021). This phenomenon is ubiquitous in real life. Of people suffering setbacks or predicaments in childhood, the majority are free of psychosocial functional disturbance after growing up (Bonanno, 2004). In the event of experiencing serious danger and great pressure, they are not trapped in mental and

behavior problems (Martinez-Torteya et al., 2009). Traditional psychopathology holds that, pressure and adversity exert negative influence on the growth and development of individuals, and even thoroughly change their life track (Goldstein & Brooks, 2013), which is challenged with the presentation of the concept of resilience. However, the development of the concept of resilience is full of setbacks and barriers. In the academic circle, the concept of resilience was initially doubted, later experienced disregard, rejection and gradual acceptance, and was widely accepted by scholars by the end of last century (Werner, 2013).

The concept of resilience has been unceasingly supplemented and perfected over the past 4 decades. From the summary of existing literature, it can be seen that, the concept of resilience is mainly defined by scholars on fronts of quality, process and result. Quality-oriented definition holds that resilience is a dual attribute construct with cultural generality and concreteness, and that individuals possess the capacity and quality to respond to emergencies and resist common pressure in adversity (Xi et al., 2015); process-oriented definition describes resilience in details and holds that resilience is the dynamic development process of individuals in reacting with environment and other factors on their existence (Montpetit et al., 2010); result-oriented definition defines resilience from two aspects, namely, “pressure and adversity resulting from previous and existing experience” and “results arising therefrom” (Flores et al., 2005). In combination with the above-mentioned three opinions on resilience, the general conditions and definitions of resilience may be concluded. Factors leading to the generation of resilience include situation with major difficulties and coping capacity and adaptive capacity of individuals. Resilience means the physical and mental ability that people having experienced or experiencing severe pressure or adversity show against adverse environmental implication. This ability is unceasingly enhanced, instead of being destroyed. Thanks to resilience, individuals can realize self-service and self-rescue, draw on advantages and avoid disadvantages, and yield continuous growth, despite severe pressure and adversity.

2.1.3.2 Measurement of resilience

The measurement of resilience is highly focused in such disciplines and research fields as histology, management and medicine. Effective and reliable scale development and application of mature measuring tools are able to make the systematic analysis, monitoring and prediction of resilience more feasible. In this regard, the development of resilience scales (RS) is of the utmost significance. From the review of available literature, it can be seen that, of the focus is on developing resilience scales, career resilience scales and business resilience scales.

Measurement of resilience mainly appears in early literature. G. M. Wagnild and Young

(1993) took the lead to perform helpful exploration for the development of RS. In 1988, G. M. Wagnild and Young (1993) carried out pretest for RS. The pretest was initially carried out among samples of elderly females, which was later extended to males and wider age-bracket. Upon pre-screening of participants prior to the experiment, this research took 24 females successfully accommodating to major life events (G. Wagnild and Young, 1990) as research objects, who feature proactive psychosocial adaptation and take on medium-high degree of morale and social participation. Everyone was required to describe how she coped with the losses affirmed by herself. Based on their narration, the five interrelated components of resilience were determined, namely, composure, perseverance, self-dependence, meaning and existential loneliness. The formal experiment adopted the factor analysis method and determined that, resilience may be measured in terms of perseverance, confidence, meaningful life experience, comfortable feeling and balance. Norem (2001) further checked and verified RS and based on the research of G. Wagnild and Young (1990), summarized the resilience measurement into four dimensions, namely, personal construct, trouble-shooting, harmonious social relations and ego defense mechanism. The above-mentioned two dimensions classification methods expedited the development of resilience measurement, after which scholars introduced resilience research to different fields and attached great significance to the development and inspection of resilience adaptation scales.

Career resilience scale is applicable for specific professional workers. In order to improve the deficiency of previous career resilience measurement methods, McLarnon and Rothstein (2013) developed the more comprehensive WRI measurement scale. This scale comprises eight factor dimensions, namely, personal emotion, personal cognition, individual behaviors, social support networks, initial response to major and life changes, emotional self-regulation process, cognitive self-regulation process and behavioral self-regulation process. As evidenced by the empirical test, all the aspects of WRI show the acceptable internal consistency and sufficient independence. For the explicit RAW developed by Winwood et al. (2013), the application of exploratory factor analysis and confirmatory factor analysis is to confirm its seven factors, namely, sense of reality, sense of control, sense of mission, pressure management ability, cooperation, keeping fit and establishment of interpersonal network.

Business resilience is usually measured via questionnaire measurement method and second-hand data measurement method (J. C. Zhang et al., 2021). Due to the complexity of the connotation of business resilience, early scholars de-structured its connotation from multi-dimensional perspectives. Akgün and Keskin (2014) once classified business resilience into six dimensions, namely, competition orientation, social capital, organizational agility,

organizational routines, readiness plan and resources network, which failed to be extensively applied by other scholars as a result of their messy relationships. Thereafter, scholars began to develop measurement scales from capability perspective, process perspective, trait perspective and result perspective, and even simplified the original six dimensions to one dimension. As single-dimension scale fails to cover all the aspects of business resilience, the majority of the existing scales are of two-dimension structure and three-dimension structure. From the capability perspective, Prayag et al. (2018) classified business resilience into planning capacity and adaptive capacity; Bustinza et al. (2019) directly treated business resilience as single-dimension capacity. From the process perspective, Sincorá et al. (2018) measured business resilience on fronts of predictability, adaptation and restoring ability. From the trait perspective, most scholars measured the resilience of an enterprise by robustness, redundancy, adequacy, and rapidity. From the result perspective, H. Parker and Ameen (2018) developed the measurement scale with business resilience as single dimension. After deepening the research on business resilience, some scholars held that, business resilience is a potential and path-dependable concept and fails to be directly measured (Ortiz-de-Mandojana & Bansal, 2016). As a result, they endeavored to access data disclosed by listed enterprises or financial institutions for the purpose of building the measurement and appraisal system. Relatively typical indexes include post-crisis loss degree and recovery time with the former revealing the stability of businesses and the latter demonstrating the flexibility of businesses (DesJardine et al., 2019; Sajko et al., 2021). The Studies on the measurement of entrepreneurs' resilience shown in Table 2.1.

Table 2.1 Studies on the measurement of entrepreneurs' resilience

tabke	Scale development and improvement	Major contributions
G.M.Wagnild and Young (1993)	A prototype of the Entrepreneurial Resilience Scale (RS)	An important preliminary exploration of resilience measurement
Norem (2001)	Refinements to the RS	An advancement of resilience measurement
McLarnon and Rothstein (2013)	Development of a more comprehensive workplace resilience questionnaire (WRI) scale	Classification of resilience into eight dimensions: personal emotion, perception, behavior, social support networks, initial reactions to major and life changing events, processes of emotional self-regulation, processes of perception self-regulation, and processes of behavioral self-regulation
Winwood et al. (2013)	Development of an explicit work resilience scale (RAW)	Simplification of the above dimensions into a definitive scale containing seven dimensions: sense of authenticity, sense of control, sense of purpose,

		stress management capability, cooperation, health keeping, and interpersonal network. Classification of entrepreneurs' resilience into six dimensions: competitive orientation, social capital, organizational agility, organizational practices, preparatory plan, and resource network
Akgün and Keskin (2014)	Induction and summary of the existing scales	Classification of entrepreneurs' resilience into two dimensions: planning competency and adaptive competency
Prayag et al. (2018)	A useful exploration based on a competency perspective	Measurement of entrepreneurs' resilience in three dimensions: prediction, adaption, and resilience
Sincorá et al. (2018)	A useful exploration based on a process perspective	Development of a single-dimension scale for measuring entrepreneurs' resilience
H. Parker and Ameen (2018)	A useful exploration based on a result perspective	Summary of entrepreneurs' resilience measurement as a single-dimension competency
Bustinza et al. (2019)	A useful exploration based on a competence perspective	
DesJardine et al. (2019); Sajko et al. (2021)	A suggestion that entrepreneurs' resilience cannot be measured directly and that an evaluation system be established with reference to data from listed companies	Provision of a new perspective on the measurement of entrepreneurs' resilience

2.2 Dynamic management capability

2.2.1 Management cognition capability

Dynamic management capabilities are driven by management cognition which includes the belief system and psychological model managers use to make decisions (Prahalad & Bettis, 1986) and are the result of individuals, professional experience and managers' interaction within inner network and outside network (Adner & Helfat, 2003). Up to now, there is greater exploratory space for the cognition basis of dynamic management capability (Eggers & Kaplan, 2013).

Management cognition means the effective management of self-belief and thinking mode, and may serve decision making (Walsh, 1995). In the early research, scholars, represented by Cyert and March (1963), held that, management cognition depends on cognitive basis, and is manifested as the selection of knowledge, assumption of future events and access to the comprehension of results of implementing alternative proposals. As a result of limited

rationality, managers may fail to obtain the complete information on future events, alternative proposals and consequences of actions. In this connection, the establishment of management cognition system grows to be more significant, as it is likely to affect the priority of choices and results. On this basis, Hambrick and Snow (1977) and Hambrick and Mason (1984) held that, the foundation of a continuously perceiving process of making decisions was constituted by cognitive basis and value system. And Prahalad and Bettis (1986) mentioned the dominant logic within businesses that reflect management belief structure and reference frame in a similar way. According to the opinions put forward by Gavetti and Levinthal (2000), recognition is defined to be “a prospective intelligence form on the premise of actors’ belief of the relationship between behavior choice and subsequent influence of those choices on results”. In practice, managers are inclined to minimize their recognition efforts (Baron, 1998), for which they enjoy limited capacity to cope with new information, fail to embrace overall perception, and may perform management cognition of surrounding circumstances in the manner of selective cognition only (Huff, 1990). Such recognition serves as the basis of management decision-making in turn and is likely to suffer the influence of more pervasive recognition bias through decision making (Schwenk, 1984). According to Helfat and Peteraf (2015), management cognition capability means the capability of single manager to implement one or more psychological activities, including the cognitive ability of mental activities, and its influence on the development of innovation ability. These mental activities constitute the cognitive basis of managers and include attention and perception, reasoning and trouble-shooting, language and communication, mental process and emotion (Hodgkinson and Healey, 2011). Talke et al. (2010) put forward three kinds of management cognition capability, namely, sensory ability, problem-solving and reasoning ability, language and communication competence. Consciousness means the mental activity of organizing and explaining information from the external environment (Powell et al., 2006). Problem-solving and reasoning means the process of finding the approach to specific problems and reaching the expected goal (Gazzaniga et al., 2010).

After being put forward, management cognition capability has been extensively applied to various research. In addition to being the most stable portion of dynamic management capability, management cognition also ranks to be the most important part of strategy decision-taking and is the foundation for management decision-taking and entrepreneurship activities (Andersson & Evers, 2015). The ever-changing environment may make specific thinking mode become inapplicable, and result in the strategy mistakes of strategic leaders (Tripsas & Gavetti, 2000). The recent empirical research also proved that management cognition is likely to influence strategic decision-making and results, including response to external environmental changes.

Tripsas and Gavetti (2000) found that, the failure to achieve ongoing business can be ascribed to the improper thinking mode of senior managers. Holbrook et al. (2000) detected that, with the industry development, the various cognitive opinions of early senior managers of American semiconductor companies have led to different development states of their companies. It was also found by Kaplan et al. (2003) that, if the top management of pharmaceutical companies manages to realize the significance of biotechnology and the strategic response opportunities, the business performance might be remarkably improved. The above-mentioned cases all evidenced that different management cognition may result in various strategic decision-making and results. Teece (2016) applied this concept to the research on dynamic capability and organizational agility. Felin et al. (2015) regarded management cognition capability as the micro-foundation of organizational strategy. Situated at the ever-changing environment, managers may make active or negative contributions based on their cognitive competence (Adner & Helfat, 2003). Research shows that, cognitive competence of managers is the micro-foundation of dynamic management capability and can further influence business strategy transformation and performance. Strategy transformation lays emphasis on the “difference from the past” and includes changes in business development directions as well as sustainable improvement and upgrading of businesses (Harreld et al., 2007). The foregoing improvement and upgrading can benefit the long-term development of businesses and enable them to efficiently cope with environmental changes and realize sustainable development.

As the basis of dynamic management capability, management cognition capacity explains the potential influence of managers’ cognition on organizational strategy change in such ways as perception, acquisition and relocation (Helfat & Peteraf, 2015; Teece, 2007). Management research has been regarding cognition as a vital attribute of senior managers in organizations for long (Cannella et al., 2009). During the process of searching for factors that facilitate strategic reform, the management cognition of senior managers grows to be more significant. For instance, Smith and Tushman (2005) put forward that, senior managers need to establish a type of “paradox cognition” for the full use of existing information resources. Management cognition of managers originates from their previous experience, particularly, the experience in the past “information environment” (Walsh, 1995). Managers usually respond to present problems via information processing and handling of previous experiences. According to C. C. Miller and Ireland (2005), however, intuition and feeling may be harmful to businesses’ exploration of new technologies and strategies because they are automatically and, in many cases, improperly depend on prior professional knowledge. Thereafter, Gavetti (2012) held that, strategic leaders with superior associative psychology are able to avoid this pitfall and embrace

higher possibility of identifying potential strategic opportunities.

Besides, management cognition may affect the perception, intelligence and social interaction framework adopted by managers for environmental interpretation, exchange and interaction with others, and thought pertaining to their patterns of action (Fiske, 1993). The opportunity perception capability of managers may be affected by their cognition because managers' thinking spaces and their ability to adapt to their environment are ultimately determined by management cognition (S. C. Henneberg et al., 2006; S. C. Henneberg et al., 2010). Management cognition capability endows managers with higher analysis capacity, for which they can respond to competition and adapt to environmental changes in a better way (Helfat & Peteraf, 2015; Levine et al., 2017). In addition, management cognition may be linked with managers' perception on the formulation of strategic decisions (Adner & Helfat, 2003). Such managers as featuring cognitive competence may carry out comprehensive analysis throughout problem-solving, and provide proper strategies (Caughron et al., 2013; Partlow et al., 2015). This competence further enables managers to conclude correct decisions and develop solutions, for which subordinates are more confident in them (Sirmon & Hitt, 2009).

2.2.2 Managerial social capital capability

According to Resource-Based Theory (RBT), businesses achieve competitive advantages via many valuable and rare resources and maintain those advantages for long when the foregoing resources are hardly possible to be imitated or replaced by competitors (Badrinarayanan et al., 2019b). J. B. Barney and Arikan (2005) held that, resources mean tangible and intangible assets that businesses leverage to make their strategies conceived and implemented, which can be divided into tangible assets, financial assets and human assets. Businesses play the role of combining those resources with capability, and are able to create excellent performance by purchasing, developing and arranging their specific heterogeneous and partially movable resources (Hunt, 1999). Undoubtedly, valuable, rare, inimitable and irreplaceable resources are of the utmost significance in helping organizations achieve and maintain extraordinary performance and competitive advantages (Badrinarayanan et al., 2019b).

Managerial social capital is the second largest driver of dynamic management capability (Adner & Helfat, 2003; J. A. Martin, 2011). The social capital of management is composed of the business reputation in formal and informal relationships, namely, the relationship between managers and others, which can be leveraged to access resources and information. Social capital grows out of social relationship and may endow individuals with influence, control force and power. Social capital's concept reveals that social relationship and other relationships may exert

influence and be transferred to another environment. Thanks to the social relationship, information may be transferred from either environment to the other one. Managerial social capital refers to the capacity of managers to obtain resources via relationship (Adler & Kwon, 2002). Social capital is linked to the concepts of relationship and network at close range (Andersson & Evers, 2015). Formal and informal network ties of managers are conducive to their access to necessary resources and may furnish important information for their decision making (Gelatkanycz & Hambrick, 1997). Adler and Kwon (2002) draw a distinction between external and internal social capital because they come from the internal and the external of organizations respectively. As to managers, the strategic research on social capital should center on external relation. Geletkanycz and Hambrick (1997) pointed out that, managers' external relation may do help in performance promotion of business from two aspects. On the one hand, external relation may provide businesses with approaches to external resources (i.e., financing) essential for operation; on the other hand, external information may furnish managers with different practical information. And information diversity, in turn, is able to improve the formulation of decisions. Research shows that, external relation is conducive to the improvement of business performance.

Apart from external relation, managers usually possess internal social capital as well. For managers dominating the vantage point of the internal social network, they are likely to be granted with the power of effectively utilizing opportunity resources. Similar to how social capital has internal power and influence, changes in personnel, organizational structure, and tangible assets related to restructuring may benefit. Blyler and Coff (2003) held that it is impossible for businesses to acquire, reorganize and release resources in the absence of individuals' social capital. Burt (2004) analyzed the internal social capital of managers of large-scale high-tech enterprises and held that both formal and informal working relationships furnish managers with a network where information and other resources are available. Business managers make decisions based on the information from department managers. Business managers mainly acquire resources and information by virtue of corporate-level or other business managers. In a way, managers have access to different social capital and various approaches to information acquisition due to their respective position levels. The difference in information source may procure managers to make different decisions (Ron et al., 2003).

Trust is a relational dimension of senior managers' social capital. Trust means the belief of the parties to establish good intentions and to care for each other (Nahapiet & Ghoshal, 1998). It reveals the nature of the relationship between the parties (Atuahene-Gima & Murray, 2007). In other words, confidence represents the expectation of depending on another stakeholder to

perform obligations and to carry out fair action in the case with opportunism possibility (Zaheer et al., 1998). Confidence is able to reduce the uncertainty in relationship, contribute to the generation of cooperative intention, and provide reasonable assurance, thus realizing expected objectives and results in relationship (Payan et al., 2010).

Managerial social capital means the acquisition of resources and information by managers via social relationship (Nahapiet & Ghoshal, 1998). Managers are equipped with the “network capacity” of acquiring knowledge and resources. Network capacity includes the capacity of establishing confidence, interaction and frequency relationships with stakeholders to gain access to knowledge and resources (Andersson & Evers, 2015). The social capital of management is of the utmost significance for acquiring and re-distributing resources. Social relationship outside organizations may make access to resource possible (Pfeffer & Salancik, 2003). Burt (2004) held that, in managing social capital, managers prefer to exert active influence on business performance via essential conditions for the better connection and promotion of resource exchange and combination, which can make explanation on how managers carry out activities in a more efficient way. By managing relationship network, organization can access various resources and obtain knowledge that are unavailable to be gained normally, and further promote the realization of business objectives (Hernández-Carrión et al., 2017).

Managerial social capital inevitably triggers the bond among individuals within an organization and reinforces their mutual confidence and hopes (Ugaddan & Park, 2017). For managers with managerial social capital capability, they are good at perfecting organizational relations via negotiation and consultation with all the organization members, stimulating organization members (X. Zhang et al., 2017), and facilitating resource exchange and knowledge transfer among network members (Guo et al., 2017; Kim et al., 2016; Liu, 2017). And the managerial social capital capability of managers may encourage knowledge sharing and expedite the reform progress (X. Zhang et al., 2017). Correspondingly, organization members will comprehend the significance of changes, and establish a collectively initiated change for sustainable development (Woodward & Hendry, 2004).

2.2.3 Human capital management capability

Human capital falls into the most significant resources held by businesses (Hitt et al., 2001). Human capital means skills, education, experience and knowledge of business employees (Ployhart & Moliterno, 2011), including intelligence, personality, value and interest (Ployhart & Moliterno, 2011). Broadly, it is defined as the learning skills that need to be further invested

in education, training or a wider scope (Adner & Helfat, 2003). Similarly, managers, based on their previous working experience, acquire knowledge, develop professional skills and perfect their own capacity. The same as any other tasks, effective management needs to be carried out in practice. Human capital means resources of any entity, which is created via knowledge, skills, capacity or other characteristics of individuals and is conducive to the generation of competitive advantages (Ployhart & Moliterno, 2011). Managers with high-level human capital management capability can convert their value-added resources and to gain new knowledge by combining their information with knowledge (Bontis & Fitz-enz, 2002). A lot of empirical research on human capital substituted knowledge and skills with previous experience resources. For instance, Bates (1990) converted human capital operation to multi-year education and management experience as well as small business practice in family environment; Gimeno et al. (1997) converted normal human capital operation to working and management experience, and human capital operation of education and specific industries or businesses to experience in clients, suppliers, products and / or services. The implicit hypothesis means that, although we are unable to clearly identify or measure the specific knowledge and skills essential for the improvement of business performance, the previous experience, one of the possible sources of such knowledge and skills, may increase the possibility of bearing the specialized knowledge in terms of essential knowledge and skills, and lead to better business performance.

The human capital management framework provides a method for the heterogeneity appraisal of management skills. Managers may vary in skill set or in the capacity level of each skill. Except for general skills, the transfer of any other skill within or outside businesses is limited. Due to the progress achieved by managers in their career life, they will accept new positions of duty. Different managerial career pathways result in different managerial human capital contributions and workplace acquisitions. When the technological and market prospects that support a company's continued innovation are uncovered, individual experience is especially important (Hill & Rothaermel, 2003). High-level human capital allows employees to alter their regular tasks, which aids in the organizational implementation of higher ordering capability (King & Tucci, 2002). Firms with high-level human capital will profit from fresh marketing and creative ideas offered by their well-educated and functional employees (Krasnikov & Jayachandran, 2008). Additionally, more competent staff members are more likely to thoroughly acquire, assimilate, and apply knowledge from both internal and external sources (Cohen & Levinthal, 1990). Because it facilitates employees' quick learning, some academics contend that human capital is the cornerstone of dynamic capacity growth (Bruni & Verona, 2009; Mäkelä et al., 2012; Zollo & Winter, 2002).

There are two types of human capital management: specialized and broad (Bailey & Helfat, 2003; Castanias & Helfat, 2001). However, little is known about how dynamic management capability is affected by human capital in general and in specific firms (Helfat & Peteraf, 2015; J. A. Martin, 2011). Just like human capital in general, past experience forms the basis for the practical management knowledge and skills that serve as dynamic management capability. Managers may identify opportunities and risks, grasp chances, and change organizational capabilities, structures, and resources by utilizing their knowledge and skills. Managers with expertise in different functional areas, technologies, industries, and firms have varying capacities for learning new information (Cohen & Levinthal, 1990), which affects how they view opportunities. A similar logic applies to the reallocation of resources. Differences in managerial expertise generated by human capital are likely to result in differences in managers' reallocation of organizational resources. In addition to managers' individual human capital, the concept of dynamic management capability includes the management team (J. A. Martin, 2011). This leads to managers' in-depth consideration of human capital at the team level (Ployhart & Moliterno, 2011) and suggests that complementation in human capital among team members may positively influence corporate performance (P. M. Wright et al., 2014).

Human capital management capability includes managers' skills and knowledge reserve, which are formed from their educational experiences and individual professional experiences (Castanias & Helfat, 2001). Management experience in a specific environment allows managers to acquire and develop specialized knowledge and skills (Kor, 2003). It is the human capital of corporate management that theoretically constitutes one of the potential driving forces of dynamic management capability (Adner & Helfat, 2003; Castanias & Helfat, 2001; J. A. Martin, 2011). Typically, managers use their knowledge and experience to identify opportunities through education, formal and informal training, and the development of work experience (Bailey & Helfat, 2003), and take such opportunities by ways of resource collection and reallocation (Helfat & Martin, 2015). Managers can more effectively design possible resource decisions that are practicable thanks to their personal knowledge and understanding of external situations, internal resources, and business competence (Ployhart et al., 2014).

Managers who are successful in the workplace are adept at taking advantage of human capital management capability (Helfat & Martin, 2015). Such capability allows managers to make changes to routine work processes through hands-on activities. This promotes the growth of highly competent human capital management capability (Bendig et al., 2018). Such capability refers to the skills and knowledge that individuals learn and develop through prior experience, training, education, and the psychological attributes of individual cognitive abilities

(general intelligence) and other capacities (personality, values and interests); besides the managerial cognition and social capital, human resources are also involved skills and knowledge, cognition and other capacities (Helfat & Martin, 2015). High-level managers can create new knowledge and value-added resources by combining existing information and knowledge sources (Bontis & Fitz-enz, 2002), which in turn enhances their ability to innovate. Innovative organizations will have the ability to develop fresh items that satisfy the wants of their target market (Zhao & Goodman, 2019).

2.3 Business innovation performance

2.3.1 Meaning of business innovation performance

The word innovation can also be understood as “pioneering”, which means to be the first one, or to create something new or establish something. Meaning of innovation varies from one subject to another. Philosophers attribute the philosophical connotation of innovation to the creative behavior of individuals, where new material forms arise from the formation of new contradictory relationships in the process of discovery, utilization and re-creation of things, through which the increase of the overall social benefits takes place. Innovative philosophical view holds things as developing and any finite existence can be created infinitely; the existence of matter itself and existence itself are a contradictory and unified contradiction, and contradictions are the core of innovation; the self-denying development of humanity promotes the formation of innovation, and humanity is the result of self-innovation; human develops by the way of innovation, and new ways of creation realize new egos. Sociologists define innovation as an activity in which people use the information and technical conditions at their disposal to break the conventional pattern and create something new and valuable in order to meet their development needs. The essence of innovation lies in “new”, breakthrough sociologically becomes the essential attribute of innovation. By breaking the confinement of traditional thinking and the backwardness of rules and regulations, product performance and external form are changed, new shape, content and form are created, or a new way of thinking and acting is practiced. The economist Schumpeter elaborated on the concept of innovation in his book *Theory of Economic Development*, and this was the first time the concept of innovation was economically leveraged. Schumpeter defines innovation as the integration and application of completely new production factors and production technologies to the production process; the technological change triggers impact on economy by solving business problems with new

combinations of existing productivity (Schumpeter, 1982). It consists of five situations: 1) introduction of a new product; 2) introduction of a new method of production; 3) opening of a new market; 4) to the availability of a new source of supply of raw materials or semi-finished products; 5) alternative organizational forms. Schumpeter's definition of innovation covers a wide range, including organizational innovations that involve non-technical improvements as well as innovations including technical changes. Economists define innovation as all useful acts of breaking out of the inherited patterns under certain thinking, utilizing existing knowledge and material resources, putting forward insights different from others' thinking according to one's own will, making the overall social needs and idealized needs the goal, and creating brand new things, methods and ways to achieve the goal. That is, the act of using existing social and natural resources, replacing and overlaying old things, and constantly creating contradictions to achieve development, breakthrough and creation of new things.

The innovation process is inherently iterative (Garcia & Calantone, 2002) and is a renewal of core process within organizations (Tranfield et al., 2003). Intensive global competition has led to rapid changes in the market environment and strengthening in labor sharing and collaboration in corporate innovation process. As technology develops, industry characteristics, products, and crucial success factors are all developing together with it. Companies with poor adaptability, as a result, are driven out of the market. Therefore, the structure, attractiveness, and capability needed to succeed in an industry may change over time; companies also propose different strategies at each stage (Afuah & Utterback, 1997). Agility, adaptability, and a focus on core competitiveness are seen as sources of competitive advantages in the majority of industries. The degree to which intellectual property and shared technologies are opened affects not only the ability of developers to innovate, but also the power of platform sponsors to price (G. Parker & Van Alstyne, 2018). The forms of open innovation thus resulted are increasingly favored (Gassmann, 2006). As the core of technological change, open innovation activities rely on the accumulation, sharing, and development of a variety of relevant knowledge (Fischer & Varga, 2002), which not only change the traditional closed innovation model, but also introduce external innovation capability, thus enhancing diversity of products, technologies, and systems, and fostering and cultivating the ability to innovate (Carr et al., 2016).

Companies provide goods and services in the market, and the law of demand shows that as a commodity's price rises, fewer consumers are willing and able to pay for it, whereas as a commodity's price falls, a greater number of consumers are. As the consumers' quality of life has increased and the diversity of their needs has changed, however, the business model of winning with low prices has been impacted. The rapid development of production technology,

the changing needs of customers, and the unceasing innovation of competitors have forced companies to consider more comprehensively complex factors affecting consumers' willingness to buy, such as functions and quality of products, after-sales service, and packaging design. To this end, companies should use their innovation ability to take the advantageous places in competition. However, not all innovations are effective, and only those that are ultimately successful are accepted by the market. Innovation performance, as a comprehensive evaluation index for the impact of innovation activities of a company, measures the implementation results of the company's innovation capability and is directly tied to the operation and development of the business.

Innovation performance is a refinement of performance in innovation, and first of all, we give a brief explanation on the conceptual connotation of performance. Performance, a term that originates from Management Science, is seen as an effective output, the desired result of an organization's efforts to achieve its set goals. It consists of two parts, and the first one is "performance", which emphasizes business performance and is highlighted by the degree to which corporate profit targets are achieved; "effectiveness", the other part, refers to efficiency, which requires more output with less input to reduce inefficient resource use and resource waste, and is manifested in the completeness and impact of corporate rules and regulations, as well as the work competence and attitude of employees. Therefore, performance means the effective output activities carried out by an organization at different levels to achieve its overall objectives. Performance is multifactorial, multi-dimensional and dynamic. Multifactor means that the quality of performance is affected by various factors, including environment, skills, opportunities and motivation; multi-dimensionality means that performance should be evaluated from varied aspects and perspectives, and that the work behaviors of employees are quantified and transformed through specific and effective data to ensure that the performance results are objective and impartial; dynamism means that performance should change from time to time; when a factor affecting employee performance changes, employee performance should be adjusted accordingly.

Performance is divided into organizational performance and individual performance to match the ultimate strategic goals of a company. Strategy implementation serves the purpose of bringing about performance improvement; therefore, organizational performance is usually considered as the starting point of organizational strategy implementation, as well as the core concern in strategic management. Performance is usually regarded as the culmination of descriptive work behaviors and quantifiable work outcomes of individuals or groups over the course of an organization, and the work outcomes realizable for an organization in a certain

period of time in the future by combining the quality and capability of individuals or groups in their past work. In other words, performance means an organization, team, or individual, under the given resource environment, works effectively to achieve desired goals, measures and provides feedback on the degree to which and efficiency with which the goals are achieved (Fang & Bao, 2009). However, organizational performance is only an unclear structure that cannot be accurately determined and measured by itself; for this reason, potential aspects related to organizational performance can only be measured by building a theoretical model (Campbell, 1977), so as to reflect organizational performance in an indirect manner. In this regard, the measurement of organizational performance should be adapted as the specific case may be.

At present, there is no consensus in the academic circle on the connotation definition of innovation performance. In early studies, innovation performance was mainly used as a criterion for rating the technological competence of innovation in companies (Drucker, 1993; Linton, 2009), added social innovation to the existing technological innovation dimension, elaborated the differences in innovation value from different perspectives by establishing a coordinate system, and clearly indicated the perspective from which the importance of innovation should be considered. Innovation performance can rate not only the production and technology competence of a company, but also status and other social-related aspects of a company. Alegre and Chiva (2013), however, innovation is seen as a key factor in improving corporate performance in a competitive environment, and define innovation performance of a company as product innovation and process innovation of such company; among them, production innovation is market-oriented and customer-oriented, and process innovation focuses on the work within company and aims at improving efficiency. These two types of innovation outcomes are closely related and combine to form a highly complex process that typically involves all operational processes of a company. According to scholars on the outcome perspective, business innovation performance, the standard to measure the results obtained from the implementation of innovation activities by a company, refers to the significant increase in productive capacity that results in an increase in corporate value after the application of a completely new technology (Hou & Hao, 2012). It is a product, process, method and idea produced at the individual level that is novel, feasible and valuable (Han et al., 2007). It is a result of the product of individual thinking, and the production process does not require consideration of the product's acceptability to the organization and practical productivity transformation. Scholars on the process perspective argue that corporate employees can develop through the gathering and sharing of knowledge and create a competitive advantage to achieve performance improvement through product iteration and process innovation (Alegre & Chiva,

2013). Scholars on the outcome perspective believe that companies innovate in technologies, products, and services for profit growth and consider innovation performance as an important measure of business profitability, which results from the satisfaction of customer needs (Smart et al., 2008). Scholars based on the action perspective argue that innovation performance is influenced by the interaction between innovation activities of a company and the innovation environment (Christensen, 1995). The traditional school of organizational management defines innovation performance in both broad and narrow senses. Innovation performance in a broad sense is defined as the actual outcome performance of products, services, and proceeds produced from implementation of innovation activities by a company; innovation performance in a narrow sense is more clearly defined as the specific innovation capability of a company and the results of innovative behaviors. Both of the definitions consider innovation performance as the impact and consequences of an organization's implementation of innovation activities. In reality, the effective utilization of human resources, production technologies, intellectual capital, and market information by a company to carry out innovation activities and the all-round measure of the implementation effect can be regarded as a company's innovation performance (Hagedoorn & Cloudt, 2003).

Innovation performance is undoubtedly important for enterprises. Through innovation performance, corporate managers have a comprehensive and dynamic grasp of corporate innovation capability and innovation development, timely identify and solve problems and shortcomings in the innovation process, formulate practical and targeted improvement plans, clearly point out the goal and direction of optimal structure and allocation of corporate resources and strategy implementation, and transform innovation results into corporate performance, which is of significance for improving corporate innovation efficiency and establishing corporate competitive advantage and position. In particular, product innovation is of vital importance for companies (Montalvo, 2006). In this regard, this study, focusing on the degree to which private businesses innovate in products, considers innovation performance as the output result of innovation activities by enterprises.

2.3.2 Measurement of business innovation performance

Performance is an important topic in management research, especially in strategic management. It is not feasible to deliberately avoid measuring and testing the validity of corporate performance whose improvement constitute a core issue in strategic management. For this reason, measurement of corporate performance was regarded as the focus of study by early scholars (Venkatraman & Ramanujam, 1986). As innovation emerged in different possible

forms, radical or incremental innovation, administrative or technological innovation, and innovation in products or processes (Caughron et al., 2013), innovation performance received increasingly more attention from scholars. Innovation performance can also be measured in many ways. So far, however, no uniform measure criteria of business innovation performance have been developed. In general, following aspects are the measurements of innovation performance:

Number of patents: The purpose of the patent system is to promote invention and technical advancement by giving inventors a temporary monopoly and by enforcing the early disclosure of knowledge required for the manufacture of an item or the execution of a novel procedure. (Griliches, 2007). Patent statistics can provide a competitive advantage for companies as a unique resource for analyzing the process of technological progress. Patents are an important criterion of innovation output, and a company's innovation output is determined by the frequency of a company's patent applications, i.e., the number of patents granted in a particular year. Directly related to innovativeness, they represent a measure of external validation of technological novelty (Ahuja, 2000). Ahuja and Katila (2001) used the number of patents granted in the year, a count variable that only accepts non-negative integer values, to access innovation output in their study on the effect of acquisitions on the following innovation performance of companies acquired in the chemical industry. Business innovation performance can be measured through patents by counting: 1) the number of patents granted to a company in a fixed time period (Yayavaram & Chen, 2015), 2) the number of annual average registered patents of a company that are applied by other companies within five years, and 3) the monthly interval between the time when a company files a patent application and when it first uses the patent granted itself (Leone & Reichstein, 2012). However, measuring innovation performance by the number of patents comes with large limitations. Some inventions are not patentable, and some are not patentable for strategic reasons. In particular, many innovations proposed by small companies are never patented. The cost and effort needed to apply for patent protection and deal with patent infringement may be beyond a company's capacity; the pace of technological progress is so rapid that it is unworthy of patenting; or an innovation is not fundamentally novel enough to be patentable (Romijn & Albaladejo, 2002).

Financial and non-financial indicators: Venkatraman and Ramanujam (1986) were the first to develop a two-dimensional classification scheme to measure performance by dividing the criteria for financial and non-financial indicators. Scholars have argued that innovation performance may also be influenced by non-financial indicators such as entrepreneurial practices and code of ethics (Khalili & Fazel, 2013). J. Chen, et al. (2007) measured business

innovation performance in terms of three non-financial performance indicators: number of new products, number of corporate patent applications, and applied technological know-how, and on this basis, explored the action mechanism of technological learning on business innovation performance. In that study, a measurement that incorporates corporate technological know-how was applied to compensate for the difficulty of patent applications in previous studies.

New product development: The performance of a company innovation is frequently measured by new product creation. Song and Parry (1996) argued that there are four dimensions to measure performance: profitability, sales revenue, market share, and market opportunity, and explored the link between successful new product development and 10 factors comprising product advantage, marketing synergy, technological synergy, market potential, market competitiveness, understanding of markets and technologies, top management support, proficiency in the pre-development planning process, concept development and evaluation, proficiency in market research, market pretest, market launch, and technological proficiency. H. Li and Atuahene-Gima (1999) measured business innovation performance with the speed of new product introduction and the speed of new product development; based on data gathered by 114 high-tech companies in China, they explored the function of marketing in process of developing new products in terms of socio-political influence. Their study clearly distinguished between the engagement and function of marketing and empirically examined how each had a different impact on the performance of new products. The findings indicate that marketing impact is positively correlated with the market performance of new products and timeliness of development. The positive impact of marketing involvement on new product performance is fully moderated by its influence. The effectiveness of marketing influence on new product performance is determined by the freshness of the product to a company, the formalization of the project, the perceptibility of marketing and the intensity of the influence attempts. Romijn and Albaladejo (2002) used the experimental innovation indexes together with traditional innovation performance indicators to measure innovation performance through the number of significant innovations, the number of patents and the new product indexes. Chao-hui (2008) measured a company's innovation performance with five indicators: speed of new product development, quality of new product development, success rate of product development, number of corporate patent applications, and share of new product sales. Y. Zhang and Li (2010) measured corporate product innovation with five questions – are you frequently introducing new products; are you the first to introduce new products in the market; are you quickly bringing new products to the market; are you making development of better new products; and are you developing greater market with the new products. Zeng et al. (2010) investigated the innovation

performance of 137 Chinese small and medium-sized manufacturers, measuring their innovation performance with three indicators: the proportion of new products in annual turnover, new product index, and improved product index. Yu et al. (2018) used the 3D indicators comprising the probability of new product success, the number of patents applied annually, and the rate of new product output to measure technological innovation performance. Being divided into such two dimensions as process innovation and product innovation, technological innovation refers to the whole process of a product or technology from the generation of innovative ideas to the practical development and then to final use. However, it is important to keep in mind, though, that objective measuring criteria or data on product innovation issued by businesses or governments have a strong correlation with subjective ones. The subjective measurement criteria of product innovation performance should be leveraged because there is a shortage of systematic and trustworthy objective data on innovation performance. Most of the respondents were from SMEs that are not listed on public exchanges and therefore the ready access to objective data was unreachable. On this account, C. L. Wang and Ahmed (2004) explored the relationship between transformational leadership and new product development via a questionnaire survey. The findings suggest that CEOs can improve product innovation performance by adopting transformational leadership, while G. Wang et al. (2016) employed the same research method to examine the connection between information technology and new product development. discovering that companies can promote improvement of innovation performance by enhancing their information technology capability.

Organizational learning: The importance of organizational learning as a tool for gaining competitive advantage has been well established. Brockman and Morgan (2003) conducted an empirical study on the link between existing knowledge and organizational performance in the context of new product development and demonstrated that the efficiency of acquiring new information and the innovation degree had an impact on the degree of new product development. The organizational learning capability was defined by Alegre and Chiva (2013) through five dimensions or mechanisms: experimentation, risk-taking, interaction with the external environment, dialogue and participatory decision making, and analyzed the effect of these mechanisms on product innovation performance. Among them, product innovation performance is shown in two dimensions: innovation effectiveness and innovation efficiency.

Subjective measurement. Haiyang developed a four-item subjective measurement questionnaire of new product performance to rate the success of a new product relative to competitor's based on sales growth, market share growth, profit growth, and return on investment. Subjects were asked to report the sales growth rate of the new product in each of

the past three years, and then the mean was calculated as our performance measurement criterion. Atuahene-Gima et al. (2006) argued that performance of an organization or strategy could be measured in two ways. First, innovation performance can be measured through subjective reporting by the people involved in. Second, innovation performance can also be collected through objective performance data sources such as secondary archives and information. Atuahene-Gima et al. (2006) measured the innovation performance through the increase percentage of new products in market share, sales volume, profit, and other income indicators. Richard et al. (2009) argued that subjective performance measurement methods could be classified as thoroughly subjective and quasi-subjective, in which quasi-subjective measurement criteria such as the accounting industry and financial markets were firstly examined for performance measurement, followed by subjective and quasi-subjective measures like self-report of subjects and filling of Likert scale.

Searching range: Laursen and Salter (2006) discovered that both external search breadth and external search depth showed an inverted U-shaped relationship with business innovation performance. They used three proxy variables to measure business innovation performance. The first variable, new product introduction cycle, was used to indicate a company's ability to generate radical innovations. The proportion of a company's turnover related to new products serves as the gauge for this variable. The second variable is a company's internal new product production cycle, which is measured by the proportion of the company's turnover associated with new products; the last variable is the product renewal cycle which is applied to indicate the proportion of the company's turnover associated with significantly improved products. J. Chen et al. (2011) analyzed the impact of range, depth, and direction of corporate external searching strategy on innovation performance. Their study found that the openness with greater scope and depth in scientific and technological innovation and interactive innovation models improved innovation performance, which suggests that open innovation is associated with innovation in technology.

Multi-indicator comprehensive measurement. Hagedoorn and Cloudt (2003) argued that multiple indicators or combinations of multiple indicators may be employed in a comprehensive performance measurement. To this end, they used four indicators comprising R&D investment, number of patents, patent applications and new product announcement to measure innovation performance through a more complex and informative comprehensive measure. In this case, R&D investment may be a reasonable indicator of innovation efforts, patents may be a more acceptable indicator or innovation output, patent application may be used to measure the quality of innovation output, and new product announcement may indicate the level of product

innovation. Prajogo and Ahmed (2006) argued that innovation performance comes with two different types of structures: product innovation performance and process innovation performance and examined the relationship between the technical and human factors of innovation management in the behavior of innovation performance. They considered the human factor of innovation management as a motivation and the technological factor as a stimulus for innovation capability, of which the effect is determined by the “action” of the stimulus. The innovation stimulus determines the innovation capability of an organization, and the innovation capability determines the innovation performance.

In addition to the above divisions, measurement of business innovation performance should consider a broader range of factors such as product innovation, technological innovation, process innovation, and management innovation (Jiao et al., 2015). A summary of study on the measurement of business innovation performance is shown in Table 2.2:

Table 2.2 Study on the measurement of business innovation performance

Author	Measurement indicators	Measuring method
Li and Atuahene-Lina (1999)	Speed of new product introduction and speed of new product development	Subjective, new product, non-financial
Ahuja and Katila (2001)	Number of patents	Subjective, number of patents, non-financial
Romijn and Albaladejo (2002)	Number of major innovations, number of patents and new product indexes	Subjective, new product, number of patents, non-financial
Hagedoorn and Cloudt (2003)	R&D investment, number of patents, patent application, new product announcement	Subjective, new product, number of patents, non-financial
Atuahene-Lina and Li (2006)	Market share of new products, sales volume, percentage of profit growth	Subjective, new product, financial
Laursen and Salter (2006)	New product introduction cycle, production cycle, renewal cycle	Subjective, new product, non-financial
Alegre and Chiva (2008)	Innovation effectiveness, innovation efficiency	Subjective, non-financial
Y. Zhang and Li (2010)	Speed and frequency of new product introduction, quality of new products	Subjective, new product, non-financial
Zeng et al. (2010)	Proportion of new products' annual turnover, new product indexes and improved product indexes	Subjective, new product, financial
Hua (2010)	Probability of new product success, the number of patents applied annually, new product output	Subjective, new product, number of patents, non-financial
Khalili et al. (2013)	Entrepreneurial practice, code of ethics	Subjective, non-financial
Jin et al. (2013)	Number of new products, number of patents applied, applied technological know-how	Subjective, new product, number of patents, non-financial

Gunawan et al. (2016)	Number of new products introduced last year	Subjective, new product, non-financial
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2.3.3 Antecedents of business innovation performance

Innovation activities cannot be carried out by a single entrepreneur alone, and their diversity and complexity require the participation and coordination of multiple parties, including entrepreneurs and stakeholders. Therefore, innovation should be understood as a complex collaborative process in which multiple factors interact and multiple groups collaborate and intermingle with each other. Business innovation performance is affected by such factors as internal communication and coordination of corporate members, working atmosphere, leadership style and leadership traits, as well as external interactions with other companies and access to market information and resources. Based on different research perspectives, scholars have conducted in-depth studies on the antecedents affecting innovation performance.

From the differential pattern perspective, N. Wang et al. (2021) explored the effects of feedback seeking behavior and feedback valence on innovation performance, with sources of feedback from both within and outside the organization. Individual innovation performance within an organization may be affected by supervision and inquiry of leaders and colleagues; if the feedback source is from outside, such as friends, however, the influence on the individual innovation performance is not obvious. Dong and Zhang (2021) explored the innovation performance from the perspective of goodwill surplus. Implementing M&A behavior changes risk-bearing capacity, financing restriction capacity and business performance of a company. Their study found that business reputation increased dramatically when a company's M&A activities were increasing, and the excess business reputation significantly inhibited its innovation performance. In particular, the inhibitory effect on innovation performance is more apparent for high-tech enterprises, non-state-owned enterprises and enterprises in a highly competitive environment. At the same time, scholars have also studied the independent variables affecting innovation performance from the perspective of motivational factors. On the one hand, innovative talent development is an important driving force of innovation performance. Yu et al. (2018) argued that top management traits were a significant predictor of business innovation performance. The prior experience of top managers, to some extent, discourages short-sightedness among insiders and increases the intensity of corporate R&D investment, which in turn increases the efficiency of corporate innovation output and innovation collaboration. On the other hand, for most businesses, the capability to acquire and assimilate outside knowledge is essential to innovation; in this regard, Roper et al. (2017) investigated the

relationship between corporate knowledge search and local knowledge externalities and innovation performance. Roper et al., (2017) firstly made a corporate-level differentiation between the innovation benefits of collaborative or interactive knowledge search and the innovation performance of non-interactive knowledge search strategies. Both interactive and non-interactive knowledge search boost innovation at the corporate level by lowering the development costs of team projects or by giving access to resources that would not otherwise be available, thereby increasing the expected return on innovation. The openness impacts brought about by the local intensity of interactive and non-interactive knowledge search in companies are complex and varied, and both types of knowledge search activities have the potential to generate knowledge diffusion effects that increase knowledge availability, reduce search costs and increase returns on innovation. However, their research also revealed that both varieties of information search might also have an impact on regional competition, escalating market tensions and lowering anticipated returns on innovation.

In terms of innovation models, open innovation is a concept that has been widely referred to in the past few years and has offered companies more options for innovation as a new approach. Open innovation means using use of purposeful knowledge inflow and outflow to access the acceleration of internal innovation and expansion of the external market for the utilization of innovation (Chesbrough et al., 2006). As research, technology, and product development are more globalized in a flat world, open innovation becomes easier (Gassmann et al., 2010). The emergence of new models has changed traditional thinking and perceptions; when referring to open innovation, there is a growing awareness over the importance of considering non-profit purposes and a need for public and non-profit organizations to connect with other stakeholders to gain a more comprehensive understanding of how to innovate more efficiently and effectively (Bogers et al., 2018). Loss of management and organizational control, as well as the ensuing cost increase, are all potential drawbacks of open innovation. However, Rauter et al. (2019) argued that open innovation activities with a variety of partners could trigger an active impact on a company's innovation success since the possibilities for a single company to assimilate all necessary knowledge and competences internally were limited. Utilizing external knowledge in particular aids in keeping a company competitive. The performance of financial and sustainable innovations is positively impacted by open innovation partners. Managers can understand which partners they should enhance their collaboration with in order to achieve higher innovation performance and sustained innovation performance by integrating more external stakeholders as possible open innovation partners (Rauter et al., 2019).

As innovation practices continue to deepen and develop, more and more companies may

face market-based barriers to innovation, which are defined as forces that prevent companies from undertaking innovative activities. For example, internal barriers to innovation include lack of innovation capability, lack of resources, or inappropriate organization, while market-based barriers to innovation may reflect competition with competitors or a lack of innovative market demand, for which Szambelan et al. (2020) explored the process mechanism of implementation orientation for a company's ability to leapfrog barriers to achieve breakthroughs in business innovation performance, based on both mindset and behavioral perspectives, with the help of orientation structures. This process is divided into two dimensions: first, the application of a company's mindset represented by the effective control orientation; second, the focus on a company's behavioral orientation, specifically the tolerable loss orientation, contingency orientation, means orientation and cooperation orientation. The specific implementation orientation can effectively mitigate the inhibiting effect of the market's innovation barriers on a company's innovation performance improvement.

The above studies suggest that factors affecting innovation performance, such as feedback seeking behavior, feedback valence, M&A behavior, corporate knowledge search and local knowledge externalities, have been investigated from different perspectives like differential pattern and goodwill surplus, and that the antecedents of innovation performance, such as lean management and open innovation, have also been empirically examined from specific aspects like management method and innovation model. However, power to explain these variables is limited in relevant studies, and the pathways that affect business innovation performance are not clearly revealed, requiring us to further explore the antecedents of business innovation performance.

2.4 Industry environment

Dynamic changes in the level of industry environment and influence thereof on business performance represent a significant research topic in organizational theories and strategy management literature. According to Duncan (1972), industry environment means the sum of material and social factors that individuals of organizations directly take into account on decision-making. Businesses maintaining favorable consistency with environment usually feature high performance, because higher industry environment suitability enables businesses to elect and implement efficient competitive strategies, and to carry out diversification and re-orientation as needed (Romanelli & Tushman, 1986). This relatively broad definition includes dimensions existing in various research.

The industry environment confronting businesses is characterized by the difficulty in ensuring a fixed form. In the existing research, industry environment is mainly defined and measured from four dimensions, namely, tolerance, dynamics, competitiveness, and heterogeneity. Tolerance means the degree to which the applicable resources can be obtained by a business in the industry environment (Abiodun et al., 2019), which not only determines the business growth opportunities, but also protects businesses from external shocks as much as possible. Businesses of higher tolerance normally enjoy more strategic choices compared with businesses facing resource constraint, thus available to improve business performance. Dynamics mean the uncertainty of overall industry development in the future (Rosenbusch et al., 2007) and take on the characteristics of diversified manifestation patterns, such as diversity of customer demands, reform on industry production technologies and changes in industry upstream and downstream behaviors. Acting as a double-edged sword, dynamic industry environment not only furnishes businesses with opportunities, but also pose some risks to them. For instance, technical discontinuity is likely to procure potential competitors to apply new technologies to create new growth and profit-making opportunities. Competitiveness refers to the adverse environmental conditions for businesses, where a lot of similar businesses must compete with each other for rare or critical resources (Abiodun et al., 2019). Heterogeneity means the quantity of talents, knowledge, capital, resources and capabilities essential for the successful operation of businesses in industry environment. In this connection, heterogeneity may occur in a single business, or be the outcome of diversified businesses. Tolerance and competitiveness represent the favorable facets of environment, while dynamics and heterogeneity increase the difficulty confronting managers in strategic decisions-taking (Rosenbusch et al., 2007). The concept of heterogeneity of industry environment relates to industry environment dynamics. From the available literature, there is less in-depth research on tolerance and heterogeneity of industry environment. Therefore, this thesis, by reference to the existing research (Keats & Hitt, 1988; Y. H. Zhang, 2008), elaborates the differences in industry environment from such dimensions as industry environment dynamics and industry environment competitiveness, as environment dynamics and competitiveness bring greater pressure to businesses, and force them to adjust innovation resources, procedures and routines and improve original products, processes and services within the short run, thus intensifying their competitive advantages (L.-Y. Wu, 2006).

2.4.1. Industry environment dynamics

Industry environment dynamics is related to the unpredictable rate of changes in the industry environment where businesses are situated (Duncan, 1972), whose influence on businesses may be analyzed from such aspects as frequency, degree of change and unpredictability (Castrogiovanni, 2002). When the environment dynamics of any industry are excessively high, the investment cost will experience obvious increase, the investment intention of businesses declines, and large-scale investment behaviors be avoided as much as possible. In order to meet the internal investment demand, however, businesses prefer to outsource some management functions to third-party service platforms for management, so as to acquire more flexible services, effectively curb relative risks, and control the industry uncertainty. There is no denying that, outsourcing may remarkably lower the dominant position of businesses, and the continuously increasing outsourcing cost will eventually result in poorer performance. When the environment dynamics of any industry are relatively low, businesses usually adopt the contrary behavior strategy, namely, reducing outsourcing. Despite the significant increase of management cost arising therefrom, it is available to prevent from weakening the internal capabilities resulting from outsourcing, and notably improve own management capabilities.

Scholars hold that, industry environment dynamics may be ascribed to the change rate and unpredictability degree of external environment (Jansen et al., 2009), which get clients, competitors, suppliers, dealers and potential competitors involved. Duncan (1972) took the lead in putting forward the word – environment dynamics in this research and focused on the uncertain environment characteristics experienced by organizational members during decision-making process, including environment complexity and environment dynamics. According to him, environment dynamics mean the change degree, or the duration of process changes the environment where decision-makers are situated experience during the specific time frame. D. Miller and Friesen (1983) held that, organization environment is closely related to business strategy formulation, and environmental changes cause organizations to respond to information processing tasks of different complexity degrees. To ensure the efficient formulation, selection and implementation of strategies, some attributes of business environment should be consistent with the strategy formulation behavior in specific forms. Therefore, environment dynamics may be defined as the unpredictability degree of changes in technologies essential for the achievement of strategic objectives and market demands in any industry businesses are affiliated with, as well as the occurrence degree and frequency (D. Miller & Friesen, 1983). Elements determining business performance are further divided into those from businesses and

those outside businesses, among which elements from businesses include product production quality, management level and organizational characteristics and elements outside businesses mean the industry environment confronting business development. Situated in the industry featuring increasingly fierce competition, businesses are fueled by environment dynamics to perform reforms unceasingly, which are prone to bring both opportunities and threats to businesses. In this connection, businesses must improve their perception level, and endeavor to minimize the negative influence resulting from environment dynamics (Yeoh & Jeong, 1995). The empirical research of Zahra et al. (1997) checked the influence of senior managers' perception level of domestic environment on the export performance of startups, which indicated that the domestic environment dynamics confronting output businesses and their output performance show significant correlation. The capability of businesses to respond to the dynamic environment is of utmost significance for their sustainable survival. Any business failing to predict or control its external environment is likely to have its normal production and management affected. In the meantime, dynamic environment also drives the management to closely focus on new opportunities and challenges, and to further change the strategy selection of businesses. Following analysis based on Environmental Analysis Model and Michael Porter's Five Forces Model, He and Su (2016) defined environment dynamics as a feature used to measure environment change degree, including government policies, demographic characteristics, social culture, industrial relations and other factors (exclusive of market environment and technology environment). Jansen et al. (2009) held that, environment dynamics may change the style of leaders, because environment dynamics mean more uncertainty and boost the pressure and anxiety of leaders. Exposed to the ever changing external environment, organizational members are more prone to accept the behaviors and styles of their leaders, not least transformational and captivating behaviors. And the turbulent environment ensures greater discretionary power of transformational leaders, as they, dominated by a kind of collective sense, may deem radical reforms and exploratory innovation as an essential condition of dealing with external changes. W. Li et al. (2020) credited environment dynamics to the outcome of diversified elements like enterprise development scale, industry competition degree, supporting policies issued by government, regulation of market resources and backup of production technologies, which affect critical knowledge and capabilities of businesses and finally act on business performance by virtue of internal and external coordination, integration and organization of resources.

2.4.2 Measurement of industry environment dynamics

Currently, industry environment dynamics are mainly measured in the following two ways: the first is to carry out the objective and indirect evaluation of relevant indexes, and apply the objective data to reveal the development characteristics of environment dynamics of the industry where a business is situated; the second is more frequently used, namely, designing a scale with relevant items, issuing questionnaires to managers of businesses, and reflecting the dynamic development changes of industry environment from the side by virtue of their perception level of external environment. Objective data normally mean the measurement results of some characteristics or particular industry indexes and can reveal the environment phenomena upon processing via a series of statistical methods, such as demand fluctuation, industry production and sales of products in some types. And the environment dynamics coefficient is calculated according to the time, which serves as an index for the measurement of industry environment dynamics.

Duncan (1972) classified environment into the inside and the outside with businesses as coordinate, among which the internal environment includes existing assets and resources, and the external environment means other stakeholders and social elements outside businesses. The external environment comprises suppliers and competitors from development to marketing of products, as well as systems, economic environment and technologies hard to be controlled. Priem et al. (1995) classified dynamic factors of environment into changes in industry structure, fluctuation of market demands and potentially radical changes of environment. Therein: changes in industry structure mean that the industry structure changes from the stable one to the turbulent one as a result of changes in competition patterns and innovative activities; The fluctuation of market demands may influence the dynamics of industry environment, for which significant demand fluctuation, either demand increase or demand decrease, will result in more fierce competition and greater uncertainty; as an unpredicted major event, radical changes of environment will lead to the abrupt disconnection of industry development, and even the disappearance of successful business models in the industry, namely, creative destruction put forward by Joseph Alois Schumpeter. In the subsequent research, some scholars applied this approach to calculate new product development speed, new product development performance and other data while measuring technology dynamics (Krishnan et al., 2006). The other approach means the adoption of questionnaires, where items are designed to reveal the external environment and relatively subjective measurement is carried out via comprehensive and perception of respondents thereof. With the further study, the approach of questionnaires has

been gradually and extensively accepted in the research field of strategy management (Ashill & Jobber, 2001). Hannan and Freeman (1977) and Wholey and Brittain (1989) classified environment dynamics into three dimensions, and had the same measured via frequency of environment changes. The amplitude of environment changes is measured based on the interval between two changes, so as to further measure the degree of differences around a change and the predictability of changes, which take on negative correlation with the unpredictability of change frequency and amplitude. Jaworski and Kohli (1993) measured technology dynamics and market dynamics in their research. In studying technology dynamics, they gave priority to the technology improvement speed, significance of technology improvement for business products, opportunities and challenges confronting businesses with the technology upgrade, and whether businesses may predict the future technology development trend; market dynamics are customer-oriented and measured by gaining more understanding of the demands and satisfaction of customers and potential customers as well as product differentiation. D. Y. Li et al. (2009) measured industry environment dynamics from four aspects, namely, industry product and service update speed, prediction degree of competitors' behaviors, industry technology advancement speed, and changes of customer demands, according to which timely following the dynamic development and changes of an industry may help businesses maintain continuous competitive advantages and make their achievement capability match with environment evolution. Based on Dynamic Management Capabilities Theory, Qiu and Yu (2019) deepened their research on the moderating role of environment dynamics between dynamic capabilities of technological innovation and commercialization performance of technologies against the environment background of transition economy, including technology dynamics and market dynamics. By reference to relevant measurement scales of environment dynamics and in combination with the external environment of Chinese transition economy, Qiu and Yu (2019) applied five items (i.e. industry technology improvement speed, promotion degree of technology for products and predictability of technical changes) for the measurement of technology dynamics and five items (i.e. market volatility, product diversity, industry competitive and customer demands) for the measurement of market dynamics. The measurement of industry environment dynamics is shown in Table 2.3.

Table 2.3 Measurement of industry environment dynamics

Dimension	Source
Environment is classified into the environment within businesses and the environment outside businesses with businesses as coordinate.	Duncan (1972)
Industry environment dynamics include technology dynamics and market dynamics and are revealed via different	Jaworski and Kohli (1993) Qiu and Yu (2019)

specific indexes.

Elements of environment dynamics are divided into changes in industry structure, fluctuation of market demands and potentially radical changes of environment.

Priem et al. (1995)

Environment dynamics are measured via frequency of environment changes, and the amplitude of environment changes is measured based on the interval between two changes

Hannan and Freeman (1977);
Wholey and Brittain (1989)

Dynamics include industry product and service update speed, prediction degree of competitors' behaviors, industry technology advancement speed, and changes of customer demands.

D. Y. Li et al. (2009)

2.4.3 Industry environment competitiveness

The present free market environment furnishes businesses with a platform to achieve their economic goals and create value on the one hand and propels them to face the threats and challenges resulting from globalization. With the increasingly fierce industry competition, business managers now attach greater significance to innovation of industry technologies and internal management. The fiercer and cruel the industry competition is, the higher the management pressure and difficulty confronting entrepreneurs will be, which indirectly fuel entrepreneurs to improve management concepts and facilitate technological upgrade. Therefore, industry environment competitiveness results in both advantages and disadvantages. In this context, scholars are focusing on how to reasonably apply and leverage the positive influence of competitiveness.

The research on industry competition dated to the 1980s. During the entire growth process, businesses are exposed to the influence of myriad environmental factors, and environmental changes usually make businesses no longer advantageous in resources and performance. It was Michael Porter who took the lead in building the classical competitive analysis model comprising five items, namely, competitive capability of existing competitors, ability of transcendence of potential competitors, substituting capability of substitutes, ability of bargaining of suppliers and purchasers. The foregoing five forces interplay and jointly act on the industry ecology, and further exert influence on businesses' strategy decision-making and operation performance. Jaworski and Kohli (1993) equaled environment competitiveness to the external environment of fierce competition confronting businesses. The higher the competitiveness is, the stronger the influence of market orientation on business performance will be. As indicated by Matusik and Hill (1998), environment competitiveness is used to measure the difference level of same attribute in terms of manufacturer quantity in the external environment of businesses, with specific manifestation as efficiency and price difference.

According to Rosenbusch et al. (2007), competitiveness exists in the price and non-price forms, which means intensified competition for rare or critical resources and represents an unfavorable environmental condition for business development. The research of Chang et al. (2015) found that, the interaction between quality of corporate governance and competition of product market may influence the adjustment speed of corporate capital structure. In an industry of fierce competition, businesses featuring weaker governance structure and those of stronger governance structure see little difference in adjustment speed. The empirical research performed by S. L. Martin and Javalgi (2016) on 260 newly-incorporated enterprises in Mexico found that, exposed to fierce competition, organizations are prone to launch more marketing activities to meet the competition demand. In the environment of less competition, organizations are inclined to carry out operation within the predictable scope of the existing system; in the face of fierce competition, organizations become increasingly active, and prefer to adopt innovative behaviors to make up for the disadvantages, in which case it is likely for businesses to allocate more resources to incremental innovation in pursuit of short-term performance. Although environment competitiveness results in pressure on business in most cases, opportunities are probably to be delivered to businesses in this way. By reinforcing their own dynamic capabilities, businesses are able to coordinate and integrate internal and external resources or carry out recombination and transformation of external resources to build the dual organization mode, and balance and intensify the synergistic effect of incremental innovation and breakthrough innovation to embrace or maintain long-term competitive advantages (D. Q. Li et al., 2017). Therefore, businesses are encouraged to master the industry environment changes in a reasonable manner, timely adjust their technical competence, effectively utilize the opportunities resulting from competitiveness, and facilitate the improvement of business performance upon consideration of multiple factors.

2.4.4 Measurement of industry environment competitiveness

Currently, industry environment competitiveness is mainly measured in two ways. First, Herfindahl Index is elected to be a replacement variable for measuring the competition intensity of industry, and the value of operation revenue as the judgment basis. The smaller the value is, the stronger the industry competition intensity will be (Kwoka Jr, 1985). Second, questionnaires may be used. Specifically, access data by inviting respondents to complete questionnaires, and carry out analysis to judge the competition intensity of an industry, which features more application on the contrary. The three-dimensional measurement items used by Thong (1999) serve as the most typical classic one, and include difficult level for competitors to grab

consumers, competition intensity among homogeneous businesses, and quantity of substitute products and services. Most questionnaires of subsequent research are designed on this basis. Rosenbusch et al. (2007) applied five indexes, namely, industry exit rate, business risk index, industry competition degree, corporate price war and marginal profit of business operation, to measure industry environment competitiveness, whose results show that industry environment competitiveness may influence business performance under certain conditions and managers should give priority to a more relaxed industry environment. D. Y. Li et al. (2009) measured industry environment competitiveness from four aspects, namely, competition intensity among competitors in the same industry, level of consumer demands, difficult level to gain resources for business development and diversification degree of competitors' behaviors and evidenced the negative correlation between environment competitiveness and continuous advantages of businesses. Exposed to the industry competition of higher strength, businesses fail to make timely and efficient response to and prediction of strategies and actions of others in the same industry. And previous experience even successful experience shared by other businesses in the same industry cannot help them resolve present problems, for which they must seek for and probe into new solutions to accommodate to environment. Bai and Liu (2019) held that, industry environment competitiveness, as a significant dimension of environmental features, may exert influence on the micro innovation paths of businesses. Therefore, they adopted the expert scoring method to perform subjective evaluation of environment competitiveness in specific cases. The greater the value is, on a scale from 1 to 10, the more intense the rivalry shall be. Based on the Resource Medley Theory, Gou and Ding (2020) deemed environment competitiveness as the external stimulating factors for businesses to carry out resource medley activities. In this operation environment, the impetus of entrepreneurs is activated, for which they utilize all the resources available in an innovative manner. The higher the environment competitiveness confronting businesses is, the stronger the capability of performing resource medley shall be. Therefore, they combined with the actual development of businesses, and measured industry environment competitiveness in terms of market competition intensity, price competition level and behaviors of competitors in the same industry. The measurement of industry environment competitiveness is shown in Table 2.4.

Table 2.4 Measurement of Industry Environment Competitiveness

Dimension	Source
Herfindahl Index may be used to measure the industrial concentration	Kwoka and John (1985)
Difficult level for competitors to grab consumers, competition intensity among homogeneous businesses, and quantity of substitute products and services	Thong (1999)

Industry exit rate, business risk index, industry competition degree, corporate price war and marginal profit of business operation	Rosenbusch et al. (2007)
Competition intensity among competitors in the same industry, level of consumer demands, difficult level to gain resources for business development and diversification of competitors' behaviors	D. Y. Li et al. (2009)
Expert scoring method on a scale from 1 to 10: the greater the value is, the more intense the rivalry shall be.	Bai and Liu (2019)
Market competition intensity, price competition level and behaviors of competitors in the same industry	Gou and Ding (2020)

To sum up, the differences in industry environment are mainly demonstrated via industry environment dynamics and industry environment competitiveness, which are measured in different ways at present, such as data indexes of specific industry environment elements, and questionnaires prepared based on mature scales. This thesis applied the questionnaire method. Although as many questionnaire questions as possible can improve the measurement validity, however, the incorporation of excessive measuring elements in a questionnaire is likely to result in anxiety of respondents and further lower the measurement effect. In this connection, this thesis referred to the two-dimensional questionnaire with 8 items inclusive that was once used by Yuan et al. (2009) and elected critical environmental features of industry environment dynamics and competitiveness for measurement, which stroke a balance between the questionnaire completion effect and the content validity level.

2.5 Summary

This Chapter reviews the existing literature on the degree of narcissism, entrepreneurial resilience, dynamic management capability, business innovation performance and industry environment in entrepreneurial traits, and summarizes the variable definitions, measurement methods and relevant empirical studies on this basis.

Innovation is the fundamental driving force for a company's progress (Tranfield et al., 2003), an important measure of a company's ability to survive a changing market environment, and an important aspect of its social competitiveness. Entrepreneurial traits are crucial to the growth and development of a business (Qazi et al., 2020). In this regard, the association between "traits of private entrepreneurs and the innovation performance of private business" is a study that is introduced in this thesis. With reference to Upper Echelons Theory and Dynamic Management Capabilities Theory, we introduce the dynamic management capability of entrepreneurs as a variable and try to explore the mechanism for influence of private entrepreneurial traits on innovation performance of private businesses. Also, based on the status

quo of private businesses in China and considering the influence of different external environments, this thesis introduces industry environment variable as a moderating variable to analyze the influence of industry environment on the mechanism of “traits of private entrepreneurs - dynamic management ability - innovation performance of private businesses”.

This thesis holds that existing studies have shortcomings as follows: firstly, entrepreneurial traits have been attributed as an antecedent variable of corporate performance, but the mode and path of influence between the two have not been clearly analyzed; secondly, existing studies on entrepreneurial traits and dynamic management capability have got the influence of different leadership styles on the entrepreneurial management capability, but less attention has been paid to entrepreneurial resilience, entrepreneurial personality and other traits; thirdly, while scholars have much explored the impact of management capability on strategic choices and performance changes in organizations in studies on the relationship between dynamic management capability and innovation performance, there have been relatively few empirical studies on innovation performance; fourthly, the majority of studies on entrepreneurial traits and business innovation performance were conducted in the context of Western theory, in which Chinese contexts have been less considered.

This thesis has significant theoretical and practical meaning in exploring the mechanisms of the influence of entrepreneurial traits on innovation performance in the Chinese context, and the existing studies provide literature support for the topic of this thesis, which make the thesis well-founded, enriched and expanded.

Chapter 3: Theory Basis and Research Hypotheses

3.1 Theory basis

3.1.1 Upper echelons theory

Strategy formulation has experienced unceasing evolution (Mintzberg, 1977). The early strategic management theory holds that, enterprises perform reasonable business planning considering the predictable market development prospect, with the direction selection of strategy formulation hinging on their industry attraction power and market competition status (Rumelt et al., 1991), which offers explanation about the access to enterprises' competitive edge in terms of external industry environment and enterprises' competitive strength. The formulation of the vendor-dominated global market enabled the thought of the environmental dependence school to occupy the leading position. After entering the stage of relatively stable development, enterprises took on such characteristics as slow technology change and having the role of resource utilization efficiency inferior to that of enterprises' market standing. In the beginning of the 1990s, the application of new technologies contributed to the improvement of productivity, reform on production mode and shorter product life cycle. And the remarkable improvement of production efficiency further fueled the transformation from vendor-dominated market to purchaser-dominated market. Against the background, enterprises had to rapidly change their development patterns to accommodate to the discontinuous, uncertain, and unpredictable environment, which thoroughly put an end to the traditionally scheduled and predictable strategic planning. The management decisions concluded by senior managers under the complicated, uncertain, and vague conditions are highly dependent on their individual experience and psychological features (Schmid & Dauth, 2014). Due to the obvious limitation of developing enterprise strategies based on the external market environment, scholars carried out discussion about strategy formulation in accordance with the enterprise analysis and the analysis on social network relationships. In this context, Upper Echelons Theory was put forward upon reflection of enterprise strategy formulation in accordance with the concept of bounded rationality and the concept of dominant alliance (corporate performance represents the results of the collective choices of top decision-makers; Hambrick and Mason (1984)). Acting as a catalyst, the Theory studies how the characteristics and experiences of senior managers

shape their opinions, selections and actions, and finally influence various results of enterprises (Bromiley & Rau, 2016; G. Wang et al., 2016).

Upper Echelons Theory holds that, organizational outcomes reflect the actual responses of values and cognitive foundation of enterprise managers, who are inclined to conclude decisions based on their comprehension of realities. They prefer to describe the real phenomena according to the results of their consideration, and then integrate opinions and expression with actual actions, which raises higher demands for enterprise managers. It is stressed under the theory of bounded rationality that, human behaviors feature conscious rationality and bounded rationality, as people fail to comprehensively understand the market environment. On the contrary, the external environment in the impersonal exchange type is usually versatile, complicated and uncertain, and when higher the transaction frequency is, greater the external risk will be. Compared with the overwhelming marketing information, the cognitive competence of people is limited, for which it is hardly possible for senior managers to make accurate prediction of results generated from strategy formulation, and the dynamic marketing information and versatile environment further increase the difficulty of active acquirement confronting managers. Given the preference of senior managers, decisions are concluded based on the subjective judgment of individuals when the information accessible thereto is incomplete. For enterprises likened to a hierarchical structure with complicated and correlated secondary structures, senior managers dominate the upper strata thereof, thus having a clear and comprehensive insight into enterprise development and changes. Benefiting from the advantaged structural position, they are more likely to embrace accurate and latest competitive information as well as unique opinions (Reimeret et al., 2016), for which they are able to spot external opportunities and threats, achieve progress and create value (Dhaouadi, 2018).

The diagrammatic figure of research framework of Upper Echelons Theory is shown in Figure3.1. Upon 35-odd years of enrichment and development, Upper Echelons Theory, proposed by Hambrick and Mason (1984), has grown to be one of the most powerful theories in the management research field (Neely Jr et al., 2020). Strategic situations include potential environmental changes failing to be observed and incentive systems within enterprises, and senior managers will be exposed to the existence far beyond their cognitive category, as well as events, rules and future development trends of external environment and internal systems. In this context, senior managers work out enterprise strategies in three steps (namely, own position as senior managers, strict deletion and selection, and generation of organizational results), provide a reasonable interpretation of realities by virtue of insight and perceptivity, and finally apply for enterprise performance, which is a continuous process of concentration, refining and

simplification. (See Figure 3.1 for the Research Framework of Upper Echelons Theory)

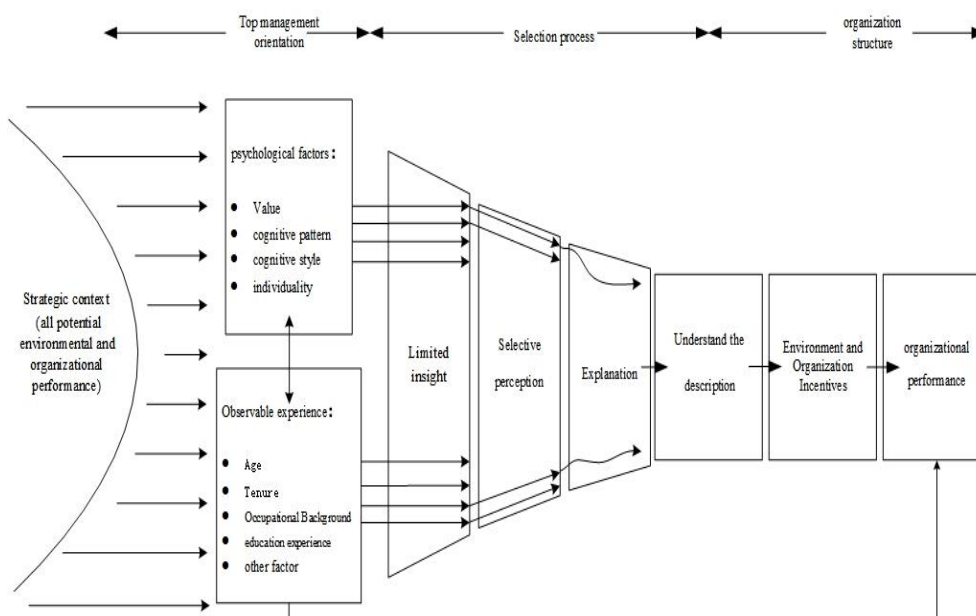


Figure 3.1 Diagrammatic Figure of Research Framework of Upper Echelons Theory

Source: Hambrick and Mason (1984)

Under Upper Echelons Theory, strategic choices concluded with bounded rationality are classified into three stages, namely, position of senior managers, deletion and selection, and generation of organizational results. In the stage of position of senior managers, the insight scope of senior managers is determined by their psychological factors, cognition, experience and other elements. According to the theory of bounded rationality, senior managers are unable to possess an in-depth and detailed knowledge of both external environment and internal organizations; due to the cognitive gap, it is available for managers to make strategy formulation and strategic choices within the limited insight scope merely. With limited insight, senior managers, in the stage of deletion and selection, are inclined to carry out selective perception of real phenomena in accordance with their psychological factors (i.e. personal preference, values and cognitive pattern) and experiential factors (i.e. professional history and educational background), the interaction effect of which results in the cognitive limitations of senior managers and drives them to select some (rather than all) of the events spotted and perceived for explanation. In the final stage of generation of organizational results, senior managers achieve personalized understanding of realities by combining with the actual situations and unceasingly simplifying events, formulate the implementation plan of enterprise decisions, and perform strategic choices, which eventually determine whether to apply strategies for enterprise development and management, and to exert influence on organizational performance. As shown by the foregoing diagrammatic figure, the “bridge” during the entire strategy formulation process is set up in the stage of deletion and selection. By virtue of deletion and selection, senior

managers may continuously explore priorities, make direction clearer and refine strategy formulation.

On the one hand, enterprise strategies are expected to be comprehensive. An all-covering strategic decision-making is correlated with satisfactory decision-making results. Innovation, for example, integrates all the innovative behaviors of an organization, including innovation in products, processes and systems (Alexiev et al., 2010). Conversely, innovation represents the direct route of innovation output, which is the most dependable way to realize the economic significance of innovative process, because innovation output is eventually demonstrated via enterprise performance and the innovation-driven transformation propels enterprises to foster the internal culture that encourages and facilitates innovation. As organization leaders, senior managers undoubtedly influence the implementation of organization innovation and the cultivation of innovation culture (Sperber, 2017). That whether decision-making results are reasonable and correct hinges on the cognitive judgment of senior managers and their observation of the market. Therefore, traits of entrepreneurs are associated with the comprehensiveness of strategic decision-making (Michaelis et al., 2020). And the different capacity of enterprise managers of looking for and disposing of information from environment to conclude wise decisions determines that, the strategic decisions made by them vary in comprehensiveness (Reina et al., 2017).

On the other hand, the influence of environmental factors on the mind of people has been spotted as objective circumstances and cognition of managers are linked to enterprise performance by scholars based on the conjectures under Upper Echelons Theory (Mintzberg et al., 2003). Through enterprise development, environment is an important reference factor needs to be considered. As strategy formulation is a dynamic accommodation process, the strategy formulation and decision implementation should change under the circumstances of different environment fluctuations. Any company failing to adjust its strategies in light of the environment changes is destined to suffer continuously deteriorated performance (Yang et al., 2019). Although the leadership of senior managers is of the utmost significance, environmental factors also play an irreplaceable role. The existing research indicates that, it is available for senior managers to influence enterprise performance via environment identification (Garg et al., 2003), develop the organizing ability with competitive edge, pay attention to core competitiveness again (Bigley & Wiersema, 2002), and enhance the competitive advantage of enterprises by boosting organizational learning (Vera & Crossan, 2004). This thesis holds that, traits of private entrepreneurs may exert influence on enterprise performance. Now the influence of entrepreneurs' behaviors on corporate development and performance improvement

has become increasingly greater (Quigley & Hambrick, 2015). For entrepreneurs, they are highly motivated to work and stand ready to apply their passion for daily work (Allison et al., 2022).

They are motivated to take action and show initiative in order to meet the continuously shifting needs of important stakeholders. Dominating the desired position, they are driven to connect organizations with clients, and to distinguish their products from those of competitors via innovation (Heyden et al., 2020). In an organization, managers usually hold the vintage point for strategic reform. Normally, reform initiators are capable of spotting and creating unique opportunities, developing relevant business to meet the resource demand of enterprise development by virtue of network relationship, and launching profitable business models to gain the support of powerful stakeholders, all serving the purpose of triggering reforms. Falling into the fields with higher research value, personality traits of senior managers like narcissism level and confidence level can not only influence the dynamics and efficiency of internal work of organizations, but also relate to the overall atmosphere thereof (Abatecola & Cristofaro, 2018). Characteristics of organization decision-makers can drive their decision-making process (G. Wang et al., 2016) and even influence the results of final enterprise strategic decision-making. For instance, personality, emotion and other internal orientation of senior managers have been evidenced as available to influence the significant strategic results of enterprises. In the meantime, personality traits may be used to predict the stability and persistence of individual behaviors under various circumstances and to explain the differences through decision-making (Feist et al., 2017). The strategic selection and performance level of some enterprises may be efficiently forecasted in accordance with the traits of their senior managers (Hambrick & Mason, 1984). It is due to those personal characteristics with organizational results affected that senior managers have become a vital component of strategic management (Finkelstein et al., 2009). Experienced senior managers are able to maximum the benefits resulting from the reduction and cancelation of interests and taxes on debts; it is feasible for senior managers to enhance the corporate value (Matemilola et al., 2018).

To sum up, Upper Echelons Theory is developed on the basis of limited rationality and dominant alliance concept and highlights the influence of senior managers' psychological cognitive models, behavioral patterns and personality traits on enterprises' strategy formulation, strategic choices, strategic decision-making and development performance. Upon years of enrichment and development, Upper Echelons Theory has been applied to quite a few management-related research fields (Muldoon et al., 2022). Recent years has seen the extensive application thereof for the research of top management team, which focuses on biographical

characteristics, psychological characteristics, ability characteristics and social characteristics. Team characteristics mean the summary and overall reaction of individual characteristics, and the value of studying top management team has been widely recognized in the academic circle. Now the domestic research on Upper Echelons Theory has taken on the trend of transforming from individual research to team research. However, the existing research refers to the research methods abroad on the whole, instead of exploring the theoretical innovation upon consideration of the realities in China. In this connection, the domestic research on Upper Echelons Theory should take into consideration the realities in China and divert more attention to the impact of managers' traits on enterprise performance against the background of localization in the future.

3.1.2 Dynamic management capabilities theory

3.1.2.1 Dynamic capabilities theory

Under Webster's Dictionary, the definition of "capability" is the "the quality or state of being capable", and "rich capabilities" means that "an individual enjoys the attribute (physically or mentally) essential for the realization of goals or achievements". As indicated by the foregoing definition, capability and its related activities may be psychological or physical. In strategic management, "capability" is interpreted to be the normally reliable measurement of functions on the realization of certain demands (Amit & Schoemaker, 1993). Due to the measurable characteristic, there is the lower limit of capabilities. In other words, the capability of reliably implementing activities in a certain type means that such capability satisfies the lowest standard of the acceptable limit (Helfat et al., 2007).

The corporate capability opinion concentrates upon the strategic management research, which lays more emphasis on the significance of enterprises' independent study and assets arrangement. Instead of highlighting production factors and production capacity of enterprises merely, the corporate capability opinion follows the dynamic changes of the entire market and encourages enterprises to realize self-coordination and resource integration amid economic activities, and to create value via continuous technical improvement and product innovation. The corporate capability opinion is strongly interlinked with the strategy opinion, as the realization of strategies is inseparable from the support of corporate capability. As to the capability theory, attempts have been made to tap the source of competitive advantages, and to explicitly determine the enterprise boundary in combination with corporate capability and available resources. In economics, the long-term competitive edge of an enterprise is usually

deemed as the approach and capability of the enterprise to resolve various problems amid production and management activities, which other competitors fail to overtake. The external environment of enterprises may provide reference for enterprise decision-making, while the internal conditions thereof determine the competitive advantages. Therefore, the corporate capability theory appeals us to comprehend the competitive advantages of enterprises from internal resources and competence thereof.

Dynamic management capabilities theory is further derived from the corporate capability opinion. Dynamic capabilities means that enterprises carry out well-targeted expansion, creation and even modification of the resource base essential for development in light of their own demands, and further intensify their internal adaptability and building capability of external environment (Helfat et al., 2007). According to the foregoing definition, dynamic management capabilities are critical in keeping the improvement of enterprise competitiveness identical with the enhancement of adaptive capacity to changing environmental conditions (Adner & Helfat, 2003; Bergen & Peteraf, 2002; Sirmon & Hitt, 2009). As the external environment is constantly changing and uncertain (Masoudian et al., 2022), Dynamic Management Capabilities Theory highlights the significance for enterprises to adapt to shifting external conditions by integrating, building and rearranging resources and capabilities of enterprises (Teece, 2007), and furnishes enterprises with new approaches and thought to carry out strategic renewal and dynamic environment fit (Kor & Mesko, 2013). Under this framework, it is available for enterprises to achieve and maintain competitive advantages in responding to the rapidly changing environmental conditions better (Eisenhardt & Martin, 2000). The dynamic task environment propels enterprises to develop the capability in response to changes (Fainshmidt et al., 2019), and the innovation and improvement of products is deemed as a key factor for organizations to achieve success in the ever-changing market resulting from technical breakthrough (Mehta et al., 2020). Dynamic Management Capabilities Theory holds that, enterprises must develop new skills to recognize and react to opportunities quickly (Teece, 2014), particularly, the mastery of brand-new production technologies, as advanced production technologies can lead to the reduction of production cost and generation of scale economy, aside from the improvement of production efficiency. Companies embracing dynamic capabilities are active producers of competitive resources, because dynamic capabilities enable companies to implement new strategies by combining and converting available resources in brand-new and various ways for the purpose of dealing with the ever-changing market conditions (Ambrosini & Bowman, 2010).

The resource base of an enterprise is a necessary condition for the successful

implementation of its management decisions, and differences among enterprises in resources and capabilities also result in various management decisions. According to the existing modes, the resource base of enterprises is classified into tangible resources and intangible resources, which enterprise managers distribute and use as per their respective ownership or order of priority (Teece, 2007). Dynamic capabilities make the adjustment of resource utilization as per the smallest increment possible and furnish multiple routes to realize objectives and access new resources (Eisenhardt & Martin, 2000; Helfat et al., 2007a). Although Dynamic Management Capabilities Theory implies the necessity for distinguishing capabilities from resources, it highlights the significance of dynamic capabilities construction for access to competitive advantages. Within organizations are capabilities in two different types, namely, operating capability and dynamic capability (Helfat & Raubitschek, 2018), wherein operating capability means factors satisfying the existing survival and development of enterprises (Protogerou et al., 2012) and ensuring the normal performance of routine functions, while dynamic capability, different from operating capability, stresses changes and innovation on the basis. Featuring the learning property of higher strength (Helfat & Raubitschek, 2018), dynamic capabilities may be continuously perfected by depending on the formation and development trajectory of organizations and is a strategic organization process of higher level built inside organizations (Zollo & Winter, 2002). Therefore, dynamic capabilities may ensure the vitality of enterprises exposed to dynamic changes inside and outside and enable them to maintain stable adaptation despite the constantly changing technical conditions and market demands for products as well as the increasingly fierce competition environment (Teece, 2007, 2014).

The successful implementation of dynamic capabilities has strategic value for enterprises (Kevill et al., 2021). In the highly dynamic market, strategy formulation and implementation at the level of enterprise are interwoven, rather than be advanced separately (Helfat & Martin, 2015; J. A. Martin, 2011). In combination with the early evaluation of market forms, business environment and technological changes, enterprises work out the strategy schemes in advance, carry out continuous modification and improvement as per the actual operation situation, and integrate them with multiple links like routine management, product innovation and marketing (Corrêa et al., 2019). Dynamic capabilities originate from the conventional combination of simple and related capabilities, which are strategic, concrete, special and hard to be imitated. While dynamic capabilities are unique in some details, their appearance hinges on the path each organization takes, and their functions can be duplicated in the inter-organization manner. And their value is demonstrated by the competitive advantages continuously created for enterprises. In the context that the influence of market globalization has been increasingly expanded (Teece,

2007), the significance of dynamic capabilities for organizational strategies has become increasingly remarkable, for which enterprises must improve their dynamic capability to make their resource base accommodate to the actual changes in the market and their competitors (J. A. Martin, 2011). Apart from integrating and innovating diversified technologies (Somaya & Teece, 2007), enterprises should value the remodeling of and supervision over organization structure in order to improve their performance and furnish helpful guidelines on the management practice of other enterprises (Mostafiz, 2020).

3.1.2.2 Dynamic management capabilities theory

The idea of dynamic capabilities (Teece et al., 1997) put forward 20-odd years ago has become the theoretical basis of sustainable competitive advantages in the dynamic industry upon unceasing development and perfection, and now is generally accepted by scholars and widely applied to industries of low dynamics (Ambrosini & Bowman, 2010; Eisenhardt & Martin, 2000). Dynamic Capabilities Theory serves as the rudiment of Dynamic Management Capabilities Theory. On the contrary, the idea of dynamic management capabilities is similar to more ordinary dynamic capabilities of organizations. Different from Dynamic Management Capabilities Theory which focuses on the industry level, dynamic management capabilities have discussion further carried out oriented at individuals and groups (Adner & Helfat, 2003; Kevill et al., 2021). According to Teece et al. (1997), “dynamic capabilities” mean the capability of organizations to conduct integration, construction and rearrangement. As a form of dynamic capabilities, “dynamic management capabilities” mean the capability of managers to change organizational resources and capacity to create, expand or modify the survival modes of organizations amid profit-making enterprises, or to achieve their missions amid non-profit organizations (Helfat, 2018). The idea of dynamic management capabilities may be applied to make an explanation on the differences between management actions and decisions (Andersson & Evers, 2015) and the relationship between management decision-making quality, strategic reforms and organization performance (J. A. Martin & Bachrach, 2018).

Management capabilities, which are based on the official description of organizational routines, are different from dynamic capabilities (Eisenhardt & Martin, 2000; Teece et al., 1997). Organizational routines are pattern-based, repeatable and interdependent actions performed by numerous activists, thus transcending the scope of individual level (Annosi et al., 2020). Given the inseparability from individual managers featuring implementing competence, dynamic management capabilities are more flexible, instead of being bounded by the formal definition (Adner & Helfat, 2003; J. A. Martin, 2011).

Dynamic management capabilities center on resource acquisition, strategic decision-making of managers, and final enterprise performance. On the one hand, assets realignment highlights the significance of integrating and matching resource investment and deployment decisions and is a core component of dynamic management capabilities and resource management (Sirmon & Hitt, 2009). The micro-foundation of enterprise development ensures the generation of enterprises' competitive advantages (Zainol & Al Mamun, 2018), and resources under the possession of enterprises like employee skills, operating assets and social relations provide reference frame for managers to make thoughtful decisions and action schemes (J. A. Martin, 2011). Those management resources also render vigorous support for the management ability of enterprises to maintain their present business and bring competitive dynamics to enterprises (J. Barney & Felin, 2013). The capability of managers to conclude new resource decisions is closely related to the organizations and environment where they are situated (Helfat & Martin, 2015), and dynamic management capabilities are demonstrated when managers formulate and adopt resource actions substantially different from the previous ones to respond to unexpected market changes (J. A. Martin & Bachrach, 2018). It is available for managers to make the most suitable resource selection by developing potentially feasible resource decisions in the specific organizations and market environment (J. A. Martin, 2011). On the other hand, dynamic management capabilities are likely to influence enterprise managers' selection of enterprise resource portfolio, and further alter decisions on enterprises and competitive strategies upon interaction with resource portfolio, thus resulting in different enterprise performance results (Beck & Wiersema, 2013). As evidenced by the empirical research, the dimension of dynamic management capabilities may exert influence on enterprise performance (Adner & Helfat, 2003; Hernández-Linares et al., 2021; Torres et al., 2018).

As a specific subset of dynamic capabilities in enterprises' resource portfolio, dynamic management capabilities are closely related to individual managers, who are detectors of opportunities (Adner & Helfat, 2003; Helfat & Martin, 2015) and play a fundamental role in strategic reforms and corporate performance improvement. First, dynamic management capabilities are exposed to the influence of managers' cognitive patterns, which comprise mental model and knowledge structure (Collins, 2021). The mental model of managers is demonstrated via spontaneous management intention (Helfat et al., 2007; J. A. Martin, 2011), a result of the identity of managers. As managers are expected to comprehend and master the full process of enterprise management, managers must find and resolve problems spontaneously, and achieve enterprise development by virtue of own practical activities (J. A. Martin, 2011). Confronted with diverse and complicated market information, managers must build the

knowledge structure for information storage (Moon et al., 2019). Second, knowledge structure may influence the prejudice and enlightenment confronting managers while predicting market changes, understanding different decisions and finally adopting actions (Garbuio et al., 2011). Some managers are capable of establishing the connection between knowledge structures against different backgrounds, thus enabling themselves to spot remote yet superior market opportunities (Gavetti, 2012). From a long-term perspective, managers have a tendency to show enhanced capability of transferring knowledge to different environment while exposed to the rapidly ever-changing environment (Gary et al., 2012). Therefore, in the ever-changing market and organizations, it is highly possible for experienced managers to develop such knowledge structures as available to deal with diversified situations. Aside from knowledge structure, psychological process and emotion are the foundation of dynamic management capabilities (Huy & Zott, 2019). In addition to moderating their own emotions, managers are expected to take into account the emotion of employees, investors and other stakeholders, so as to maintain or acquire their support (Huy & Zott, 2019). Only by taking into consideration all possible situations can managers better leverage their dynamic management capabilities.

However, enterprise growth should be the outcome of the joint efforts of all the organization members, rather than be limited to top management or CEO merely (Teece, 2020). In order to perceive market opportunities, organizations must take on the diverging structure to make enterprise employees at all levels intensify their capacities of spotting market opportunities and to reinforce the communication within organizations (Teece, 2007). In the centralized structure, senior managers are less closely related to clients compared with managers in middle and lower levels, for which it is hard for senior managers to identify opportunities arising from customer demands, and concepts of senior and middle managers fail to be implemented (Teece, 2020). Senior managers are expected to spot and implement relevant ideas from all levels of organizations, in addition to participating in entrepreneurial activities (Teece, 2020). In the decentralized structure, communication barriers are eliminated to the maximum, and dynamic management capabilities of managers at all levels may be fully leveraged (Altintas et al., 2022). The research results of Kor and Mesko (2013) indicate that, managers are able to reinforce the communication and contact with other members in their organizations by attending practical activities of management skills, such as identification, employment and training, and significantly improve their dynamic management capabilities during this process. Furthermore, the team sharing mechanism may be developed to strengthen the mutual collaboration and continuous learning of management team members, and to enable individuals to share, discuss and negotiate different ideas and opinions during the sharing process, thus coordinating and

lifting dynamic management capabilities of the management team.

In combination with the existing literature, it can be observed that, scholars have performed classification for dynamic management capabilities as per different reference standards. First, Kawai (2013) classified dynamic management capabilities into capability of dynamic strategy formulation and dynamic resource transformation pursuant to the influence of capabilities on enterprise strategy formulation and resource acquisition. Dynamic strategy formulation capability means the capability of enterprises to acquire sustainable competitive advantages in the ever-changing market environment or dynamic environment by implementing strategies available to create the value higher than the market one. Such dynamic strategy formulation is unique and hard to be imitated, which peer competitors and potential competitors fail to copy and implement in a relatively short time. Dynamic resource transformation capability refers to multiple aspects like resource acquisition and allocation, and corresponds to the present conception of dynamic capabilities, based on the above-mentioned two classifications, enterprises must change strategies and resources to manage the environmental changes in the high-velocity environment (Kawai, 2013). Second, Bellner (2014) carried out classification for dynamic management capabilities from learning, innovation and other different perspectives. The dynamic management capability from the learning perspective means that, managers apply skills to acquire explicit knowledge and implicit knowledge in such ways as own experience, practice, study and acceptance of tutoring, and further become capable of creating, expanding or modifying the resource base of organizations. This opinion highlights the technique of knowledge access and encourages us to further study to embrace solutions and achieve transformation of existing systems. From the innovation perspective, the dynamic management capability means the capability of managers to change existing matters, so as to make creation, expansion or modification of the resource library of organizations. It relates to the process that managers convert ideas to commodities and services and stimulates the consumption intention of consumers by increasing the added value of products. Third, Kawai classified dynamic management capabilities into dynamic strategy capability and dynamic resource capability, which is similar to that of the scholar Kawai (2013). Dynamic strategy capability offers explanation for strategy changes and dynamic resource capability interprets the resource changes with the passage of time. The opinion generally accepted by scholars classifies dynamic management capabilities into managerial human capital, managerial social capital and managerial cognition (see Figure 3.2 for the relationship thereof), which may exert influence on managers' strategy and management decisions respectively or collectively. The summary thereof in different dimensions is as follows.

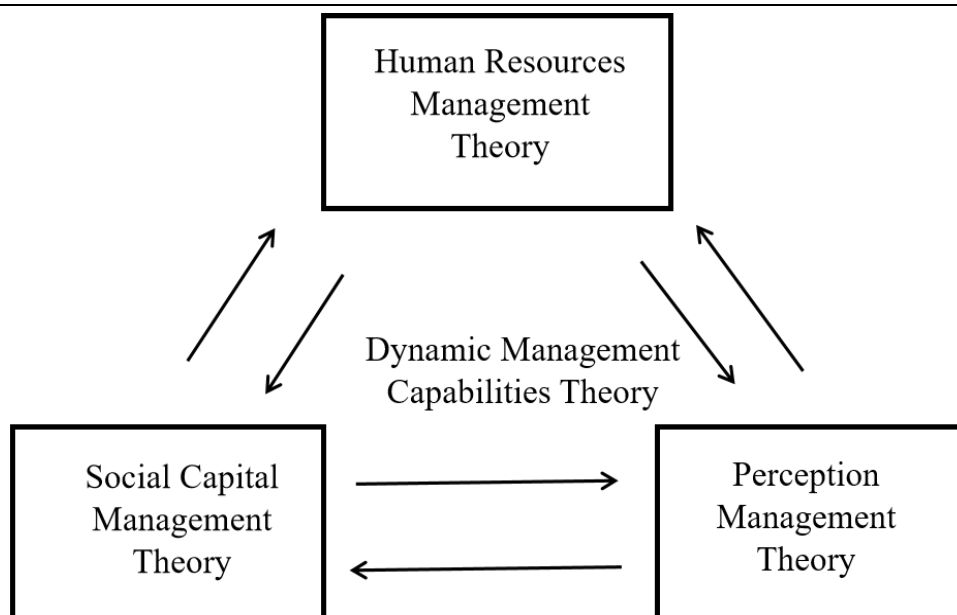


Figure 3.2 Potential Properties of Dynamic Management Capabilities

Source: Andersson and Evers (2015); Hitt et al. (2001); Nahapiet and Ghoshal (1998)

3.2 Research framework

From the arrangement and reading of available literature, and in combination with Upper Echelons Theory and Dynamic Management Capabilities Theory, the author agrees to the opinion held by quite a few scholars that traits of entrepreneurs may exert influence on the innovative performance of private businesses. According to the author, however, the action mechanism needs to be further tapped. In this connection, this thesis introduces dynamic management capabilities as a variable of mediating and industry environment as a variable of moderating to study the mechanism through which traits affect performance, in addition to maintaining original variables like personality traits of private entrepreneurs and performance of new ventures. Upper Echelons Theory holds that, traits of entrepreneurs may provide companies with resources and capabilities essential to resolve dilemma confronting them, and directly influence the final enterprise performance output. Dynamic Management Capabilities Theory holds that, an organization's growth has a close relationship with managerial human capital, managerial social capital and managerial cognition of its core members, the mutual influence and conversion of which drives entrepreneurs to carry out knowledge acquisition, resource medley and talent accumulation and then has a direct impact on enterprise's innovative performance. Subject to the fundamental research logic arrangement of "traits – capabilities – performance level", upon consideration of the influence resulting from uncertain external

environment, and in the context that there are different factors through entrepreneurial management, industry environment is added as a moderating variable to build the fundamental theoretical research model of “traits of private entrepreneurs – dynamic management capabilities – innovative performance of private businesses”. Narcissism, resilience and other traits of entrepreneurs are likely to change their dynamic management capabilities, which, deemed as a unique competitive edge, will exert direct influence on the innovative performance of private businesses. It can be observed that, traits of entrepreneurs like narcissism and resilience may indirectly influence the innovative performance of private businesses.

Although Upper Echelons Theory indicates that senior managers carry out strategy formulation and strategy selection by influencing the scope, they may have an insight into via psychological factors and observable experience, due to the existence of bounded rationality, individuals feature limited cognition and fail to offer comprehensive and reasonable explanation for phenomena confronting them. And such significant variable as industry environment is usually ignored. In reality, enterprises must deal with the ever-changing market environment through operation, while the rapidly changing market dynamics and fierce market competition may create both opportunities and challenges for enterprise operation and development. According to Dynamic Management Capabilities Theory, managerial human capital, managerial social capital and managerial cognition by entrepreneurs are related to personality traits thereof and take on obvious differences against different industry environment backgrounds. Therefore, industry environment is able to influence the cultivation of and access to dynamic management capabilities by influencing entrepreneurs’ perception of their own traits, which means that the influence mechanism of entrepreneurial traits on dynamic management skills is moderated by the industry context. In combination with the measurement of industry environment under the existing research, this thesis probes into the influence of private entrepreneurial traits on dynamic management capabilities from two dimensions, namely, industry dynamics and industry competitiveness. Industry dynamics forecast development and changes, and test decision-making and judgment of entrepreneurs exposed to conditions full of both weakness and strength. On the one hand, the higher the industry dynamics are, the greater the probability of generating new business opportunities will be, and the larger risks will be. For entrepreneurs featuring narcissism and entrepreneurial tenacity, they have preference for challenges, and have a positive outlook for and stand ready to respond to future development, thus managing to remarkably improve their dynamic management capabilities. On the other hand, the greater the industry competitiveness is, the higher the difficulty in acquiring rare or critical resources will be. Amid entrepreneurs from the same

industry and exposed to the formidable living environment, individuals characterized by narcissism and entrepreneurial tenacity embrace confidence and tenacity of higher level, and succeed in performing efficient resource medley and integration to ensure enterprise survival in the market competition despite adversity, thus taking on the dynamic management capabilities of higher level.

To sum up, in the research on the mutual relation between private entrepreneurial traits and private businesses' innovative performance, dynamic management capabilities play a mediating role, dynamics and competitiveness of industry environment plays a moderating role, and industry environment moderates the mediating role. In accordance with the foregoing theoretical analysis on the relationship among private entrepreneurial traits, dynamic management capabilities, private businesses' innovative performance and industry environment, the theoretical model is built as Figure 3.3 shows:

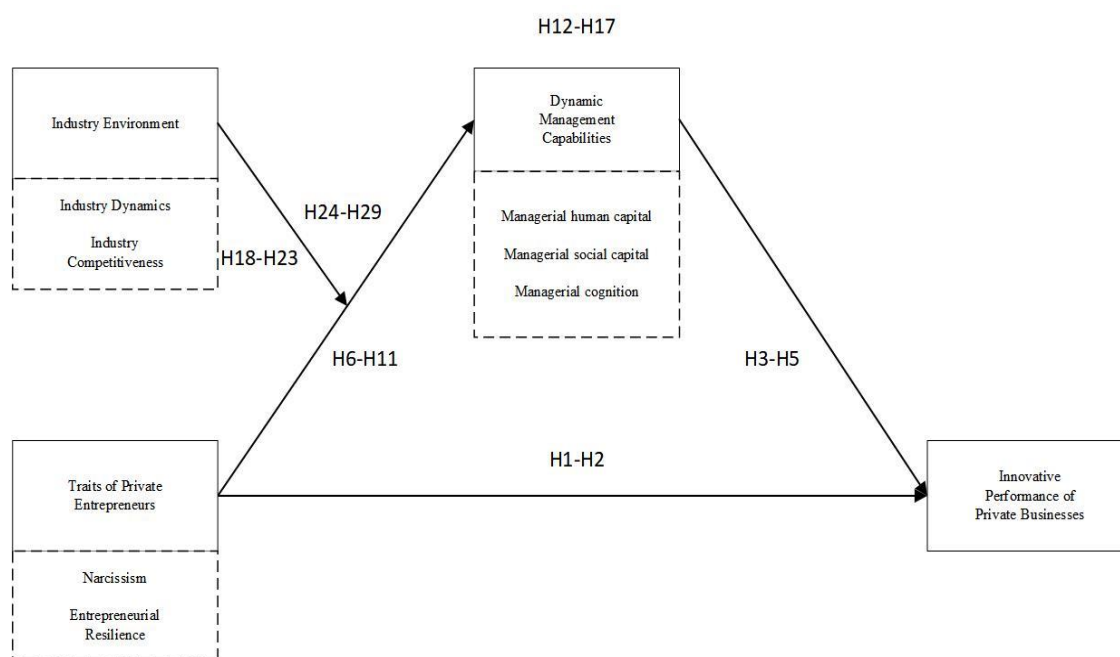


Figure 3.3 Theoretical Model

3.3 Research hypotheses

3.3.1 Traits of private entrepreneurs and innovation performance of private businesses

Narcissism is an important psychological trait of entrepreneurs. Narcissistic individuals tend to express themselves and promote themselves usually by adopting positive behaviors and ways to receive attention and respect. They exhibit arrogance, overconfidence, indifference, hostility to helpful suggestions, and disrespect for other people's rights, which are prone to interpersonal

relationship problems (Cain et al., 2008). Entrepreneurs with narcissistic personalities have manifestations of exaggeration and vulnerability and lead to contradictory results with both positive and negative evaluations (J. D. Miller et al., 2017; A. G. Wright & Edershire, 2018). Individuals with higher narcissism level exhibit an extroverted personality, are adept at self-recommendatory behaviors, stress their values and significance, appreciate their achievements, and advertise them in public (J. D. Miller et al., 2017). This behavior may be criticized by others, but it is indeed a good way for others to learn more about their capabilities and experiences; for entrepreneurs themselves, it is conducive to making friends and reinforcing social relationships and to access to useful market information, so that they can make accurate and scientific decisions. Highly narcissistic entrepreneurs show a high-level of confidence and believe that they can live up to their predetermined ambitions through their efforts and respond positively to the measures and related policies they formulate, which are conducive to obtaining social support, such as policy support and financial support, fueling the development of their enterprises and performance improvement. Conversely, individuals with lower levels of narcissism are prone to self-doubt and shy away from opportunities to showcase their talents, losing the chance to secure resources (Cain et al., 2008). This introverted personality tends to generate negative emotions, which is not conducive to the enhancement of social capabilities and the disruption of interpersonal and social networks, thus lowering business performance.

Also, further research is required to determine the connection between private entrepreneurs' resilience and private enterprises' innovative performance. Resilience is considered in psychology as a trait that allows individuals to overcome difficulties and recover from trauma relying on their resilience. This demonstrates the individual's ability to bounce back from emotions of passive with high flexibility when under stress (Tugade & Fredrickson, 2004). The higher the level of entrepreneurs' resilience in front of challenges and obstacles from the ever-changing market environment, the more they can have a adaption to the environment and deal with the crises and challenges with a stable mind and positive emotions, thus achieving breakthroughs through rich practical experiences (Sels et al., 2021). Business operation is not always a plain sailing, and difficulties may cause entrepreneurs to lose meaning in their lives and show confusion and concern about the future, to the extent that they make the decision to exit their businesses. Resilience can help entrepreneurs to counteract negative emotions in hardships, enhance their psychological adjustment capability, strengthen their risk awareness and risk-taking abilities, and use positive psychological factors to be immune from the erosion of negative information. More resilient entrepreneurs stay persistent in their goals even when overwhelmed by stress, difficulties and challenges, overcome their hardships through self-

soothing and self-encouragement, learn to save themselves and draw on advantages and avoid disadvantages under great pressure and adversities, and keep growing (Xi et al., 2015). After overcoming difficulties, they rebuild confidence, and their businesses get rapid development. On the contrary, entrepreneurs with lower resilience are more vulnerable and choose to retreat in the face of difficulties and challenges, showing a “sluggish” state after a blow, which accelerates the decline of their businesses. This suggests that the traits of private entrepreneurs have an effect on the private businesses’ innovation performance.

In summary, there are hypotheses as follows:

H1: There are significant active effects of the level of narcissism of private entrepreneurs on the innovation performance of private businesses.

H2: There are significant active effects of resilience of private entrepreneurs on innovative performance of private businesses.

3.3.2 Dynamic management capabilities and innovation performance of private businesses

First, the entrepreneurs’ capability to manage human resources has an impact on business performance. Human resources constitute an important resource in a firm, including the background, knowledge, skills and work experience, and even interests and values of individual employees (Hitt et al., 2001). High-level human resources equip enterprises with highly qualified employees, bring new marketing ideas and innovative concepts, and help enterprises break traditional models. The stronger the individual competencies of employees are, the greater their ability to learn quickly and bring benefits to enterprises is (Krasnikov & Jayachandran, 2008). At the same time, entrepreneurs’ capability to manage human resources brings a clear competitive advantage to enterprises. Effective management must be with practical experience, as entrepreneurs perceive external chances and threats using their expertise, identify and grasp chances through keen observation, and motivate employees to restructure organizational resources. As managers, entrepreneurs gain experience through the management of employees, learn management skills and enhance their management capabilities, so as to accelerate the rate of resource acquisition, effectively use and the add the value of resources, and improve business performance. This process helps managers acquire and develop their expertise and skills, strengthens the bonds between team members and positively impacts on business performance (P. M. Wright et al., 2014).

Secondly, entrepreneurs’ capability to manage social capital may have an impact on business performance. Based on the Resource-Based Theory, the amount of an enterprise's

valuable and scarce resources which are irreplaceable determines its competitive strength. Since it is difficult for peer firms to imitate such advantages, owners of such resources can maintain a long-term market advantage, and such resources play a part in helping enterprises to improve their performance (Badrinarayanan et al., 2019a). Social capital, which includes both formal and informal business reputation, arises from complex social relationships and is developed in the course of interactions. Its value lies in the social influence, control and voice it confers on individuals and in its transferability across varying contexts (Badrinarayanan et al., 2019a). Entrepreneurs with stronger capability to manage social capital are good at building external networks and quickly searching for key information and necessary resources to help decision-making, such as using social networks to broaden access to finance and using diversified information to improve decision-making options (Geletkanycz & Hambrick, 1997). In addition, the crucial dimension of social capital is trust, and entrepreneurs are at the heart of organizations and have the power to adjust governance structures and allocate resources. Entrepreneurs with stronger capability to manage social capital improve organizational relationships and motivate organization members in their interactions with subordinates and employees (X. Zhang et al., 2017), which is conducive to resource exchange and knowledge transfer and provides motivation for business performance improvement (Liu, 2017).

Finally, entrepreneurs' management cognition may have an impact on business performance. Driven by management cognition, changes take place in entrepreneurs' mental models and knowledge structures. Mental models and are spontaneous and are management awareness to control the whole process of business operation, which are determined by entrepreneurs' identity. For business development, entrepreneurs proactively search for and store information available in the market and use it effectively to solve problems and improve business performance (Winter, 2003). Knowledge structure is a way for entrepreneurs to connect what they have learned in the course of their business with knowledge already acquired by them to anticipate changes in the market environment, to offer necessary support in making decisions and taking actions, and to avoid bias and misinformation in making scientific and rational decisions (Garbuio et al., 2011). This suggests that management cognition of entrepreneurs affects business performance. Entrepreneurs with high management cognition capability are able to change their mental models, quickly build up a knowledge and information reserve structure, and through effective management of their beliefs and way of thinking, objectively evaluate reality and make scientific decisions. Entrepreneurs can also use management cognition in different environments responding to market changes, so as to improve business performance.

In summary, there are hypotheses as follows:

H3: There are significant active effects of management cognition on innovative performance of private businesses.

H4: There are significant active effects of managerial human capital on innovative performance of private businesses.

H5: There are significant active effects of managerial social capital on innovative performance of private businesses.

3.3.3 Traits of private entrepreneurs and dynamic management capabilities

The narcissism level plays a role in influencing managers' behavioral choices (J. D. Miller et al., 2018). Narcissists typically exhibit above-average self-appreciation and confidence, desire to live up to their value to highlight their achievements, are enthusiastic about power, and expect recognition from others (A. G. Wright & Edershile, 2018). Narcissistic individuals are more sensitive to environment, identify and seize opportunities of self-expression, and tend to accept and perform tasks that make them superior. Under the same context, narcissists have a greater desire to perform and are more willing to improve through learning (J. D. Miller et al., 2017). In this regard, narcissism affects entrepreneurs' dynamic management capabilities. Firstly, Narcissistic individuals generally show strong social interaction capabilities and use words and behaviors to convey ideas and attract the attention of others, which is conducive to stakeholders' acceptance of their views and access to more social resources and cooperation opportunities. Secondly, narcissistic individuals prefer to show their personal charisma to their teams and society, establish a favorable image, and aspire to be a role model for others to learn from, which is conducive to the steady and harmonious team relationships, stimulation of employee potential, and mobilization of employees' working enthusiasm. Finally, in order to reduce unnecessary losses and gain more favorable evaluations, they are good at using their keen observation skills to identify potential threats in the environment and transform uncertainty conditions into available resources, thus deepening cognition and promoting the implementation of decisions.

Resilience, on the other hand, is another trait of being positive-minded and optimistic in response to threats, difficulties and obstacles from an uncertain environment, adapting to changes through self-regulation, and achieving self-transcendence and self-growth. The trait of resilience can help individuals withstand disturbance of negative emotions, increase sense of responsibilities and risks, embrace difficulties and challenges with positive mental attitude, and make a breakthrough in practice (Sels et al., 2021). Resilient entrepreneurs do not give up easily,

face up to their shortcomings and deficiencies, and are motivated to move forward by adverse environments. Entrepreneurs' resilience, which may have a correlation with dynamic management capabilities, is a valuable quality (Xi et al., 2015) that makes entrepreneurs better accepted by clients and investors so that they can get access to key resources for sustainable development of their businesses. Also, employees take as an example an entrepreneur whose spirit of arduous struggle and facing challenges with great passion enhances team morale and mobilize employees' working enthusiasm. Resilient entrepreneurs quickly change their way of thinking amid adversities, cope with difficulties by forming a cognition model suitable for the current circumstances, and eventually live up to their business ambitions under tough environments.

In summary, there are hypotheses as follows:

H6: There are significant active effects of narcissism level on management cognition.

H7: There are significant active effects of narcissism level on managerial human capital.

H8: There are significant active effects of narcissism level on managerial social capital.

H9: There are significant active effects of entrepreneurial resilience on management cognition.

H10: There are significant active effects of entrepreneurial resilience on managerial human capital.

H11: There are significant active effects of entrepreneurial resilience on managerial social capital.

3.3.4 Mediating effect of dynamic management capabilities between traits of private entrepreneurs and innovative performance of private businesses

Entrepreneurial traits, such as narcissism and resilience, may affect enterprises' innovation performance, but the mechanism of action is to be explored. Traits underlie the building of entrepreneurs' individual personalities and qualities, but to improve their performance, there are still insufficient. Upper Echelons Theory classifies traits as individual psychological factors (Hambrick & Mason, 1984) and identifies two paths for them to affect performance of organizations. Psychological factors affect performance of organizations in the interaction of such factors as education experiences and occupational background. Entrepreneurs, under psychological factors, undergo a screening process in which entrepreneurs selectively perceive realities based on psychological factors such as individual preferences, values and cognition patterns, as well as empirical factors such as occupational experience and educational experience, and make choices taking into account their particular conditions. In this process,

they continuously explore their priorities, improve their competence, and finally choose the right business strategy for the development of enterprises to achieve the business goal of business performance improvement (Le, 2019). In the process of business operation, accumulation of practical experience may lead to changes in the capabilities of entrepreneurs. Individuals with positive traits are more likely than those with negative traits to try new things, to discover their shortcomings in practice, to change their perceptions and adopt an appreciative and learning attitude towards external stimuli, and to have full utilisation of existing resources to achieve their expected goals, which help them to develop and improve their capabilities. On the contrary, individuals with negative traits respond to difficulties by adopting a retreating and defensive strategy, resulting in their missing opportunities and dissatisfactory growth. This suggests that traits have an impact on individual competencies.

At the same time, individual capabilities can directly affect enterprises' innovation performance. Improvement in innovation performance of enterprises requires not only unique entrepreneurial traits, but also entrepreneurs' keen insight to recognize, develop and exploit market chances, strong sociability, and skill to access and integrate resources, and to innovate outside the box. This fits in with management cognition, managerial human capital and managerial social capital involved in the dynamic management capabilities. Dynamic management capabilities vary from entrepreneurs with different traits. Entrepreneurs with stronger capabilities are able to effectively motivate their employees, use tangible and intangible assets flexibly to keep their current business running smoothly, and develop action plans to meet growth requirements and become competitive in the marketplace (J. Barney & Felin, 2013). Additionally, they are adept at identifying and using external opportunities, seeking social support, searching for and exploiting key resources via their networks, so as to innovate in technologies and contribute to the enterprises' innovation performance (Beck & Wiersema, 2013).

This thesis argues that entrepreneurial traits and the performance of innovation in private enterprises are mediated by dynamic management capabilities. Most studies have termed dynamic management capabilities as an antecedent variable. Following the "trait-capability-performance" logic, however, dynamic management capabilities constitute the bridge between entrepreneurial traits and innovation performance of private businesses. Individuals with different traits show differences in dynamic management capabilities and in ways of seeing and solving problems, and the strategies and decisions they make may have an effect on enterprises' innovation performance.

In summary, there are hypotheses as follows:

H12: There is a significant mediating effect of managerial cognition in the active influence of narcissism level on innovative performance.

H13: There is a significant mediating effect of managerial human capital in the active influence of narcissism level on innovative performance.

H14: There is a significant mediating effect of managerial social capital in the active influence of narcissism level on innovative performance.

H15: There is a significant mediating effect of managerial cognition in the active influence of entrepreneurial resilience on innovative performance.

H16: There is a significant mediating effect of managerial human capital in the active influence of entrepreneurial resilience on innovative performance.

H17: There is a significant mediating effect of managerial social capital in the active influence of entrepreneurial resilience on innovative performance.

3.3.5 Moderating effect of industry environment

The industry environment is a formless external factor that affects entrepreneurial growth and business operations, showing a complex and dynamic development. The totality of physical and social elements that influence decision-making has an impact on innovation performance (Romanelli & Tushman, 1986). According to psychologists, environmental factors are the soil in which personal traits and capabilities are developed, and individuals are always selective in making changes in response to varying environmental changes. For private entrepreneurs, given a highly-risky and ever-changing industry environment, the stronger the positive traits (e.g. strong adaptability, high resilience, confidence), the more likely they are to realize their potential, identify risks and take advantage of favorable market opportunities, the more calm and collected they are in dealing with emergencies and situations, and the more competent they are. In contrast, the stronger the negative traits (e.g., weak adaptability, low resilience, self-abasement), the more likely they are to show anxiety and nervousness, and the less likely they are to deal with difficulties and challenges in a rational way, the less able they are to use rational thinking to deal with critical events, and the less competent they are. In this regard, the industry environment has an impact on the relationship between entrepreneurial traits and entrepreneurial capabilities, and this thesis concentrates on how competitive and dynamic the industry environment is.

The industry environment's dynamic essence refers to the uncertainty of the development of the industry as a whole (Rosenbusch et al., 2007), including changes in the diversity of customer needs, technological innovations in production, and changes in the behaviors of

upstream and downstream industries. This may be attributed to the unpredictable pace of market change (Jansen et al., 2009). Entrepreneurs with positive traits are more likely to seize the opportunity for business development in a dynamic industry environment, observe market changes, search and capture business information, proactively maintain relationships with customers, suppliers, distributors and other stakeholders, make scientific judgments and decisions, and continuously improve business profitability. The competitive nature of the industry environment is an environmental condition in which firms are at a disadvantage and refers to the behavior that many similar firms competing for access to at-a-premium or critical resources (Abiodun et al., 2019). Entrepreneurs with positive traits are able to face unfavorable market conditions such as product price competition and shortage of critical resources with an optimistic mindset. They use their strengths to pool resources, produce differentiated products to form a competitive advantage, adopt a rational approach responding to industry environment changes, adjust their strategies in time to improve technological capabilities, effectively exploit the opportunities brought about by competitiveness, and in the process of doing so, constantly improve their capabilities.

All factors are considered to improve business performance.

In summary, there are hypotheses as follows:

H18: The relationship between narcissism level and managerial cognition are moderated by industry environment. Specifically, the more dynamic and competitive the industry environment is, the stronger the influence of narcissism level on managerial cognition will be.

H19: The relationship between narcissism level and managerial human capital are moderated by industry environment. Specifically, the more dynamic and competitive the industry environment is, the stronger the influence of narcissism level on managerial human capital will be.

H20: The relationship between narcissism level and managerial social capital are moderated by industry environment. Specifically, the more dynamic and competitive the industry environment is, the stronger the influence of narcissism level on managerial social capital will be.

H21: The relationship between entrepreneurial resilience and managerial cognition are moderated by industry environment. Specifically, the more dynamic and competitive the industry competitiveness is, the stronger the influence of entrepreneurial resilience on managerial cognition will be.

H22: The relationship between entrepreneurial resilience and managerial human capital are moderated by industry environment. Specifically, the more dynamic and competitive the

industry competitiveness is, the stronger the influence of entrepreneurial resilience on managerial human capital will be.

H23: The relationship between entrepreneurial resilience and managerial social capital are moderated by industry environment. Specifically, the more dynamic and competitive the industry competitiveness is, the stronger the influence of entrepreneurial resilience on managerial social capital will be.

3.3.6 Moderated mediating effect

According to the above-mentioned hypotheses, the theoretical model used in this thesis is a moderated mediating model. Dynamic changes and fierce competition in the industry environment put pressure on firms to survive, force them to adjust their innovation processes and practices within a short period of time, to improve their process flow using technologies of state-of-the-art, and to enhance the level of their products and services quality (L.-Y. Wu, 2006), thus indirectly improving their innovation performance. In this regard, this thesis argues that a rapidly changing and intensely competitive industry environment enhances the mediating effect of dynamic management capabilities between private entrepreneurial traits and private firms' innovation performance, and that a rarely changing and less competitive industry environment diminishes the mediating effect of dynamic management capabilities between private entrepreneurial traits and private firms' innovation performance. In summary, the following hypotheses are proposed:

H24: Industry environment moderates the influence of narcissism level on innovative performance of private businesses via managerial cognition. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial cognition between narcissism level and innovation performance of private businesses will be.

H25: Industry environment moderates the influence of narcissism level on innovative performance of private businesses via managerial human capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial human capital between narcissism level and innovative performance of private businesses will be.

H26: Industry environment moderates the influence of narcissism level on innovative performance of private businesses via managerial social capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial social capital between narcissism level and innovative performance of private businesses will be.

H27: Industry environment moderates the influence of entrepreneurial resilience on innovative performance of private businesses via managerial cognition. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial cognition between entrepreneurial resilience and innovative performance of private businesses will be.

H28: Industry environment moderates the influence of entrepreneurial resilience on innovative performance of private businesses via managerial human capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial human capital between entrepreneurial resilience and innovative performance of private businesses will be.

H29: Industry environment moderates the influence of entrepreneurial resilience on innovative performance of private businesses via managerial social capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial social capital between entrepreneurial resilience and innovative performance of private businesses will be.

6. Moderated mediating effect

H24: Industry environment moderates the influence of narcissism level on innovative performance of private businesses via managerial cognition. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial cognition between narcissism level and innovation performance of private businesses will be.

H25: Industry environment moderates the influence of narcissism level on innovative performance of private businesses via managerial human capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial human capital between narcissism level and innovative performance of private businesses will be.

H26: Industry environment moderates the influence of narcissism level on innovative performance of private businesses via managerial social capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial social capital between narcissism level and innovative performance of private businesses will be.

H27: Industry environment moderates the influence of entrepreneurial resilience on innovative performance of private businesses via managerial cognition. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial cognition between entrepreneurial resilience and innovative performance of private

businesses will be.

H28: Industry environment moderates the influence of entrepreneurial resilience on innovative performance of private businesses via managerial human capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial human capital between entrepreneurial resilience and innovative performance of private businesses will be.

H29: Industry environment moderates the influence of entrepreneurial resilience on innovative performance of private businesses via managerial social capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial social capital between entrepreneurial resilience and innovative performance of private businesses will be.

3.4 Summary

Based on Upper Echelons Theory and Dynamic Management Capabilities Theory, this Chapter logically reasons about the relationship between such variables as entrepreneurial traits (narcissism level, entrepreneurial resilience), dynamic management capabilities, innovation performance and industry environment (dynamics and competition), and based on the analysis results, proposes following, succinctly stated, hypotheses for this study:

1. Traits of private entrepreneurs and innovative performance of private businesses

H1: There are active effects of narcissism level of private entrepreneurs on innovative performance of private businesses.

H2: There are active effects of Resilience of private entrepreneurs on innovative performance of private businesses.

2. Dynamic management capabilities and innovative performance of private businesses

H3: There are active effects of management cognition on innovative performance of private businesses.

H4: There are active effects of managerial human capital on innovative performance of private businesses.

H5: There are active effects of managerial social capital on innovative performance of private businesses.

3. Traits of private entrepreneurs and dynamic management capabilities

H6: There are active effects of narcissism level on management cognition.

H7: There are active effects of narcissism level on managerial human capital.

H8: There are active effects of narcissism on managerial social capital.

H9: There are active effects of entrepreneurial resilience on management cognition.

H10: There are active effects of entrepreneurial resilience on managerial human capital.

H11: There are active effects of entrepreneurial resilience on managerial social capital.

4. Mediating effect of dynamic management capabilities between traits of private entrepreneurs and innovative performance of private businesses

H12: There is a significant mediating effect of managerial cognition in the active influence of narcissism level on innovative performance.

H13: There is a significant mediating effect of managerial human capital in the active influence of narcissism level on innovative performance.

H14: There is a significant mediating effect of managerial social capital in the active influence of narcissism level on innovative performance.

H15: There is a significant mediating effect of managerial cognition in the active influence of entrepreneurial resilience on innovative performance.

H16: There is a significant mediating effect of managerial human capital in the active influence of entrepreneurial resilience on innovative performance.

H17: There is a significant mediating effect of managerial social capital in the active influence of entrepreneurial resilience on innovative performance.

5. Moderating effect of industry environment

H18: The relationship between narcissism level and managerial cognition are moderated by industry environment. Specifically, the more dynamic and competitive the industry environment is, the stronger the influence of narcissism level on managerial cognition will be.

H19: The relationship between narcissism level and managerial human capital are moderated by industry environment. Specifically, the more dynamic and competitive the industry environment is, the stronger the influence of narcissism level on managerial human capital will be.

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H21: The relationship between entrepreneurial resilience and managerial cognition are moderated by industry environment. Specifically, the more dynamic and competitive the industry competitiveness is, the stronger the influence of entrepreneurial resilience on managerial cognition will be.

H22: The relationship between entrepreneurial resilience and managerial human capital are moderated by industry environment. Specifically, the more dynamic and competitive the industry competitiveness is, the stronger the influence of entrepreneurial resilience on managerial human capital will be.

H23: The relationship between entrepreneurial resilience and managerial social capital are moderated by industry environment. Specifically, the more dynamic and competitive the industry competitiveness is, the stronger the influence of entrepreneurial resilience on managerial social capital will be.

Chapter 4: Research Preparation and Research Design Method

In order to analyze and resolve problems in a scientific manner, research preparation and research design should demonstrate the rationality of overall planning for the research and build a firm foundation for the future empirical analysis. Based on the arrangement and analysis of relevant theories and literature, in Chapters 2 and 3, the author presented the theoretical model of traits of private entrepreneurs, dynamic management capabilities, innovative performance of private businesses and industry environment, and put forward the research hypotheses of this thesis thereby. The present chapter comprises research preparation and research design. In the part of research preparation, the interview and survey of private entrepreneurs was completed by designing interview outline, selecting research samples, collecting and analyzing interview data; the interviews serve the purpose of discovering the relationship between private entrepreneurial traits and private firms' innovation performance and attempt to find out variables that affect such relationship. In the part of research design, early-stage preparations for the research like quantitative analysis were displayed by virtue of questionnaire design, research variables measurement, pre-research test, introduction to empirical analysis methods, questionnaire distribution and respondent selection. Due to the above-mentioned qualitative research and quantitative analysis, the author has obtained the primary research data and analytical data to evidence whether the theoretical model and research hypotheses are tenable.

4.1 Research preparation

4.1.1 Design of interview outline

To deepen the understanding of private entrepreneurial traits and private businesses' development process, this thesis adopted the semi-structured interview method to carry out field interview with entrepreneurs from large and medium-sized private businesses in Tianjin. The interview method itself is flexible, accurate and in-depth. As a process of two-way communication, interview features higher flexibility. Given that outline design, performed prior to interview, is unlikely to take into account all the elements and make accurate predictions of the field interview, through the field interview, the interviewer may make proper adjustment as per the actual situations, offer specific explanation for issues with vague expression, and guide

respondents if their answer deviates from or is irrelevant to the study. While engaging in face-to-face communication and exchange, in the meantime, the interviewer may create the relaxed and comfortable interview atmosphere by encouraging respondents orally, so as to eliminate their negative sentiments like tension and anxiety and obtain the primary data of higher reliability and validity. As this research focuses on the relationship among such variables as traits of private entrepreneurs, dynamic management capabilities, innovative performance of private businesses and industry environment, the semi-structured interview form is more suitable. Being an interview form between open interview and structured interview, semi-structured interview is superior to both of them, because it utilizes the rigorous interview questions to guide and question respondents, and effectively prevents them from deviating from the research theme. On the other hand, it promises much room for respondents to express their opinions and suggestions, thus available to access key information aside from research variables and improve the research value and significance.

Prior to the formal interview, the author carried out the preliminary interview outline design in combination with the research purposes and particulars upon collection and reading of relevant materials. The author further modified, supplemented and perfected the outline in accordance with the opinions and suggestions offered by the tutor MA Jie in team discussion, so as to meet the requirements for interview outline design and ensure the access to valuable information via question setting. Through formal interview, the author interviewed respondents as per the interview outline, and timely made a detailed inquiry in case of any critical information or question, particularly, information related to variables involved in the research. After interviewing each time, the author reviewed the procedures of interview and critical links therein, sorted out primary interview data obtained therefor, summarized existing problems and deficiencies, and optimized the interview outline to make sufficient preparations for the subsequent interviews.

The interview outline design mainly relates to the following three aspects:

1. Comment on the present technical strength of companies: Do they dominate the leading position of the industry? What are their performance change trend and performance growth details in combination with their development over the past years? Do they value innovation in terms of products, technology and management? What are their advantages compared with competitors?

2. Do they frequently communicate their experience and technologies with clients, suppliers and competitors? Do they frequently contact government organs, financial institutions and scientific research institutions?

3. Amid such traits as having passion for social activities, remaining confident and optimistic, and being expert in interpersonal communication, or enjoying acute insight into objects, being good at spotting opportunities and standing ready to change environment, or being ready to accept challenges and prone to conclude risky decisions, or rising up to challenges, shouldering responsibility, pursuing excellence and striving for success, what are most significant for contemporary entrepreneurs?

4.1.2 Selection of interview samples

Proper sample selection helps improve the validity level of research particulars. This thesis mainly relates to private entrepreneurs as well as businesses run by them, among which entrepreneurs are usually defined to be such senior managers as detecting, creating and utilizing resources to achieve brand-new combination. The said definition only interprets the concept of entrepreneurs from the functional perspective. During the economic system reform in China, private businesses featuring nature of non-public enterprises have come into being, including sole proprietorship enterprises, partnerships, limited liability companies, incorporated companies and any other type of business, with the exception of state-owned, state-owned asset holding, and foreign-funded businesses, whose principal managers are known as private entrepreneurs. In this thesis, interviewees were selected subject to the following principles: (1) enterprises run by them must enjoy the nature of the above-mentioned private businesses; (2) business operation relates to activities in different industries and fields; and (3) private entrepreneurs selected are different from each other in terms of age, gender and professional experience. By virtue of the social network, the author invited managers of 10 private businesses in Tianjin and carried out field interview with them. This thesis sorted out the interview data using Nvivo 11.0 software and presented the interview content and basic information of these enterprises in the Annex 3.

In this thesis, face-to-face interview with 10 senior managers of the above-mentioned private businesses was carried out with the average interview duration of 0.5-1 hour. To gain more understanding of and acquire more information on traits of private entrepreneurs and innovative performance of private businesses, in the research, well-targeted questions were put forward through interview to reduce the interference of irrelevant information as much as possible, and records thereof were sorted out. Eventually, interviews were converted to text information for arrangement and storage.

4.1.3 Collection of interview data

The research mainly obtained the primary data via interview with private entrepreneurs and combined online interview with face-to-face interview. Prior to each interview, the author encouraged interviewees to fully express their real thoughts as per the fundamental principle of “say all you know without reserve”. In the meantime, the author highlighted the purpose of interview, namely, for personal academic research merely, rather than any other purposes. During interview, the author made a request to interviewees when it came to critical information points, and performed recording upon access to consent, which helped improve research validity and perfect evidence chain. Upon each interview, the author carried out review, summary and reflection of the present interview, found deficiencies thereof, and made well-targeted strategies for the next interview.

4.1.4 Analysis on interview data

Upon collection of interview data, the next step is to carry out text transformation thereof. In accordance with the language expression of interviewees on field interview, the author transformed interview notes and recordings into literal data, summarized the expression of the 4 private entrepreneurs from different fields in this research, and produced the interview records, so as to acquire and analyze information concerning traits of private entrepreneurs and development of private businesses. Interview records are shown in the Annex 3.

The interview records with the entrepreneur from each business comprises interview date, interview place, interviewee No., specific title, text No. and key statement of the interviewee. Upon arrangement and analysis of interview records, it is observed that, the above-mentioned 10 private entrepreneurs and private businesses share common characteristics yet bear differences, which are analyzed as follows:

Born after 1990s, the private entrepreneur A1 enjoys the education background of furthering study abroad. In addition to engaging in such services as investment and lease, he also expands business in other industries. Personally, A1 attaches great significance to the innovation capability. For instance, he has utilized the knowledge learnt to build a website platform to maintain contact with suppliers, thus boosting the development of Business A. Besides, A1 takes on the obvious trait of confidence and holds that, it is available to overcome difficulties in our life and eventually embrace success in ways like self-motivation and confidence.

The private entrepreneur B1 once worked in a state-owned company, which benefits his startup of Business B in terms of interpersonal network and experience. According to him, the capability of spotting opportunities, an essential trait of successful entrepreneurs, is of the utmost significance for the development and operation of a private business. In terms of market, Business B embraces the broad market due to the huge product production quantity and transaction quantity. As a listed company, it pays due attention to the close connection with suppliers, competitors, clients and other stakeholders. Technically, Business B boasts the globally leading technologies, which may be ascribed to the reversed transmission effect of market demands as well as its continuous pursuit for technological innovation. Furthermore, the company has applied for a lot of patents, and has reinforced its technological level by seeking for the comments on and suggestions for products from clients.

The private entrepreneur C1 holds that, continuous innovation may empower and support development. And the capability of carrying out resource integration, scientific and technological innovation and communication is expected to be improved. On the one hand, we should exchange with clients, suppliers, competitors and entrepreneurs as much as possible to gain experience from them. On the other hand, active efforts should be made to build a platform to communicate with government organs, financial institutions and scientific research institutions, thus reinforcing the inter-association. Due to his previous experience, he values sense of responsibility as an important trait of entrepreneurs. In his opinion, entrepreneurs are expected to shoulder their responsibility and to try their best to boost enterprise development. Incorporated at the initial stages for reform and opening up, Business C furnished its clients with the overall solution to tire factory at the very beginning. With the market development and expansion, the business scope of Business C has been gradually expanded to robot, intelligent logistics and warehousing, air fixtures and medicine. Similar to Business B, Business C also highlights scientific and technological innovation, and always takes technology as its main business. In the first year upon its incorporation, Business C began to apply for patented technologies. At present, Business C boasts 86 patents for invention in China and 9 abroad. And its capability of developing proprietary intellectual property rights has reached the internationally leading level.

The private entrepreneur D1 obtained his bachelor's degree and master's degree from overseas universities, thus featuring better education background. According to him, social competence is the most significant for contemporary entrepreneurs. Although individuals must spend some time and energy and lots of financial resources in attending some social activities, a platform may be developed in such manner to ensure communication among young

entrepreneurs, which further broadens their horizon, procures them to make profound consideration, expands their social network relationships, and eventually benefits enterprise development. Due to the emphasis on technological innovation, Business D boasts 5 product R&D centers, 6 public technology centers and 4 scientific research service departments. It has successively undertaken and participated in 117 projects (inclusive of significant research projects in innovation of science and technology) of national 863 and 973 Programs. Furthermore, it has acquired 4 national awards for scientific and technological progress, 19 provincial and ministerial awards for scientific and technological progress and 3 national key new products successively, applied for 1,815 patents with 1,526 patents for invention inclusive, and published 22 monographs, 1,536 Chinese core periodicals, and 242 theses included into SCI. In the meantime, Business D values the exchange and collaboration with suppliers, clients, competitors and other stakeholders, and leverages various social relations to build platforms for communicating with government organs, financial institutions and scientific research institutions.

Born after 1980s, the private entrepreneur E1 has been inspired by his father's hardworking and down-to-earth attitude towards learning when he was a child. He holds that the development of business with success has a close relationship with an entrepreneur's ability to integrate resources. In particular, it is important to strengthen the ties between entrepreneurs through social network relationship platforms to share resources and thus maximize the value of resources. Private business E is engaged in the medical industry and mainly produces and sells new medical device products. Due to the special nature of the medical industry, its suppliers must have the appropriate qualifications and the production process must be strictly controlled. To this end, Business E attaches particular importance to building relationships with upstream and downstream partners and conducts regular product sampling to ensure product quality. It now has a number of domestically leading technologies and products that are well received by consumers in the new medical device market.

Private entrepreneur F1 had a stable job in his early days and eventually started entrepreneurial activities as driven by his hobby. He has always been arguing that an entrepreneur's firm belief is indispensable for the business success and has operated his founding business into the largest tailoring chain in the country after more than 10 years of development and exploration. Business F has a world-class intelligent manufacturing service production line, customizes and sells men's suits, trousers, shirts, as well as trench coats and overcoats for business. Employing the production method of individual tailoring of a single piece of clothing, it produces accurately tailored clothes based on the unique body type of each

customer to guarantee the uniqueness of each product and implement an “individualized” production model. The company currently has about 30,000 high-end customers and focuses on maintaining relationships with them by organizing regular visits to them to be kept updated with their needs and market trends.

Private entrepreneur G1 was not involved in business activities in the early days, but entered the business world by chance. He now holds the position of Chairman at several enterprises. Incorporating Tianjin culture into corporate products, he forms a corporate product culture with unique and diverse styles; he also stays inclusive to learn from and absorb outstanding foreign cultures to enhance customer experience. Private entrepreneur G1 holds that sense of responsibility is a basic quality that entrepreneurs must have, and that China’s excellent traditional culture, a mission and responsibility that contemporary youth should undertake, should be inherited and carried forward by contemporary youth.

Private entrepreneur H1 has overseas study experience and established a joint venture with his family after returning to China with a master’s degree. His business philosophy was nurtured by both his father and his foreign experience, and he seized the opportunity to open up overseas markets. Private entrepreneur H1 attaches importance to product innovation and customer interaction, which helps him update ideas and follow up on market customer needs and improve product quality from the customer’s perspective. He concludes social interaction capability as the most important thing for contemporary private entrepreneurs and builds social network relationships through diverse platforms to obtain help and support from the government, financial institutions and research institutes for the development of private enterprises.

I1, a private entrepreneur, believes that the most important trait that entrepreneurs possess is faith, especially the confidence to overcome difficulties in times of adversity. She believes that the inheritance of Chinese private enterprises is as much about the business as it is about the family. It is the result of the efforts of each member of the family business as well as the transformation of the individual's strong belief in success. Private entrepreneur I1 not only focuses on the economic benefits gained by the enterprise, but also adheres to the concept of “gratitude to the society and inheritance of love” to give back to the society, lend a helping hand to others when they face difficulties and take up social responsibility.

Private entrepreneur J1 served the army following the receipt of a master’s degree and formed a team to start his business after his discharge from the army. His military experience has honed his hard-working qualities, and he has developed his business from a two-person start-up team to a 200-person R&D team in exploration of a dozen years. He believes that the most important thing for private entrepreneurs is not experienced and wealth, but the courage

It is found through interviews that the 10 private entrepreneurs think individual traits affect private firms' innovation performance. With the purpose of further explore the correlation between the two and the influence process, this thesis selects the words that appear more frequently in the interviews and belong to the trait factors of private entrepreneurs as research variables. This thesis selects narcissism level and entrepreneurial resilience among the individual trait factors and introduces dynamic management capabilities as a variable of mediating and industry environment as a variable of moderating to further analyze their relationship with private enterprises' innovation performance.

4.2 Research design

4.2.1 Questionnaire design

The application of a scientific and reliable questionnaire is the premise of accessing accurate measurement data. The principal research variables in this thesis include traits of private entrepreneurs (narcissism level and entrepreneurial resilience), dynamic management capabilities, innovative performance of private businesses and industry environment. According to the arrangement and reading of the available literature, the author obtained a relatively mature measurement scale related to foregoing variables and featuring higher frequency of use. In combination with the research particulars and background of this thesis, the author properly adjusted the expression of the measurement scale to gain accurate measurement data, and finally formed the questionnaire used for this research.

The questionnaire comprises the following components. The first is introduction to the questionnaire, which elaborates the research purposes and particulars of this thesis, and briefly introduces the measurement thereof. The second relates to the profile of respondents and private businesses, among which the profile of private entrepreneurs includes age, gender, education background, marital status and working experience and that of private businesses covers present development stage, duration upon business incorporation, number of employees, industry affiliated with, and profitability. The last is about the measurement of research variables in this thesis. By reference to the measurement methods in existing literature, this thesis adopted Likert Scale for scoring, with different figures representing different degrees. Specifically, 1 means strongly disagree; 2 means disagree; 3 means uncertain; 4 means somewhat agree; 5 means strongly agree.

4.2.2 Measurement of research variables

The theoretical model hereunder consists of four variables, namely, independent variable - traits of private entrepreneurs (including two sub-variables: narcissism level and entrepreneurial resilience), dependent variable - innovative performance of private businesses, mediating variable - dynamic management capabilities (in three dimensions: managerial human capital, managerial social capital and managerial cognition) and moderating variable - industry environment (in two dimensions: industry competitiveness and industry dynamics). As the scale elected hereunder has been evidenced by the existing research as featuring better reliability and validity, it may make data measurement more reliable to some extent. Given that the scale is developed by foreign scholars, there is the limitation of applicable situation, and the accuracy of translation may be lowered. In order to resolve this issue, this thesis applied the questionnaire translation method of back translation to minimize the comprehension error resulting from different languages as much as possible, and then developed the initial questionnaire for measurement. The measurement scale of each variable is introduced in details as follows:

(1) Traits of private entrepreneurs

Measurement of narcissism level: The existing research mainly measured the narcissism level of research objects by developing narcissism measurement scales or distributing questionnaires. Currently, representative scales include Diagnostic Narcissism Scale (DMS), Narcissistic Personality Inventory (NPI), Minnesota Multiphasic Personality Inventory (MMPI), improved NPI and California Psychological Inventory (CPI). R. N. Raskin and Hall (1979) took the lead in putting forward the NPI with 54 items, which is rarely used as a result of excessive items; Emmons (1984) inspected the NPI of 54 items and extracted 4 items, namely, leading authority, right, self-appreciation and superiority; after reviewing the validation thereof, R. Raskin and Terry (1988) analyzed and detected that, multiple items of the same factor feature stronger interpret ability. The said scale comprises 6 items, and respondents are instructed to offer comments as per the Likert 5-level scoring method (1=strongly disagree; 2=disagree; 3=uncertain; 4=somewhat agree; 5=strongly agree).

Measurement of entrepreneurial resilience: After reading quite a few literatures concerning entrepreneurial resilience, the author found that, the entrepreneurial resilience measurement scale commonly used at present is improved based on RS and WRI, while no uniform measurement standards have been developed. G. M. Wagnild and Young (1993) took the lead to perform helpful exploration for the development of RS. Norem (2001) further checked and verified RS and based on the research of G. Wagnild and Young (1990), summarized the

resilience measurement into four dimensions, namely, personal construct, trouble-shooting, harmonious social relations and ego defense mechanism. The above-mentioned two-dimension classification methods expedited the development of resilience measurement. By reference to the research achievements of the above-mentioned scholars, Connor and Davidson developed CD-RISC comprising capability evaluation, high self-evaluation criteria, self-trust, resistance against negative events and acceptance of changes. By virtue of the foregoing scale, Chinese scholars K. Q. Wu et al. (2021) measured the entrepreneurial resilience of farmer entrepreneurs and evidenced the higher reliability and validity thereof. The said scale comprises 6 items, and respondents are instructed to offer comments as per the Likert 5-level scoring method (1=strongly disagree; 2=disagree; 3=uncertain; 4=somewhat agree; 5=strongly agree).

(2) Dynamic Management Capabilities

As dynamic supplement to and improvement of management capabilities, dynamic management capabilities include capability of human resource management, capability of managerial social capital and capability of managerial cognition. By reference to the research achievements of scholars like Adner and Helfat (2003) and Corrêa et al. (2019), questionnaire items were designed based on the measurement scale of dynamic management capabilities developed by them. The said scale comprises 9 items, among which 3 items (i.e. education level of employees, competence of handling the relationship with stakeholders, and rich experience in developing products and services) are for the measurement of capability of human resource management, 3 items (i.e. development and maintenance of external social relations, establishment of cooperative partnership, and competence of accessing social relation network resources) for the measurement of capability of managerial social capital and 3 items (competence of spotting market opportunities and threats, enterprise competence of talent absorption, and creation of team innovation atmosphere) for the measurement of capability of managerial cognition. Respondents are instructed to offer comments as per the Likert 5-level scoring method (1=strongly disagree; 2=disagree; 3=uncertain; 4=somewhat agree; 5=strongly agree).

(3) Innovative Performance of Private Businesses

The variable of innovative performance requires much attention in the academic circle and is measured in myriad ways. The data source classifies the evaluation of innovative performance into subjective evaluation and objective evaluation. Furthermore, it can be measured as per different evaluation standards, such as number of patents, financial indicators and non-financial indicators, new product development, organizational learning, search range and multi-indicator comprehensive measurement. Up to now, no uniform measurement

standard for innovative performance of enterprises has been developed. By reference to the subjective measurement upheld by Lovelace et al. (2001), this thesis measured the innovative performance of private businesses on fronts of product and service innovation speed, number of patent application, development rate of new products and services, R&D success rate of products and services, and proportion of sales volume of new products and services to the aggregate one. The said scale comprises 5 items, and respondents are instructed to offer comments as per the Likert 5-level scoring method (1=strong inconformity; 2=inconformity; 3=uncertainty; 4=conformity; 5=strong conformity).

(4) Industry Environment

Amid literature of organization theories and strategy management, industry environment is a significant research theme, and scales applied for measurement thereof are relatively mature. On the whole, relevant scales are classified into two perspectives, i.e., taking environmental elements as principal measuring standards and selecting key elements as measurement indicators. Although such evaluation criterion may ensure comprehensive measurement of industry environment to improve the overall validity due to many elements involved therein, the existence of excessive items is likely to result in the fatigue of respondents, thus remarkably lowering the quality of questionnaire-based measurement. Therefore, the industry environment of private businesses was measured in terms of industry environment dynamics and industry environment competitiveness in this thesis, which not only ensures the accuracy of questionnaire-based measurement, but also improves the questionnaire data quality by limiting the number of questionnaire questions within the reasonable scope and ensuring the effective rate of questionnaire completion. This thesis measured the industry environment by reference to the measurement scale used by D. Y. Li et al. (2009) and Gou and Ding (2020), which comprises 8 items with 4 for industry environment dynamics and 4 for industry environment competitiveness. Respondents are instructed to offer comments as per the Likert 5-level scoring method (1=strong inconformity; 2=inconformity; 3=uncertainty; 4=conformity; 5=strong conformity). The Measurement items is shown in Table 4.1.

Table 4.1 Measurement items

Variable	Dimension	Item and description	Source
Narcissism (NA)		NA1 I am a key figure of the company	Emmons (1984)
		NA2 I enjoy achievements I have gained	
		NA3 I would like to become famous to more people	
		NA4 I value personal leadership more than team capacity sometimes	
		NA5 I deserve higher income than	

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			others	
		NA6	I am the most valuable person for the company	
		ER1	I prefer to search for changes in order to enrich my life	
		ER2	I am fond of challenging new things	Connor and Davidson (2003);
		ER3	I remain committed to my goals	Wu
		ER4	I am confident of handling most issues in work and life properly	Keqiang et al. (2021)
		ER5	I stand ready to accept the results different from the expected ones	
		ER6	Business failure is other than a crushing blow for me	
		DMC1	Most employees are of higher education level	
	Managerial human capital	DMC2	I am experienced in flexibly handling the relationship with clients and suppliers	
		DMC3	I am experienced in developing products and services within the strategic scope	
		DMC4	I value the development and maintenance of external social relations	
	Managerial social capital	DMC5	I am ready to establish partnership with more enterprises	Adner (2003);
		DMC6	I am good at finding valuable resources from the social relation network	Corrêa (2019)
		DMC7	I am able to accurately spot and timely detect market opportunities and threats	
	Managerial cognition	DMC8	I agree to and encourage the absorption of well-educated management talents	
		DMC9	I encourage the management team to foster strong innovation atmosphere and exchange ideas	
		EP1	We often launch new products and services	
		EP2	We have applied for quite a few patents	
		EP3	We feature rapid development rate of new products and services	Lovelace et al. (2001)
		EP4	We enjoy higher success rate of new product and service development	
		EP5	The proportion of sales volume of our new products and services to the aggregate one is high	
		IE1	Products and services in this industry are rapidly updated	D. Y. Li et al. (2009);
		IE2	It is hard to predict behaviors of competitors in the same industry	Gou and Ding
Entrepreneurial Resilience (ER)				
Dynamic Management Capabilities (DMC)				
Industry Environment (IE)	Industry Environment Dynamics			

Industry Environment Competitiveness	IE3	This industry features constant technical progress	(2020)
	IE4	Customer demands experience rapid and unpredictable changes	
	IE5	Competition is increasingly fierce	
	IE6	Customer demands are increasingly higher	
	IE7	It is increasingly difficult to access essential resources	
	IE8	Behaviors of competitors in the same industry become diverse	

(5) Control Variables

Apart from variables studied in this thesis, there are a lot of other elements probably to influence the innovative performance of private businesses, for which control variables on fronts of private entrepreneurs and private businesses are designed hereunder. For private entrepreneurs, control variables include age, gender, education background, marital status and working experience. of entrepreneurs; for private businesses, control variables include present development stage, duration upon business incorporation, number of employees, industry affiliated with, and profitability, among which development stages comprise startup stage, growth stage, expansion stage and mature stage, duration upon business incorporation divided into less than 1 year, 1-3 years, 3-5 years and more than 5 years, number of employees divided into less than 10, 10-50, 51-100 and more than 100, industries affiliated with covering agriculture, forestry, husbandry and fishery industry, mining industry, manufacturing industry, power, heat, gas and water production and supply industry, architecture industry, wholesale and retail industry, transportation, warehousing and post industry, accommodation and catering industry, information transmission, software and information technology service industry, finance industry, real estate industry, lease and commercial service industry, scientific research and technical service industry, culture, sports and entertainment industry, sanitary and social work and other enterprises, and profitability divided into straight climb, curve growth, stability, curve decline, straight decline and stable fluctuation. In addition, the questionnaire relates to such fundamental information as date of birth of private entrepreneurs and name of private businesses.

4.2.3 Selection of data analysis method and processing tool

This thesis mainly discusses the action mechanism of private entrepreneurial traits on private businesses' innovation performance, as well as the moderating impact of industry environment and the mediating impact of dynamic management capabilities. The following methods are

proposed to be used to validate the hypotheses of this thesis:

Common method bias (CMB) test. CMB is a systematic error that is widely found in studies using questionnaires. It arises from a variety of sources, including the measurement environment, clarity of presentation, questionnaire design and the individual completer. Systematic errors caused by the above-mentioned human factors may lead to covariation between predictive variables and criterion variables and may result in misleadingly skewed facts. CMB is currently controlled by employing both procedural and statistical control methods. Test of Harman's single factor is used in this thesis for the CMB.

Reliability and validity analysis. Reliability and validity are the valuation criteria for the measurement consistency and accuracy of scales, and good reliability and validity constitute a prerequisite for the scientific use of a scale. In this thesis, SPSS 26.0 statistical analysis software is used to calculate Cronbach's α coefficient to test the internal consistency of scales. Content validity and construct validity are the two main categories of scale validity, and the validity levels of scales are calculated using AMOS 24.0 statistical analysis software. The scales used in this thesis are all well-established scales that have been used in existing studies and therefore meet the content validity requirements. The measurement of construct validity includes exploratory factor analysis which calculates KMO values, and confirmatory factor analysis which calculates standardized factor loading (SFL), component reliability (CR), and average variance extracted (AVE).

Correlation tests and regression analyses. In this thesis, such data as the mean and standard deviation of the variables are counted and the Pearson product-moment correlation coefficient test with control variables included in is employed to examine the correlations between the variables. Linear regression analysis is conducted to examine the main effect and to investigate the connection between private entrepreneurial traits and innovation performance of private firms, private entrepreneurial traits and dynamic management capability, and dynamic management capability and innovation performance of private firms, with the software SPSS 26.0 used.

Mediating effect test and moderating effect test. In this thesis, the Process plug-in in SPSS.26 software is used, and the Bootstrap method is chosen to verify the mediating effect of dynamic management capabilities, and the hierarchical regression method is used to examine the moderating effect of industry environment after the data are standardized. Finally, the moderated mediating model is examined for significance employing the Bootstrap method in the Process plug-in in SPSS.26, with reference to the method provided by Hayes.

4.2.4 Small sample testing

To ensure reliable and accurate scale use, the author carried out the pre-research questionnaire distribution within the small scope prior to the formal questionnaire distribution. By virtue of pre-research, it is available to find potential problems existing during questionnaire implementation in advance, and then adjust and modify the questionnaire to avoid errors during the formal survey. Normally, the number of samples for pre-research is between 30 and 60, so as to control sampling error and facilitate statistical analysis. Therefore, the author selected 40 private entrepreneurs in Tianjin, and distributed questionnaires to them from Oct. 2022 to Nov. 2022. As the sample quantity was small and questionnaires were completed on the spot, the overall quality was good and 40 effective questionnaires were taken back.

(1) Reliability analysis

In this thesis, the reliability of questionnaires was tested using Cronbach's Cronbach's α reliability coefficient method. The value of Cronbach's α coefficient ranges from 0 to 1. $\alpha \geq 0.9$ signifies that the inherent reliability of the scale is extremely high; $0.8 \leq \alpha < 0.9$ signifies that the inherent reliability is acceptable; $0.7 \leq \alpha < 0.8$ signifies that the scale design is problematic; $\alpha < 0.7$ signifies that the scale design suffers serious problems and re-design should be taken into consideration. Also, the calculated CITC (Corrected Item-Total Correlation) value should be greater than 0.5, and the Table 4.2 displays the analysis' specific results:

Table 4.2 Results of small sample reliability analysis

Variable	Dimension	Item	CITC	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Entrepreneurial traits	Narcissism level	NA1	.733	.823	.826
		NA2	.755	.816	
		NA3	.495	.859	
		NA4	.583	.851	
		NA5	.779	.817	
		NA6	.616	.813	
	Entrepreneurial resilience	BI1	.688	.830	.859
		BI2	.531	.856	
		BI3	.765	.816	
		BI4	.685	.829	
		BI5	.709	.824	
		BI6	.560	.852	
Dynamic management capabilities	Managerial cognition	DC1	.702	.817	.848
		DC2	.639	.824	
		DC3	.609	.828	
	Managerial human capital	DHC4	.649	.826	
		DHC5	.635	.844	
		DHC6	.711	.815	

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		Differences			
Innovation performance of private firms	Managerial social capital	DSC7	.727	.814	.829
		DSC8	.639	.824	
		DSC9	.543	.834	
	Innovation performance	IP1	.724	.766	
		IP2	.571	.811	
		IP3	.653	.788	
		IP4	.582	.811	
		IP5	.625	.797	
Industry environment	Environment dynamics	IED1	.653	.896	.901
		IED2	.338	.900	
		IED3	.593	.897	
	Environment competitiveness	IED4	.903	.866	
		IEC1	.758	.882	
		IEC2	.722	.885	
		IEC3	.834	.874	
		IEC4	.754	.882	

(2) Validity analysis

The validity tests were conducted using KMO values (which was used to test the bias connection between the variables) and Bartlett's test. It is generally accepted that a KMO value of 0.9 or above indicates very strong validity; a value of 0.8-0.9 indicates strong validity; a value of 0.7-0.8 indicates general validity; a value of 0.6-0.7 indicates average validity; a value of 0.5-0.6 indicates poor validity; and a value of less than 0.45 indicates that the data are invalid and should be discarded. Of the variables included in this study, the KMO value was 0.826 for narcissism level, 0.866 for entrepreneurial resilience, 0.679 for dynamic management capabilities, 0.797 for innovation performance and 0.707 for industry environment; the P-value of Bartlett's test of sphericity for all variables was 0.000, which satisfied the conditions for conducting factor analysis. The factors with eigenvalues greater than 1 in all variables were extracted through the principal component analysis method; the rotated matrix was obtained through the maximum variance method; the items with factor loadings less than 0.5 in the questionnaire items were excluded, and the Table 4.3 displays the analysis' specific results.

Table 4.3 Results of factor analysis of entrepreneurial traits.

Variable	Dimension	Item	KMO value	Sig	Factor loading	Cumulative % of variance
Entrepreneurial traits	Narcissism level	NA1	.826	.000	.835	60.419%
		NA2			.857	
		NA3			.623	
		NA4			.712	
		NA5			.864	
		NA6			.744	
	Entrepreneurial resilience	BI1	.866	.000	.800	59.811%
		BI2			.667	
		BI3			.857	
		BI4			.796	
		BI5			.814	
		BI6			.688	

As shown in Table 4.3, both entrepreneurs' narcissism level and entrepreneurial resilience only obtained one factor with an eigenvalue greater than 1, which are unidimensional variables. The cumulative % of variance is 60.419% among the five items measuring narcissism level and 59.811% among the five items measuring entrepreneurial resilience, which is in line with the needs of this study and there is no need to eliminate any item.

There are three factors with eigenvalues greater than one, as can be seen in Table 4.4, which presents the findings of the factor analysis of dynamic management capabilities, and the measurement questions of each factor meet the requirements of the loading criteria. The cumulative % of variance of the three factors of dynamic management capabilities is 70.341%, which is in line with the needs of this study and there is no need to eliminate any item.

Table 4.4 Results of factor analysis of dynamic management capabilities

Variable	Dimension	Item	KMO value	Sig	Factor loading			Cumulative % of variance
Dynamic management capabilities	Managerial cognition	DC1	.823	.000	.845			62.599 %
		DC2			.830			
		DC3			.821			
	Managerial human capital	DHC4	.823	.000		.689		
		DHC5				.621		
		DHC6				.610		
	Managerial social capital	DSC7	.823	.000			.587	
		DSC8					.581	
		DSC9					.522	

As shown in Table 4.5, only one factor for the innovation performance of private businesses is obtained with an eigenvalue greater than 1, which is a unidimensional variable. The cumulative % of variance of the factor variance of the five items measured is 59.845%, which is in line with the needs of this study and there is no need to eliminate any item.

Table 4.5 Results of factor analysis of innovation performance of private enterprises.

Variable	Item	KMO value	Sig	Factor loading	Cumulative % of variance
Innovation performance of private firms	IP1	.797	.000	.841	59.845%
	IP2			.726	
	IP3			.798	
	IP4			.734	
	IP5			.764	

As can be seen in Table 4.6, the factor analysis of the industry environment variables yields two factors with eigenvalues greater than one, and the measurement items of each factor meet the loading criteria requirements. The cumulative % of variance of the two factors of industry environment dynamics and competitiveness is 66.608%, which is in line with the needs of this

study and there is no need to eliminate any item.

Table 4.6 Results of factor analysis of industry environment

Variable	Dimension	Item	KM O value	Sig	Factor loading		Cumulative % of variance
					Factor 1	Factor 2	
Industry environment	Dynamics	IED1	.707	.000	.889		66.608%
		IED2			.877		
		IED3			.812		
		IED4			.682		
	Competitiveness	IEC1		.000		.792	
		IEC2				.657	
		IEC3				.626	
		IEC4				.583	

The results of the small sample pre-study analysis suggest that the scales utilized in this thesis are reliable and valid and satisfy the study's criteria. Taking into account the problems encountered by completers, the eventually developed formal questionnaire is detailed in Annex 1 to facilitate completers by polishing words without altering the original expression.

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Chapter 5: Data Analysis and Hypotheses Testing

5.1 Basic statistical analysis of the sample

5.1.1 Descriptive statistical analysis

The pre-study shows that the scales used in this thesis are reliable and valid, and the author forms the final questionnaire after further refinement of the scales. The questionnaire was distributed from Jan. 2022 to Mar. 2022. The thesis focuses on the connection between the traits of private entrepreneurs and the private businesses' innovation performance, involving dynamic management capabilities, industry environment and other relevant variables. With the purpose of improving questionnaire quality, the author invited entrepreneurs to fill in the questionnaire anonymously. Anonymous completion of questionnaire helps to gain higher confidentiality and true presentations of the inner thoughts of entrepreneurs, and lower CMB. The questionnaire is mainly a descriptive statistical survey in basic information about entrepreneurs and information about the business they run. 212 questionnaires were distributed during the formal survey process. 200 valid questionnaires were ultimately kept, for an effective rate of 94.3 percent, after 12 invalid questionnaires, such as those with blanks, inconsistent options, and the same consecutive options, were eliminated.

For private entrepreneurs, in terms of gender, 155 male questionnaires were filled out, accounting for 77.5% of the total sample, while 45 female questionnaires were filled out, accounting for 22.5% of the total sample. From the analysis of the gender ratio, there were significantly more male private entrepreneurs than female private entrepreneurs, which is in line with the actual gender distribution of entrepreneurs; in respect of marital status, there were 185 married private entrepreneurs, which account for 92.5 percent of the total sample, and there are were 15 unmarried private entrepreneurs, which account for 7.5 percent of the total sample.; in terms of education experience, there were 39 private entrepreneurs with specialist education or below, which account for 19.5% of the total sample, there were 93 private entrepreneurs with undergraduate education, which account for 46.5% of the total sample, there were 67 private entrepreneurs with master's degree education, which account for 33.5% of the total sample, and there were 1 private entrepreneurs with doctoral education, which account for 0.5% of the total sample. It can be seen that the group of private entrepreneurs generally has a high level of education quality and can have a strong understanding of the questionnaire items. In respect of

working experience, there were 19 private entrepreneurs who had worked in foreign enterprises, which account for 9.5% of the total sample, while there were 181 private entrepreneurs who had never worked in foreign enterprises, which account for 90.5% of the total sample. The Table 5.1 shows the descriptive statistics of the basic information of respondents.

Table 5.1 Descriptive Statistics of the Basic Information of Respondents

Type of Principal Characteristics	Description of Principal Characteristics	Number	Percentage
Gender	Male	155	77.5%
	Female	45	22.5%
Marital Status	Married	185	7.5%
	Unmarried	15	12.5%
Education Background	College degree and below	39	19.5%
	Bachelor	93	46.5%
	Master	67	33.5%
	Doctor	1	0.5%
Working Experience in Foreign Companies	Yes	19	9.5%
	No	181	90.5%
Development Stages	Startup stage	7	3.5%
	Growth stage	105	52.5%
	Expansion stage	26	13%
	Mature stage	62	31%
Duration upon Corporate Incorporation	Less than 1 year	0	0%
	1-3 years	7	3.5%
	3-5 years	91	45.5%
	More than 5 years	102	51%
Number of Employees	Less than 10	0	0%
	10-50	55	27.5%
	50-100	80	40%
	More than 100	65	32.5%
Industries Affiliated with	Agriculture, forestry, husbandry and fishery industry	1	0.5%
	Manufacturing industry	33	16.5%
	Wholesale and retail industry	26	13%
	Transportation, warehousing and post industry	27	13.5%
	Accommodation and catering industry	22	11%
	Information transmission, software and information technology service industry	43	21.5%
	Real estate industry	42	21%
	Lease and commercial service industry	6	3%

Of private businesses, if classified by development stages, there were 7 businesses at the startup stage with proportion as 3.5%, 105 businesses at the growth stage with proportion as 52.5%, 26 businesses at the expansion stage with proportion as 13% and 62 businesses at the mature stage with proportion as 31%; if classified by duration upon corporate incorporation, there were 7 businesses incorporated for 1-3 years with proportion as 3.5%, 91 businesses

incorporated for 3-5 years with proportion as 45.5%, and 102 businesses incorporated for more than 5 years with proportion as 51%; if classified by enterprise scale, there were 55 businesses engaging 10-50 employees with proportion as 27.5%, 80 businesses engaging 50-100 employees with proportion as 40% and 65 businesses engaging more than 100 employees with proportion as 32.5%.

According to the data revealed by pre-research questionnaires, industries private businesses are affiliated with take on the characteristics of diversity, including agriculture, forestry, husbandry and fishery industry, manufacturing industry, wholesale and retail industry, transportation, warehousing and post industry, accommodation and catering industry, information transmission, software and information technology service industry, real estate industry, lease and commercial service industry and others. The multi-industry attribute helps demonstrate respective characteristics of private businesses and measure the difference level among enterprises.

5.1.2 Reliability analysis

Reliability evaluates the stability and consistency of a measurement, and its magnitude varies in relation to random error. In this thesis, the method of Cronbach's α reliability coefficient was mainly used to examine the questionnaire reliability. If $\alpha \geq 0.7$, the questionnaire design is considered acceptable. At the same time, the CITC value of each item is calculated; if the value is higher than 0.5, the item can be retained for use. When the sample data analysis results have both of the above conditions, it indicates good reliability for the scales and measurement data used. Table 5.2 below shows the reliability of the formally distributed questionnaire in this thesis.

Table 5.2 Results of the formal measurement questionnaire reliability analysis

Variable	Dimension	Item	CITC	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Entrepreneurial traits	Narcissism level	NA1	.857	.952	.959
		NA2	.857	.952	
		NA3	.881	.950	
		NA4	.908	.946	
		NA5	.810	.958	
		NA6	.909	.947	
	Entrepreneurial resilience	BI1	.855	.934	.946
		BI2	.847	.935	
		BI3	.852	.934	
		BI4	.820	.938	
		BI5	.770	.944	
		BI6	.873	.931	

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Dynamic management capabilities	Managerial cognition	DC1	.650	.883	.894
		DC2	.709	.879	
		DC3	.732	.877	
	Managerial human capital	DHC4	.576	.889	
		DHC5	.739	.876	
		DHC6	.716	.878	
	Managerial social capital	DSC7	.653	.883	
		DSC8	.552	.891	
		DSC9	.581	.889	
Innovation performance of private firms	Innovation performance	IP1	.848	.915	.935
		IP2	.859	.914	
		IP3	.858	.914	
		IP4	.817	.921	
		IP5	.751	.933	
	Environment dynamics	IED1	.698	.950	
		IED2	.852	.941	
		IED3	.866	.940	
		IED4	.854	.941	
Industry environment	Environment competitiveness	IEC1	.756	.947	.950
		IEC2	.869	.940	
		IEC3	.845	.941	
		IEC4	.782	.945	

According to Table 5.2, Cronbach's α reliability coefficient for each scale is higher than 0.8, which exceeds the acceptable standard of 0.7. The alpha is no longer elevated after the deletion of the items in the questionnaire, and the CITC for each variable is higher than 0.5, for which all the items should be reserved, the scale feature's better reliability level, and the data collected meet the reliability requirements.

5.1.3 Validity analysis

(1) Exploratory factor analysis

The data should be tested to meet the requirements before exploratory factor analysis. Firstly, the KMO value of the sample data is generally required to be greater than 0.7. It is considered to be very appropriate to conduct factor analysis when the KMO value is greater than 0.8. Additionally, the results of Bartlett's test of sphericity reaches a satisfactory level which is required to be less than 0.05. The KMO value is 0.951, which is greater than 0.8 and also significant at the 0.000 level, so both requirements are met.

Using SPSS 26.0 analysis software and the exploratory factor analysis over the questionnaire data obtained using principal component analysis, seven factors with eigenvalues greater than one were extracted from all variables, and each of the factor loadings obtained was greater than 0.7. The rotated component matrix was consistent with the scales' dimension structure and had good validity. Table 5.3 below shows the specific results of the analysis:

Table 5.3 Results of exploratory factor analysis.

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
NA1			.759				
NA2			.797				
NA3			.789				
NA4			.836				
NA5			.804				
NA6			.829				
BI1		.848					
BI2		.873					
BI3		.874					
BI4		.831					
BI5		.810					
BI6		.895					
DC1					.839		
DC2					.852		
DC3					.846		
DHC4						.816	
DHC5						.720	
DHC6						.814	
DSC7							.718
DSC8							.755
DSC9							.811
IP1				.877			
IP2				.846			
IP3				.849			
IP4				.847			
IP5				.848			
IED1	.746						
IED2	.864						
IED3	.872						
IED4	.854						
IEC1	.789						
IEC2	.873						
IEC3	.864						
IEC4	.813						
% of variance	18.319	14.837	13.592	12.277	8.037	6.698	6.493
Cumulative % of variance	18.319	33.156	46.748	59.026	67.063	73.761	80.254

With the purpose of improving the interpretability of the factors, orthogonal rotation transformation was completed using the rows of the factor loading matrix. As shown in the above Table, after the rotation operation, F1 is basically associated with IED and is therefore named the industry environment factor; F2 is basically associated with BI and is therefore named the entrepreneurial resilience factor; factor F3 is basically associated with NA and is therefore named the narcissism level factor; F4 is basically related to IP and is therefore named the innovation performance factor; F5 is basically associated with DC and is therefore named the managerial cognition factor; F6 is basically associated with DHC and is therefore named the managerial human capital factor; F7 is basically associated with DSC and is therefore named

the managerial social capital factor. F7 is basically associated with DSC and is therefore named the managerial social capital factor.

(2) Confirmatory factor analysis

In-depth construct validity measurement of scales is allowed and indicators using the maximum likelihood estimation method based on the results of the exploratory factor analysis are calculated by the confirmatory factor analysis. Table 5.4 shows the fit indices of the overall structural equation model, which generally requires X^2/df to be greater than 0 and less than 5 to make the model acceptable. When X^2/df is greater than 0 and less than 3, it means the fit of the model is very good. The X^2/df of this model is 1.969, which meets the optimal criteria; if the absolute fit index RMSEA is less than 0.08, it means that the fit of the model is up to grade; if the RMSEA is less than 0.05, it means that the fit is very good. The RMSEA of this model is 0.071, which meets the optimal standard; the Normed Fit Index (NFI) is required to be higher than 0.8, and the NFI value of this model is 0.856, which is higher than the standard level; the Incremental Fit Index (IFI) and Comparative Fit Index (CFI) are also required to reach above 0.9, and the IFI and CFI of this study model are 0.923 and 0.923 respectively, which meet the requirements; the PNFI is greater than 0.5, and the PNFI of this study model is 0.784, which meets the optimal criteria. The Figure 5.1 shows the confirmatory factor analysis model:

Table 5.4 Fit indices of structural equation model

	X^2/df	RMSEA	NFI	IFI	CFI	PNFI
Reference standards	<3	<0.08	>0.8	>0.9	>0.9	>0.5
Results in this model	1.969	.071	.856	.923	.922	.784

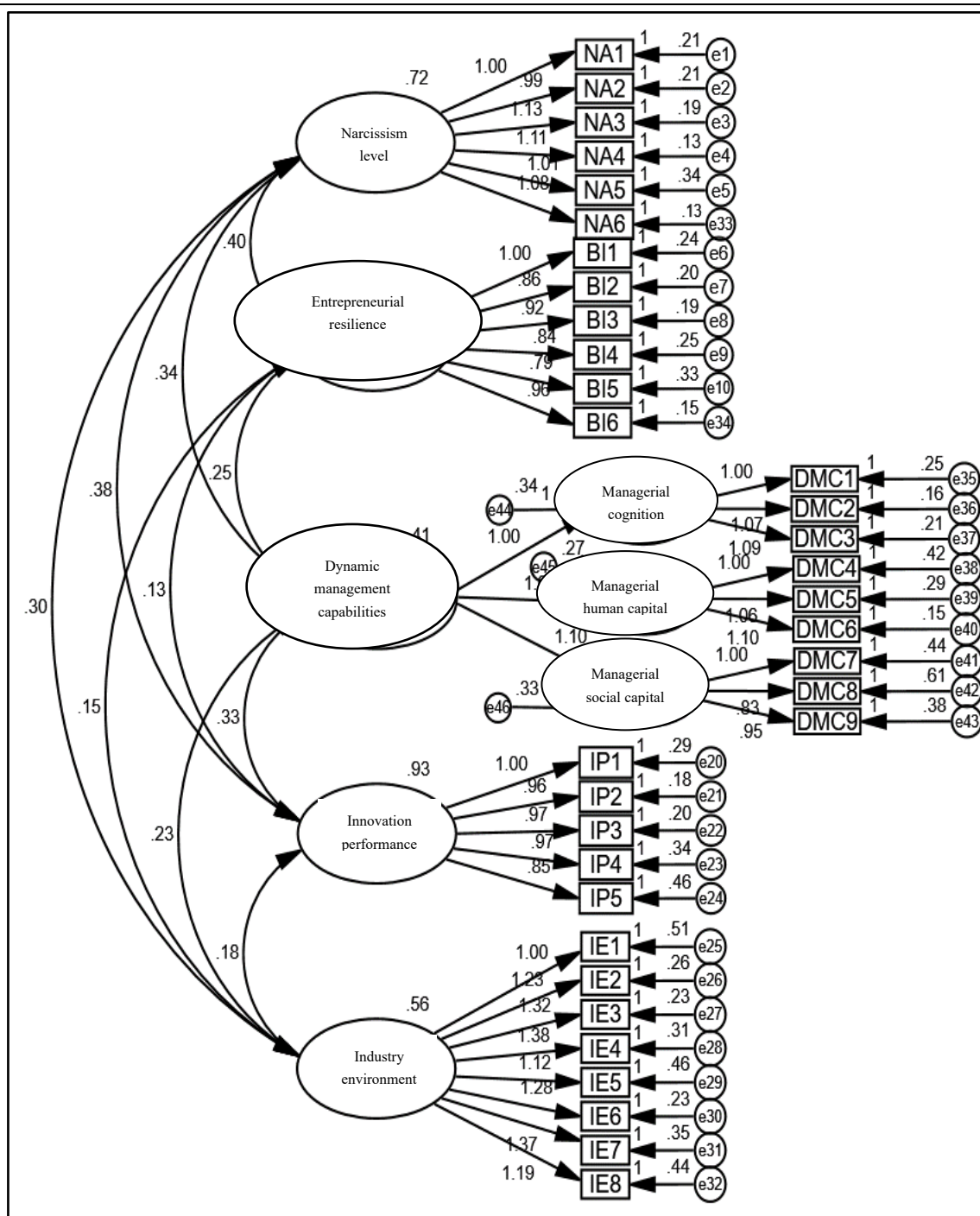


Figure 5.1 Diagram of the confirmatory factor analysis model

(3) Convergent validity

Convergent validity is to measure whether or not a measurement item under an agreed measurement index is the same factor and is analyzed using AVE and CR values. It is generally required that the factor loading of measurement items is higher than 0.7, average variance extracted (AVE) value is higher than 0.5, and composite reliability (CR) value is higher than 0.7. As shown in Table 5.5, the factor loadings for measurement items are all above 0.7, the AVE values are all above 0.5 and the CR values are all above 0.8, so it can be concluded that

the measurement scales used in this thesis have good convergent validity.

Table 5.5 Convergent validity test

Variable	Measurement item	Factor loading		
Narcissism level	NA1	.759		
	NA2	.797		
	NA3	.789	.6444	.9157
	NA4	.836		
	NA5	.804		
	NA6	.829		
Entrepreneurial resilience	BI1	.848		
	BI2	.873		
	BI3	.874	.7321	.9425
	BI4	.831		
	BI5	.810		
	BI6	.895		
Managerial cognition	DC1	.839		
	DC2	.852	.7152	.8828
	DC3	.846		
Managerial human capital	DHC4	.816		
	DHC5	.720	.6156	.8273
	DHC6	.814		
Managerial social capital	DSC7	.718		
	DSC8	.755	.5811	.8059
	DSC9	.811		
Innovation performance	IP1	.877		
	IP2	.846		
	IP3	.849	.7284	.9306
	IP4	.847		
	IP5	.848		
Industry environment	IED1	.746		
	IED2	.864		
	IED3	.872		
	IED4	.854	.6981	.9486
	IEC1	.789		
	IEC2	.873		
	IEC3	.864		
	IEC4	.813		

(4) Discriminant validity

When the square root of the AVE value is higher than the absolute value of the correlation coefficient of the other variables, it is said that a construct used to assess questionnaire data is the discriminant validity. The discriminant validity test results for the measurement constructs in this thesis are shown in Table 5.6, where the values on the diagonal line are the square root of the AVE values and the remaining values are the absolute values of the correlation coefficients between the variables. As shown in the Table, the square roots of the AVE values are all above 0.7 and meet the requirement of being greater than the absolute value of the correlation coefficient for the same row and column. This shows that the discriminant validity of scales for measurement and use in this thesis is good.

Table 5.6 Discriminant validity test

	1	2	3	4	5	6	7
Narcissism level	0.803						
Entrepreneurial resilience	0.502**	0.856					
Managerial cognition	0.257**	0.453**	0.846				
Managerial human capital	0.360**	0.430**	0.534*	0.785			
Managerial social capital	0.288**	0.440**	0.497*	0.514*	0.762		
Innovation performance	0.138	0.428**	0.357*	0.357*	0.372*	0.853	
Industry environment	0.211**	0.443**	0.286*	0.376*	0.351*	0.228*	0.836

**, Significant correlation at 0.01 level.

5.2 Common method bias test

The problem of common method bias exists in research of questionnaire method and is currently controlled using both procedural and statistical control methods.

Procedural control is an ex ante control method that regulates and controls conditions in advance from a causal perspective. In this thesis, the questionnaire was designed with reference to existing well-established scales and was formally distributed on the premise of a small-scale pre-study to ensure its reliability and validity. Before the distribution of the questionnaire, the wording of the questionnaire was deliberated and amended repeatedly to make it concise and easy to understand and avoid using induced or suggestive words that may affect judgments of respondents. The questionnaires were distributed through a variety of channels, involving a considerable amount of people and covering a wide range of areas, to ensure the diversity of data sources. Statistical control is a method of control using statistical methods. This thesis carried out tests employing Harman's single factor test, and the data from 200 valid questionnaires were subjected to exploratory factor analysis with all variables except the control variables having an eigenvalue greater than one. The KMO value obtained was 0.906 and the contribution of the first common factor variance explained was 18.319%, which was below the test criterion of 40%. This indicates that the problem of common method bias in this thesis is not serious.

5.3 Correlation analysis

Correlation analysis is a study method that presents the degree to which variables are closed using statistical indicators. In this thesis, the Pearson product-moment correlation coefficient test was used to explore the correlation between the variables, control variables were added to the test, and the results of the analysis are shown in Table 5.7.

Table 5.7 Correlation test among variables

	GD	MS	EB	WE	DS	DC	NE	ID	EN	NL	ER	MC	MH	MS	IP	IE
G	1															
D																
M	.16	1														
S	5*															
E	.00	.17	1													
B	9	3*														
W	.17	.09	-.2	1												
E	5*	2	10*													
			*													
D	-.0	-.2	-.3	.24	1											
S	66	35*	42*	5*												
		*	*	*												
D	-.0	-.2	-.2	.45	.77	1										
C	29	06*	17*	3*	7*											
		*	*	*	*											
N	.08	-.0	-.1	.28	.75	.70	1									
E	9	18	49*	6*	8*	1**										
			*	*	*											
I	.09	.24	.01	-.0	-.1	-.2	-.1	1								
D	2	5**	4	72	76	92*	12									
					*	*	0									
E	-.2	-.0	-.2	.04	.22	-.0	.0	.1	1							
N	01*	47	52*	3	5*	92	74	24								
	*		*		*											
N	-.2	-.0	.02	.02	.03	.08	-.1	-.1	-.1	1						
L	28*	78	4	6	9	1	01	08	00							
	*						2	5	6							
E	-	-.0	.01	.05	-.0	-.0	-.1	.0	.0	.50	1					
R	0.1	28	7	3	17	29	02	26	06	2*						
	03						2			*						
M	-.0	-.0	-.0	-.0	-.0	.01	-.1	-.1	.0	.25	.45	1				
C	57	08	40	59	10	0	07	00	62	7*	3*					
							8	9		*	*					
M	-.1	.00	.03	-.0	-.1	-.1	-.1	.0	.0	.36	.43	.53	1			
H	40*	3	5	20	10	02	08	40	46	0*	0*	4*				
							2			*	*	*				
M	-.1	-.1	.02	-.0	-.0	-.0	-.1	-.1	.0	.28	.44	.49	.51	1		
S	75*	04	6	73	49	08	07	03	19	8*	0*	7*	4*			
							2	0		*	*	*	*			
I	-.0	-.0	.05	-.0	-.0	.04	.0	-.1	-.1	.13	.42	.35	.35	.37	1	

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P	38	52	2	83	36	8	08	00	02	8	8*	7*	7*	2*	
								2	0		*	*	*	*	
I	-.0	-.0	-.0	.06	.06	.05	.1	-.05	-.06	.21	.44	.28	.37	.35	.22
E	03	34	34	1	0	5	05	05	06	1*	3*	6*	6*	1*	8*
								3	2	*	*	*	*	*	*

** Significant correlation at 0.01 level (two-tailed).

* Significant correlation at 0.05 level (two-tailed).

c. Columns N=21

P-values vary between -1 and 1. The correlation increases as the absolute value gets nearer to 1. When P is less than 0.8, it is considered that the multicollinearity among variables is not now a concern; also, the significance level should reach the standard requirement. Table 5.8 demonstrates that there is a substantial positive association between such variables as narcissism level, entrepreneurial resilience, managerial cognition, managerial human capital, managerial social capital, innovation performance and industry environment at a two-tailed test $p\text{-value} < 0.01$.

5.4 Regression analysis

5.4.1 Private entrepreneurial traits and private firms' innovation performance

Regression analyses were conducted with private firms' innovation performance being the dependent variable and private entrepreneurs' narcissism level and resilience being the independent variables to explore the effect of private entrepreneurial traits and private firms' innovation performance. Firstly, model 1 was constructed using all control variables including gender, marital status, education background, working experience, development stages, duration upon corporate incorporation, number of employees, industry, earnings and innovation performance; then, on this basis, model 2 was constructed by adding the narcissism level variable and model 3 was constructed by adding entrepreneurial resilience variable. Regression analyses over the three models were conducted, and the regression analyses results are presented in Table 5.8:

Table 5.8 Results of the regression analysis of entrepreneurial traits and innovation performance

Variable	Innovation performance								
	Model 1	Tolerance	VIF	Model 2	Tolerance	VIF	Model 3	Tolerance	VIF
Control variable									
Gender	-.004	.848	1.179	.027	.810	1.234	.059	.834	1.199

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Marital status	-0.049	.801	1.249	-.045	.800	1.250	-.024	.799	1.252
Education background	.017	.792	1.263	.011	.791	1.265	.002	.791	1.264
Working experience	-.173	.642	1.558	-.181	.640	1.562	-.239	.633	1.581
Development stages	-.340	.209	4.793	-.340	.209	4.793	-.369	.208	4.798
Duration upon corporate incorporation	.358	.217	4.615	.347	.216	4.622	.436	.215	4.646
Number of employees	.064	.344	2.910	.073	.343	2.915	.050	.343	2.911
Industry	.040	.856	1.169	.044	.855	1.170	.024	.855	1.170
Earnings	.088	.670	1.492	.092	.670	1.493	.116	.669	1.496
Independent variable									
Narcissism level				.136	.933	1.072			
Entrepreneurial resilience							.452***	.972	1.029
F		1.016			1.272			6.109***	
R ²		0.046			0.063			0.244	
ΔR ²		0.001			0.013			0.204	
DW value					2.234			2.402	

From the regression analysis of narcissism level and innovation performance, it can be shown that after adding the independent variable narcissism level, the explanatory power of the models increases by 1.3% from 0.1%, and the increase is not distinct; the regression coefficient of the narcissism level variable is 0.136 and its P-value is 0.065, indicating that the active effects of narcissism level on innovation performance is not distinct.

From the regression analysis of entrepreneurial resilience and innovation performance, it can be shown that after adding the independent variable entrepreneurial resilience, the explanatory power of the models increased by 20.4% from 0.1%, and the increase is significant; in terms of the colinearity test, the tolerance values of the model 3 variables were all above 0.1, the variance inflation factor (VIF) values were all below 10, and the Durbin-Watson (DW) value was 2.402, which was close to the standard value of 2, meaning that the multicollinearity was not now a concern among variables; the similar standardized residual distribution and normal

distribution suggests that the model is less affected by heteroscedasticity; the regression coefficient of the entrepreneurial resilience variable was 0.452, indicating that entrepreneurial resilience has an active effect on innovation performance at a significance level of $P < 0.001$.

The regression analysis results indicate that H1 is not tenable, i.e., narcissism level of private entrepreneurs does not have active effects of significance on innovative performance of private businesses.; H2 is tenable, i.e. Resilience of private entrepreneurs has active effects of significance on innovative performance of private businesses. The above empirical analysis answered the research question 1: private entrepreneurs affect the innovation performance of private businesses.

5.4.2 Dynamic management capabilities and innovation performance of private businesses

Regression analyses were conducted with innovation performance of private businesses being the dependent variable and managerial cognition, managerial human capital and managerial social capital being independent variables to explore the effect of dynamic management capabilities on private businesses' innovation performance. Firstly, model 1 was constructed using all control variables including gender, marital status, education background, working experience, development stages, duration upon corporate incorporation, number of employees, industry, earnings and innovation performance; then, on this basis, model 2 was constructed by adding managerial cognition variable, model 3 constructed established by adding managerial human capital variable, and model 4 was constructed by adding managerial social capital variable. Regression analyses over the four models were conducted, and Table 5.9 shows the regression analysis results:

Table 5.9 Results of regression analysis of dynamic management capabilities and innovation performance

Variable	Innovation performance							
	Model 1	VIF	Model 2	VIF	Model 3	VIF	Model 4	VIF
Control variable								
Gender	-.004	1.179	-.004	1.179	.055	1.205	.049	1.201
Marital status	-.049	1.249	-.068	1.252	-.039	1.250	-.019	1.257
Education background	.017	1.263	.032	1.264	.015	1.263	.013	1.263
Working experience	-.173	1.558	-.128	1.575	-.193	1.562	-.151	1.562
Development stages	-.340	4.793	-.314	4.799	-.285	4.817	-.277	4.825

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Duration upon corporate incorporation	.358	4.615	.263	4.690	.381	4.620	.302	4.641
Number of employees	.064	2.910	.131	2.948	.037	2.916	.072	2.911
Industry	.040	1.169	.040	1.169	.030	1.169	.037	1.169
Earnings	.088	1.492	.048	1.506	.077	1.493	.072	1.494
Independent variable								
Managerial cognition			.352***	1.035				
Managerial human capital					.366***	1.042		
Managerial social capital							.361***	1.051
F	1.016		3.754***		3.998***		3.876***	
R ²	0.046		0.166		0.175		0.170	
ΔR ²	0.001		0.122		0.131		0.126	
DW value			2.169		2.253		2.253	

From the regression analysis results of dynamic management capabilities and innovation performance, it can be shown that the explanatory power of model 2 increases by 12.2% from 0.1% after adding the independent variable managerial cognition, with a regression coefficient of 0.352, indicating that managerial cognition has an active impact on innovation performance at a significance level of $P < 0.001$; the explanatory power of model 3 increases by 13.1% from 0.1% to after adding the independent variable managerial human capital, with a regression coefficient of 0.366, indicating that managerial human capital has an active impact on innovation performance at a significance level of $P < 0.001$; the explanatory power of model 4 increases by 12.6% from 0.1% after adding the independent variable managerial social capital, with a regression coefficient of 0.361, indicating that managerial social capital has an active impact on innovation performance at a significance level of $P < 0.001$. The explanatory power of each model was significantly improved by adding independent variables; the tolerance value of each model was higher than 0.1, the VIF value was lower than 10, and the DW value was close to the standard value of 2, meaning that the multicollinearity was not an concern among variables; the similar standardized residual distribution and normal distribution suggest that the model appears to be less susceptible to heteroscedasticity.

The regression analysis results indicate that H3, H4 and H5 are tenable, i.e. Management cognition has active effects of significance on innovative performance of private businesses; Managerial human capital has active effects of significance on innovative performance of private businesses; Managerial social capital has significant positive effects on innovative performance of private businesses, which answered the research question 2: dynamic

management capabilities affect the innovation performance of private enterprises.

5.4.3 Private entrepreneurial traits and dynamic management capabilities

Regression analyses were conducted with managerial cognition, managerial human capital and managerial social capital being dependent variables and narcissism level and entrepreneurial resilience being independent variables to explore the effect of private entrepreneurial traits on dynamic management capabilities. Firstly, model 1 was constructed using all control variables including gender, marital status, education background, working experience, development stages, duration upon corporate incorporation, number of employees, industry, earnings and managerial cognition; then, on this basis, model 2 was constructed by adding the narcissism level variable, model 3 was constructed by adding entrepreneurial resilience variable. Secondly, model 4 was constructed by control variables and managerial human capital; then, on this basis, model 5 was constructed by adding narcissism level variable, and model 6 was constructed by adding entrepreneurial resilience variable; finally, model 7 was constructed by control variables and managerial social capital; then, on this basis, model 8 was constructed by adding narcissism level variable, and model 9 was constructed by adding entrepreneurial resilience. Regression analyses over the nine models were conducted, and Table 5.10 shows the regression analysis results:

Table 5.10 Results of the regression analysis of private entrepreneurial traits and dynamic management capabilities

	Managerial cognition			Managerial human capital			Managerial social capital		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Control variable									
Gender	.001	.065	.067	-.159	-.077	-.101	-.147	-.087	-.086
Marital status	.052	.060	.078	-.029	-.018	-.006	-.085	-.077	-.060
Education background	-.041	-.054	-.057	.007	-.010	-.007	.012	.000	-.002
Working experience	-.128	-.144	-.198	.056	.036	-.005	-.061	-.076	-.125
Development stages	-.073	-.074	-.104	-.149	-.151	-.177	-.173	-.175	-.202
Duration upon corporate incorporation	.269	.246	.351	-.063	-.092	.009	.156	.135	.232
Number of	-.18	-.171	-.205	.075	.098	.061	-.02	-.005	-.035

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employees	9								
	2								
Industry	-.002	.007	-.019	.026	.038	.011	.006	.015	-.009
Earnings	.116	.124	.144	.031	.041	.056	.045	.053	.072
Independent variable									
Narcissism level		.282*			.358*			.262*	
		**			**			**	
Entrepreneurial resilience			.477*			.418*			.439*
			**			**			**
F	0.748	2.296	6.476	0.891	3.609	5.041	1.080	2.398	5.826
R ²	0.034	0.108	0.034	0.041	0.160	0.211	0.049	0.113	0.236
ΔR ²	0.012	0.061	0.255	0.005	0.116	0.169	0.004	0.066	0.195
DW value		1.848	1.899		1.763	1.758		1.734	1.813

From the regression analysis results of private entrepreneurial traits and dynamic management capabilities, it can be shown that the explanatory power of model 2 increases by 6.1% from 1.2% after adding the independent variable narcissism level, with a regression coefficient of 0.282, indicating that narcissism level has an active impact on managerial cognition at a significance level of $P < 0.001$; the explanatory power of model 3 increases by 25.5% from 1.2% after adding the independent variable entrepreneurial resilience, with a regression coefficient of 0.477, indicating that entrepreneurial resilience has an active effect on managerial cognition at a significance level of $P < 0.001$; the explanatory power of model 5 increases by 11.6% from 0.5% after adding the independent variable narcissism level, with a regression coefficient of 0.358, indicating that narcissism level has an active effect on managerial human capital at a significance level of $P < 0.001$; the explanatory power of model 6 increases by 16.9% from 0.5% after adding the independent variable entrepreneurial resilience, with a regression coefficient of 0.418, indicating that entrepreneurial resilience has an active effect on managerial human capital at a significance level of $P < 0.001$; the explanatory power of model 8 increases by 6.6% from 0.4% after adding the independent variable narcissism level, with a regression coefficient of 0.262, indicating that narcissism level has an active impact on managerial social capital at a significance level of $P < 0.001$; the explanatory power of model 9 increases by 19.5% from 0.4% after adding the independent variable entrepreneurial resilience, with a regression coefficient of 0.439, indicating that entrepreneurial resilience has an active impact on managerial social capital at a significance level of $P < 0.001$. The explanatory power of each model was significantly increased by the addition of independent variables; the tolerance value of each model was higher than 0.1, the variance inflation factor (VIF) value was

lower than 10, and the DW value was close to the standard value of 2, meaning that the multicollinearity was not an concern; the similar standardized residual distribution and normal distribution suggest that the model is less affected by heteroscedasticity.

The the regression analysis results indicate that H6, H7, H8, H9, H10 and H11 are tenable, i.e. Narcissism level has significant positive effects on management cognition; Narcissism level has significant positive effects on managerial human capital; Narcissism level has active effects of significance on managerial social capital; Entrepreneurial resilience has active effects of significance on management cognition; Entrepreneurial resilience has active effects of significance on managerial human capital; Entrepreneurial resilience has active effects of significance on managerial social capital. The regression analysis results showed that private entrepreneurial traits affect dynamic management capabilities to a varying degree, thus answering the research question 3.

5.5 Testing for mediating effect

If the independent variable X itself influences the dependent variable Y and may also has the potential to influence Y through the variable M, then the variable M is referred to as a mediating variable. The process plug-in in SPSS 26.0 was used in this thesis to examine the mediating effect of dynamic management capabilities. The method of Bootstrap was applied to verify the mediating effect of the dynamic management capabilities as a variable, and the mediating effect is proven to be tenable when the upper limit (BootULCI) and the lower limit (BootLLCI) of the 95% confidence interval do not contain a value of zero. To this end, this thesis firstly added gender, marital status, education background, working experience, development stages, duration upon corporate incorporation, number of employees, industry, and earnings as control variables; secondly, this thesis added private entrepreneurial traits as the independent variable, dynamic management capabilities as the mediating variable and private firms' innovation performance as the dependent variable; finally, model 4 was chosen to test the significance of the variables at the 95% confidence interval, and Table 5.11 and Table 5.12 show the analysis results:

Table 5.11 Main effect, direct effect and mediating effect test results

			NA→D	NA→DH	NA→DS	BI→D	BI→DH	BI→DS
			C	C	C	C	C	C
			→IP	→IP	→IP	→IP	→IP	→IP
Main effect	95% CI	Effect size	0.152	0.152	0.152	0.470	0.470	0.470
		Lowe	-0.035	-0.035	-0.035	0.303	0.303	0.303

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	r						
Direct effect	Upper	0.351	0.351	0.351	0.637	0.637	0.637
	Effect size	0.044	0.006	0.050	0.383	0.378	0.380
	Lower	-0.115	-0.157	-0.109	0.235	0.236	0.236
Indirect effect	Upper	0.203	0.168	0.207	0.531	0.520	0.524
	Effect size	0.018	0.147	0.103	0.087	0.093	0.090
	Lower	0.036	0.059	0.035	-0.013	0.010	0.007
	Upper	0.205	0.269	0.183	0.192	0.197	0.180

In the examination for the mediating effect of narcissism level – managerial cognition – innovation performance, the main effect value obtained was 0.152 and the interval obtained was [-0.0093, 0.3313], which contained the value of 0; the direct effect value was 0.0441 and the interval was [-0.1146, 0.2027], which contained the value of 0; the indirect effect value was 0.0179 and the interval was [0.0356, 0.2051], which did not contain the value of 0, indicating that the indirect effect was significant. In the test for the mediating effect of narcissism level – managerial human capital – innovation performance, the main effect value obtained was 0.152 and the interval obtained was [-0.0093, 0.3313], which contained the value of 0; the direct effect value was 0.0055 and the interval was [-0.1568, 0.1677], which contained the value of 0; the indirect effect value was 0.1465 and the interval was [0.0589, 0.2686], which did not contain the value of 0, indicating that the indirect effect was distinct. In the examination for the mediating effect of narcissism level – managerial social capital – innovation performance, the main effect value obtained was 0.152 and the interval obtained was [-0.0093, 0.3313], which contained the value of 0; the direct effect value was 0.0492 and the interval was [-0.1082, 0.2066], which contained the value of 0; the indirect effect value was 0.1028 and the interval was [0.0351, 0.1831], which did not contain the value of 0, indicating that the indirect effect was distinct. In this regard, the mediating effects of managerial cognition, managerial human capital and managerial social capital on the narcissism level and innovation performance were not significant.

The results of the mediating effect analysis indicate that H12, H13 and H14 are not tenable and H15, H16 and H17 are tenable, i.e. There is significant mediating effect of managerial cognition in the active influence of entrepreneurial resilience on innovation performance; There is significant mediating effect of managerial human capital in the active influence of entrepreneurial resilience on innovation performance; There is significant mediating effect of managerial social capital in the active influence of entrepreneurial resilience on innovation performance. Therefore, the research question 4 – how dynamic management capabilities play

the mediating role – is answered.

5.6 Testing for moderating effect

When the correlation between the independent variable X and the dependent variable Y is affected by the variable M, M is referred to as the moderating variable. In this thesis, I have analyzed the effects of narcissism level, entrepreneurial resilience, managerial cognition, managerial human capital and managerial social capital on the innovation performance of private businesses. It is believed in this thesis that the development and change of external industry environment pose external impact on the above-mentioned effects. Based on the collection of influence factors of external environment, this thesis took industry environment as a moderating variable for research, tested the moderating effect of industry environment on the connection between entrepreneurial traits and dynamic management capabilities, and further tested the moderated mediating model. The moderating effect was tested by standardizing the data prior to analysis to prevent inter-model co-linearity. Regression analyses between variables and interaction items were conducted with narcissism level and entrepreneurial resilience being independent variables, managerial cognition, managerial human capital and managerial social capital being dependent variables, industry environment being moderating variables, and gender, marital status, education background, working experience, development stages, duration upon corporate incorporation, number of employees, industry and earnings being control variables. Table 5.12 shows the test results of the moderating effect.

Table 5.12 Testing for the moderating effect of industry environment

Variable	Managerial cognition		Managerial human capital		Managerial social capital	
Interacti on item						
NA*IE	0.224***		0.272***		0.237***	
BI*IE		0.057***		0.118***		0.034***
R ²	0.223	0.275	0.325	0.281	0.262	0.273
F	4.442	5.901	7.495	6.087	5.541	5.856

Note: *** indicates significant at the 0.001 level; ** indicates significant at the 0.01 level

From Table 5.13, it can be shown that the influence coefficient of the interaction term between narcissism level and industry environment on managerial cognition is 0.224; the influence coefficient of the interaction term between entrepreneurial resilience and industry environment on managerial cognition is 0.057; the influence coefficient of the interaction term between narcissism level and industry environment on managerial human capital is 0.272; the

influence coefficient of the interaction term between entrepreneurial resilience and industry environment on managerial human capital is 0.118; the influence coefficient of the interaction term between narcissism level and industry environment on managerial social capital is 0.237; the influence coefficient of the interaction term between entrepreneurial resilience and industry environment on managerial social capital is 0.034. The interaction terms between narcissism level, entrepreneurial resilience and industry environment are all significantly correlated at the 0.001 level.

The moderating effect analysis results indicate that industry environment has an active moderating effect between private entrepreneurial traits and dynamic management capabilities, and H18, H19, H20, H21, H22 and H23 are tenable. On the one hand, industry environment moderates the connection between narcissism level and managerial cognition, managerial human capital and managerial social capital; i.e. the more dynamic and competitive the industry environment is, the stronger the effect of narcissism level on managerial cognition, managerial human capital and managerial social capital will be; on the other hand, industry environment moderates the relationship between entrepreneurial resilience and managerial cognition, managerial human capital and managerial social capital, i.e. the more dynamic and competitive the industry environment is, the stronger the effect of entrepreneurial resilience on managerial cognition, managerial human capital and managerial social capital will be. The above empirical analysis validated the research question 5, proving the moderating role of the industry environment between private entrepreneurial traits and dynamic management capabilities.

With the purpose of showing the moderating effect of industry environment more clearly and intuitively, this thesis employed slope test and mapped the correlations between variables under industry environment at high and low change and competitiveness. The Positive moderating effect of industry environment see Figure 5.2.

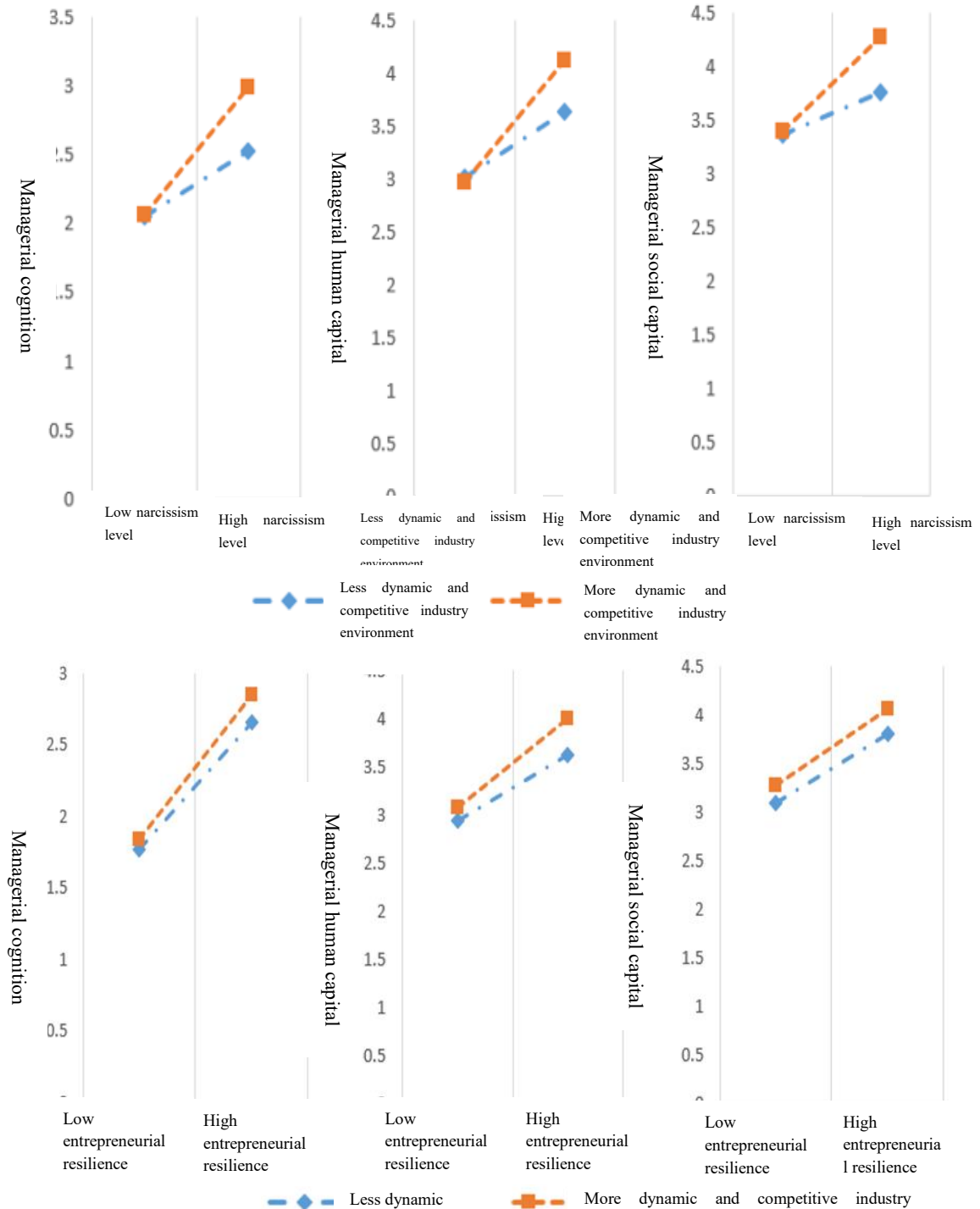


Figure 5.2 Positive moderating effect of industry environment

5.7 Testing for moderated mediating effect

Moderated mediating effect refers to the mediating effect in models that is influenced by the moderating variables. With reference to the theoretical model design, this thesis leveraged the Process plug-in in SPSS.26 to examine the significance of the moderated mediating model.

From the Process output data, it can be shown that in the narcissism level – managerial cognition – innovation performance process, industry environment plays a significant moderating role on the mediating variable managerial cognition, with an effect value of 0.155, a standard error of 0.062, an upper limit of 0.057 and a lower limit of 0.296 (which does not contain the value of 0) at the 95% confidence interval; therefore, the H24 is tenable. For the narcissism level – managerial human capital – innovation performance process, industry environment plays a significant moderating role on the mediating variable managerial human capital, with an effect value of 0.209, a standard error of 0.074, an upper limit of 0.090 and a lower limit of 0.378 at the 95% confidence interval which does not contain the value of 0; therefore, H25 is tenable. For the narcissism level – managerial social capital – innovation performance process, industry environment plays a significant moderating effect on the mediating variable managerial social capital, with an effect value of 0.153, a standard error of 0.053, an upper limit of 0.062 and a lower limit of 0.270 at the 95% confidence level that excludes the value of 0; therefore, H26 is tenable. For the entrepreneurial resilience – managerial cognition – innovation performance process, industry environment plays a non-significant moderating effect on the mediating variable managerial cognition, with an effect value of 0.089, a standard error of 0.059, an upper limit of -0.014 and a lower limit of 0.220 at the 95% confidence interval which contains the value of 0; therefore, H27 is not tenable. For the entrepreneurial resilience – managerial human capital – innovation performance process, industry environment plays a significant moderating effect on the mediating variable managerial human capital, with an effect value of 0.097, a standard error of 0.055, an upper limit of 0.009 and a lower limit of 0.226 at the 95% confidence interval which does not contain the value of 0; therefore, H28 is tenable. For the entrepreneurial resilience – managerial social capital – innovation performance process, industry environment plays a significant moderating role on the mediating variable managerial social capital, with an effect value of 0.079, a standard error of 0.049, an upper limit of 0.004 and a lower limit of 0.195 at the 95% confidence interval which does not contain the value of 0; therefore, H29 is tenable. The above empirical analysis validated and answered the research question 6 – industry environment moderates the mediating role of mediating variables in the research model.

Table 5.13 Results of the moderated mediating model test where the industry environment is the moderating variable

Independent variable	Mediating variable	Effect	BootSE	BootLLCI	BootULCI
Narcissism level	Managerial cognition	0.155	0.062	0.057	0.296

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Narcissism level	Managerial human capital	0.209	0.074	0.090	0.378
Narcissism level	managerial social capital	0.153	0.053	0.062	0.270
Entrepreneurial resilience	Managerial cognition	0.089	0.059	-0.014	0.220
Entrepreneurial resilience	Managerial human capital	0.097	0.055	0.009	0.226
Entrepreneurial resilience	managerial social capital	0.079	0.049	0.004	0.195

5.8 Results of the empirical study

After empirical analysis, this thesis confirmed the hypotheses proposed herein.

H1: There are significant active effects of the level of narcissism of private entrepreneurs on the innovation performance of private businesses. (Reject)

H2: There are significant active effects of resilience of private entrepreneurs on innovative performance of private businesses. (Not Reject)

H3: There are significant active effects of management cognition on innovative performance of private businesses. (Not Reject)

H4: There are significant active effects of managerial human capital on innovative performance of private businesses. (Not Reject)

H5: There are significant active effects of managerial social capital on innovative performance of private businesses. (Not Reject)

H6: There are significant active effects of narcissism level on management cognition. (Not Reject)

H7: There are significant active effects of narcissism level on managerial human capital. (Not Reject)

H8: There are significant active effects of narcissism level on managerial social capital. (Not Reject)

H9: There are significant active effects of entrepreneurial resilience on management cognition. (Not Reject)

H10: There are significant active effects of entrepreneurial resilience on managerial human capital. (Not Reject)

H11: There are significant active effects of entrepreneurial resilience on managerial social capital. (Not Reject)

H12: There is a significant mediating effect of managerial cognition in the active influence of narcissism level on innovative performance. (Reject)

H13: There is a significant mediating effect of managerial human capital in the active influence of narcissism level on innovative performance. (Reject)

H14: There is a significant mediating effect of managerial social capital in the active influence of narcissism level on innovative performance. (Reject)

H15: There is a significant mediating effect of managerial cognition in the active influence of entrepreneurial resilience on innovative performance. (Not Reject)

H16: There is a significant mediating effect of managerial human capital in the active influence of entrepreneurial resilience on innovative performance. (Not Reject)

H17: There is a significant mediating effect of managerial social capital in the active influence of entrepreneurial resilience on innovative performance. (Not Reject)

H18: The relationship between narcissism level and managerial cognition are moderated by industry environment. Specifically, the more dynamic and competitive the industry environment is, the stronger the influence of narcissism level on managerial cognition will be. (Not Reject)

H19: The relationship between narcissism level and managerial human capital are moderated by industry environment. Specifically, the more dynamic and competitive the industry environment is, the stronger the influence of narcissism level on managerial human capital will be. (Not Reject)

H20: The relationship between narcissism level and managerial social capital are moderated by industry environment. Specifically, the more dynamic and competitive the industry environment is, the stronger the influence of narcissism level on managerial social capital will be. (Not Reject)

H21: The relationship between entrepreneurial resilience and managerial cognition are moderated by industry environment. Specifically, the more dynamic and competitive the industry competitiveness is, the stronger the influence of entrepreneurial resilience on managerial cognition will be. (Not Reject)

H22: The relationship between entrepreneurial resilience and managerial human capital are moderated by industry environment. Specifically, the more dynamic and competitive the industry competitiveness is, the stronger the influence of entrepreneurial resilience on managerial human capital will be. (Not Reject)

H23: The relationship between entrepreneurial resilience and managerial social capital are moderated by industry environment. Specifically, the more dynamic and competitive the industry competitiveness is, the stronger the influence of entrepreneurial resilience on managerial social capital will be. (Not Reject)

H24: Industry environment moderates the influence of narcissism level on innovative performance of private businesses via managerial cognition. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial cognition between narcissism level and innovation performance of private businesses will be. (Not Reject)

H25: Industry environment moderates the influence of narcissism level on innovative performance of private businesses via managerial human capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial human capital between narcissism level and innovative performance of private businesses will be. (Not Reject)

H26: Industry environment moderates the influence of narcissism level on innovative performance of private businesses via managerial social capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial social capital between narcissism level and innovative performance of private businesses will be. (Not Reject)

H27: Industry environment moderates the influence of entrepreneurial resilience on innovative performance of private businesses via managerial cognition. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial cognition between entrepreneurial resilience and innovative performance of private businesses will be. (Reject)

H28: Industry environment moderates the influence of entrepreneurial resilience on innovative performance of private businesses via managerial human capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial human capital between entrepreneurial resilience and innovative performance of private businesses will be. (Not Reject)

H29: Industry environment moderates the influence of entrepreneurial resilience on innovative performance of private businesses via managerial social capital. Specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial social capital between entrepreneurial resilience and innovative performance of private businesses will be. (Not Reject)

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Chapter 6: Research Findings and Outlook

This thesis explores the connection between private entrepreneurial traits and private businesses' innovation performance from the perspective of dynamic changes and intense competition in the external environment. On the basis of literature review and theoretical analysis, the mediating effect of dynamic management capabilities and the moderating effect of industry environment are confirmed through empirical testing of data. This Chapter will summarize the findings of this thesis, draw management insights, specify the limitations of this study and provide an outlook on future study directions.

6.1 Research findings

Entrepreneurs are essential to improve business performance, especially in a rapidly changing industry environment. As the “helmsperson” of a firm, an entrepreneur holds the key resources of the firm, makes decisions based on his or her own cognitive and behavioral patterns, and determines the future direction of business development. According to the Upper Echelons Theory and Dynamic Management Capabilities Theory, this thesis focuses on the influence mechanism of private entrepreneurial traits on the innovation performance of private businesses, constructs corresponding conceptual models, and introduces dynamic management capabilities as a mediating variable, which are specifically divided into three dimensions: managerial cognition capability, managerial human capital capability and managerial social capital capability. In consideration of the fact that corporate development is affected by the external factor of market, the industry environment is introduced as a moderating variable. Therefore, this thesis examines the mediating effects of dynamic management capabilities and the moderating effects of industry environment. With the combined use of qualitative research method and quantitative research method, the thesis captured the relevant factors of the influence of entrepreneur traits on business innovation performance via interviews with entrepreneurs at the preliminary stage, followed by the preparation and distribution of questionnaires by selecting well-established scales. The results of the empirical analysis suggest that dynamic management capabilities have a mediating effect in the positive connection between private entrepreneurial traits and private firms' innovation performance, and that industry environment has a moderating effect in the connection between private entrepreneurial

traits and dynamic management capabilities and partially moderates the mediating effect of dynamic management capabilities. Specifically, following are the main findings of this research:

1. Private entrepreneurial traits and private firms' innovation performance

Traits are important attributes in individuals that have direct or indirect impact to varying degrees on the relevant things due to their variability. This thesis goes with the research question why private entrepreneurial traits affect private firms' innovation performance, explores the relationship between the narcissism level and resilience traits of private entrepreneurs and the innovation performance of private businesses. The empirical results have answered this question and the research findings suggest that private entrepreneurs' narcissism level has no active effect of significance on private businesses' innovation performance, and that private entrepreneurs' resilience has an active effect of significance on private businesses' innovation performance. Narcissism is mostly described as an individual's sense and behavior of self-complacency with the aim of receiving attention and praise from others. A low narcissism level may help to increase an individual's confidence, enhance the desire to perform and create more opportunities for business development. However, it is difficult for a narcissistic entrepreneur to precisely control the degree of narcissism, because narcissistic entrepreneurs show too much arrogance and a desire for external affirmation to satisfy their sense of honor and are willing to try risky and radical behaviors. Facing uncertain changes in the market environment, narcissistic entrepreneurs are confident enough and are more willing to try new things, and even show a tendency to overestimate their abilities, but this does more harm than good, and may put a firm at high risk and cannot bring substantial benefits to it. In contrast, entrepreneurial resilience refers to the tenacious and strong quality presented by individuals who have endured hardship, and high flexibility and adaptability homed in adversities. Therefore, in front of difficulties and challenges, resilient private entrepreneurs can withstand external pressure, counteract negative emotions and events, and always strive to live up to their goals. With the accumulation of knowledge and experience, they learn and grow in practical activities, and eventually get out of the gloom to make breakthroughs in business innovation performance.

2. The mediating effect of dynamic management capabilities

Existing literature has discussed and empirically tested the presence of influence of entrepreneurial traits on innovation performance, but few studies have explored the pathways of such influence. According to the review of existing literature, this thesis proposed three research questions about dynamic management ability to examine the connection between entrepreneurial traits and dynamic management capabilities, the connection between dynamic management capabilities and private firms' innovation performance, and the mediating role of

dynamic management capabilities respectively, and answered these questions using regression analysis. Addressing the question of the pathways through which entrepreneurial traits affect innovation performance, an important variable in measuring firm development and innovation capabilities, can works on understanding and uncovering the antecedents of innovation performance and enriching and improving the chain of effect pathway. The transformation of traits into improvement in innovation performance requires individual capabilities and behaviors; in this regard, dynamic management capabilities are a key factor connecting traits and performance. Dynamic management capabilities include managerial cognition, managerial human capital and social capital, which are gradually discovered, cultivated and developed by individuals through knowledge learning and experience accumulation in practice. As corporate leaders, private entrepreneurs assume the important responsibility of exploring and discovering market opportunities. The level of dynamic management capabilities affects cognition patterns, way of thinking, resource integration and interpersonal relationships, and is related to change in strategies and business operation. Also, dynamic management capabilities vary from individual to individual. In other words, ways and strengths of acquiring dynamic management capabilities vary among individuals with different traits; they show different tendencies in making key choices and proceeding with actions. When faced with fleeting market opportunities, small differences in choices may create huge gaps, which in turn affect corporate performance. The empirical findings of this thesis suggest that both narcissism level and entrepreneurial resilience have a significant positive effect on managerial cognition, managerial human capital and managerial social capital, and that managerial cognition, managerial human capital and managerial social capital have significant mediating effects in the positive effect of entrepreneurial resilience on innovation performance. In this regard, entrepreneurial resilience produces effect on the innovation performance of private firms via the dynamic management capabilities; specifically, the higher the entrepreneurial resilience is, the stronger the entrepreneurs' managerial cognition, managerial human capital and managerial social capital will be, and the more resilient they are in the face of setbacks and difficulties, the more they are able to seize opportunities even in adversities and reasonably use the value of resources, thus improving the business innovation performance. The mediating effect of dynamic management capabilities between narcissism level and innovation performance is not significant, but reasonable confidence helps private entrepreneurs maintain a healthy psychological state, providing a good environment for the cultivation of dynamic management capabilities and continuously improving personal quality and capability.

3. The moderating effect of industry environment

As an external factor that exerts a direct and far-reaching impact on enterprises, the industry environment, featuring irregular form, dynamic development and fierce competition, have an influence in the development of business. The industry environment is not simply a single factor, but an integrative system formed by the interaction of such factors as enterprise stakeholders, industry codes, legal restriction and industry clusters. Under the influence of this system, private entrepreneurs have an impact on the key knowledge and capabilities of enterprises by exercising their ability in aspects of coordinating, integrating and organizing resources internally and externally. For private enterprises, the notion responsive to the requirements of the industry environment should be developed at the very beginning, and major strategic decisions and organizational changes in the enterprises should be in consistency with the current industry environment in a specific form. In this thesis, it is believed that industry environment has an influence between private entrepreneurial traits and dynamic management capabilities; industry environment is taken as a moderating variable with efforts to answer questions in the research about the presence of a moderating role between private entrepreneurial traits and dynamic management capabilities. The empirical findings suggest that the connection between narcissism level and managerial cognition, managerial human capital and managerial social capital are moderated by the industry environment; specifically, the more dynamic and competitive the industry environment is, the stronger the influence of narcissism level on managerial cognition, managerial human capital and managerial social capital will be. Meanwhile, industry environment moderates the relationship between entrepreneurial resilience and managerial human capital and managerial social capital; specifically, the more dynamic and competitive the industry environment is, the stronger the influence of entrepreneurial resilience on managerial cognition, managerial human capital and managerial social capital will be. It is therefore suggested that narcissistic private entrepreneurs pay more attention to the improvement of their capabilities in a highly dynamic and competitive industry environment, make technological breakthroughs and accumulate resources through bold innovative decisions and extensive social interaction, and then become the focus of attention and realize their desire for self-satisfaction. Resilient private entrepreneurs are more tolerant of the highly dynamic and competitive industry environment, regard environment changes as opportunities for development rather than challenges, transform their cognitions and concepts in the process, and learn knowledge to cover shortcomings through interaction with others, thus improving their dynamic management capabilities.

4. Industry environment moderates the mediating effect

This thesis also proposed the research question how industry environment moderates the

mediating role and answered this question through empirical analysis. The industry environment moderates the influence of private entrepreneurial traits on dynamic management capabilities. In addition, as an objective factor affecting the sustainable development of enterprises, external industry environment drives to a certain extent private entrepreneurs to take the initiative to learn and improve their capabilities to innovate in enterprise processes in the short term and change the backward production methods that do not meet the requirements of the environment, which in turn indirectly affects the innovation performance of private firms. In this thesis, dynamic management capabilities (managerial cognition, managerial human capital, managerial social capital) have a mediating effect between private entrepreneurial traits (narcissism level, entrepreneurial resilience) and private firms' innovation performance, while the industry environment moderates the relationship between private entrepreneurial traits and dynamic management capabilities; it remains necessary to further confirm the hypothesis that industry environment, as a variable, affects private firms' innovation performance through dynamic management capabilities, as a variable. Therefore, this thesis proposes a moderated mediating model in which industry environment is the moderating variable and verifies the mediating effect of industry environment in moderating dynamic management capabilities using empirical analysis.

The moderated mediating model is tested with the Process plug-in in SPSS.26. The the data analysis results show that the industry environment moderates the effect of narcissism level on private businesses' innovation performance via managerial cognition, managerial human capital and managerial social capital; specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial cognition, managerial human capital and managerial social capital between narcissism level and innovation performance of private firms. Also, industry environment moderates the effect of entrepreneurial resilience on private firms' innovation performance via managerial human capital and managerial social capital; specifically, the more dynamic and competitive the industry environment is, the stronger the mediating effect of managerial human capital and managerial social capital between entrepreneurial resilience and private firms' innovation performance. Industry environment, on the whole, moderates the mediating effect of dynamic management capabilities between private entrepreneurial traits and private firms' innovation performance. In other words, industry environment has an influence in the mechanism by which entrepreneurial traits influence private businesses' innovation performance.

6.2 Management insights

This research investigates the action mechanism of the influence of private entrepreneurial traits on the innovation performance of private enterprises under the rapidly developing industry environment and validates the hypotheses through theoretical analysis and empirical tests, which is of reference significance for practical activities. From the empirical analysis results in this thesis, the following management insights are summarized:

(1) Private entrepreneurs should cultivate and use their dynamic management capabilities. For entrepreneurs, such traits as narcissism and resilience are intrinsic and innate attributes, and those who do not yet possess these traits need to develop them gradually over time through practical experience. In contrast, dynamic management capabilities can be acquired by imitative learning, professional training and practical experience, and can be enhanced through continuous efforts. This is a process of initiative in which private entrepreneurs may change and purposefully acquire dynamic management capabilities based on their needs. The empirical results of this thesis suggest that dynamic management capability is a “catalyst” that has a mediating effect between private entrepreneurial traits and private firms’ innovation performance; for entrepreneurs with narcissism and resilience traits, in particular, dynamic management capabilities significantly enhance their positive impact on innovation performance. Therefore, private entrepreneurs should take seriously the “bridging” effect of dynamic management capabilities between entrepreneurial traits and innovation performance, develop their managerial cognition capability, managerial human capital capability and managerial social capital capability, use their insights to identify market opportunities, and adapt their cognition patterns to changes in the external environment. Within enterprises, they should act as a role model, guide people employees, drive employees to establish correct values, strengthen the connection and collaboration between departments, enhance team cohesion, and fully mobilize employees’ work enthusiasm. Also, private entrepreneurs should take active part in social practice activities and join social organizations such as entrepreneurs’ clubs. Outside enterprises, they should build and improve their social networks, attach importance to the search and accumulation of resources, and seek extensively for social support, thus forming unique market competitiveness, realizing their values and improving the innovation performance of enterprises.

(2) Private enterprises should attach importance to innovation, play the active part of dynamic management capabilities in improving the enterprises’ innovation performance, and

continuously enhance product and service innovation capabilities by leveraging the positive influence of entrepreneurs, in order to create core competitive advantages of enterprises. Innovation is the driving force for sustainable business operation and development, and an important indicator for an enterprise to survive in a fiercely competitive market environment. The empirical findings of this thesis suggest that dynamic management capabilities have a significant positive effect on the innovation performance of private firms from three dimensions: managerial cognition, managerial human capital and managerial social capital. Private enterprises should strengthen the construction of internal dynamic management capabilities, formulate relevant measures to improve employees' capabilities, fully consider the suitability in the staff selection and appointment, develop a complete organizational structure, establish a complete talent reserve space, and select managers potentially possessing dynamic management capabilities through training, so as to provide continuous fuels for the improvement of business innovation performance. In the meanwhile, enterprises should also closely focus on and utilize the market opportunities brought about by changes in the industry environment. Empirical studies have shown that the industry environment partially moderates the mediating effect of dynamic management capabilities and affects the improvement of business innovation performance. In this regard, private businesses should focus on the direction of the macro environment, follow industry market trends, know about competitors' acts, investigate the supply and demand of products and services, increase financial support for research, develop reasonable R&D and production plans, and gradually establish an innovative corporate image in the market, thus achieving the goal of steadily improving the business innovation performance.

(3) Government authorities should reasonably guide the development of private businesses. The development of private enterprises is conducive to social progress, industry innovation, increase in job opportunities and improvement in people's living standards, but the premise is help and guidance of government authorities. To this end, government authorities should put in place enterprise-support policies, trigger the vitality and creativity of private enterprises, create a fair competitive market environment, and implement a fair and unified market supervision system; they should also introduce precise policies, reduce the tax burden on private enterprises to provide financial support, create a sound legal environment and implement a legal protection mechanism for private enterprises in accordance with the law. In addition, "service-oriented" governments should be built to guide private enterprises to consciously strengthen the ability to reform and innovation, and help enterprises achieve transformation, upgrading, resource optimization and restructuring. Besides, government authorities should develop

appropriate reward and punishment codes to encourage independent innovation behavior of enterprises and mobilize the innovation enthusiasm of private enterprises.

6.3 Research limitations

This thesis empirically tests the influence of private entrepreneurial traits on the innovation performance of private firms and has managerial implications. But this research still has limitations as follows due to the limitations of time, workload and objective factors:

First, the limitations of context. This thesis used well-established scales to measure private entrepreneurial traits, dynamic management capabilities, private firms' innovation performance, and industry environment. Although the scales have been repeatedly revised and used in previous studies and have been shown to have high reliability and validity, they are mostly developed based on foreign research contexts. Therefore, the question whether the scales can be applied to business situations in different countries remains to be further confirmed because the subjects in this study are Chinese private entrepreneurs. In this sense, it's crucial to identify the shortcomings of the scales in situational applications and improve them, so as to develop more universal scales based on the Chinese business context for study and development of management in the future.

Second, the limitations of sample. The subjects of this thesis are private entrepreneurs; although the author used the snowball sampling method to find research subjects, empirical study requires a large number of sample data as supporting evidence. Due to objective factors, the sample size in this study was insufficient since only 10 private entrepreneurs were interviewed, and 200 valid questionnaires were distributed and collected in the follow-up study. Moreover, the data used in the empirical analysis of this thesis is cross-sectional, but it is a long-term process to investigate the development of private enterprises and to evaluate the innovation performance of private enterprises, which requires observation and evaluation from the perspective of dynamic development. To this end, future studies should search for a larger sample size of private entrepreneurs and fully consider the impact of the time factor in analysis.

Third, the limitations of the research method. The questionnaire method is good for quantification and operation and is convenient for statistical analysis using data analysis software. However, data collection is more subjectively influenced because the data sources are the perceptions and evaluations of those who complete the questionnaires, which are subject to such factors as individual life background, emotions and behavioral habits that will result in data deviation from objective facts and further reduce the accuracy of data. The questionnaire

method also restricts this study to the framework of questions; its inherent inflexibility also limits the thinking of the respondents, resulting in the omission of important information. In this regard, the addition of more objective evaluation indicators should be considered in the future, in order to assess the objectivity, authenticity and validity of the data from multiple perspectives.

Fourth, the limitations of variables. Private entrepreneurial traits are a broad concept comprising demographic traits such as age and gender, and psychological traits such as experience and personality. The narcissism level and entrepreneurial resilience (which are psychological traits) used in this thesis as independent variables are not sufficient to fully explain the connection between private entrepreneurial traits and private businesses' innovation performance. In this regard, future studies may select more extensive trait factors based on the "trait – capability – performance" logic in this study.

6.4 Outlook

In combination with the above-mentioned shortcomings, subsequent studies may emphasize sample expansion, development of contextualized scales and longitudinal dynamic process research. Based on the existing studies on the traits of private entrepreneurs, dynamic management capabilities and innovation performance of private firms, this thesis proposes the following three directions for future studies.

Firstly, the process and mechanism by which private entrepreneurial traits influence the innovation performance of private firms need further enrichment and improvement. This thesis selects important psychological traits of private entrepreneurs, including narcissism level and entrepreneurial resilience, as independent variables, and introduces dynamic management capabilities as a variable of mediating and industry environment as a variable of moderating to explore their effects on private businesses' innovation performance as the dependent variable. The research findings indicate the association and significant effects between the variables. However, entrepreneurial traits include many factors other than the variables selected for the study in this thesis. Therefore, other representative traits of private entrepreneurs other than those used in this study can be selected for future targeted research. At the same time, this thesis is only a probe into the hidden mechanism between private entrepreneurial traits and private firms' innovation performance which has not yet fully explained in the existing literature.

Secondly, the application of Upper Echelons Theory and Dynamic Management Capabilities Theory to management-related studies should be further expanded. As a key theory

in management, Upper Echelons Theory and Dynamic Management Capabilities Theory have influence and significance in explaining individual behaviors and business performance. This study analyzes the impact of private entrepreneurs on the innovation performance of private firms, and the connection between entrepreneurial traits and dynamic management capabilities in terms of both individual entrepreneurs and private businesses. However, in addition to individual entrepreneurial efforts, the improvement of business performance is also closely related to corporate behaviors and may be affected to varying extent by such factors as niche market, target customers and organizational restructuring. Therefore, Upper Echelons Theory and Dynamic Management Capabilities Theory can be connected to corporate behaviors in future studies, with the purpose of providing a more comprehensive and rational explication for the improvement of business innovation performance. The continuous exploration of theories should be conducted to fuel the development and progress of management.

Thirdly, the differences between the innovation performances of private businesses in different countries' institutional environments should be explored. Institution plays a significant part as a predictor of innovation achievement. It is part of the environment, and no firm is immune to the institution in which it is embedded. This institution influences firms' strategy choices and business performance through both formal and informal organizational constraints. Specifically, the institutional environment has three isomorphic pressures on organizations, which are coercive, simulative and normative, thus guiding and moderating firms' economic behaviors through the establishment of codes of conduct, legal provisions and social rules, and influencing firms' innovation performance. This institutional influence is even more pronounced for firms in transition and upgrading. Future research in this area may concentrate on the dynamic evolution of the institutional environment in different countries to accurately study the influence of institutional differences on innovation performance and to more rationally explain the behaviors and decisions of firms.

Bibliography

- Abatecola, G., & Cristofaro, M. (2018). Hambrick and Mason's "Upper Echelons Theory": evolution and open avenues. *Journal of Management History*, 26(1), 116-136.
- Abiodun, B., Olalekan, U., & Grace, O. (2019). Environmental munificence and service firm performance: The moderating role of management innovation capability. *Business Management Dynamics*, 9(6), 13.
- Adler, P. S., & Kwon, S.-W. (2002). Social capital: Prospects for a new concept. *Academy of Management Review*, 27(1), 17-40.
- Adner, R., & Helfat, C. E. (2003). Corporate effects and dynamic managerial capabilities. *Strategic Management Journal*, 24(10), 1011-1025.
- Afuah, A. N., & Utterback, J. M. (1997). Responding to structural industry changes: a technological evolution perspective. *Industrial and Corporate Change*, 6(1), 183-202.
- Ahuja, G. (2000). Collaboration networks, structural holes, and innovation: A longitudinal study. *Administrative Science Quarterly*, 45(3), 425-455.
- Ahuja, G., & Katila, R. (2001). Technological acquisitions and the innovation performance of acquiring firms: A longitudinal study. *Strategic Management Journal*, 22(3), 197-220.
- Akgün, A. E., & Keskin, H. (2014). Organisational resilience capacity and firm product innovativeness and performance. *International Journal of Production Research*, 52(23), 6918-6937.
- Alegre, J., & Chiva, R. (2013). Linking entrepreneurial orientation and firm performance: The role of organizational learning capability and innovation performance. *Journal of Small Business Management*, 51(4), 491-507.
- Alexiev, A. S., Jansen, J. J., Van den Bosch, F. A., & Volberda, H. W. (2010). Top management team advice seeking and exploratory innovation: The moderating role of TMT heterogeneity. *Journal of Management Studies*, 47(7), 1343-1364.
- Allison, T. H., Warnick, B. J., Davis, B. C., & Cardon, M. S. (2022). Can you hear me now? Engendering passion and preparedness perceptions with vocal expressions in crowdfunding pitches. *Journal of Business Venturing*, 37(3), 106193.
- Allport, G. W. (1961). *Pattern and growth in personality*. Oxford, England: Holt, Reinhart & Winston.
- Altintas, G., Ambrosini, V., & Gudergan, S. (2022). MNE dynamic capabilities in (un) related diversification. *Journal of International Management*, 28(1), 100889.
- Ambrosini, V., & Bowman, C. (2010). The impact of causal ambiguity on competitive advantage and rent appropriation. *British Journal of Management*, 21(4), 939-953.
- Ames, D. R., Rose, P., & Anderson, C. P. (2006). The NPI-16 as a short measure of narcissism. *Journal of Research in Personality*, 40(4), 440-450.
- Amit, R., & Schoemaker, P. J. (1993). Strategic assets and organizational rent. *Strategic Management Journal*, 14(1), 33-46.
- Andersson, S., & Evers, N. (2015). International opportunity recognition in international new ventures—a dynamic managerial capabilities perspective. *Journal of International Entrepreneurship*, 13(3), 260-276.
- Annosi, M. C., Martini, A., Brunetta, F., & Marchegiani, L. (2020). Learning in an agile setting: A multilevel research study on the evolution of organizational routines. *Journal of Business Research*, 110, 554-566.

- Ashill, N. J., & Jobber, D. (2001). Defining the information needs of senior marketing executives: an exploratory study. *Qualitative Market Research: An International Journal*, 4, 52-61.
- Atuahene-Gima, K., Li, H., & De Luca, L. M. (2006). The contingent value of marketing strategy innovativeness for product development performance in Chinese new technology ventures. *Industrial Marketing Management*, 35(3), 359-372.
- Atuahene-Gima, K., & Murray, J. Y. (2007). Exploratory and exploitative learning in new product development: A social capital perspective on new technology ventures in China. *Journal of International Marketing*, 15(2), 1-29.
- Badrinarayanan, V., Ramachandran, I., & Madhavaram, S. (2019a). Mirroring the boss: Ethical leadership, emulation intentions, and salesperson performance. *Journal of Business Ethics*, 159(3), 897-912.
- Badrinarayanan, V., Ramachandran, I., & Madhavaram, S. (2019b). Resource orchestration and dynamic managerial capabilities: focusing on sales managers as effective resource orchestrators. *Journal of Personal Selling & Sales Management*, 39(1), 23-41.
- Bai, G. L., & Liu, X. C. (2019). Research on the impact of environmental uncertainty and competitiveness on enterprise micro-innovation path. *Reform of Economic System*, (03), 115-121.
- Bailey, E. E., & Helfat, C. E. (2003). External management succession, human capital, and firm performance: An integrative analysis. *Managerial and decision economics*, 24(4), 347-369.
- Barney, J., & Felin, T. (2013). What are microfoundations? *Academy of Management Perspectives*, 27(2), 138-155.
- Barney, J.B. & Arian, A. M. (2005). The resource-based view: origins and implications. In M.A. Hitt, R.E. Freeman, & J.S. Harrison (Eds.), *The blackwell handbook of strategic management* (pp. 123-182). Wiley.
- Baron, R. A. (1998). Cognitive mechanisms in entrepreneurship: Why and when entrepreneurs think differently than other people. *Journal of Business Venturing*, 13(4), 275-294.
- Bates, T. (1990). Entrepreneur human capital inputs and small business longevity. *The Review of Economics and Statistics*, 72(4), 551-559.
- Beattie, S. (2016). Which entrepreneurial traits are the most critical in determining success. *Otago Management Graduate Review*, 14(1), 13-20.
- Beck, J. B., & Wiersema, M. F. (2013). Executive decision making: Linking dynamic managerial capabilities to the resource portfolio and strategic outcomes. *Journal of Leadership & Organizational Studies*, 20(4), 408-419.
- Bellner, B. W. (2014). *Dynamic managerial capabilities and competitive advantage: an empirical analysis of managers from the finance and insurance and real estate sectors*. Heriot-Watt University,
- Bendig, D., Strese, S., Flatten, T. C., da Costa, M. E. S., & Brettel, M. (2018). On micro-foundations of dynamic capabilities: A multi-level perspective based on CEO personality and knowledge-based capital. *Long Range Planning*, 51(6), 797-814.
- Bergen, M., & Peteraf, M. A. (2002). Competitor identification and competitor analysis: a broad-based managerial approach. *Managerial and Decision Economics*, 23(4-5), 157-169.
- Bigley, G. A., & Wiersema, M. F. (2002). New CEOs and corporate strategic refocusing: How experience as heir apparent influences the use of power. *Administrative Science Quarterly*, 47(4), 707-727.
- Block, J., & Kremen, A. M. (1996). IQ and ego-resiliency: conceptual and empirical connections and separateness. *Journal of Personality and Social Psychology*, 70(2), 349.
- Block, J. H., & Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.), *Development of cognition, affect and social relations: the minnesota symposia on child psychology* (Vol. 13, pp. 39-101). Hillsdale, NJ: Erlbaum.

- Block, J. H., Fisch, C. O., & Van Praag, M. (2017). The Schumpeterian entrepreneur: A review of the empirical evidence on the antecedents, behaviour and consequences of innovative entrepreneurship. *Industry and Innovation*, 24(1), 61-95.
- Blyler, M., & Coff, R. W. (2003). Dynamic capabilities, social capital, and rent appropriation: Ties that split pies. *Strategic Management Journal*, 24(7), 677-686.
- Bogers, M., Chesbrough, H., & Moedas, C. (2018). Open innovation: Research, practices, and policies. *California Management Review*, 60(2), 5-16.
- Bonanno, G. A. (2004). Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events? *American Psychologist*, 59(1), 20.
- Bontis, N., & Fitz-enz, J. (2002). Intellectual capital ROI: a causal map of human capital antecedents and consequents. *Journal of Intellectual Capital*, 3(3), 223-247.
- Brockman, B. K., & Morgan, R. M. (2003). The role of existing knowledge in new product innovativeness and performance. *Decision Sciences*, 34(2), 385-419.
- Bromiley, P., & Rau, D. (2016). Social, behavioral, and cognitive influences on upper echelons during strategy process: A literature review. *Journal of Management*, 42(1), 174-202.
- Bruni, D. S., & Verona, G. (2009). Dynamic marketing capabilities in Science-based firms: An exploratory investigation of the pharmaceutical industry. *British Journal of Management*, 20, S101-S117.
- Burt, R. S. (2004). Structural holes and good ideas. *American Journal of Sociology*, 110(2), 349-399.
- Bustanza, O. F., Vendrell-Herrero, F., Perez-Arostegui, M. N., & Parry, G. (2019). Technological capabilities, resilience capabilities and organizational effectiveness. *The International Journal of Human Resource Management*, 30(8), 1370-1392.
- Cain, N. M., Pincus, A. L., & Ansell, E. B. (2008). Narcissism at the crossroads: Phenotypic description of pathological narcissism across clinical theory, social/personality psychology, and psychiatric diagnosis. *Clinical Psychology Review*, 28(4), 638-656.
- Campbell, J. P. (1977). On the nature of organizational effectiveness. *New Perspectives on Organizational Effectiveness*, 13, 55.
- Cannella, S. F. B., Hambrick, D. C., Finkelstein, S., & Cannella, A. A. (2009). *Strategic leadership: theory and research on executives, top management teams, and boards*. Strategic Management.
- Carr, K., Kendal, R. L., & Flynn, E. G. (2016). Eureka!: What is innovation, how does it develop, and who does it? *Child Development*, 87(5), 1505-1519.
- Castanias, R. P., & Helfat, C. E. (2001). The managerial rents model: Theory and empirical analysis. *Journal of Management*, 27(6), 661-678.
- Castrogiovanni, G. J. (2002). Organization task environments: Have they changed fundamentally over time? *Journal of Management*, 28(2), 129-150.
- Caughron, J. J., Antes, A. L., Stenmark, C. K., Thiel, C. E., Wang, X., & Mumford, M. D. (2013). Competition and sensemaking in ethical situations. *Journal of Applied Social Psychology*, 43(7), 1491-1507.
- Chang, Y.-K., Chen, Y.-L., Chou, R. K., & Huang, T.-H. (2015). Corporate governance, product market competition and dynamic capital structure. *International Review of Economics & Finance*, 38, 44-55.
- Chao-hui, Z. (2008). Explorative learning, exploitative learning and innovation performance: moderating effects of environmental turbulence. *Studies in Science of Science*, 26(4), 840-867.
- Chen, J., Chen, Y., & Vanhaverbeke, W. (2011). The influence of scope, depth, and orientation of external technology sources on the innovative performance of Chinese firms. *Technovation*, 31(8), 362-373.

- Chen, J., Qiu, J. M., & Shen, H. H. (2007). 技术学习对企业创新绩效的影响因素分析 [The effect of technical learning on innovative performance]. *Studies in Science of Science*, 25(6), 1223-1232.
- Chen, Y., & Lin, Z. (2021). Business intelligence capabilities and firm performance: A study in China. *International Journal of Information Management*, 57, 102232.
- Chesbrough, H., Vanhaverbeke, W., & West, J. (2006). *Open innovation: researching a new paradigm*. Oxford University Press.
- Christensen, J. F. (1995). Asset profiles for technological innovation. *Research Policy*, 24(5), 727-745.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, (4), 128-152.
- Collins, C. J. (2021). Expanding the resource based view model of strategic human resource management. *The International Journal of Human Resource Management*, 32(2), 331-358.
- Corrêa, R. O., Bueno, E. V., Kato, H. T., & Silva, L. M. d. O. (2019). Dynamic managerial capabilities: Scale development and validation. *Managerial and Decision Economics*, 40(1), 3-15.
- Cyert, R. M., & March, J. G. (1963). *A behavioral theory of the firm*. Prentice Hall/Pearson Education.
- Del Rosario, P. M., & White, R. M. (2005). The Narcissistic Personality Inventory: Test–retest stability and internal consistency. *Personality and Individual Differences*, 39(6), 1075-1081.
- DesJardine, M., Bansal, P., & Yang, Y. (2019). Bouncing back: Building resilience through social and environmental practices in the context of the 2008 global financial crisis. *Journal of Management*, 45(4), 1434-1460.
- Dhaouadi, K. (2018). Corporate Board and Upper Echelons: The Case of the American Most Admired Firms. *International Journal of Business and Management*, 13(4), 245-245.
- Díaz-Fernández, M. C., González-Rodríguez, M. R., & Simonetti, B. (2020). Top management team diversity and high performance: An integrative approach based on upper echelons and complexity theory. *European Management Journal*, 38(1), 157-168.
- Dong, Z., & Zhang, X. (2021). 超额商誉对企业创新的影响研究 [The Impact of Excess Goodwill on Corporate Innovation]. *Nankai Business Review*, 25(5), 15.
- Drucker, P. F. (1993). The rise of the knowledge society. *The Wilson Quarterly*, 17(2), 52-72.
- Duncan, R. B. (1972). Characteristics of organizational environments and perceived environmental uncertainty. *Administrative Science Quarterly*, 17(3), 313-327.
- Eggers, J. P., & Kaplan, S. (2013). Cognition and capabilities: A multi-level perspective. *Academy of Management Annals*, 7(1), 295-340.
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: what are they? *Strategic Management Journal*, 21(10-11), 1105-1121.
- Ellis, H. (1898). Auto-erotism: A psychological study. *Alienist and Neurologist (1880-1920)*, 19(2), 260.
- Emmons, R. A. (1984). Factor analysis and construct validity of the narcissistic personality inventory. *Journal of Personality Assessment*, 48(3), 291-300.
- Emmons, R. A. (1987). Narcissism: theory and measurement. *Journal of Personality and Social Psychology*, 52(1), 11.
- Fainshmidt, S., Wenger, L., Pezeshkan, A., & Mallon, M. R. (2019). When do dynamic capabilities lead to competitive advantage? The importance of strategic fit. *Journal of Management Studies*, 56(4), 758-787.
- Fang, Z. B., & Bao, C. L. (2009). 政府组织基于平衡计分卡的绩效评价体系设计 [The Designing of Government Performance Management System Based on Balanced ScoreCard]. *Journal of Gansu Administration Institute*, 4, 50-55+125.

- Feist, G. J., Reiter-Palmon, R., & Kaufman, J. C. (2017). *The cambridge handbook of creativity and personality research*. Cambridge University Press.
- Felin, T., Foss, N. J., & Ployhart, R. E. (2015). The microfoundations movement in strategy and organization theory. *Academy of Management Annals*, 9(1), 575-632.
- Finkelstein, S., Whitehead, J., & Campbell, A. (2009). *Think again: why good leaders make bad decisions and how to keep it from happening to you*. Harvard Business Press.
- Fischer, M. M., & Varga, A. (2002). Technological innovation and interfirm cooperation: an exploratory analysis using survey data from manufacturing firms in the metropolitan region of Vienna. *International Journal of Technology Management*, 24(7-8), 724-742.
- Fiske, S. T. (1993). Social cognition and social perception. *Annual Review of Psychology*, 44(1), 155-194.
- Flores, E., Cicchetti, D., & Rogosch, F. A. (2005). Predictors of resilience in maltreated and nonmaltreated Latino children. *Developmental Psychology*, 41(2), 338.
- Garbuio, M., King, A. W., & Lovallo, D. (2011). Looking inside: Psychological influences on structuring a firm's portfolio of resources. *Journal of Management*, 37(5), 1444-1463.
- Garcia, R., & Calantone, R. (2002). A critical look at technological innovation typology and innovativeness terminology: a literature review. *Journal of Product Innovation Management*, 19(2), 110-132.
- Garg, V. K., Walters, B. A., & Priem, R. L. (2003). Chief executive scanning emphases, environmental dynamism, and manufacturing firm performance. *Strategic Management Journal*, 24(8), 725-744.
- Gary, M. S., Wood, R. E., & Pillinger, T. (2012). Enhancing mental models, analogical transfer, and performance in strategic decision making. *Strategic Management Journal*, 33(11), 1229-1246.
- Gassmann, O. (2006). Opening up the innovation process: towards an agenda. *Research and Development Management*, 36(3), 223-228.
- Gavetti, G. (2012). PERSPECTIVE—Toward a behavioral theory of strategy. *Organization Science*, 23(1), 267-285.
- Gavetti, G., & Levinthal, D. (2000). Looking forward and looking backward: Cognitive and experiential search. *Administrative Science Quarterly*, 45(1), 113-137.
- Gazzaniga, M. S., Heatherton, T. F., & Halpern, D. F. (2010). *Psychological science* (3rd ed.). New York: W. W. Norton & Co.
- Geletkanycz, M. A., & Hambrick, D. C. (1997). The external ties of top executives: Implications for strategic choice and performance. *Administrative Science Quarterly*, 42(4), 654-681.
- Gimeno, J., Folta, T. B., Cooper, A. C., & Woo, C. Y. (1997). Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms. *Administrative Science Quarterly*, 42(4), 750-783.
- Goldstein, S., & Brooks, R. B. (2013). Why study resilience? In *handbook of resilience in children*. Springer.
- Gou, L., & Ding, J. (2020). The Effect of resource Patchwork on firm performance: moderating effects of environmental competitiveness and organizational flexibility. *Pioneering with Science & Technology Monthly*, 33(5), 79-84.
- Griliches, Z. (1990). *Patent statistics as economic indicators: a survey*. University of Chicago Press.
- Guo, Y., Huy, Q. N., & Xiao, Z. (2017). How middle managers manage the political environment to achieve market goals: Insights from China's state-owned enterprises. *Strategic Management Journal*, 38(3), 676-696.
- Hagedoorn, J., & Cloudt, M. (2003). Measuring innovative performance: is there an advantage in using multiple indicators? *Research Policy*, 32(8), 1365-1379.

- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193-206.
- Hambrick, D. C., & Snow, C. C. (1977). *A Contextual Model of Strategic Decision Making in Organizations*. *Academy of Management Proceedings*, 1, 109-112.
- Han, Y., Liao, J., & Long, L. (2007). Model of development and empirical study on employee job performance construct. *Journal of Management Sciences in China*, 10(5), 62-77.
- Hannan, M. T., & Freeman, J. (1977). The population ecology of organizations. *American Journal of Sociology*, 82(5), 929-964.
- Harreld, J. B., O'Reilly III, C. A., & Tushman, M. L. (2007). Dynamic capabilities at IBM: Driving strategy into action. *California Management Review*, 49(4), 21-43.
- He, X., & Su, X.-H. (2016). The relationship between strategy alliance of new ventures and organizational legitimacy under environmental dynamism: An organizational learning perspective. *Science Research Management*, 37(2), 90.
- Helfat, C. E. (2018). The dynamics of capability search and creation. *Industrial and Corporate Change*, 27(6), 1155-1157.
- Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D. J., & Winter, S. (2007). *Dynamic capabilities: foundations. dynamic capabilities: understanding strategic change in organizations*. Oxford.
- Helfat, C. E., & Martin, J. A. (2015). Dynamic managerial capabilities: Review and assessment of managerial impact on strategic change. *Journal of Management*, 41(5), 1281-1312.
- Helfat, C. E., & Peteraf, M. A. (2015). Managerial cognitive capabilities and the microfoundations of dynamic capabilities. *Strategic Management Journal*, 36(6), 831-850.
- Helfat, C. E., & Raubitschek, R. S. (2018). Dynamic and integrative capabilities for profiting from innovation in digital platform-based ecosystems. *Research Policy*, 47(8), 1391-1399.
- Henneberg, S. C., Mouzas, S., & Naudé, P. (2006). Network pictures: Concepts and representations. *European Journal of Marketing*, 40(3/4), 408-429.
- Henneberg, S. C., Naudé, P., & Mouzas, S. (2010). Sense-making and management in business networks—Some observations, considerations, and a research agenda. *Industrial Marketing Management*, 39(3), 355-360.
- Hernández-Linares, R., Kellermanns, F. W., & López-Fernández, M. C. (2021). Dynamic capabilities and SME performance: The moderating effect of market orientation. *Journal of Small Business Management*, 59(1), 162-195.
- Hernández-Carrión, C., Camarero-Izquierdo, C., & Gutiérrez-Cillán, J. (2017). Entrepreneurs' social capital and the economic performance of small businesses: The moderating role of competitive intensity and entrepreneurs' experience. *Strategic Entrepreneurship Journal*, 11(1), 61-89.
- Heyden, M. L., Wilden, R., & Wise, C. (2020). Navigating crisis from the backseat? How top managers can support radical change initiatives by middle managers. *Industrial Marketing Management*, 88, 305-313.
- Hill, C. W., & Rothaermel, F. T. (2003). The performance of incumbent firms in the face of radical technological innovation. *Academy of Management Review*, 28(2), 257-274.
- Hisrich, R. D., & O'Kinneide, B. (1996). Entrepreneurial activities in Europe-oriented institutions. *Journal of Managerial Psychology*, 11(2), 45-64.
- Hitt, M. A., Bierman, L., Shimizu, K., & Kochhar, R. (2001). Direct and moderating effects of human capital on strategy and performance in professional service firms: A resource-based perspective. *Academy of Management Journal*, 44(1), 13-28.
- Hodgkinson, G. P., & Healey, M. P. (2011). Psychological foundations of dynamic capabilities: Reflexion and reflection in strategic management. *Strategic Management Journal*, 32(13), 1500-1516.

- Holbrook, D., Cohen, W. M., Hounshell, D. A., & Klepper, S. (2000). The nature, sources, and consequences of firm differences in the early history of the semiconductor industry. *Strategic Management Journal*, 21(10-11), 1017-1041.
- Hou, E. X., & Hao, W. T. (2012). A review on the influencing factors of organizational innovation performance. *Business Research*, (18), 7-9.
- Huff, A. S. (1990). *Mapping strategic thought*. John Wiley & Sons Incorporated.
- Hunt, S. D. (1999). *A general theory of competition: resources, competences, productivity, economic growth*. Sage publications.
- Hunt, S. D., & Morgan, R. M. (2017). The resource-advantage theory of competition: A review. *Review of marketing research*, 153-205.
- Huy, Q., & Zott, C. (2019). Exploring the affective underpinnings of dynamic managerial capabilities: How managers' emotion regulation behaviors mobilize resources for their firms. *Strategic Management Journal*, 40(1), 28-54.
- Jansen, J. J., Vera, D., & Crossan, M. (2009). Strategic leadership for exploration and exploitation: The moderating role of environmental dynamism. *The Leadership Quarterly*, 20(1), 5-18.
- Jaworski, B. J., & Kohli, A. K. (1993). Market orientation: antecedents and consequences. *Journal of Marketing*, 57(3), 53-70.
- Jia, Y. C., & Lv, J. W. (2020). 经济周期和经济政策不确定性推动了贸易摩擦吗? [Does the Economic Cycle And Economic Policy Uncertainty Drive Trade Friction?]. *Economist*, 1(03), 75-86.
- Jiao, H., Koo, C. K., & Cui, Y. (2015). Legal environment, government effectiveness and firms' innovation in China: examining the moderating influence of government ownership. *Technological Forecasting and Social Change*, 96, 15-24.
- Jiao, H., Yang, J. F., & Ying, Y. (2021). A review of dynamic capability research and suggestions for contextualized research in China. *Management World*, 37(05), 191-210.
- Kaplan, S., Murray, F., & Henderson, R. (2003). Discontinuities and senior management: Assessing the role of recognition in pharmaceutical firm response to biotechnology. *Industrial and corporate change*, 12(2), 203-233.
- Karabulut, A. T. (2016). Personality traits on entrepreneurial intention. *Procedia-Social and Behavioral Sciences*, 229, 12-21.
- Kawai, T. (2013). A new framework of dynamic capabilities including dynamic strategies: with an illustration of the flat-panel TV wars. *Journal of Strategic Management Studies*, 5(1-2), 11-29.
- Keats, B. W., & Hitt, M. A. (1988). A causal model of linkages among environmental dimensions, macro organizational characteristics, and performance. *Academy of Management Journal*, 31(3), 570-598.
- Kernberg, O., F. (1974). Further contributions to the treatment of narcissistic personalities. *International Journal of Psycho-Analysis*, 55, 215-240.
- Kevill, A., Trehan, K., Harrington, S., & Kars-Unluoglu, S. (2021). Dynamic managerial capabilities in micro-enterprises: Stability, vulnerability and the role of managerial time allocation. *International Small Business Journal*, 39(6), 507-531.
- Khalili, H., & Fazel, A. (2013). The influence of entrepreneurial orientation on innovative performance: Study of a petrochemical company in Iran. *Journal of Knowledge-based Innovation in China*, 5(3), 262-278.
- Kim, K. Y., Atwater, L., Patel, P. C., & Smither, J. W. (2016). Multisource feedback, human capital, and the financial performance of organizations. *Journal of Applied Psychology*, 101(11), 1569.

- King, A. A., & Tucci, C. L. (2002). Incumbent entry into new market niches: The role of experience and managerial choice in the creation of dynamic capabilities. *Management Science*, 48(2), 171-186.
- Kor, Y. Y. (2003). Experience-based top management team competence and sustained growth. *Organization Science*, 14(6), 707-719.
- Kor, Y. Y., & Mesko, A. (2013). Dynamic managerial capabilities: Configuration and orchestration of top executives' capabilities and the firm's dominant logic. *Strategic Management Journal*, 34(2), 233-244.
- Krasnikov, A., & Jayachandran, S. (2008). The relative impact of marketing, research-and-development, and operations capabilities on firm performance. *Journal of Marketing*, 72(4), 1-11.
- Krishnan, R., Martin, X., & Noorderhaven, N. G. (2006). When does trust matter to alliance performance? *Academy of Management Journal*, 49(5), 894-917.
- Krizan, Z., & Johar, O. (2015). Narcissistic rage revisited. *Journal of Personality and Social Psychology*, 108(5), 784.
- Kubarych, T. S., Deary, I. J., & Austin, E. J. (2004). The Narcissistic Personality Inventory: factor structure in a non-clinical sample. *Personality and Individual Differences*, 36(4), 857-872.
- Kwoka Jr, J. E. (1985). The Herfindahl index in theory and practice. *The Antitrust Bulletin*, 30(4), 915-947.
- Laursen, K., & Salter, A. (2006). Open for innovation: the role of openness in explaining innovation performance among UK manufacturing firms. *Strategic Management Journal*, 27(2), 131-150.
- Lazarus, R. S. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual Review of Psychology*, 44(1), 1-22.
- Le, H. (2019). Literature review on diversification strategy, enterprise core competence and enterprise performance. *American Journal of Industrial and Business Management*, 9(1), 91-108.
- Leone, M. I., & Reichstein, T. (2012). Licensing-in fosters rapid invention! The effect of the grant-back clause and technological unfamiliarity. *Strategic Management Journal*, 33(8), 965-985.
- Levine, S. S., Bernard, M., & Nagel, R. (2017). Strategic intelligence: The cognitive capability to anticipate competitor behavior. *Strategic Management Journal*, 38(12), 2390-2423.
- Li, D. Q., Peng, C., & Xi, L. (2017). The effect of dynamic capability on dual innovation synergy: the moderating effect of environmental competitiveness. *Operations Research and Management Science*, 26(09), 183-192.
- Li, D. Y., Xiang, B. H., & Chen, Y. L. (2009). Firm dynamic capabilities and their efficacy: the impact of environmental uncertainty. *Nankai Business Review*, 12(06), 60-68.
- Li, H., & Badri, K. (1999). Marketing's influence and new product performance in Chinese firms. *Journal of International Marketing*, 7(1), 34-56.
- Liang, Q. Z., Meng, Y., Liu, J., & Yuan, B. (2012). The Relationship Among Personality Traits, Working Values and Entrepreneurial Performance: The Mediating Role of Entrepreneurial Orientation. *Science of Science and Management of S. & T*, 33(07), 171-180.
- Linton, J. D. (2009). De-babelizing the language of innovation. *Technovation*, 29(11), 729-737.
- Liu, C.-H. (2017). The relationships among intellectual capital, social capital, and performance- The moderating role of business ties and environmental uncertainty. *Tourism Management*, 61, 553-561.
- Lovelace, K., Shapiro, D. L., & Weingart, L. R. (2001). Maximizing cross-functional new product teams' innovativeness and constraint adherence: A conflict communications perspective. *Academy of Management Journal*, 44(4), 779-793.

- Mäkelä, K., Sumelius, J., Höglund, M., & Ahlqvist, C. (2012). Determinants of strategic HR capabilities in MNC subsidiaries. *Journal of Management Studies*, 49(8), 1459-1483.
- Martin, J. A. (2011). Dynamic managerial capabilities and the multibusiness team: The role of episodic teams in executive leadership groups. *Organization Science*, 22(1), 118-140.
- Martin, J. A., & Bachrach, D. G. (2018). A relational perspective of the microfoundations of dynamic managerial capabilities and transactive memory systems. *Industrial Marketing Management*, 74, 27-38.
- Martin, S. L., & Javalgi, R. R. G. (2016). Entrepreneurial orientation, marketing capabilities and performance: the moderating role of competitive intensity on Latin American International new ventures. *Journal of Business Research*, 69(6), 2040-2051.
- Martinez-Torteya, C., Anne Bogat, G., Von Eye, A., & Levendosky, A. A. (2009). Resilience among children exposed to domestic violence: The role of risk and protective factors. *Child Development*, 80(2), 562-577.
- Masoudian, S. M. R., Ahadi Serkani, Y., Mahmoodi, M., & Ghavidel, S. (2022). Effects of Forward-looking Information Disclosure on Stock Price Response in External Environment Uncertainty. *Journal of Investment Knowledge*, 11(41), 333-356.
- Matemilola, B., Bany-Arifin, A., Azman-Saini, W., & Nassir, A. M. (2018). Does top managers' experience affect firms' capital structure? *Research in International Business and Finance*, 45, 488-498.
- Matusik, S. F., & Hill, C. W. (1998). The utilization of contingent work, knowledge creation, and competitive advantage. *Academy of Management Review*, 23(4), 680-697.
- McLarnon, M. J., & Rothstein, M. G. (2013). Development and initial validation of the workplace resilience inventory. *Journal of Personnel Psychology*, 12(2), 63.
- Mehta, A. M., Ali, F. H., Farooq, S., & Tariq, M. (2020). Dynamic managerial capabilities, competitive advantage and business performance: an integrative model, literature review and research propositions. *Academy of Strategic Management Journal*, 19(4), 1-12.
- Meyer, A. D. (1982). Adapting to environmental jolts. *Administrative Science Quarterly*, (5), 515-537.
- Michaelis, T. L., Pollack, J. M., Mulvey, P., Ritter, B. M., & Carr, J. C. (2020). Gender bias and venture funding: discussing bias in the entrepreneurship classroom. *Entrepreneurship Education and Pedagogy*, 3(2), 154-181.
- Miller, C. C., & Ireland, R. D. (2005). Intuition in strategic decision making: Friend or foe in the fast-paced 21st century? *Academy of Management Perspectives*, 19(1), 19-30.
- Miller, D., & Friesen, P. H. (1983). Strategy-making and environment: the third link. *Strategic Management Journal*, 4(3), 221-235.
- Miller, J. D., Lynam, D. R., Hyatt, C. S., & Campbell, W. K. (2017). Controversies in narcissism. *Annual Review of Clinical Psychology*, 13, 291-315.
- Miller, J. D., Lynam, D. R., Vize, C., Crowe, M., Sleep, C., Maples-Keller, J. L., . . . Campbell, W. K. (2018). Vulnerable narcissism is (mostly) a disorder of neuroticism. *Journal of Personality*, 86(2), 186-199.
- Mintzberg, H. (1977). Strategy formulation as a historical process. *International Studies of Management and Organization*, 7(2), 28-40.
- Mintzberg, H., Ghoshal, S., Lampel, J., & Quinn, J. B. (2003). *The strategy process: concepts, contexts, cases*. Pearson education.
- Montalvo, C. (2006). What triggers change and innovation? *Technovation*, 26(3), 312-323.
- Montpetit, M. A., Bergeman, C. S., Deboeck, P. R., Tiberio, S. S., & Boker, S. M. (2010). Resilience-as-process: negative affect, stress, and coupled dynamical systems. *Psychology and Aging*, 25(3), 631.

- Moon, K., Guerrero, A. M., Adams, V. M., Biggs, D., Blackman, D. A., Craven, L., . . . Ross, H. (2019). Mental models for conservation research and practice. *Conservation Letters*, 12(3), e12642.
- Mostafiz, M. I. (2020). The antecedents and the outcomes of a firm's dominant logic-the dynamic managerial capability perspective. *Journal for International Business and Entrepreneurship Development*, 12(2-3), 142-155.
- Muldoon, J., Deal, N. M., Smith, D., & Lakshmikanth, G. S. (2022). The past masters: the impact of the evolution of management thought on history. *Journal of Management History*, 29(1), 10-28.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242-266.
- Neely Jr, B. H., Lovelace, J. B., Cowen, A. P., & Hiller, N. J. (2020). Metacritiques of upper echelons theory: Verdicts and recommendations for future research. *Journal of Management*, 46(6), 1029-1062.
- Norem, J. K. (2001). Defensive pessimism, optimism, and pessimism. In E. C. Chang (Ed.), *Optimism & pessimism: implications for theory, research, and practice* (pp. 77-100). American Psychological Association.
- Olivari, J. (2016). Entrepreneurial traits and firm innovation. *Eurasian Business Review*, 6(3), 339-360.
- Ortiz-de-Mandojana, N., & Bansal, P. (2016). The long-term benefits of organizational resilience through sustainable business practices. *Strategic Management Journal*, 37(8), 1615-1631.
- Parker, G., & Van Alstyne, M. (2018). Innovation, openness, and platform control. *Management Science*, 64(7), 3015-3032.
- Parker, H., & Ameen, K. (2018). The role of resilience capabilities in shaping how firms respond to disruptions. *Journal of Business Research*, 88, 535-541.
- Partlow, P. J., Medeiros, K. E., & Mumford, M. D. (2015). Leader cognition in vision formation: Simplicity and negativity. *The Leadership Quarterly*, 26(3), 448-469.
- Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality*, 36(6), 556-563.
- Payan, J. M., Svensson, G., Awuah, G., Andersson, S., & Hair, J. (2010). A "cross-cultural RELQUAL-scale" in supplier-distributor relationships of Sweden and the USA. *International Marketing Review*, 27(5), 541-561.
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: a resource dependence perspective*. Stanford University Press.
- Phares, E. J., & Erskine, N. (1984). The measurement of selfism. *Educational and Psychological Measurement*, 44(3), 597-608.
- Ployhart, R. E., Nyberg, A. J., Reilly, G., & Maltarich, M. A. (2014). Human capital is dead; long live human capital resources! *Journal of Management*, 40(2), 371-398.
- Powell, T. C., Lovallo, D., & Caringal, C. (2006). Causal ambiguity, management perception, and firm performance. *Academy of Management Review*, 31(1), 175-196.
- Prahalad, C. K., & Bettis, R. A. (1986). The dominant logic: A new linkage between diversity and performance. *Strategic Management Journal*, 7(6), 485-501.
- Prajogo, D. I., & Ahmed, P. K. (2006). Relationships between innovation stimulus, innovation capacity, and innovation performance. *Research and Development Management*, 36(5), 499-515.
- Prayag, G., Chowdhury, M., Spector, S., & Orchiston, C. (2018). Organizational resilience and financial performance. *Annals of Tourism Research*, 73, 193-196.

- Priem, R. L., Rasheed, A. M., & Kotulic, A. G. (1995). Rationality in strategic decision processes, environmental dynamism and firm performance. *Journal of Management*, 21(5), 913-929.
- Protogerou, A., Caloghirou, Y., & Lioukas, S. (2012). Dynamic capabilities and their indirect impact on firm performance. *Industrial and Corporate Change*, 21(3), 615-647.
- Qiu, J. G., & Yu, Y. (2019). Research on the relationship between technological innovation dynamic capability and Technological commercialization Performance: The moderating role of environmental dynamics. *Science & Technology Progress and Policy*, 36(10), 91-98.
- Quigley, T. J., & Hambrick, D. C. (2015). Has the “CEO effect” increased in recent decades? A new explanation for the great rise in America's attention to corporate leaders. *Strategic Management Journal*, 36(6), 821-830.
- Raskin, R. N., & Hall, C. S. (1979). A narcissistic personality inventory. *Psychological Reports*, 45(2), 590.
- Raskin, R., & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology*, 54(5), 890-902.
- Rauter, R., Globocnik, D., Perl-Vorbach, E., & Baumgartner, R. J. (2019). Open innovation and its effects on economic and sustainability innovation performance. *Journal of Innovation & Knowledge*, 4(4), 226-233.
- Reina, C. S., Peterson, S. J., & Zhang, Z. (2017). Adverse effects of CEO family-to-work conflict on firm performance. *Organization Science*, 28(2), 228-243.
- Rhodewalt, F., & Morf, C. C. (1995). Self and interpersonal correlates of the Narcissistic Personality Inventory: A review and new findings. *Journal of Research in Personality*, 29(1), 1-23.
- Richard, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. (2009). Measuring organizational performance: Towards methodological best practice. *Journal of Management*, 35(3), 718-804.
- Romanelli, E., & Tushman, M. L. (1986). Inertia, environments, and strategic choice: A quasi-experimental design for comparative-longitudinal research. *Management Science*, 32(5), 608-621.
- Romijn, H., & Albaladejo, M. (2002). Determinants of innovation capability in small electronics and software firms in southeast England. *Research Policy*, 31(7), 1053-1067.
- Roper, S., Love, J. H., & Bonner, K. (2017). Firms’ knowledge search and local knowledge externalities in innovation performance. *Research Policy*, 46(1), 43-56.
- Rosenbusch, N., Bausch, A., & Galander, A. (2007). The impact of environmental characteristics on firm performance: a meta-analysis. *Academy of Management Annual Meeting Proceedings*, 2007, 1-6.
- Rumelt, R. P., Schendel, D., & Teece, D. J. (1991). Strategic management and economics. *Strategic Management Journal*, 12(S2), 5-29. .
- Sajko, M., Boone, C., & Buyl, T. (2021). CEO greed, corporate social responsibility, and organizational resilience to systemic shocks. *Journal of Management*, 47(4), 957-992.
- Schmid, S., & Dauth, T. (2014). Does internationalization make a difference? Stock market reaction to announcements of international top executive appointments. *Journal of World Business*, 49(1), 63-77.
- Schumpeter, J. A. (1982). *The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle*. Transaction Publishers.
- Schwenk, C. R. (1984). Cognitive simplification processes in strategic decision-making. *Strategic Management Journal*, 5(2), 111-128.

- Sels, L., Tran, A., Greenaway, K. H., Verhofstadt, L., & Kalokerinos, E. K. (2021). The social functions of positive emotions. *Current Opinion in Behavioral Sciences*, 39, 41-45.
- Shi, J. C. (2021). 中国民营经济发展面临的三大挑战 [The development of Chinese private economy faces three challenges]. *China Economic Review*, (04), 62-68.
- Sincorá, L. A., Oliveira, M. P. V. d., Zanquetto-Filho, H., & Ladeira, M. B. (2018). Business analytics leveraging resilience in organizational processes. *RAUSP Management Journal*, 53, 385-403.
- Sirmon, D. G., & Hitt, M. A. (2009). Contingencies within dynamic managerial capabilities: Interdependent effects of resource investment and deployment on firm performance. *Strategic Management Journal*, 30(13), 1375-1394.
- Smart, J., Amar, A., O'Brien, M., Grice, P., & Smith, K. (2008). Changing land management of lowland wet grasslands of the UK: impacts on snipe abundance and habitat quality. *Animal Conservation*, 11(4), 339-351.
- Smith, W. K., & Tushman, M. L. (2005). Managing strategic contradictions: A top management model for managing innovation streams. *Organization Science*, 16(5), 522-536.
- Somaya, D. , & Teece, D. J. (2007). Patents, licensing, and entrepreneurship: effectuating innovation in multi-invention contexts. In 1a. (Ed.), *The transfer and licensing of know-how and intellectual property : understanding the multinational enterprise in the modern world*. (pp. 287-314). World Scientific Book Chapters.
- Song, X. M., & Parry, M. E. (1996). What separates Japanese new product winners from losers. *Journal of Product Innovation Management*, 13(5), 422-439.
- Sperber, S. C. (2017). The top managers' impact on opening the organizational culture to innovation. *International Journal of Innovation Management*, 21(02), 30-43.
- Szambelan, S., Jiang, Y., & Mauer, R. (2020). Breaking through innovation barriers: Linking effectuation orientation to innovation performance. *European Management Journal*, 38(3), 425-434.
- Talke, K., Salomo, S., & Rost, K. (2010). How top management team diversity affects innovativeness and performance via the strategic choice to focus on innovation fields. *Research Policy*, 39(7), 907-918.
- Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319-1350.
- Teece, D. J. (2014). The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. *Academy of Management Perspectives*, 28(4), 328-352.
- Teece, D. J. (2016). Dynamic capabilities and entrepreneurial management in large organizations: Toward a theory of the (entrepreneurial) firm. *European Economic Review*, 86, 202-216.
- Teece, D. J. (2020). Hand in glove: Open innovation and the dynamic capabilities framework. *Strategic Management Review*, 1(2), 233-253.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-533.
- Thong, J. Y. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15(4), 187-214.
- Torres, R., Sidorova, A., & Jones, M. C. (2018). Enabling firm performance through business intelligence and analytics: A dynamic capabilities perspective. *Information & Management*, 55(7), 822-839.
- Tranfield, D., Young, M., Partington, D., Bessant, J., & Sapsed, J. (2003). Knowledge management routines for innovation projects: developing a hierarchical process model. *International Journal of Innovation Management*, 7(1), 27-49.

- Tripsas, M., & Gavetti, G. (2000). Capabilities, cognition, and inertia: Evidence from digital imaging. *Strategic Management Journal*, 21(10-11), 1147-1161.
- Tugade, M. M., & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology*, 86(2), 320.
- Ugaddan, R. G., & Park, S. M. (2017). Quality of leadership and public service motivation: A social exchange perspective on employee engagement. *International Journal of Public Sector Management*, 30(3), 270-285.
- Venkatraman, N., & Ramanujam, V. (1986). Measurement of business performance in strategy research: A comparison of approaches. *Academy of Management Review*, 11(4), 801-814.
- Vera, D., & Crossan, M. (2004). Strategic leadership and organizational learning. *Academy of Management Review*, 29(2), 222-240.
- Wagnild, G., & Young, H. M. (1990). Resilience among older women. *Journal of Nursing Scholarship*, 22(4), 252-255.
- Wagnild, G. M., & Young, H. M. (1993). Development and psychometric. *Journal of Nursing measurement*, 1(2), 165-17847.
- Walsh, J. P. (1995). Managerial and organizational cognition: Notes from a trip down memory lane. *Organization Science*, 6(3), 280-321.
- Wang, C. L., & Ahmed, P. K. (2004). The development and validation of the organisational innovativeness construct using confirmatory factor analysis. *European Journal of Innovation Management*, 7(4), 303-313.
- Wang, G., Holmes Jr, R. M., Oh, I. S., & Zhu, W. (2016). Do CEOs matter to firm strategic actions and firm performance? A meta-analytic investigation based on upper echelons theory. *Personnel Psychology*, 69(4), 775-862.
- Wang, N., Yang, R., Zhou, M., & Yu, L. L. (2021). Research on the Effect of Individual Feedback Seeking Behavior on Creative Performance from the Perspective of the Pattern of Difference Sequence. *Soft Science*, 35(08), 69-75.
- Wang, Y. (2020). Impact of COVID-19 Pneumonia Epidemic on High-quality Development of Private Economy and Countermeasures. *Management Review*, 32(10), 11-21.
- Werner, E. E. (2013). *Handbook of resilience in children*. Springer.
- Wholey, D. R., & Brittain, J. (1989). Characterizing environmental variation. *Academy of Management Journal*, 32(4), 867-882.
- Wink, P., & Gough, H. G. (1990). New narcissism scales for the California Psychological Inventory and MMPI. *Journal of Personality Assessment*, 54(3-4), 446-462.
- Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal*, 24(10), 991-995.
- Winwood, P. C., Colon, R., & McEwen, K. (2013). A practical measure of workplace resilience. *Journal of Occupational and Environmental Medicine*, 55(10), 1205-1212.
- Woodward, S., & Hendry, C. (2004). Leading and coping with change. *Journal of Change Management*, 4(2), 155-183.
- Wright, A. G., & Edershile, E. A. (2018). Issues resolved and unresolved in pathological narcissism. *Current Opinion in Psychology*, 21, 74-79.
- Wright, P. M., Coff, R., & Moliterno, T. P. (2014). Strategic human capital: Crossing the great divide. *Journal of Management*, 40(2), 353-370.
- Wu, K. Q., Zhao, X., Xie, Y., & Wang, X. Y. (2021). The mechanism of entrepreneurial resilience on the entrepreneurial performance of migrant workers returning to their hometowns: a regulated intermediary model. *World Agriculture*, (05), 101-116.
- Wu, L.-Y. (2006). Resources, dynamic capabilities and performance in a dynamic environment: Perceptions in Taiwanese IT enterprises. *Information & Management*, 43(4), 447-454.

- Xi, J. Z., Zeng, Y. T., & Zuo, Z. H., (2015). 中国心理弹性思想探源 [An overview of ideology on resilience in China]. *Chinese Journal of Clinical Psychology*, 23(3), 555-559
- Yang, D., Wang, A. X., Zhou, K. Z., & Jiang, W. (2019). Environmental strategy, institutional force, and innovation capability: A managerial cognition perspective. *Journal of Business Ethics*, 159(4), 1147-1161.
- Yayavaram, S., & Chen, W. R. (2015). Changes in firm knowledge couplings and firm innovation performance: The moderating role of technological complexity. *Strategic Management Journal*, 36(3), 377-396.
- Yeoh, P. L., & Jeong, I. (1995). Contingency relationships between entrepreneurship, export channel structure and environment: a proposed conceptual model of export performance. *European Journal of Marketing*, 29(8), 95-115.
- Yu, Y. H., Zhao, Q. F., & Ju, X. S. (2018). Inventor Executives and Innovation. *China Industrial Economics*, (03), 138-156.
- Zaheer, A., McEvily, B., & Perrone, V. (1998). Does trust matter? Exploring the effects of interorganizational and interpersonal trust on performance. *Organization Science*, 9(2), 141-159.
- Zahra, S. A., Neubaum, D. O., & Huse, M. (1997). The effect of the environment on export performance among telecommunications new ventures. *Entrepreneurship Theory and Practice*, 22(1), 25-46.
- Zainol, N. R., & Al Mamun, A. (2018). Entrepreneurial competency, competitive advantage and performance of informal women micro-entrepreneurs in Kelantan, Malaysia. *Journal of Enterprising Communities*, 12(3), 299-321.
- Zeng, S. X., Xie, X. M., & Tam, C. M. (2010). Relationship between cooperation networks and innovation performance of SMEs. *Technovation*, 30(3), 181-194.
- Zhang, G. Y., Ni, D. B., & Tang, X. W. (2021). 企业创新能力、消费者参与和新产品开发 [Firm's Innovation Capacity, Consumer Participation and New Product Development: An Analysis Based on Signaling Game]. *Chinese Journal of Management*, 18(02), 253-261.
- Zhang, J. C., Long, J., Ling, Y. P., & Jiang, L. (2021). Against the Trend: A Review and Outlook on Firm Resilience Research. *Modernization of Management*, 41(03), 121-125.
- Zhang, X., Liu, S., & Chen, X. (2017). Social capital, motivations, and knowledge sharing intention in health Q&A communities. *Management Decision*, 55(7), 1536-1557
- Zhang, Y., & Li, H. (2010). Innovation search of new ventures in a technology cluster: the role of ties with service intermediaries. *Strategic Management Journal*, 31(1), 88-109.
- Zhang, Y. H. (2008). The moderating effect of dynamic environment on the relationship between entrepreneurial strategy and corporate performance. *China Industrial Economics*, (01), 105-113.
- Zhao, X., & Goodman, R. M. (2019). Western organizational change capacity theory and its application to public health organizations in China: A multiple case analysis. *The International Journal of Health Planning and Management*, 34(1), e509-e535.
- Zhu, M. B., & Li, S. (2018). Analysis of housing inequality between Urban and rural residents in China. *Research on Economics and Management*, 39(09), 91-101.
- Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3), 339-351.

Annex A: Interview Outline

1. Evaluate the company's current technical strength and whether it is in a leading position in the industry? According to the development of companies over the years, how about the trend of performance transformation and performance growth of the company? Does the company attach importance to product innovation, technological innovation and management innovation? What are the advantages of the company compared with peers in the same industry?
2. How often does the company exchange experience and technology with customers, suppliers and peers? How often does the company exchange with the government, financial institutions, research institutes?
3. What do you think are the most important characteristics for a contemporary entrepreneur? Socially active, confident, optimistic, good at interpersonal communication; have a keen insight into things, good at capturing opportunities and taking the initiative to change the environment; like to accept challenges and make risky decisions; seek challenges, dare to assume responsibility, pursue excellence and strive for success?

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Annex B: Questionnaire for Firms

Distribution time:

Respondent No.:

To whom it may concern:

Hello! Thank you for taking part in this survey!

The time required to complete this survey ranges from 15 to 20 minutes.. This questionnaire offers some questions about you and your business. These are important information for you, so please fill them out yourself or they will not be valid. You are not required to think too carefully about each question, but simply answer the questionnaire quickly based on your first reaction to the questions you see. This questionnaire is for personal academic research only and we adhere to the moral codes of scientific research and will not divulge in any form information or data involved in this study to anyone. Your answers will not be judged as right or wrong, so please answer the questions following your direct feelings and thoughts.

Please mark the number before the option you think is appropriate with “√”. Thanks again for your kind help!

Part I: Particulars

Note: This section is divided into 2 parts that describe your personal and corporate information respectively. Please complete this section according to your personal information and the particular situation of your company and select the appropriate answers from the alternatives by **marking the appropriate boxes with “√”**.

1. Individual background information

1.1 Date of birth: MM/DD/YY

1.2 Gender: ☐Male ☐Female

1.3 Marital status: ☐Married ☐Unmarried

1.4 Education background: ☐High school graduate or lower ☐College graduate ☐Bachelor
☐Master ☐Doctor

1.5 Have you ever worked in a foreign-funded company? ☐Yes ☐No

2. Corporate information

2.1 Department you served: ☐Production & Operation ☐R&D ☐Marketing ☐Legal Affairs
☐Finance ☐Other

2.2 Which stage is your employer in? ☐Start-up ☐Growth ☐Expansion ☐Maturity

2.3 Duration upon incorporation of your employer: ☐1 year or shorter ☐1 – 3 years ☐3 – 5 years
☐5years or longer

2.4 Number of employees: ☐10 or fewer ☐10 - 50 ☐50 - 100 ☐100 or more

2.5 Which industry does your employer belong to:

☐ Agriculture, forestry, husbandry and fishery industry	☐ Mining industry	☐ Manufacturing industry	☐ Electricity, heat, gas and water production and supply
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On the Relationship between Personality Traits of Private Entrepreneurs and Innovation Performance of Businesses

☐ Building industry	☐ Wholesale and retail industry	☐ Transportation, warehousing and post industry	☐ Accommodation and catering industry
☐ Information transmission, software and information technology service industry	☐ Finance	☐ Real estate industry	☐ Lease and commercial service industry
☐ Scientific research and technology services	☐ Culture, sports and entertainment	☐ Health and social work	☐ Other

2.6 Which of the following scenarios does your firm's profitability in the past year correspond to?

- | | | |
|---|---|---|
| ☐ Straight-line growth | ☐ Curve-shaped growth | ☐ Stable |
| ☐ Curve-shaped | ☐ Straight-line decrease | ☐ Stable fluctuation |
- Less dynamic and competitive industry environment

Part II: Questionnaire on the relationship between entrepreneurial traits and innovation performance

Part 1 Measurement of entrepreneurial traits:

The following descriptions are your self-evaluation; please select numbers based on your thoughts and perceptions. Different numbers in the questionnaire represent different levels of feeling. Specifically, 1=strongly disagree; 2=disagree; 3=uncertain; 4=somewhat agree; 5=strongly agree. **Please mark the number that corresponds to your opinion with "√".**

- | | | | | | |
|--|---|---|---|---|---|
| 1. I prefer to search for changes in order to enrich my life..... | ① | ② | ③ | ④ | ⑤ |
| 2. I am fond of challenging new things..... | ① | ② | ③ | ④ | ⑤ |
| 3. I remain committed to my goals..... | ① | ② | ③ | ④ | ⑤ |
| 4. I am confident of handling most issues in work and life properly.... | ① | ② | ③ | ④ | ⑤ |
| 5. I stand ready to accept the results different from the expected ones... | ① | ② | ③ | ④ | ⑤ |
| 6. Business failure is other than a crushing blow for me..... | ① | ② | ③ | ④ | ⑤ |
| 7. I am a key figure of the company..... | ① | ② | ③ | ④ | ⑤ |
| 8. I enjoy achievements I've gained..... | ① | ② | ③ | ④ | ⑤ |
| 9. I would like to become famous to more people..... | ① | ② | ③ | ④ | ⑤ |
| 10. I value personal leadership more than team capacity sometimes..... | ① | ② | ③ | ④ | ⑤ |
| 11. I deserve higher income than others..... | ① | ② | ③ | ④ | ⑤ |
| 12. I am the most valuable person for the company..... | ① | ② | ③ | ④ | ⑤ |

Part 2 Measurement of dynamic management capabilities:

The following descriptions are about your experiences in the development of your business; please select numbers based on your thoughts and perceptions. Different numbers in the questionnaire represent different levels of feeling. Specifically, 1=strongly disagree; 2=disagree; 3=uncertain; 4=somewhat agree; 5=strongly agree. **Please mark the number that corresponds to your opinion with "√".**

- | | | | | | |
|---|---|---|---|---|---|
| 1. I am able to accurately spot and timely detect market opportunities and threats... | ① | ② | ③ | ④ | ⑤ |
| 2. I agree to and encourage the absorption of well-educated management talents..... | ① | ② | ③ | ④ | ⑤ |
| 3. I encourage the management team to foster strong innovation atmosphere and exchange ideas..... | ① | ② | ③ | ④ | ⑤ |

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-
4. Most employees are of higher education level.....① ② ③ ④ ⑤
 5. I am experienced in flexibly handling the relationship with clients and suppliers.... ① ② ③
④ ⑤
 6. I am experienced in developing products and services within the strategic scope.....① ② ③
④ ⑤
 7. I value the development and maintenance of external social relations...① ② ③ ④ ⑤
 8. I am ready to establish partnership with more enterprises.....① ② ③ ④ ⑤
 9. I am good at finding valuable resources from the social relation network.....① ② ③
④ ⑤

Part 3 Measurement of corporate innovation performance

The following descriptions are questions evaluating innovation performance measurement of your company; please select numbers based on your thoughts and perceptions. Different numbers in the questionnaire represent different levels of feeling. Specifically, 1=strongly disagree; 2=disagree; 3=uncertain; 4=somewhat agree; 5=strongly agree. **Please mark the number that corresponds to your opinion with “√”.**

1. We often introduce new products and services.....① ② ③ ④ ⑤
2. We have applied for quite a few patents.....① ② ③ ④ ⑤
3. We feature rapid development rate of new products and services...① ② ③ ④ ⑤
4. We enjoy higher success rate of new product and service development...① ② ③ ④ ⑤
5. The proportion of sales volume of our new products and services to the aggregate one is high.....①
② ③ ④ ⑤

Part 4 Measurement of industry environment:

The following descriptions are questions to evaluate the industry environment of your company; please select numbers based on your thoughts and perceptions. Different numbers in the questionnaire represent different levels of feeling. Specifically, 1=strongly disagree; 2=disagree; 3=uncertain; 4=somewhat agree; 5=strongly agree. **Please mark the number that corresponds to your opinion with “√”.**

1. Products and services in this industry are rapidly updated.....① ② ③ ④ ⑤
2. It is hard to predict behaviors of competitors in the same industry...① ② ③ ④ ⑤
3. This industry features constant technical progress.....① ② ③ ④ ⑤
4. Customer demands experience rapid and unpredictable changes...① ② ③ ④ ⑤
5. Competition is increasingly fierce.....① ② ③ ④ ⑤
6. Customer demands are increasingly higher.....① ② ③ ④ ⑤
7. It is increasingly difficult to access essential resources.....① ② ③ ④ ⑤
8. Behaviors of competitors in the same industry become diverse...① ② ③ ④ ⑤

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Annex C: Interview Data

Table 1.1 The interview data

Business name	Year established	Business profile	Interview content	Views of entrepreneur
Business A	2000	Business A mainly invests in real estate and technology industry with self-owned capital, and leases out self-owned properties. In addition, Business A has a taxi fleet and a telegraph pole factory dedicated to the production of public facilities specifically for the city of Tianjin.	Born in 1992, I failed to do well in study, for which I was sent by my father to study in Canada so as to obtain the bachelor's degree. I have launched a website platform to maintain contact with our suppliers and aim to leverage my network capability to bring some benefits to our company.	I hold that, entrepreneurs must be confident. Of course, I am confident. In my opinion, life is not as difficult as we imagine. As long as we trust ourselves, we are highly likely to achieve success.
Business B	2004	Business B mainly engages in R&D, production and sales of and services relating to financial self-service equipment and aims to launch all-round services for large-scale state-owned banks, including national joint-stock commercial banks. It has furnished banks with such products as cash recycling system.	I once worked as an employee on the regular payroll for 20-odd years. During this period, I got acquainted with many friends, embraced the interpersonal network, and accumulated much experience. Later on, I chose to establish Business B by chance. Now we have established cooperation with more than 2,000 clients in China with equipment inventory over 300,000, carried out our business in over 50 foreign countries, and had 700-odd bank outlets accepting our services. Besides, our clients and I visit each other frequently, which results in the close relationship between us.	On my personal note, entrepreneurs must capture opportunities confronting them. In the past, I worked as a civil servant. However, I succeed in grasping the opportunity of market economy, and utilizing my experience and resources to realize the present achievements. I hold that, any man with a dream should possess the capability of seizing opportunities to gain success.
Business C	1989	Business C, a	Business C was	I hold that,

		scientific and technical company, applied for the first patent in the first year of business incorporation. After being marketed, this patented product – the first electrically heated tire bead ring linkage production line achieved success. The company attaches great significance to innovation in terms of products, technology and management. At present, Business C has 86 patents for invention in China and 9 abroad. The capability of developing proprietary intellectual property rights has reached the internationally leading level.	founded by my father under the leadership of my grandpa at the beginning of reform and opening up. Subject to the decision of my family members, I became the Chairman of the listed company at the age of 30 and grew to be one of the youngest chairmen of listed companies then. Business C mainly furnishes its clients with the overall solution to tire factories, and also has its business relating to robot, intelligent logistics and warehousing and air fixtures. Now efforts have been made to achieve development in the medical industry. Therefore, I stand ready to participate in such activities through innovation, so as to gain valuable experience from others. The technological level of our company rivals the internationally leading one and is promising to become better in the future.	contemporary entrepreneurs should have the sense of responsibility. I began to hold the post of Chairman without any preparation, just as notified by my family members. At that moment, I was about to spend my 30 years old birthday. In my opinion, my grandpa is great because he did dare to lead my father and the entire team to start up business upon retirement. Therefore, I dream of shouldering my responsibility, and becoming as excellent as, and even more excellent than my grandpa. This is my pursuit for the rest of my life.
Business D	1994	Business D is a high-tech enterprise driven by both industry and capital, which takes health industry and medical service (i.e., medical rehabilitation, health regimen and health management) as two supporting business. It boasts 5 product R&D centers, 6 public technology centers and 4 scientific research service departments. The company has	Business D was incorporated by my father - a soldier in the past, who was transferred to work in hospital by chance. Expert in medicine, he set up the enterprise with pan-health industry as principal line, comprehensive internationalization as guide, and biological medicine industry as core business. After obtaining the bachelor's degree in computer	On my personal note, contemporary entrepreneurs must possess social competence. Instead of gaining a real-time return, we must spend much time and energy and lots of financial resources to build a platform for young entrepreneurs to communicate with each other while attending such

		successively undertaken and participated in 117 projects (inclusive of significant research projects in innovation of science and technology) of national 863 and 973 Programs. Furthermore, the company has acquired 4 national awards for scientific and technological progress, 19 provincial and ministerial awards for scientific and technological progress and 3 national key new products successively, applied for 1,815 patents with 1,526 patents for invention inclusive, and published 22 monographs, 1,536 Chinese core periodicals, and 242 theses included into SCI. In this connection, Business D has struck a balance between modernization and internationalization and launched a new platform for biological medicine. The Company now has many domestically leading products and technologies. For 10 consecutive years, it has independently developed and innovatively designed a number of new medical equipment such as SC series automatic gastric lavage machines, MC series sputum aspirators and surgical irrigators, which have	from Aston University and the master's degree in international finance from the University of Reading, in 2005, I returned to work in Business D due to the corporate needs. Our company lays emphasis on technological innovation, as evidenced by the so-called fence-free research institute situated at the courtyard of our company. I was born in 1982 and arguably a "second generation of entrepreneur" who has learned a lot from my father when I grew up. My father was born in a poor family, but he studied very hard. After the "Cultural Revolution" (a sociopolitical movement in China from 1966 until Mao Zedong's death in 1976), the college	social activities. I hold that, it is available for us to embrace huge progress by doing so, as we gradually become able to consider problems in a deeper level and grow to be closer with surrounding people. Actually, that benefits our company as well. I think entrepreneurs need the ability to integrate resources. Members in our chamber of commerce are some of the largest companies in Tianjin, and I organize the "second-generation leaders" of these businesses together to do something right
Business E	1993			

		successfully combined new technologies with clinical needs and have been generally accepted by the domestic and international markets.	entrance examination was resumed, and he was admitted to the Tianjin University Institute of Mechanical Research without having attended high school. It was a government-funded study tour in Japan that made my father identify the gap of science and technology between China and other countries and strengthened his belief in developing science and technology in China. To this end, my father returned home and established a high-tech enterprise specializing in the production of new medical devices. We ask our clients about their needs by regularly visiting more than 80 of them every year. We also inspect our suppliers' products every three months to secure quality products. As a medical practitioner, we must be careful enough to safeguard people's health.	and share resources. I have also benefited from this and gained my value by integrating resources.
Business F	1992	After ten years of development, it has now become the largest tailoring chain organization in China. In 1995, the company merged with the Tianjin State-owned Clothing Factory which had been in losses for years and was heavily in debt, making it the first private enterprise in Tianjin to merge with a state-owned enterprise. Our	I was born in 1962 and was a freight clerk at the Xingang Section of Tianjin Railway Branch Administration when I started working. It was a hard work, but I felt that I could not unleash my genius in this job. I got a hobby when I was a student. More specifically, it was making clothes. My friends and relatives asked me to make some new clothes with their fabrics at every festival	The most important thing for an entrepreneur in my opinion is to have faith. I quitted a state-owned company 30 years ago, but I have always been holding the belief that "I need to develop the tailoring industry and create an internationally renowned tailor's shop. This belief

		business has grown in volume and scale since 1988.	and at New Year. Gradually, the idea of opening a tailor's shop came to my mind. Later on, I started my entrepreneurial career with a sewing machine, a scissor, and a ruler. Our fabrics are the best in the world and originate from all over England, Italy, Scotland and France. We never consider the cost of raw materials, and that is why we use these best fabrics.	has supported me to move forward. I think young people nowadays, no matter what they do, should always keep their beliefs and not forget their original aspirations.
Business G	1982	As one of the earliest "Chinese Well-known Trademarks" and one of the first "China Time-honored Brand" enterprises recognized by the State, Business G has been granted dozens of titles and awards such as one of the "Top Ten National Catering Brand Enterprises" and has won numerous honors in international and domestic well-known industry competitions and contests. In 2007, a Chinese authority identified that the brand value of Business G was RMB757 million, ranking first in Tianjin time-honored brands and 26th in Chinese enterprises. It also jumped from the fifty-fourth place to the 18th place in the List of National Top 100 Catering Businesses in 2008 released by the China Cuisine Association.	Born in 1959, I worked as an acrobat at the Tianjin Youth Arts Troupe. Then, by chance, I ended my 23 years of work as an acrobat and entered the business world. I served as chairman of several companies. Later, I acquired Business G with Tianjin Tong Ren Tang, becoming the chairman of Business G. I am constantly upgrading the food features and production processes by communicating with VIPs from home and abroad who dine at Business G. I also add a sense of personal cooking experience and appreciation of traditional Tianjin culture such as cross talk and traditional opera to the dining process for my clients, which further enriched us as a food group. I also regularly inspect the ingredients of food and ask about user experience from clients to ensure food safety and satisfy clients with	Personally, the most important thing for an entrepreneur is the sense of responsibility. I do not want to be the one who distains the reputation of Business G, the calling card of Tianjin's traditional culture. I am further developing this time-honored brand by injecting modern elements so that it can be accepted by more young people. I perceive it as a responsibility and mission which is very important for me.

		our products and services.	
	My father invested in this enterprise that transported cows from Australia and processed dairy products. We are now in the top ten in China, but there is still room for improvement.	Born in 1988, I studied in Australia where I received my master's degree. I studied for a PhD in law, but I failed eventually. After returning to China for a few years, I was involved in a joint venture between my father and an entrepreneurial aunt. We are now in a right track, looking back on our development in the past years. Now we have more than 50 suppliers and over 700 clients, and exchange with our suppliers and peers on experience and technology 2-4 times a year. We also pay a return visit to our clients every 3 months to show the importance we attached to them.	Our company places great emphasis on innovation. I interact with my key clients, shareholders and other stakeholders in various ways once every 1-2 months on average to be informed of their feelings and thoughts on our innovative products and effectively summarize the suggestions they make to improve the quality of our products. I would describe social interaction capability as the most important for an entrepreneur. We can interact with the government, financial institutions, research institutes through various platforms to find support and assistance for growth of our business.
Business H	2015		
	Under the business philosophy of "producing premium steels and developing technology & finance, and fueling culture & health industry", Rockcheck Group has been upgrading its core competitiveness in steel in its strategic layout. Now, Rockcheck is carrying out the new operation	I was born in 1989. My father, an orphan surviving the Tangshan Earthquake (on Jul. 28, 1976), started his business with my mother. He still remains true to the original aspiration as their business grows bigger and stronger. We attach great importance to technological innovation. Our	For me, faith is the most important thing for an entrepreneur. Rockcheck Group donated RMB100 million during the Wenchuan earthquake and RMB100 million during the COVID-19 epidemic. I think the heritage of Chinese private
Business I	2007		

		model of “integration of production, supply and sales”, “integration of iron and steel rolling processes”, “integration of finance” and “integration of online and offline business”. This approach has formed a synergy in all aspects to continuously optimize the production organization and production efficiency, further upgrade the intellectual manufacturing of Funeng Steel, accelerate the “5G+Smart Factory” building and create a dream factory of steel.	Technology Center now possesses 214 employees, of whom 91 are scientific and technical personnel with intermediate titles or above, accounting for 42.52% of the total number of employees in the Center, including 39 senior engineers. 157 scientific and technical personnel have received college education or above, accounting for more than 73.36% of the total number of employees. The Technology Center is a combination of the old, the middle-aged and the young, appoints some experts as technical consultants, and technologically collaborates with scientific research entities and institutions of higher learning such as the Central Iron & Steel Research Institute, Tianjin University, Northeastern University and University of Science and Technology Beijing.	enterprises is both the heritage of enterprise and the heritage of family. The glory of Rockcheck today is attributed to the efforts of each and every member of the family and their firm belief. I think we should continue to develop and grow our business and continue to “give thanks to the community and pass on our love”, turning our beliefs into strength so that Rockcheck can steadily go even further.
Business J	2010	Business J has integrated R&D, production and sales, obtained more than 120 product registration certificates and 150 patent certificates, and undertaken 4 national research projects, 9 provincial and ministerial research projects, including the scientific research project for prevention and treatment of serious infectious	I was born in 1982 and went into the army in Tianjin after completing my postgraduate study. After the military service I led a team to start my entrepreneurial path in biopharmaceuticals which was then called a gaofushuai, or the “tall-rich-handsome”, in the industry. Over the past a dozen years, the team has developed into a R&D team of 200. My	As far as I am concerned, the most important thing for entrepreneurs is not experienced or wealth, but the courage to dream by trial and error. After the outbreak of the COVID-19 epidemic, I have never let go of my concern for the country and the people. Taking advantage of my

diseases such as AIDS and viral hepatitis of the State. The chemiluminescence immunoassay technique it has developed put an end to an unfavorable state that the domestic market was monopolized by foreign high-level medical examination technologies and products and made available to the world products created by China.	company has also been rated as a pilot entity of patent in Tianjin, possessing a number of research results.	expertise, I joined the fight against the epidemic, initiated an emergence argumentation and R&D of a “novel coronavirus antibody test kit”. We got a race against time in those days; I worked indefatigably a few days in order to detect the hidden virus and assist in the epidemic prevention and control.
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