

**A Study of Founder-entrepreneurs from
High-tech Software SMEs in China in
Managing Risks and Exploring Market
Opportunities**

Yanzhi Huang

PhD

University of York

Electronic Engineering Department

December 2022

Abstract

Small and medium-sized enterprises (SMEs) are the backbone of the national economy (Franco *et al.*, 2014). And the rapid growth of the software market has brought in a lot of new opportunities for SMEs, especially in the high-tech software sector in China. However, the development of these SMEs still faces many uncertainties and competition that highly threaten their survival and sustainability (Li, 2019). In such scenarios, having good risk management strategies can be a significant factor towards the development and success of enterprises (Gourinchas *et al.*, 2020; Bartik *et al.*, 2020). However, limited by size and resources, SMEs commonly lack a well-developed risk management structure. In most scenarios, the founder-entrepreneurs tend to play a key role in the risk management of their SMEs (Islam and Tedford, 2012; Oláh *et al.*, 2019). Their personal risk attitude and judgments will therefore directly decide the company's development and direction, and sometimes will even influence the company's survival (Carland *et al.*, 1995).

To understand the risk management status of Chinese high-tech software SMEs, this study adopted a qualitative research approach, using multiple case studies to deeper explore the role of the founder-entrepreneur in the risk management process. Nine founder-entrepreneurs from Chinese high-tech software SMEs have been selected as samples in this study.

The findings show the important role of founder-entrepreneurs plays in the risk management of Chinese high-tech software SMEs. In this study, founder-entrepreneurs are primarily driven by 'pull motivations' to see entrepreneurship as a self-directed pursuit. Besides, the study supports that different personality traits significantly impact the founder-entrepreneurs' risk attitude, and further lead the different risk strategies during the company's operation. Among them, openness and neuroticism are the two main personality traits which highly impact the founder-entrepreneurs' decision-making when facing risks. In this study, participants with a higher level of openness tended to accept new challenges and tasks, they showed a more positive attitude towards facing market uncertainties and addressing challenges. At the same time, people who scored lower in neuroticism have a better capability to manage their emotions. This quality in their personality helps them to be more objective in their decision-making, especially during crises and when facing risks and setbacks.

List of Contents

Abstract.....	3
List of Contents.....	4
List of Tables.....	9
List of Figures.....	10
Acknowledgement.....	12
Author’s Declaration	13
Chapter 1. Introduction.....	14
1.1 Research Background and Research Focus.....	14
1.2 Personal motivation.....	15
1.3 Research Objectives.....	16
1.3.1 Theoretical objectives.....	16
1.3.2 Empirical objectives	16
1.4 Thesis Structure	17
Chapter 2. The Significance of SMEs in China.....	19
2.1 Chapter Overview	19
2.2 Chinese High-tech Software SMEs.....	19
2.2.1 Definition of SMEs	19
2.2.2 Definition of high-tech software enterprises in China	22
2.2.3 The definition of Chinese high-tech software SMEs in this study	23
2.3 The Important Role of SMEs	23
2.3.1 Contribution to national economy	25
2.3.2 Job creation.....	26
2.3.3 Promotion of innovation.....	28
2.4 Risks and SMEs.....	29
2.4.1 Hazard risks.....	31
2.4.2 Financial risks	32
2.4.3 Operational risks.....	34
2.4.4 Strategic risks.....	37
2.5 Risk Management in SMEs.....	38
2.5.1 COVID-19 – a specific risk in recent years	40
2.6 Chapter Summary	47
Chapter 3. The Role of Founder-entrepreneurs in SMEs	48
3.1 Chapter Overview	48
3.2 Who is a Founder-entrepreneur?	48

3.3 Entrepreneurial Motivation	54
3.3.1 Pull and push motivations	55
3.4 Role and Responsibilities of SME Entrepreneurs.....	61
3.5 Personality Traits of Entrepreneurs.....	65
3.5.1 Openness to experience	74
3.5.2 Conscientiousness.....	75
3.5.3 Extraversion	76
3.5.4 Agreeableness.....	77
3.5.5 Neuroticism.....	79
3.6 Founder-entrepreneurs' Influence on the Implementation and Management of a Company's Risk Strategies.....	80
3.6.1 Gender	81
3.6.2 Educational background and skills.....	82
3.6.3 Entrepreneurial motivation	83
3.6.4 Personality	84
3.7 Gap Analysis.....	86
3.8 Chapter Summary	88
Chapter 4. Research Methodology	89
4.1 Chapter Overview	89
4.2 Research Philosophy.....	89
4.2.1 Ontology	89
4.2.2 Epistemology	91
4.3 Research Question.....	92
4.4 Research Design.....	92
4.4.1 Case study as a research approach.....	96
4.4.2 Case selection	98
4.4.3 The process of recruiting cases.....	99
4.5 Data Collection.....	101
4.5.1 Phase 1. General understanding of the cases.....	102
4.5.2 Phase 2. Impact of COVID-19 and responding strategies	103
4.5.3 Phase 3. Personality traits and risk attitudes of founder-entrepreneurs.....	103
4.5.4 Phase 4. Update on risk management and the role of founder-entrepreneurs	104
4.6 Data Analysis.....	105
4.6.1 Interview transcription and translation.....	105
4.6.2 Using NVivo for data analysis	105
4.6.3 Record keeping during the study.....	108
4.6.4 Principal ethics involved in the project.....	108
4.7 Quality of the Case Study.....	110

4.8 Chapter Summary	112
Chapter 5. Review of Case Studies.....	113
5.1 Chapter Overview	113
5.2 Case 1: Kehao Chen from Hangzhou Potential Network Technology Co., Ltd.	113
5.2.1 Profile of the founder-entrepreneur	115
5.3 Case 2: Xingyuan Yuan from Beijing ColorfulClouds Pacific Technology Co., Ltd.	117
5.3.1 Profile of the founder-entrepreneur	118
5.4 Case 3: Ting Xu from Hangzhou Zhupai Information Technology Co., Ltd.	120
5.4.1 Profile of the founder-entrepreneur	121
5.5 Case 4: Qiannan/Nancy Chen from Hangzhou Flyby Network Technology Co., Ltd.	122
5.5.1 Profile of the founder-entrepreneur	123
5.6 Case 5: Zuohua Fu from Zhejiang Ruxie Network Technology Co., Ltd.	124
5.6.1 Profile of the founder-entrepreneur	124
5.7 Case 6: Haijun Xu from Hangzhou Good Memory Information Technology Co., Ltd.	125
5.7.1 Profile of the founder-entrepreneur	127
5.8 Case 7: Pengyao Zhu from Zhejiang Muzhiji Network Technology Co., Ltd.	128
5.8.1 Profile of the founder-entrepreneur	129
5.9 Case 8: Tong Han from Hangzhou eConage Technology Co., Ltd.	130
5.9.1 Profile of the founder-entrepreneur	131
5.10 Case 9: Yong Cui from Hangzhou Wanjian Network Technology Co., Ltd.	133
5.10.1 Profile of the founder-entrepreneur	134
5.11 Chapter Summary	134
Chapter 6. The Important Role of Founder Entrepreneurs in Chinese High-Tech Software SMEs	135
6.1 Chapter Overview	135
6.2 Entrepreneurial Motivation	135
6.2.1 Pull motivation	137
6.2.2 Push motivation	150
6.3 Responsibilities of Founder-Entrepreneurs in Chinese high-tech software SMEs	152
6.3.1 Defining company direction.....	153
6.3.2 Group organisation	156
6.3.3 External relationship maintenance	162
6.4 Chapter Summary	164
Chapter 7. Risk Management in Chinese High-Tech SMEs.....	166
7.1 Chapter Overview	166
7.2 Essential Role Played by Founder-entrepreneurs in the Risk Management Process.....	166
7.3 Risks Encountered by Chinese High-tech SMEs.....	169

7.3.1 External Risks	169
7.3.2 Internal risks	175
7.4 Impact of COVID-19 in Chinese High-tech Software SMEs	184
7.4.1 Risks and challenges	184
7.4.2 Market opportunities due to COVID-19.....	192
7.5 Risk Strategies in Chinese High-tech Software SMEs.....	194
7.5.1 Selecting a clear direction for market growth	195
7.5.2 Seeking external financial support and collaboration	197
7.5.3 Risk evaluation	199
7.5.4 Timely adjustment in the event of risk	201
7.5.5 Reflections and self-improvement.....	208
7.6 Chapter summary	210
Chapter 8. Founder-Entrepreneurs' Personality Traits and Risk Attitudes	211
8.1 Chapter Overview	211
8.2 Risk Attitude of Founder-entrepreneurs	211
8.3 How do Personality Traits Affect the Founder-entrepreneur's Risk Strategies?.....	214
8.3.1 Openness	215
8.3.2 Neuroticism.....	217
8.3.3 Agreeableness.....	220
8.3.4 Extraversion	221
8.3.5 Conscientiousness.....	224
8.4 Chapter summary	226
Chapter 9. Discussion and Conclusion	228
9.1 What Drives Entrepreneurial Motivation?	230
9.2 Risks Affecting SMEs	231
9.3 Impact of COVID-19 on High-tech Software SMEs	233
9.4 Risk Management among SMEs	234
9.5 Personality traits and risk strategies.....	236
9.6 Contributions of the study	238
Chapter 10. Limitations and Further Recommendations.....	240
Reference list.....	243
Appendix List.....	267
Appendix 1. The Definition of SME in China	267
Appendix 2. Research Approach of SME Risk Management Study.....	269
Appendix 3. Research Consent Form	273
Appendix 4. Research Consent Form (Chinese Version).....	274

Appendix 5. First Round Interview Guide	275
Appendix 6. Second Round Interview Guide	278
Appendix 7. Chinese Big-Five Personality Inventory Brief Version (CBF-PI-B) (Chinese Version) ..	279
Appendix 8. Chinese Big-Five Personality Inventory Brief Version (CBF-PI-B) (English Version)....	280
Appendix 9 (a). Risk Questionnaire by Oxford Risk Research & Analysis Ltd	282
Appendix 9 (b). Follow-up Interview Questions on risk attitude.....	285
Appendix 10. Fourth Round Interview Guide	286

List of Tables

Table 2.1 <i>The definition of SMEs in the EU (EU Publications Office, 2015)</i>	20
Table 2.2 <i>Definition of SMEs in the UK (GOV.UK, 2012)</i>	21
Table 2.3 <i>Definition of SMEs in the US (United States International Trade Commission, 2010)</i>	21
Table 2.4 <i>Sources of operational risk (Chapelle, 2019, p.25)</i>	35
Table 3.1 <i>Some definitions of the term ‘entrepreneur’ in entrepreneurial studies</i>	51
Table 3.2 <i>The four dichotomies of the MBTI (Myers et al., 1998, p.6)</i>	66
Table 3.3 <i>Studies related to Big-Five personality traits and entrepreneurship</i>	69
Table 4.1 <i>Contrasting features of quantitative and qualitative research (Bryman, 2003, p 94)</i>	93
Table 4.2 <i>The four phases of data collection</i>	101
Table 4.3 <i>Interview structure of Phase 1</i>	102
Table 4.4 <i>Interview structure of Phase 2</i>	103
Table 4.5 <i>Interview structure of Phase 4</i>	105
Table 5.1 <i>Basic Information of Research Cases</i>	114
Table 7.1 <i>Risk management in Chinese high-tech SMEs</i>	167
Table 8.1 <i>Risk Attitude of Participants</i>	211

List of Figures

Figure 2.1 Main Classification of the Chinese High-tech Industry (Figure edited by the author, source from the National Bureau of Statistics of China, 2018a,b).....	22
Figure 2.2 How to identify a Chinese high-tech software SME (Edited by author)	23
Figure 2.3 The number of SMEs in China from 2012 to 2020 (Blazyte, 2022).....	24
Figure 2.4 Number of people employed by SMEs in the UK 2010–2021 (Clark, 2021).	26
Figure 2.5 US employment by business size (U.S. SBA Office of Advocacy, 2021).	26
Figure 2.6 Proportion of jobs created by MSMEs in China and the US (Ping An Digital Economic Research Center, 2020).	27
Figure 2.7 Gross domestic product per capita: China and other countries (2020) (The World Bank, 2022b).	28
Figure 2.8 Number of COVID-19 cases reported weekly by WHO Region, and global deaths, 30 December 2019 through 1 August 2022 (World Health Organization, 2022)	41
Figure 2.9 Global GDP growing speed (The World Bank Group, 2020).....	43
Figure 2.10 MSME registration and cancellation ratio, 2017–2020 (Ren, 2021).....	44
Figure 2.11 Main pressures on the SMEs by sector (Lu et al., 2021, p.5).....	45
Figure 2.12 Risks and Opportunities for SMEs from COVID-19	46
Figure 3.1 ‘Push’ and ‘Pull’ entrepreneurial motivation (edited by author)	55
Figure 3.2 Different kinds of entrepreneurial motivation (Stephan et al., 2015).....	59
Figure 3.3 A framework for entrepreneurial decision-making model (Vermeulen and Curseu, 2008, p.16)	64
Figure 3.4 The relationship between openness and participants’ entrepreneurial activities (Antoncic et al., 2015, p. 828).....	75
Figure 3.5 Personality traits between entrepreneurs and employees (Janowski and Szczepańska-Przekota, 2022, p.11)	77
Figure 3.6 The relationship between agreeableness and participants’ entrepreneurial activities (Antoncic et al., 2015, p.829)	78
Figure 3.7 The relationship between neuroticism and creativity of entrepreneurs (Gao et al., 2020, p.9)	80
Figure 3.8 Risk behaviours among the three groups of participants (Tyszka et al., 2011, p.128).....	84
Figure 3.9 The connection between entrepreneurs, risk management and SMEs’ development	87
Figure 4.1 Data analysis of the research.....	107
Figure 5.1 The official website of the Hangzhou Potential Network Technology Co., Ltd.	115
Figure 5.2 Kehao Chen, founder-entrepreneur of Hangzhou Potential Network Technology Co., Ltd. ..	116
Figure 5.3 The official website of Beijing ColorfulClouds Pacific Technology Co., Ltd.	117
Figure 5.4 ColorfulClouds Weather	117
Figure 5.5 ColorfulClouds Translate	118
Figure 5.6 Xingyuan Yuan, founder-entrepreneur of Beijing ColorfulClouds Pacific Technology Co., Ltd.	119
Figure 5.7 The official website of Hangzhou Zhupai Information Technology Co., Ltd	121
Figure 5.8 The official website of Hangzhou Flyby Network Technology Co., Ltd.	122
Figure 5.9 Qiannan/Nancy Chen, founder-entrepreneur of Hangzhou Flyby Network Technology Co., Ltd.	123
Figure 5.10 Zuohua Fu, the founder-entrepreneur of Zhejiang Ruxie Network Technology Co., Ltd.	125
Figure 5.11 The official website of Hangzhou Good Memory Information Technology Co., Ltd.	126
Figure 5.12 The costing system of Hangzhou Good Memory Information Technology Co., Ltd.....	126
Figure 5.13 Haijun Xu, founder-entrepreneur of Hangzhou Good Memory Information Technology Co., Ltd.....	127
Figure 5.14 The official website of Zhejiang Muzhiji Network Technology Co., Ltd.	128
Figure 5.15 Pengyao Zhu, founder-entrepreneur of Zhejiang Muzhiji Network Technology Co., Ltd.....	129
Figure 5.16 The official website of Hangzhou eConage Technology Co., Ltd	130
Figure 5.17 AlphaFlow BPM of Hangzhou eConage Technology Co., Ltd.....	131
Figure 5.18 AlphaFlow BPM of Hangzhou eConage Technology Co., Ltd.....	131

Figure 5.19 Tong Han, founder-entrepreneur of Zhejiang eConage Technology Co., Ltd.....	132
Figure 5.20 The official website of Hangzhou Wanjian Network Technology Co., Ltd.	133
Figure 6.1 Entrepreneurial Motivation of Participants	136
Figure 6.2 The daily responsibilities of founder-entrepreneurs in Chinese high-tech SMEs.....	152
Figure 7.1 Different risks faced by Chinese high-tech SMEs.....	169
Figure 8.1 Participants' overall profiles within the Big-Five personality model.....	214
Figure 8.2 Participants' scores of openness	215
Figure 8.3 Participants' scores of neuroticism	218
Figure 8.4 Participants' scores of agreeableness	220
Figure 8.5 Participants' scores of extraversion	222
Figure 8.6 Participant's score of conscientiousness.....	224

Acknowledgement

I would like to express my sincere gratitude to my supervisors, Dr Bidyut Baruah and Prof Tony Ward. I am appreciative of their advice, help, guidance, and encouragement, which has been crucial to my PhD journey and my overseas study experience.

Thank you for your patience and care, Bidyut, you have given me so much help and encouragement both in my studies and in life. You always encouraged me when I was down, guided me when I was confused and warned me when I was slacking off. Without your help, my PhD journey might not have been as warm and memorable.

I want to convey my appreciation to my Thesis Advisory Panel members, Matthew Hollow, Noel Jackson, and Deborah Roberts. I am grateful for their advice, sharing and encouragement, which has helped me to improve my research and build greater confidence.

I would like to acknowledge the support from all the members in the Engineering Management research group. Thank you, Maher, as a colleague and a friend, for always sharing so much useful information and advice with me. Thank you, Noel, thanks for your smile and encouragement. Thank you to everyone I have met in this lovely group, you have made my years in the UK more wonderful.

Thank you to my supervisor during my master's degree, Adar. Without your encouragement, I might not have had the opportunity to be a PhD student.

I am grateful to all the founder-entrepreneurs who participated in my research. Thanks to them for their time and sharing. Thanks to the Zhejiang Small and Medium Enterprises Association who helped me to contact some potential participants to make the study run more smoothly.

I am very grateful to my loved one and friends, thanks for your continued understanding and encouragement. The happiness and emotion you have brought to me has made my study abroad experience less lonely and isolating.

Thank you, Mum, for always believing in me and supporting me. You always encouraged me and comforted me, even in your most difficult times. Without your consistent love and understanding, all my achievements would not have been possible.

Author's Declaration

I declare that this thesis entitle 'A Study of Founder-entrepreneurs from High-tech Software SMEs in China in Managing Risks and Exploring Market Opportunities' is a presentation of original work and I am the sole author. This research has been composed by myself and has not previously been presented for an award at this, or any other University other than the Doctor of Philosophy at the University of York.

All sources are acknowledged as References.

Parts of the thesis are based on my following publications:

Huang, Y., Baruah, B. and Ward, T. (in press) 'Founder-entrepreneurs personality characteristics and their influence on risk strategies within High-tech Software SMEs in China', *International Journal of Business Continuity and Risk Management*

Huang, Y., Baruah, B. and Ward, T. (2022) 'How Founder-entrepreneurs from Chinese High-tech SMEs Assess Market Risks and Explore New Opportunities for Growth and Survival during COVID-19', *Small Business International Review*, 6(2): e504, DOI: 10.26784/sbir.v6i2.504

Huang, Y., Baruah, B. and Ward, T. (2022) 'How Founder-entrepreneurs from Chinese High-tech SMEs Assess Market Risks and Opportunities during COVID-19?', Proceedings of the *7th Business & Entrepreneurial Economics 2022*, Plitvice Lakes, Croatia, 03 - 05 June, pp. 30-38.

Huang, Y., Baruah, B. and Ward, T. (2021) 'How do High-tech Software SMEs in China Manage Risks and Survive in Today's Complex Environment?', Proceedings of the *16th European Conference on Innovation and Entrepreneurship (ECIE 2021)*, ISCTE Business School, Instituto Universitário de Lisboa, Portugal, 15-17 September, pp. 1144-1152.

Huang, Y., Baruah, B. and Ward, T. (2021) 'How Chinese High-tech SMEs are Coping with COVID-19 Related Risks?', Proceedings of the *9th International OFEL Conference on Governance, Management and Entrepreneurship*, Dubrovnik, Croatia, 23-24 April, pp. 63-78

Huang, Y., Baruah, B. and Ward, T. (2021) 'Does Entrepreneurial Motivation Help Build Resilience and Facilitate Success in SMEs? - A Study of Founder-entrepreneurs from High-Tech Software SMEs in China', Proceedings of the *Applied Research International Conference on Business & Interdisciplinary Studies (ARICBIS)*, London, United Kingdom, 17-18 February, pp. 5-16

Chapter 1. Introduction

1.1 Research Background and Research Focus

Small and medium-sized enterprises (SMEs) are usually the economic backbone of most countries (Franco *et al.*, 2014; Altman and Sabato, 2007). In China, more than 97% of companies are SMEs, contributing to about 60% of GDP and 80% of work opportunities (Ministry of Science of China, 2019). Every year, Chinese SMEs, especially in the technical sectors, tend to launch a range of new products and services, which strongly promote market development and innovation (Li, 2006). The number of high-tech SMEs in China reached 320,000 by the beginning of 2022, creating more than 5 million jobs, contributing to about 70% of technological innovations, and over 70% of invention patents (Jin, 2022; Ministry of Science of China, 2019).

Although SMEs have much potential in terms of their innovative capabilities and economic contribution, they are limited by their size, infrastructure, and resources. In today's unpredictable market, they are usually exposed to several risks, which can be detrimental to their success and survival. According to Li (2019), on average, the life expectancy of a Chinese SME is only 3.7 years, with more than half of SMEs failing to survive beyond the first five years. In recent years, the outbreak of COVID-19 has greatly increased market uncertainty and increased the pressure on SMEs to survive (e.g. Diez *et al.*, 2021; Lu *et al.*, 2021; Zutshi *et al.*, 2021). In such scenarios, having good risk management strategies can be a significant factor in building stability for SMEs and their overall development and success.

While large organisations might have the resources and capabilities to handle risks and manage crises, for SMEs such scenarios could potentially be fatal due to their limitations (Crovini, Santoro and Ossola, 2020). Hence, implementing effective risk management can help SMEs better cope with constraints and increase their chances of survival and growth (Smit and Watkins, 2012; Brustbauer, 2016; Crovini, Santoro and Ossola, 2020). However, in most SMEs, the risk management process tends to be simple and informal (Islam and Tedford, 2012). Many studies highlight the inconsistencies with approaches adopted by SMEs for managing risks (e.g. Vargas-Hernández, 2011; Gao, Sung and Zhang, 2013; Brustbauer, 2014; Crovini, Santoro and Ossola, 2020). Brustbauer (2016) indicates that SMEs commonly lack resources and reliable mechanisms to develop their risk-management strategies. They may not be able to develop a sophisticated risk management system within the organisation to face challenges during the company's operation. In most cases, the founder-entrepreneur, as the main decision-maker within a SME, tends to take on the responsibility of risk management. According to Brunninge, Nordqvist and Wiklund (2007), large organisations

with relatively mature management structures, rich resource accumulation and complex ownership are usually very different from SMEs in risk management. In SMEs, the concentration and unification of ownership and management allow entrepreneurs to enjoy a high degree of control and decision-making in their own businesses. In this context, their judgement and assessment of risks can largely determine the strategies adopted for risk management and the direction of the company (Ray, 1994; Britzelmaier, Häberle and Landwehr, 2015). Such judgements and assessments are usually influenced by one's personal traits and characteristics.

Relationships between personality traits and entrepreneurial behaviours are frequently mentioned in entrepreneurship literature (Rauch and Frese, 2007). Dollinger (2008) emphasises that "*The role that individuals play in entrepreneurship is undeniable. Each person's psychological, sociological, and demographic characteristics contribute to or detract from his or her abilities to be an entrepreneur*" (p.21–22). Researchers believe that different personal traits and experiences could lead people to make different decisions when facing similar situations, thus leading to different results (Rauch and Frese, 2007). Although an increasing number of studies have focused on the significant role of personal traits in entrepreneurial activities, there is a lack of consensus on how these characteristics specifically influence entrepreneurs' risk-taking behaviour and thus impact entrepreneurial success or failure. In a lot of studies, when discussing the impact of personal traits on one's entrepreneurial behaviour, the focus is usually on a single trait. However, as Antoncic *et al.* (2015) state, entrepreneurial behaviour is influenced by a combination of factors; in this case, individually analysing the impact of one factor on entrepreneurship may not be comprehensive enough to draw credible conclusions. It is worth noting that many of the existing research studies on risk management and entrepreneurship have focused mainly on Western countries and large organisations. There are very limited studies on high-tech SMEs in China. So, what kind of risks and challenges do Chinese high-tech SMEs face in the current market? How do they assess risks, make decisions, and explore new development opportunities? What roles do founder-entrepreneurs play in the management of such SMEs? What influence do they have on the development of risk strategies as part of risk management? These are some of the research questions that have guided my area of interest and focus for this PhD project.

1.2 Personal motivation

I have some personal reasons that motivated me to choose a research topic related to entrepreneurship. I was born into a business family in China. My parents run a successful business, and from a very early age, I developed a keen interest in business management and aspired to start and run my own company. During my MSc in Engineering Management here at York, I was exposed to more specialised modules related to entrepreneurship, such as 'Enterprise', 'Management and

Marketing of Technology', and 'Strategic and Operations Management'. These courses helped further my interest in entrepreneurship. I was curious to understand why some entrepreneurs could successfully lead their businesses while others would fail under similar market conditions. I wanted to understand how entrepreneurs respond to complex market challenges and changes. These themes and questions helped me to develop a research proposal, and I liaised with my supervisors to develop this into a PhD research project that combined the areas of entrepreneurship and risk management. I decided to focus on the Chinese market as the knowledge and experience I gain from this research will help me with my career aspirations in China.

1.3 Research Objectives

This study aims to build a deeper understanding of the Chinese high-tech software market and how it manages risks and explores new business opportunities.

The outbreak of COVID-19 significantly changed China's market dynamics, bringing unprecedented risks and challenges for Chinese SMEs. This PhD project uses this opportunity to explore and understand the impacts of COVID-related risks for high-tech software SMEs, and the risk management strategies they used to survive and sustain their business operation.

Using case studies of nine successful high-tech software SMEs in China, this research explores the role of the founder-entrepreneurs in the management of their organisation. The overall objectives of this PhD study can be divided into two aspects: theoretical objectives and empirical objectives.

1.3.1 Theoretical objectives

The key theoretical objectives for this study are as follows:

- Discuss the role of high-tech SMEs in China and the risks they face in today's market environment.
- Discuss the overall role of SME founder-entrepreneurs in the management of risks and business operation.
- Present a critical literature review on the influence of personal traits on decision-making and risk management.

1.3.2 Empirical objectives

The key empirical objectives of this research study are as follows:

- Understand the key motivational factors that drive founder-entrepreneurs towards an entrepreneurial career.
- Explore how founder-entrepreneurs from high-tech SMEs engage with the market and assess risks.
- Identify and discuss the strategies used by founder-entrepreneurs to manage risks and explore new business opportunities.
- Discuss how certain personal traits of founder-entrepreneurs can influence their entrepreneurial activities in terms of decision-making and risk strategies.

1.4 Thesis Structure

The thesis is structured into nine chapters. Chapter 1 is an introduction to the thesis. Chapters 2 and 3 focus on the theoretical aspects with an in-depth review of the core literature themes. Chapter 3 discusses the research design and methodology used in this study. Chapter 4 provides an overall introduction to the cases. Chapters 5, 6 and 7 present the empirical findings from the data analysis of the case studies. Chapter 8 gives an overall discussion and conclusion of the thesis. Chapter 9 discusses the limitation of this study and gives some suggestions for further research.

Chapter 1 is an introductory chapter. It provides a brief overview of the research background and focus, points out the gaps in existing studies and introduces the major objectives of this PhD project.

Chapter 2 discusses the definitions of SMEs and the important role they play in boosting the national economy, creating employment and promoting innovation. The chapter also highlights some of the risks that SMEs face in today's market, including COVID-19.

Chapter 3 discusses the important role of founder-entrepreneurs in SMEs and how their personality traits could have an influence on their decision-making and risk management. In this context, the chapter reviews some of the popular models, like the Big-five personality model, widely used in entrepreneurship research. Following the review, the key research gaps will be summarized at the end of this chapter.

Chapter 4 will discuss the research design and methodology, including the philosophical worldview of the researcher. It will highlight the use of a case study and discuss the case selection criteria and data collection strategies used in the research project.

Chapter 5 provides an overview of the nine cases used in this study, including the background of the founder-entrepreneurs.

Chapter 6 explores the entrepreneurial motivation of founder-entrepreneurs and their important

roles and responsibilities in the management of their businesses.

In chapter 7, the focus is on the different risks faced by the nine Chinese high-tech software SMEs in this study and the strategies used by their founder-entrepreneurs to manage their impact.

Chapter 8 discusses the influence of founder-entrepreneurs' personal traits on their decision making and risk management.

An overall conclusion is presented at the end of the thesis, which summarises the contributions and limitations of this study along with some recommendations for future research.

Chapter 2. The Significance of SMEs in China

2.1 Chapter Overview

The important role of SMEs has already been acknowledged in both developing and developed countries and is viewed as the backbone of the national economy (Singh, Garg and Deshmukh, 2009). By 2018, the number of high-tech enterprises in China reached over 2.16 million, a large section of which was SMEs. These enterprises made tremendous contributions toward the improvement of China's innovation capability (National Bureau of Statistics of China, 2019). On the other hand, due to the limitations in size and resource accumulation, the development of SMEs is often constrained by various risks (Islam, Tedford and Haemmerle, 2008).

This chapter focuses on the development status of SMEs. It will first introduce the definition of SMEs from different countries' perspectives and explain the definition of Chinese high-tech SMEs used in this study. And in section 1.3, the chapter will discuss the important role of SMEs based on the existing literature. After that, the chapter will present the main risks faced by SMEs in their operations.

2.2 Chinese High-tech Software SMEs

2.2.1 Definition of SMEs

SMEs are usually a priority for national governments due to their important economic contributions. Hence, to better promote and support such small and medium-sized businesses, some countries have established official definitions to define an SME. However, due to differences in business culture, national economic development, population, and industries among other factors, applying one standard to define all SMEs is not feasible (Gibson and Vaart, 2008). Therefore, the official definition of SMEs tends to vary from country to country. Although specific standards might differ, most countries tend to use variables such as the number of employees, annual income and/or working capital to determine the size of the company (Buculescu, 2013). What follows is a list of definitions of SMEs used in some Western countries and in China.

2.2.1.1 Definition of SMEs in some Western countries

2.2.1.1.1 European Union (EU)

As an economic union, there is a need for the EU to have a standard definition of an SME. A clear definition can help governments choose companies that might need help, and ensure that

support measures work more effectively (EU Publications Office, 2015). To achieve this objective, the EU adopted a proposal for setting a common definition of SMEs in 1996. This definition has been revised a few times over the years, with the latest being published in 2003.

In the EU, SMEs are generally defined by the following criteria (European Commission, 2009):

- Staff headcount, and
- Annual turnover or Annual balance sheet total.

According to regulations, companies that can be defined as SMEs must meet the requirement of the staff headcount. Staff headcount here means its number of employees, which include full-time, part-time, temporary, and seasonal staff. Apprentices or vocational training students, and employees on maternity or parental leave, are not counted. The regulation also establishes asset standards to distinguish companies of different scales. According to the standard, both the annual turnover and the annual balance sheet total can be used as a factor to decide whether the company is an SME. Under the premise of meeting the requirement of the staff headcount, the company can be identified as an SME only by matching any of the asset standards. For example, let's take a case of a company that has 200 employees, €43 million in annual turnover and a €45 million annual balance-sheet total. Although the balance-sheet total already exceeds the limits for medium-sized enterprises, its number of employees and the figure for annual turnover comply with the recommended standards. So, in this case, it can still be defined as an SME (EU Publications Office, 2015).

Table 2.1 shows the definition of SMEs in the EU. According to the official definition, SMEs can be defined as companies which employ fewer than 250 people. Meanwhile, these companies' annual turnover should not exceed €50 million, or their annual balance-sheet total should not exceed €43 million (EU Publications Office, 2015).

Table 2.1 The definition of SMEs in the EU (EU Publications Office, 2015)

SME Definition				
Enterprise category	Ceilings			
	Staff Headcount (number of persons expressed in annual work units)	Turnover	Or	Balance sheet total
Medium-sized	< 250	≤ € 50 million		≤ € 43 million
Small	< 50	≤ € 10 million		≤ € 10 million
Micro	< 10	≤ € 2 million		≤ € 2 million

2.2.1.1.2 The UK

Although the EU offers a common definition of SME to be used within Europe, the national definition of SMEs published by the UK government shows some differences from the EU standard. As shown in Table 2.2, as compared with the EU standard, the UK definition uses gross

assets, replacing the balance-sheet total, which becomes one of the evaluation indexes. According to the regulation of Department for Business, Innovation & Skills, SMEs are those enterprises which have fewer than 250 employees, and their annual turnover should be lower than £25 million, with gross assets not exceeding £12.5 million (GOV.UK, 2012).

Table 2.2 Definition of SMEs in the UK (GOV.UK, 2012)

	Annual Turnover	Staff Number	Gross Assets
SME	Less than £25m	Less than 250	Less than £12.5m

2.2.1.1.3 The United States (US)

The US government has not announced any official definition of an SME. Because of the complexity of its industries, it is difficult to use a common standard to judge firms in the manufacturing, agricultural or service areas. Therefore, some of the US government institutions have given different standards in different industries to determine whether a company is an SME or not (United States International Trade Commission, 2010).

The United States International Trade Commission (2010) published a report which summarised definitions of SMEs from the U.S. Department of Commerce (Commerce), the U.S. Small Business Administration (SBA), and the U.S. Department of Agriculture (USDA). It also analysed data from the Orbis database, a global analytics company which masters the information of more than 310 million companies worldwide. Such a large amount of data ensures the rationality and operability of the SME definition. The criteria for the definition of SMEs are shown in Table 2.3.

Table 2.3 Definition of SMEs in the US (United States International Trade Commission, 2010)

	Manufacturing and non-exporting services firms ^a	Exporting services firms ^b		Farms
		Most	High value ^c	
Number of employees	< 500	< 500	< 500	< 500 ^d
Revenue	Not applicable	≤ \$7 million	≤ \$25 million	< \$250,000
Defining institution	SBA Advocacy ^e	SBA / SBA Advocacy ^f	SBA / SBA Advocacy ^f	USDA
Data source	U.S. Census	ORBIS	ORBIS	USDA

^a Includes exporting and nonexporting manufacturing firms and nonexporting services firms.

^b Selected on the basis of size and export potential, and includes wholesale trade services; professional, scientific, and technical services; and finance and insurance services.

^c Computer services was the only sector in this category.

^d This threshold was imposed by Commission staff to partially harmonize definitions across sectors; it was not imposed by the defining institution.

^e SBA Advocacy from Census data.

^f Revenue parameters established by SBA; employee number established by SBA Advocacy for research purposes.

According to this definition, enterprises are mainly divided into three categories: manufacturing and non-export services, export services, and agriculture. Among them, computer service companies are regarded as high-value industries, which have different standards from other export service companies when judging the status of the company. Although detailed income data

varies from industry to industry, the number of employees is another simple standard that has been recommended to assess a company's size. Regardless of the sector, if the company has fewer than 500 employees, it can be defined as a small and medium-sized business.

2.2.1.2 Definition of SMEs in China

Compared with Western countries, the definition of an SME in China is much more complicated (EU SME Centre, 2018). The definition of Chinese SMEs was revised a few times until 2017, when the National Bureau of Statistics of China published the 'Statistical Methods for Dividing Large, Medium, Small and Micro Enterprises' (National Bureau of Statistics, 2018c), which applies to enterprises of all kinds of ownership and organisation size in China (Yan, 2018). The detailed categories of definition are shown in Appendix 1. The Chinese government classifies companies into 16 different sectors, and based on various characteristics of these industries there are different standards for definition of company size. Three indicators are used to assess the company scale, and these are employee number, annual income, and total assets.

2.2.2 Definition of high-tech software enterprises in China

In China, high-tech industries are divided into two categories: high-tech manufacturing and high-tech services (see Figure 2.1).

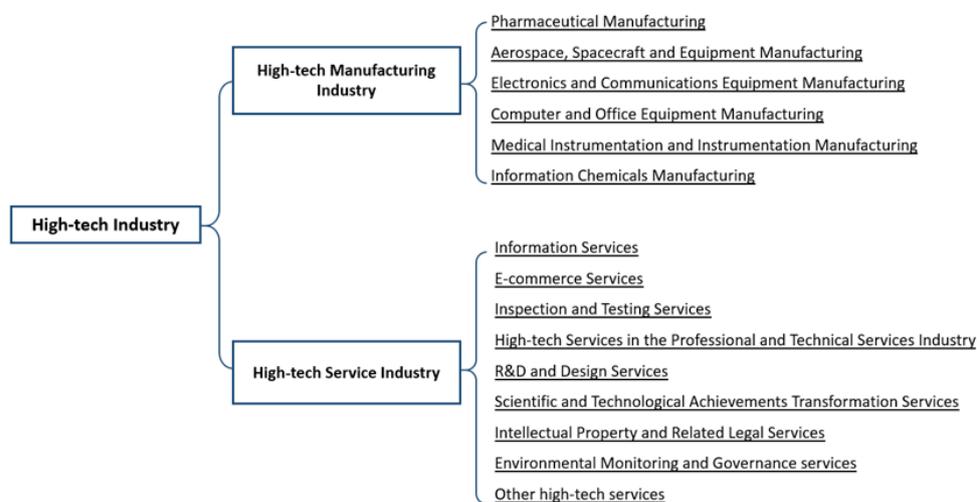


Figure 2.1 Main Classification of the Chinese High-tech Industry
(Figure edited by the author, source from the National Bureau of Statistics of China, 2018a,b)

According to the 'High-tech Industry (Manufacturing) Classification Standard', which is promulgated by the National Bureau of Statistics of China (2018a), high-tech manufacturing is defined as a manufacturing industry with relatively high R&D input intensity. Based on this definition, the standard lists six major categories of high-tech manufacturing industries, which are pharmaceutical manufacturing; aerospace; spacecraft and equipment manufacturing; electronics and communications equipment manufacturing; computer and office equipment

manufacturing; medical instrumentation and instrumentation manufacturing; and information chemicals manufacturing (National Bureau of Statistics of China, 2018a).

The National Bureau of Statistics of China also gives a detailed classification standard of the high-tech services industry, which it divides into nine industry groups: information services; e-commerce services; inspection and testing services; high-tech services in the professional and technical services industry; R&D and design services; scientific and technological achievements transformation services; intellectual property and related legal services; environmental monitoring and governance services; and other high-tech services (National Bureau of Statistics of China, 2018b). Based on this classification, the industry of software development and design is included in the information services industry group and is acknowledged as a high-tech service industry.

2.2.3 The definition of Chinese high-tech software SMEs in this study

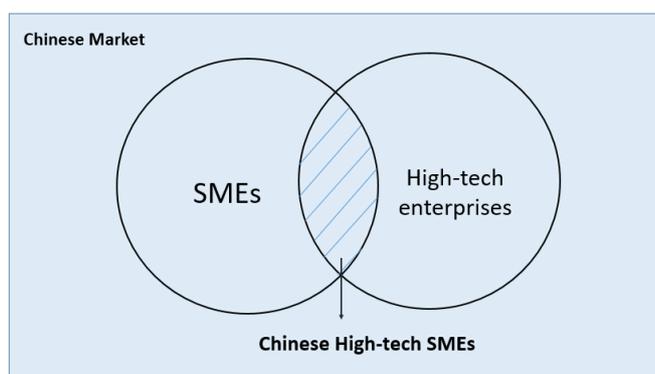


Figure 2.2 How to identify a Chinese high-tech software SME (Edited by author)

This research focuses on Chinese high-tech software SMEs. As Figure 2.2 shows, these enterprises should have both SME and high-tech software company characteristics. In this context, the latest definition of SMEs released by the National Bureau of Statistics of China in 2018 was used for reference. Based on these standards, a Chinese high-tech software SME in this study is defined as a company which mainly provides software and information technology products and/or services. The number of employees in these companies should be less than 250 and their annual income should not exceed ¥100 million (approximately £1.2 million). The company should be established and registered in mainland China.

2.3 The Important Role of SMEs

The importance of SMEs has been widely acknowledged by researchers and economists, and in most countries, SMEs have become the backbone towards promoting national economic growth (Franco *et al.*, 2014; Altman and Sabato, 2007).

There are far more SMEs than there are large organisations. For example, in China, the number of SMEs by the end of 2020 had already reached 43.03 million (See Figure 2.3) (Blazyte, 2022), making up about 95.68% of all registered companies (China Economic Network, 2021; National Bureau of Statistics of China, 2022). The situation is similar in other countries. In the UK, there were 5.6 million SMEs recorded in 2021 (Hutton and Ward, 2021). SMEs are also the backbone of Europe’s economy. Based on the report of the European Commission (2022) on their official website, SMEs “represent 99% of all businesses in the EU. They employ around 100 million people, account for more than half of Europe’s GDP and play a key role in adding value in every sector of the economy. SMEs bring innovative solutions to challenges like climate change, resource efficiency and social cohesion and help spread this innovation throughout Europe’s regions”.

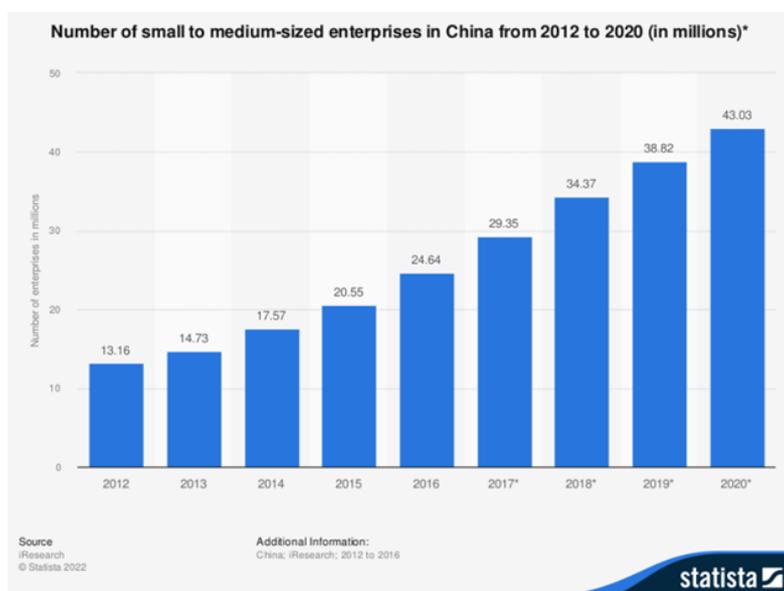


Figure 2.3 The number of SMEs in China from 2012 to 2020 (Blazyte, 2022).

Beck *et al.* (2005) discuss how SMEs' development contributes to economy-wide efficiency and innovation, and aggregate overall productivity growth and their expansion as a major factor for job creation. Yoshino and Hesary (2018) identify the importance of SMEs using four indicators: the number of enterprises, employment, domestic output, and exports. They analyse available data from 15 Asian economies, including the People’s Republic of China (PRC), Japan, and India. They found that in most Asian countries, SMEs are the backbone of the economy, supporting a large proportion of employment and import and export markets. Savlovski and Robu (2011) also support this opinion and highlight that the SMEs and entrepreneurs play a vital role in the industrial development of a country, and they believe that SMEs can become the 'seed' of economic revival. To better understand the significant role of SMEs, their contributions will be analysed from three main aspects, which are:

- Contribution to national economy;

- Job creation; and
- Promotion of innovation.

2.3.1 Contribution to national economy

One of the most significant roles of SMEs is their contribution towards the development of national economy. Venkatesh and Muthiah (2012) point out that although the contribution from individual SMEs might be limited, considering the large number of SMEs in a country, they have become the dominant contributor towards the overall development of the national economy. In the UK, for the year 2021, the turnover of SMEs reached 48% of all companies, which played a significant role in economic growth (Hutton and Ward, 2021). A report from the U.S. Small Business Administration found that small businesses accounted for 44% of US economic activity (Kobe and Schwinn, 2018). As a developing country, China's economic development seems to be more dependent on the expansion of SMEs. According to the Yearbook of China Small and Medium Enterprises (2018), the total income of Chinese SMEs was ¥4.26 billion in 2017, which accounted for more than 60% of GDP (China Centre for Promotion of SME Development, 2019). This shows the increasing importance of SMEs in China's transformation from the aspects of both modernisation and industrialisation. SMEs have in fact become the driving power in China's socialist market economy (Cunningham, 2011).

In addition to financial reporting, many academic studies have also validated the positive impact of SME development to the national economy. For example, Beck, Demirgüç-Kunt and Levine (2005) conducted a cross-country study based on data from 45 countries, including developed and developing countries, to analyse whether the development of SMEs could affect the country's GDP growth. Based on the results, they conclude that taking into account the different characteristics of different countries, there is a strong positive association between the development of SMEs and national economic growth. Ayyagari, Beck and Demirguc-Kunt (2007) analysed data from 76 countries focusing on their SMEs, developing a new cross-country indicator to assess the contribution of SMEs to employment in manufacturing and to wealth creation. They found that SMEs constitute most of the private sector in a large number of developing countries and contribute a lot to national economic development. Audretsch and Keilbach (2004) also support the notion that entrepreneurship can bring vitality to the market and promote faster development of the economy. They used the data of start-up new enterprises from 327 West German Kreise (regions) to calculate the influence of entrepreneurial capital on the national economic output. Their results indicate that entrepreneurship capital is a significant and important factor shaping output and productivity. They suggest that encouraging entrepreneurship could be a new direction for policies focused on promoting economic growth. Similarly, Savlowski and Robu (2011) state that SMEs can become the 'seed'

for economic revival. According to them, SMEs and entrepreneurs play a vital role in industrial development and market expansion both in developed and developing countries.

2.3.2 Job creation

SMEs play a significant role in promoting employment by creating job opportunities. According to a report by the World Bank (2022a), formal SMEs provide more than 50% of employment worldwide, which greatly reduces the national employment pressure of most countries. This report also emphasises that in emerging markets, most formal jobs are generated by SMEs, creating 7 out of 10 jobs (The World Bank, 2022a). In the UK, SMEs account for three-fifths of employment (Clark, 2021). Of these, about 8.75 million people are employed by micro-enterprises, 4.11 million by small enterprises, and 3.47 million by medium enterprises (see Figure 2.4).

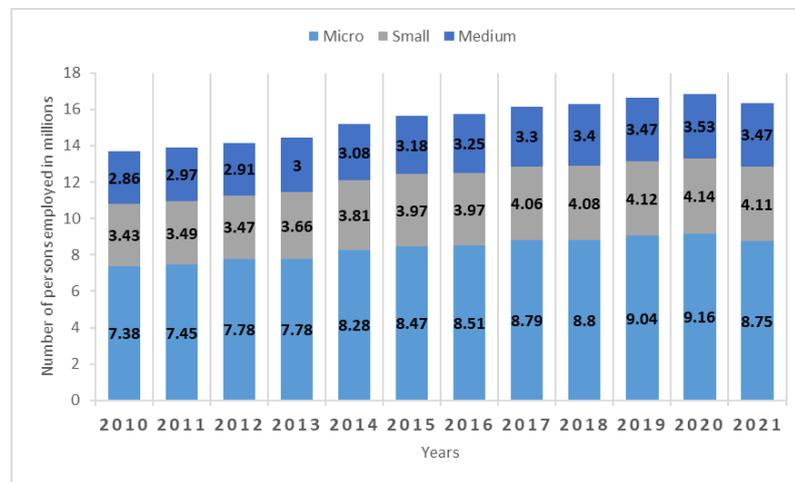


Figure 2.4 Number of people employed by SMEs in the UK 2010–2021 (Clark, 2021).

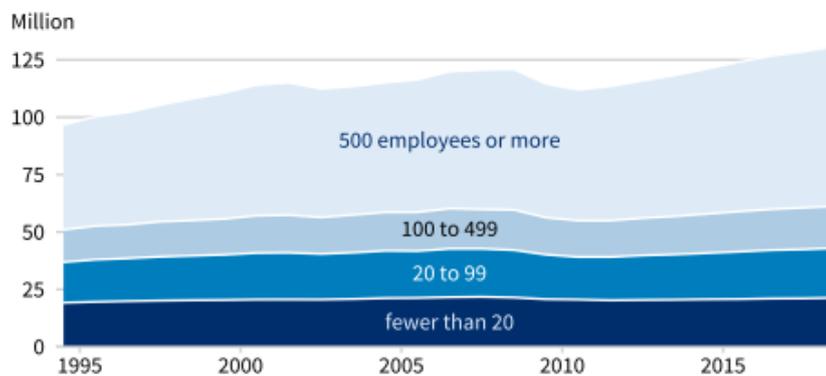


Figure 2.5 US employment by business size (U.S. SBA Office of Advocacy, 2021).

A similar scenario is seen in the US: as Figure 2.5 shows, about 61.2 million people work for small businesses, accounting for 46.8% of national employment (U.S. SBA Office of Advocacy, 2021).

Compared with Western countries, the contribution of SMEs to employment is even more pronounced in China. By 2022, SMEs had provided over 340 million jobs, accounting for over 85% of total urban employment in China (CCTV, 2022). A recent report analysed the proportion of employment created by MSMEs in China and the US (see Figure 2.6). It found that compared to the US, the share of jobs created by Chinese MSMEs is much higher. This implies that the Chinese job market is more dependent on smaller businesses (Ping An Digital Economic Research Center, 2020).

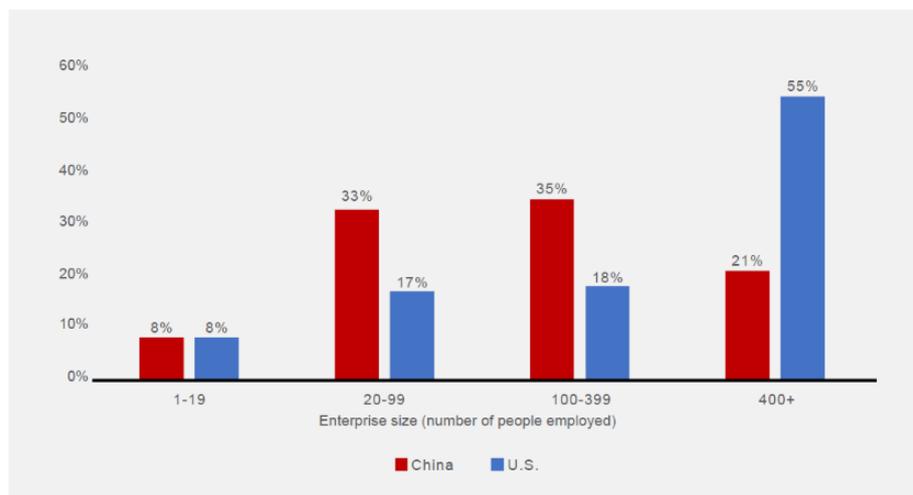


Figure 2.6 Proportion of jobs created by MSMEs in China and the US (Ping An Digital Economic Research Center, 2020).

Ayyagari, Demircuc-Kunt and Maksimovic (2011) explored the different impacts of SMEs on employment in different countries. They present a comprehensive analysis of statistics on the contribution of SMEs towards total employment, job creation, and formal sector growth in 104 developing countries. According to their study, small firms contribute more to employment in low-income countries than in high-income countries. Savlovski and Robu (2011) indicate that one of the reasons why SMEs can be a major source of employment is their lower job-creation costs. Compared with large enterprises, SMEs can create new work opportunities with relatively lower associated resources and costs, which is beneficial to the stability of the national economy and employment rate. Especially for some low-income countries in which may not have strong resource reserves, the benefits offered by SMEs can be vital. China, as the second-largest economy in the world, has a huge economic aggregate with many potentials for market growth and development. However, China's GDP per capita has remained at a relatively low level over the years. As shown in Figure 2.7, China's GDP per capita in 2020 was approximately \$10,500, placing it 81st in the world (The World Bank, 2022b). Based on the annual report from China Small and Medium Enterprises (2018), about 16 million new workers joined the labour force in 2018, which increased the national employment pressure. The report indicates that in order to

expand jobs and improve employment options, China relies on SMEs (China Centre for Promotion of SME Development, 2019).

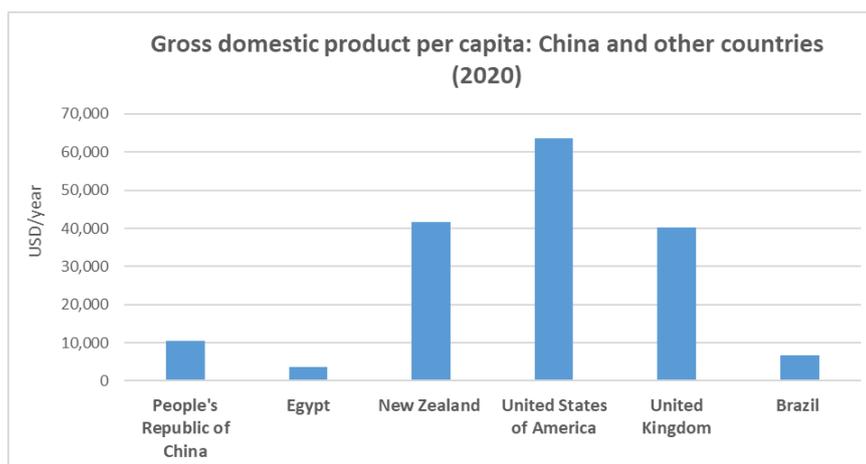


Figure 2.7 Gross domestic product per capita: China and other countries (2020) (The World Bank, 2022b).

Some empirical evidence shows that large enterprises have the ability to offer more stable employment, higher wages, and more non-wage benefits than small firms in developed and developing countries (Brown *et al.*, 1990; Beck, Demirgüç-Kunt and Levine, 2005). Ian, Mazumdar and Page (1987) argue that many small firms are often 'forced' to produce relatively labour-intensive, low-quality, and cheap products due to resource and capacity constraints. Although they can offer a large number of work opportunities, the quality and development of these jobs are questionable. Nyström (2008) points out that SMEs are more likely than large organisations to close down in the event of a critical failure, and in such situations, all employees would potentially lose their jobs. In comparison, working opportunities provided by large companies might be seen as more stable. In addition, because of resource limitations, SME entrepreneurs are more willing to employ people of relatively lower educational and professional levels, and it is also difficult for companies to provide comprehensive staff training for their employees (Cravo, Gourlay and Becker, 2012). Despite some of these limitations, it is evident that overall SMEs do contribute a lot in terms of job opportunities and their important contributions to a country's economy is undeniable.

2.3.3 Promotion of innovation

SMEs are an important source of innovation, providing significant contributions to technological improvement and industrial upgradation (Khaliq, 2011). Yago and White (2014) highlight the significant role of SMEs in innovation development and state that the entry of new companies can lead to new products, services, and business models. These innovative activities and increase the competitiveness and productivity of firms, even fundamentally changing an industry. In addition, they enhance competition and diverse entrepreneurship in the market, leading to further economy-wide efficiency, innovation, and productivity (Beck, Demirgüç-Kunt and Levine,

2005). North and Smallbone (2002) note that compared with large organisations, SMEs tend to have a higher propensity to innovate, because they are more flexible, dynamic, and responsive to shifts in demand and changes in economic conditions. Therefore, SMEs are more likely to bring new and better processes or products to the market.

In China, high-tech SMEs, tend to be one of the most active sectors and according to a report by the Ministry of Science and Technology of the People's Republic of China, the number of high-tech SMEs in China has now reach 320,000 by the beginning of 2022 (Liu, 2022). This has created more than 5 million jobs (Jin, 2022), contributing to about 70% of technological innovations and more than 70% of patents (Ministry of Science of China, 2019). Every year, Chinese SMEs launch a large number of new products and services, accounting for about 80% of the total, which highly promotes market development (Li, 2006). Veugelers *et al.* (2019) mention that innovation investments would commonly involve large and uncertain costs, and the availability of internal and external finance is a critical issue that should be considered by SMEs. Compared with large enterprises with adequate capital accumulation and proven financing channels, small and nascent firms might face more financial barriers and challenges. Especially for R&D-intensive SMEs, the shortage of funds could be a major hurdle to their growth and success.

To promote SMEs' R&D capabilities and growth, governments in different countries have introduced a range of measures, policies, and regulations. For example, the Chinese government has set up support funds for SME innovation projects. It has also implemented a series of supportive measures such as tax reduction and technical assistance and training for innovative enterprises to encourage SMEs to carry out technological innovation and product research and development (High Technology Industry Development Center of China, 2018). In the UK, the government has set up the 'innovation loan' to support small businesses that want to scale up and grow by developing new and improved products, and to help them solve financial problems in the start-up process (GOV.UK, 2017). Cravo, Gourlay and Becker (2012) mention that SMEs always face more competition and challenges than large enterprises. A company's ability to innovate is the most important trait that makes them stand out from the rest of the market competition. For this reason, SMEs should have a higher demand for innovations than large firms.

SMEs do face many challenges due to their limited size and resource accumulation, and some of these risks could have a strong impact on their success and survival. In the next section, the main risks faced by SMEs will be discussed.

2.4 Risks and SMEs

In today's changing business environment, SMEs' growth has been frequently challenged by various risks, which could seriously affect their prospects for growth and even threaten their survival.

Although risk has been widely discussed in the research community, there is still no unified and shared concept and/or definition of risk (Janney and Dess, 2006; Holton, 2004; Haimes, 2009). In traditional definitions, risk is commonly measured from two variables: frequency of occurrence (probability) of the 'risky' event, and the extent of the consequences (magnitude) of the event, which includes all of the results of its occurrence (He, 2018). For example, Lowrance (1980) identifies risk as *"a compound measure of the probability and magnitude of adverse effect"* (p.5). In this context, 'risk' is a description of the likelihood and consequences of harmful effects. Similar to Lowrance (1980), in Kaplan and Garrick's (1981) study, they identify the two main concepts involved within risk, which are 'Uncertainty' and 'Hazard', and use two equations to express their connection to risk:

- Equation 1. Risk = Uncertainty + Damage
- Equation 2. Risk = Hazard/Safeguards

The first equation shows that risks will include uncertainties and could result in some form of loss or damage. The second equation explains the difference between hazard and risk. According to Kaplan and Garrick (1981), 'hazard' simply exists as a source while 'risk' includes the likelihood of conversion of that source into actual delivery of loss, injury, or some form of damage. Therefore, in Kaplan and Garrick's (1981) opinion, risk can be reduced and controlled by increasing the safeguards. But despite using all strategies and measures, one can never reduce risk to zero. In addition, the researchers suggest that risk is a subjective element, and is relative to the observer's feelings, knowledge, and sensitivity. Therefore, *"qualitatively, risk depends on what you do and what you know and what you do not know"* (Kaplan and Garrick, 1981, p.12). For MacCrimmon, Wehrung and Stanbur (1986), risk should cover a potential loss of some amount and there must be a chance of loss. They highlight the significant role of the decision-maker and argue that the actions of the decision-maker can increase or decrease the magnitude or chance of loss.

The definition of risk is more specific in business and management literature. For example, in Chapman and Cooper's (1983) research, risk is defined as the possibility of economic or financial loss or gain. It is a consequence of the uncertainty associated with pursuing a course of action, and/or the possibility of suffering economic and financial losses or physical material damage as a result of an inherent uncertainty associated with an action taken. From the perspectives of the British Bankers' Association (BBA) (1999), the concept of risk includes both positive and negative consequences of an event and these may affect the achievement of the strategic, operational, and financial objectives of a company (BBA, 1999).

In this study, the definition of risk from MacCrimmon, Wehrung and Stanbur (1986) and Kaplan and Garrick (1981) are followed. The risks in the context of Chinese high-tech SMEs for this study are as follows:

- Issues which might challenge and hinder the company's development and growth, or cause potential financial loss.
- Impacts which may be difficult to estimate or have a certain level of uncertainty.
- A significant influence of decisionmakers and their behaviours and strategies adopted, which can reduce or increase the impact of risks on the business.

Florio and Leoni (2017) suggest that good risk identification can help the subsequent risk management process for SMEs. In today's competitive market environment, this process is essential for the company's stable operation and growth. Islam, Tedford and Haemmerle (2008) highlight that only when companies build a clear knowledge of the challenges they may face can they develop appropriate risk strategies and gain a better performance in the market.

One of the most widely recognised and adopted risk classifications was published by the Casualty Actuarial Society (CAS) in 2003, where they categorise risks for enterprises into the following four types:

- Hazard risks,
- Financial risks,
- Operation risks,
- and Strategic risks (Casualty Actuarial Society, 2003).

2.4.1 Hazard risks

Hazard risks, also called 'pure risks', are related to the potential conditions that may lead to injury, illness, or death to workers. The damages that could occur include loss of bodily functions, equipment, or damage to the environment (Rahman and Samin, 2021; Lima, Crema and Verbano, 2020). In the CAS report (2003), seven main risks are identified as hazard risks, which include: fire and other property damage; windstorm and other natural perils; theft and other crime; personal injury; business interruption; disease and disability (including work-related injuries and diseases); and liability claims (CAS, 2003). Compared with other types of risk, the consequences of hazard risk are more intuitive and obvious.

For SMEs, the threat of hazard risks might be greater than for large organisations. Rahman and Samin (2021) point out that due to the limitation of resources and budget, SMEs might be unable to provide a comprehensive safety programme to their employees, which increases their exposure to hazard risks. Bogna, Dell and Raineri (2018) note that due to a number of barriers, such as resources, size, and access to technology, most SMEs do not have the capability to identify and manage health and safety (OHS) hazards, unlike large organisations. For these reasons, the accident rate in SMEs is usually high. In addition, due to the lack of a risk

management system, it is also difficult for SMEs to mitigate negative impacts in the event of a risk. In such scenarios, an occurrence of a hazard risk can significantly affect the development and survival of SMEs.

There seems to be no research studies on hazard risks for high-tech software SMEs. A large number of studies in the literature are related to industries that are physical-work intensive, such as manufacturing (e.g. Willquist and Törner, 2003; Rahman and Samin, 2021; Beqiri, 2020) and construction (e.g. Perlman, Sacks and Barak, 2014; Purohit *et al.*, 2018). There are elements of physical and mental health issues in such sectors due to the nature of the business environment (Rahman and Samin, 2021). In comparison, in high-tech software SMEs, employees usually work in a safer work environment. In this context, the hazard risks may not be frequently highlighted in risk management studies for the high-tech software industry. However, there are still some studies that refer to some health burdens that software engineers may face. For example, Jasmine *et al.* (2021) pointed out that due to their job characteristics, software engineers are required to use computers for a long time every day. This model of work causes intense postural demands, repetitive stress and static muscle loading, which makes software engineers more likely to suffer from musculoskeletal disorders. In this context, Jasmine *et al.* (2021) suggest that software engineers should be aware of the musculoskeletal problems that can be caused by a long time of work. Conducting some coping strategies, such as periodic health check-ups, healthy lifestyles, and adequate breaks between computer usage to reduce the health risks.

2.4.2 Financial risks

Financial risk commonly refers to the tangible losses experienced when a firm suffers from business failure, but it is especially relevant to financial aspects (Kim and Vonortas, 2014). It arises through transactions of a financial nature, including sales and purchases, investments and loans, and various other business activities (Horcher, 2005, p.2). Horcher (2005) summarises three main sources of financial risk:

- An organisation's exposure to changes in market prices, such as interest rates, exchange rates, and commodity prices;
- The actions of, and transactions with, other organisations such as vendors, customers, and counterparties in derivative transactions;
- Internal actions or failures of the organisation, particularly people, processes, and systems. (Horcher, 2005, p 3).

Financial risk is seen as a significant risk that can highly impact most organisations' operations and development. Sosnovska and Zhytar (2018) highlight that maintaining the necessary level of

financial security for enterprises is a prerequisite for ensuring their stable growth and strong competitiveness in the internal and external market environment. Therefore, they suggest developing a comprehensive financial risk management process, which can help companies avoid a large part of financial losses during the operation and help them achieve sustainable development in an unstable economic environment. He and Ma (2021) emphasise that the evolving market economy has increased the financial risks faced by enterprises, which poses a great challenge to their risk management capabilities and capital accumulation. For some companies, without a well-developed financial risk management mechanism these challenges can directly lead to a huge financial crisis, even to bankruptcy and liquidation. In this case, He and Ma (2021) warn that enterprises should pay attention to the financial risks that may arise at various stages of the business process, such as investment, financing, and sales, and adopt strategies to manage them effectively.

Ślusarczyk and Grondys (2019) state that the poor capital background in SMEs carries a high risk of financial loss and bankruptcy. They further explain that compared with large firms, SMEs generally lack sufficient cashflow to support their business operation. In this context, any uncertain issue that could increase the company's financial pressure may lead to a serious financial crisis (Nunes, Serrasqueiro and Leitão, 2012). At the same time, limited by their size and talent/ skills/ resources, SMEs commonly lack a comprehensive system to deal with financial risk. This results in their inability to find effective strategies to mitigate negative impacts when faced with financial risks (Havierníková and Kordoš, 2019). A study by Abimbola and Kolawole (2017) mentions that 60% of SMEs fail within the first five years of their operation. The majority of these failures are related to their poor financial status and inefficient working capital management structure. Abdulsaleh and Worthington (2013) reviewed the literature on SME financing and note that the financial management of SMEs is totally different from that of large firms. Due to their small size, SMEs often lack a systematic financial management structure, many decisions relying on the personal judgement of their founder-manager. The development of SMEs might also rely heavily on the personal savings of the entrepreneurs, especially in the start-up stages. This situation might lead entrepreneurs to consider their personal benefits when managing financial risks, thus making decisions that benefit themselves rather than the business.

In addition to insufficient capital accumulation and weak financial management structures, another common manifestation of financial risk for SMEs is the difficulty in accessing finance (Ślusarczyk and Grondys, 2019). A report from the Bank for International Settlements (BIS) reflected that for SMEs, especially start-ups, financing is the biggest constraint on their development and profitability. It used data from the 2005 European Commission survey and the 2013 SAFE survey to assess the impact of financial constraints on firm profitability. According to its analysis, small and young enterprises may face more challenges in the financing process, and

these problems may lead to a shortage of funds that could affect the expansion and profitability of the business (Banerjee, 2014). Ślusarczyk and Grondys (2019) identify the lack of access to funds as the main challenge for SMEs. They argue that due to their limited accumulation of capital, SMEs generally need external financing support to meet their development needs. However, in the current market environment, SMEs only have a few opportunities to access credit financing or attract investment. Banks are usually unwilling to grant loans to SMEs because they are not considered to have a sufficient repayment capacity and credit base (Ślusarczyk and Grondys, 2019).

R&D and innovation activities are the fundamental drivers for high-tech SMEs to improve market competitiveness (Booltink and Saka-Helmhout, 2018). However, some researchers indicate that the high R&D investment might also increase their financial risks and pressures. Müller and Zimmermann (2009) conducted a survey on around 6,000 German SMEs to analyse the importance of equity finance for the R&D activity. They conclude that SMEs need to take on a high level of risk in the process of business development and innovation. In this case, in order to ensure the smooth development of R&D activities, SMEs have to rely on the original equity investment of their owners since they have not yet accumulated retained earnings and can rely less on bank financing. Moreira (2016) stresses that although SMEs are prospectively the most flexible and adaptive firms in the emerging internet and high-tech market, it is common for them to have limited access to credit, long-term loans, and also suffer administrative obstacles and legal restrictions. These setbacks have hindered the expansion of high-tech SMEs and shaken their enthusiasm for innovation. In this context, Moreira (2016) recommends that the government improve the relevant regulations to support SMEs in addressing their financial challenges. Nunes, Serrasqueiro and Leitão (2012) explore the different relationships between R&D intensity and growth in high-tech and non-high-tech SMEs. They divided the selected SMEs into two groups: non-high-tech SMEs and high-tech SMEs, to compare the role of R&D in the different SME categories and to discuss the financial risks arising from these activities. They found that compared with non-high-tech SMEs, R&D intensity is of greater importance in determining the growth of high-tech SMEs. At the same time, based on their research, the higher R&D investment has increased the financial pressure on high-tech SMEs. Therefore, financial restrictions are more severe in the case of high-tech SME growth than in non-high-tech SME growth.

2.4.3 Operational risks

Operational risk can be defined as a risk of loss as a direct consequence of inadequate or failed processes, people, and systems from external and internal events (Oláh *et al.*, 2019). Islam and Tedford (2012, p.2) state that operational risk mainly "*involves the loss of production and the*

loss of production capability including productivity losses, quality-related losses, interrelated activity losses, and asset losses". Compared to other types of risk, operational risk has a wide range of multifaceted sources. Sweeting (2011, p.102) describes operational risk as "a group of risks which impact on the way in which a firm carries on business. They include a wide number of different risks, which often overlap each other to a significant degree". Chapelle (2019) divided the sources of operational risk into four main categories, which are People, Processes, Systems, and External events, and further details and gives examples of these four sources of risk.

Table 2.4 Sources of operational risk (Chapelle, 2019, p.25)

Level 1	Level 2
People	Resources/Capacity
	Competence
	Engagement
	Experience
Process	Manual complexity
	Documentation
	Multiple input
	Automation
Systems	Availability
	Bug
	Capacity
	Performance
	Obsolescence
External events	Socio-political changes
	Regulatory
	Stakeholder interference
	Natural events
	Third party

As Table 2.4 shows, operational risk has sources in almost all phases of the business. It is related to human resources, such as staff changes, skills shortages and inexperience, and can also occur due to some process and system issues (Islam, Tedford and Haemmerle, 2008). Some external events, including regulatory requirements, competitors, as well as economic and social factors, can also increase the uncertainty of the company's operation (Blome, Schoenherr and Eckstein, 2014).

Operational risk can cause significant financial losses to a business and is often more difficult to predict and identify than other types of risk. Walker (2015) notes that operational risk is not strictly the product of an internal decision process, but rather manifests through the complex web of employees, products, clients, systems, legal judgments, regulations, and fines. Such complex causes make operational risks difficult to control and manage, thus becoming a significant threat to the growth of a company (Guertler and Spinler, 2015). In addition, Walker (2015) warns that the impact of operational risk may be lasting and contagious. It can lead to a series of hazards occurring in succession, and once operational risks arise, business managers may find it difficult to separate these from the business operation. Sweeting (2011) also stresses

the importance of controlling operational risk, arguing that if not correctly managed, operational risk can be the biggest risk faced by any organisation. He further explains that operational failures or inadequacies could result in mistakes and inefficiencies that could result in fines or losses. On a more extreme level, operational failures can directly lead to the ultimate demise of the enterprise. In this context, Walker (2015) recommends that senior management should treat operational risk as a distinct discipline of risk and manage it more systematically and comprehensively to reduce its impact on the normal development of the company.

For any SMEs lacking an adequate risk management system, it may be a great challenge to manage operational risks with complex sources (Bayaga and Flowerday, 2010). Chiweshe and Naude (2017) state that SMEs continuously face various operational risks that could highly impact their productivity, costs, and profits. These can be major setbacks hindering their expansion and success. In such scenarios, developing an operational risk management framework would be a helpful approach to control potential loss. Chiweshe and Naude (2017) point out that compared with large organisations, risk management is not as well-structured or developed in SMEs. They tend not to formally assess and manage their risks, and in most cases, the owner-manager makes the final decision based on their personal experiences. This situation leaves SMEs in a vulnerable position when facing operational risks. Hence, there is a need for SMEs to develop a more comprehensive operational risk management structure to face challenges as part of their daily operation. There is also a need for owner-managers to build a better understanding of risk identification and analysis for companies to survive during times of crisis. Alrashidi and Baakeel (2012) conducted an online survey with 150 employees from different SMEs in Saudi Arabia. Their study found a positive relationship between operational risk management and corporate performance.

A large proportion of operational risk arises from the innovation process and the need for businesses to engage with innovation (Oláh *et al.*, 2019; Epstein and Buhovac, 2006). For high-tech SMEs that rely heavily on innovation activities, controlling operational risk might be a crucial task. For Zhu, Wittmann and Peng (2012), besides financial setbacks, SMEs also face a lot of other operational risks during the innovation process, including complex regulations, external market power, and unstable channel and information about new technologies and markets. These risks can increase a firm's innovation costs and further affect its market performance. Hemrit and Arab (2012) argue that changing market trends require companies to continually improve their knowledge and capabilities to achieve better risk measurement and management systems. High-tech SMEs are usually involved with advanced technologies, and hence the management of operational risks is even more indispensable.

2.4.4 Strategic risks

The existing literature shows an inconsistent view on strategic risk (Acharyya, 2010). For example, Slywotzky and Drzik (2005) define strategic risk as *"the array of external events and trends that can devastate a company's growth trajectory and share-holder value"* (p.80) and categorise strategic risk into seven major areas: industry, technology, brand, competitor, customer, project, and stagnation. However, Acharyya (2010) questions this classification, as this perspective of strategic risk fits more as a source than a category, arguing that the study by Slywotzky and Drzik (2005) does not clearly define risk, but focuses more on analysing the causes of strategic risk and the methods of control. Emblemsvåg and Kjølstad (2002) indicate that finding a definition of 'strategy' is an important prerequisite for properly defining 'strategic risk'. In this case, they refer to the definition proposed by Clausewitz (1997, cited in Emblemsvåg and Kjølstad, 2002, p.846) that strategy is *"the employment of the battle as the means towards the attainment of the object of the war"* and revise it for use in a business context. For them, strategy is *"the employment of competition as the means to attain business objectives"* (Emblemsvåg and Kjølstad, 2002, p.846). Following this definition, they describe strategic risk as *"the risk that arises in the pursuit of business objectives"* (Emblemsvåg and Kjølstad, 2002, p.846). They note that many strategic issues exist in a state of uncertainty; in this context, strategic risks can randomly emerge as objectives are pursued. Therefore, it may be difficult for researchers and managers to measure the probability of strategic risks during the company's operation. Fraser and Simkins (2010) discuss strategic risks from two aspects, internal factors and external factors. For them, external strategic risks mainly include *"the likelihood that industry, economy, legal, and regulatory changes and competitors will cause the breakdown of operations or variability in the firm's earnings"*; while the internal factors refer to *"the likelihood that the firm's reputation, strategic focus, patent, and trademark types of company-specific factors will cause variability in the revenues or net earnings of the firm"* (Fraser and Simkins, 2010, p.510).

Although definitions of strategic risk vary across the literature, they all reflect that managing strategic risk can enhance the value of a company (Bromiley, Rau and McShane, 2015). However, strategic risks tend to be more complex since they involve a careful negotiation between risk and reward (Thu and Phan, 2018). Therefore, for enterprises, managing the strategic risk might be a difficult task. Funston (2004) explains that this situation might be related to the weak strategy and risk management structure. Compared to some common and predictable risks such as financial risks, strategic risks are often categorised as episodic events and are more difficult to assess. In this context, senior managements tend to focus their risk management efforts on more visible risks and ignore the importance of managing strategic risks (Funston, 2004). A study from Slywotzky and Drzik (2005) reflects the lack of strategic risk management among businesses. They state that although companies are becoming more adept at managing financial,

operational, and hazard risks, few managers are yet to systematically address strategic risks. For them, strategic risk takes many forms and can occur at different stages of a company's operation. Therefore, for managers, how to assess and respond to strategic risk might be a major challenge during the risk management process (Slywotzky and Drzik, 2005, p.80).

Compared with large organisations, strategic risk management might be more informal in SMEs. This deficiency makes it difficult for them to properly address the relationship between competitive strategy and performance, and thus suffer the dilemma posed by strategy risk (Parnell, Long and Lester, 2015). Aiming to understand the impact of strategic risks on SMEs' growth, Thu and Phan (2018) conducted a questionnaire on 30 SMEs in Dien Bien. They classify strategic risks into three main categories: political, social, and technological risks, and measure the impact of each of them on the business development of SMEs. According to their analysis, all of these risks act as constraints on the growth of SMEs. The authors suggest that SMEs should therefore develop a range of risk-averse measures to avoid the occurrences of strategic risks. Managers in SMEs should pay attention to external market changes, including changes in social trends, regulatory updates, and technological advances, and use these measures to adjust their company's development strategy. In many SMEs, strategies and decision-making are highly dependent on the personal judgement of the founder-entrepreneurs (Mador, 2000). This helps the company become more flexible and adapt quickly to a changing market (Govori, 2013), but on the other hand, it also increases the likelihood that they will be exposed to strategic risks and errors.

Stuart (1991) indicates that the development of high-tech enterprises involves a great deal of innovative activity and generation of new products, which bring them a lot of uncertainties and challenges. In this context, high-tech companies must take measures against the potentially disruptive consequences that could occur when developing high-risk strategies. The inevitable business and technology risks require entrepreneurs to adapt their strategies in time to ensure the smooth growth of their companies. High-tech companies should aim to develop a comprehensive long-term strategy to maintain their dominance in the market.

2.5 Risk Management in SMEs

Risk management is a systematic process that aims to identify and control uncertainty in the company's operations through a series of actions such as assessment, evaluation, elimination, and minimisation (Conroy and Soltan, 1998). For enterprises that operate in an increasingly dynamic, complex and unpredictable market, risk management can be seen as a key driver of their competitiveness and profitability (Crovini, Santoro and Ossola, 2020) and a prerequisite for their survival and success (McMullen and Shepherd, 2006; Brustbauer, 2016). Radner and Shepp (1996)

describe the essential role of risk management in promoting the company's competitiveness. They state that a good risk strategy can help the company avoid potential losses and explore windows for opportunities and thus achieve a better market performance. Similarly, Belás *et al.* (2015) mention that the market demand is changing more and more rapidly as the economy develops. In this context, to avoid being eliminated from the market, entrepreneurs have to keep bringing new ideas, products, and services to market. Such a changing market forces companies to improve their risk management capabilities to attain a chance of survival. To explore the relationship between the extent of implementation of enterprise risk management and company performance, Florio and Leoni (2017) conducted a study on 462 Italian listed companies from 2011 to 2013, to understand how their risk management activities impact their financial performance and business development. In their study, the companies with more mature risk management systems were both more profitable and better in their evaluation of the financial markets. Based on the results, they suggest that a well-developed risk management system can help companies improve operational and strategic decisions and reduce the direct and indirect costs of risk, thus concluding that risk management activities have positive implications for the long-term growth of the company.

For SMEs, risk management could potentially be much more important than for large organisations. Due to the constraints of size and resources (López and Hiebl, 2015), the risk-bearing capability for SMEs might be much lower than for large organisations. While larger companies may be able to absorb some of the losses, for SMEs the same losses could be fatal (Crovini, Santoro and Ossola, 2020). In this context, implementing effective risk management can help SMEs better cope with constraints and increase their chances of survival and growth (Smit and Watkins, 2012; Brustbauer, 2016; Crovini, Santoro and Ossola, 2020). Smit and Watkins (2012) point out how both SMEs and large enterprises are running in the same market environment. They have to face similar challenges. However, due to SMEs' characteristics, they might face more pressure. Kozubíková *et al.* (2015) state that the inability to tolerate risk is one of the most common reasons for an SME's failure. For many SMEs, financial losses caused by market risks may seriously damage the company's cashflow, and result in further consequences, even affecting the chances of the company's survival. Therefore, SMEs should pay more attention to risk management to seek stable and long-term market development.

Although the importance of risk management is widely recognised, in most SMEs the risk management process tends to be informal (Islam and Tedford, 2012). Oláh *et al.* (2019) mention that inadequate funding is a major impediment to the development of risk management in SMEs. And the shortcomings in risk identification and inadequate implementation of risk management can cause problems for SMEs in terms of competitiveness and sustainability. Brustbauer (2016) indicates that many enterprises lack the resources and reliable mechanisms to develop their risk-management strategies, and this is particularly notable for SMEs. While larger organisations tend

to manage risk through some formal and comprehensive approach, SMEs, due to their resource constraints, may not be in a position to develop a relatively sophisticated risk management system.

Another important feature of risk management in SMEs is the involvement of entrepreneurs. Unlike large organisations with a complex management structure, the ownership and management of SMEs are usually carried out by one person. In many cases, the founder-entrepreneur is responsible for directing and controlling the company as well as making pivotal decisions. Brustbauer (2016) highlights the significant role entrepreneurs play during the SME's risk management process and states that due to the simplicity of the risk management structure, most risk strategies rely on the personal judgement of the entrepreneur. In this context, entrepreneurs are generally described as 'risk takers', who are responsible for assessing risks and making the final decisions. Therefore, the entrepreneur's perception of risks directly affects the company's risk-management approaches. Crovini, Santoro and Ossola (2020) implemented a multi-case study involving 3 entrepreneurial SMEs located in north-western Italy. Their study found that risk management was not formalised in the three SMEs selected for that study. However, the lack of a formal risk management framework does not mean that SMEs ignore risk activities in their operations. Crovini, Santoro and Ossola (2020) indicate that in SMEs, the risk management process may not need to be formalised using manuals, flow charts or written procedures, as risks can be easily managed by the owner-manager. They further explain that the organisational structure of SMEs is commonly small and not well structured; in this case, formalising the risk management process by defining a group of people with specific competencies would also be time- and cost-consuming (Henschel, 2006). Hence, a simplified risk management approach from the founder-entrepreneur may be a more appropriate approach to maintain the flexible nature of SMEs (Crovini, Santoro and Ossola, 2020).

2.5.1 COVID-19 – a specific risk in recent years

2.5.1.1 The emergence of Covid-19

In December 2019, Wuhan Municipal Health Commission first reported a type of 'unknown' pneumonia (Wuhan Municipal Health Commission, 2019) leading the Chinese Government to take immediate measures. This situation was promptly highlighted to the World Health Organization (WHO) (Health Emergency Office of China, 2020; World Health Organization, 2020). This pneumonia was later labelled as Corona Virus Disease 2019 (COVID-19) by the WHO in February (World Health Organization, 2020). It is a contagious respiratory and vascular (blood vessel) disease caused by a specific type of coronavirus — Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2) (Smith, 2020). Infected patients often exhibit symptoms such as fever, cough, fatigue, shortness of breath or difficulty breathing, and loss of smell and taste (Ye, Wang and Mao, 2020).

Due to its highly contagious nature, COVID-19 rapidly exploded and spread across the entire

world (Han *et al.*, 2020). Figure 2.8 shows the overall situation of COVID-19 worldwide based on WHO (2022) data. From the latest data as of August 2022, it can be noted that despite several measures worldwide, this global pandemic is still very serious. As of 3 August 2022, there had been 577,018,226 confirmed cases of COVID-19, and over 6.4 million people had lost their lives to this health crisis (World Health Organization, 2022).

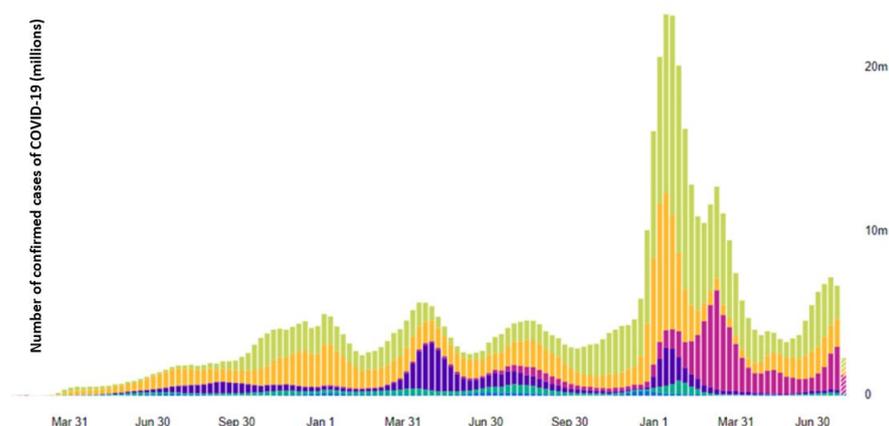


Figure 2.8 Number of COVID-19 cases reported weekly by WHO Region, and global deaths, 30 December 2019 through 1 August 2022 (World Health Organization, 2022)

In response to this global situation, Dr Tan Desai, the Director-General of WHO, issued a warning in the media. He asked countries all over the world to take strong measures to slow down the spread of COVID-19. This included banning public gatherings, encouraging people to work from home, temporarily closing schools, colleges, and universities, requiring public to maintain adequate social distance, using face masks and increasing personal hygiene such as washing hands (World Health Organization, 2020). These strategies have been effective in controlling the spread of the pandemic, but on the other hand have also increased the pressure on the economy to some extent (Nicola *et al.*, 2020).

Fortunately, with the availability of vaccines, the threat to people's health from COVID-19 has become more manageable (Tandoc and Lee, 2022). In this context, many countries such as the UK have slowly started to lift restrictions (GOV.UK, 2022). However, the attitude and strategies of the Chinese government to prevent COVID-19 are very different. As the first country to be hit by COVID-19, the Chinese government has been taking a relatively strict and cautious approach to managing the outbreak. Unlike other countries, China is determined to keep the number of confirmed cases to a very low level, and this policy is named 'Dynamic Zeroing' (GOV.CN, 2022). Such an efficient controlling method quickly limited the potential spread of the virus, bringing some form of normality to China in the short term (Huang, Baruah and Ward, 2021; Guan and Zhong, 2022).

But with the recent relaxation of preventative measures by other countries, the pressure on the Chinese government is also increasing (Vasiev *et al.*, 2020). Strict pandemic prevention and control measures highly affected the recovery of the economy and the normal life of the population. To express their dissatisfaction with this policy, in November 2022, citizens in some Chinese cities, including Shanghai and Chengdu, staged protests to advocate for the removal or relaxation of the current pandemic measures. This activity further forced the government to rethink the current COVID policies (Wong and Williams, 2022). Ding and Zhang (2022) note that the long-term strict prevention strategies can cause social exhaustion among the public and increase the economic downward pressure. They suggest that the Chinese government should find a way to balance the wellbeing of the public with the need to have measures in place as a country to control the pandemic. Otherwise, the unpredictable and prolonged quarantine will greatly affect people's lives and work rhythms. Guan and Zhong (2022) also support this opinion. They state that *"The dynamic zeroing policy has been adopted for maintaining effective disease prevention and control. However, China needs to reopen so as to normalize socio-economic development and adapt to global reopening"* (p.4). They recommend that the Chinese government should make efforts to enforce vaccination nationwide, invest resources, and offer adequate medical treatment so as to reduce the risk of cases progressing to critical illness and death. With this approach, China could gradually begin to experiment with an orderly and effective re-opening.

2.5.1.2 COVID-19 and SMEs

Due to COVID-19, countries all over the world had to adopt measures such as border closures, travel restrictions, and quarantines to slow down its spread. There is no doubt that these measures are necessary; however, they also significantly influence the development of the global economy (Nicola *et al.*, 2020). A recent report published by the World Bank Group (2020) about the Global Economic Prospects describes the impact of COVID-19 on global economic growth, making reasonable predictions on its future. It points out that the international market has faced significant challenges this year because of the impact of COVID-19. The growth rate of global GDP appears negative for the first time since 1990 (see Figure 2.9) (The World Bank Group, 2020). In this challenging market environment, a large number of companies are either closing down or using extreme survival measures, such as laying off staff members and reducing expenditures wherever possible to decrease financial pressure. The increasing rate of unemployment is now becoming a big risk for the national economy of many countries (Chetty *et al.*, 2020).

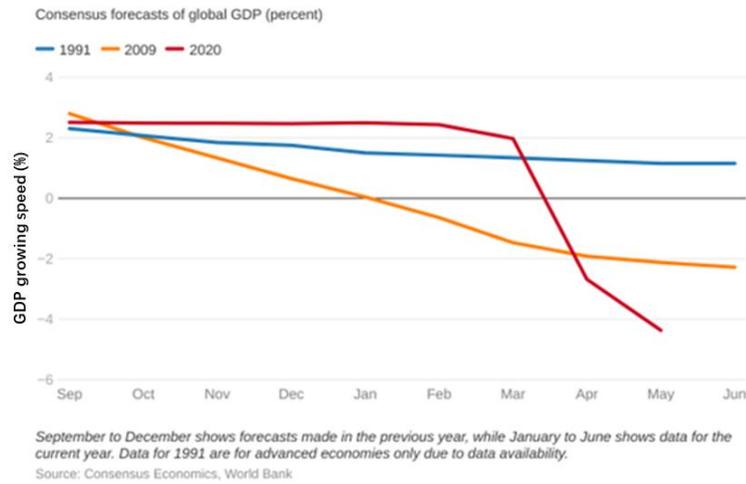


Figure 2.9 Global GDP growing speed (The World Bank Group, 2020)

Compared with large organisations with relatively higher risk tolerance and more resource accumulation, the impact of COVID-19 on SMEs is more serious. The International Monetary Fund estimated the impact of COVID-19 on business failures among SMEs in 17 countries based on a large representative firm-level database. Based on their research, if the government does not adopt a series of supportive measures to help the SMEs' survival, the failure rate of SMEs will greatly increase by nearly 9% (Gourinchas *et al.*, 2020). Bartik *et al.* (2020) also highlight how SMEs struggle under COVID-19, and conducted a survey with more than 5,800 small businesses in the US. In their sample, 43% decided to temporarily close their business whereas many others chose to reduce their employee counts. Bartik *et al.* (2020) indicate that businesses on average had to cut down 40% of their employees to reduce the financial pressure. For SMEs, the prospects of further expansion and development has taken a big setback.

For Chinese SMEs, the impact of the pandemic was also significant. Figure 2.10 shows the Chinese SMEs' development status from 2017 to 2020. As seen in the figure, due to the impact of the pandemic, the growth of Chinese micro, small and medium enterprises (MSME) continued to decline, with the registration to write-off ratio falling to a historic low in 2020. This shows that an increasing number of small businesses decided to leave the market during the pandemic, with only a limited number of new businesses managing to set up in such unprecedented times. The total number of MSMEs in the Chinese market dropped by 10% in just a year in 2020. Ren (2021) claims that this record should be taken seriously by the government and existing founder-entrepreneurs. He argues that COVID-19 highly impacted the market environment and further increased the difficulties for SMEs to survive. In this case, the government should implement a number of supportive measures to help companies maintain normal operations and find some form of stability.

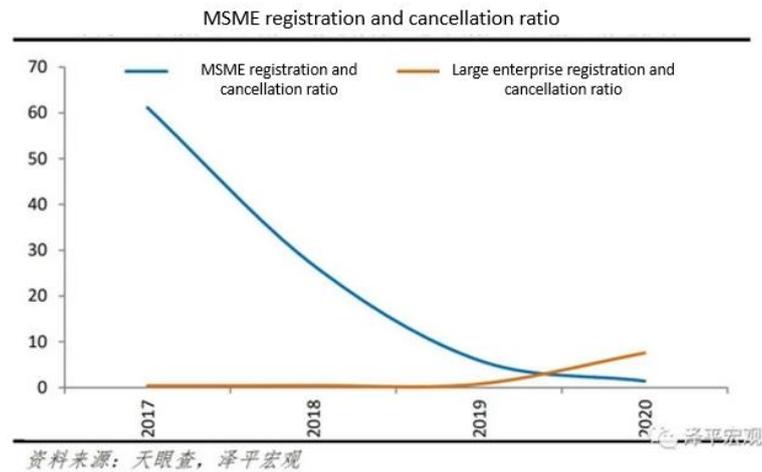


Figure 2.10 MSME registration and cancellation ratio, 2017–2020 (Ren, 2021)

As Gourinchas *et al.* (2020) highlights, the impact of COVID-19 is unprecedented, both in its complexity and its severity. And for SMEs in different sectors, the impact of COVID-19 varies. Fernandes (2020), for instance, observed how the pandemic severely disrupted global supply chains, causing resource shortages in several areas. Countries have been taking various measures, such as quarantines, travel restrictions, and lockdowns to control the spread of the pandemic. Sectors such as tourism and hospitality had to face many negative consequences due to measures such as limiting public gatherings, work-from-home schemes, temporary closures of educational institutes and hotels, strict social distance policies, and mandatory wearing of face masks in public spaces. In addition, the lockdown measures and policies have also resulted in many people losing their stable sources of income. Alves *et al.* (2020) note how the outbreak has widely impacted SMEs in terms of demand constraints and HR issues. A study by Sun *et al.* (2021) identifies some of the negative impacts of COVID-19 on Chinese SMEs' performance. They highlight some of the major setbacks such as logistics blocks, shortages of labour, and a decline in consumer demand. Lu *et al.* (2020) surveyed 4,807 SMEs in China and found how the pandemic presented a huge existential challenge for SMEs impacting the resumption of work, income, and confidence with day-to-day operations. Ma, Liu and Gao (2021) similarly conducted a survey with 234 SMEs from various industries in Beijing to study the specific challenges from COVID-19. They studied the pandemic's impact from four perspectives: financing activities, markets, employees, and costs. Their analysis showed that the market had the most prominent effect from the pandemic and emphasized the importance of support from government to reduce the negative impact of the pandemic on SMEs. Gourinchas *et al.* (2020) used a large representative firm-level database from 17 countries, including Japan, Korea and the United Kingdom, to estimate the impacts of the COVID-19 crisis on business failure among SMEs, concluding that without government support, the failure rate for SMEs would increase by nearly 9%. Lu *et al.* (2021) collected data from 3,194 SMEs engaged in the primary sector such as manufacturing, wholesale

and retail trade and hospitality in Sichuan, China, to understand the impact of COVID-19 on different categories of SMEs. As can be seen in Figure 2.11, for all categories of SMEs, financial pressures, declining market demand and strict pandemic management measures are the major challenges which highly influenced the company's stable development. And for some other COVID-related risks, such as products or services delivery and supply chain management, the impact varies in intensity across different categories of businesses.

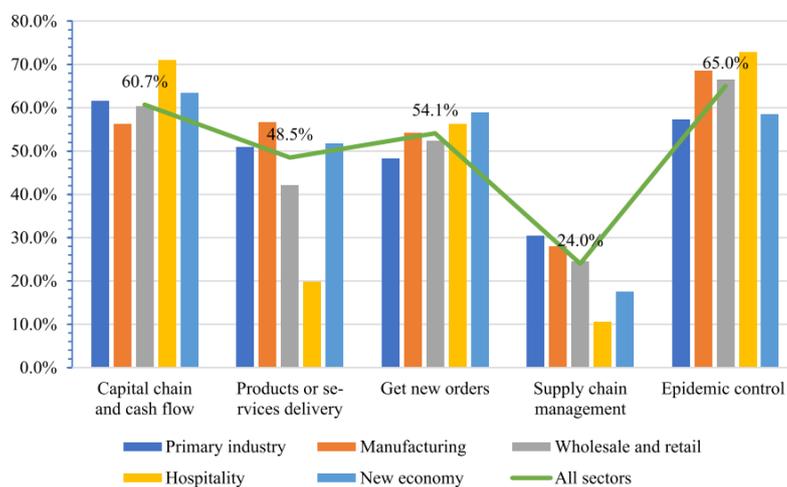


Figure 2.11 Main pressures on the SMEs by sector (Lu et al., 2021, p.5)

For example, according to Lu *et al.* (2021), challenges in products or services delivery seem to have little impact on the operations of SMEs in the hospitality industry. It might be related to their business contents, SMEs in the hospitality industry mainly provide services to their customers and do not rely on the transportation of large quantities of products. On the other hand, for companies in the primary sector, the obstacle of transporting could be more fatal. Lu *et al.* (2021) mention that SMEs in the primary sector faced poor logistics, especially during the early stages of the outbreak when road controls and staff shortages hampered the transport of feed ingredients, finished products, and farm animals, affecting feed supplies and increasing costs. Poor logistics also prevented the timely delivery of orders, which further increased the difficulty of selling, and this led to a backlog of stock, which in turn increased the financial pressure on SMEs. For small businesses in the wholesale and retail trades, the challenges of products delivery were also present. The lockdown during COVID-19 hindered the timely delivery of goods. And this change prompted some SMEs to start experimenting with online sales approaches. Lu *et al.* (2021) feel that from a long-term perspective, this shift might be beneficial to the development of retail SMEs as more businesses are exploring innovative and advanced sales models to build their competitive advantages. So, despite the challenges and risks, the pandemic has pushed organisations to build their resilience and competitiveness through innovation and explore new opportunities by thinking outside the box.

Zutshi *et al.* (2021) observe how the beginning stage of the pandemic brought a period of confusion and fear of the unknown and a general lack of acceptance with a lot of unanswered questions. With time, there was a gradual stage of acceptance and adaptability leading to “*fantastic examples of creativity and innovation*” (p. 7). For instance, when the hospitality sector faced serious survival threats at the peak of the pandemic due to the nationwide lockdown, Lau (2020) notes how hotel chains were forced to explore new approaches and technologies to generate revenues, maintain cashflow, and mitigate the impact of the pandemic. Several hotels started using information and communication technologies to optimise their innovation performance, build/sustain brand awareness, and reduce safety risks. Some used live promotion via streaming platforms, live-stream conferences to replace face-to-face conferences, Artificial Intelligence-based temperature checks for seamless check-in services, and robot-based room services and deliveries. There was also a general push/demand for better internet connectivity and technology as remote-based working schemes became more and more common among several organisations. There was an increase in the use of social media and IT to promote businesses and their products and services such as takeaway food options from regular restaurants. In this context, researchers like Alves *et al.* (2020) and Adam and Alarifi (2021) observe a heavy reliance on technology during the crisis and note the importance of technology utilisation to improve the performance of SMEs and build their likelihood of future survival. Zutshi *et al.* (2020) observe how SMEs also focused on local partnerships with other businesses and local councils to build their resilience during the pandemic. There was more openness and transparency in communication with both internal and external stakeholders in order to strengthen and preserve their relationships. Alves *et al.* (2020) suggest that there should be more investment from governments to improve IT and telecommunication infrastructure and support for local SMEs to adapt to these changes in the business environment. Following the review, Figure 2.12 summarises the key risks and opportunities faced by SMEs from COVID-19:

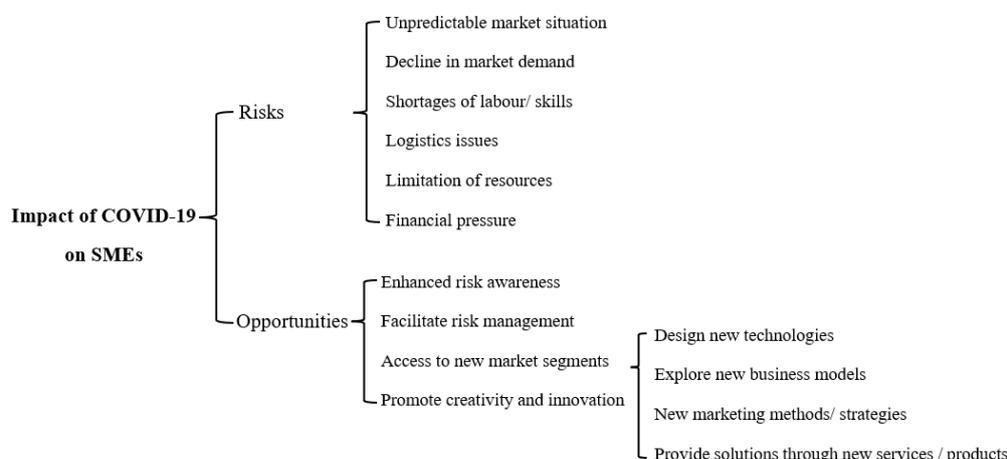


Figure 2.12 Risks and Opportunities for SMEs from COVID-19

2.6 Chapter Summary

This chapter comprehensively introduced the development status of SMEs based on current studies. It firstly described the definition of SMEs in different countries and highlighted the definition of Chinese high-tech software SMEs used in this PhD project. The chapter then analysed the significant role of SMEs particularly in their contribution to the overall economic development, promoting employment, and advancing innovation. However, due to size and resource constraints, the growth of SMEs is often challenged by various types of risks. In this context, this chapter provided a detailed discussion of the various types of risks faced by SMEs and the state of risk management in SMEs, including the significant risk faced by SMEs in recent years, COVID-19. Based on the analysis, it can be found that in most SMEs, entrepreneurs commonly play a significant role during the risk management process. In the next chapter, the thesis will focus on the founder-entrepreneur, to understand the role they play during the company operations and how their personal traits could impact the risk management approaches used in SMEs.

Chapter 3. The Role of Founder-entrepreneurs in SMEs

3.1 Chapter Overview

This chapter will explore a range of literature and present an up-to-date account of the role of founder-entrepreneurs and the impact of their personal traits on their entrepreneurial behaviours.

It will first present the various definitions of founder-entrepreneur proposed in the literature and identify the definition used in this project. After that, in section 2.3, it will discuss the motivations which drive people to start their own businesses. The role and responsibilities of founder-entrepreneurs will be discussed in section 2.4. Another focus of this chapter is to explore the impact of entrepreneurs' personality traits on their entrepreneurial behaviour. For this, an important personality model, the Big-five personality model will be discussed. The chapter will also cover how different personal factors, such as gender, educational background, and personality traits can impact the risk strategy among founder-entrepreneurs. Following the literature review, the key research gaps will be presented at the end of this chapter.

3.2 Who is a Founder-entrepreneur?

Founder-entrepreneur is a compound word, in which case, in order to understand the definition of the term, we need to explain the meaning of the keyword 'founder' and 'entrepreneur' separately.

Founders, as firm creators, are the initial architects of the organisation's structure and strategy (Nelson, 2003). In reviewing the existing literature, the meaning of 'founder' appears to be closely related to the incubation and formation of a company. For example, in their study, Wadhwa *et al.* (2009, p.8) define a founder as "*an early employee, who typically joined the company in its first year, before the company developed its products and perfected its business model*". Abid *et al.* (2012) also propose a similar definition, that a founder is the person who has established and supported a new business enterprise. They not only build vision and finance but also convert that vision and finance into a successful and compatible business and play a significant role in the company's further expansion. For Nelson (2003), founders organise and take the initiative in the organisational founding process. They play a significant role in the company's establishment, and their activities and contributions will have a long-term impact on the further development of the company. He also points out that the identity and number of founders are not fixed. In other words, an organisation may have one or more founders. And founders can hold different positions: they can be a manager, an owner, or an employee. In the years after the company was established, some founders may choose to leave it because of new market opportunities or internal management

issues. However, even if they do not continue working for the company, their recognition as a founder will stay despite the change (Chandler and Hanks, 1994).

Compared with the definition of 'founder', defining an entrepreneur is much more complicated. According to the Cambridge Dictionary, the term 'entrepreneur' is defined as "*the person who starts his own business, especially when it involves a new opportunity*" (Cambridge Dictionary, 2019). This explanation looks simple and easy to understand, however in the business world economists still face challenges in finding a unified and suitable definition for an entrepreneur (Mueller and Thomas, 2001).

The English word 'entrepreneur' comes from the French verb 'entreprendre', which means "*to begin something; undertake*" (Cunningham and Lischeron, 1991). It was frequently used in the 1500s and 1600s with different meanings. It was not until the eighteenth century that a Franco-Irish economist, Richard Cantillon, firstly formulated the definition of entrepreneur in his book *Essai Sur la Nature du Commerce au General (Essay on the Nature of Commerce)*, which was published in 1755. In this study, he uses 'entrepreneur' to describe "*a profit-seeking individual who takes risks by purchasing at a low price in order to sell high*" (Attali and Yemini, 2017, p.142). In this definition, Cantillon (1755) highlights the element of risk as a core aspect of entrepreneurial projects, and explains, "*entrepreneurs never know how great the demand will be in their city, nor how long their customers will buy from them since their rivals will try, by all sorts of means, to attract their customers. All this causes so much uncertainty among these entrepreneurs*" (p.74).

Another important definition of 'entrepreneur' was published by Jean-Baptiste Say (1880). Compared with Cantillon's (1755) definition, Say's (1880) definition is relatively more comprehensive. He points out that entrepreneurs occupy a central role in the economy. They are the linchpin, holding together landlord and capitalist, technician and labourer, producer and consumer (Koolman, 1971, p.273). Such an important role requires entrepreneurs to acquire the necessary knowledge and to be able to translate it into productive action and thus reap capital gains (Say, 1880). At the same time, Say points out that risk and uncertainty accompany almost all of the industrial enterprises, therefore the risk-bearing capability should be another essential function of an entrepreneur (Koolman, 1971). Another significant contribution of Say (1880) is bringing innovation into the definition of an entrepreneur. In his book *Cours d'économie politique et autres essais*, he mentions that "*new methods of working must be introduced, and that, if the entrepreneur was not the first in the field as an inventor, then the inventions of others should be copied as quickly as possible*" (Koolman, 1971, p.281). It should be noted that, in Say's view, entrepreneurs are not necessarily inventors: they more frequently act as exploiters of inventions, reaping benefits and profits by using advanced methods and products (Koolman, 1971). Taking these points together, Say presents a relatively comprehensive definition of an entrepreneur. He states that an

entrepreneur is *"the person who takes upon himself the immediate responsibility, risk, and conduct of a concern of industry, whether upon his own or a borrowed capital"* (Say, 1880, p.78). They obtain and organise production factors to create value (Bruyat and Julien, 2000).

Say's views have caused significant repercussions in the economics community. For a long time his definition has been regarded as an important theory and has been widely used in entrepreneurial research (Hoselitz, 1951). In the twentieth century, Austrian American economist Joseph Alois Schumpeter (1949) further sharpens the existing definitions and defines entrepreneurship as *"the ability to use resources in a novel way so as to create products or new modes of production, thereby opening new markets or even rearranging an entire industry"* (Attali and Yemini, 2017, p.142). In his book, *The Theory of Economic Development*, Schumpeter (1949) emphasises the importance of 'creation' and 'innovation' to entrepreneurs and believes that the element of innovation is the most important characteristic of the entrepreneur. He describes entrepreneurs as people who could do new things, people who could do more with less, and people who would obtain more by doing something in a new or different way, and associated the innovation of entrepreneurs with five elements:

- The introduction of a new good;
- The introduction of a new method of production;
- The opening of a new market;
- The conquest of a new source of supply of raw material; and
- The carrying out of the new organisation of any industry (Schumpeter, 1949, p.66).

The theories of the three pioneers laid the foundations for research on entrepreneurship, however in recent studies, the definition of entrepreneur seems to have become more complex. Table 3.1 summarises the definitions of entrepreneurs based on different entrepreneurial studies. It can be noted that although specific definitions vary between authors, there are some key elements that are frequently mentioned when describing entrepreneurs and their activities, such as risk-taking, opportunity seeking, and value creation.

Table 3.1 Some definitions of the term 'entrepreneur' in entrepreneurial studies

Author	Definition of entrepreneur	Major element
Knight (1921)	Entrepreneurs are the people who make decisions in an uncertain environment and earn profits by taking insurable risks (Knight, 1921).	Risk-taking
Kirzner (1973)	Entrepreneurs are people who observe market opportunities in order to gain benefits. And in this entrepreneurial market process, competition is an inevitable and inherent property (Kirzner, 1973).	Opportunity-seeking, Competition
Wayne (1983)	Entrepreneurs are defined as risk takers, organisational managers, and opportunity seekers (Wayne, 1983).	Risk-taking, Organisation-managing, Opportunity-seeking
Drucker (1985)	An entrepreneur is someone who is always looking for change, reacting to it and exploiting it as an opportunity (Drucker, 1985).	Opportunity-seeking
Masters and Meier (1988)	The entrepreneur is defined as a major owner of a small business or the major owner and manager of a small business" (Masters and Meier, 1988, p. 32).	Ownership
Vosloo (1994)	Entrepreneur "as a person who has the ability to explore the environment, identify opportunities for improvement, mobilize resources and implement action to maximize those opportunities" (Vosloo, 1994, p. 147).	Opportunity-seeking, Value creation
Wennekers and Thurik (1999)	Entrepreneurs as people who "perceive and create new economic opportunities (new products, new production methods, new organisational schemes and new product-market combinations) and to introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location, form and the use of resources and institutions" (Wennekers and Thurik, 1999, p.46–47).	Opportunity-seeking, Risk-taking, Value creation
Bruyat and Julien (2000)	"Entrepreneur to be not simply a blind machine responding automatically to environmental stimuli (interest rates, subsidies, information networks, etc.), but a human being capable of creating, learning and influencing the environment" (Bruyat and Julien, 2000, p. 165).	Innovation, Value creation
Kirzner (2009)	Entrepreneurs are opportunity seekers who can notice changes in the market faster than others and seize the perceived opportunities to their advantage (Kirzner, 2009).	Opportunity-seeking
Bygrave and Zacharakis (2010)	"An entrepreneur is someone who perceives an opportunity and creates an organisation to pursue it" (Bygrave and Zacharakis, 2010, p. 49).	Opportunity-seeking

Sergiu Rusu et al. (2012)	"In the modern sense of market economy, an entrepreneur is an economic agent assuming an innovative and active behaviour, who deliberately accepts financial risks to develop new projects" (Sergiu Rusu et al., 2012, p. 3571).	Innovation, Risk-taking
Walter and Heinrichs (2015)	"Entrepreneur as an individual independently owning and actively managing a business" (Walter and Heinrichs, 2015, p.226).	Organisation-managing
Kuratko (2014)	<i>"The entrepreneur is one who undertakes to organize, manage, and assume the risks of a business. Today, an entrepreneur is an innovator or developer who recognizes and seizes opportunities; converts those opportunities into workable/marketable ideas; adds value through time, effort, money or skills; assumes the risks of the competitive marketplace to implement these ideas; and realizes the rewards from these efforts".</i> (Kuratko, 2014, p.23)	Risk-taking, Opportunity-seeking, Value creation, Organisation-managing
Filion (2021)	<p>"An entrepreneur is:</p> <ul style="list-style-type: none"> • An imaginative actor who recognizes entrepreneurial opportunities, makes moderately risky decisions with a view to innovating, and takes action by using resources to implement a differentiated vision that contributes an added value. • An intuitive, resourceful, tenacious actor who is able to recognize and develop risky opportunities with potential for innovation, and who adds value to what already exists by setting up activities that involve a scarce use of resources. • A result-oriented designer of innovations who is able to develop risky opportunities, who learns to be creative and resourceful, takes action by making practical use of limited resources and a network of contacts. • A result-oriented actor who maintains a high level of sensitivity in order to recognize and develop entrepreneurial opportunities. This actor makes moderately risky decisions and is discerning in the use of resources" (Filion, 2021, p.80). 	Value creation, Innovation, Risk-taking, Opportunity-seeking

One of the significant elements of the entrepreneur is risk-taking. In many entrepreneurial studies, researchers highlight the significant role of entrepreneurs in risk-taking and risk management. For example, Knight (1921) regards risk-taking as the most important function of an entrepreneur. He argues entrepreneurs have the responsibility to take risks for their businesses. Conversely, if that person cannot bear the risks and uncertainties during the business operation, then they can no longer be defined as an entrepreneur. Wayne (1983) states that entrepreneurial activity is fraught with uncertainty and risk. In this case, entrepreneurs should have the ability to self-adjust in order to gain a chance of survival in the marketplace.

Besides, entrepreneurs should have the ability to promote innovation and seek market opportunities. Based on this perspective, Vosloo (1994) explains that entrepreneurs are people who

recognise market opportunities and realise them through entrepreneurial activity. They have the ability to explore the environment, find gaps in the market, and fill those gaps with available resources to win profits. Similar to Vosloo (1994), Drucker (1985) believes that entrepreneurs should only be used to define the people who create new things and can bring something different to the market. Based on his opinion, entrepreneurs are 'revolutionaries' in the market. They are the people who always search for change in the market, find new opportunities in this process, and create new things to respond to these changes and opportunities (Drucker, 1985).

At the same time, some authors argue that the influence of entrepreneurs on external markets should also be considered when defining entrepreneurs. Wennekers and Thurik (1999) indicate that entrepreneurship is the process by which entrepreneurs bring their ideas to market, and define entrepreneurship as *"the manifest ability and willingness of individuals, on their own, in teams, within and outside existing organisation"* (Wennekers and Thurik, 1999, p.46). Bruyat and Julien (2000) emphasise that the influence of the environment on entrepreneurs is not unidirectional. Entrepreneurs should have the ability to respond to the changing market, but more importantly, they should be able to create new value and promote market growth.

Combined with these elements, Filion (2021) presents a relatively comprehensive definition of entrepreneur. According to Filion (2021), the entrepreneur can be described by four types of role, which are an imaginative actor, an intuitive, resourceful, tenacious actor, a results-oriented designer of innovations, and a results-oriented actor. 'Imaginative actor' means that entrepreneurs should have the ability to seek out market opportunities. 'Intuitive, resourceful, tenacious actor' means that they are able to turn opportunities into profits. 'Results-oriented designer of innovations' refers to entrepreneurs who are able to create new value for the market, while 'result-oriented actors' emphasises the entrepreneur's willingness to take risks.

After referring to different definitions and the opinions of the researchers, this paper summarises the definition of founder-entrepreneurs by the following aspects:

- The creator, owner and leader of an organisation.
- A market-opportunity seeker.
- A new value creator.
- A risk-taker.

Firstly, the founder-entrepreneur should be the person who creates and owns the company and is continuously involved in its management and leadership. They should have the highest control and be actively involved in managing their own business and leading the direction of growth. At the same time, founder-entrepreneurs should have the ability to seize opportunities in the ever-

changing market, and depending on the market situation, introduce new products, technologies or services that are appropriate to fill the market gaps and thus bring considerable profits to the business. Another significant element that should be considered when defining a founder-entrepreneur is risk-taking. During the company's operation, founder-entrepreneurs are required to assume and manage a lot of risks and potential losses; in this case, risk-taking is an essential characteristic of founder-entrepreneurs.

3.3 Entrepreneurial Motivation

From a psychological perspective, motivation is often defined as the reason for one's decision-making and goal-setting. It drives people's behaviours and profoundly affects one's response to the environment (Ryan and Deci, 2000). In the context of entrepreneurship, entrepreneurial motivation signifies the reason that leads a person to start their own business and become an entrepreneur (van der Zwan *et al.*, 2016). It determines the goals set by entrepreneurs and also reflects their willingness and what they hope to achieve through their company's operations (Rosa *et al.*, 2008).

Mukhtar (1998) points out that different entrepreneurial motives could lead entrepreneurs to make different choices when establishing a company, and this could lead to completely different company characteristics. It can be seen as one of the important personality traits of entrepreneurs, which highly affects the company's success or failure. Reijonen (2008) also supports this opinion and states that entrepreneurs are seen as goal-oriented people who are more focused on achieving their set objectives and are more likely to be driven by goals. Especially in SMEs, where management and ownership are often highly concentrated on the entrepreneur alone, achieving their personal goals could be a fundamental condition for determining their success. Jennings and Beaver (1997, cited by Forsman, 2008, p. 609) point that an *"Owner-manager's values and beliefs affect the objectives, she or he is seen to be in the main role in defining the success or failure in the SME context"*. In SMEs or start-up organisations, it is difficult to distinguish entrepreneurs' individual accomplishments from organisational goals. Barba-Sánchez and Atienza-Sahuquillo (2017) argue that many SME entrepreneurs run a company to achieve personal goals and view their business as a platform to showcase their personality. For SMEs, one important criterion that can be used to judge the success of a company is whether the company meets the expectations of the entrepreneur (Gorgievski, Ascalon and Stephan, 2011). Bourlès and Cozarenco (2018) state that entrepreneurial motivations highly influence entrepreneurs' behaviours during the entrepreneurial process and can guide their decision-making. People who have clear entrepreneurial motivations can make more decisive choices and give a quicker response when faced with some business challenges. Ismail *et al.* (2016) also mention that if entrepreneurs want to make their company successful, in addition to having sufficient funds and good ideas, their personal determination and motivation will also have a great impact on business development. A good entrepreneurial

motivation can make entrepreneurs more courageous when facing risks and challenges. This can make them more likely to strengthen their business, build a competitive edge, and achieve success in the market. However, the differences in people's motivations, understanding and willingness will get them to provide varying responses and decisions when facing similar opportunities or risks (Shane, Locke and Collins, 2003). For example, entrepreneurs who are motivated by high incomes may not have the willingness to spend too much on training employees or improving technology, whereas entrepreneurs who seek a relaxed lifestyle may give up some market opportunities in the favour of a more flexible and relaxed pace of work (Mkubukeli and Cronje, 2018).

3.3.1 Pull and push motivations

Entrepreneurial motivations are influenced by complex factors. Because of variations in work experience, personality, education level, and market environment, one entrepreneurs' motivation might totally differ from another's (Machmud and Sidharta, 2014; Shepherd and Patzelt, 2018). Some people may decide to start a business because of external elements, such as a good business environment, market opportunities, or policy incentives (Dawson and Henley, 2012), while others can be motivated by internal factors, such as seeking higher incomes, more flexible timetables, or a more independent working style (Carsrud and Brännback, 2011). In addition, some psychological factors, such as gaining confidence, enjoying risks, expecting achievement, and self-satisfaction can also promote people to start their entrepreneurial journeys (Woldie, Leighton and Adesua, 2008). In order to better explore the impact of motivation on one's entrepreneurial behaviour, researchers have developed a framework and classified motivations into categories of push and pull factors (see Figure 3.1) (e.g. Amit and Muller, 1995; Kirkwood, 2009; Dawson and Henley, 2012; Lundberg and Melander, 2019).

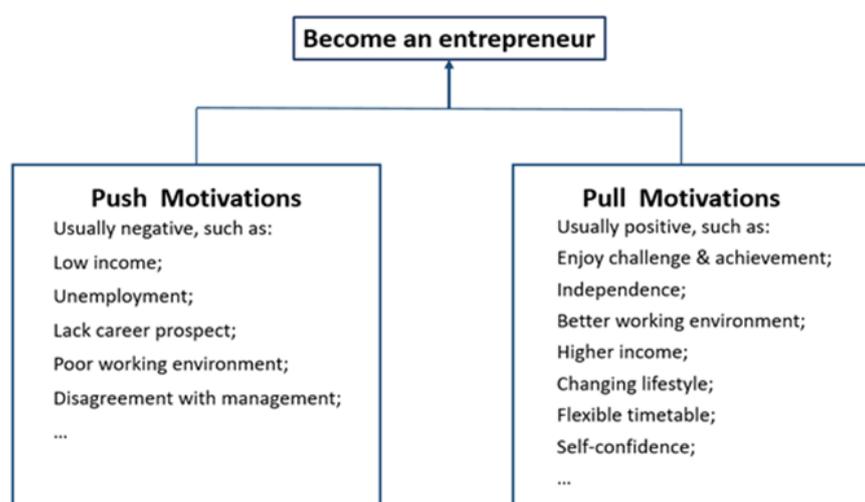


Figure 3.1 'Push' and 'Pull' entrepreneurial motivation (edited by author)

3.3.1.1 Push factors

As Figure 3.1 shows, 'push' factors are usually associated with negative aspects that force people to start their own businesses (Gilad and Levine, 1986). It can be defined as circumstances which force an individual to establish a new enterprise due to negative prospects, such as unemployment, a poor working environment in their current job, and other negative job-related circumstances (Gilad and Levine, 1986; Kirkwood, 2009; Mkubukeli and Cronje, 2018). As Amit and Muller (1995, p.66) state, *"Push' entrepreneurs are being pushed out of their current employment"*. In this case, for someone who is driven by some push factors, becoming an entrepreneur might not be something they want to do, but something they have to do (Kirkwood, 2009).

In the entrepreneurship research domain, unemployment has been seen as a 'push' factor that impacts new business formation (Ojiaku, Nkamnebe and Nwaizugbo, 2018). Oxenfeldt (1943) and Birley and Westhead (1994) argue that for those who have lost their job and cannot afford to live on their current income, entrepreneurship might be the last means to help them earn a living and keep their work status. Some studies suggest that unemployed workers may be more likely to become self-employed than those with stable jobs (e.g. Oxenfeldt, 1943; Ritsilä and Tervo, 2002; Audretsch and Keilbach, 2004; Tervo, 2006). For example, Huisman and De Ridder's (1984, cited in Noorderhaven *et al.*, 2004) study explores the connection between unemployment and entrepreneurship. They analysed entrepreneurship data from 11 different countries and found that unemployment is one of the key motivations cited most frequently by the participants. The study shows that unemployment and the stresses of life might highly affect people's entrepreneurial decisions and force them to improve their living conditions by starting their own businesses. However, prolonged unemployment can also lead to decreased labour market activity and deterioration in the quality of entrepreneurial qualifications, such as professional skills and liquidity, thus discouraging self-employment.

Another push factor frequently discussed in entrepreneurship research is dissatisfaction with one's current situation. Aiming to examine whether dissatisfaction with a previous job was what pushed entrepreneurs to create new ventures, Brockhaus (1980) conducted a study using three groups of participants. The first group consisted of 22 individuals who had stopped working for their employer in the three months prior to the study and who owned and managed a commercial enterprise at the time of the study. Two other groups consisted of managers who changed positions three months prior to the study. One group of managers changed organisations (30 participants), while the other group changed positions within one organisation (31 participants). Participants were required to finish the Job Description Index (JDI)¹ to

¹ The Job Description Index (JDI), developed by Smith, Kendall, and Hulin of Cornell University. It consists of five subscales, each of which attempts to measure one of five aspects of the job. The five aspects are the

evaluate their satisfaction with the work. Brockhaus (1980) found that the entrepreneurs were more dissatisfied than the two groups of managers with promotion opportunities, co-workers, work environment and supervision. Based on these results, the researcher claims that dissatisfaction with a previous job is a major reason that motivates people to become entrepreneurs.

However, other studies relating to dissatisfaction and entrepreneurship offer different conclusions. Stoner and Fry (1982) conducted a survey by mail among 300 entrepreneurs from central Illinois and six-parish in southern Louisiana. In the study, the participants were required to answer three main questions concerning the history and nature of their current business, their impressions of the last job held before starting their own businesses, and their major reasons for leaving their previous jobs and starting their current businesses. The study found that many participants did not show significant dissatisfaction with their previous jobs. Instead, more participants stated that some pull factors, such as a desire for freedom, independence, opportunity, or greater economic potential were the main motivations for starting their own business. The study of Schjoedt and Shaver (2007) suggests a similar opinion. Their study involved a total of 845 participants. Based on the work status of participants, Schjoedt and Shaver (2007) divided them into three research groups: fully autonomous nascent entrepreneurs (367 participants), partially autonomous nascent entrepreneurs (70 participants), and the comparison group (308 participants). Through mail questionnaires and telephone interviews, the researchers obtained detailed knowledge of the participants' entrepreneurial status, personal experiences, satisfaction with their work and life, and other information that might be relevant to successful organisational entrepreneurship. They found no significant differences related to life satisfaction between the new entrepreneurs and the control group. With regard to satisfaction with previous job, Schjoedt and Shaver (2007) surprisingly found that the mean value of entrepreneurs was significantly higher than that of the comparison group. Based on this result, they claim that it is rare for entrepreneurs to be pulled into an entrepreneurial career due to low job satisfaction in pre-entrepreneurial jobs. They further highlighted that in the current market environment, pull factors may have a greater impact on entrepreneurial behaviour than push factors.

3.3.1.2 Pull factors

'Pull' factors are positive factors which attract people spontaneously to be an entrepreneur. It could be a tangible factor, such as higher income and a better working environment. In the meantime, some psychological factors, such as risk-taking, self-confidence, independence, and

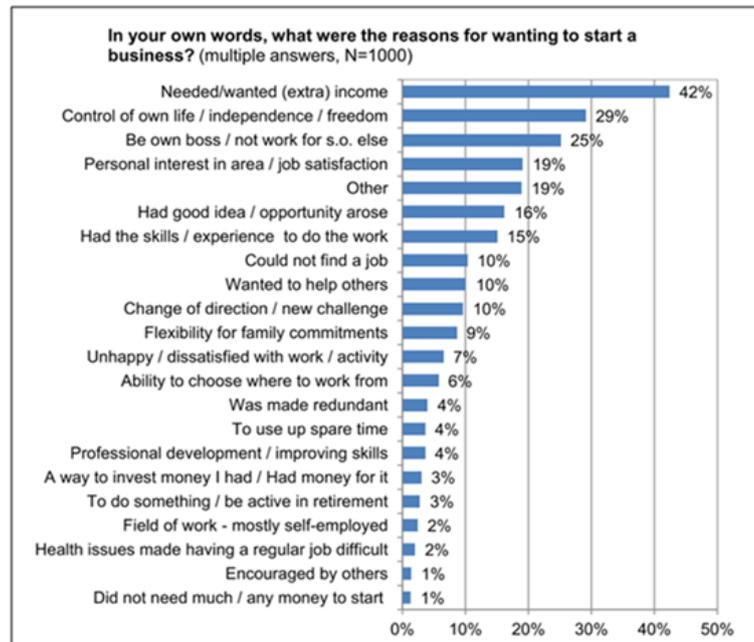
employee's satisfaction with the work itself, his or her perception of supervision, pay, opportunity for promotion, and attitude towards co-workers (Brockhaus, 1980).

the achievement of personal values also highly influence people's decisions (Kirkwood, 2009). Subsequent research (e.g. Gilad and Levine, 1986; Orhan and Scott, 2001; Segal, Borgia and Schoenfeld, 2005) found that, compared with 'push' factors, 'pull' factors are more prevalent. Zwan *et al.* (2016) also point out that, although situations might vary from country to country, 'pull' motivations generally tend to be the main reasons that encourage people to start up a company. In the meantime, entrepreneurs with 'pull' motivations are found to have better performance during the company's operation. Stephan *et al.* (2015) argue that companies owned by 'pull entrepreneurs' can generate higher income and lead their business to pursue better development prospects than the companies run by 'push entrepreneurs'.

3.3.1.2.1 Higher income

When discussing entrepreneurial motivations, the importance of financial incentive must be recognised, because it is a necessary resource to support business operations and the achievement of any organisational goal (Shepherd and Patzelt, 2018). In fact, high income is one of the major factors that attracts people towards an entrepreneurial career. According to neoclassical economic theory, profit maximisation should be the main goal for entrepreneurs. It motivates them to start their businesses, and in this context, the only goal of entrepreneurs is earning more capital (Watson *et al.*, 2011). In 1993, Young and Welsch (1993) ran a questionnaire among 157 entrepreneurs in Mexico with the objective of finding the main motivations that drove them to start a business. Based on their results, the researchers point out that financial independence is the primary reason leading people to become entrepreneurs. People hope to increase family income and improve quality of life by running their own businesses. According to the survey, financial reward is seen as the most basic and direct benefit of entrepreneurial activity. If entrepreneurial activities do not generate revenues, people may abandon their businesses.

Current research also acknowledges the importance of financial motivation. Shepherd and Detienne (2005) argue that a high level of potential financial reward is a significant factor attracting people to start a company. People will judge their decision according to the benefits they might get from it. Only when the expected accomplishments can meet their inner standards can people choose to become entrepreneurs.



Source: Entrepreneurial Motivation Survey

Figure 3.2 Different kinds of entrepreneurial motivation (Stephan *et al.*, 2015)

To understand entrepreneurial motivations, in 2015 the UK's Department for Business, Innovation and Skills (Stephan *et al.*, 2015) conducted a survey among entrepreneurs, which asked them to answer the main reason for starting a business. Figure 3.2 shows the results of the study. 42% of entrepreneurs from the sample said they chose to run a business because they wanted to earn more money and get higher profit. However, some researchers argue that, with the continuous improvement of people's living standards, for some entrepreneurs the financial reward may not be the most important motivation driving them to establish a company. Carsrud and Brännback (2011) emphasise that although the influences of economic factors cannot be ignored when analysing entrepreneurial motivations, an increasing number of studies show that other motives, such as the realisation of self-worth and the enjoyment of challenges, are gradually replacing the financial factors and can become significant entrepreneurial motivations.

3.3.1.2.2 Degree of control and independence

One of the most striking differences between entrepreneurs and paid workers is that entrepreneurs have a high degree of control over their work and life. Compared with general employees, entrepreneurs can plan their own working schedule and assign tasks for themselves, which gives them the chance to have a better work–life balance (Shir, Nikolaev and Wincent, 2018). Especially in SMEs, the rights of entrepreneurs are not restricted by others. As the top manager and the owner of the company, SME entrepreneurs can completely control their 'own' business based on their 'own' opinions (Watson *et al.*, 1998). Many research studies point out that this degree of control and independence are some of the important motivations which drive

people to become an entrepreneur. According to the survey of the Department for Business, Innovation and Skills (shown in Figure 3.2, Stephan *et al.*, 2015), in addition to earning a higher income, for many entrepreneurs the reason for starting a company is to gain a more flexible and independent life. Entrepreneurs also indicated that, compared with the scenario of working for somebody else, they are more willing to be their own boss. While being an entrepreneur means they sometimes have to take on higher risks, more challenges and greater responsibilities, this feeling of '*total control over their life*' drives people to choose entrepreneurial careers.

According to Altinay and Altinay (2004), when the absolute control of entrepreneurs is threatened during the development process of SMEs, they might choose to abandon further expansions of the company. They may give up opportunities to achieve higher financial performance and keep the company to a small scale to ensure that their personal control and influence will not be weakened. Rubinstein and Levine (2017) offer a similar opinion, that entrepreneurs are those who want to control their lives through their own decisions. Based on this characteristic, it seems that some entrepreneurs may be reluctant to extend their business to a stage where they cannot fully control or manage individual business elements.

3.3.1.2.3 Need for achievement

The need for achievement is an individual desire that drives people to strive for more significant accomplishments, better skills, or higher standards. According to the motivation theory of McClelland (1961), the need for achievement highly determines an individual's productivity and working performance.

Many researchers note that the high need for achievement is one of the main traits among entrepreneurs. Korunka *et al.* (2003) conducted a questionnaire among Australian entrepreneurs to find the common characteristics of entrepreneurs. Based on 1,169 survey responses, more than 80% of entrepreneurs showed a high need for achievement. Similar surveys have also been carried out in other countries, such as the UK (Mueller and Thomas, 2001) and China (Carragher, Buchanan and Puia, 2010). However, due to the cultural and market environments, the results of the survey from each country varied. But these studies commonly suggest that entrepreneurs are more likely than the general population to be driven by achievement.

For SME entrepreneurs, achieving their personal goal might be the main reason to start a company. Compared with high income, the sense of accomplishment and identity brought about by entrepreneurial activities may be more important for some SME entrepreneurs. According to Shir, Nikolaev and Wincent (2018), the reason people choose self-employment is mainly because they want to achieve their personal goals through start-ups. This kind of psychological need

encourages entrepreneurs to choose more difficult tasks and make high-risk decisions. This is why even if financial rewards are not optimistic, entrepreneurs will insist on running their own business and still get satisfaction from it. In fact, in SMEs, entrepreneurs might feel a stronger sense of satisfaction and accomplishment after achieving the goal than that in large enterprises. In small businesses, entrepreneurs' personal goals cannot be clearly differentiated from the organisation goals and hence the achievement of each company's goal can also be seen as success and accomplishment for the entrepreneur, which can then bring them a strong sense of self-confidence and self-identity (Ahmad *et al.*, 2011).

3.3.1.2.4 Enjoying challenges and risks

As a person responsible for creating new value for the market, entrepreneurs should show a high level of interest in gaps in the markets and unknown issues and have a positive approach towards uncertain business challenges (Tvede and Faurholt, 2018). Because of these characteristics, the people who have the potential to become entrepreneurs are more likely to be motivated by challenges than others who might want to avoid unpredictable risks.

Many research studies on entrepreneurial motivation list '*enjoying challenges*' as a significant intrinsic motivation prompting an individual to start a business (Kuratko, Hornsby and Naffziger, 1997; Ryan and Deci, 2000). In this context, intrinsic motivation is defined as "*the doing of an activity for its inherent satisfactions rather than for some separable consequence*" (Ryan and Deci, 2000, p.56), which is clearly distinguished from extrinsic motivation, such as financial rewards and benefits. A study from Carree and Verheul (2012) identified that people who choose to start a business are not always attracted by high income; some non-monetary rewards such as entrepreneurial challenges and independent working style also encourage people to start a company and become their own boss. Their study on 1,107 Dutch founder-entrepreneurs showed that entrepreneurs are willing to face the changing market environment and new challenges, and always actively participate in market competition. Many respondents in this study explained that they had chosen to become an entrepreneur because they enjoy facing challenges. Buttner and Moore (1997) also support similar views with their study on 129 female entrepreneurs who chose to leave large organisations and start their own businesses. For them, the most important entrepreneurial motivation was the desire for challenge and self-determination.

3.4 Role and Responsibilities of SME Entrepreneurs

Unlike founder-entrepreneurs from large firms, entrepreneurs in SMEs may be required to take on various roles and tasks (Trevelyan, 2011). Bhide (1996) argues that "*before entrepreneurs have the*

option of doing less, they first must do much more" (p.129). The researcher explains that the role of SME entrepreneurs should cover almost all of the company's operational processes. They are responsible for ensuring the sustainability of the business model, managing the perceptions of the resource providers (such as potential customers, employees, and investors), designing the organisation's structure, system, and culture, and dealing with uncertain challenges and risks. On a similar note, Wickham (2001) also highlights the complex responsibilities of entrepreneurs during the company's growth. He lists six main tasks of entrepreneurs, including owning organisations, founding new organisations, bringing innovations to market, identifying market opportunities, applying expertise, and providing leadership. Pareras (2021) emphasises the significant role entrepreneurs play in human resource management, and explains that for entrepreneurs, wanting to control all the tasks may seem to be a natural tendency, however in most cases entrepreneurs might not have enough energy or capability to maintain that level of control and engagement. In this case, giving employees a certain degree of freedom may be a more appropriate option to achieve efficient production. Man and Lau (2000) divide entrepreneurial tasks into three categories. Firstly, there is the forming of the firm's competitive scope. This task requires entrepreneurs to interpret the environmental condition and seek market opportunities, thus identifying the range of options that are suitable for business growth and development. The second task is creating organisational capabilities. For this, the entrepreneur should have the ability to gather and organise internal and external resources. Another essential task for entrepreneurs is setting goals and taking action towards these goals by assessing the competitive scope and using organisational capability. In other words, it is the responsibility of the entrepreneur to determine the direction of his or her business in the light of the company's realities and lead the company to achieve the set goal.

From the literature discussion, it seems that there is currently no clarity on the roles and tasks for entrepreneurs, but two main aspects of responsibility frequently mentioned are team organisation and decision-making and strategy formulation.

Team organisation includes team formulation and maintenance. As the founder of the company, entrepreneurs are responsible for attracting suitable talents and developing a powerful team to achieve their entrepreneurial ideas (Cooney, 2005; Chakravarthy and Lorange, 2008; Pareras, 2021). As Cooney (2005) argues, although in some romantic notion the entrepreneur is a lone hero, the reality is that most of the successful businesses cannot function without a powerful team. He explains that the capabilities of entrepreneurs are limited and as their business expands, they may not be able to individually cope with the increasingly demanding tasks of the business. In this case, in order to maintain the rapid growth of the company, the entrepreneur needs to attract and select the right talent to form a new entrepreneurial team to respond to the new needs of the growing business (Mazzarol, 2003). Festing *et al.* (2017) highlight the importance of attracting talent on a similar note, but with the development of economy and changes in the market, SMEs are facing

increasing competition. In this context, companies need to build a strong team to face the various challenges of the market and to gain a better chance of survival and success. However, in SMEs there is generally a lack of a formal and comprehensive human resource management structure to support the team's organisation. Therefore, in these companies, entrepreneurs usually need to take on the further responsibilities of talent screening and management (Pareras, 2021). Pareras (2021) therefore stresses that entrepreneurs not only need to have the ability to identify, motivate, and persuade talent to join the entrepreneurial team, but more importantly they should have the ability to retain talent to continue working for them. Entrepreneurs should have a clear understanding of the strengths and weaknesses of their employees and team, and use this to develop a more suitable management style to improve the overall competitiveness of the team. And in the company's daily operation, entrepreneurs also need to play the role of the 'mediator': they are responsible for eradicating the barriers between group members to maintain team cohesion.

Decision-making and strategy formulation is another aspect that can directly affect a business's survival and market performance. Vermeulen and Curseu (2008) define decision-making as "*a strategic activity. It is related to setting out specific courses of action to reach strategic goals*" (p.3), and argue that "*the success of small firms is to a large extent dependent upon strategic decision-making practices*" (p.2), which significantly affect the health and survival of organisations, guide their future and shape their processes. Wingwon (2012) indicates that every stage of a company's development from its inception is closely linked to the strategic decisions made by the entrepreneur. These key strategies determine the company's general development direction and performance when facing market uncertainties, and further impact the company's success. In this case, in order to maintain the company's stable development, Wingwon (2012) suggests that every organisation should have strategic plans to guide the business's management and growth. And considering the importance of strategic decisions to a company's success, he recommends the decision-maker to conduct a comprehensive analysis before any strategic implementation or deployment. Lee and Kwon's (2017) study provides more intuitive evidence of the impact of corporate strategy development on company performance. They divided high-tech SMEs into two performance groups: high performers and low performers. Their analysis found that the strategic choices of SMEs largely determined their sales growth, R&D intensity, current ratio, and return on assets. They argue that in a highly competitive market environment, improving strategic capabilities is a key factor in enhancing the market competitiveness of SMEs.

Figure 3.3 shows a framework for entrepreneurial decision-making. There are three main components highlighted in this framework: the environment, the specific characteristics of the decision to be taken, and the entrepreneur themselves (Vermeulen and Curseu, 2008; Ogarcă, 2010). During the decision-making process, these three components are in constant interaction.

They influence each other, work together and ultimately lead to the presentation of the decision (Vermeulen and Curseu, 2008).

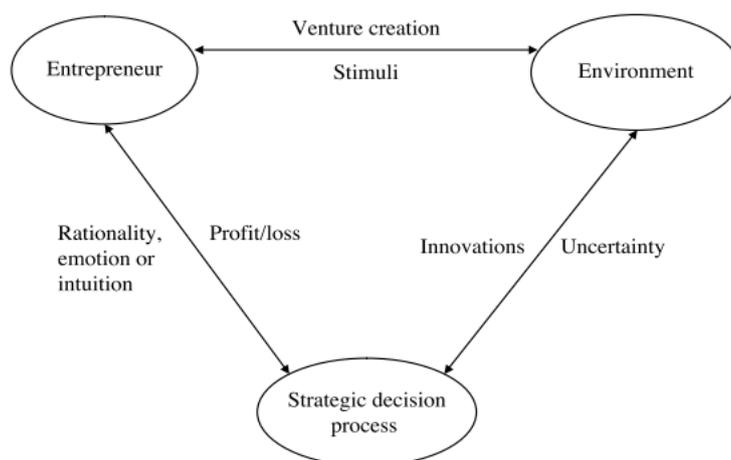


Figure 3.3 A framework for entrepreneurial decision-making model (Vermeulen and Curseu, 2008, p.16)

Of these three components, the role of the entrepreneur is frequently cited in the literature in relation to the SMEs' decision-making process (Ogarcă, 2010). As the individual who establishes and runs his/her own business, the entrepreneur is a central element of the management process and often plays a key role in the decision-making of SMEs (Vermeulen and Curseu, 2008; Jansen *et al.*, 2013; Picken, 2017). Gudonavičius and Fayomi (2014) emphasise that while other factors such as environment and organisation may also influence decisions to some extent, as the final decision maker, the influence of the entrepreneur is the most significant and deserves attention. Lloyd-Reason and Mughan (2002) compared the decision-making process in SMEs and large organisations and conclude that decision-making is commonly a group activity in large organisations. However, in SMEs, limited to a smaller size and simpler personnel structure, this responsibility tends to rest with the owner-manager. On a similar note, Culkin and Smith (2000) state that larger organisations are inherently more complex in their structure, their organisation, and the level of departmentalisation and specialisation within the company. This leads to increasingly complex decision-making criteria. However, in SMEs, this process is much simpler. They point out that generally, in SMEs, only one or a few individuals are involved in decision-making, which leads to the high degree of influence from the entrepreneurs in the company's decision-making. Therefore, in SMEs, entrepreneurs are more likely to mix their personal and organisational goals while making important business decisions (Lieberman-Yaconi, Hooper and Hutchings, 2010).

Due to the central role of entrepreneurs in the decision-making process, their personal characteristics, such as knowledge, experiences, motivation, and personality can significantly influence their company's operation. For example, Deakins and Freel (1998) identified the impact of entrepreneurial knowledge on the decision-making process of SMEs. They conducted case studies of four SMEs at the development stage, interviewing entrepreneurs to understand how

their personal knowledge and skills influenced their decision-making and strategy formulation. Based on the study, they point out that the entrepreneur's understanding of the market and ability to learn both impact his/her decision-making and thus determine their company's success. Deligianni *et al.* (2022) highlight the role of experience in entrepreneurial decision-making. Their study involved 620 Greek start-up SMEs operating in four major industries (Information and Communication Technology (ICT), food and beverages, chemicals, and clothing and textiles), using a semi-structured questionnaire to understand the relationship between entrepreneurs' entrepreneurial experience and their innovation decisions. They found that the entrepreneurs' prior start-up experience will significantly enhance the innovation outcomes of new ventures. They further explain that prior entrepreneurial experience could help entrepreneurs deepen their understanding of markets and innovation activities, which helps them to make informed decisions and become more competitive in the marketplace. Vermeulen and Curseu (2008) suggest that different characteristics and motivations of entrepreneurs may lead them to make different decisions when faced with similar scenarios and further impact the company's operation. Mensah, Asamoah and Jafari-Sadeghi (2021) explored the relationship between entrepreneurs' cognitive skills and personality traits to their decision-making under uncertainty. They found that, in some cases, entrepreneurs' personality traits and cognitive skills can combine to influence their judgements, enabling them to better identify opportunities and risks in the marketplace. For example, individuals with high self-efficacy personality traits are more willing to exploit business opportunities under uncertainty. However, entrepreneurs should also acquire a certain level of cognitive capability to ensure accurate decision-making.

3.5 Personality Traits of Entrepreneurs

Researchers believe that certain characteristics of entrepreneurs can make them and their companies successful in the market. However, some question the effectiveness of the study of entrepreneurial personality traits (e.g. Brockhous and Horwitz, 1986; Gartner, 1988). Many argue that each entrepreneur is a specific individual; their success cannot be simply imitated and reproduced (Katongole, Ahebwa and Kawere, 2013). However, recent research on entrepreneurial personality traits has regained prominence among researchers and has gradually developed a consistent theoretical framework, with meaningful insights for innovation policy and business education (Kerr, Kerr and Xu, 2018, p.8). Kerr, Kerr and Xu (2018, p.9) point out that current literature on entrepreneurial traits mainly focuses on explaining two main questions:

- What personality traits drive people to become entrepreneurs?
- Which personality traits contribute to entrepreneurial success?

To better answer these two questions, it is essential to have a comprehensive personality assessment standard. There are two existing personality measures that are widely recognised in the academic field (Furnham, 1996):

- The Myers-Briggs Type Indicators (Furnham, 1996), and
- The Big-Five personality model (Barrick and Mount, 1993).

The Myers-Briggs Type Indicators (MBTI) (Myers, et al., 1998) is a popular personality inventory that has been widely used in the consultancy and training world (Furnham, 1996). Based on Myers et al. (1998, p.3), *“The purpose of the Myers-Briggs Type Indicator (MBTI) personality inventory is to make the theory of psychological types described by C. G. Jung (1921/1971) understandable and useful in people’s lives”*. It uses a paper-and-pencil self-report format and includes 94 forced-choice items to evaluate people's personality traits from four bipolar discontinuous scales (Furnham, 1996; Driessen and Zwart, 2006): Extraversion (E)–Introversion (I); Sensing (S)–Intuition (N); Thinking (T)–Feeling (F); and Judging (J) and Perceiving (P) (See Table 3.2). Based on performance of these four dichotomies, people's personality traits could be further classified into 16 possible personality types (Myers et al., 1998; Driessen and Zwart, 2006), such as ESTJ and INFP.

Table 3.2 *The four dichotomies of the MBTI (Myers et al., 1998, p.6)*

Extraversion–Introversion Dichotomy (attitudes or orientations of energy)	
Extraversion (E)	Introversion (I)
Directing energy mainly toward the outer world of people and objects	Directing energy mainly toward the inner world of experiences and ideas
Sensing–Intuition Dichotomy (functions or processes of perception)	
Sensing (S)	Intuition (N)
Focusing mainly on what can be perceived by the five senses	Focusing mainly on perceiving patterns and interrelationships
Thinking–Feeling Dichotomy (functions or processes of judging)	
Thinking (T)	Feeling (F)
Basing conclusions on logical analysis with a focus on objectivity and detachment	Basing conclusions on personal or social values with a focus on understanding and harmony
Judging–Perceiving Dichotomy (attitudes or orientations toward dealing with the outside world)	
Judging (J)	Perceiving (P)
Preferring the decisiveness and closure that result from dealing with the outer world using one of the Judging processes (Thinking or Feeling)	Preferring the flexibility and spontaneity that results from dealing with the outer world using one of the Perceiving processes (Sensing or Intuition)

For a simple, straightforward description of a people’s personality makeup, the use of the MBTI seems to be an appropriate choice. However, it also has some common deficiencies that limit its widespread use in academia (Boyle, 1995). For example, Druckman and Bjork (1991, p.96) comment

on the MBTI that “*The popularity of the instrument is not coincident with supportive research results*”. They highlight that self- assessment instruments like the MBTI can only capture a person's current state. Therefore, it should not be considered typologies to identify people's personality traits. In addition, the validity of MBTI has also been doubted by some psychology researchers. Boyle (1995) states that MBTI relies on dichotomous preference scores rather than continuous scores, which unduly limits the level of statistical analysis (e.g., assigning frequencies to the 16 types). Based on these limitations, Boyle (1995) suggests that the MBTI needs further improvements and refinements, and warns that academics should be vigilant and cautious when applying this personality model in academic studies.

Another model which is frequently used to define the psychological traits of entrepreneurs is the Big-Five personality model. As a multidimensional approach to defining personality traits, the Big-Five model has been the dominant model for personality traits since the 1980s, and has been widely used in different studies, such as career choice, work performance, and entrepreneurship (e.g. Barrick and Mount, 1993; Thoms, Moore and Scott, 1996; Rothmann and Coetzer, 2003). For example, in a study by Rothmann and Coetzer (2003), the Big-Five model was used in assessing the personality traits of 159 employees from a pharmaceutical company to explore the relationship between personality dimensions and job performance. Bozionelos (2004) conducted a questionnaire survey of 279 white-collar workers to understand how people's Big-Five personality traits affected their work engagement.

This model evaluates one's characteristics from five main aspects: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (John, Naumann and Soto, 2008; Kerr, Kerr and Xu, 2018). According to John, Naumann and Soto (2008, p.138), these five ‘macro features’ can be described as follows:

- ***Openness to experience*** describes the breadth, depth, originality, and complexity of an individual's mental and experimental life;
- ***Conscientiousness*** describes socially prescribed impulse control that facilitates task- and goal-orientated behaviour, such as thinking before acting, delaying gratification, following norms and rules, and planning, organizing, and prioritizing tasks;
- ***Extraversion*** implies an energetic approach toward the social and material world and includes traits such as sociability, activity, assertiveness, and positive emotionality;
- ***Agreeableness*** contrasts a prosocial and communal orientation toward others with antagonism and includes traits such as altruism, tender-mindedness, trust, and modesty;
- ***Neuroticism*** contrasts emotional stability and even-temperedness with negative emotionalities, such as feeling anxious, nervous, sad, and tense.

Table 3.3 lists some recent studies involving Big-Five personality traits and entrepreneurship. As shown here, researchers have come to various conclusions about the impact of different personality traits on entrepreneurial intentions and entrepreneurial performance.

Table 3.3 Studies related to Big-Five personality traits and entrepreneurship

Author(s)	Research Focus	Research Method	Finding ²
Zhao and Seibert (2006)	<ul style="list-style-type: none"> • Entrepreneurs vs Managers 	<ul style="list-style-type: none"> • Meta-analysis • Studies involved entrepreneurship and personality traits 	Openness (+) Conscientiousness (+) Extraversion (?) Agreeableness (-) Neuroticism (-)
Zhao, Seibert and Lumpkin (2010)	<ul style="list-style-type: none"> • Entrepreneurial intentions • Entrepreneurial performance 	<ul style="list-style-type: none"> • Meta-analysis • Studies involved entrepreneurship and personality traits 	<p>Entrepreneurial intentions:</p> Openness (+) Conscientiousness (+) Extraversion (+) Agreeableness (?) Neuroticism (-) <p>Entrepreneurial performance:</p> Openness (+) Conscientiousness (+) Extraversion (+) Agreeableness (?)

² In this table, "+" indicates a positive effect of personality traits on entrepreneurship, "-" indicates a negative effect, and "?" indicates that no significant effect of personality on entrepreneurship was found in the study.

			Neuroticism (-)
Brandstätter (2011)	<ul style="list-style-type: none"> • Traits of Entrepreneurs • Entrepreneurial intentions • Entrepreneurs' performance 	<ul style="list-style-type: none"> • Meta-analysis • Studies involved entrepreneurship and personality traits 	<p>Entrepreneurs are compared with managers:</p> <p>Openness (+)</p> <p>Conscientiousness (+)</p> <p>Extraversion (+)</p> <p>Agreeableness (?)</p> <p>Neuroticism (?)</p> <p>Entrepreneurial intention:</p> <p>Openness (+)</p> <p>Conscientiousness (+)</p> <p>Extraversion (+)</p> <p>Agreeableness (?)</p> <p>Neuroticism (?)</p> <p>Entrepreneurs' performance:</p> <p>Openness (+)</p> <p>Conscientiousness (+)</p> <p>Extraversion (+)</p> <p>Agreeableness (?)</p> <p>Neuroticism (?)</p>

Katongole, Ahebwa and Kawere (2013)	<ul style="list-style-type: none"> Entrepreneurial performance 	<ul style="list-style-type: none"> Interviews 167 female entrepreneurs operating in the tourism and hospitality sector in Uganda. 	<p>Openness (?)</p> <p>Conscientiousness (+)</p> <p>Extraversion (+)</p> <p>Agreeableness (?)</p> <p>Neuroticism (?)</p>
Mortan <i>et al.</i> (2014)	<ul style="list-style-type: none"> Entrepreneurial intentions 	<ul style="list-style-type: none"> Questionnaire 394 students from the University of Valencia 	<p>Agreeableness (+)</p> <p>Neuroticism (-)</p>
Antoncic <i>et al.</i> (2015)	<ul style="list-style-type: none"> Entrepreneurial intentions 	<ul style="list-style-type: none"> Face-to-face structured interviews 546 individuals from Slovenia 	<p>Openness (+)</p> <p>Conscientiousness (?)</p> <p>Extraversion (+)</p> <p>Agreeableness (-)</p> <p>Neuroticism (?)</p>
Chan <i>et al.</i> (2015)	<ul style="list-style-type: none"> Entrepreneurial intentions 	<ul style="list-style-type: none"> Questionnaire Data from two research efforts conducted one year apart. <p>First sample: 396 students from a large comprehensive university in Singapore</p> <p>Second sample: 272 students from the same university</p>	<p>Openness (+)</p> <p>Conscientiousness (?)</p> <p>Extraversion (+)</p> <p>Agreeableness (?)</p> <p>Neuroticism (-)</p>
Hussein and Aziz (2017)	<ul style="list-style-type: none"> Entrepreneurial intentions 	<ul style="list-style-type: none"> Questionnaire 109 entrepreneurs and 117 managers in Egypt 	<p>Openness (+)</p> <p>Conscientiousness (?)</p>

			Extraversion (+) Agreeableness (+) Neuroticism (?)
Mei <i>et al.</i> (2017)	<ul style="list-style-type: none"> Entrepreneurial intentions 	<ul style="list-style-type: none"> Questionnaire 280 college students in China 	Openness (?) Conscientiousness (+) Extraversion (+) Agreeableness (?) Neuroticism (-)
Sahinidis <i>et al.</i> (2019)	<ul style="list-style-type: none"> Entrepreneurial intentions 	<ul style="list-style-type: none"> Questionnaire 422 students and graduates (age 18–25) 	Openness (+) Conscientiousness (+) Extraversion (+) Agreeableness (-) Neuroticism (-)
Şahin, Karadağ and Tuncer (2019)	<ul style="list-style-type: none"> Entrepreneurial intentions 	<ul style="list-style-type: none"> Questionnaire 253 senior university business students from a state university and 290 adult workforces in Turkey 	A unique set of personal characteristics does not exist. A high level of entrepreneurial intention can be realized through multiple configurations of the big five personality traits.
Gao <i>et al.</i> (2020)	<ul style="list-style-type: none"> Entrepreneurial performance 	<ul style="list-style-type: none"> Questionnaire 	Negative U-shape relationship:

		<ul style="list-style-type: none"> • 202 entrepreneurs from different areas of China 	<p>Extraversion</p> <p>Neuroticism</p>
Pratama and Kristanto (2020)	<ul style="list-style-type: none"> • Entrepreneurial intentions 	<ul style="list-style-type: none"> • Questionnaire • 149 peoples of Tegalyoso Village, Klaten Utara District, Klaten Regency, Central Java Province, Republic of Indonesia 	<p>Agreeableness (+)</p> <p>Neuroticism (-)</p>
Awwad and Al-Aseer (2021)	<ul style="list-style-type: none"> • Entrepreneurial intentions 	<ul style="list-style-type: none"> • Questionnaire • 323 Undergrad university students in Jordan 	<p>Openness (+)</p> <p>Conscientiousness (+)</p> <p>Extraversion (+)</p> <p>Agreeableness (?)</p> <p>Neuroticism (?)</p>

3.5.1 Openness to experience

Someone characterised as having openness to experience characterizes as open to new opinions, experiences, and knowledge. People scoring high in this category tend to be unconventional. They are willing to question authority and find it easier to entertain new ethical, social, and political ideas (Rothmann and Coetzer, 2003). Open individuals are curious about both inner and outer worlds, and their lives are experientially richer. They are willing to entertain novel ideas and unconventional values. At the same time, open people are more sensitive, and they experience positive and negative emotions more acutely than closed people (Raad, 2000; Rothmann and Coetzer, 2003).

Researchers have extensively acknowledged the beneficial effects of openness on entrepreneurship (e.g. Zhao, Seibert and Lumpkin, 2010; Brandstätter, 2011). As the person who sets the direction of the company, entrepreneurs need to explore new ideas, concepts, products, and services to keep themselves competitive in the marketplace (Orhan and Scott, 2001; Usai *et al.*, 2018) and are frequently perceived to be more open to experiences than managers (Kerr, Kerr and Xu, 2018). Kerr, Kerr and Xu (2018) point out that people with a higher level of openness are more likely to be attracted to constantly changing environments and the novelty of new challenges, thus starting their entrepreneurship. Furthermore, they suggest that *"individuals who thrive on challenges and novel environments are those who present creative solutions, business models, and products, and the openness of entrepreneurs may aid these functions"* (p.13). In other words, in their view, a higher degree of openness is not only one of the distinguishing characteristics that separates entrepreneurs from other groups, but is also an important factor that promotes business growth and success (Brandstätter, 2011). Antoncic *et al.* (2015) conducted face-to-face structured interviews with 546 individuals from Slovenia to understand how different Big-Five personality traits affect people's entrepreneurial activities. Based on entrepreneurial intentions and current status, participants were divided into four categories: non-entrepreneurs, possible entrepreneurs, potential entrepreneurs, and practising entrepreneurs. As Figure 3.4 shows, at the univariate level, levels of openness differed significantly between groups of participants. Based on this result, Antoncic *et al.* (2015, p.831) claim that *"the openness personality factor may be the most important of the five factors for differentiating real-life entrepreneurs from other people"*. They further explain that people who score high in openness are often described as creative, imaginative, philosophical, intelligent, complex, and profound. These people are more likely to start and perform better through entrepreneurship than those who do not have these characteristics.

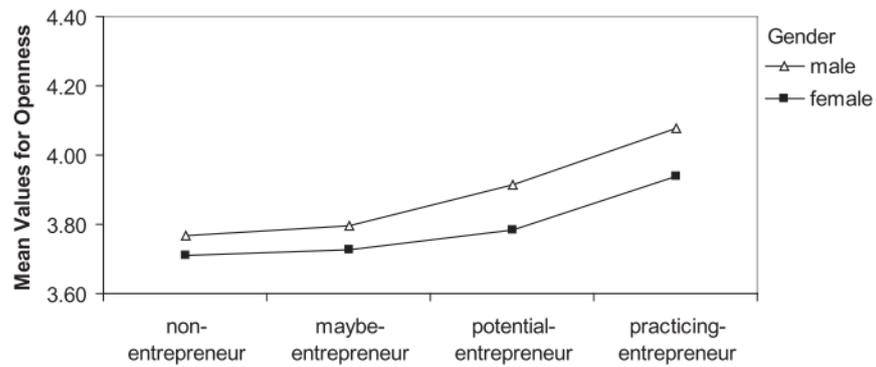


Figure 3.4 The relationship between openness and participants' entrepreneurial activities (Antonicic *et al.*, 2015, p. 828).

3.5.2 Conscientiousness

Conscientiousness is the degree to which someone shows dependability, responsibility, achievement orientation, and perseverance (Barrick, Mount and Judge, 2001; Zhao, Seibert and Lumpkin, 2010). Individuals scoring high in conscientiousness tend to be highly encouraged by achievement (Ahmad, 2010). They have strong self-discipline and are always pursuing higher work efficiency and better work results (Barrick, Mount and Judge, 2001).

The current studies commonly suggest that a high level of conscientiousness is both positive in entrepreneurial intention and entrepreneurial performance. Zhao and Seibert (2006) state that higher conscientiousness is the most significant difference between entrepreneurs and managers. They found that compared with managers, entrepreneurs have a stronger desire for achievement, and believed this high-level demand for achievement is one of the main motivating factors that drive entrepreneurs to start their own businesses. More recently, Mei *et al.* (2017) conducted a questionnaire survey with 280 university students from China to understand how personality traits impact people's entrepreneurial intention in the Chinese context. They found that conscientiousness is significantly positively correlated with entrepreneurial self-efficacy and entrepreneurial intention. Based on this finding, they explain that individuals with significant conscientiousness traits are generally concerned with long-term commitment. They are more interested in achievement and advancement, and are willing to devote themselves more to entrepreneurship to achieve greater goals.

Conscientiousness is also closely related to entrepreneurial performance. In a recent study, Jannati and Khalaf (2021) highlight the impact of entrepreneurs' conscientiousness on their business performance. In comparison to other entrepreneurs, individuals that display significant levels of conscientiousness are likely to have superior market performance (e.g., larger economic returns and higher firm-survival rates). Similar results have been reported by Perry, Penney and Witt (2008). To determine the relationship between conscientiousness

and entrepreneurial burnout, they conducted an online survey with 269 self-employed entrepreneurs. The study indicated that entrepreneurs with a relatively low level of conscientiousness are more susceptible to burnout when confronted with difficulties during firm operation. Based on this finding, Perry, Penney and Witt (2008) claim that since conscientious individuals are more inclined to use more constructive coping strategies during company operations, they tend to be more successful in avoiding burnout and thus earn better market performance.

3.5.3 Extraversion

Extraversion is a psychological indicator that can assess people's desire to interact with their external environment (Raad, 2000). According to Zhao, Seibert and Lumpkin (2010, p.387), *“People high on extraversion are gregarious, outgoing, warm, and friendly; they are energetic, active, assertive, and dominant in social situations; they experience more positive emotions and are optimistic; and they seek excitement and stimulation”*.

Considering the responsibilities of entrepreneurs, extraversion may be an important personality trait that could highly affect their profile, status and performance. Leutner *et al.* (2014) indicate that as the leader of a company, entrepreneurs need to communicate frequently with their clients, investors, employees and any other stakeholders during the business process. In this case, having some extroverted traits may allow them to perform better in some social scenarios, and thus achieve a better entrepreneurial outcome (Orhan and Scott, 2001). Similarly, Janowski and Szczepańska-Przekota (2022) note that extraversion is crucial for successful work performance in occupations that require high levels of social interaction, and hypothesised that there is a positive correlation between extraversion and entrepreneurial performance. To test this hypothesis, they conducted questionnaires and in-depth interviews with 188 entrepreneurs and 21 top-level employees of Polish SMEs to assess the association between their personality traits and entrepreneurial intentions and performance. Based on the study, they found that of the five personality traits, entrepreneurs and managers differ most significantly in terms of extraversion (see Figure 3.5). Furthermore, they point out that entrepreneurs with a higher level of extraversion are more likely to achieve entrepreneurial success. According to them, entrepreneurs' extroverted traits can help them manage groups more effectively. In addition, with this trait, entrepreneurs can better handle business issues related to social interaction, which facilitates their survival in the ever-changing economic environment.

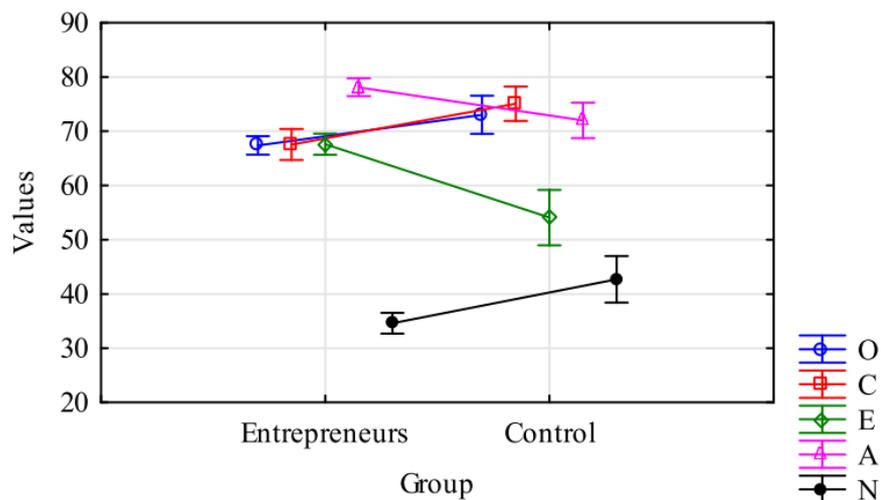


Figure 3.5 Personality traits between entrepreneurs and employees (Janowski and Szczepańska-Przekota, 2022, p.11)

On the other hand, some authors argue that there is no clear link between extraversion and entrepreneurship (e.g. Zhao and Seibert, 2006). For example, Concordia and Langford (2000) conducted a questionnaire survey with 99 managers and 119 entrepreneurs and found that compared with entrepreneurs, managers exhibited higher social tendencies and more pronounced extroversion traits. Based on this result, the researchers explain that many entrepreneurs may run a small-scale business from their homes. In such cases, entrepreneurs may not need to deal with the complexities of interpersonal and social aspects.

3.5.4 Agreeableness

The agreeableness scale measures an individual's interpersonal orientation. Individuals with high levels of agreeableness are trustworthy, forgiving, kind, altruistic, and gullible. They typically appreciate cooperation and enjoy pleasant interpersonal interactions. Conversely, a person at the low end of the dimension can be described as manipulative, self-centred, distrustful, and merciless (Raad, 2000; Zhao and Seibert, 2006).

Although agreeableness may contribute to a perception of one's trustworthiness and facilitate the formation of positive, cooperative working relationships, high levels of agreeableness may reduce their tendency to drive hard bargains, look out for one's own self-interest, and manipulate or influence people for one's own benefit (Zhao and Seibert, 2006). In this case, excessive agreeableness may reduce entrepreneurial intention and be negative to the growth of the entrepreneurial firms (Zhao, Seibert and Lumpkin, 2010; Antoncic *et al.*, 2015; Hussein and Aziz, 2017). The study of Antoncic *et al.* (2015) determines a negative association between agreeableness and people's entrepreneurial intention. As Figure 3.6 shows, people who have no intention of starting up their own firms (non-entrepreneurs) tend

to score higher in agreeableness than other people who have the willingness to start their own business. This finding supports the notion that some agreeableness traits, such as sympathy and kindness, may be seen as detrimental traits in the decision-making stages of a new start-up/firm. In addition, due to resource constraints, start-up entrepreneurs may have less margin for error, which forces them to manage their teams in a more demanding manner (Zhao and Seibert, 2006). In this context, they may be less concerned about agreeableness and more focused on getting the job done. Besides, Antoncic *et al.* (2015) suggest that agreeable persons tend to prefer a friendly and stable work environment and may be better able to adapt to an organisation's norms, policies, procedures, and culture. Therefore, they may rarely have a strong desire to leave their current environment and start a business. Kerr, Kerr and Xu (2018) state that in most companies, especially small-scale businesses, entrepreneurs commonly hold the highest level of power and do not need to worry about pleasing other people around them. In this case, even with a low level of agreeableness, they can also finish their work smoothly. However, the situation is different for managers. Zhao and Seibert (2006) mention that if managers operate in an overly self-interested and disagreeable manner, they are likely to eventually suffer negative consequences from peers and supervisors. Therefore, compared with entrepreneurs, managers are more likely to spend more time and energy in building and maintaining a friendly work environment.

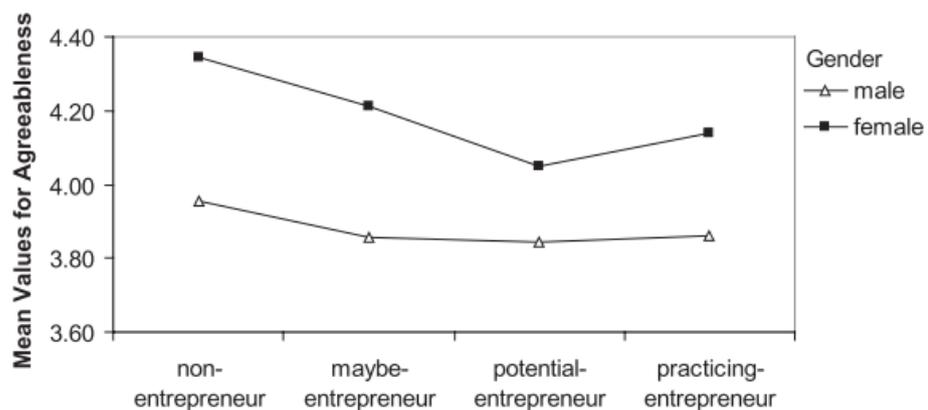


Figure 3.6 The relationship between agreeableness and participants' entrepreneurial activities (Antoncic *et al.*, 2015, p.829)

However, there are some studies that offer a different perspective, arguing that higher levels of collegiality have a positive effect on team building, which is critical to the start-up of a business. For example, in a study by Hussein and Aziz (2017), the score of entrepreneurs in agreeableness was significantly higher than for managers, which means that in the context of their study, individuals with high agreeableness increase their tendency to be entrepreneurs. Hussein and Aziz (2017) state that this difference in the empirical results could

be attributed to cultural differences and suggested that researchers should be concerned with the social environment and cultural influences when analysing the relationship between entrepreneurship and personality traits.

3.5.5 Neuroticism

Neuroticism is another important dimension of the Big-Five personality traits, which is associated with people's ability for emotional control. People with higher scores on this trait are usually more likely to be affected by negative emotions, such as fear, sadness, embarrassment, anger, guilt, and disgust. They are prone to having irrational ideas, being less able to control impulses, and coping poorly with stress. A low neuroticism score is indicative of emotional stability. People with low levels of neuroticism can manage negative emotions better and stay calm while facing challenges and setbacks (Hough *et al.*, 1990; Raad, 2000).

For entrepreneurs, relatively low levels of neuroticism may be more conducive to their business operations, which can help them maintain greater emotional stability in the face of business uncertainties and challenges (Katongole, Ahebwa and Kawere, 2013). Zhao and Seibert (2006) state that as the main decision-maker of the company, entrepreneurs are required to be rational and calm even during crises, losses, and setbacks. In this context, good emotional management can enhance their problem-solving abilities and protect them from mental stress. To identify this opinion, Zhao and Seibert (2006) conducted a meta-analysis which summarised results from 23 studies carried out between 1970–2006 and found that entrepreneurs are commonly less neurotic than managers. Based on this result, they explain that entrepreneurs need to take greater risks in running their companies, which requires them to be extraordinarily assertive and resilient in the face of pressure. These are traits that define low levels of neuroticism. Therefore, it is not surprising that the level of neuroticism among entrepreneurs is generally low. Pratama and Kristanto (2020, p.64) conducted a questionnaire with 149 participants in Indonesia to understand the impact of neuroticism on people's entrepreneurial intention. They found that neuroticism personality influences entrepreneurial intentions negatively and significantly. This means that people with high levels of neuroticism may not actively choose to start their own business. However, the study pointed out that the entrepreneurial difficulties caused by high neuroticism can be improved by others' encouragement and support. As Pratama and Kristanto (2020, p.64) describe, *"Initially, someone with a neuroticism personality did not intend to become an entrepreneur, but after getting input or encouragement from close someone, and then turned into intending to become entrepreneurs"*. Based on this finding, they argue that while low levels of neuroticism may have a positive impact on people's entrepreneurial activity, it may not be a necessary condition of success, but can be compensated by many other factors such as

interpersonal relationships. The study of Gao *et al.* (2020) also provides new evidence for the influence of neuroticism on entrepreneurship. As shown in Figure 3.7, there is a negative U-shaped relationship between neuroticism and creativity, which means that a moderate degree of neuroticism is positive for stimulating entrepreneurial creativity. Based on this result, Gao *et al.* (2020) claim that neuroticism is the personality dimension closely related to creative thinking and behaviour. Entrepreneurs with certain neurotic traits tend to perform better in terms of creativity and innovation, resulting in greater competitiveness and better market performance for their companies. On the other hand, Gao *et al.* (2020) highlight that excessive neuroticism in entrepreneurs might pose a threat to business development. They explain that operating a business requires the ability to effectively integrate information and seek new ways of thinking, which can be enhanced by a calm attitude and self-confidence. In this case, excessive neuroticism may affect the entrepreneur's ability to be emotionally stable and cope with the problems and challenges that the business may encounter at any stage.

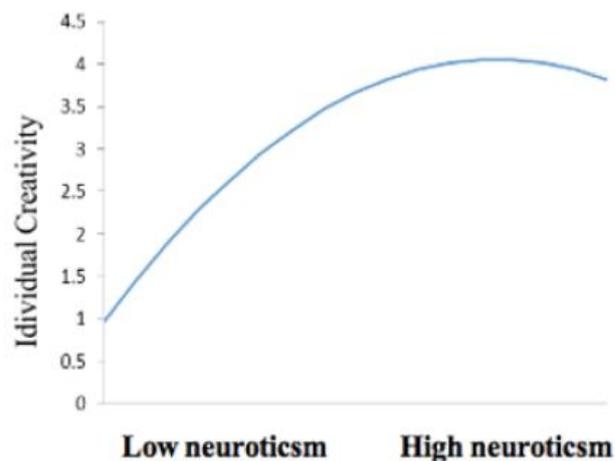


Figure 3.7 The relationship between neuroticism and creativity of entrepreneurs (Gao et al., 2020, p.9)

3.6 Founder-entrepreneurs' Influence on the Implementation and Management of a Company's Risk Strategies

An SME's overall development and success rely on its risk management capabilities. But in most SMEs, it is seen that due to their relatively simple internal structure, they usually lack or don't prioritise specific departments or resources to deal with market uncertainties. In most situations, any risk-management-related responsibilities are handled by the final decision-maker – the founder-entrepreneur (Alquier and Tignol, 2006; Crovini, Santoro and Ossola, 2020). As Dollinger (2008) emphasises, *"The role that individuals play in entrepreneurship is undeniable. Each person's psychological, sociological, and demographic characteristics contribute to or detract from his or her abilities to be an entrepreneur"* (p.21–22). In recent years, an increasing

number of researchers have realised that the individual differences in an entrepreneur's personal characteristics might lead to different entrepreneurial performances, especially when facing market risks and uncertainties (Kerr *et al.*, 2019). Some personal characteristics, such as gender (e.g. Belás *et al.*, 2015; Mukhtar, 1998), educational background and skills (e.g. Sluis, Praag and Vijverberg, 2008; Maigida and Saba, 2013), and personality traits (e.g. Kerr, Kerr and Xu, 2018; Antoncic *et al.*, 2015) are frequently discussed in entrepreneurial studies. They are considered important factors that directly influence one's entrepreneurial behaviour and decisions, further determining the direction of growth for the company.

3.6.1 Gender

When it comes to entrepreneurial behaviour, gender is frequently cited by many researchers as a major factor in entrepreneurs' decision-making, risk attitude, and management skills. Some stereotypical views of women as being more cautious and risk-averse and as being easily influenced by other people still exist (Hisrich and Brush, 1984). When faced with setbacks and risks, some researchers note that women are more likely to lose confidence in themselves (North *et al.*, 2010). Some researchers like Booth and Nolen (2012) and Gorzeń-Mitka (2015) even claim that women do not have enough capabilities to serve as excellent managers or entrepreneurs. However, with the development of society and the advancement of women's rights, more women are receiving better education and support and now have the opportunity to take senior management, leadership, and entrepreneurial roles. Traditional gender-based perspectives are gradually being questioned and challenged (Gorzeń-Mitka, 2015). In this context, many researchers are turning their attention back to the connection between gender and entrepreneurship, with some contradictory findings.

Lim and Envick (2013) collected data from 389 university students in the United States, Korea, Fiji, and Malaysia to understand their entrepreneurial orientation. In their analysis, male and female participants showed different risk preferences and attitudes when faced with potential risks. Compared with female participants, males tend to perform relatively more aggressively, and are generally willing to take a degree of risk to pursue opportunities for company growth. For females, business expansion seems less attractive. They are satisfied with the stable operation of their business and would tend to avoid any risks that might threaten the company's survival. However, Lim and Envick (2013) point out that females have better innovation ability compared to males, which can be a significant factor when starting a business. Langowitz and Minniti's (2007) findings also support the view that gender is an important factor that greatly affects people's risk awareness. They analysed individual-level survey data collected in 2001 for the global entrepreneurship monitor (GEM) project. The project collected data from 17 countries. And a standardized survey was administered to a

representative sample of at least 2,000 adults (18–64 years old) in each country. The analysis argues that women have a higher propensity for risk aversion and a lower risk tolerance than men, and this kind of risk performance might further influence their decision-making and strategy selection. Garwe and Fatoki (2012) believe that some female entrepreneurs are more willing to keep their company at a relatively small scale due to their high degree of risk aversion. At the same time, they are more likely to lack confidence in their management and problem-solving capabilities. Such characteristics might bring some adverse effects to their company's development, especially in a market full of competition and uncertainty. However, Gorzeń-Mitka (2015) provides a different perspective. Based on his study, he argues that there is no significant evidence showing that gender influences people's risk performance. He conducted questionnaires with 299 entrepreneurs, including 180 males and 119 females, and evaluated their risk behaviours from four main aspects: risk identification, risk monitoring, risk analysis, and implementation of effective risk mitigation. In the study, the researcher only found a slight difference in risk monitoring between male and female entrepreneurs. The data shows that women are more sensitive to risks during company operation, and this may be an advantage as it can help women to be proactive and prepare themselves for potential challenges.

3.6.2 Educational background and skills

Education level is another personal factor that can highly impact one's entrepreneurial behaviour. Researchers generally agree that an entrepreneur's good educational background has a positive impact on entrepreneurship (e.g. Mondragón-Vélez, 2009; García, 2014; Zhang, Duysters and Cloodt, 2014). Mondragón-Vélez (2009) analysed the data from the Panel Study of Income Dynamics (PSID) survey and points out that people with a higher education level are more likely to become entrepreneurs. He also mentions that different educational backgrounds may also influence the entrepreneurs' choice of industry. Entrepreneurs with a college degree or above prefer to choose industries that require higher professional skills, such as engineering, communication, and medical services. Another significant point cited in this study is that the education level of entrepreneurs might also influence the financial performance of their organisation. Mondragón-Vélez (2009) compared the financial status of entrepreneurs with their education levels and found that those with a higher education level tend to perform better financially. García (2014) also emphasises education as an important measure, which can help people to improve their confidence, entrepreneurial skills, and attitude, further encouraging them to start their own businesses. García (2014) believes that the crucial skills provided by a high level of education can help entrepreneurs to gain better performance in the market.

Risk management is considered an important entrepreneurial capability that can be improved by training and education. Many researchers point out that the risk management capabilities of entrepreneurs might be related to their educational backgrounds. In order to evaluate the relationship between entrepreneurs' risk attitudes with their personal characteristics, including gender, education, age, and personality traits, Kozubíková *et al.* (2017) conducted questionnaires with 1141 entrepreneurs. They found that entrepreneurs with a higher education level are more willing to take risks during the company operation. They also noted that education may change some personality traits of entrepreneurs, and some of the educational courses and training could make a person more active and adventurous. Komla, Yawo and Abankwa (2014) also label educational background as an essential factor that plays a key role in risk management and decision-making of entrepreneurs. For them, formal education has the potential to improve one's entrepreneurial knowledge and capabilities which makes them more confident when handling market risks. In such scenarios, they are more willing to take risks, and pursue prospective market opportunities to facilitate their company's growth and development.

3.6.3 Entrepreneurial motivation

As the purpose or psychological reason for entrepreneurship, entrepreneurial motivations highly impact entrepreneurs' behaviours during the company operation (Gundolf, Gast and Géraudel, 2017), especially when facing market risks (Block, Sandner and Spiegel, 2010, 2015). However, there is not enough research that examines the impact of entrepreneurial motivation on entrepreneurial risk attitudes and behaviour. Among them, one important study is from Block, Sandner and Spiegel (2015). To understand the risk attitude and entrepreneurial motivation of entrepreneurs, they conducted an online survey in Germany among 1,526 individuals, consisting of early-stage entrepreneurs and individuals who planned to start a firm. Based on their entrepreneurial motivation, Block, Sandner and Spiegel (2015) divided the participants into three groups: opportunity entrepreneurs (mainly motivated by 'pull' factors), necessity entrepreneurs (mainly forced by 'push' factors'), and mixed-motivated entrepreneurs (impacted by a combination of 'push' and 'pull' factors). The study suggests that opportunistic entrepreneurs are more willing to take risks than those who are compelled by a number of driving factors to choose to start a business. Based on this finding, Block, Sandner and Spiegel (2015) suggest that for opportunistic entrepreneurs, the satisfaction and rewards of entrepreneurship might not only lie in the increase of income. Some other pursuits, such as creativity, might motivate them to undertake more risky choices during the company's operation.

The study of Tyszka *et al.* (2011) also discusses the different risk performances of entrepreneurs with different entrepreneurial motivations. Using a questionnaire, they collected data from 117 entrepreneurs and 120 non-entrepreneurs. Similar to Block, Sandner and Spiegel (2010, 2015), they identified entrepreneurs as opportunity-driven entrepreneurs and necessity-driven entrepreneurs based on their motivation. As Figure 3.8 shows, Tyszka *et al.* (2011) found that entrepreneurs (both opportunity-driven and necessity-driven) commonly take more risks than employees. In addition, opportunity-driven entrepreneurs seem to be more active in taking risks than necessity-driven entrepreneurs. However, Tyszka *et al.* (2011) state that *"in risky business situations, entrepreneurs would more frequently, as compared to employees, choose risky options. However, it should not be attributed to high risk-proneness among entrepreneurs"* (p.130). They further explain that risk is inevitable on the path to entrepreneurship (although the consequences may be undesirable) and it is the responsibility of the entrepreneur to take that part of the risk, whatever the motivation behind the choice.

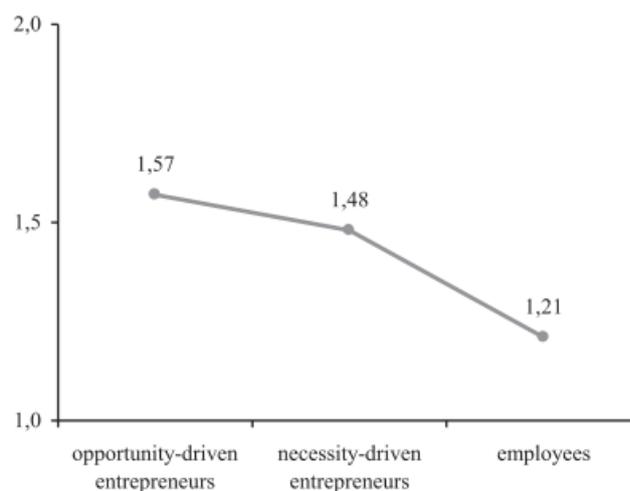


Figure 3.8 Risk behaviours among the three groups of participants (Tyszka *et al.*, 2011, p.128)

3.6.4 Personality

Compared with gender and education, personality factors are more complex and challenging to quantify and measure. However, there are many studies which have focused on personality factors in order to identify the connection between a person's personality traits and their entrepreneurial performance and risk-taking propensities.

Some studies link the personalities of entrepreneurs to their performance with risk management. Compared with other career choices, entrepreneurship is generally viewed as a risky route due to a high degree of uncertainty and challenge. In this context, risk-taking is frequently cited as an important personal characteristic of an entrepreneur. Risk-taking

entrepreneurs are always positive and willing to try something new, even though such attempts might carry the possibility of failure (Carland *et al.*, 1995). Rubinstein and Levine (2017) argue that the person who launches a business enterprise usually shows a lower level of risk aversion. In order to achieve their business objectives and goals, they are willing to accept uncertain results and unstable income, and even bear a certain level of loss. Lazear *et al.* (2005) support this opinion. They analysed graduates from Stanford Graduate School of Business to understand the connection between people's entrepreneurial intention and their risk tolerance. Their study identified a positive correlation between one's risk-taking propensity and their entrepreneurial behaviour. Although risk-taking is considered a specific personality trait that is discussed separately in many studies, there are some researchers who believe that other personality traits, such as optimism and confidence, can highly influence one's risk attitude and performance. A study conducted by Usai *et al.* (2018) showed the importance of the founder-entrepreneur's positive personality to the success of an SME's innovation and risk management process. In their case studies of two firms, they found that despite some of the challenges and imperfections with an SME's risk management and innovation process, entrepreneurs tend to show a positive attitude and confidence with their company's growth and development. The researchers believed that an entrepreneur's open and positive attitude can help them in addressing some of these limitations, thus leading their company towards a better market performance. Murad, Sefton and Starmer (2016) highlight the influence of confidence on one's risk attitudes and decision-making. They conclude that those who are confident in their capabilities are more likely to make risky choices and decisions. However, the authors caution that overconfidence could be harmful, leading people to lose their rational judgement and face adverse consequences.

The Big-Five personality model is also frequently used to determine the link between people's personality traits and risk-taking propensity. For example, the study of Sarwar *et al.* (2020) explores the relationship between Big-Five personality traits and people's investment behaviours. They collected data through a self-administered questionnaire from a sample of 397 active individual investors (a structured form that consisted of a series of closed-ended and open-ended questions). In their study, some of the Big-Five personality traits, including openness to experience, extraversion, conscientiousness, and agreeableness, were found to have a substantial positive association with participants' investment intentions, while neuroticism was found to have a negative link. To understand entrepreneurship, Kerr, Kerr and Dalton (2019) collaborated with CIC (Cambridge Innovation Centre) to conduct a 15-week survey collecting data from 1,334 participants, categorising them into four main groups: founder-entrepreneurs, non-founder CEOs/ leaders, inventor employees and non-inventor employees.

To measure the participants' risk performance, they asked participants to complete a self-evaluation for risk tolerance and a follow-up survey to capture their risk attitudes. They found that compared with participants in other occupations, founder-entrepreneurs commonly got a higher score in openness, which means that entrepreneurs are more willing to accept new ideas and make new attempts. This trait might help them to achieve better performance in innovation areas during their company's development. The results of the risk attitude also supported this view; compared with other participants, founder-entrepreneurs showed the highest level of risk tolerance. Kerr, Kerr and Dalton (2019) note that the openness of an founder-entrepreneur's personality impacts their risk tolerance, and the pursuit and desire for innovation may be one of the reasons which encourages them to undertake risks. Bergner, Auburger and Paleczek (2021) conducted an online survey with 236 employees to understand their personality traits (Big-Five traits), entrepreneurial intention, opportunity recognition, and risk-taking activities. Based on their analysis, the researchers claimed that people with higher levels of openness, conscientiousness, extroversion, and lower levels of neuroticism may be better at identifying market opportunities and more willing to take risks than others. And these characteristics may further increase their entrepreneurial intentions and motivate them to start their own business. A similar study was conducted by Mawardi and Sujarwoto (2021). They state that a lot of different factors might influence people's risk-taking behaviours. Among them, the impact of personality traits is significant and cannot be ignored. In their study, Mawardi and Sujarwoto (2021) discovered positive associations between risk-taking behaviours and openness, agreeableness, and neuroticism, and a weak negative association with conscientiousness. Regarding the influence of extraversion on risk-taking, no significant evidence was observed in this study.

3.7 Gap Analysis

Many existing studies have already validated the important role of founder-entrepreneurs in SMEs. Due to their specific characteristics, the growth of SMEs is often highly dependent on the individual capability and judgement of entrepreneurs. In this context, some personal traits, such as their entrepreneurial motivation, can directly impact their decision-making and further influence their entrepreneurial performance. This can also have an impact in the risk management process of SMEs. Current studies emphasise the importance of risk management in SMEs' development and success. In today's changing market, having good risk management can help SMEs avoid potential losses and find ways to reap better growth opportunities. However, due to the limitation of size and resources, SMEs commonly lack a comprehensive risk management structure. Therefore, as key decision-makers, SME entrepreneurs need to take responsibility for developing risk strategies for their businesses. From the overall literature

discussion, the connection between entrepreneurs, their risk management and SMEs' growth is summarised in Figure 3.9.

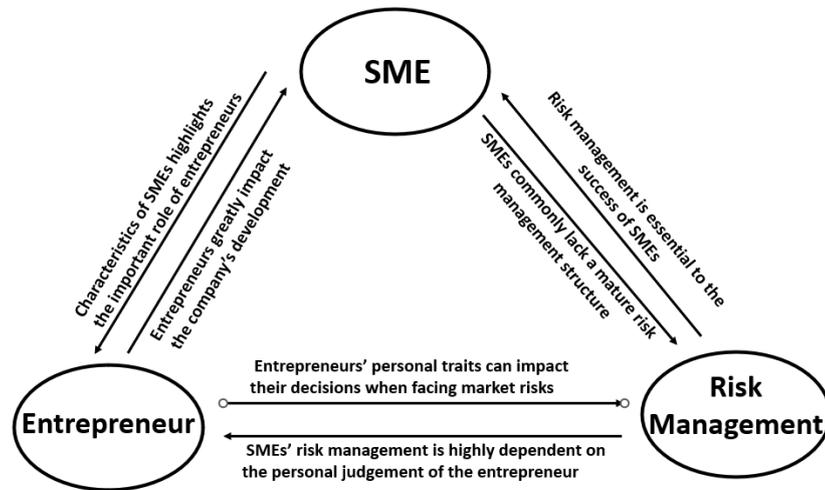


Figure 3.9 The connection between entrepreneurs, risk management and SMEs' development

Although in recent years more and more researchers are beginning to recognise that some of the personal characteristics of entrepreneurs can have a significant impact on their entrepreneurial behaviours and further impact their firm performance, the connection between entrepreneurs' personal traits and their risk behaviours is still not clear. For example, some studies explore the impact of personality traits on entrepreneurship, including entrepreneurial intention and performance. However, researchers have inconsistent or mixed views on the precise consequences of different personality qualities (See Table 3.3). In addition, some researchers have suggested that entrepreneurs' personality traits and decision-making related to risk might be related to regional factors (e.g. Kozubíková *et al.*, 2015; Hussein and Aziz, 2017) and the industries in which they work (Mansor, Norbaya and Okazaki, 2016). In other words, due to the differences in cultural environment and industry characteristics, entrepreneurs with similar personality traits may behave completely differently to others, leading to varying entrepreneurial outcomes (Hussein and Aziz, 2017; Mansor, Norbaya and Okazaki, 2016). However, most of the existing research on entrepreneurship and risk management is based on studies in Western countries, and there is very limited research on Chinese SMEs, especially Chinese high-tech software SMEs. So, what risks do Chinese high-tech software SMEs face in an ever-changing and highly competitive market? What strategies do founder entrepreneurs adopt to lead their companies to better growth in the marketplace? And what personal factors and characteristics influence the risk strategies of founder entrepreneurs? These questions and gaps guide the development of this PhD project.

Another gap in the literature is the study of businesses affected by COVID-19. As discussed earlier, COVID-19 has significantly impacted the global economy. Compared with large organisations with relatively higher risk tolerance and more resource accumulation, the impact of COVID-19 on SMEs has been far more serious. Some studies and financial reports have highlighted the significant threat of COVID-19 to SMEs' growth (e.g. Bartik *et al.*, 2020; Gourinchas *et al.*, 2020). However, most of these reports analyse the impact of the pandemic on the economy and the SME sector from a relatively macro-level perspective, and there is not enough research to analyse the development of high-tech software SMEs in China during COVID-19 and the role played by founder-entrepreneurs in managing their businesses under such complex conditions. As COVID-19 is a relatively new and ongoing phenomenon, one of the major gaps in the literature is the role of founder-entrepreneurs in assessing market risks and opportunities, especially for high-tech SMEs in China. So, how does COVID-19 impact Chinese high-tech software SMEs' growth? Which risk management strategies are utilised by founder-entrepreneurs to handle the challenges brought in by COVID-19? How do founder-entrepreneurs from high-tech SMEs in China engage with the market during COVID-19 to explore new opportunities, assess risks, and make critical decisions to survive? The following chapter will discuss the research design and methodology to explore and study some of these gaps.

3.8 Chapter Summary

This chapter discussed the essential role of founder-entrepreneurs in SMEs and how their personal traits impact their risk strategies and further impact the company's success. This chapter highlighted a well-known personality model, Big five personality traits. Following this model, the author described each of the five personality traits and their impact on entrepreneurial intentions and performance.

As discussed in the previous chapter, risk management highly impacts SMEs' development. However, due to limitations of size and resource accumulation, SMEs commonly lack a comprehensive risk management structure. In this case, the founder entrepreneur is often required to take responsibility for decisions when their business is exposed to risk. Some studies pointed out that the different personal traits of entrepreneurs might lead them to making different decisions. Therefore, the chapter discussed the personal factors that can influence entrepreneurs' decision-making skills. The limitation and gaps of the current study were highlighted, and the next chapter will now look at the research questions and methodology.

Chapter 4. Research Methodology

4.1 Chapter Overview

This chapter will focus on the research design used in this PhD study. It will first introduce the research philosophy, including ontology and epistemology, and then describe the research approach and strategies based on the project's research objectives. It will discuss the data collection and analysis techniques, and the relevant ethical considerations followed in the study.

4.2 Research Philosophy

Research philosophy refers to a system of beliefs and assumptions about the development of knowledge (Saunders, Lewis and Thornhill, 2009, p.124). Although it remains commonly hidden in research, it still influences the practice of research and needs to be identified (Creswell and Creswell, 2018). Bell, Bryman and Harley (2019) emphasise that all research should be based on a set of implicit or explicit philosophical assumptions that define the conduct of research and the theoretical implications derived from the evidence we collect and analyse.

In previous studies, researchers have used different terms to describe research philosophy. Creswell and Creswell (2018) use the term 'worldview' to describe a basic set of beliefs that guide the research activities, and illustrate four types of worldviews: Postpositivism, Constructivism, Transformative, and Pragmatism. However, some other researchers, such as Bell, Bryman and Harley (2019) and Cassell, Cunliffe and Grandy (2018) categorise the philosophical assumptions/paradigms of research into two main spheres:

- **Ontology**— the understanding of what reality is;
- **Epistemology**— the understanding of how reality can be known.

4.2.1 Ontology

Ontology refers to the assumptions about the nature of reality that shape the way researchers view and study their study objects (Saunders, Lewis and Thornhill, 2009; Easterby-Smith, Thorpe and Jackson, 2015). Bell, Bryman and Harley (2019, p.26) note that ontology is concerned with theorising about the nature of reality, which affects people's understanding and interpretation of the meaning of something's existence. In other words, ontological considerations aim to answer the question of what reality is. Researchers should consider whether the social phenomena they study should be understood as existing objectively from the observer (objectivist ontology), or whether they are 'made real' through

human activity and the meanings given to them by the observer (a constructivist ontology, which is also called subjectivism). The different views of ontology guide researchers to define reality in different ways and thus determine their research direction and approach (Lewis and Thornhill, 2009).

Two main positions are discussed in the context of ontological considerations: objectivism and subjectivism (also known as constructionism or interpretivism). Objectivism incorporates the assumptions of the natural sciences (Saunders, Lewis and Thornhill, 2009), and implies that social phenomena appear to people as external facts beyond their reach or influence, and exist whether people are aware of them or not (Bell, Bryman and Harley, 2019). Based on this view, social and physical phenomena exist independently, being universal and enduring in character (Saunders, Lewis and Thornhill, 2009).

The view of subjectivism is totally different. It challenges the suggestion that social categories, such as organisation and culture, are objective phenomena and asserts that they are made from the perceptions and consequent actions of social actors (people) (Bell, Bryman and Harley, 2019; Saunders, Lewis and Thornhill, 2009). The most extreme form of subjectivism, nominalism believes that there is no underlying reality to the social world beyond what social actors (people) attribute to it. And due to different perceptions and experiences, the reality perceived by different people may not be uniform. Therefore, talking about multiple realities might make more sense than recognising a single reality that is the same for everyone (Saunders, Lewis and Thornhill, 2009). Compared with nominalism, a less extreme version is social constructionism. Based on this viewpoint, reality is constructed through social interaction. In this process, social actors' actions and understandings create and influence reality and meaning (Bell, Bryman and Harley, 2019; Saunders, Lewis and Thornhill, 2009). Saunders, Lewis and Thornhill (2009) also highlight that social interaction between actors is an ongoing process and, as such, social phenomena are in a constant state of change and revision. In this context, reality, which is built up during social interaction, might shift through time and place. They suggest that social constructivist researchers should pay attention to the research background during their research to better understand what is happening or how reality is experienced.

This research study subscribes to a social constructionist perspective, which believes that reality is influenced by the researcher and social actors' actions, perceptions, and understandings (Bell, Bryman and Harley, 2019). Based on this ontological position, this study is conducted on the individual (founder-entrepreneurs) level. It believes that founder-entrepreneurs, like other social actors, may interpret the realities based on their own understanding and perceptions. In addition, the social constructionist view suggests that the

founder-entrepreneurs' understanding of reality is produced through the social interactions between founder-entrepreneurs, the market environment, and other social actors, such as competitors, clients, and other stakeholders, and is continually being revised. Therefore, during the study, the researcher should pay attention to the analysis of the research background.

4.2.2 Epistemology

Epistemology is the theory of knowledge. As Bell, Bryman and Harley (2019, p.29) point out, "*Epistemology follows logically from ontology*". A given ontological position will imply a particular epistemological position – a particular understanding of how we can gain knowledge of that reality. In addition, a clear understanding of epistemology helps researchers seek the best ways of enquiring into the nature of the world and allows them to answer the question of how they should conduct their research (Bell, Bryman and Harley, 2019; Easterby-Smith, Thorpe and Jackson, 2015).

The debate on epistemology has been divided into two contrasting views: positivism and interpretivism (also called constructivism, or social constructionism) (Easterby-Smith, Thorpe and Jackson, 2015). Among these, positivism is an epistemological position that advocates the application of the methods of the natural sciences to the study of social reality. It is informed by an objectivist ontological position and holds that reality exists objectively and externally. Based on this belief, the appropriate way to gather data is to observe phenomena directly or to 'measure' them using surveys or other instruments (Bell, Bryman and Harley, 2019, p.30), rather than subjectively inferring them through sensation, reflection, or intuition (Easterby-Smith, Thorpe and Jackson, 2015).

However, the task of the social scientist should not only be to gather facts and measure the frequency of patterns of social behaviour, but also to appreciate the different constructions and meanings that people place upon their experiences. In this context, in reaction to the limitation of principles of positivism, interpretivism has been developed by philosophers during the last half-century (Easterby-Smith, Thorpe and Jackson, 2015, p.53). Bell, Bryman and Harley (2019) highlight the different underlying purposes of positivist and interpretivist research, with positivism aiming to explain human behaviour, while interpretivism is primarily concerned with understanding human behaviour. They point out that "*Interpretivism is also concerned with the 'how' and the 'why' of social action, including the processes whereby things happen*" (Bell, Bryman and Harley, 2019, p.31). In this context, the primary focus of research undertaken within this epistemological assumption is "*the way we as humans attempt to make sense of the world around us*" (Saunders, Lewis and Thornhill,

2009, p.134). The concern of the researcher would be to become involved in the organisation's everyday activities in order to understand and explain what is going on, rather than change things (Saunders, Lewis and Thornhill, 2009).

Following logically from social constructionist ontology, this study uses interpretivism epistemology, which is primarily concerned with understanding founder-entrepreneurs' behaviours, including their entrepreneurial motivations, risk attitudes, and strategies. Besides, in this study, the researcher aims to understand 'how' founder-entrepreneurs manage risks during the company's operation and 'how' they lead their company to success. These research questions highlight the essential role of founder-entrepreneurs as 'people' who make an impact on their business's growth. It follows the purpose of interpretivism, which is about "*understanding people's behaviour*" (Bell, Bryman and Harley, 2019, p.31).

4.3 Research Question

Identifying the research question is the most fundamental and important step in the research process (Bell, Bryman and Harley, 2019). Based on the detailed literature review and the research gaps described in the previous chapters, the research focus of this project is placed on the following question:

- How founder-entrepreneurs from high-tech software SMEs in China engage with the market to explore new opportunities, assess risks, and make critical decisions to survive?

To better explore this research question, the following sub-questions were posed during the research:

- What role do founder-entrepreneurs play in the management and development of high-tech software SMEs in China?
- What motivational factors drive founder-entrepreneurs towards an entrepreneurial career?
- What strategies do founder-entrepreneurs use to engage with the market, assess and manage risks including COVID-19, and explore new business opportunities?
- How do the personal traits of founder-entrepreneurs influence their entrepreneurial activities in terms of decision-making and risk strategies?

4.4 Research Design

Saunders, Lewis and Thornhill (2016) define the research design as the overall plan of how the researcher will go about addressing the research question(s). In the most elementary sense, the

research design is the logical sequence that links the data to a study's initial research questions and finally leads the researcher to their conclusions (Yin, 2018). A complete research design should include clear objectives derived from the research questions, methods for data collection and analysis, and a discussion of ethical issues and other constraints that the researcher may face in the research process (Saunders, Lewis and Thornhill, 2016). Researchers need to take the research design seriously and choose the most appropriate research methods to obtain the most reliable findings.

According to Saunders, Lewis and Thornhill (2016), the first methodological choice is whether the study follows a quantitative or qualitative method research design. The main difference between quantitative and qualitative research is the distinction between numeric data (figures) and non-numeric data (text, images, video clips, and other similar material) (Saunders, Lewis and Thornhill, 2016). However, the contrasts between quantitative and qualitative research are not limited to the form of data. As can be seen in Table 4.1, Bryman (2003, p.94) summarises the different features of quantitative and qualitative research from 8 aspects.

Table 4.1 *Contrasting features of quantitative and qualitative research (Bryman, 2003, p 94).*

	Quantitative	Qualitative
Role of qualitative research	Preparatory	Means to exploration of actors' interpretation
Relationship between researcher and subject	Distant	Close
Researcher's stance in relation to subject	Outsider	Insider
Relationship between theory/concepts and research	Confirmation	Emergent
Research strategy	Structured	Unstructured
Scope of findings	Nomothetic	Ideographic
Image of social reality	Static and external to actor	Processual and socially constructed by actor
Nature of data	Hard, reliable	Rich, deep

Among them, quantitative research emphasises quantification in the collection and analysis of data. It is generally associated with positivism and takes a view of social phenomena as an external, objective reality (Saunders, Lewis and Thornhill, 2016). This research strategy usually entails a deductive approach to the relationship between theory and research and tends to test theories (Bell, Bryman and Harley, 2019; Saunders, Lewis and Thornhill, 2016). Conger (1998, p.108) notes that as researchers' understanding becomes more and more defined, quantitative analysis can then refine and validate with 'empirical rigour' the hypotheses generated by prior

qualitative investigations. Burrell and Gross (2017, p.1378) argue that *“the purpose of quantitative research is to generate knowledge and create understanding about the social world”* and point out that the theory verified by quantitative research can be generalised to a larger and more general population.

Qualitative research is usually expressed in words rather than numbers in data collection and analysis (Walliman, 2014). As a research strategy, it is in general inductive, constructionist, and interpretive (Bell, Bryman and Harley, 2019, p.355). Compared to quantitative research, one of the main advantages of qualitative research is that it allows the researcher to gain an in-depth understanding of the chosen issue, case or social phenomenon. As Walliman (2014, p.73) explains, qualitative data is descriptive, and its richness and subtlety lead to great insights into human society. Qualitative research encourages researchers to consider the meaning behind people's actions rather than simply focusing on the actions themselves (Bell, Bryman and Harley, 2019). In addition, in business research, quantitative and qualitative strategies generally have different research focuses. Bell, Bryman and Harley (2019) point out that qualitative research strategies are conducted to analyse small-scale aspects of social reality, while quantitative researchers are commonly involved in uncovering large-scale social trends. Such research commonly works with smaller sample sizes. In this case, qualitative researchers have the opportunity to build a deeper connection with the people being investigated. Although some researchers believe that such close involvement might impact the researcher's objectivity, it can help them approach a genuine understanding of the world from their subject's perspective. Borrego, Douglas and Amelink (2009) note that qualitative studies place more emphasis on the context of the study than quantitative studies. These studies tend to focus on smaller groups in order to examine a particular context in great detail. Through thick descriptions of specific contexts, quantitative research leads readers to relate the study to their own situations. In this case, the reader's understanding may vary depending on his or her own experiences and circumstances.

Appendix 2 collates a number of studies related to risk behaviour and risk management among SME entrepreneurs. It can be seen that both qualitative and quantitative approaches are frequently involved in entrepreneurship and risk management research. However, there are some differences in the research focus of qualitative and quantitative studies. As Table 4.1 shows, qualitative studies have been used commonly to explore 'How' questions. For example, McCarthy (2000) conducted a longitudinal case study to explore how entrepreneurs think about and deal with risk in the strategy formation process. The researcher found the qualitative approach more suitable for his research purpose as it allowed him to be 'theoretically sensitive' to many different concepts and to remain open to new and surprising findings. Ellegaard (2008)

also uses the qualitative approach in his research to explore how small-company owners manage supply risk in the course of their company's development. They note that risk management is a complex process, there are many different factors that can influence the small-company owners' risk behaviour. To explore such complex issues, qualitative methods offer more advantages than quantitative methods.

On the other hand, quantitative studies generally aim to deal with some 'What' questions, which cover approaches that attempt to measure and/or count social phenomena and the relationships between them (Bell, Bryman and Harley, 2019, p.163). For example, Lu *et al.* (2020) used a questionnaire to collect data from 4,807 Chinese SMEs to answer a question about the main challenges SMEs faced during the COVID-19 outbreak. Kotaskova *et al.* (2020) designed a quantitative study to define and present significant factors affecting the perception of personnel risk in the SME segment. As already seen, unlike qualitative research, quantitative research focuses more on the social phenomenon itself rather than the meaning behind it. Lu *et al.* (2020) list the main challenges faced by SMEs, but do not explore how these challenges would affect the business or how the business would respond to these risks. Kotaskova *et al.* (2020) summarise the important factors that influence entrepreneurs' risk awareness, but do not describe in detail how this influence occurs.

This PhD project uses a qualitative approach for the following reasons:

- The research philosophy supports a qualitative strategy. Bell, Bryman and Harle (2019, p.35) point out that "*particular ontological assumptions lead researchers to particular epistemological assumptions...particular epistemological assumptions lead scholars toward particular methodological assumptions*". As discussed earlier, this project's research strategy follows its epistemological and ontological assumptions. It acknowledges the significant impact of individuals on social reality and aims to understand one's behaviour. In this context, the qualitative strategy can be deemed as a suitable choice.
- As this research explores the areas of entrepreneurship and risk management, it will involve multiple levels of phenomena in order to explain different events and outcomes. Many factors can influence or motivate entrepreneurs to make decisions when facing market risks and many of these can be difficult to quantify. To get a comprehensive understanding of these factors, a quantitative approach may not be sufficient. According to Conger (1998), quantitative studies aim to measure the presence and frequency of a static term, but there is insufficient description and explanation of the meaning of the term and the context in which it appears. Therefore, the quantitative strategy will not help researchers to get a deeper understanding of the entrepreneurial phenomena. To address this limitation, this

study chose a qualitative strategy as it allows the researcher to collect rich data and build a deeper understanding of the role of founder-entrepreneurs, their risk performance, and entrepreneurial behaviours.

- The role of founder-entrepreneurs might evolve and change with the growth of the business. Conger (1998) highlights that some significant experiences, such as achievements, failures, opportunities, setbacks, and risks could highly affect and even reshape the leaders' management behaviours. At the same time, the impact of a number of external (e.g. changing market conditions) and internal factors (e.g. company expansion) can also influence the risk attitudes of founder-entrepreneurs, leading them to make different decisions at different points in time, even if they face similar situations. In this context, adopting the qualitative research approach can help the researcher better understand the observed changes in their key subjects, founder-entrepreneurs, and their various roles over a given time period. Therefore, from this aspect, qualitative research appears to be more suitable for this study.

4.4.1 Case study as a research approach

According to Yin (2018), the case study is an in-depth inquiry that relies on multiple sources of evidence to generate a deep, multifaceted understanding of complex real-life issues. It emphasises detailed contextual analysis of one or a small number of events, organisations, or individuals, generally over time (Easterby-Smith, Thorpe and Jackson, 2015; Bell, Bryman and Harley, 2019). Flyvbjerg (2006) highlights that the success of the case study relies on developing a 'good narrative', focusing on the situational details and specific events and writing about them in a way that captures the *"complexities and contradictions of real life"* (p. 237). This research method allows researchers to focus in-depth on a 'case' and to build a holistic and real-world perspective. If the research questions require an extensive and detailed description of some social phenomenon, then the case study should be an appropriate option (Yin, 2018). Based on this criteria, Yin (2018) highlights some conditions to judge when the case study should be used:

- The form of the research question: "how" or "why" questions
- Where the researcher cannot control the events
- When there is focus on contemporary events.

This PhD research project meets these three conditions. Firstly, the study aims to address the question of how founder-entrepreneurs from high-tech software SMEs in China manage risks and explore market opportunities. It is a 'how' question, and Yin (2018) notes that such questions commonly deal with the tracing of operational processes over time, rather than

mere frequencies or incidences. Therefore, some quantitative methods, such as surveys or examinations, are rarely considered for such questions. In addition, Yin (2018) argues that case studies are preferred when the relevant behaviours cannot be controlled and manipulated and when the desire is to study some contemporary event or set of events. This is also consistent with this study. In this study, although the researcher has the chance to meet and interact directly with the founder-entrepreneurs, she cannot influence or control their behaviour or decision-making within their organisations. Based on these factors, the case study should be a suitable data collection method for this study.

Based on different research purposes, case studies can be divided into three categories: exploratory, descriptive, and explanatory (Yin, 2018, p.9). Among them, the exploratory case study is suitable for topics with a limited existing knowledge base (Yin, 2018). It is set to explore any phenomenon in the data which serves as a point of interest to the researcher. Descriptive case studies are designed to describe the natural phenomena occurring in the data in question. In this type of case study, the researcher must start with a descriptive theory to support the description of the phenomenon or story. Explanatory case studies scrutinise the data at both the surface and the deeper levels to explain the phenomena in the data. On the basis of the data, the researcher may then form a theory and set about to test this theory (Zainal, 2007). In this PhD study, the research focuses are:

- Understanding the role of founder-entrepreneurs in managing and leading their company's day-to-day operation.
- How their personal characteristics influence the company's risk strategies.

For this PhD, a descriptive case study has been utilised.

According to the number of analysis units, the case study design can be either a single-case design or a multiple-case design (Yin, 2018). Based on Zainal (2007), researchers can adopt a single-case design when no other cases are available for replication. However, it must be noted that the single-case design may not allow a generalisation within its conclusion, in particular when the events are rare. In addition, Yin (2018, p.51) points out that "*a potential vulnerability of the single-case design is that a case may later turn out not to be the case it was thought to be at the outset*". In this case, the researcher suggests that when selecting a single-case study, the researcher should conduct a careful investigation of candidate cases to minimise the chance of misrepresentation and to maximise the opportunities needed to gather evidence for the case study. Compared with the single-case design, evidence from multiple cases is often considered more compelling, and the overall multiple-case study is therefore regarded as being more robust (Herriott and Firestone, 1983). There are also some

shortfalls with multiple case designs, Yin (2018) notes that the unusual or extreme case, the critical case, and the revelatory case are all likely to involve only single-case studies. In addition, to conduct a multiple-case study, extensive resources and time are usually needed, which can greatly increase the researcher's workload. However, he also emphasises that when researchers have the choice (and resources), multiple-case designs may be preferred over single-case designs (Yin, 2018, p.61). Due to these advantages, the researcher chose a multiple-case design for this study.

Unlike the cross-sectional study, which collects data at a single point in time (Wei and Moyer, 2008), the longitudinal examination provides a systematic way of observing the events, collecting data, analysing information, and reporting the results over a long period of time (Zainal, 2007). As Bell, Bryman and Harley (2019, p.67) note, case study research frequently includes a longitudinal element. The researchers are often participants in an organisation over a period of months or years. Alternatively, they may interview individuals over a long period of time or inject additional longitudinal elements into the study by analysing archival information and retrospective interviews. Compared with a cross-sectional study, the longitudinal study has some significant advantages. Wei and Moyer (2008) argue that this type of research design has a better capability of capturing sequential developmental patterns and changes. In addition, longitudinal studies allow for a large amount of data to be collected from every single individual over time. This can greatly increase the comprehensiveness and representativeness of the data. Therefore, in this PhD project, a longitudinal case study approach is used.

4.4.2 Case selection

Identifying the unit of analysis is an important part of the case study design. According to Bell, Bryman and Harley (2019), the levels of analysis for case study research include individuals, groups, organisations, and societies. Yin (2018) suggests that case study researchers should identify the unit of analysis based on the research questions and study propositions. Without a specific research question, the researcher may collect a lot of unnecessary data, which will affect the quality and comprehensiveness of the research's output.

This research focuses on founder-entrepreneurs from Chinese high-tech software SMEs with an aim to understand their role and how their personal characteristics influence decision-making and risk strategies in the business operation and management. Therefore, the unit of analysis is the individual, the founder-entrepreneur of that SME.

After defining the unit of analysis, case study researchers need to further define the boundaries of the case (Yin, 2018). As Yin (2018) highlights, the boundaries also should tighten the connection between the case and the research questions. Researchers need to refine the case selection criteria based on the research questions to clearly distinguish data about the subject of the case study from data external to the case.

Following the recommendations of Yin (2018), and based on the research question on how founder-entrepreneurs from high-tech software SMEs in China manage risks and explore market opportunities, this research selects cases based on the following criteria:

Firstly, the selected participants should be the people who created the enterprise and are continuously involved in its operation and management.

Secondly, companies owned by participants should meet the following criteria:

- The main business of the company should mainly involve software design, development, or operation. In other words, the company should be identified as a high-tech software company based on the 'High-tech Industry (service) Classification Standard' of China (National Bureau of Statistics of China, 2018).
- Based on the definition of SMEs in China (National Bureau of Statistics, 2018), the company should have fewer than 250 employees and its annual income should not exceed one billion RMB.
- The company should have been operating in the market for over 3 years with relatively good financial and market performance. Their experience from the market competition and challenges will ensure rich data on risk management strategies to this study.

4.4.3 The process of recruiting cases

Recruiting suitable cases is essential to ensure the smooth delivery of the research design and study. Aiming to select suitable participants to take part in this study, the researcher searched for information on relevant companies through LinkedIn and Tianyancha (a leading business enquiry platform in China), screening companies that met the case selection criteria as potential cases. Through email and LinkedIn, the researcher connected with potential cases. However, only one founder-entrepreneur replied to the email and agreed to join the study.

The researcher then contacted the Zhejiang Association of Small and Medium Enterprises, a government agency dedicated to assisting and supporting the development of SMEs. After presenting the content and objectives of the PhD project, the researcher received the support of the association and was invited to attend an SME networking session in China. In

that event, the researcher had the opportunity to communicate face-to-face with some founder-entrepreneurs. Some of them showed interest in the study and agreed to participate. In addition, the association also provided a list of Chinese software SMEs with contact details of founder-entrepreneurs, which greatly assisted the process of recruiting cases.

As a result of these strategies, a total of 11 founder-entrepreneurs agreed to participate in the study. However, due to a number of personal reasons, such as busy schedules and a lack of interest in such academic interviews, two of the founder-entrepreneurs later decided to withdraw from this study. Therefore, eventually, 9 founder-entrepreneurs of Chinese high-tech software SMEs participated in the study as cases.

The unexpected outbreak of COVID-19 greatly increased the uncertainty in the research process, posing a great deal of challenges to the organisation of the planned face-to-face interviews as per the research design. Some founder-entrepreneurs were too busy dealing with the unforeseen problems of the pandemic to be distracted from participating in academic interviews. In these cases, the researcher had to reschedule the interviews based on the convenience of the participants and their busy schedules. In addition, the international travel restrictions caused by COVID-19 made face-to-face communication more difficult, especially in China due to the government's zero-COVID policy. Fortunately, with the support of the department and the university, the researcher was allowed to stay in China for distance learning between mid-2020 and mid-2021. This gave the researcher opportunities to engage with the participants directly, organise site visits following the protocols and safety measures of the Chinese government, and observe the physical environment of their enterprises despite all the challenges.

4.5 Data Collection

As a longitudinal case study, the researcher collected data at different points in time from 2019 to 2021, in total of four phases as shown in Table 4.2.

Table 4.2 The four phases of data collection

Research phase	Data collection techniques	Point in time
Phase 1. General understanding of the cases	Semi-structured interview and documents (Official website and some paper materials provided by participants)	November to December 2019
Phase 2. Impact of COVID-19 and founder-entrepreneurs' strategies to manage the challenges of the pandemic	Semi-structured interview	March to April 2020
Phase 3. Personality characteristics and risk attitudes of founder-entrepreneurs	Semi-structured interview and Big-Five personality and risk attitude test	October to December 2020
Phase 4. Update on risk management and the role of founder-entrepreneurs	Semi-structured interview	March to May 2021

The unexpected emergence of COVID-19 in early 2020 changed some of the initial plans for this research, especially some of the planned interview questions. Semi-structured interviews were used in this study; these interviews generally involve open-ended questions that allow participants to freely express their opinions (Creswell and Creswell, 2018). Easterby-Smith, Thorpe and Jackson (2015, p.139) note that in semi-structured interviews, researchers' questions are used to stimulate a conversation rather than to guide responses. At the same time, this data collection approach also offers researchers a flexible research process: as Bell, Bryman and Harley (2019) note, in qualitative interviewing, researchers *"can depart significantly from any schedule or guide that is being used. They can ask new questions that follow up interviewees' replies and can vary the order of questions and even the wording of questions"* (Bell, Bryman and Harley, 2019, p.435).

Before conducting a semi-structured interview, researchers commonly prepare a research guide to organise the main elements of the interview. According to Bell, Bryman and Harley (2019), a well-designed question list should cover the areas of interest in the research. This can ensure the smooth conduct of the interview and help researchers gather more useful information during the communication. Saunders, Lewis and Thornhill (2016) highlight that in semi-structured interviews, researchers should take care in their approach to questioning. They should reduce the scope for bias during the interview and increase the reliability of the information obtained. For example, interview questions should be phrased clearly to ensure that

the interviewee can understand them. Besides, Saunders, Lewis and Thornhill (2016) suggest researchers use open questions in semi-structured interviews. These can then be followed up by the use of appropriately worded probing questions. However, they emphasised that researchers should avoid using leading or proposing types of question in order to control any bias that may result from their use.

This study involved Chinese high-tech software SMEs, and both the participants and the researcher were native Chinese speakers. Although most of the literature involved in this study is in English, considering the fluency of communication and the differences in understanding that may arise due to unfamiliar languages, the researcher decided to use Chinese in the data collection process. Based on this decision, the researcher needed to translate the risk questionnaire into Chinese prior to the start of the Phase-III study. In addition, the transcription of all interviews were translated into English before moving on to the data analysis stage. To ensure the validity of the translation, the researcher invited a person who knew both English and Chinese, but was not involved in the relevant elements of the study, to review the translation. This person was also invited to check the accuracy of the interview transcription, which will be discussed in detail in a later section.

4.5.1 Phase 1. General understanding of the cases

The main purpose of Phase I is to get a general understanding of the founder-entrepreneurs and their business. The interviews start with an introductory question: '*Could you please tell me a little bit about your company?*'. Such a question gives the founder-entrepreneur a flexible opportunity to talk about their business. It also helps the researcher to create an overall understanding of the business and helps to break the ice. The follow-up questions explore founder-entrepreneurs' personal background, entrepreneurial motivation, risk management of their company, innovation attitude, and understanding of success. Table 4.3 highlights some of the Phase 1 interview questions; a full list of questions can be found in Appendix 5.

Table 4.3 Interview structure of Phase 1

Themes of interview questions		
General operation situation of the company		
Theme 1	Personal background	Founder-entrepreneurs' working experiences
		Founder-entrepreneurs' educational experiences
		Connection between personal experiences and their entrepreneurship
Theme 2	Entrepreneurial motivation	The motivation of founder-entrepreneurs to start a business
Theme 3	Risk management	Risks faced by Chinese high-tech software SMEs
		Risk management in Chinese high-tech software SMEs
Theme 4		Role of innovation in Chinese high-tech software SMEs

	Innovation attitude	Innovation and related risks
Theme 5	Company success	What success means to the founder-entrepreneur
		Connection between success and risk management

4.5.2 Phase 2. Impact of COVID-19 and responding strategies

Phase 2 data collection was conducted between March and April 2020. During that period, the COVID-19 outbreak greatly impacted the Chinese market development, threatening SMEs' survival. In order to get a deeper understanding of the influences of the pandemic on these Chinese high-tech SMEs, this interview mainly focuses on three aspects: the setbacks faced by Chinese high-tech software SMEs during COVID-19, strategies used to cope with COVID-19 risks, and the company's future development plans (see Table 4.4). A full list of questions can be found in Appendix 6.

Table 4.4 Interview structure of Phase 2

Themes for Interview questions:		
Theme 1	COVID-19 risks	Impacts of COVID-19 on business and life
		Impacts of COVID-19 on the software industry
		Operation model of business
		Changes to business model due to COVID-19
Theme 2	Risk Strategies	Risk attitude towards COVID-19
		Risk strategies implemented during COVID-19
Theme 3	Development plan	How COVID-19 experiences shape future direction
		Impact of COVID-19 on SMEs' risk management structure for future

4.5.3 Phase 3. Personality traits and risk attitudes of founder-entrepreneurs

The previous two phases of the study helped the researcher to create a general understanding of the important role of founder-entrepreneurs in their company. In this phase, the researcher wanted to understand how the founder-entrepreneurs' risk attitude and personality traits might impact their risk strategies. To clearly identify the personality traits and risk attitudes of participants, the researcher used the Big-Five personality test and risk attitude test during the data collection. The researcher also used follow-up interview questions to understand the participants' self-evaluation of their own personality characteristics and risk attitudes.

- **Big-Five personality test**

As discussed in Chapter 2, the Big-Five personality model is frequently used in entrepreneurship studies (e.g. Şahin, Karadağ and Tuncer, 2019; Antoncic *et al.*, 2015; Leutner *et al.*, 2014) and risk management studies (e.g. Nicholson *et al.*, 2005; Lönnqvist *et al.*, 2015). For this study, the Chinese Big Five Personality Inventory (CBF-PI) by Wang, Dai

and Yao (2010a, 2010b, 2011) has been used (See Appendices 7 and 8). Compared with the Revised Neo Personality Inventory (NEO-PI-R) (Boyle, Matthews and Saklofske, 2008) which is widely used in academic studies, the CBF-PI is more simplified. More importantly, it has been developed specifically to assess the Chinese personality, which will be more suited to the Chinese culture. In this research, all participants are native Chinese speakers. In this context, using this personality inventory is beneficial to avoid culture and language biases.

Based on the report of Wang, Dai and Yao (2010a, 2010b, 2011), the CBF-PI has good reliability and validity. Until now, this personality inventory has been used in a number of academic studies involving the personality traits of Chinese people. For example, Cheng *et al.* (2015) use the CBF-PI to explore the influence of personality factors on suicidal behaviour, and Gong *et al.* (2016) adopt this personality inventory to discuss the connection between people's personality traits and their addictive Internet behaviour. At the same time, the researcher contacted the lead author of the CBF-PI, Mengcheng Wang, describing the main research aims and content of the study and asking for his advice on the use of the personality scale in this study. According to his suggestions, the CBF-PI is suitable for use in this case study research.

- **Risk attitude test**

In this study, the researcher uses the risk questionnaire published by Oxford Risk Research & Analysis Ltd (2018) (See Appendix 9 (a)) to test participants' risk attitudes. This is a short questionnaire with 10 questions related to risks. Based on the results of this test, the researcher can get a general understanding of participants' risk tolerance and attitudes. However, it should be noted that the results of risk questionnaires alone may not be sufficient to fully assess participants' attitudes to risk. To get a comprehensive understanding of the participants' risk attitudes, the researcher used a follow-up interview in conjunction with their self-assessment. Some of the interview questions included how they would rate their understanding and attitude towards risk, their views on the relationship between risks and opportunities, and how their attitude towards risks has changed/evolved over the course of running the business, especially with the experience of COVID-19, see full list of interview questions in Appendix 9 (b).

4.5.4 Phase 4. Update on risk management and the role of founder-entrepreneurs

The fourth phase of the study mainly focuses on getting an update on the risk management of the Chinese high-tech software SMEs. It aims to explore the significant role that founder-entrepreneurs play during the company's risk management process and how their personal traits impact the company's risk strategies. This phase allowed the researcher to get an in-

depth understanding of how the founder-entrepreneurs were managing their business and future plans following their experiences with COVID-19.

Table 4.5 shows the main structure of Phase 4. As the final phase of data collection, this phase of the study also allowed the researcher an opportunity to explore some of the follow-up themes and queries from the previous data collection. The focus of the interview was on ‘risk’, including the risk management process of the company and the impacts of COVID-19 on founder-entrepreneurs’ risk strategies. It also included some questions on the development plans for company risk management (see Appendix 10 for a full list of the questions).

Table 4.5 Interview structure of Phase 4

Theme of interview questions:		
Theme 1	Overall questions about risk management	Important role of risk management to company development
Theme 2	Risk and innovation	Connections between risk and innovation
Theme 3	COVID-19 and risk strategies	The impact of the pandemic on founder-entrepreneurs' risk strategies
		Risk management follow-up plans and improvement

4.6 Data Analysis

4.6.1 Interview transcription and translation

Transcription is an essential step for qualitative research involving an interview approach. Bell, Bryman and Harley (2019, p.445) stress that transcription has the advantage of keeping intact the interviewee's words, which allows the researcher to conduct a more comprehensive analysis. Besides, this behaviour facilitates the retention of original research data and the conduct of secondary scrutiny. Each interview lasted between 45 minutes and 90 minutes, which resulted in a relatively large transcription workload. To ensure accuracy, the researcher carried out the transcriptions immediately after the interviews. The researcher listened to the audio recordings multiple times, so as to create a full draft. After that, the interview transcriptions were translated from Chinese to English. In order to avoid any potential bias that could have occurred during the translation process, another person was commissioned for proofreading (somebody who was proficient in both Chinese and English and who had no association with this research project). Through the interview transcription and translation, the researcher created a general understanding of the participants' opinions. This facilitated the establishment of an analytical framework to provide a basis for the next data coding step.

4.6.2 Using NVivo for data analysis

As discussed above, this study is primarily concerned with qualitative data. Compared to quantitative research, qualitative research relies more on unstructured language in the form

of field notes, interview transcripts, documents, or visual images (Bell, Bryman and Harley, 2019), which leads to a more varied, resilient and complex meaning of qualitative data (Saunders, Lewis and Thornhill (2016). Due to these characteristics, “*there are few well-established and widely accepted rules for the analysis of qualitative data*” (Bell, Bryman and Harley, 2019, p.518).

Thematic analysis is one of the most common approaches to qualitative data analysis (Bell, Bryman and Harley, 2019). Burnard *et al.* (2008) point out that data analysis for qualitative research should begin with the identification of themes and categories emerging from the data. Based on this point, Burnard *et al.* (2008) highlight the 'open coding' process. They suggest that once the interviews have been transcribed verbatim, the researcher should read the transcription and summarise a statement or word for each element that is discussed in the interview. After that, the researcher collects all these words and phrases together, works on them, and cuts out the duplicates. Once these steps have been completed, the researcher is provided with a final list that can be used to divide up all of the interviews. The interviews in this study were analysed following the guidelines of Burnard *et al.* (2008). As Bell, Bryman and Harley (2019, p.531) stress, “*code as soon as possible*”; the researcher conducted preliminary analysis and coding of the data at the end of each phase of the interviews.

There are several widely-used computer-assisted qualitative data analysis software (CAQDAS) packages available, such as NVivo and ATLAS.ti, that can be used to manage and help in the analysis of qualitative data (Burnard *et al.*, 2008; Bell, Bryman and Harley, 2019). They can help to manage, sort and organise large volumes of qualitative data, store, annotate and retrieve text, locate words, phrases and segments of data, prepare diagrams, and extract quotes, thus making the data analysis process clearer, more flexible, and more comprehensive (Burnard *et al.*, 2008). In this study, NVivo 12 was used to support the data analysis. The software helps to organise and analyse unstructured information, thus helping to uncover important links between different sources and to substantiate the findings with evidence. It provides a unique workspace and a very user-friendly platform with many unique features that help to visually code interview transcripts, examine the frequency of code use, and derive diagrams and models from the codes. For this study, one of the significant features of NVivo is its case classification. With this function, the researcher can integrate all the digital material related to the case, including audio recordings, transcriptions of interviews, photos of the entrepreneur, and screenshots of the company's official website, which helped with the storage and analysis of the data.

As discussed earlier, four phases of data collection were conducted for this study and each with different contents. At the end of each phase, the researcher coded the study data in

stages. When all four phases of data collection were finished, the researcher looked back at the overall analysis results and put them together to make the final coding. The initial coding steps of the research were a little messy and wide; based on the suggestions of Burnard *et al.* (2008), the researcher collected key points of participants and used some keywords to name and summarise them. Through the reviewing, the codes were focused on broader areas, such as Innovation Management, Company Success, Talent Attraction, and Entrepreneurial Activities. With in-depth analysis of the interview transcription and coding data, combined with the existing literature, a more refined coding framework emerged. As Figure 4.1 shows, three main themes were assigned in this framework, which are:

- Important role of founder-entrepreneurs
- Risk management status in Chinese high-tech software SMEs
- COVID-19 and SMEs' development.

Name	Files	References
Basic Information of Cases	15	134
Company success and development	16	125
Achievement and success	14	107
Development of software industry in China	2	3
Futher goal	5	15
COVID-19	20	284
Impact of COVID-19	18	182
Influence to the risk attitude	3	3
Strategy to reduce the impact	16	99
Important role of founder-entrepreneurs	16	217
Entrepreneurial Motivation	12	131
Important skills for entrepreneurs	12	62
Personality	9	16
Responsibilities of founder-entrepreneurs	4	8
Risk Management of Chinese high-tech software SMEs	18	276
Entrepreneurship is a risky selection	2	2
Innovation	18	231
Risk attitude	3	3
Risk examples	5	6
Risk Management	2	2
Role of founder-entrepreneur play during the risk management	10	27
Type of risks	1	1

Figure 4.1 Data analysis of the research

There are some common criticisms of coding. Bell, Bryman and Harley (2019) note that coding might lead to the qualitative data losing the context of what is said. For example, *"By picking chunks of text out of the context within which they appeared, such as a particular interview transcript, the social setting can be lost"* (Bell, Bryman and Harley, 2019, p.533). In addition, the fragmentation of information caused by coding should be taken into account. Another essential issue that should be considered by researchers is ensuring the reliability and validity

of the categorisation. During the transcript reviewing and coding process, researchers should avoid potential bias due to their own subjectivity as much as possible. Based on this point, Burnard *et al.* (2008, p.431) suggest that the researcher should have their analyses verified or validated by a third party, and list two key ways of having data analyses validated by others: respondent validation (or member check), and peer review (or peer debrief).

The first approach requires researchers to return their analysis to study participants and ask them to validate it. The second approach requires researchers to ask another qualitative researcher to help them validate the analysis. This study mainly adopted the peer review approach, and also referenced the feedback of study participants. Based on their suggestions, the research made final amendments to the thematic coding framework. Based on the data analysis at that stage, a conference paper, "How do high-tech software SMEs in China manage risks and survive in today's complex environment?" was presented at the 16th European Conference on Innovation and Entrepreneurship (ECIE 2021). The feedback from the reviewers of this conference paper greatly facilitated the research design. This paper was also shared with some participants to get some comments and feedback. Their advice was helpful in developing further research. Follow-up publications in other conferences, as well as two journal papers, also facilitated the quality of data analysis and presentation.

4.6.3 Record keeping during the study

As part of good research practice, all important information and details conducted during this study were properly collated and kept in personal files, including interview recordings and other case-related materials.

To prevent data loss due to equipment problems, interviews were fully recorded simultaneously using a smartphone and a voice recorder. All recording acts were made with the permission of the participants (See section 3.6.4, Principal ethics involved in the project). After the interview, these recorded files were transferred to a password-protected personal laptop. They were noted with the date and the name of the participant, for further analysis. For research materials in paper form, such as notes, correspondence details, key information about participants and their enterprises were classified according to different cases. These materials were kept locked in a cabinet at the university.

4.6.4 Principal ethics involved in the project

It is very important to deal with ethical issues properly in business research. Bell, Bryman and Harley (2019, p.109) warn that "*ethical issues can arise at various points in the research process. Business researchers, therefore, need to be aware of and prepared to address these issues in order to ensure the integrity of their study and the reputation of business research*

more generally". Based on Diener and Crandall (1978), the ethical principles can be mainly broken down into four main areas:

- Research should not harm participants
- Research requires informed consent from participants
- Research should not invade the privacy of participants
- Research should not involve any deception (Diener and Crandall, cited in Bell, Bryman and Harley, 2019, p.114).

This research project has been approved by the Physical Sciences Ethics Committee (PSEC) of the University of York. During the course of the research, several rounds of in-depth interviews were conducted, which may pose certain ethical risks to the researcher. Among them, two of the major ethical issues that needed to be addressed were informed consent and privacy. In order to protect the participants' right to informed consent, a 'research consent form' (see appendices 3 and 4) was prepared. In the consent form, the researcher gave participants a brief outline of the research purpose and major contents, and described to the participants how the data were stored. Participants were informed of their full right to refuse to answer questions that made them uncomfortable or to call off or withdraw from the study midway through. This consent form was provided to participants prior to the start of the Phase 1 study. Before participants signed it, the researcher verbally prompted the key points on the consent form and confirmed their intention to participate in the study. In addition, the researcher wanted to be able to use the full names of the participants and their enterprises in the project reports. This action was communicated to the participants in advance and permission was obtained from all.

Another ethical area is the storage of the data. As stated by Bell, Bryman and Harley (2019), researchers are required to protect the privacy of research participants. Therefore, the proper storage of research data involving participants' personal information and opinions is an important step in protecting their rights. In this project, all digital information relating to participants and their business, including interview recordings and transcribing, introduction documents provided by participants, personal photos of participants, and the screenshot of the company's official website, were stored on the university computer and the researcher's personal laptop. Both devices are password-protected to ensure data security and privacy. All paper documents, such as printed transcripts of interviews, were safely locked away in a cabinet in the researcher's university office. In order to further safeguard the privacy of the

participants, all records and other digital information will be deleted, and all paper documents shredded 18 months after the PhD is completed.

The study does not involve sensitive, vulnerable groups such as children, homeless youth, people with illnesses, etc. However, the research questions in the interviews have the potential to touch on sensitive points for the participants. They may lead participants to share some rich perspectives, and also carry the risk of making participants feel uncomfortable. Aiming to avoid such situations as far as possible, the researcher would reiterate to the participants before each interview that they had the right to refuse to answer questions that made them feel uncomfortable. At the same time, the researcher was very careful about the way she asked questions and paid attention to the body language of the participants during the interviews.

4.7 Quality of the Case Study

As a social science method, four main tests are commonly used to establish the quality of case study research. These are Construct validity, Internal validity, External validity and Reliability (Yin, 2018).

Among them, internal validity highlights the causal relationships between variables and results (Carnahan, Agarwal and Campbell, 2010). It tests whether the researcher has provided sound causal argument to justify the study's conclusions (Saunders, Lewis and Thornhill, 2016). Saunders, Lewis and Thornhill (2016) point out that the concept of the internal validity is *“associated with positivist and quantitative research”* (p. 203). Since this research is a descriptive case study, this section will only discuss the quality of the case study from the aspects of Construct validity, External validity, and Reliability.

- **Construct validity**

Construct validity testing in case studies is particularly controversial. Scholars who are critical of case studies often argue that case study researchers fail to develop a sufficiently operational set of measures. Therefore, during the data collection in case studies, researchers' preconceived notions often lead them to make more 'subjective' judgements (Yin, 2018, p.43; Flyvbjerg, 2006, p.219). Based on this situation, Yin (2018, p.44) lists three tactics to increase construct validity when doing case studies. He recommends researchers to use multiple sources of evidence and establish a chain of evidence during the data collection process. At the same time, he encourages researchers to provide draft case studies to key informants for verification to enhance the authenticity of the evidence.

In this study, the sources of evidence were diverse. As discussed, the main data collection technique used in this study is the in-depth interview. However, in conducting the research, some other forms of evidence, such as documents and personality tests, were used to understand the case and address the research questions. The evidence is embodied in different forms, yet these are closely and logically linked. For example, both interviews and personality tests are used to assess the personality traits of founder-entrepreneurs. In this context, these two types of evidence can be cross-checked to enhance the construct validity of the research.

- **External validity**

External validity deals with the problem of knowing whether a study's findings are generalisable beyond the immediate study. For the case study, one of the traditional concerns is that researchers cannot generalise on the basis of a single or a small number of cases (Flyvbjerg, 200; Yin, 2018). Focusing on this point, Yin highlights that case study researchers should clearly identify the difference between 'statistical generalisation' and 'analytic generalisation'. He points out that when doing case study research, the goal of the researchers should be to expand and generalise theories and not to extrapolate probabilities (Yin, 2018, p.21). Rather than thinking about the case(s) as a sample, researchers should think of the case study as the opportunity to shed empirical light on some theoretical concepts or principles (Yin, 2018, p.39).

To assess the external validity of the case study, Yin (2018) recommends researchers review the initial research questions. He argues, "*The form of the question(s) can help or hinder the preference for seeking generalizations—that is, striving for external validity*" (Yin, 2018, p.45). Based on his opinion, for a descriptive case study, 'how' and 'why' questions can be extremely helpful for analytic generalisation. This project was guided by several 'how' questions (as can be seen in Chapter 3.3), that can naturally lead the research to arrive at an analytic generalisation.

- **Reliability**

The objective of reliability is "*to be sure that, if a later researcher follows the same procedures as described by an earlier researcher and conducts the same study over again, the later investigator will arrive at the same findings and conclusions*" (Yin, 2018, p.46), which aims to minimise the errors and biases in a study.

In order to increase the reliability of the study, Yin (2018, p.46) suggests case study researchers document their research process in as much detail as possible. He also recommends setting up a detailed case study protocol and database, so that others can follow the procedures. Creswell and Creswell (2018) advise conducting intercoder agreement (or cross-checking) in the data collection process. They explain that the researcher can find another person who can cross-check their codes to ensure the study's reliability.

In this study, the researcher references both of these two authors' suggestions. As previously mentioned, all data and materials involved in this study have been well documented and properly maintained. Meanwhile, the cross-checking had been conducted in all key processes of the research, such as interview transcription, translation, and coding. The next chapter will give an overview of the cases used in this study.

4.8 Chapter Summary

This chapter discussed the research methodology used in this research project. This study aims to address the research question on how founder-entrepreneurs from high-tech software SMEs in China engage with the market to explore new opportunities, assess risks, and make critical decisions to survive. Based on this, a qualitative research strategy was used and this included longitudinal case studies with founder-entrepreneurs from nine high-tech software SMEs in China. Semi-structured interviews were conducted during the data collection process, which helped the researcher to obtain more comprehensive and detailed information. In addition, to understand the founder-entrepreneurs' personality traits and risk attitude, the Chinese Big Five Personality Inventory (CBF-PI) and the risk questionnaire published by Oxford Risk Research & Analysis Ltd were used in this study. This chapter also presented some details about data analysis, such as thematic analysis using Nvivo 12, and the key aspects of assessing the quality of a case study, including construct validity, external validity, and reliability. Relevant information is presented in sections 3.6 and 3.7.

Chapter 5. Review of Case Studies

5.1 Chapter Overview

As discussed earlier, this research selected the case studies of nine successful Chinese high-tech SMEs. And as part of a longitudinal study the researcher interviewed the founder-entrepreneurs of these SMEs to understand their company's operational model, risk management strategies, their personal characteristics and the influence they have on their company's overall growth and risk management. This chapter will give a general introduction of these companies including a profile of their founder-entrepreneurs. Table 5.1 summarises some of the basic information of the nine cases including their background, year of establishment and the number of employees.

5.2 Case 1: Kehao Chen from Hangzhou Potential Network Technology Co., Ltd.

Hangzhou Potential Network Technology Co., Ltd. is based in the city of Hangzhou, Zhejiang and was established in July 2015. As an innovative software company, it runs an online platform and mobile application to provide human resources management services to programmers and organisations across China. Programmers who are actively seeking jobs can create a profile on this platform and record their professional skills, job search intentions, preferred working hours, ideal salary, and other relevant information. At the same time, companies with recruitment needs can also register their conditions and requirements. Based on the information provided by both parties, the platform matches them through a series of algorithms and helps both the programmer and enterprise to find the most suitable candidates. This algorithm is unique to this company, making it innovative and distinct compared to others in this sector. The platform also provides task distribution services.

Kehao Chen is the founder-entrepreneur of this company. He feels that the work of programmers often has no restrictions on time and place, whereas for some enterprises, especially SMEs, hiring a full-time programmer might significantly increase their operational cost, so they are keen on cost-effective solutions. In such scenarios, when a temporary technical task arises in an organisation, they can post that specific task request on the platform of this company instead of recruiting a full-time programmer. The platform can then match this task to an available programmer based on their skills, competences, and personal situation. For programmers, this platform offers good, flexible opportunities to increase income in their spare time.

Table 5.1 Basic Information of Research Cases

Case No.	Company Name	Founder-entrepreneur	Main Products & Services	Year Established	Number of employees
1	Hangzhou Potential Network Technology Co., Ltd.	Kehao Chen	Online platform and application for human resources management	2015	0-49
2	Beijing ColorfulClouds Pacific Technology Co., Ltd.	Xingyuan Yuan	Software and online platform for translation and weather forecast	2014	0-49
3	Hangzhou Zhupai Information Technology Co., Ltd	Ting Xu	Software and online platform for capital management	2014	50-99
4	Hangzhou Flyby Network Technology Co., Ltd.	Qiannan/Nancy Chen	Online services and platform for business travel	2016	50-99
5	Zhejiang Ruxie Network Technology Co., Ltd.	Zuohua Fu	Online services and platform for personal insurance	2016	0-49
6	Hangzhou Good Memory Information Technology Co., Ltd.	Haijun Xu	Mobile application and online platform for engineering cost management	2016	0-49
7	Zhejiang Muzhiji Network Technology Co., Ltd.	Pengyao Zhu	Mobile application Designing	2016	0-49
8	Hangzhou Weihong Technology Co.,Ltd.	Tong Han	Work collaborative software designing	2005	50-249
9	Hangzhou Wanjian Network Technology Co., Ltd.	Yong Cui	Online platform and application for medical education	2015	0-49



Figure 5.1 The official website of the Hangzhou Potential Network Technology Co., Ltd.

Since its launch in 2015, the company has experienced several setbacks and challenges, as well as a number of achievements. Until recently, it has become the most extensive online work platform for mid to high-end programmers in China. Over the years, Hangzhou Potential Network Technology Co., Ltd. has always insisted on hiring experienced experts and consultants, and using high-tech technologies and concepts such as cloud calculation and big data to help companies solve software development and technical employment problems and provide stable online job opportunities.

Although this company has faced the unprecedented challenges of the COVID-19 pandemic since 2020, their mission still remains unchanged. Kehao mentioned in one of the interviews, *“Any setback will not change my mind, I want to improve programmers' working environment, and hope our platform can help more and more programmers find the most suitable job and work method.”* Going forward, the company wants to retain and maintain this goal/objective. It hopes that its efforts will revolutionise the way Chinese programmers work and one day, its platform can become the birthplace of new ideas, technologies, and standards.

5.2.1 Profile of the founder-entrepreneur

Kehao Chen graduated from the Department of Information Engineering at Hubei Minzu University in 2014 with a Bachelor's degree, and established Hangzhou Potential Network Technology Co., Ltd. a year after graduation. This was not the first entrepreneurial venture for Kehao. During his university years, he had also tried his hand at an entrepreneurial project with his classmates. However, due to lack of financial resources and management ability, that initial entrepreneurial venture did not succeed. While talking about this experience, Kehao shows an optimistic and spontaneous attitude. Although the initial business failure brought him some financial loss and mental stress, he never changed his mind about becoming an entrepreneur. On the contrary, he feels that this experience actually improved his personal capabilities, including management skills, communication skills, and stress management, which became an important foundation for his current entrepreneurial venture.



Figure 5.2 Kehao Chen, founder-entrepreneur of Hangzhou Potential Network Technology Co., Ltd.

When talking about why the company chose to focus on offering services to programmers, Kehao explained how it was due to his educational background and experience. His university major is Computer Science, and after graduation, many of his classmates started working as programmers and fed back to him on the working situation in that field. Many complained about the inconsistent work mode and long working hours, making him realise that there was room for improvement in programmers' work scenarios. This motivated him to address this gap and start his business.

Now, Kehao and his business seem to be on the right track. They have withstood the market for over eight years and have gained a certain amount of recognition from clients and investors. As the founder-entrepreneur, Mr Chen is keen on improving his decision-making and management skills to face future uncertainties and challenges.

5.3 Case 2: Xingyuan Yuan from Beijing ColorfulClouds Pacific Technology Co., Ltd.

Beijing ColorfulClouds Pacific Technology Co., Ltd. is an AI-powered high-tech company that offers machine translation and minute-by-minute weather forecast services to the public and other organisations. It is based in the city of Beijing and was founded in 2014.



Figure 5.3 The official website of Beijing ColorfulClouds Pacific Technology Co., Ltd.

Since its establishment, the company has been committed to the development and application of AI technology. It currently has two main software products, which are ColorfulClouds Weather and ColorfulClouds Translate.



Figure 5.4 ColorfulClouds Weather

ColorfulClouds Weather was the first product released in 2014 by Beijing ColorfulClouds Pacific Technology Co., Ltd. It can provide accurate future weather forecasts and real-time weather information updates. These functions help users to plan their next trips more rationally. Compared with other types of weather forecasting software, ColorfulClouds Weather uses AI-based technology to achieve minute-by-minute weather forecasts. Besides, the software also provides a platform for weather enthusiasts to communicate and exchange ideas. In this

application, people can share weather-related photos, such as rainbows, hailstorms, and sunsets. Such a creative aspect of sharing and communication within this platform makes the weather forecasting more interactive and interesting for a range of users. For Xingyuan, who is the founder-entrepreneur of ColorfulClouds, the objective is to get more people interested in weather, build more knowledge and understanding of meteorology, pay more attention to weather's changes and thus, in the bigger picture, create more awareness of the need to protect ecology and the environment.

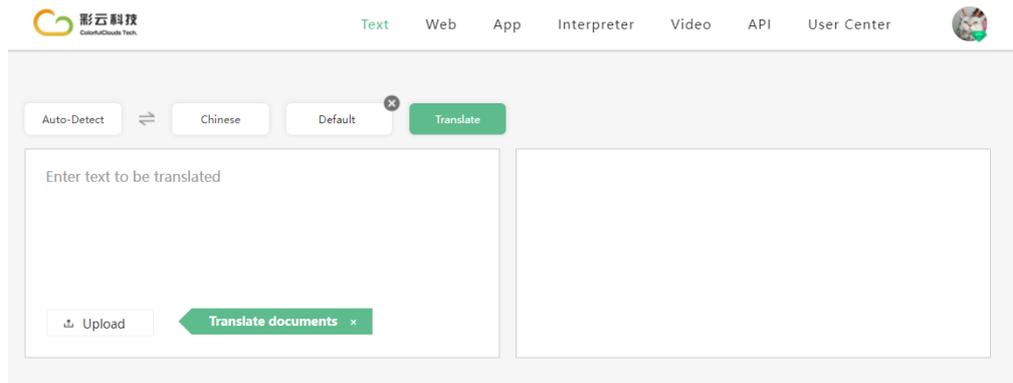


Figure 5.5 ColorfulClouds Translate

In 2016, the team from ColorfulClouds created a new business concept: they wanted to break the communication barriers between different languages by using AI-based technology. This then led to the development of ColorfulClouds Translation, which was officially launched on the market in December 2017. It's a C-end software product that provides translation of words, documents (including pdf, Excel, etc.) and websites. Users can easily translate content between Chinese, Japanese and English through their services. At the same time, they also provide matching translation services for some search engines, such as 360 Browser and Google Chrome. As long as the user has their plug-in installed in the browser, ColorfulClouds Translate can automatically convert the original web content into the language of the user's choice. For video and audio, the software also offers a real-time translation service. Using AI technology, ColorfulClouds Translate can achieve accurate speech-to-text conversion and translate text into the user's desired language in the process. When introducing this product, Xingyuan mentioned with pride that he hoped this product would meet more people's desire to communicate, thus removing language barriers as an obstacle to learning and working in people's lives.

As a relatively young and active innovation company, ColorfulClouds Tech wants to continue developing more AI technology-based platforms and provide excellent services to their users.

5.3.1 Profile of the founder-entrepreneur

Xinyuan Yuan is the founder-entrepreneur of Beijing ColorfulClouds Pacific Technology Co.,

Ltd. He started this venture in 2014 with his team. Given his programming background, he was able to use his expertise and experience when building this company. After graduating from Shandong University of Science and Technology in 2005, he worked at Alibaba as an Algorithmic Project Manager. However, this stable work routine didn't satisfy him or motivate his career aspirations; he wanted to do something more challenging to test and prove his technology competences. Based on this ambition, he and his team launched ColorfulClouds Weather with very limited funds and resources. Currently, the product has become one of the company's main products and over the years has brought considerable revenue and industry awareness to the business.



Figure 5.6 Xingyuan Yuan, founder-entrepreneur of Beijing ColorfulClouds Pacific Technology Co., Ltd.

Talking about his entrepreneurial journey, Xingyuan reflected how before starting his own business, he didn't think much about how much money he could make from his project. Instead of focusing on money, he is more concerned about how his company could improve the industry through their technology. Through his business, he is keen to explore how it could bring benefits to the society. Xingyuan understands that if the company wants to influence the industry, it should have larger power and market influences. And for a software-based company, good technology is a fundamental and essential competence that could be their biggest competitive advantage. Hence, throughout his entrepreneurial journey, Xingyuan has never stopped learning and improving his skills. Over the years, he has participated in a number of academic conferences and published several research papers. He said that technology is changing rapidly and as an entrepreneur, he needs to keep updating his personal knowledge to follow the trend. Only in this way will he be able to lead his team to survive and succeed in a highly competitive market.

5.4 Case 3: Ting Xu from Hangzhou Zhupai Information Technology Co., Ltd

Hangzhou Zhupai Information technology Co., Ltd. is based in Hangzhou, Zhejiang and was founded in July 2016. This company uses a SaaS (software as a service) model to help users dispose of non-performing assets and solve financial problems through their online platform and mobile application. For users who are in desperate need of funds, the platform can help them cash in on fixed assets as quickly as possible to weather a financial crisis. And for those interested in buying, the platform helps them to get up-to-date information on assets being auctioned at judicial auctions and allows them to acquire them at below-market prices. In addition, the company also provides financial information services to its users. In the words of its founder-entrepreneur, Ting Xu, it acts as a bridge to help users and financial institutions, such as banks, build a better connection and avoid communication barriers. At the same time, the company also cooperates with local courts, offers a range of services in judicial auction proceedings, which includes but is not limited to financial matching, asset information aggregation, due diligence and evaluation and judicial services, providing tailor-made service solutions for customers and courts.

Up to now, it has disposed of over ¥800 million of non-performing assets for users, banks, and companies. It has been widely recognised in the industry and built long-term cooperation with asset-management enterprises, banks, and government organisations. In April 2017, Hangzhou Zhupai Information Technology Co., Ltd. completed its Series A funding round.³ The milestones of success in the financial markets have highly encouraged the company's development.

³ A series A round (also known as series A financing or series A investment) is the name typically given to a company's first significant round of venture capital financing. It is usually the first series of stock after the common stock and common stock options issued to company founders, employees, friends and family and angel investors (CFI Team, 2022).



Figure 5.7 The official website of Hangzhou Zhupai Information Technology Co., Ltd

5.4.1 Profile of the founder-entrepreneur

Ting Xu founded Hangzhou Zhupai Information Technology Co., Ltd in 2016. Before starting his own business, Ting had relatively extensive work experience. After graduating from university in 2004, Ting worked for Alibaba as a Microfinance Risk Controller for a few years. After that, he moved to People's Insurance Company of China in 2007 and worked there for five years. During these roles, Ting built up a comprehensive understanding of the asset management industry and also accumulated certain contacts for his business venture.

In the interview, Ting used the phrase 'Euthanasia for enterprise' to describe their business content. He said, *"Many of our clients are the companies which face serious financial problems. Some of them even struggle with life and death. In this case, the only thing we can do is to help them to properly dispose surplus assets and reduce their losses as much as possible."* After the setback of COVID-19, Ting is more aware of the importance and necessity of his business. In such a high-risk market, failure is sometimes inevitable. When failure occurs, Ting and his team can help their clients dispose of their final assets and exit the market with dignity. Despite the complexity of such business, in his mind, his company's work is meaningful and worthy of his commitment.

5.5 Case 4: Qiannan/Nancy Chen from Hangzhou Flyby Network Technology Co., Ltd.



Figure 5.8 The official website of Hangzhou Flyby Network Technology Co., Ltd.

Hangzhou Flyby Network Technology Co., Ltd (Flyby Business Travel) is a technology-driven, innovative internet company that provides enterprises with comprehensive solutions for intelligent business travel. It is based in the city of Hangzhou Zhejiang and was first launched in 2016. In 2019, this company was rated as a national high-tech enterprise of China.

Based on the intelligent travel management SaaS cloud platform, the company has upgraded the traditional travel process, including application, approval, reservation, reimbursement, and settlement, to online digitalisation, which helps companies with business travel-management needs realise process data, data visualisation, analysis, and decision-making intelligence. The company's business content covers air tickets, train tickets and hotel reservations, car rentals, visa processing, insurance purchases, conference travel programme design, etc. Their packages almost cover the entire category of corporate business travel.

Apart from these services, Flyby Business Travel also offers a bespoke service to its clients. The company will design a specific business travel package based on the client's travel needs and budget. Their comprehensive price comparison system helps their clients find the best value for money on their travel products, which highly reduces the cost of business travel for their clients.

Flyby Business Travel has now gained some recognition within the business travel industry. So far, it has provided professional business travel services to over 1,000 listed companies and large enterprises. It has also established good cooperation with the Hangzhou Municipal Government and has been selected as one of the tourism service providers for the 2022 Asian Games. In the financial market, the performance of the company is also significant. In 2017, the company

completed a Series A round of funding, raising over ¥10 million.

5.5.1 Profile of the founder-entrepreneur

Qiannan/Nancy Chen, the founder-entrepreneur of Hangzhou Flyby Network Technology Co., Ltd, has a lot of experience living abroad. Before establishing the company, she spent around eight years in the US where she completed her Master's degree in Communication and Education from Columbia University in 2015.

When she was living in the U.S., she found that compared with China (in that period), the way of learning and working there was more digital and informative. Although the Chinese Internet industry was growing rapidly, more people seemed to be paying their attention to the C-end market. For the B-end market, however, there was a lack of standard digital services and products that could meet the needs of enterprises. Based on these observations, Nancy decided to start a B-end software company to fill these gaps in the Chinese market. After she returned to China in 2015, she found that business travel was still a blue ocean that could benefit from start-ups. This led her to seize an opportunity and establish Flyby Business Travel in 2016.



Figure 5.9 Qiannan/Nancy Chen, founder-entrepreneur of Hangzhou Flyby Network Technology Co., Ltd.

Regarding her educational background's influence on her becoming an entrepreneur, Nancy noted that it was not directly related to her entrepreneurial venture. She had to gain more knowledge and develop certain business skills in the process of establishing this company. Through the growth of the company, Nancy also gained some personal achievements. In 2019, she was named in the 'Forbes China List of 300 Top Innovators, Entrepreneurs and Leaders Under Age 30'. In 2020, she was selected as one of the 'Hurun Under30s Entrepreneurial Leaders', and in the same year, she was named one of the 'Top Ten Leaders of China's Industrial Supply Chain 2020'. Nancy is very modest when it comes to these accolades, but

she also shows confidence in the company's further development. *"After the big setback of COVID-19, we are still alive, which means we have enough power to survive in the market,"* she said. She believes that she can lead her team to achieve further development in the future and she has several plans in her vision for business growth.

5.6 Case 5: Zuohua Fu from Zhejiang Ruxie Network Technology Co., Ltd.

Zhejiang Ruxie Network Technology Co., Ltd is a platform operation service provider which is based in Hangzhou, Zhejiang. It was founded in 2016 and mainly provides information services for customers in insurance enterprises. Its customer group is mainly concentrated to large organisations, such as banks or insurance enterprises. At the same time, it also cooperates with government units, provides technical support and helps them to build and maintain web platforms for customer service and feedback.

Compared with other enterprises, this company's customer group is relatively fixed and stable. The founder-entrepreneur, Zuohua Fu, explained how for most of their clients, relationship building mainly relies on the personal connections and networks of Zuohua and his key business partner. Hence, creating an official business website for them isn't a priority. *"We prefer to spend our energy on customer maintenance as opposed to some promotional activities,"* Zuohua stated. This business strategy seems suitable for their company, as until now, the company has been able to run at a stable rate and has built long-term cooperation with some famous insurance enterprises.

5.6.1 Profile of the founder-entrepreneur

Zuohua Fu is the founder-entrepreneur for Zhejiang Ruxie Network Technology Co., Ltd. In 2016, he decided to quit a stable job he had in a large insurance company where he worked for four to five years to establish his own business venture. For him, this was a risky and challenging choice to make. He had good opportunities for career progression in his former company. There, his abilities were generally well recognised by his superiors and clients, and he had become the youngest marketing regional manager in the company. However, the fixed structural pattern and repetitive work routine made Zuohua feel unchallenged and demotivated. On his 30th birthday, he finally made the decision to give up that job and embark on a new career journey.



Figure 5.10 Zuohua Fu, the founder-entrepreneur of Zhejiang Ruxie Network Technology Co., Ltd.

However, for Zuohua, his entrepreneurial journey didn't go very well at first. He initially tried to start a business in sectors such as online marketing and services, but due to a lack of understanding of these market sectors, the overall results were unsuccessful. Following his experience with failures in these areas, Zuohua decided to return to the industry he was familiar with – the insurance industry. *"The insurance industry highly relies on personal connections, in this industry, people will only cooperate with someone they are familiar with,"* he noted. And his work experience had helped him accumulate enough contacts and social capital, which then played a significant role in the company's establishment.

For the development of the company, Zuohua has shown great ambition. After COVID-19, he further strengthened this idea. He believes that the pandemic will raise public awareness of risk, which may open up some new opportunities for the insurance industry and will leave more room for his company to expand.

5.7 Case 6: Haijun Xu from Hangzhou Good Memory Information Technology Co., Ltd.

Hangzhou Good Memory Information Technology Co., Ltd. is based in Hangzhou, Zhejiang, and was founded in February 2016. It is an innovative enterprise that aims to use advanced computer technologies, including cloud computing, big data, mobile internet, voice and image recognition, and AI to improve the digital level of engineering costs in the construction industry.



Figure 5.11 The official website of Hangzhou Good Memory Information Technology Co., Ltd.

The company provides its services through computer clients, mobile applications, and online websites. Clients can check and edit their project information on these three platforms. To use the company's service, the user needs to firstly record the basic information of the engineering project from any platform. Once their users have uploaded the project information, the software will automatically generate a database that will record all the details of the project from beginning to end. For enterprise users, the company also provides online co-working services. As Figure 5.12 shows, project participants with access can log into the costing system from their computer or smartphone to edit the project details together.

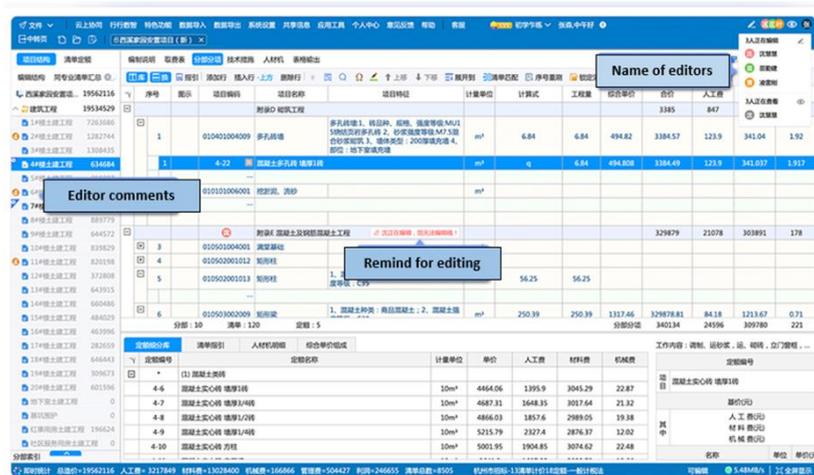


Figure 5.12 The costing system of Hangzhou Good Memory Information Technology Co., Ltd.

The system records each person's editing actions and provides real-time feedback to other project participants. In addition to information and data management functions, the company also offers one-to-one online consulting services for small companies that may lack professional engineering cost talents. The company's engineering cost experts will give a detailed cost plan based on the client's actual situation. At the same time, the company will help its clients create digital costing models on their systems and provide video and text tutorials to help them use the features more effectively.

Since its establishment, the company has grown from a start-up to a company with some influence on the industry sector. The company's costing system has been recognised by

professional institutions, such as the Zhejiang Provincial Bureau of Standard and Cost and the Hangzhou Construction Engineering Association. In 2019, Hangzhou Good Memory Information Technology Co., Ltd. completed its Series A funding round. The company appears to have a bright future ahead.

5.7.1 Profile of the founder-entrepreneur

Haijun Xu is the founder-entrepreneur of Hangzhou Good Memory Information Technology Co., Ltd. Reviewing his career journey, Haijun feels that he has never left the engineering cost industry. After graduation from college in the area of engineering, Haijun was hired as a cost engineer by a state-owned construction enterprise. He then worked at the company for more than ten years. During that process, he witnessed the rapid development of the construction industry in China. The increasing number of high-rise buildings and the modern infrastructure in the cities reflect the growing strength of this country. But on the other hand, Haijun realised that beneath the surface of prosperity, there were also some hidden dangers and shortcomings in the industry that had been largely overlooked.

Compared with other industries, the work model of the construction industry is relatively traditional. *"I have been working for more than ten years, but our work methods and content have hardly changed and improved at all,"* Haijun said. How to use information technology to improve the efficiency and accuracy of project cost, and then to promote the digital transformation of the construction industry, has become the most concerning issue for Haijun. He tried to communicate with his supervisor in the hope that his opinion would be taken into account by the company. However, due to the company's complex work structure and fixed working patterns, his views were not taken into consideration. After being frustrated, he decided to quit his job and start his own business to realise his ideas.



Figure 5.13 Haijun Xu, founder-entrepreneur of Hangzhou Good Memory Information Technology Co., Ltd.

"I am grateful for my decision," Haijun said. His company's digital system has helped many

organisations simplify the engineering cost process, which also played a certain role in the standardisation of the construction industry. About the further development of the company, Haijun is very confident. He stated that he and his team would continue developing a more convenient and ingenious costing system to help more and more users with their daily work.

5.8 Case 7: Pengyao Zhu from Zhejiang Muzhiji Network Technology Co., Ltd.

Zhejiang Muzhiji Network Technology Co., Ltd. is based in the city of Hangzhou and was established in 2016. It is a software design company that focuses on providing digital services such as internet platform construction, application development, and internet marketing promotion for enterprises. It aims to help clients to increase company visibility through digitalisation methods.



Figure 5.14 The official website of Zhejiang Muzhiji Network Technology Co., Ltd.

Before providing any services, the company specialist has an initial meeting with the client to understand some basic information, such as the company size, the budget of the project, specific requirements, and expectations of project results. Afterwards, the company's design team specify an information promotion programme tailored to the client's requirements and needs. *"For different customers, the promotion programme should be different. For some of them, mobile apps can deliver significant results. But for others, a webpage might be more effective for promotion,"* Pengyao Zhu, the founder-entrepreneur of Zhejiang Muzhiji Network Technology Co., Ltd. explained.

The company's services are not limited to the design of applications and websites, but also include further promotion and maintenance. In order to better promote its mobile application, the company collaborated with some famous Android phone manufacturers, such as Huawei, Oppo and Vivo, to ensure that the apps they launch are well recommended in each manufacturer's application store. Besides, the company also cooperates with some of the famous e-commerce platforms in China, such as Jingdong. It advertises on these platforms and hopes to rely on their huge client flow to achieve a higher exposure for its software products.

As a growing software SME, Zhejiang Muzhiji Network Technology Co., Ltd. is improving day by day in the market. It has won a certain recognition from clients and the industry. It also establishes long-term cooperative relations with some influential and large enterprises, which has helped the company maintain a stable cash flow. This has helped with the company's technology management and improvement.

5.8.1 Profile of the founder-entrepreneur

As the founder-entrepreneur of Zhejiang Muzhiji Network Technology Co., Ltd., Pengyao Zhu surprisingly has no technical background in software design or programming. After obtaining a college degree in Chinese as a Foreign Language, Pengyao worked for many years in the advertising industry. Talking about this career experience, he said, *"Working in the advertising industry, you always need to know exactly what people like and what they need. It required me to keep sensitive to catch any change in the market."* This characteristic also brought some significant benefits to his entrepreneurial motivation and drive.

For Pengyao, the idea of starting a business began in 2010. At that time, he felt that he had already accumulated enough experience and resources in the advertising industry, supporting him to establish his own media company. However, this attempt did not go well, as due to a lack of financial accumulation, Pengyao's first entrepreneurial venture ended as a failure. Fortunately, this setback did not erode his determination and confidence. Benefiting from his market sensitivity, he realised the opportunities in the internet and software market. *"The Chinese internet market was growing rapidly in 2014 and if our company can use internet technology in the advertising industry then we will be more competitive in the market."* Based on this opinion, Zhejiang Muzhiji Network Technology Co., Ltd. was established in 2016.



Figure 5.15 Pengyao Zhu, founder-entrepreneur of Zhejiang Muzhiji Network Technology Co., Ltd.

Establishing this company has not meant putting an end to his learning and development.

Over the years, Pengyao has never slowed down his zeal for self-learning and improvement. He actively participates in various industry conferences to learn professional knowledge with his peers and competitors and follows industry news to ensure the company can catch the market opportunities in time. He explains how he does not want to be limited by his personal ability. He hopes that in future, he can lead his team to achieve better growth.

5.9 Case 8: Tong Han from Hangzhou eConage Technology Co., Ltd

Hangzhou eConage Technology Co., Ltd. is located in the city of Hangzhou and was established in 2005. As a software company, eConage mainly provides their Business Project Management (BPM) system and Collaboration Official (OA) system, to help their clients streamline work management processes and improve efficiency. Over the past ten years, eConage has provided products and services to more than 1,000 large to mid-sized enterprises. Among them are many well-known companies, such as Alibaba, Greentown (one of China's largest real-estate companies) and Wahaha (China's largest beverage company). It has also established a solid cooperative relationship with government organisations and participated in constructing many of the government's digital projects.

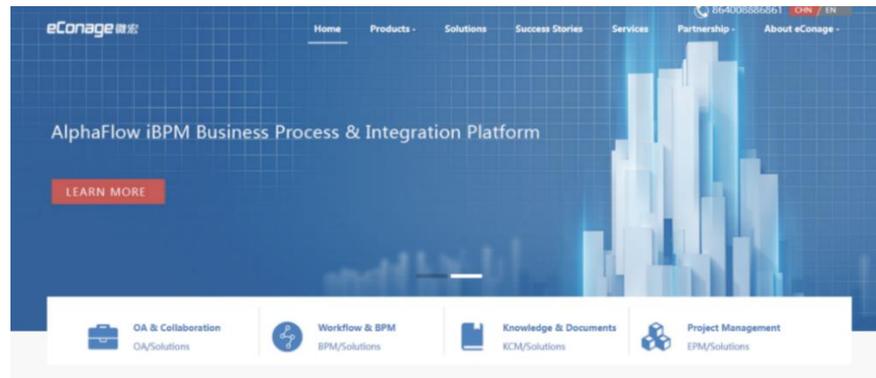


Figure 5.16 The official website of Hangzhou eConage Technology Co., Ltd

The AlphaFlow BPM was first launched in 2012, which is one of the leading products developed by Hangzhou eConage Technology Co., Ltd. This is an intelligent business process management platform that can help enterprises better organise and standardise business processes. The system emphasises the hierarchical management of enterprises, and divides the overall work into different stages for detailed management. For the internal management of the enterprise, the systems use different management modules to divide different departments. Employees with specific permissions can perform a series of operations on the system in the corresponding modules, such as editing documents and adding comments. The platform allows multiple people to operate simultaneously, which increases the efficiency of employees' collaborative work. At the same time, the real-time update of the system also ensures that managers can evaluate and

supervise employees' work for the first time. In addition, the system is based on AI technology, which can automatically manage and analyse some basic work information, avoiding the waste of human resources caused by blind repetitive work.

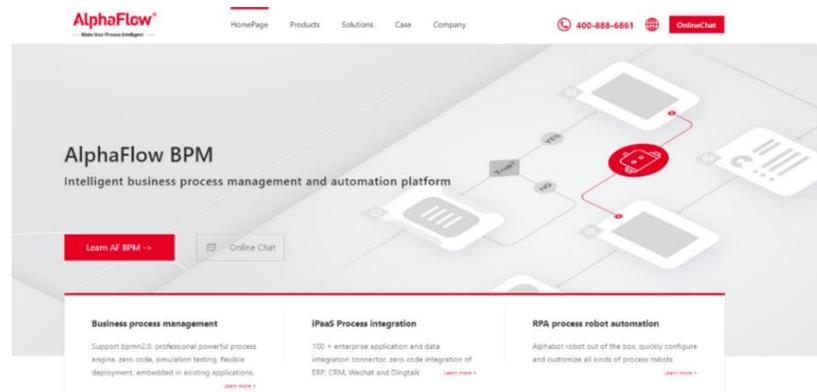


Figure 5.17 AlphaFlow BPM of Hangzhou eConage Technology Co., Ltd

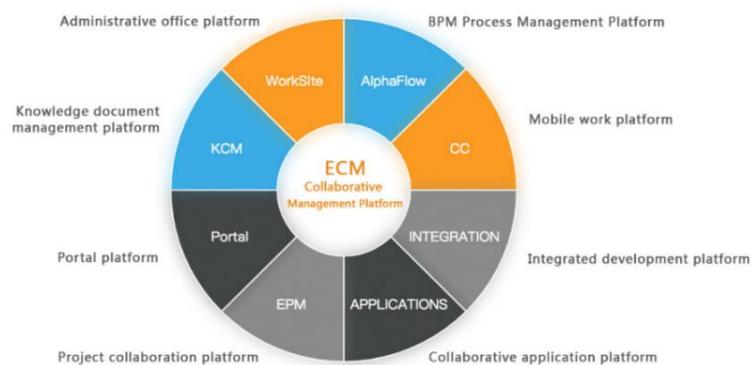


Figure 5.18 AlphaFlow BPM of Hangzhou eConage Technology Co., Ltd
(Hangzhou eConage Technology Co.,Ltd. , 2020)

The ECM Collaborative Office (OA) system was introduced in 2020. This has been developed based on business project management systems. Compared with BPM systems, it is more comprehensive. As can be seen in Figure 5.18, the system covers eight platforms that can fill the enterprise's daily management needs. It is more flexible, and users can log in and edit the system from mobile devices or computers through apps or websites. To date, the system has been adopted by thousands of international and domestic brand enterprises. Its essential role in enhancing the synergy of corporate execution, creativity, learning, cohesion, control, decision-making, and resilience has been recognised by a large number of users.

5.9.1 Profile of the founder-entrepreneur

Tong Han is the founder-entrepreneur of Hangzhou eConage Technology Co., Ltd. He graduated from Zhejiang University in the area of Bioengineering in the 1980s. Because of his

excellent grades, he was recommended by his university to pursue further studies in the US. There, he received two Master's degrees, one in Bioengineering and another in Computer Engineering. Tong used to hesitate about his career path; both majors were interesting to him and both fields seemed to offer good prospects for career growth. Finally, considering the potential for further development of the industry, Tong decided to pursue a career in computer science and successfully joined a Fortune 500 company in the US. His abilities were quickly recognised by the company, and the ensuing promotions and pay rise further enriched and stabilised his life.

However, he explained how a phone call from China changed his life. In 2001, his mother called him to inform him of how his father was in poor health, and that she wanted him to return home as soon as possible. After returning home, Tong quickly realised that no matter how good life was in the US, China was his home. He then decided to quit his job in the US and sell his property. *"I didn't know what would happen when I came back but at least, I could use what I had learned to promote the development of the software industry in China,"* Tong said. In 2005, after giving up everything in the US, Tong decided to take an entrepreneurial route and established the Zhejiang eConage Technology Co., Ltd.

Due to his excellent educational background and extensive work experience, Tong's entrepreneurial journey so far has been relatively smooth. Due to his degrees and his rich experiences from the US, his project got some support from governments and investors. He and his team managed to live up to the expectations and developed the eConage BPM process management software, which was way ahead of the software market in China at that time. To a certain extent, their contribution has advanced the digitalisation of management in Chinese companies.

Now, Tong and his team are still working on the development of office software. They hope that their work can help an increasing number of companies to standardise and digitise their management processes and thus improve operational efficiency.



Figure 5.19 Tong Han, founder-entrepreneur of Zhejiang eConage Technology Co., Ltd.

5.10 Case 9: Yong Cui from Hangzhou Wanjian Network Technology Co., Ltd.

Hangzhou Wanjian Network Technology Co., Ltd. is an internet operation company focusing on internet medical education and internet medical-affairs network services. It is located in Hangzhou, Zhejiang. The company was established in 2014 and since its inception it has always attached importance to the improvement of its own research and development capabilities. Up to now, the company has several R&D centres in major cities in China, including Hangzhou, Wuhan, and Tianjing.



Figure 5.20 The official website of Hangzhou Wanjian Network Technology Co., Ltd.

There are two main software systems launched by Hangzhou Wanjian Network Technology Co., Ltd., which are the Clinical Skills Management System and the Residency Programme Management System. These two systems address the different training stages of medical students, and aim to enhance the standardisation of the training process and help medical students to improve their professional competence.

The Clinical Skills Management System focuses on medical students who are preparing for field training in the hospital. It includes three main modules: General Management, Examination Management, and Training Management. After registration, the medical student can upload basic personal information to the general management module, including the major, grade, examination status, and learning goals. The system will automatically generate an information profile and create an individual learning plan based on the student's personal status. In the exam management module, students can self-test their stage learning outcomes. The system provides a wealth of testing resources that can fill the requirements for medical students from different stages and majors. In the Training Management module, students can find a wide range of online course resources. Besides, students can communicate with some well-known medical professors through the systems, and even have the chance to observe their medical operations remotely.

The residency Programme Management System is mainly for medical students who have started field training. The system covers all training venues in the hospital, such as clinical skills centres, demonstration rooms, wards, ICUs, operating theatres, etc. The system captures and records a

series of data during the student's field training and use this to produce an individual evaluation report. The student can understand their shortcomings and strengths through the report. Meanwhile, the report also provides some recommendations for the student's next step of training, which can help to enhance their further development. Besides, the system is also open to teaching staff. It allows teachers to monitor and understand the training status of their students. Based on the information provided by the system, teachers can adjust their teaching plans to achieve better teaching results.

At present, Hangzhou Wanjian Network Technology Co., Ltd. has established good cooperation with more than 20 hospitals in China, including some famous Grade-A Tertiary hospitals. And in the future, the company will continue its commitment to enhancing medical education and the professional competence of medical staff through software technology.

5.10.1 Profile of the founder-entrepreneur

Yong Cui is the founder-entrepreneur of Hangzhou Wanjian Network Technology Co., Ltd. Before setting up the company in 2014, he worked for many years as a marketing strategy manager for a state-owned medical enterprise. Because of this work experience, Yong has gained a deep understanding of the overall situation of China's medical industry. As one of the most important industries for people's livelihoods, the development of the medical industry is closely related to public daily life. However, in the Chinese medical system, there are still many aspects that need improving. Yong is aware of these shortcomings and is determined to fill them through his own efforts. Through his business venture, he wants to push the development of the whole industry. *"I know my personal ability is limited, but no matter how little impact we bring, it is a boost to the overall development,"* Yong said.

Thanks to his perseverance, his company is gradually getting on the right track of development and success. Now, the company has made a certain level of influence in the medical industry. After experiencing the outbreak of COVID-19, Yong is more determined in fulfilling his goals and commitments. He states that in the future, he and his team will remain committed to medical education and aim to train more outstanding talents for China's medical industry.

5.11 Chapter Summary

This chapter presented a general introduction of the nine cases used in this study. It introduced the main aspects of the companies as well as the basic profile and experiences of the founder-entrepreneurs. It helps the reader to get an overview of the cases in order to better understand the subsequent research content and perspectives.

Chapter 6. The Important Role of Founder Entrepreneurs in Chinese High-Tech Software SMEs

6.1 Chapter Overview

As discussed in the previous chapters, SMEs and large enterprises have very different management structures, and a lot of the decisions in SMEs rely on the personal characteristics and management styles of the founder-entrepreneurs. In this content, this chapter will firstly discuss the entrepreneurial motivations of founder-entrepreneurs in Chinese high-tech software SMEs, using 'push and pull motivation theory' to discuss the factors which influence the founder-entrepreneurs' entrepreneurial activities. After that, the chapter will further explore the important role of founder-entrepreneurs in terms of their responsibilities towards management of their businesses.

6.2 Entrepreneurial Motivation

Entrepreneurial motivation as discussed in the literature review can potentially answer why one chooses to start a business and become an entrepreneur. Based on different work experiences, educational backgrounds and personalities, founder-entrepreneurs may have different motivations for starting a business, which significantly influences their attitude towards risks and understanding of success. Understanding the entrepreneurial motivation of the founder-entrepreneurs can help understand their objectives when starting a business, and understand their strategic choices and management styles. As founder-entrepreneurs play an important role in the management of SMEs, their motivations can potentially have a strong impact on the direction of their company and the market segments they tap into.

One of the main objectives of the Phase 1 interviews was to explore the entrepreneurial motivations of the participants, and the 'push and pull motivation theory' was used in this context. The analysis showed that the participants' entrepreneurial venture as a career choice was mainly influenced by pull factors. Figure 6.1 shows the main push and pull factors derived from the interview analysis.

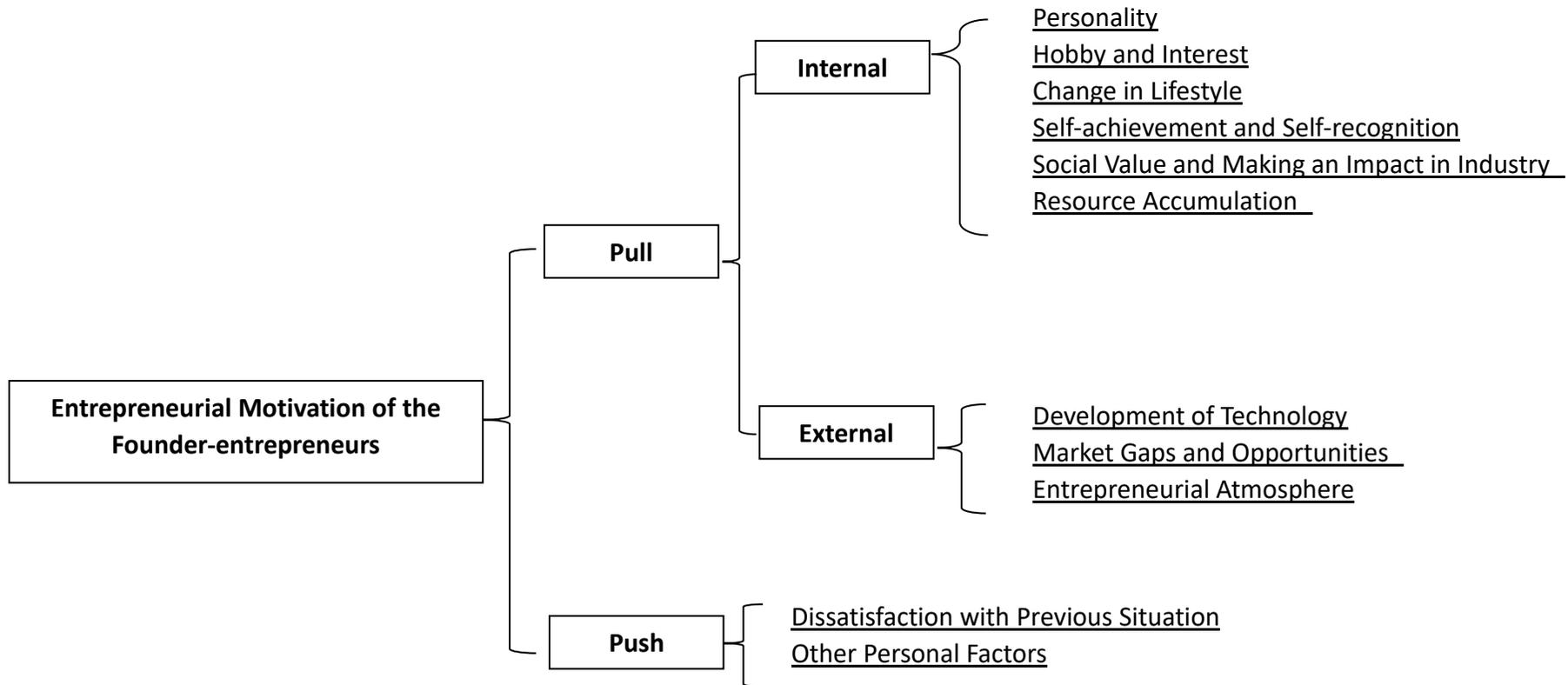


Figure 6.1 Entrepreneurial Motivation of Participants

6.2.1 Pull motivation

From the interview analysis, the impact of pull motivation appeared to be much more prevalent as a driving force towards an entrepreneurial career than push motivation among the participants and this will be explored further using the internal and external factors associated with it.

6.2.1.1 Internal factors

The internal factors from the analysis mainly include personal hobbies and interests, life quality improvement, ability and resource accumulation, self-achievement and recognition, and social value creation, which seemed to have an important impact on their motivation to starting a business.

6.2.1.1.1 Personality

An individual's personality can seriously affect their decision-making and understanding of different aspects in life, including career choices. Specific personalities can potentially influence and motivate people to pursue entrepreneurial activities. In the interviews, many participants agreed that their personality played a significant role in their career choices.

Kehao emphasised the important role of his personality in entrepreneurial decision-making and noted that starting a business seemed like the most suitable career direction for him due to his personal characteristics. He described himself as a 'restless' person: he couldn't stand the tedious and repetitive work pattern and was always looking for something interesting and challenging. Kehao described how he had no work experience prior to starting his own business because he was convinced that his personality would not suit an environment where he has to work for others. He said, *"I am confident that I have the suitable personality traits to be an entrepreneur. I enjoy doing something new, something that can improve and challenge my ability. At the same time, I am resistant to pressure, which makes me have higher risk tolerance"*. He noted that running his own business brings him a lot of emotional rewards; for him, these are more valuable and important than financial rewards. Now, he is happy with his current status, and every time when he faces market challenges, he feels excited and empowered. He said, *"I'm glad I stuck with the idea of starting my own business. Although entrepreneurship is always risky and challenging, it gives me a greater sense of meaning in life"*.

Ting also noted that his personality directly promoted him to become an entrepreneur. He evaluated that he is a person who enjoys taking risks and due to this personality, he is highly attracted by the uncertainties of entrepreneurship. He said, *"Entrepreneurship is a risky process,*

which brings me a lot of new challenges and opportunities. For me, it's very interesting, which makes my life more fulfilling and meaningful".

On a similar note, for Haijun, starting his own business seemed like a good way to escape from a routine work pattern. This choice has made his life more exciting and enjoyable. In the interview, he characterised himself as someone who could not stand repetitive and tedious work. Due to this personality trait, working in large organisations gradually became unbearable for him. He stated, *"I want to do something innovative and interesting, so I decided to start my own business"*. Although entrepreneurship is a risky choice, it helped Haijun in breaking his previously monotonous work style and brought more challenges, which excites and motivates him.

Another personality factor that motivates people to choose entrepreneurship for a career is having independence. For some participants, starting a business helped them to escape from bureaucracy, management, and dependence on others.

For instance, in Ting's case, he does not want to be tied down by rigid rules and regulations. Because of this, he was not comfortable with working for a large company. He believed that entrepreneurship would be a more suitable choice for him. As a founder-entrepreneur with the highest authority and decision-making power in his company, he felt that he could pursue opportunities based on his innovative ideas. He explained, *"I will have the power to select and evaluate the projects for my company. For some innovative ideas, if I think it's worth trying, as long as I can afford the possible consequences, I can just let my team implement them. I think it's an important benefit of running my own business"*. Ting noted that compared with working for others, there is more flexibility in the role of the founder-entrepreneur. As they are their own boss, founder-entrepreneurs can plan their own workload and do not necessarily have to report to anyone.

The process of running a business also requires a lot of optimism, particularly in the event of challenges. Some of the participants attributed the reason for choosing an entrepreneurial route to their optimistic personality. Nancy for instance, believed that her extroverted and optimistic traits made her choose this as a career and that such traits support her in her leadership role. She does not give up easily when faced with setbacks and she is also able to get rid of negative emotions very quickly. She expressed, *"Entrepreneurship always comes with challenges. As an entrepreneur, I need to keep a positive attitude even when I am facing some significant losses. Otherwise, how can I encourage my team and lead them through setbacks? So, in this aspect, I think my personality is really suitable for starting a business"*. Zuohua also supported this idea, arguing that people who are outgoing and optimistic are more likely to be successful

entrepreneurs than others. In the interview, he emphasised the importance of communication skills for entrepreneurs and said that optimistic people are more likely to leave a better impression when communicating with clients, investors, and employees. He said, *"Because of my easy-going personality, I am good at handling relationships with clients and investors. In this respect, I think I'm suited to being an entrepreneur"*.

6.2.1.1.2 Hobbies and interests

Generally, hobbies are defined as typical things that people pursue in their leisure time to enjoy themselves, make them feel comfortable, and relaxed (Milanesi, 2018). Because of these positive emotional rewards, people are willing to spend more time and energy on their hobbies, which gives them a higher level of understanding and competence in these areas. In some cases, this kind of preference and advantages can be transferred to entrepreneurial opportunities and motivate people to start their businesses. Milanesi (2018) argues that people's hobbies can highly improve their entrepreneurial passion and influence their start-up decisions. People prefer to run a business in an industry in which they feel confident and interested, and their hobbies can significantly affect their identification of market opportunities and new-value development.

In the interviews, the participants mentioned the significant role of hobbies in their choice of entrepreneurship for a career. For some of them, incorporating their hobby into their career is one of the main motivations that attracted them to this route. Xingyuan, who runs a software SME for weather forecasting services, felt that for him, entrepreneurship was the best way to mix his two main hobbies: programming and meteorology. *"Not everyone has the chance to make the hobby become your work, so I think I am lucky"*, he said. Reviewing his working experiences, he found his current state of work most attractive and suitable for him. He argued that to do something he liked was one of his initial entrepreneurial goals. And only when people are dedicated to the work they love will they have the passion to persevere and have a chance to attain success.

Ting's example also supports this aspect. As a person who enjoys communicating with others, hearing other people's entrepreneurial experiences motivates him. He explained, *"After hearing the stories of so many different entrepreneurs, I began to consider whether I could find a way to help them cut their losses when they faced failure"*. For him, his current business can be seen as an outgrowth of his hobbies and interests, which have always made him passionate about what he does.

6.2.1.1.3 Change in lifestyle

Changes in lifestyle can be a factor that prompts some to choose entrepreneurship for a career. Some participants in the interviews noted that the quest for higher income to improve their life quality was one of the motivations that led them to start their own business.

"In the beginning, my aim was very simple. Firstly, I thought that establishing a company could help me to achieve a higher income and further to improve my life quality", Pengyao said. He used to work for a large media enterprise, but although he worked hard, the salary wasn't satisfactory and there weren't many prospects for growth and salary rises. With age, he also had to take on more family responsibilities, which prompted him to look for ways to increase his income. Starting his own company was a way for him to achieve this.

For some, income may not necessarily be the most important factor for choosing an entrepreneurial career path. For them, the change of lifestyle brought by this choice was much more important than an increase in income. Some used to be employees in large organisations before becoming entrepreneurs. The entire change of identity required them to take on more responsibilities, pushing them to master a broader range of skills and knowledge. This change also brought a totally new lifestyle, including flexible schedules and workstyles.

Nancy described this change in the interview. Before starting her company, she worked as a lecturer at a university, which was a stable role without much pressure. But she became bored with this style of work and began to look for ways to make her life more exciting. She noted that when she decided to set up her company, she didn't think too much about its future development plans or business goals. For her, entrepreneurship seemed like a choice that could help her to achieve a better lifestyle. She said, *"For me, the motivation for running the business in the first place was simple: to make my life more interesting and fulfilling"*.

For Tong as well, improving his lifestyle was the main priority when choosing this route for a career. As described, Tong used to work in the US and had already achieved a good work performance and income. He expressed, *"My job in the US had helped me to achieve a good standard of living. However, I slowly felt that the stable and humdrum lifestyle was a bit boring"*. At that time, everything in Tong's life was predictable and calculable. The day-to-day work routine was similar, and his future development plan appeared to be fixed. He stated, *"I'm not saying that this state of work is bad, but it does lack some challenges, unknowns and enthusiasms"*. Tong therefore started to look for new career options that could make his life more interesting and challenging. He noticed some business opportunities in China, which finally

led him to going on an entrepreneurship journey. In addition, starting a business also fulfilled his desire for freedom, which includes the freedom of wealth, the freedom of work, and the freedom of time. He noted that when he worked for a large corporation, he felt that he was mostly busy with the tasks assigned to him by others, which made him feel exhausted, and he lacked freedom in such roles. Now as a founder-entrepreneur, he enjoys the change in his work and life, and believes that having the opportunity to control and plan his life is a kind of luck that needs to be cherished.

6.2.1.1.4 Self-achievement and self-recognition

Becoming a successful founder-entrepreneur is a challenging process: it requires people to have different types of skills, such as risk management, marketing, and technical and financial capabilities. For participants who desire challenge, starting a business was a good way to demonstrate their competence. Meanwhile, during the entrepreneurship process, they have the chance to challenge themselves and further improve their capabilities.

Kehao's case demonstrates this aspect. He was very firm in his determination to start a business and expressed that becoming an entrepreneur was the only career option he has considered. For him, one of the main reasons for his persistence in starting a business is that he wants to prove his capability and win recognition and respect from the industry and market. He said, *"I have the ability to lead the team to get some excellent achievements. I wanted to make some brave attempts to even change or lead the industry"*. For him, how much money he earns is not so important; he just enjoys the process of entrepreneurship and the sense of achievement it brings. In the last five years since he established the company, he noted that his original intention has hardly changed. During the company's growth, Kehao encountered many setbacks, some of them even posing a great challenge to the normal operation and survival of the company. However, when faced with these negative issues, the high need for achievement supported him to remain optimistic and have a positive attitude. He explained, *"Even when I was in some bad situations, I still believed that the company could gain a better development in the future. I still want to do something big, still want to get some unique achievements to show my capability"*. He felt that his persistence was precious, which motivated him to find his confidence when he faced failures.

In Xingyuan's mind, entrepreneurship is a good way to test the extent of his capability. Due to this motivation, he decided to give up his previous job that had provided him with a stable income and good development opportunities. When he reflected on his entrepreneurial

experience, he referred to a quote he had seen before he decided to become an entrepreneur and said, *"I remember a sentence I read before, which is 'Give yourself one year, do exactly what you want to do and see what will really happen, what you can really achieve'"*. He stated that this quote really encouraged him when he was wrestling with his career choices. He wanted to prove himself, and in this context, being an entrepreneur was a good way to identify his own capabilities. However, the transition from programmer to entrepreneur has not been an easy task. Prior to starting the company, Xingyuan had no management experience and had limited knowledge of finance and marketing. But these limitations did not stop him from venturing into entrepreneurship. Xingyuan believed that this choice has become an important avenue for his self-improvement. He stated, *"I know that I still have a lot to learn to become a good entrepreneur. But for me, the process of starting a business was supposed to be the best way to drive my self-growth"*. He described entrepreneurship as a process of upgrading: he could gain valuable experiences. He felt this sense of achievement brought by self-improvement was one of the forces that made him to persevere with his business management.

Ting also cited a similar opinion: for him, starting a business fulfilled his desire for self-achievement. He felt that his abilities were greatly underestimated in his former role in a large organisation. In that environment, it was difficult for him to find opportunities to demonstrate his personal abilities. Ting indicated that these experiences made him realise that if he continued to work in a large organisation, he might never have the opportunity to fully demonstrate his capabilities. Being a founder-entrepreneur appeared to be a sensible choice to fulfil those ambitions: *"Starting my own business was the best decision I ever made, it helped me discover my personal value and made me more confident in my abilities"*.

6.2.1.1.5 Social value and making an impact in industry

For some of the participants, the strong sense of social responsibility appeared to be a significant factor which encouraged them to become an entrepreneur.

In Xingyuan's case, he stated, *"In addition to my own hobbies and abilities, when choosing the main business elements of the company, I also considered how I could create some value for the industry and society"*. In his opinion, having a sense of social responsibility is important for entrepreneurs, especially in the high-tech industry. He noted that high-tech enterprises shoulder the responsibility of leading national innovation development. In this case, promoting the industry's development and improving public quality of life is more important than personal capital accumulation for him. He explained, *"The goal of my entrepreneurship should not only*

focus on myself. If a person just wants to open a business to earn more money or achieve a better lifestyle, then the high-tech industry may not be the right selection for him". For him, entrepreneurs who work in the high-tech industries should always have a desire to explore, solve complex problems, and maintain the enthusiasm to drive the industry growth. For him, these desires are essential reasons for his pursuit of entrepreneurship.

In Nancy's case, she studied and worked in the US for many years, and during that process she noticed the rapid growth of the Internet and its impact on people's lives, as well as the market. She explained, *"Internet technology has developed rapidly in China in recent years. However, when I lived in the US, the development of the internet was relatively backward in China compared with some Western countries"*. She saw the advantages of the development of the Internet, and how that led to a number of new business models in the US market, but these were totally new to the Chinese market. In this context, she began to consider whether it would be possible to introduce these innovative models in China. She explained, *"If I succeed, then I would have the chance to achieve my entrepreneurial goals. More importantly, the emergence of new business models can significantly boost the development of industries and markets in China"*. Reviewing this experience, Nancy noted that the greater the capacity, the greater the responsibility. As an entrepreneur of a high-tech software SME, she leads a team with good innovation abilities. They have the capability to touch the most advanced technology and business models. In this case, their goal should not be limited to the company's own financial return or business scale growth but should also consider taking on some social responsibility and contributing to the advancement of the industry.

For Zuohua, one of the driving factors for entrepreneurship is pushing the development of the industry. Before starting his own business, he already had many years of work experience in the insurance industry, which helped him to build up a thorough understanding of the sector and made him aware of its limitations and shortcomings. He stated, *"When I realised the problems in the industry, I started to think about how I could improve the industry and provide better products and services to my customers"*. He points out that changing the market requires a higher level of market impact. If he had continued to work as an employee, he would hardly have the chance to influence the market and the industry. *"So, I decided to build my own business"*, he claimed, and *"one day, as the company expands, my efforts can have an impact on the entire market"*.

Haijun also acknowledged a high level of responsibility for the development of the industry. He said, *"I had already worked in the construction industry for more than ten years, I have witnessed*

the rapid growth and bottleneck periods of the industry". Compared to other industries, the construction industry in China has a relatively more traditional working pattern. Practitioners in this industry according to him are not sensitive to new technological development in these areas. They prefer to finish their work in a conventional and repetitive way. Haijun wanted to change this situation: *"People just finish their specific tasks by old ways and hardly consider the improvement method to increase the work efficiency"*. However, he understood that changing the industry environment was a difficult task, which required him to have greater market influence. *"My original job could not support me to achieve my goal, so finally, I decided to establish my own company"*, he said. During his entrepreneurial venture, Haijun led his team to develop a series of engineering costing software products for the construction industry, which greatly increased the work efficiency of its practitioners. He was proud of his achievements and stated, *"Now, I can say that our company has indeed made some contribution to the digital upgrade of the Chinese construction industry"*. Reviewing his entrepreneurial experiences, for him, compared with personal capital accumulation, creating something for the public was more important. Through his work he wants to bring some beneficial impacts to the industry, and he believed that it's a good way to prove his personal worth and make his life more meaningful.

Yong operates a software company that mainly provides online medical education services. Due to the characteristics of the business, significant research and development costs were incurred at the start-up period of the venture, making profitability a very difficult goal. His company experienced some difficult years in its start-up phase and didn't even have enough income to cover the salaries of the employees. Such a poor financial performance created a lot of mental stress for him. However, even in the most critical situation, he never considered giving up his entrepreneurial ambition. One of the reasons for this is his confidence in his personal abilities. He also believes that everything he does is worthwhile and meaningful. He explained, *"I believe that what I am doing is meaningful. It can change the national medical education landscape"*. Instead of receiving a good financial return, he would like to see the Chinese healthcare system gain better development. He expressed, *"I want to see everyone in this country enjoy better medical care and have a richer range of medical resources. So, I will continue to work in this field, no matter how many setbacks and challenges I face"*. Fortunately, his persistence has been worthwhile. Now, his company is on the right track, has built long-term cooperation with some hospitals and medical universities, and its financial performance is much better than before. More importantly, Yong and his team have truly pushed the digital transformation of the medical industry and created some benefits for the public through their software products. Looking back on these experiences, Yong exclaimed that people working in the high-tech industry should have

a certain degree of 'idealism'. For those who just want a high income to improve their lives, this industry may not be for them.

6.2.1.1.6 Resource accumulation

Building an enterprise requires a certain accumulation of business resources, including human resources, financial resources, intellectual resources and physical resources (Brush, Greene and Hart, 2002). In fledgling SMEs, a large proportion of primary resources always come from the founder-entrepreneurs themselves (Deakins and Freel, 1998). It is only when one collects enough capital that they might have the ability to venture down an entrepreneurial route. Some are more likely to challenge themselves and want to increase their wealth further by starting a company. In such scenarios, sufficient resource accumulation could be seen as an important factor that motivates people to start entrepreneurial ventures.

During the interviews, most participants acknowledged the importance of resource accumulation for entrepreneurship. However, participants emphasised the critical role of personal knowledge and experiences instead of financial resources. Some participants expressed that they preferred to start a business in familiar market; it made them feel more confident as they could use their previous work experiences to build a relatively comprehensive view of the specific industry and establish the essential foundation of their business.

"The reason I decided to start a business in the insurance industry is that I've worked here for many years, and I do understand how things are going in this industry", Ting said. He argued that entrepreneurship is a complicated and challenging process, and it is difficult to succeed by relying only on impulse and enthusiasm. Before establishing a company, founder-entrepreneurs should understand the industry's overall potential and grasp the rules of the market's operation. When he felt that he was fully equipped with information about the industry, Ting became clearer about his desire to start his own business. He said, *"The understanding of the market is also a factor in motivating me to start the business. People are always more comfortable working in areas they are familiar with and so am I".*

On a similar note, Zuohua also emphasised the benefits brought by his work experiences: *"My entrepreneurship is closely related to my work experiences. Since graduating, I have had several employment experiences. And all these jobs I have held are more or less related to my current entrepreneurial project".* During his employment, he had more opportunities to communicate with professional workers in the industry, which helped him get newer, more in-depth information. He highlighted that communication is very important. By exchanging information

with professionals, he could get up-to-date information about the industry, which provided him with a lot of entrepreneurial inspiration. More importantly, from communicating with them, he had gained a further understanding of the rules of the industry, which was essential for his entrepreneurial success. Zuohua explained that every industry probably has some 'unspoken rules' that are only known to the people working there. For people who want to join the market, it is necessary to understand these rules. The ability of an entrepreneur to follow and use these rules can even directly determine the success or failure of his/her entrepreneurship. He argued that he hadn't made up his mind to establish the company until he felt he had a thorough understanding of the industry. In this case, his ability and knowledge accumulation can be seen as a motivation that encouraged him to pursue an entrepreneurial career.

For both Haijun and Nancy, having a clear understanding of the market is essential for entrepreneurship. What is distinct about Nancy is that her knowledge of the market does not come from her previous work experience but from her overseas experience. As the founder-entrepreneur, Nancy operates a software SME that provides online services and digital support to organisations and helps them deal with business travel issues. *"We are a B2B business travel software company, which mainly provides services to enterprises and organisations"*, she noted. *"At the time I decided to establish the company, the business travel market in China was not that developed. However, the B2B is a very popular trend in the US, which has some significant advantages, especially for SMEs that lack a huge capital accumulation"*. A relatively new market might have a number of gaps and opportunities; Nancy quickly realised this and decided to seize the chance to drive her business plan. She reviewed a lot of market information, read a wide range of business travel industry reports from China and overseas, and communicated with industry professionals to get suggestions about her business plan. These preparations significantly helped drive her entrepreneurial venture.

6.2.1.2 External Factors

The opportunities in a dynamic market can be an important factor that attracts people to entrepreneurship.

During the interviews, most participants cited the impacts of the market environment on their decision to embark on an entrepreneurial venture. This includes the development of software technology in China, the growing market demand, and the external entrepreneurial atmosphere.

6.2.1.2.1 Development of technology

Compared with other industries, the development of software SMEs is more reliant on the growth of technology. Many innovations in software SMEs are based on the growth of internet

technology. The emergence of new technologies, such as big data and cloud computing, has opened up a range of new opportunities and attracted more people to explore prospects in this new market.

Focusing on this, Haijun pointed out that the appearance of new technologies always brings new market trends. Therefore, when he realised the rapid development of internet technology in the Chinese market, he decided to seize the opportunity and start a business in this field. He stated, *"I was confident with my decisions, some large internet enterprises' success already proved the great potential of the internet market. In the meantime, I believed that the development direction of the technology always guides the market trend"*.

Xingyuan also agreed with this. When he started his business, the concepts of AI and Deep Learning were very popular in the Chinese market. As a programmer, Xingyuan was interested in these new technologies and began to consider how to better use them to improve people's lives. *"My intuition tells me that these new technologies will have good market potential"*, he said, *"The problem is how to use them to satisfy the current market demand"*. After some consideration, he finally decided to combine his personal hobby with his abilities and set up a software company with the aim of providing users with timely and accurate weather forecasting services. He explained, *"The root of weather forecasting is calculation. We need to use existing conditions to project future weather situations. In this case, if we can combine new technologies such as artificial intelligence techniques with traditional weather forecasting, then we could highly improve the accuracy of weather forecasting"*. Summarising his entrepreneurial experience, Xingyuan noted that the development of technology is one of the key factors that drove his entrepreneurial ambition and said, *"Without AI technology our product cannot be developed"*.

"Being sensitive to market changes is crucial for founder-entrepreneurs", Pengyao highlighted. For him, paying attention to the development of new technologies is a good way to grasp future market trends. In the interview, he shared an example to illustrate this point. He pointed out that mobile internet technology had experienced rapid growth in China from 2014 to 2015. With the development of this technology, people gradually started to change their internet habits from using computers to using mobile terminals such as tablets (e.g. iPads) and mobile phones. In his view, changes in people's habits meant that new market opportunities could potentially emerge. He also believed that once the habit has been established, it is difficult to change that in a short time. For these reasons, he concluded that the Chinese mobile internet industry would offer him a lot of potential opportunities and therefore he decided to start his business venture.

6.2.1.2.2 Market gaps and opportunities

As discussed earlier, internet and software technologies are developing rapidly in China and with the support of the government, digital transformation is gradually becoming the mainstream trend in the market. More and more companies are becoming aware of the advantages of digital management and want to increase their productivity in a more informed and intelligent manner. However, for some industries, digitalisation is not yet widespread and open. Such gaps in the existing market mean more business opportunities for those with business ideas, and this attracts them to venture into entrepreneurship. During the interviews, participants generally indicated that they would assess the market first based on its gaps to look for prospects for business development and growth.

"I have always believed that finding the market gaps and opportunities is one of the key factors of entrepreneurship, especially for SMEs", Nancy said. Compared with large organisations, SMEs are more vulnerable due to size and financial constraints. In this context, it might be unwise to join a saturated market and engage directly with powerful competitors. As the founder-entrepreneur of a business travel software SME, Nancy clearly understands that it is impossible for her company to win in direct competition with some large travel enterprises, such as Ctrip and Fliggy. The only thing she could do is to explore an area that doesn't have much competition to start her business venture, thus reducing the pressure to survive. She explained, "For these companies with large financial accumulation, short-term financial performance is less important than capturing market share. But for us, the situation is totally different. We haven't got huge funding that can support us to fight for the market with other powerful competitors. In this case, joining the B-side market is a better choice". According to her, B2B business models require less initial capital accumulation than B2C, and can help companies to build more stable business relationships. "More importantly", Nancy emphasised, "The business travel market in China is still a blue-ocean market. So, I decided to seize the opportunity and choose it as my entrepreneurial direction". She summarised that finding a suitable business track is one of the most basic conditions for starting a business. This will give a chance to attain market success. "I might have considered giving up my entrepreneurial ideas if I hadn't found the suitable business direction," she said, "So, it can be said that realising the market opportunities is also an essential reason I decided to conduct entrepreneurial activities".

Pengyao had a similar opinion. He said that, on the one hand, an affection for the industry had created an inner urge that encouraged him to improve its shortcomings through entrepreneurship. And on the other, an imperfect market always brings many market

opportunities, which is beneficial for entrepreneurs. Over the years, he has gained a clear understanding of China's construction industry, especially its limitations, noting that *"The market demand was still there, but only a few enterprises could accommodate those needs. This gap between the market demand and supply is the opportunity."* He clarified that his business plan only started once he found a market opportunity that was worth exploring.

Yong's case also highlights the influence of market opportunities on one's decision to pursue an entrepreneurial career. He chose the medical sector due to its market potential. He explained that due to the large population in China, medical resources are limited. So, it becomes important to use new technologies, such as the Internet and digital technologies, to better allocate and manage, or even increase, resources. *"This is an industry flaw that needs to be improved, and on the other hand, it is also a business opportunity that lies within the industry"*, Yong said, *"For the medical industry, a standard training system for talents is very important and essential. However, before I started my business, the training system that was widely used in the market there still existed many points that needed to be improved"*. This led him to develop a digital medical training system to enhance the quality of training amongst medical students.

6.2.1.2.3 Entrepreneurial atmosphere

The interviews with the participants showed that sometimes the prevailing values of a society and the general perception of its public may also be a motivating factor for someone to pursue entrepreneurship.

In Ting's case, his business started in 2014, at a time when starting one's own business was a popular career choice for young people in China. The popularity of entrepreneurship as a career attracted many, Ting noted, *"Many people have experienced this change. Not only me, but many of my former colleagues have decided to leave and start their own businesses"*. He acknowledged his entrepreneurial decision was mainly impacted by this kind of entrepreneurial atmosphere and for him, many people saw entrepreneurship as a sign of success. Also, the government introduced a series of measures to encourage entrepreneurship, which further strengthened people's entrepreneurial enthusiasm. *"I cannot say that my decision was not influenced by the external environment"*, Ting said. Despite his hesitation at the start, after hearing many inspirational stories of entrepreneurial success from his friends, colleagues, and the media, he got some motivation: *"It seems that everyone can succeed once they start a business, so if other people can succeed, why can't I?"* At the same time, he also believed that following the mainstream trend is also a good choice and said, *"In an overall thriving entrepreneurial environment, there are always opportunities for success"*.

6.2.2 Push motivation

Push motivations are generally negative factors, such as financial pressure and unemployment, which can potentially drive people to explore entrepreneurial opportunities (Dawson and Henley, 2012; Amit and Muller, 1995). People who are mainly motivated by push factors might see entrepreneurship as a choice they have to make, and have to rely on it to get out of hardship.

During the interviews, some of the participants identified a few push factors that influenced the decision to choose an entrepreneurial career, some of these factors are as follows.

6.2.2.1 Dissatisfaction with previous situation

One of the key push motivations is dissatisfaction with one's work lifestyle. Such dissatisfaction can force someone to explore other alternatives through entrepreneurship. In the interviews, some participants articulated this point, mainly noting their dissatisfaction with their past jobs in respect to working environment, supervisors, and income.

In this study, some of the participants used to work in large enterprises, and the complex and solid management structure limited their personal development. For them, starting their own business seemed to be a good alternative to addressing this issue. Ting for instance worked for organisations like Alibaba and China Life Insurance Company for 4–5 years. He stated, *"The management and working systems of these institutions are relatively rigid. If I continue to work under this system, it will be difficult to get a good career promotion"*. Due to the sophisticated management structure in large companies, even a small business decision requires multiple layers of discussion and approval. Ting noted, *"We always had to wait a few weeks to get a final decision from the top, which was such a waste of time and energy"*. He pointed out that such an inflexible decision-making approach would lead the company to lose a lot of market opportunities. Especially for some innovative ideas, missing the right time meant losing the chance for success. He said, *"Some of my innovation ideas were abandoned due to this rigid structure, which made me feel really upset"*. After experiencing several setbacks, his work enthusiasm gradually wore out and he chose to leave.

Haijun shared a similar opinion. He worked as a construction cost engineer in a state-owned enterprise for ten years, where people's work patterns barely changed. He said, *"I am not a person who can tolerate boring and repetitive work. So, in a large company, I gradually felt more and more dull, even miserable"*. The lack of appreciation from his superiors further accelerated his decision to resign. He described how there is a very strict hierarchy in some large enterprises. In such environment, any ideas need to be approved by supervisors before they can be

implemented. Unfortunately, he did not get much support from his supervisor, which led to many of his ideas not going anywhere in the company. He was frustrated by this aspect, and this played a crucial role in pushing him to leave. He expressed, *"I did not meet a leader who was willing to trust me and reappoint me. I couldn't show what I could do and that made me feel very unsatisfied. I couldn't stand the situation and finally decided to work for myself"*.

Similar to Haijun, Yong also experienced a difficult dilemma in his former role as a market strategist where many of his ideas were ignored by his manager. He stated, *"I couldn't see my career potential there. That's why I decided to leave"*. For Zuohua, the influence was mainly due to salary. He found that in the large enterprise where he worked, the salary for each position was relatively fixed. Also, due to the rigidity, there were relatively few opportunities for promotion. He said, *"As a man, I need to earn more money to improve my and my family's life. However, in a large organisation, winning a salary increase is not an easy thing. You need to work very hard to move up. But even if you get a promotion, it doesn't mean your income will significantly improve. If my hard work is not rewarded, then why don't I just work for myself?"*

6.2.2.2 Other personal factors

In some cases, there were other personal factors that pushed some of the founder-entrepreneurs to start their own businesses.

In Ting's case, age played a key role that prompted him to explore entrepreneurship as a career. He felt that he didn't have much time to hesitate and if he didn't try now then he may never get the chance to build his own company. *"You may think I'm exaggerating a bit, but for me, this is the truth,"* he explained, *"Establishing and managing a company requires physical support. If I had not decided to start a business at that time, then a few years later, even if I still had the mind, my physical state would not support me to make it happen"*.

In Xingyuan's case, his entrepreneurial motivation had a romantic push factor that might be unique. He acknowledged that he enjoyed programming a lot, and so for him, becoming a programmer seemed like a good and obvious career choice. However, his partner at that time thought that programming was a boring profession. So, in order to impress her, he took the plunge and gave up his original job to start his own business. *"I just wanted to show her that I am not only a programmer, I also have the ability to run an enterprise and lead it to success"*, he said.

6.3 Responsibilities of Founder-Entrepreneurs in Chinese high-tech software SMEs

In the interviews, founder-entrepreneurs discussed their day-to-day responsibilities, and it was evident that compared to employees with very defined roles within the company, founder-entrepreneurs seemed to have a relatively broad range of duties and functions. As they are in charge of managing the entire business, they need to have a clear understanding of the big picture so as to make effective decisions.

The major responsibilities of founder-entrepreneurs from the case studies are summarised in Figure 6.2. Based on the interview analysis, the most important responsibility for founder-entrepreneurs is to define the main direction of the company's development. In interviews, many participants emphasised the importance of selecting a clear direction to facilitate the company's success. Many mentioned the difficulty of this aspect of their job. To ensure the right direction of the company's growth, founder-entrepreneurs always need to do a lot of research before making a final decision.

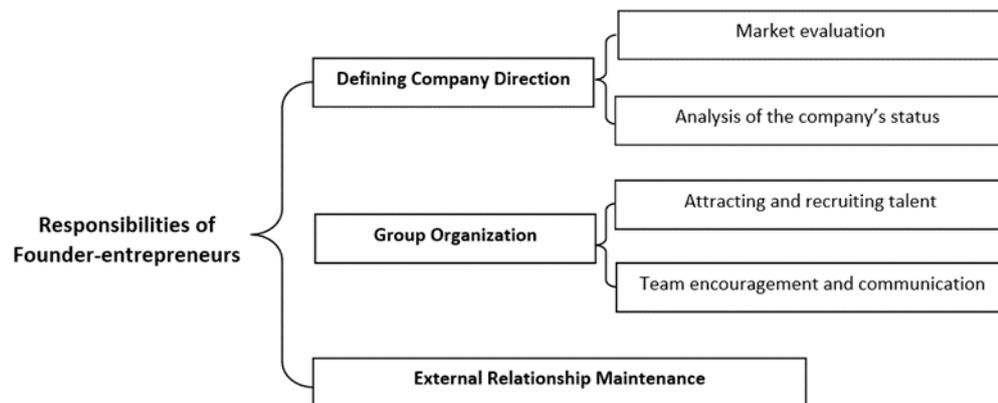


Figure 6.2 The daily responsibilities of founder-entrepreneurs in Chinese high-tech SMEs

Another essential aspect for founder-entrepreneurs is team building and management. They need to coordinate the work of various departments and ensure that employees have a clear understanding of the company's growth strategy.

In addition, entrepreneurs often act as a channel of communication between the internal and external aspects of the business. They need to maintain a good relationship with stakeholders, such as investors, clients, co-operators and suppliers, to ensure the company's stable development.

6.3.1 Defining company direction

The founder-entrepreneur, as the person who builds the business, is commonly responsible for selecting and holding the direction of its growth. For many participants in this study, this seems to be their most important task as they believe that choosing an appropriate path for development was essential for the success of their company.

"Selecting a suitable development path can help SMEs avoid a lot of growing setbacks from the roots", Kehao said. However, he stated that selecting the company's direction for growth is also a complex task and cannot fully rely on entrepreneurial intuition. The judgements of founder-entrepreneurs should be based on the actual situation, such as the market trend or the enterprise's internal ability. They should be very careful because any choice or decision they make can determine the direction of the company's growth and thus its success or failure.

Xingyuan also supported this opinion, *"I think at least half of entrepreneurs will agree that the right direction is the key to company success".* He expressed that running a business is just like driving a car, with the founder-entrepreneur playing the role of the driver. The driver needs to know where he is going and how he can get there, otherwise the journey will become much more arduous. Similarly, in the enterprise, if the founder-entrepreneur does not have a clear direction for growth, it is difficult for the company to achieve good performance in the market. Nancy described herself as a person who leads her team forward in the dead of night. She said, *"In my company, the staff moves forward under my guidance, and only I can stand the responsibility to set the company's direction".*

Haijun defined himself as the 'No. 0 employee' of the company. He said that he made his company from scratch; the business can be seen as the extension of his personal will. He explained that he had many other business ideas and made some other attempts before starting this company, but those attempts were unsuccessful. Reflecting on his experiences, he summarised, *"The main reason I failed was that I chose the wrong field to start my business. Now, I am more confident than before, because I know my company is on the right track".* Haijun also takes this power with the role seriously, as he is the founder and owner of his company, so for him, it means that the company belongs to him completely. He believed that he should have the right and responsibility to set the company's direction for growth. He said, *"Maybe the company will continue to grow, maybe we'll have 100 or even 1,000 employees in the future, but no matter how big the company gets, I'll still be the root of the company. I will still maintain the right to set the direction for the company".*

In the interviews, participants pointed out that selecting a company's future direction is not a simple task, and there are two main aspects to analyse before making final decisions: market evaluation and self-evaluation.

6.3.1.1 Market evaluation

For founder-entrepreneurs, keeping up with the market trends and using their knowledge and experiences to do market evaluation is one of their important responsibilities.

"I always need to keep an eye on market trends, which is an important reference when I set the direction for my company", Kehao said. As the founder-entrepreneur of a software SME, he understands the importance of following the market trends. He explained that due to their smaller size and lower market influences, it's difficult for SMEs to influence customer consumption habits or create market needs. The best approach for him is to follow the market mainstream. He spends some time every day obtaining the latest information about the industry and the market. At the same time, he also pays attention to the other companies in the same sector, following their upcoming projects or products as references for the future development of his company. For Kehao, these initiatives are very helpful. "These methods help me build a deeper understanding of the market. So, when I make the decisions, I will be more confident, because all my behaviours are supported by market evidence". However, simply understanding the market is not enough: founder-entrepreneurs need to have the capability to find market gaps and opportunities. He emphasised, "For me, the key to entrepreneurial success is to find the market opportunities which are ignored by others". Founder-entrepreneurs need to find a space for their business, close to the prevailing market trends, but at the same time, it should be new and unique. "It's a daunting task, but we have to face it", Kehao lamented.

"Understanding the market trend is very important. In fact, it's one of the most essential tasks founder-entrepreneurs need to do in their daily work", Pengyao claimed. He said that the software market is changing rapidly. There are so many products appearing every day, and so many being eliminated. In this case, if they want to produce software products that perform well in the market, they must have a clear vision of customer needs and market demands. Pengyao noted that he needs to do a lot of work to capture market trends. Similar to Kehao, he often reads a number of reports published by industry research institutions to obtain the latest information on industry developments. He also follows the latest academic research in the software field to get inspiration. Pengyao also attends industry conferences. He said, "Joining a conference is a good chance to network with people who work in a similar area. Through

communication, we can exchange our views on the market and share our innovative ideas. So, I think that this kind of external networking is necessary for founder-entrepreneurs".

Haijun also agreed that market evaluation is a significant task for founder-entrepreneurs. However, different from Kehao and Pengyao, his market evaluation is mainly based on his personal understanding of the market. With over ten years of experience, he is confident in his knowledge and understanding of the market. He believed that his experiences help him to have a good grasp of the market dynamics, which supports him to set the relevant development direction of the company. He explained, *"My extensive experience has given me a deep understanding of the market. I can proudly say that I have enough ability to catch the market demand and industry growing trend".*

Due to this confidence, Haijun believed that he is the most suitable person in the company to carry out the market assessment work. He said most of his employees do not have as much long-term work experience as him. When faced with some market changes and opportunities, these employees may not be sensitive enough to make timely and effective responses, which might lead the company to miss the opportunities or even cause some avoidable losses. *"As an SME, we hope to avoid unnecessary losses as much as possible. Therefore, for me, it is very necessary to understand and grasp the market trend personally",* Haijun stated.

For Tong's company, a large percentage of clients are large organisations and government departments which offer the company a relatively stable client flow. In this case, for him, understanding market trends is almost equivalent to understanding the needs of existing customers. He explained, *"We are working with a number of government departments and large organisations. In this case, as long as we can meet their needs, we can guarantee a relatively healthy and stable flow of customers".* In this context, Tong would still spend some time understanding the external market trends, but what is more important for him is to analyse existing clients' demands, and develop the products that are better suited to their requirements. He argued that the direction of SMEs' development should be guided by client demand, therefore, as long as they can meet the needs of their customers better than their competitors, they can achieve a good performance in the changing market.

6.3.1.2 Analysis of the company's status

A comprehensive analysis of the capability of the business is another significant responsibility carried out by founder-entrepreneurs.

"Before making any choice and decision, I will spend some time analysing the company's running situation", Kehao said. As the founder-entrepreneur of a software SME, he understood that having a clear self-awareness is essential for business development. Compared with large organisations, due to the limitation of capital, SMEs cannot afford the high cost of trial and error. In this situation, running projects that are beyond the capacity of the company is not wise. To select the right direction for development, Kehao needs to establish a clear picture of the company growth, understand the company's innovation capability, financial accumulation, talent structure, and other operational details. With this information in hand, he will be able to make a feasible decision that can help the company avoid a lot of losses and setbacks.

This opinion was also supported by Xingyuan. He stated that in his company, most business decisions rely on his deep understanding of the company's capabilities. He explained that many new projects in his company require a high initial investment to support R&D activities. These innovation projects might bring a lot of development opportunities and help the company achieve a good market performance, but on the other hand, high investment also brings high risk. *"No matter how well prepared we are, we cannot totally control the market and ensure that the outcome is positive. As the entrepreneur, I want to make sure that the possible consequences are within the company's reach, or at least don't threaten the company's survival",* Xingyuan said. He explains that every time he needs to set a budget for a new project, he refers to company reports such as financial statements to assess the overall state of the company. *"Maintaining the stable state of the company is the most important thing for me,"* he emphasised; if the project requires more money than the company can afford, then he will abandon or postpone it, to avoid the huge financial pressure.

6.3.2 Group organisation

Founder-entrepreneurs are the leaders of the company. Therefore, group management and organisation are an important part of their tasks. In the interview, participants commonly argued that the group organisation, including team building (recruiting talent), group communication, and company culture development are significant responsibilities.

"Besides the direction control, another main responsibility of founder-entrepreneurs should be group organisation", Xingyuan said, *"As I said before, running a business is like driving a car, directional control is determining where to go, and group organisation is making the car."* He expressed that the quality of the 'car' is critical, as it determines the length of the journey, and a powerful team can help the company cover a lot of setbacks and achieve a better performance

in the market. Yong also highlighted the important role of group organisation. In his opinion, how to build and manage a competent team is even more significant than controlling the company direction. He said, *"I have the power to set the direction for the company. However, I also understand that without the support of my team, none of my ideas can be achieved"*. In this case, how to attract the right people to join the group, how to make the capabilities of team members better represented, and how to maintain good relationships among group members are the key issues that the founder-entrepreneur needs to address.

6.3.2.1 Attracting and recruiting talent

Talent attraction is one of the most essential tasks in organisation building. For founder-entrepreneurs, their ability to attract and then recruit suitable talent will directly influence the enterprise's market performance. In the interviews, participants indicated that professional talent is the main source of their company's competitive advantage. And due to its important role, participants commonly considered talent attraction to be a significant daily responsibility of founder-entrepreneurs.

In the interview, Kehao highlighted the importance of attracting and recruiting candidates with skills and talent. He explains that software SMEs are more demanding in terms of talent selection than other industries. In his opinion, the market competitiveness of a software SME is mainly based on their innovation capability, and the development of the innovation activities should be supported by a powerful team. In this context, he stated that since the company's inception, he has placed great emphasis on recruiting and sourcing talent. How to attract powerful talent and make his team stronger is the main question he considers every day. In addition, Kehao believed that attracting professional talent is a great way to address the limitations of his personal capacity. As the founder-entrepreneur, though he has a professional degree, in most cases he will not directly join the company's R&D activities. He confessed that although he graduated with a degree in Computer Science, his professional skills are not advanced enough to support his company's R&D activities. He said, *"I could not handle complex coding tasks, and deal with some unexpected problems of software. It can be said that I cannot achieve my business plan without my group members' support"*. However, Kehao still emphasised that he is the most appropriate person to lead the company's talent selection criteria and be responsible for the company's talent hunt and recruitment. He argued that the talent attraction should follow the company's development trend. As the person who sets the direction of the company, he clearly grasps the up-to-date status and future development plan of the company. And this information can largely help him to filter the talent that will be more beneficial to the company.

Yong's example also supports this opinion. For him, the awareness of the importance of attracting talent was gradually drawn from his entrepreneurial experience. He explained that during the start-up process of the enterprise, he had not realised the significant role of hiring talent. To reduce operating expenses, he did not hire enough employees to support the company's daily operations. Therefore, at that time, he had to undertake almost all the tasks of the company, which added a lot of work pressure. He described, *"In the beginning, my job encompassed a wide range of tasks, including R&D activities, sales, customer communication, etc. Such a large workload made me feel tired and stressed. Meanwhile, the market performance of my company was also not satisfactory. I think it's because everyone's ability is limited, I could not finish every job perfectly"*. After realising this point, Yong began to shift his attention to team building and organisation. He has spent a lot of time learning about talent system building, basing this on the company's growing situation to develop a detailed talent recruitment and selection standard. *"I want to build a suitable personnel structure for my company and want to hire the right people in the right positions"*, he said. In his opinion, simply hiring capable employees is not enough. As a team leader, he has the responsibility to create a good working environment for the group members and establish a good system to help them better perform their capabilities. In this case, professional competence is not the only criterion for Yong to select talent. He explained, *"In addition to professional skills, I would consider, is this person passionate about technology and innovation? Will he/she get along well with other team members, and will he/she fit in with our company culture? Overall, I want to make sure that this person is the right person"*.

After these adjustments, Yong's responsibilities became clearer and more focused. With the team's support, he no longer needs to deal with trivial issues and can focus on more meaningful work. He said, *"My team can help me to deal with a lot of complex tasks and issues, so now, I think my most essential work is to make my team stronger and attract more suitable talents to join our company"*.

Ting also agreed with the importance of recruiting talent, but different from other participants, he was more concerned with building a stable relationship with his employees. He explained that entrepreneurship is a long-term process; in this case, having a stable team is a big advantage that can help the company have a better performance when facing market challenges and setbacks. Ting said that he knows that in a company, personnel changes are bound to happen frequently. However, he still hopes he can avoid major staffing structure changes within the company. So, when selecting talent, he would ask candidate to describe their personal

development plan for the next three years, and listen to their answers to evaluate whether the person is a good fit for the company's direction. He hoped that his team members have similar goals and motivation like him and believed that only when the main team is driven by the same goal can the company operate steadily in a competitive market.

6.3.2.2 Team encouragement and communication

Founder-entrepreneurs always take on the role of regulating the atmosphere and motivating the team members. As team leaders, they are responsible for creating a suitable working environment and developing appropriate management regulations to motivate employees and further improve the company's competitiveness in the marketplace. During the company's operation, founder-entrepreneurs also need to maintain frequent communication with their employees to keep track of employees' work status, making adjustments according to the actual situation to help the company achieve better market performance.

"As the founder-entrepreneur, I have the responsibility to create a good working atmosphere for my employees, and a comfortable work environment is also one of the significant conditions to attracting powerful talents", Tong said. For him, a good working environment not only means spacious offices and good office equipment, but more importantly, building a harmonious work and communication atmosphere for his employees. *"I have developed a series of humane office rules, such as flexible working hours and work locations",* he stated. He is willing to believe in the self-motivation of his employees and is willing to give them free rein and the right to organise their working hours.

Tong observed that his company's management style has also slowly changed and developed over the course of the business operations. At first, he also used traditional management methods to regulate his employees, such as clocking in and out of work, to limit their working hours. During this time, while he could ensure that employees stayed in the office for a long enough period of time, the company's performance was not as good as expected. He gradually realised that the traditional and fixed management method might not be suitable for many of his employees. He expressed that as a software SME, the company's competitiveness greatly relies on the innovation and creative capabilities of employees. In this case, his original management style did not contribute to the growth of employees and could even have hindered their inspiration. In order to improve the efficiency of his employees, Tong had several in-depth conversations in his company. He found that different people had totally different working habits. He said, *"Some people enjoy working in the early hours of the morning, some others prefer to work in a café or library. I am willing to respect their work habits as long as they complete*

their working tasks on time and with a high standard". As Tong had hoped, with the implementation of a more humane management strategy, his employees' work efficiency has improved significantly. He felt satisfied with this result, and said, "It is obvious that the employees are much more motivated to work. At the same time, the overall working atmosphere has become more active and relaxed than before, which greatly enhances the company's collective cohesion".

Zuohua shared a similar opinion and stated that compared with large organisations, one of the significant strengths of SMEs is their flexible management structure and strategies. During the company's operation, the founder-entrepreneur should grasp this advantage and avoid rigid management. He explained that each employee has a complex set of attributes and characteristics. In this case, a rigid and homogeneous management style may not be suitable for all employees and thus may reduce the overall management efficiency of the company. Therefore, as a founder-entrepreneur, he decided to respect the personal characteristics of his employees and use a more flexible management style. He said, *"Sometimes when some employees violate the rules, I will judge how to deal with them according to their personal characteristics and the actual situation but will not only simply follow the regulations"*. However, he also voiced his concerns about this management strategy: *"this management strategy is more humane, but sometimes I worry that it makes the company's management system meaningless"*. He said that in the current situation, although he has established a set of sound company management regulations, in most cases, the day-to-day management of the company still mainly relies on his personal judgement and decisions. *"It's one of the main challenges I need to cover,"* Zuohua said, *"Companies may have different management strategies at different development stages. As a company increases in size, standardised management will become increasingly important. So, in the next step, I will work to balance humanisation and standardisation, aim to develop the most appropriate people management program for the company"*.

Haijun also emphasised the importance of team encouragement. However, for him, the most important strategy for motivating his team is to build the company culture. He required his staff to get into the habit of reading and to keep up with their self-study every day. Aiming to monitor and encourage his employees' self-learning results, Haijun organises sharing sessions in his company every week. In these sessions, employees can exchange their opinions and inspirations with others based on their reading. *"The contents of employees sharing sometimes is not so important; for me, the more important point is that these activities can help the company create a freer communication environment,"* he explained, *"In these sharing activities, employees need*

not care about each other's positions and levels, they can just focus on their personal opinions and feel comfortable to express them". He said that such a good communication environment is very essential for his company's operation. In his view, if a company wishes to succeed in the market, simply relying on a large accumulation of capital or advanced technology is not enough. A suitable company culture and good human management strategies might be more essential for the company's long-term development. *"This is not only for the growth of the company, but also to support my staff in achieving better self-improvement",* Haijun argued, *"As a founder-entrepreneur, I have the ability and responsibility to inspire my employees to advance through creating a learning atmosphere and a corporate culture".*

Starting a business is not always smooth. In a competitive market environment, business setbacks are very likely to occur, which can test the founder-entrepreneurs' ability to motivate their teams. Yong described some of the huge financial challenges he and his team have faced during his company's growth. In the worst scenario, the company even couldn't provide a steady salary for its employees. *"At that time, many of my employees lost confidence, they did not believe that the company could continue to grow in the market, and some of them decided to leave",* he said, *"I was also stressed, but as the leader of the team, I have the responsibility to motivate my employees and encourage them to continue to overcome difficulties".* He has taken a number of measures to help employees rebuild their confidence in the company. *"Most importantly, I needed to address the financial issues and make sure I can pay my employees on time",* he stated. To reduce the company's financial pressure, Yong frequently contacted potential investors in hopes of winning their financial support. Many of the investors were not positive about his product, and he suffered many questions and rejections during that process, but fortunately, he eventually gained an investor's support and help. The financial problem was solved temporarily, but for the long-term expansion of the enterprise, it is more important to convince employees that the company has a good future ahead. For Yong, communication is the most useful method to achieve this goal. He spent a long time communicating with his employees one by one, trying to understand their worries, expectations, and requirements. He also made some promises to his employees, such as salary increases and job promotions, and most of these promises have now been fulfilled. Looking back on these experiences, he exclaimed that for SMEs like his, any market challenge can bring major frustrations. Sometimes these setbacks are unavoidable, and the founder-entrepreneurs must find ways to lead the company to overcome the problems. Otherwise, the company's survival can be threatened. In such cases, having a cohesive team becomes very essential. *"That's why I argued that team*

motivation is one of the key responsibilities of founder-entrepreneurs", Yong summarised, "maintaining a powerful team is the key factor which leads company to success".

6.3.3 External relationship maintenance

It is difficult for companies to operate successfully in the marketplace without the support of external relationships. Especially in China, the building and maintenance of Guanxi (one's interpersonal network) sometimes can impact the company's business performance significantly (Wang, Siu and Barnes, 2008). In this case, how to deal with the relationship network and help the company to win more external support becomes one of the main questions that need to be considered by founder-entrepreneurs.

Ting highlighted the importance of external relationship maintenance in the interview. As discussed earlier, his main business is related to the disposal and financial management of non-performing assets. He explained that compared with other companies, their business might be a little more sensitive. Therefore, aiming to avoid the generation of compliance risk, he needs to maintain a close relationship with banks and the government. *"It is essential for our business to win the support of the government, which is a key factor for our company to be able to continue to grow in the market", Ting expressed, "I can't tell you the details of our communication, but no doubt, it is one of my main responsibilities in the company".*

In addition to the relationship with the government, more participants mentioned the significance of building relationships with potential investors. As Zuohua stated, limited financial capacity is one of the main shortcomings of SMEs compared to larger organisations. For many SMEs, especially in the start-up phase, operating capital relies heavily on the personal capital accumulation of the founder-entrepreneurs. However, through the growth of the business, the amount of capital needed for the enterprise tends to grow as well. In some cases, the revenue of the business and the personal assets of the founder-entrepreneur may not be sufficient to support the expansion costs of the enterprise. For companies in such situations, attracting external investors might become one of the most suitable selections.

Haijun agreed that attracting investors is an effective way to address a company's financial shortfalls and said, *"founder-entrepreneurs should know how to 'show your company' to attract external investors".* He noted that he is an introvert, and due to this personality trait, how to promote his product became one of the major challenges he faced at the start of his business. *"I didn't know how to handle the relationship with my potential investors, how to demonstrate the advantages of my product, and how to face their negativity and questions",* he stated. To improve the situation, he spent a lot of time learning communication skills. *"I know I have a lot*

of shortcomings to fix, so I really pushed myself to improve during that time", he pointed out. Fortunately, his efforts eventually yielded good results for his business. The company eventually won the favour of investors, who provided financial support that reduced their financial pressure and helped the company move smoothly into the next phase of growth. For Haijun, it's a significant personal achievement. Now, when he engages with investors, he feels more confident than before. This confidence comes from his affirmation of the company's products and the assurance of his personal abilities. Based on this experience, he summarised that maintaining a good external relationship is an important task of founder-entrepreneurs. Although he was weak in this area, he could not escape his responsibility. He believed that the founder-entrepreneur should keep working on such skills and evolve to keep up with the company's growth and development.

Nancy shared a similar experience with Haijun, who described how attracting external funding was one of the most challenging tasks in the start-up process. She exclaimed, *"Money is always the biggest problem we need to solve. The company's development cannot be separated from the support of external funding, but to win the approval of investors is a callous thing"*. She recalls the days when she was actively trying to attract investment: *"our company provides online business travel services for organisations and enterprises. However, many investors were unfamiliar with our industry at the time, which created a lot of challenges when I communicated with them"*. During that process, she heard a large number of negative evaluations from investors every day. They questioned her product, business model, and even her personal abilities. The feedback made her feel uncomfortable, and she even began to have doubts about herself. She expressed, *"I struggled with self-doubt and asked myself if I had chosen the wrong path. Why don't people accept my ideas?"* However, investors' negative response did not defeat her motivation and passion. *"I think it probably related to my personality. I'm a relatively optimistic person, which gives me a solid resistance to stress. At the same time, I have confidence in my team and my product, and I believe we will eventually find suitable investors who can admire our product and concept"*, she said. Now, Nancy's company has established a stable collaborative relationship with a number of investors, and financial issues are no longer the biggest deterrent to business growth. For her and her group, the most difficult time seems to have gone. But she will always remember those difficult experiences as a reminder to stay cautious during the company's growth, especially when approaching potential investors.

Besides investors, keeping a good relationship with clients is also significant for SMEs' development. Based on this point, Yong argued that a close connection with clients can help the

company to get a deeper understanding of the market needs and further reduce a large part of trial-and-error costs. Different from large enterprises, SMEs generally lack huge capital accumulation to develop different types of products to test the market. For them, it is essential to accurately grasp client demands and launch products that are more acceptable to the market. *"Especially in our business, this impact shows more significantly"*, he stated, *"As I said before, our products are mainly facing hospitals and medical students, so our potential client group is very stable and focused. In this case, operating a relationship with the hospital can help keep our business in steady demand"*. As a founder-entrepreneur, this part of the job is often undertaken by Yong. He said that as the leader of the company, he has a higher level of business decision-making power than other managers. During the meeting process, he can directly make some promises and give feedback based on the clients' requirements, which makes the communication process more efficient. At the same time, Yong believed that founder-entrepreneurs taking up the active role of communication themselves can show the company's sincerity and willingness to give clients its attention, which can build a better impression with them.

In Pengyao's opinion, managing good connections with their clients is a useful strategy to build competitive advantage in the market. He explained that their main clients are some famous mobile phone manufacturers; these powerful organisations enjoy a greater degree of choice and are free to select the companies that provide services to them. He has considered adjusting prices to attract their customers, however, the extent to which prices can be adjusted downwards is very limited due to the high cost of R&D activities. Such small price adjustments are not enough to attract large companies, which are less sensitive to minor price increases or decreases due to the vast accumulation of wealth. On the other side, the products provided by his company are not special enough. *"Some of our competitors can also provide similar products or services to us, so only relying on products or prices, we cannot win significant strengths among the competition"*, he stated. Neither price nor product is sufficient for the company's success in a competitive market, and Pengyao began to turn his attention to building relationships with clients in pursuit of stable cooperation. *"I have used some PR strategies to build relationships with manufacturers and protect our client flow"*, he revealed, *"Although I cannot tell you more details about that, it helped us to create a deeper connection with our clients"*.

6.4 Chapter Summary

This chapter discussed the significant role of founder-entrepreneurs of high-tech software SMEs in the context of their entrepreneurial motivations and daily responsibilities. Based on the analysis, the

founder-entrepreneurs are mainly driven by some 'pull' motivations, such as personal hobbies and interests, a better lifestyle and self-achievement. They commonly believe that running a business is a proactive choice and are attracted by some positive factors. Although some founder-entrepreneurs also mentioned some negative factors, such as dissatisfaction with previous situation but for them, the impact of negative factors is much less than the attraction of positive factors. Supporting existing studies (e.g. Bhide, 1996 and Wickham, 2001), founder-entrepreneurs in Chinese high-tech software SMEs are required to undertake a variety of tasks, including defining the direction of their company, group organization and external relationship maintenance. Among these, setting the company direction seems to be the most important task and can highly influence the company's market performance and success, especially when faced with a market full of uncertainty and risk. Therefore, in next chapter, the thesis will mainly focus on the risk management of Chinese high-tech SMEs, it will highlight the key risks faced by the SMEs and the strategies used by their founder-entrepreneurs.

Chapter 7. Risk Management in Chinese High-Tech SMEs

7.1 Chapter Overview

In today's competitive and changing market, having good risk management capability is becoming an important factor for an SME's success. The impact from market risks and challenges on SMEs can be more severe than large organisations due to limitations of size and resources. SMEs are commonly seen as having a simpler internal organisation and lacking a formal and comprehensive risk management structure and hence a lot of the decision-making depends on their founder-entrepreneurs.

This chapter will highlight the important role of founder-entrepreneurs in the risk management of Chinese high-tech software SMEs. It will also discuss the risks faced by such SMEs and the strategies used in their management by their founder-entrepreneurs.

7.2 Essential Role Played by Founder-entrepreneurs in the Risk Management Process

An increasing number of researchers note the importance of risk management for SMEs' development (e.g., Brustbauer, 2016; Tan, Sugiarto and Budhijono, 2021; Verbano and Venturini, 2013; Zeng, 2018). However, compared to large organisations, risk management in SMEs is still perceived to be informal and, in this context, the founder-entrepreneurs usually take on the responsibility of determining risks and making vital decisions. During the interviews, participants described the risk management provisions in their enterprises. As shown in Table 7.1, all participants indicated that they do not have a dedicated department or team in their company that is solely responsible for risk control and management. Although there were some differences in their risk management processes, all the participants emphasised their active role and participation in making critical decisions associated with risk.

Table 7.1 Risk management in Chinese high-tech SMEs

Participant	Risk Management Department/Group?	Main Risk Management Process
Kehao Chen	No	Highly relies on personal judgement of founder-entrepreneurs
Xingyuan Yuan	No	Communication with management team but the final decisions should be made by founder-entrepreneurs.
Ting Xu	No	Communication with management team, but the final decisions should be made by founder-entrepreneurs.
Qiannan/Nancy Chen	No	Communication with management team, but the final decisions should be made by founder-entrepreneurs.
Zuohua Fu	No	Communication with management team, but the final decisions should be made by founder-entrepreneurs.
Haijun Xu	No	Giving employees some decision-making power, the founder-entrepreneur is primarily concerned with the general direction of the business.
Pengyao Zhu	No	Giving employees some decision-making power, the founder-entrepreneur is primarily concerned with the general direction of the business.
Tong Han	No	Highly relies on personal judgement of founder-entrepreneurs
Cong Cui	No	Communication with management team, but the final decisions should be made by founder-entrepreneurs.

Kehao stated, *"I believe that most SMEs will not have a dedicated risk management system and most risk strategies will be provided quickly by the founder-entrepreneur when some challenges arise"*. In his view, the creation of this informal risk management model is related to the characteristics of SMEs. In most cases, SMEs tend to have a simpler structure in terms of human resources than large enterprises. Kehao pointed out, *"Our company only has about 45 employees and in this case, I would not spend the company's limited human resources on risk management"*. Nancy held a similar opinion, indicating that, unlike large companies with well-established and systematic organisational structures, the management structures in SMEs are usually simpler and flatter. In this context, establishing a risk management team may not be a cost-effective option, which would require higher costs to support and could not provide benefits to the business in a short period of time. As a small size company, Nancy pointed out that the number of businesses or projects her company has is limited, which means that they are less likely to be exposed to a significant amount of business risk. In this context, although the company's risk management structure was immature, they were

still well-positioned to address the current risks and continue working towards facilitating the company's growth.

In an informal risk management structure, the role played by the founder-entrepreneurs might become even more prominent. In the study, some participants emphasised that the enterprise's risk strategies should highly depend on their personal judgements and decisions. Tong, for example, highlighted that in his company, he often takes on the responsibility of a risk-taker. He pointed out that in China, the initial establishment for most SMEs relies on personal capital and funding from their founder-entrepreneurs. In this context, the market performance and financial position of the company will directly affect the founder-entrepreneurs' financial status, and this might lead to a higher desire for control over their company. Tong expressed that because of this aspect, founder-entrepreneurs often see the company as 'their own personal work'. They prefer to run their business according to their own ideas and perspectives rather than taking onboard the opinions of others. Hence, when faced with business risks, this tendency towards independent thinking and decision-making may become even more pronounced. Tong explained, *"The risk performance of a company will significantly impact its further development over a long period. Therefore, for founder-entrepreneurs like me, who place a high value on control, it is important to decide on a risk strategy alone"*.

There were several participants who stated that while formulating risk strategies in their business, they valued the opinions of their employees. However, they also highlighted that the ultimate risk strategy should be determined by the founder-entrepreneur. Xingyuan stated, *"I respect the opinions of my staff, compared with me, they may have a closer relationship with customers and the market, which allows them to offer some opinions that differ from my perspective"*. On a similar note, Ting added, *"When faced with a challenge, I will discuss it with my entrepreneurial partners and senior management of the company before making the final decision"*. He noted that founder-entrepreneurs should also be able to assert themselves when differences of opinion arise. Nancy also acknowledged the importance of listening to the views of their team, noting that one person's knowledge tends to be limited, and hence it can be very helpful to get advice and opinions from others. In her context, she hasn't got a strong professional background in the areas of software design and development, hence, the views of other professionals tend to have a great influence on her assessment of the potential risks of project development. She also emphasised that other people's advice should only be seen as an information resource and that a founder-entrepreneur should be able to review this information and then make an independent final decision. She said,

"One company can only have one decision-maker and the final decision of my enterprise must be made by myself".

7.3 Risks Encountered by Chinese High-tech SMEs

Chinese high-tech SMEs face a variety of risks in their operations that pose a great challenge to their development and expansion, sometimes even threatening their existence. In this study, participants cited several risks that they had experienced over time. Based on the interview analysis, these risks have been divided into two main categories: external risks and internal risks. As seen in Figure 7.1, external risks are the challenges and implications emerging from the external environment and market, such as economic situation, competitors, law and policy, and industry development. On the other hand, internal risks arise from some limitations of the enterprises, including limitations of resources (such as talents, market channel, and financial resources), an inadequate management system, and insufficient personal competences of the founder-entrepreneur.

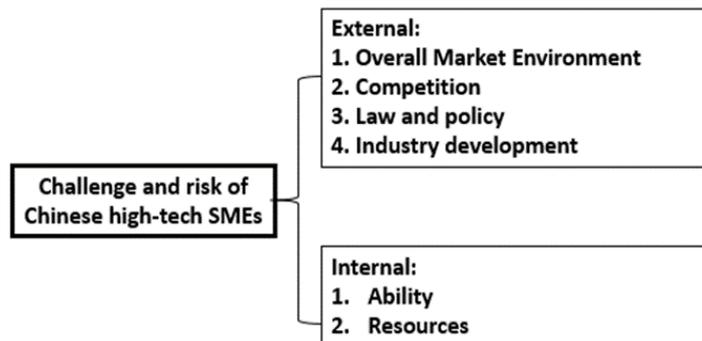


Figure 7.1 Different risks faced by Chinese high-tech SMEs

7.3.1 External Risks

Because of their smaller scale, SMEs are more likely to be influenced by external factors than larger organisations (Zeng, 2018). The changing economic environment and market demand can highly challenge the viability of SMEs. Many participants in the interviews pointed out that in recent years, the negative market environment of China is a significant factor that has hindered software SMEs' growth. Another external risk frequently cited is the strong competition in the market. Software SMEs are very likely to face competition from large organisations as well as companies of a similar size, leading to their survival space narrowing. Meanwhile, the inconsistent structure of law and regulations in China is another external risk that might further

increase the difficulty of their survival. Also, many participants observed that the timeline for the development of the software market so far in China is shorter than some of the prominent Western countries. Hence, there is not much in terms of a frame of reference or template that could be used as a guide or measurement for risk assessment and management among software SMEs.

7.3.1.1 Market Environment

SMEs' growth is strongly related to external market changes, as Zuohua explains, *"A good market environment is essential for the development of SMEs, which can provide more financing opportunities, business demands, and talent supply"*. A positive market environment can create many opportunities and favourable conditions for entrepreneurs to flourish, whereas negative markets can present many challenges and risks. In this study, many participants believed that a negative market environment plays a key role in creating challenges that could threaten the survival of SMEs. Many founder-entrepreneurs pointed out that in China, the failure rate for SMEs, especially in recent years, has increased significantly. They felt that compared to large organisations, SMEs are more easily influenced by external environment, and the market changes can sometimes make things difficult for them to manage with their limited resources and capacity.

Emphasising this point, Nancy mentioned that ever since she started her business, every day has been filled with challenges. Especially in recent times, market growth has been slow, making the competition even more intense. Under such circumstances, more and more SMEs are facing failure. She said, *"I always hear stories of businesses failing. It seems that SME closures have become more and more common, and in my opinion, this should be linked to the overall changing market environment"*. In Kehao's mind, the decline of market demand is a great challenge for his business growth. His business mainly provides human-resource services for programmers and other enterprises. In this case, the overall market situation can highly influence their company's operation. Kehao noted that at the end of 2018, many large companies began downsizing and making mass layoffs, and by mid-2019, this trend began to affect SMEs significantly. Unlike large organisations that can weather the storm by reducing their operating costs, the impact of this negative market environment can be fatal for SMEs. He said, *"It is difficult for SMEs to maintain growth in such an unfavourable environment and, as a result, more and more SMEs have disappeared from the market over the years. For us, this is certainly a bad situation"*. Kehao explained that his business was tied to the steady growth of his clients, and many of the SMEs facing closure should have been potential customers. As they disappeared from the market, his

business also faced a significant decline in business demand. At the same time, the unfavourable market conditions have also affected their existing clients; some of them have decided to slow down the pace of growth for their businesses. Kehao explains *"For us, it's a really big challenge...If our customers cannot develop well, we cannot either. And it is also the main reason why my company did not reach our desired expectations in 2019"*. The emergence of COVID-19 also added many complexities to the market environment for SMEs. This will be discussed in detail later in this chapter.

7.3.1.2 Competition

In most given markets, facing stiff competition is one of the most common scenarios for any business. In China, the rising number of SMEs creates a highly competitive market for most businesses. In this study, most founder-entrepreneurs highlighted how they faced competition from other SMEs as well as large organisations at the same time.

Ting explained, *"there have been many new companies which have joined our industry every day, they bring us a lot of new challenges. We never know if a new competitor will appear tomorrow, who might steal our clients or squeeze our market share"*. Nancy also mentioned the pressure to develop in a highly competitive market. She said, *"Although our company has gained a relatively stable market share, competitive pressure from our peers is still present"*. Based on her points, the total amount of market resources and market space are limited, and in this context, as long as there are new entrepreneurs and companies entering the market, potential competition is likely to occur. Pengyao pointed out that his company has to keep an eye on other SMEs who provide similar products or services to them. He said that, unlike other industries, software SMEs need relatively higher R&D investment. Their products have high technical costs and cannot be easily controlled and reduced, especially when new products have just entered the market. In this situation, price wars brought about by peer competition might significantly increase the company's financial pressure, thereby increasing risks to the company's overall operation.

However, compared to the challenges posed by other SMEs, the threat of large organisations is even more severe for Chinese software SMEs. Generally, large organisations are considered to have more power and greater capabilities. They have stronger market influences and can spend more resources on marketing and R&D. The entry of these powerful companies highly increases the competitive pressure on Chinese high-tech software SMEs. Focusing on this point, Xingyuan pointed out, *"One of the main problems we have encountered is that we have some potent competitors. They have a larger company size, more users, and a stronger social influence. More importantly, they have a huge accumulation of capital"*. He expressed that in China, the high-

tech software market is an industry full of potential that greatly attracts the attention of powerful investors. Relying on their substantial financial resources, these capital investors take over the market in a short space of time. For SMEs, such moves are undoubtedly detrimental and greatly shrink the market space for them to survive, grow, and develop. *"As an SME, we have little chance of winning against them"*, Xingyuan sighed, *"Even if we can launch our products earlier than the big enterprises, they can capture our existing users by offering discounts or subsidies. Some companies will even outright steal our ideas to launch a product similar to ours"*. He confessed that such situations have caused him and his team great distress in the past, *"It was difficult for us to completely resolve and avoid this situation. It really is a major setback for innovative SMEs like us"*.

Haijun shared an example to support this view. A few years ago, his company released a new software product, which was innovative for the Chinese market. To develop this product, he and his team spent a lot of time, money, and effort. *"We even stopped some other projects to bring all our resources together on this product"*, he said, *"Our whole team had very high confidence and expectations for this product"*. However, things did not go as smoothly as they had expected. Shortly after the product was launched on the market, they found that some large companies began to offer similar products at lower prices. He explained that large companies have stronger financial accumulation and hence could keep their prices low for a certain period of time. He noted, *"The price they set can sometimes be even lower than our cost. Large enterprises can bear this kind of loss in the short term due to their large scale. But for us, it will highly influence the stability of our cashflow"*. Haijun considered adopting some legal measures to protect the business opportunities for his company. However, in China, this form of legal dispute and lawsuit has a very complicated procedure. For him, this would be costly in terms of time and money. In this case, he had to terminate the project to reduce further losses and risks to their company's operation.

7.3.1.3 Law and policy

The Chinese government is very supportive of the development of SMEs and has therefore issued a series of laws and policies to protect their legitimate rights and interests. The 'People's Republic of China SME Promotion Law', which was set out in 2002, clearly affirms the important role of SMEs in the Chinese economy. It highlights the government's support from five main aspects: financial support, entrepreneurial support, technological innovation, market development, and social services (China People's Congress, 2002). The Chinese government also published specific regulations and documents to support high-tech SMEs based on their characteristics in the hope

of protecting their innovation achievement and reducing their financial pressure (Ministry of Science and Technology of China, 2015). However, during the interviews, some participants noted that the current regulations in China are not systematic enough and may not fully protect the interests of software SMEs. They argued that there is still much unfair competition and intellectual property theft issues happening regularly in the Chinese high-tech market, which highly influences the prospects for growth and development of some SMEs. On this note, Haijun pointed out, *"I have to say that compared with some Western countries, China's intellectual property protection is still somewhat inadequate"*. He said that in the Chinese software market, there still exists a relatively common practice of stealing others' ideas by some companies to reduce costs. These companies can sometimes provide products at relatively lower prices as they don't tend to spend much resource on R&D and market assessment. Their unethical approaches allow them a shortcut to bring new products and concepts onto the market using templates and ideas from other businesses. In such cases, a large number of customers who might be sensitive to price will be attracted to these companies and their cheaper alternatives. This will then have a negative impact on the SMEs with the original designs and concepts and their commitment towards innovation. What's worse is that sometimes such intellectual property theft could potentially lead to the failure of some of the original high-tech SMEs. If the government cannot push strict and comprehensive regulations to control and combat such unethical practices, software SMEs will face very significant risks in their daily operations. Unfortunately, Haijun claimed that in the current Chinese regulatory system, it is still difficult for software SMEs to find an effective way to protect their intellectual property rights. He explained, *"The penalties for stealing other people's products or ideas are too low, which encourages many companies to break the law"*.

Xingyuan also supported this opinion and highlighted the issue of intellectual property (IP) protection in the interview. He explained how he had discovered that his company's products had been copied by a famous company in China a few years ago. They tried to defend their rights, but they found that it was difficult to obtain evidence in such cases. In the meantime, due to complex legal procedures, they have to spend a lot of time awaiting final outcomes from the court. During this process, they are not allowed to sell the affected products and generate income, which then increases further pressure on the company's operation and financial stability. *"In this situation, we even do not have enough capital to defend our rights. So, we have to stand the loss"*, he said, *"I think our country still lacks a mature IP protection system to reduce these plagiarisms and unfair competition"*.

7.3.1.4 Industry development

The development of China's high-tech software industry began at the end of the 20th century. Compared with Western countries, its development history is much shorter (Fan, 2017; Zhang, 2018). However, in recent years, with internationalisation and the support and attention of the Chinese government, China's high-tech market has developed vigorously (He and Li, 2005). As one of the important areas of the high-tech industry, the Chinese software market also expanded rapidly with technological development. Now, digital products are becoming increasingly important in the daily lives of Chinese people. People are already used to doing a lot of things using software, such as shopping, communicating, working, learning, and so on. Such huge market demands have brought great market prospects and more opportunities for software companies. On the other hand, due to its short development history, there are still some biases and misunderstandings about the software industry in the market. Based on this point, some participants argued that although software products have been gradually integrated into people's daily lives, the public might still lack a deep understanding of the industry. For software SMEs, this situation can pose a number of challenges to attracting investment and developing markets.

Nancy realised this situation when she communicated with some investors. As the founder-entrepreneur of a software SME, attracting external financial support is an essential responsibility for her, she said. *"External investment is very important. It can significantly reduce the financial pressure on companies and support the development of innovative activities. However, for SMEs like ours, winning the support and favour of investors is not an easy task"*. In her opinion, one of the main obstacles to this process is that some of the investors lack an in-depth understanding of the software industry. She explained that the software industry is a broad sector with many components. Her organisation, for example, mainly provides business travel online services to enterprises. At the same time, she and her group are trying to use software technology such as big data analysis and AI algorithms to improve the travel industry's growth. In her view, the field is new and innovative, and worth the investment of money and manpower to develop. However, when she pitched their projects to some investors, their feedback was different to her expectations. She said, *"They cannot deeply understand the contents of our business, so, in many cases, they would directly question the value of our project's existence"*. Investors would compare her company to some of the leading online travel enterprises and argue that the areas of her business have already been covered by these powerful organisations, and judge that her business lacked market potential. Based on these situations, Nancy demonstrated her frustration. *"I don't think the reasons for their decision are*

justified. Some of them cannot feel the innovation points of our project just because they do not really understand the industry".

Yong also supported this opinion. He summed up two characteristics of the industry, which are immaturity and rapid growth. Both of these factors may present some uncertainties and challenges to the development of SMEs. He expressed that the software market had a relatively short history of development in China; in this context, entrepreneurs who start up in this sector often have to take on the role of pioneers. He said, *"There are few examples and experiences that we can emulate and learn from, and in many cases, we can only keep trying to find better ways to develop"*. He further explained that, for founder-entrepreneurs, opening up a new market means that they need to define a new market demand. *"It takes time for people to understand and accept new things. In this context, how to effectively promote our products is a major challenge I needed to solve at that time"*, Yong stated.

Tong pointed out that the rapid development of the industry will further attract a large number of new companies, which could potentially make the already-fierce market competition even more intense. He mentioned that in China, there are many software SMEs but only a small number of them can survive for a long time. It is undoubtedly a good thing that the government encourages the development of the software industry and high-tech entrepreneurship. However, software SMEs have to realise the potential risks which can be brought by the quick growth of the industry. He further explained that many people are encouraged to start their business in the software market due to the supportive policies or the influences of the market atmosphere, but they ignore the risks of entrepreneurship. Some of them might lack an overall understanding of the industry and may even lack the basic professional skills required to run a software company. In this case, the number of Chinese software SMEs might grow rapidly, which may greatly increase the competitive pressure of enterprises. *"If the industry grows too quickly, the market might become the 'red ocean'⁴ in a short time"*, he said. However, since some companies do not have enough technology and innovation capabilities to improve competitiveness, they might simply decide to reduce their prices to attract clients. Unreasonable price cuts and vicious competition will significantly affect the development of Chinese software companies. Tong emphasised, *"We must be alert to the risks, such unfair competition, which might be posed by this situation"*.

7.3.2 Internal risks

⁴ *Red Ocean: Red Ocean is representative of all such industries/products that already exist and are thus representative of the known market space* (Kim and Mauborgne, 2005).

In addition to external factors, some internal risks can also significantly influence software SMEs' operation and development. In this study, participants mainly mentioned two main areas of internal risk, which are the personal limitations of founder-entrepreneurs and the resource limitations of SMEs.

7.3.2.1 Abilities of founder-entrepreneurs

As discussed before, the day-to-day responsibilities of the founder-entrepreneurs of SMEs are complex and broad, and require a range of skills and competencies. However, not everyone is a natural entrepreneur. In the interviews, many participants confessed that they clearly felt the limitations of their capabilities during the entrepreneurial process. For some, particularly at the beginning stages of the business, their own shortcomings seemed to seriously hinder their company's prospects for growth and development. Some of the limitations the participants mentioned relate to areas of technical knowledge, management capability, market analysis, and the ability to manage emotional stress and pressure.

7.3.2.1.1 Technical knowledge

It is expected that founder-entrepreneurs of software SMEs have a certain level of software knowledge. However, not all participants in the study had a good technical background, and some of them pointed out that the lack of technical skills was a major shortcoming that greatly challenged them in running their companies effectively. For instance, in Haijun's case, prior to starting his own business, he worked for many years as a cost engineer for a large construction company. This work experience gave him a very deep understanding of the engineering costing industry. However, this experience didn't help him develop the technical skills needed in the software industry. This skills gap later brought him a lot of setbacks during his company's start-up stages, especially when setting up the technical team. He didn't know how to evaluate his employees' performances and abilities, didn't know what skills and talents were needed in his company. He didn't even know how to judge his company's innovation capabilities in the software market. He stated that people can only test and evaluate others when they have mastered the knowledge themselves. *"I think my lack of technical skills is the main risk I need to be wary of. In fact, not only the technical skills, during these years of entrepreneurship, I have gradually realised that I still have a lot of things I need to learn"*, Haijun said. He pointed out that the market is always changing, which constantly tests entrepreneurs' capabilities and limitations.

In order to attain a good and consistent market performance, entrepreneurs should keep working on their skills and capacities so as to keep up with their company's growth.

Yong also faced a similar situation. Like Haijun, he had no technical background before starting his business venture. To fill this shortcoming, he decided to use technology outsourcing to meet the day-to-day operational needs of the business. However, even with the help of an external technical team, he struggles to address all of the problems associated with the business operation. He stated, *"I think the main problems arise in the communication process"*. During the software R&D process, he found that the technical team he hired lacked an in-depth understanding of his business, which often made it difficult for them to develop a software product that met his expectations. At the same time, his lack of experience in software development made it difficult for him to clearly articulate his requirements and suggestions for improvement with the technical team. Yong said in frustration, *"The products developed under these conditions were often substandard and unsatisfactory, which forced us to modify them time and time again. On several occasions, we even had to withdraw products that had already been launched for adjustments"*. As an SME, their resources are limited, and such repeated product modifications and adjustments can greatly increase financial pressure and instability. *"That's why I believe that technical capabilities are essential for founder-entrepreneurs of software SMEs"*, he argued, *"I learned from my hard experiences"*.

7.3.2.1.2 Management capability

Ability to manage a business is another important aspect for founder-entrepreneurs, especially in SMEs where their engagement is critical in almost every aspect of the business. Some participants were confident in their technical skills and capabilities, but it was their management skills that they worried about. In the case of Xingyuan, he had a long history of working as a programmer, which helped him gain confidence in his technical skills and capabilities. He explains, *"Technical ability is not an issue that I need to worry about. I am confident in my personal and team capabilities. In fact, I think the technical level of our team is relatively advanced in the market"*. Compared with technical problems, he was more concerned about his management skills. Before starting his enterprise, he did not hold any management-related positions. He stated, *"When working in a technical position, I didn't need to overthink about things related to human interaction and group organisation. However, after being an entrepreneur, this part of work became much more essential"*. This element of business management made him feel a bit out of place, especially during the company's start-up stages. With the expansion of his company, he gradually realised that limitations in management skills,

particularly in communication and organisation, could significantly threaten the business's prospects for growth and development. He noted, *"Once an argument with my entrepreneurial team made me clearly understand my limitation in this aspect"*. He said that his entrepreneurial team was small at the beginning stages of the business. The members were very familiar with each other and there was no strong sense of hierarchy. During the operation of the business, it is very common for some differences of opinion to arise. If the leader is able to coordinate these opinions of various members, such differences in working styles and thinking could be utilised towards business growth. Unfortunately, he did not have such good management skills at the time. On the contrary, he stated that his inability to manage such situation only intensified team conflicts. *"The result was that one of the core members decided to leave our group"*, he sighed. After this incident, he began to pay attention to his management skills. He realised that he didn't know how to communicate effectively with his staff or tactfully manage them. These shortcomings were some potential risks that could have very serious consequences for the future development of the company. In this context, Xingyuan stated, *"A strong business cannot be built without a good leader, and I still have a lot to learn and improve"*.

7.3.2.1.3 Market analysis

In SMEs, founder-entrepreneurs are commonly responsible for setting the company's vision and direction for growth, which tests their knowledge of the industry and their ability to assess market trends. A clear direction and good choice of market segment can help SMEs avoid many potential risks and succeed with their business venture. Therefore, founder-entrepreneurs should have a cautious approach towards assessing market changes and keeping themselves up to date with the trends in that sector. They should have the ability to make a comprehensive judgement of the market opportunities and where to invest, and ultimately develop a growth strategy that is beneficial to their company. However, for some participants, it's not an easy task. As Tong pointed out, *"For many founder-entrepreneurs, the most important and difficult point is to select the correct road for their company"*. Some participants mentioned that although they tried to do some research and analysis before making important decisions, it is still very difficult to accurately predict the market situation. In this context, Zuohua stated, *"The market is always changing, and it is difficult to foresee all the risks and difficulties before we run the project"*. He described that before formally launching a new project, he and his team would make an overall judgement and assessment of it. Based on the results, they would set the initial budget and different phases for development. However, such comprehensive preparation did not help him to avoid potential losses. In the interview, he shared an example of when he had to face a major

setback because of his overconfidence in the market analysis. In the first few years of his business venture, the development style of his company was relatively aggressive. They often gave overly optimistic judgements about new projects and products and believed that the company had sufficient capacity and resources to develop these. Zuohua stated that such an aggressive growth strategy led to a rapid expansion of the company; on the other hand, it also posed potential risks. He further explained, *"The accident happened during a normal project advancement. As usual, we had a good market forecast for the project. In our projections, once the product was launched, it could generate good revenues and financial returns. However, the actual situation was totally different from our assessment"*. Firstly, he and his team encountered obstacles in the product development phase. Due to the lack of a clear product positioning in the market, they had to readjust their product development plans again and again, which greatly delayed the product launch time and increased the overall costing. And their troubles weren't resolved even after the launch of the product. Zuohua sighed, *"That investment was a complete failure, and the product was not popular in the market. We couldn't even recoup our costs, let alone make a profit"*. For Zuohua, this incident was a warning, reminding him to be aware of his limitations and shortcomings in terms of understanding the market and their capabilities as a small business to tap into viable opportunities. He stated, *"Founder-entrepreneurs need to learn from the failures. After that setback, I realised that I still have a lot of things need to learn. I need to keep improving, otherwise, a less capable entrepreneur may lead the business to its downfall"*.

Pengyao also shared a similar experience. He described how his capabilities greatly limited his understanding of the market, especially in the early stages of his business. *"I did not have sufficient experience in market analysis, which made me a bit clueless when facing unknown markets"*, he stated. He did not know how to obtain the latest market information, how to capture market gaps, or how to filter out products that had more chances of being successful among their customers and the market. This lack of experience with market analysis led him to lack confidence when making business decisions, *"At that time, it was difficult for me to be sure that I was making the right decisions because most of my judgements were just based on intuition. However, with the company's growth, this decision-making method was not suitable anymore"*. To change this situation, he started spending more time understanding the market and its trends, and how to tap into opportunities. Now, he can confidently state that he is a connoisseur in the industry. Reviewing the experiences, he highlighted that for founder-entrepreneurs, having a deep understanding of the market is a crucial step for business success. Otherwise, the company will be at great risk.

7.3.2.1.4 Ability to manage emotion and wellbeing

Another issue mentioned by the participants in this study was their ability to manage and control their emotion and wellbeing. Many pointed out that the market performance of their business can have a direct impact on their mental state and wellbeing. As many see their business as a personal extension of their life's main ambition, such a close connection can lead them to carry greater mental pressure during the company operation and management. Such intense pressure can affect their ability to manage and control their emotion and wellbeing. Nancy noted that once a person decides to start a business, they should be prepared to accept losses and risks as part of that journey. Founder-entrepreneurs may experience a variety of frustrations during the start-up process; in this case, if they do not have a strong mindset, they will struggle to cope in today's competitive and inconsistent market. Xingyuan also supported this view and confessed, *"I may have some deficiencies in emotion management. In fact, these shortcomings had even made me doubt my entrepreneurial path"*. He described a situation where after experiencing the setback of key members' departure from his company, he was faced with a number of other difficulties, such as financial pressures and misunderstandings from end-users. Such series of challenges one after the other caused him to have some serious self-doubt. He expressed, *"I started asking myself, am I really cut out to be an entrepreneur? At that time, I wasn't even sure that what I was doing was meaningful and worthwhile"*. This thinking also greatly affected his mental health and wellbeing. He started to become frustrated, and that reflected in his communication with his team. He realised that he was becoming very passive-aggressive and negative in his approaches. Gradually, his attitude started to affect the working atmosphere of the whole business, which in turn affected the company's overall performance. He said, *"This interaction seemed to create a vicious circle that seriously threatened the survival of my business. Eventually, I realised that if I couldn't adjust myself, then I would be defeated by the internal drain on my spirit"*. In this context, Xingyuan emphasised the importance of wellbeing and the ability to manage emotions during tough times among entrepreneurs. He cautioned that the inability to manage one's emotional and mental state is a potential risk that should not be ignored in businesses. He said, *"A panicked leader cannot bring his team to victory"*, hence, for founder-entrepreneurs, this is an important aspect to consider.

7.3.2.2 Resource limitation

One of the distinct characteristics of SMEs is their small scale. As discussed in the literature review, this brings some advantages, such as flexibility and the ability to respond quickly to market changes. However, it also makes them more vulnerable to resource constraints. Bharati

and Chaudhury (2009) argue that the development of SMEs has been severely constrained by a lack of resources. Because of the limitation of resource accumulation, it is difficult for SMEs to expand their market influence. Also, considering the financial pressure they usually face in the market, many SMEs have to prioritise projects and funding allocations, and in some cases even abandon projects in order to ensure the smooth operation of their businesses.

For high-tech software SMEs, such struggles with resources are common, as was evident among the participants in this study. Many pointed out that due to their business characteristics, software SMEs commonly require a higher initial investment to support R&D and innovation activities, which highly increased their companies' financial pressures. Focusing on this point, Nancy stated, *"A stable financial performance is one of the most essential conditions for the survival of a company"*. She believed that adequate financial reserves are the fundamental guarantee for continuing R&D activities and further explained that for software SMEs, good innovation capability is a key factor in maintaining strong market competitiveness. She noted that compared with large organisations, small businesses generally lack strong financial support, and in many cases their funding sources are solely dependent on personal investment from their founder-entrepreneur or the key members of the entrepreneurial group. The process of innovation is often fraught with uncertainty and risk. As Nancy mentioned, the process of taking a product from an idea to an actual reality can be very long. To ensure product quality, companies need to continually invest in adjusting and improving their products to respond to changes in the market. Any products which are in the process of being developed do not generate revenue, and R&D activities consume a significant amount of the company's resources, which can affect the normal operation of the business. *"Even with the significant resources invested, it is difficult to ensure that the product will reap the desired market performance"*, Nancy stated, *"And for SMEs, a single product error can cause very serious consequences and may even lead to financial collapse"*.

Compared with other participants, the financial setbacks suffered by Yong were much more severe. He explained, *"My company used to experience a long period of development bottlenecks. In the most difficult time, I hadn't even enough money to cover my employees' salaries"*. Looking back on this experience, he summarised that the main reasons for this setback were the company's lack of financial resources, the software industry's high investment requirements, and the limitations of his own capabilities. He explained that since the beginning of his business, he and his team had to invest over ¥10 million in developing different projects. For an individual entrepreneur, this is undoubtedly a large sum, but such an investment is still not enough for the

development of a software business. He said, *"The software industry has a much higher barrier to entry than other industries, of which the most intuitive is the need for money"*. He confessed that such a high requirement of investment was beyond his expectation, and stated, *"As I said before, at the beginning of the business, I lacked in-depth knowledge of the software industry. I had no idea that developing a software product would cost so much money and effort. By the time I realised this, it was a little too late"*. In order to help the company to survive, Yong had to stop some ongoing projects and lay off some staff to reduce operating costs. At the same time, he was also trying to communicate with some external investors, hoping to get their support to solve the company's financial problems. After this setback, he realised the importance of financial accumulation for a company, noting that the most important thing that can directly decide a company's ability to survive is money. Without financial support, all other plans and issues, such as R&D, innovation and marketing, would remain mere rhetoric.

During the interviews, some participants highlighted that as small businesses, they generally tend to have a weaker influence and voice in the overall market affecting their visibility and brand impact. Xingyuan explained that, unlike large enterprises, SMEs generally lack a focus on communication and promotion, which makes it difficult for them to establish widespread visibility in the market. This situation is both negative for product selling and investor attraction. He stated that customers are more likely to choose well-known applications released by well-known enterprises, such as Baidu and Alibaba. In this context, no matter how good the features of their products are, if they do not have suitable promotional channels, it will be difficult for them to gain a large market share. In addition, the low market visibility of SMEs also impacts their performance when faced with investors. Xingyuan said, *"In these years, I can clearly sense that more and more investors are preferring well-known projects to start-ups like ours. Sometimes, the reputation of the company is even more important to them than the content of the project"*. Although he can understand this phenomenon, he still feels very frustrated. He stated that building a strong market influence is a long-term process, which requires building a loyal customer base first and increasing positive word-of-mouth, together with a series of marketing strategies. All these require a significant investment. *"So, in the current situation, I really don't know how to solve this problem"*, he said, *"All we can do is to provide good products and services to our users and hope that their good feedback will help us attract more customers and build a better reputation"*. Zuohua also supported this view. He said that to reduce budget, many founder-entrepreneurs from software SMEs were not willing to spend money on marketing and promotion. However, stable client flow is very important for a company's growth. Founder-entrepreneurs therefore should pay more attention to this and understand that if they cannot

properly manage the company resources to maintain good customer relationships and increase their market influences, they might face bigger risks in the future.

Another resource constraint that participants were concerned about was the lack of talent in their business areas. The successful operation of a company cannot solely depend on the entrepreneur; it also relies on the contributions made by employees with the relevant skills and capabilities. In this context, attracting professional employees to build a powerful team has become key for software SMEs to enhance their competitiveness and achieve success. As Kehao mentioned, building a strong team is the first step to establishing a company. If founder-entrepreneurs can find the right people to join their company, they are more likely to achieve better market performance as the company grows. However, in the recruitment market, it seems that SMEs can be less appealing to potential applicants than larger companies. Xingyuan stated, *"The company can't grow without the support of a powerful team, however, for SMEs like us, attracting outstanding talent is a difficult task"*. He pointed out that, due to the limitation of resources, it's difficult for SMEs to provide generous salaries to attract professionals. Besides, for many people, working for an SME cannot provide them with sufficient pride and honour. He explained that there seems to be a general perception in China that people who work in large companies always have better abilities, better development potential, and a better reputation. Conversely, due to the low survival rate of SMEs, employment in an SME is seen as a precarious and risky choice for applicants. In this context, even if they could offer equivalent salaries and benefits as large enterprises, they would still struggle to win the competition for talent. This view was supported by Nancy, who emphasised that a company's ability to innovate is closely linked to the individual capabilities of its employees. She said, *"As the company expands, the support of the staff becomes increasingly important. However, for me, it is a significant challenge to recruit the right staff"*. She explained that recruitment in her business is a two-way selection process: as an entrepreneur, she certainly wants to recruit staff with strong generic and professional skills. However, such excellent employees are highly desirable in the recruitment market and will have a lot of job choices. *"In such competitions, SMEs can hardly gain favour"*, she confessed, *"Many people believe that only by working for a large company can they achieve significant self-development"*. With this view, she expressed her disagreement and frustration and said that joining a large company may seem like a more stable option, but for job seekers, joining a fast-growing SME may mean more opportunities for self-improvement and challenges. She stated, *"I know that this general perception of SMEs may not change anytime soon, but I still hope that one day people will realise that working in an SME is also a good career choice"*.

7.4 Impact of COVID-19 in Chinese High-tech Software SMEs

The outbreak of COVID-19 had an immense impact on the general market and business opportunities. For many participants in this study, as the outbreak was sudden, it left them with no time to prepare or have any contingency plan in place. Now with the ongoing pandemic, there has been an accumulation of pressure on SMEs to survive. However, for some, the risks from the pandemic were accompanied by new business opportunities. The following section will discuss some of the risks and challenges for these SMEs from COVID-19.

7.4.1 Risks and challenges

For all SMEs, the COVID-19 crisis has undoubtedly been a major challenge and slowed down their speed of development. In order to reduce the spread of the pandemic, the Chinese government implemented strict lockdown and quarantine measures, especially in the first half of 2020. These strategies effectively controlled COVID-19's development, however, they also brought a lot of challenges to the SMEs' development and operation. Restricted by the pandemic rules, many SMEs could not operate normally and employees were forced to continue their work online, which significantly affected their working rhythm and productivity. At the same time, the overall negative market environment greatly reduced people's enthusiasm for consumption, which has made attracting customers even more difficult. Reduced revenues increased financial pressure on companies, which also affected the personal motivation of entrepreneurs. In this context, many participants stated that 2020 could be regarded as the darkest period since the foundation of their business.

During the interviews, all participants described the challenges and risks they encountered due to the pandemic, and these can be summarised under the following categories:

- Mode of operation
- Market demand and market environment
- Cash flow and financial pressure
- Emotional stress and pressure.

7.4.1.1 Mode of operation

During the COVID-19 pandemic, the Chinese government implemented lockdown measures in the first few months of 2020. Most companies had to close their offices and use online working measures instead of traditional working methods (Pan, Cui and Qian, 2020). Due to the

recurrence of the pandemic and the Chinese Government's 'dynamic zeroing' policy (GOV.CN, 2022), this state of affairs has continued. During the interviews, all the participants discussed their opinions on this new mode of operation. Due to the characteristics of this industry, software SMEs compared with those from other industry sectors found it relatively easy to switch to an online working method. However, the participants also confessed that they were not able to completely get rid of their traditional mode of operation. In this case, such an abrupt shift posed challenges and affected their work efficacy to a certain extent.

Kehao noted that in his software company, most of his employees have some knowledge of software and internet technology. For them, it is not difficult to become familiar with some of the new working software and office applications. In fact, before the pandemic, they were already experimenting with some online tools, such as Zoom and DingTalk, to support their daily work. However, he stressed that prior to COVID-19, remote working was only seen as an additional form of support. In most cases, traditional ways of working, such as office work, were still the dominant or recommended way. He explained, *"Although we would also use some online working tools before, it would only be temporarily used to assist in our work. For example, to communicate with colleagues who are travelling, or to communicate informally with clients. However, due to COVID-19, we had to shift all our focus online, which has also been a challenge for us"*. He confessed that they were not quite ready to deal with this change and working online did affect the employees' work motivation and efficiency to some extent. *"Face-to-face conversations are always more productive than online communication"*, he stated, *"and in many cases, the work of employees needs to be supervised"*. He explained that when working in the office, employees are more focused because their work can be monitored and supervised by their supervisors and their colleagues. And when they encounter some work problems, they can quickly find someone to help them, which can highly improve their work efficiency. However, when they work from home, the approach towards work management and supervision can be very different.

Xingyuan also highlighted the impact of the changing operation model on his business development and stated that he has valued the importance of team communication since the company's establishment. In his opinion, face-to-face communication is the most efficient way to understand his employees. However, due to the outbreak of COVID-19, this form of communication was cut off, and though they could still contact each other via online video or phone call, for Xingyuan, online communication could not fully replace face-to-face conversations. He stated, *"Online communication is more likely to lead to some*

misunderstandings. Besides, working alone can make people feel lonely, which can greatly increase their mental stress". Similar to Xingyuan, Ting expressed that at least in the current stage, remote working should only be seen as a phased measure; it is a helpless choice under the pandemic. He said, *"I think online working is still very inefficient for most businesses. It cannot support the growth of a company and only sustains basic operations".* He explains that in the Chinese market, face-to-face conversations are essential for understanding and trust-building among clients and stakeholders. For example, they are usually unable to establish new networks simply through online communication and rarely solely rely on online interviews to recruit new employees. *"It means that any expanded work of our company relies on offline work",* Ting noted, *"in this case, being forced to work remotely has had a big impact on us. In fact, in the first few months of 2020, our company was almost at a standstill".*

7.4.1.2 Market demand and market environment

Earlier, the significant impacts of the external market environment to the Chinese high-tech software SMEs were discussed. Since 2020, the outbreak of COVID-19 has undoubtedly been one of the most significant factors affecting the market environment impacting customers' consumption habits. For software SMEs, such a decline in market demand is a major setback that hinders their development and even threatens their ultimate survival.

Focusing on this point, Haijun explained that due to the pandemic, many people's incomes have been affected. In such an uncertain condition, rather than buying software products, people are more willing to spend money on general necessities, such as food and clothes, which are more essential to their daily lives. *"This situation is certainly negative for our business",* he said. His company mainly provides software products for construction companies to offer engineering costing services. During the first few months of COVID-19, the sales of their products all experienced a significant drop. Analysing the reasons, Haijun stated that although their products can increase the work efficiency of their users, they are not classed as necessary products or services in people's day-to-day lives. Therefore, when people's spending power decreased significantly, they started to prioritise products and services that were vital. *"I think it's a common problem for software enterprises",* he said, *"How to maintain a steady flow of sales is a major challenge in the current situation".*

Xingyuan also supported this opinion. He explained that his company operates an online platform to provide real-time weather forecasting services to its users. Compared with other businesses, people's demand for weather forecasting services is closely related to their travel needs. However, aiming to control the spread of COVID-19, the Chinese government adopted

stringent controlling measures which required people to self-quarantine at home and reduce travel as much as possible. The decline in demand for people to travel had a direct impact on his business. Xingyuan stated, *"People were unable to go outside and therefore did not care about the weather conditions. In fact, the utilisation of our products dropped significantly during this period"*. Looking at his future prospects, Xingyuan confessed that due to the recurrence of the pandemic, he was not fully confident that market demand could recover in the short term and said, *"This situation has brought a lot of pressure on me. I hope the pandemic status will improve soon, only then will our company be able to develop better"*.

Nancy's business has also been greatly affected by the outbreak of COVID-19. She explained that it mainly provides business travel services to other companies and organisations. Due to the nature of her business, her company appeared to be the most affected among all participants in this study. She described, *"Due to COVID-19, many people had to temporarily postpone or cancel their travel plans. As the service provider, we were also under a very high level of pressure"*. She further explained that for the travel industry, there are several prime seasons each year, such as the Chinese New Year holiday from December to February, and the Labour Day holiday in May. For her company, these few months can sometimes account for more than half of the year's revenue. However, COVID-19 has significantly reduced the company's financial performance. She stated that to reduce the risk of pandemic transmission, the Government does not encourage the public to travel during the holidays. At the same time, the complex pre-trip preparations and quarantine policy also reduced public's enthusiasm for travel. For business travel, the influences are also significant, Nancy said, *"Business travel is also subject to higher financial costs and uncertainty than before. In this case, some of our clients may consider using online conversations to handle business issues instead of travelling"*. This situation has resulted in a direct loss of business opportunities. Nancy indicated that compared to 2019, at least a third of user demand in 2020 was lost due to the outbreak. The situation was much better in 2021, however, due to the recurrence of the pandemic and strict government policies, market demand has still not been able to return to pre-pandemic levels. *"The situation may not improve completely in the short term"*, she sighed, *"but I believe that the overall industry is still full of opportunities, and everything will be better in the future"*.

Rather than reflecting on losses that had already been incurred, Kehao was more concerned about the uncertainties and risks that might arise in the future. He described the main element of his business as providing human resource services to other companies. In this case, the survival of his clients is tied to the growth of his business. Only when his clients are able to grow

successfully will they have a greater demand for labour, which in turn will bring a constant flow of business to Kehao's company. However, the outbreak of COVID-19 broke such a positive cycle. Kehao explained that since the spread of the pandemic, his business's survival has faced many challenges such as reduced market demand, increased financial pressure, and changes in business practices. In this situation, many companies are opting for layoffs to control operating costs in order to survive. For Kehao and his company, it was absolutely a bad trend. He stated, *"The company's demand for labour has decreased, which highly impacted my company's financial performance. But what worries me more is how the future will unfold"*. He noted that COVID-19 has now lasted for over two years; during that period the pandemic has recurred several times in different cities in China. And each recurrence has brought strong impacts, such as city closures or work stoppages. *"No one knows what will happen tomorrow and which city will be suspended"*, he lamented, *"Such an uncertain social environment is not conducive to market development and will be highly threatening to the survival of our customers. If our customers cannot exist in such a changing market, then neither can we. Therefore, in my opinion, the main challenges will occur in the post-pandemic period"*.

Tong also highlighted the uncertainties of the market and stated, *"The pandemic has made market forecasting more difficult"*. He explained that COVID-19 highly changed the market environment, and in such a context, past market performance was difficult to use as a reference when setting company development goals for the following year. He said, *"I don't know how to assess the company's performance in 2020 and 2021 because the market environment in these two years was different from what we have experienced before. Similarly, I don't know how to plan for future growth because I can't accurately predict where the market will go and what will happen in the future"*. For him, such confusion about growth prospects is risky. As the founder-entrepreneur, Tong is responsible for setting the innovation budget for his business, which requires him to have a clear vision of the future development plans for the company. But in the current situation, he admitted that it was difficult for him to make any clear decision his company's future direction.

7.4.1.3 Cashflow and financial pressure

The reduced market demand from the impacts of COVID-19 has led to a decline in companies' sources of revenue. At the same time, the overall economic downtrend has also affected the attitude of potential investors, making it more difficult to attract external financial support for SMEs. In this context, SMEs have been generally under great financial pressure during the pandemic.

During COVID-19, Kehao clearly felt the surge of financial pressure on the business. He stated that in the first few months of 2020, the company's financial income fell by almost 50% year-on-year. Such a significant decline highly threatened the company's normal mode of operation. He expressed, *"This is the biggest financial downturn the company has experienced since establishment"*. Fortunately, the company still has some savings to hedge the losses caused by the risks and protect its normal operation. But Kehao still warned that if the effects of the outbreak last too long, the company would still face significant financial challenges. Haijun shared his example, which shows the impact of COVID-19 on the company's financial performance. His company mainly provides engineering costing services and its main clients are a number of construction enterprises. Due to COVID-19, most construction projects in China were asked to halt work in the first months of 2020. Haijun stated, *"My clients couldn't work properly, so they didn't need to use our software product"*. And this decrease in the frequency of usage of their services and the unwillingness of some of their clients to pay on time has had a direct impact on the financial returns of his business. In the first few months of 2020, the company's revenue was almost zero. Looking back on that time, he confessed, *"The company's business was completely stagnant at that time. I have to say, this kind of financial performance really increased the running pressure of the business"*.

For Nancy, the main financial challenge also related to the shift in investors' attitudes. As previously mentioned, due to the business content related to the travel industry, her company's financial performance was significantly impacted by COVID-19. She describes how the COVID-19 outbreak changed people's travel plans. Such unexpected circumstances led to a surge in the number of people requesting refunds or ticket changes. As an agent, they had to bear the losses caused by this situation. Nancy stated, *"The outbreak of COVID-19 occurred during the Chinese New Year, which is the most important time of the year for the travel industry. Therefore, when the crisis occurred, we were faced with substantial losses, including labour costs, loss of resources and losses due to ticket changes and refunds"*. Such huge financial losses greatly hit the business's stable cashflow. In order to keep the company afloat, Nancy contacted potential investors, hoping that they could provide some financial support to help the company through the difficult times. However, what made her feel helpless was that, unlike their previous enthusiasm, many investors showed a more cautious attitude. She expressed, *"COVID-19 has greatly increased the uncertainty in the market and in this case, people are more willing to invest their money in projects that they believe are more secure"*. Nancy said she could understand their choice, but still felt frustrated and upset. Luckily, her company eventually received help from the government and some of the companies she had been cooperating with for a long time, and with

her business's own savings, the company was able to survive those tough phases. Although the problem has been solved temporarily, she confessed that if the outbreak continued for too long, she was unsure whether the enterprise could withstand such financial pressure and continue to survive in the market.

Yong also mentioned the challenges of cashflow, but compared to other participants he showed a relatively calmer and more positive attitude. His company mainly provided professional technical training and internship resource integration services for medical students. It helps medical students to build a connection with local hospitals and gain better educational opportunities. However, during the COVID-19 crisis, many hospitals in China closed outpatient departments to concentrate all medical resources and energy on fighting the spread of the pandemic. In this emergency situation, all medical students' internships had to be suspended. For Yong, it was no doubt a very big setback: the company's income declined significantly, which highly increased its financial risks. But to the researcher's surprise, Yong had a relaxed attitude when talking about this issue. He explained, *"For every software SME, the financial problem is always a big challenge. As the entrepreneur of the company, I clearly understand this point and I think I should keep calm and be confident when my company is facing any problem"*. Compared with other industries, software companies need relatively higher initial investment and a long R&D process. In this case, having a certain amount of capital reserves is very important for the survival of some of these software SMEs. In his company, Yong had reserved such a budget, which was meant for crises like COVID-19, or unexpected risks and unknown situations. So, although the spread of COVID-19 highly impacted his company's income, they still managed to maintain a steady cashflow due to support from the reserved budget and the company's resilience with continued operation during such scenarios.

7.4.1.4 Emotional stress and pressure

As evident from the discussion so far, founder-entrepreneurs play a crucial role in the development of SMEs, and their company's financial performance and success is likely to have a huge impact on their personal wellbeing. In this context, founder-entrepreneurs tend to be under greater emotional pressure when facing serious market risks such as COVID-19. In interviews, Xingyuan and Pengyao described the emotional distress they endured during the pandemic and identified this as one of the main risks posed by COVID-19.

"For me personally, I could clearly feel the emotional pressure caused by COVID-19", Xingyuan stated. The uncertainty brought about by COVID-19 made him feel nervous and anxious, especially in the first few months of 2020. He described that he had never experienced such a

serious unexpected event before. When the government decided to lock down the city where he lived, he felt very surprised and overwhelmed, and said, *"It happened so fast that I didn't have time to prepare anything"*. Due to the COVID-19-related restrictions and policies, his company office was forced to close, and everyone was required to work from home, which greatly reduced his company's work efficiency. In addition, the significant drop in revenue and business volume also caused him serious anxiety. He expressed, *"I felt worried every day, even could not sleep well. I wanted to find a way to change the terrible status, but in the face of such a global crisis, my efforts were always useless"*. Although he was under a lot of mental pressure, he had to be upbeat and positive when dealing with his staff. He explained that not only he, but also his employees suffered from negative emotions during COVID-19. Some of them even lost confidence in the future of the company. As the founder-entrepreneur, he had the responsibility to communicate with them to alleviate their negative emotions. However, due to the pandemic, Xingyuan was unable to meet with his staff face-to-face, which prevented him from effectively providing them support or help with their emotional problems. He sighed, *"Everyone's emotional stress was increasing and highly impacted the company's stable operation"*.

Pengyao also felt the same way as Xingyuan and mentioned that the pandemic greatly affected people's daily lives. Such a big change caused him a lot of psychological stress. He stated, *"During that time, I was worried every day about how the pandemic was developing. I checked the news many times a day, but all I saw was negative information"*. Pengyao confessed that in that anxious mood, he could not focus his attention on his work. He said, *"As the founder-entrepreneur, I should be strong and lead my group to overcome the difficulties, but frankly, it was difficult for me to manage my emotions in a short period of time"*. Ting also described his negative emotions during COVID-19. He expressed that because of his emotional personality, when he read some of the bad news about the pandemic, he could not control his feelings of sadness and grief. He said that the impact of COVID-19 was everywhere. It affected everyone's work, study, and life and no one knew when this effect would end. This high degree of uncertainty about the future situation made him nervous. He stated, *"Founder-entrepreneurs should have clear goals for the further development of their companies. But now, due to the pandemic, the whole market and society are full of uncertainty. In this situation, it was difficult for me to avoid anxiety"*.

7.4.2 Market opportunities due to COVID-19

Although COVID-19 has caused a number of setbacks and challenges for the small businesses in this study, for some it has also brought some new opportunities and inspiration for their business growth. For example, the outbreak of the pandemic has made the public more aware of the importance of the Internet and software technology, which is beneficial for the software SMEs' future. In addition, some participants pointed out that after experiencing the challenges of the pandemic, they had a clearer understanding of their business and their own shortcomings. This for them was also a good thing for reflection and for thinking about the long-term development plans of their company.

7.4.2.1 New market gaps for the software industry

During COVID-19, many people were required to quarantine at home, and this situation forced them to adopt some internet-based ways of working and living. For software SMEs, this change in people's lifestyle turned out to be a positive factor.

Haijun stated that after experiencing the pandemic, an increasing number of people would realise the important role of internet technology. For someone like him who is involved in the internet and software businesses, it was no doubt a positive trend. He expressed, *"Before the pandemic, when I approached potential clients, I always had to spend a lot of time explaining why the digital way of working made sense and was worth trying. But after COVID-19, they might better understand the role of internet technology in their lives and thus be more receptive to our products"*. For Tong, this advantage was more significant. His company worked on developing online office software, which coincided with the market trend during the pandemic. Therefore, when talking about the impacts of COVID-19, he had shown a relatively optimistic attitude. He stated, *"In the short term, COVID-19 did add to market uncertainty and brought some challenges to the company's growth. However, it may even be positive for the long-term development of our business"*.

Yong also held the same view and explained that due to the quarantine and blockade that lasted for several months in 2020, more and more people were relying on internet services to support their daily lives during that period. They deeply felt the convenience of the Internet, which allowed them to work, study and shop without leaving home, and found that compared with traditional ways, many things could be finished more efficiently online. *"When people build up*

this perception of the Internet, they might more willing to pay for some software products”, Yong pointed out. This trend was significantly reflected in his business. He stated that the COVID-19 outbreak highlighted the issue of limited medical resources in China. To address this problem, people began to look for a more efficient way to organise and manage limited resources. In this context, online medical services were noted by more and more people. Yong said, *“Before the pandemic, many people, including hospitals, were not aware of the advantages and necessity of online medical services. However, now, people began to realise that the Internet can also help us solve a lot of medical problems”*. He mentioned that a lot of online medical services, such as online medical consultation and remote diagnosis, can allocate and use national medical resources more effectively. In his eyes, online medical care should be a major trend in the development of the medical industry, with large market demand and good potential for development. Based on this opinion, he also felt very confident in the growth of his company, and said, *“COVID-19 also made me realise that the future market for my business is very promising. From this perspective, I think this pandemic is actually a very good opportunity to promote the development of my company”*.

7.4.2.2 Identifying deficiencies within business structure

The outbreak of COVID-19 slowed the growth rate for most businesses and exposed their shortcomings. For some participants, it was a good opportunity to identify their enterprise's deficiencies and improve them, thus prepare to build better resilience, and aim for a better market performance in the future.

“For me, the biggest risk is my inability to spot the company's shortcomings”, Haijun claimed. In his opinion, identifying problems and solving them is beneficial for the long-term development of the company. Therefore, when facing some difficulties and challenges, he would encourage his staff to learn from the experience and use it as an opportunity to improve the company. *“The same applies to the pandemic”,* he stated, *“As long as our company still survives in the market, all of the challenges we experienced will be our motivation to move forward”*.

Xingyuan described the outbreak as a big test, posing a huge challenge to the company's internal organisation and risk management capabilities. He noted that prior to COVID-19, the company had also faced some minor setbacks, but these were never so serious as to shake or halt the normal growth and survival prospects of the business. Therefore, he had never deeply considered whether the company had any major shortcomings that needed to be improved. However, under the impact of the pandemic, some previously overlooked flaws were clearly exposed. *“For example, the financial accumulation”,* he indicated. Before COVID-19, the company

spent most of its revenue on the research and development of new projects: this strategy greatly improved the company's ability to innovate and helped it win a better competitive position in the market. But on the other hand, relatively lower financial savings made the company more reactive in the face of risks, such as the pandemic. Xingyuan was grateful that the COVID-19 crisis made him aware of the problem and said that if the shortcoming had not been identified, then the survival of the business would be difficult when the company encountered even greater risks or challenges in the future.

"Before COVID-19, everyone in the market was busy launching new products and making money. We had no time to slow our pace to optimise the company's internal structure. But the pandemic gave us this chance", Nancy expressed. The pandemic forced her business to slow down for a few months, and the significant drop in business gave her more time to review, reflect and revisit the state of the company's growth. She looked at the personnel structure of the company and found that there were a number of unreasonable allocations of positions in the company. She stated, "There were a number of positions with overlapping responsibilities, which made employees unable to fully demonstrate their capabilities at work. For the company, it's also a kind of resource waste". Before the pandemic, Nancy had not noticed these issues. For a fast-growing company, the redundancy of some roles was not a significant problem and would not greatly hinder the normal operation of the business. However, the financial pressures of COVID-19 forced her to review the company's operating costs. She said, "After this setback, I will be more cautious during the company's operation. I think this experience could also highly improve my abilities in risk-taking and company management, which is beneficial for my business's future development".

7.5 Risk Strategies in Chinese High-tech Software SMEs

For high-tech software SMEs, having good risk management strategies is essential for the successful survival in today's competitive and unpredictable market, especially with the recent pandemic. In order to mitigate losses caused by unpredictable situations such as COVID-19, participants have adopted a variety of strategies to cope with the challenges. Faced with a rapidly changing market environment, they have promptly adjusted their company's development plans and direction, and even identified new opportunities from unfavourable conditions. And for some of them, temporarily stopping the expansion of their business and shifting their attention to existing customer maintenance seems to be an effective way to keep their business operating smoothly. The following are some of the successful strategies that have been applied by the participants in this study.

7.5.1 Selecting a clear direction for market growth

Many participants in this study mentioned that a clear business direction and market segment could help companies to radically reduce the likelihood of encountering some risks. Tong emphasised that as a founder-entrepreneur, finding a specific track for the company's development is the most important factor in ensuring smooth growth. If they can head in the right direction as a business, they might face fewer competitors or risks, and at the same time, their likelihood of success might also increase significantly.

Due to their small size, the market competitiveness of SMEs is often severely constrained by resources. This deficiency often puts SMEs at a disadvantage when faced with competition from large enterprises. In this context, going head-to-head with powerful companies may not be a wise competitive strategy. Some participants argued that carving out their segments in market gaps overlooked by the large enterprises to avoid direct competition is a smarter way for SMEs to win better survival space. Tong shared his example to prove this point. His company is one of the leading software SMEs in China, which mainly focuses on some organisations and enterprises to provide workflow technical support and BPM (Business Process Management) services. Up to now, the company has established solid cooperation relationships with a number of government agencies and famous enterprises, which has helped them to gain a stable market share in the Chinese high-tech market. However, such a successful company also faced some big challenges during its start-up stages. In this interview, Tong described the business transformation his company underwent in its first years of establishment and claimed that this change of development direction is the key factor that highly promotes the company's success. He explained that due to his long time away from the Chinese market, he lacked an in-depth understanding of its development when he started his business, which led him to make wrong judgement in the selection of products. He stated, *"Based on my experience, I believed that office automation (OA) software was the right product for our company. Its development does not require a high level of technical support and at the same time, it has a high market demand and potential"*. With this assessment, Tong and his team put a lot of resources and effort into their first OA product. During the development process, all his team members, including him, were confident about the product: they all believed that it could help the company to achieve good profitability and build a positive market reputation. However, this optimism was shattered within a month of the product's launch. Contrary to their expectations, the product had not been widely accepted by clients, only a small number of people were willing to download and try their software, and even fewer were willing to pay for it. With such poor financial and marketing

performance, they were unable to cover the development costs, and this led to their first product being a complete failure.

Tong said, *"Until the losses were made, I realised I had overlooked the impact of competitors in the market, especially the challenges of those large enterprises and powerful capital investors"*. He explained that before their software was launched, there were already some similar products on the market. Besides, some large enterprises' entry further compressed their product's development space. He stated, *"As I have described, developing this type of product does not require a high level of technical competence, which means that it is easy to copy and imitate. So, only a month after we launched the product, a lot of similar software appeared on the market, and some of them were operated by large and well-funded enterprises"*. Tong said that he was not afraid to compete with companies of a similar size to his, because he was confident that he and his group could gain an advantage through better products and services. But this confidence and advantage were lost when facing larger, better-funded competitors. After communication and discussion with the team, he eventually decided to change the direction of the company. He abandoned the first product they launched and instead led the company on a new route not occupied by other competitors. *"I decided to shift our focus to developing workflows. At the time, this was still a new area for the Chinese market, so we would not encounter many competitors. In other words, we found a special track for our company's growth"*, Tong expressed. He believed that this shift in the company's direction was an essential factor contributing to its success.

Yong pointed out that in general, SMEs prefer to avoid over-saturated market segments and choose to operate in relatively immature areas to reduce the competitive pressure. However, the market situation is always changing, and the activities of large companies tend to make changes in the market happen more quickly. In this context, Yong emphasised that software SMEs always need to keep aware of market developments and the activities of large organisations, and based on the market trend to adjust their direction for growth. If they find that any project they are working on matches something from other powerful organisations, they should consider stopping the project imminently to avoid potential financial risks. Zuohua also stated, *"For SMEs like us, what we need to do is to look for areas that are not yet fully occupied by the large enterprises and capitals"*. He said that SMEs do not need to occupy a large market space for their development. Due to their small size, even a tiny gap in the market is enough for SMEs to survive and grow. He explained, *"There will be some small market demands which will be ignored or forgotten by large enterprises, in my opinion, these small gaps are good opportunities for SMEs."*

If SMEs can seize these opportunities and develop their own unique and irreplaceable characteristics, they can largely hedge their competitive risks from the root".

7.5.2 Seeking external financial support and collaboration

For software SMEs, attracting external financial support, such as external investors or partners, is also a good way to alleviate financial pressure and manage risks. During the interviews, some participants argued that founder-entrepreneurs should have relatively high-level decision-making power in their companies. In some cases, they are even willing to give up opportunities to get investment to hold their own independent control over their company.

For Haijun, finding co-operators and external investors is a useful strategy to minimise potential loss. He pointed out that as a software SME, the risk tolerance of his company is limited. In this context, when facing some new projects which need a high initial investment, it will consider cooperating with other enterprises to share the benefits and risks. He explained that cooperation can highly reduce the company's financial pressure. During the project development process, he and his co-operators will share the R&D costs and other essential fees. In some cases, the co-operators will also provide some resources, such as professional talents and marketing channels, to facilitate the steady improvement of the project. He said, *"Co-operation can help us to complete projects that we cannot finish individually. On the other hand, even if the project fails, the consequences will be shared by me and my collaborators, which can significantly reduce the impact on my company's stable growth"*. This strategy has also been used in Pengyao's enterprise. He explained that the main clients of his business are a number of enterprises and organisations, including some powerful high-tech companies, such as Huawei and Oppo. *"In this context, I began to consider the possibility of converting our clients into collaborators"*, he said. Compared with his company, these large enterprises have a greater accumulation of resources and stronger R&D capabilities, and co-operating with them could highly improve his company's market competitiveness. At the same time, it would help the company to maintain a stable business volume and healthy cashflow and improve its reputation in the market. He stated, *"For these reasons, I decided to promote collaboration with some large enterprises"*. He described that he would choose long-term clients who are familiar with his company's operations and who recognise its capabilities, demonstrating to them his inclination to build collaborative relationships. Commonly, these large organisations will list some conditions. At such times, founder-entrepreneurs need to weigh up the pros and cons to decide whether to enter into this collaboration. Pengyao confessed that when dealing with powerful enterprises, SMEs can be more passive. He said, *"They always want to gain more of our services for fewer costs, and some*

of them even want to impact our company's development and decision-making by cooperating, which cannot be accepted by me". He stressed that maintaining independent decision-making power was essential for SMEs, no matter under which type of cooperation. And founder-entrepreneurs should always be careful when promoting cooperation for their business.

Compared with other participants, in terms of attracting external capital, Tong's attitude is relatively more cautious and conservative. He claimed that attracting funds is also accompanied by the risk that entrepreneurs will lose their individual decision-making power and absolute control of their business. In many cases, financial support will go with some conditions, which may involve the company's operating direction. He said, *"No one will give us unconditional financial support, so we should be more careful when accepting external investment or partnership requests"*, and stated that rather than losing control of the company, he would prefer to slow down the company's development pace.

Kehao agreed with this opinion. He recounted his previous experience of failing in an entrepreneurial venture and attributed the main reason for this failure to his decision-making power being greatly restricted by his shareholders and partners. He stated, *"That was my first attempt at starting a business. As a fresh graduate, I did not have the confidence to lead a company on my own, so I decided to find some partners to manage and operate the business together"*. In the beginning, this strategy was helpful. Kehao explained that many of his partners were much older than him, and they had more work experience and a deeper understanding of the market. With their support, the company's initial development became much smoother. However, this positive situation did not last long. Gradually, Kehao found that the partners were no longer willing to follow his decisions unconditionally, and sometimes they even directly contradicted his opinions in the management meeting. He stated, *"I have great respect for my investors and partners. But, perhaps because of my personality, I don't know how to assert myself when they disagree with me and make them willing to follow my lead"*. Eventually, he observed that the management structure of his company became more and more chaotic. When faced with some business issues, multiple decision-makers would appear in the company and in some occasions held totally different opinions. Such situations can confuse employees and potentially reduce the company's operational efficiency. Kehao noted that in this context they had to spend more time discussing and convincing each other. Although he was still the entrepreneur of the company, he felt that his views and opinions were not supported or acknowledged by the team. This messy internal management structure greatly limited the company's market performance, leading to many missed market opportunities and ultimately to its failure. Fortunately, he

summed up the lessons from the first failure and realised that decision-making power should be held by the founder-entrepreneur. He confirmed, *"Maintaining decision-making power is essential for entrepreneurs, only if the company has a clear management structure, it will have a chance to survive in the risky environment"*.

In summary, participants commonly maintain an open attitude to cooperation and investment and acknowledged their positive impact on the company's risk tolerances improvement. However, any type of collaboration should be based on the consolidation of their decision-making power and ability to have some level of control over the business.

7.5.3 Risk evaluation

Risk evaluation is one of the most important strategies for avoiding potential risks and losses in companies. In this study, participants commonly affirmed the importance of risk evaluation and stated that in their companies, the responsibility of risk assessment is mainly taken by founder-entrepreneurs. When faced with a new project or business opportunity, they will make a comprehensive assessment based on market trends, company capabilities, and growth potential to decide whether to implement it or move forward in a different direction.

Before making any business decision, having a clear understanding of the market is essential. Xingyuan mentioned, *"If we can clearly define the market trend, it's more likely to give a correct decision and avoid the potential loss"*. He highlighted that as a software SME, his company can achieve success in the competitive market only if it can provide the products or services which can fulfil customers' needs. In this context, when he plans to start a new project, he will communicate with their existing clients, ask for some advice, and gain insight into their potential needs. Pengyao also emphasised the necessity of market evaluation for the risk management of his business. He pointed out that a detailed market assessment can help the founder-entrepreneur clearly identify market gaps and potential opportunities. He said, *"Through market analysis, we can clearly identify the 'blue ocean' market and develop our project in it. This is certainly a more secure option than entering a market with strong competition"*. He explained that when conducting market research, they focus mainly on the movements of potential competitors. For example, whether any companies have already released similar products or come up with similar innovative ideas, and whether any large companies are preparing to set up a market in the area they want to develop. Once they find that the number of potential competitors in the market was already high enough to affect their company's growth, they consider adjusting the direction of business development or giving up the project altogether.

Focusing on these selections, Pengyao stated, *"Reasonable abandonment does not mean weakness and unconfidence. As the founder-entrepreneur, my every decision will greatly affect the entire business. In this context, I believe that avoiding unnecessary competitive pressures is an important risk strategy, especially for SMEs"*.

For Nancy, the main purpose of market assessment is to predict future trends in the industry. She argued that it is very important for software SMEs to provide innovative products and ideas and an enterprise that lacks the capability to innovate will face the risk of failure in the market. However, only having innovative ideas is not enough. Nancy highlighted that the more essential question that entrepreneurs should consider is how to get their innovative product accepted by the market and further generate significant revenue for the business. She explained that due to their strong market presence, large organisations can sometimes influence their customers' consumption habits and needs by introducing new products and services. However, for SMEs, following the market trend is a better selection to reduce risks and increase the company's survival rate. In this context, Nancy pointed out that founder-entrepreneurs should keep an eye on the market and choose to launch products that are slightly ahead of what is available, but are not overly innovative. She said, *"The product we want to develop should be different from the existing products on the market, but at the same time, it should not be too innovative, to be understood and accepted by the customer"*. Based on this view, she highlighted that project development and innovation by SMEs must be highly dependent on detailed market assessments, otherwise they would be exposed to significant uncertainties and risks, which may even threaten their survival.

After gaining a comprehensive understanding of the market, the founder-entrepreneur should assess the risk tolerance of their company and the overall project potential to make more credible judgements and choices. Clearly identifying the company's ability can help entrepreneurs to control risks within a manageable range, thereby avoiding the occurrence of irreversible results. Kehao mentioned that founder-entrepreneurs should clearly understand the risk tolerance of their company. For example, under the conditions of being able to maintain normal operations, what is the maximum loss the company can sustain and how much spare resources and manpower can be used for the development of new projects? After establishing a clear understanding of the company's capabilities, he will generally make an overall prediction of the project. *"The prediction is mainly based on my personal experiences, intuition, and knowledge of the industry"*, he said, *"Commonly, I do not think too much about returns, I focus more on the worst result"*. Before making the final decisions, Kehao would ask himself the

following questions: How much money and resources will they lose if this project fails? Can he and his company afford such a loss? Will this loss affect the day-to-day operations of the company or put a heavy financial strain on it? And only if the answers to these questions are relatively optimistic will he decide to go ahead with the project.

Xingyuan pointed out that the assessment and prognosis of risks should be based on the actual development of the enterprise. He explained, *"Similar risks can have completely different effects on different companies. For our company, I am relatively optimistic about some of the risks in terms of technology development because of our relatively strong technical capabilities. On the other hand, when facing some marketing or management challenges, I am usually more cautious"*. Regarding financial risk, Xingyuan said that before starting a project, he and his team would set an innovation budget based on the company's financial situation. Generally, the amount of the budget will be based on the company's revenue in the previous quarter and whether the company reaps external funding support. He believed this kind of initiative could help the company to ensure a safe cashflow and maintain its stable growth. The situation is similar in Pengyao's company. He described that at the end of each year, he sets an overall project development budget for the coming year based on the financial returns of the business for the year. When considering a new project, he will assess whether the development costs can be covered against the budget. If the budget is sufficient, he will usually choose to try the project. However, if the budget is tight, he will carefully weigh up the potential benefits of the project to consider whether it is worth developing.

Although participants generally acknowledged the importance and effectiveness of risk assessment, some of them argued that a very detailed risk evaluation might end up wasting too much time and resources, which could lead them to miss out on some potential market opportunities. In this case, participants generally believed that timely monitoring and adjustment during the operation of the project might be more important than the initial risk evaluation.

7.5.4 Timely adjustment in the event of risk

One of the obvious advantages of SMEs is their flexible management structure. García-Morales, Lloréns-Montes and Verdú-Jover (2007) point out that due to their small size, it is easier for SMEs to adjust their direction to adapt to market changes. At the same time, compared with large organisations, the relationship between SMEs and customers tends to be more intimate, which allows them to understand the changes in consumer demand more quickly. For founder-

entrepreneurs, seizing this advantage of flexibility to formulate appropriate risk management strategies can help the company attain a better performance. In the interviews, participants expressed that during project work, regular summary and timely adjustment can help the company avoid losses, which is also an important strategy for risk management and control. As Tong mentioned, running an SME is like sailing in the sea: founder-entrepreneurs should always pay attention to the market changes and adjust their direction in time. Only in this way can they lead the company to survive in the ocean of the market and win the ultimate success. Yong explained that simply relying on an initial risk assessment is not enough. During the project development, an increasing number of uncertainties will appear, posing a great challenge to the entrepreneur's risk management capabilities. Therefore, when dealing with a sudden threat, companies should adapt their strategies to the situation in order to avoid further damage.

Especially in the face of unpredictable risks such as COVID-19, the founder-entrepreneurs' adaptation and management of risk strategies control the negative effects of the pandemic and ensure the smooth running of their business. The following are some of the strategies used by the participants in this study.

7.5.4.1 Adjustment of development plan

Founder-entrepreneurs are responsible for adjusting the company's development plan based on the actual status of the market. Under the impact of COVID-19, many participants decided to slow down their company's development speed to reduce financial pressure. In their opinion, such a temporary adjustment of the growth plan is also a smart choice to guarantee the smooth operation of their business.

Kehao stated that one of the major advantages of SMEs is their flexible management structure. Due to their smaller size, SMEs could give a quicker response to the changing market environment. Therefore, when he realised the enormous impact of COVID-19 on the market environment, he adjusted the company's development plans. He suspended several ongoing projects and lowered the company's R&D budget for two years. At the same time, he also reduced his expectations of the business revenue. He explained, *"In the current market environment, it is difficult for us to achieve a similar rate of growth as before. Rather than pushing our employees to complete impossible business tasks, we should lower our expectations and slow down the pace of development"*. Nancy also mentioned that the pandemic had seriously affected the development steps of her company. In this condition, she had to rethink the company's goals and direction in the short term. She said, *"Since the outbreak, we have redefined our quarterly,*

semi-annual and annual development plans and business lines to take account of these specific circumstances". She predicted that the impact of the pandemic would not disappear in a short time. Therefore, she would remain more cautious in terms of company development and business investment for the next few years.

Compared with other participants, Pengyao was more optimistic about the changes in the market brought about by the outbreak and believed that COVID-19 would create some new market gaps, which would be beneficial for his business's long-term expansion. He explained that before the outbreak of COVID-19, his company mainly provided software and application design services to mobile phone manufacturers. Through years of hard work, his company had entered into long-term cooperation with several of China's leading mobile phone manufacturers. However, at the same time, the business had also reached a bottleneck in its growth. He explained, *"Now we can maintain a steady flow of business, but if we want to achieve greater success, we need to find some new market gaps to explore"*. In this context, for Pengyao, the outbreak of COVID-19 not only brought him challenges but also opportunities to drive the business's growth. He said that due to COVID-19, people had to stay at home for a longer period of time. Aspects of their daily lives, including shopping, communication, and entertainment, were highly dependent on the Internet and mobile applications, which led to a rapid increase in market demand for a number of related software products and services. For the shopping and communication market, there are already well-known companies such as Alibaba and Tencent that hold the majority of the market share. However, in the entertainment market, there are still some gaps that can support the development of SMEs. Pengyao stated, *"As you might know, short-form video and live streaming are popular in the current market. And the outbreak of COVID-19 has accelerated its growth even more. In this context, I wanted to seize the opportunity to expand our business content into this area"*. However, he also highlighted that although business expansion is important, he would not neglect his original business base. He would control the amount of capital invested in new projects to ensure a stable and healthy cashflow for the business.

7.5.4.2 Existing Client maintenance

Due to the impact of COVID-19 on the market environment, for many software SMEs attracting new clients became much more difficult. To reduce this negative impact and maintain a stable business volume, many participants decided to shift their attention from opening new markets to existing-client maintenance.

During COVID-19, Zuohua, who is the founder-entrepreneur of Zhejiang Ruxie Network

Technology Co., Ltd., a company that provides online insurance services to customers, noted a significant drop in the consumption habits of the public. Especially in the first half of 2020, he even witnessed a negative growth in the number of clients. Such poor market performance made him alarmed, and he began to look for a solution to maintain the company's healthy cashflow. In order to improve the market performance of their products, Zuohua undertook a series of promotional strategies. Unfortunately, the results were not satisfactory. After these failed attempts, he realised that in the current market status, exploring new markets might not be the best option. He pointed out that although COVID-19 has raised the public's risk awareness, due to lower incomes and other reasons, people are not willing to spend more money on insurance services that do not improve their lives in the short term. *"Since it's so difficult to develop new customers, why don't we put our energy into maintaining our existing customers?"* Zuohua stated. He asked his employees to have frequent communications with their existing clients, in order to have a better understanding of their consumer characteristics and individual needs and provide specific or tailored services based on these details to increase customer loyalty. This strategy worked very well. Zuohua explained that existing customers already have a certain level of knowledge and trust in their business, which makes the communication with them highly efficient. On this basis, they designed and provided them with more targeted services, which further enhanced customer loyalty and ensured a stable cashflow.

Kehao conducted a similar strategy to reduce the impacts of COVID-19 and explained, *"We have changed our business aim from market expansion to customer maintenance in these few years"*. In his opinion, aggressive development strategies may not be appropriate in the current market environment. Compared to the period before COVID-19, their customer acquisition costs have increased significantly. As a result of reduced market demand, they had to devote more time, effort, and money to attract the attention of new customers. However, despite the amount of money they spent on promotions, the company's performance did not improve dramatically. Kehao sighed, *"As an SME, our limited market influences and capabilities are not enough to support us to swim against the tide in an overall chilly market"*. After realising this, he changed the business's strategy to maintaining and strengthening relationships with existing clients. He explained, *"While I had no method of attracting new clients for the company, I could go about retaining existing customers and encouraging them to make subsequent purchases"*. For Kehao, this strategy may not help his company achieve significant revenue growth, but it could help it maintain a relatively stable cashflow through the most difficult times.

Haijun also stresses the importance of existing clients' maintenance and described the difficulties of marketing he faced during COVID-19. He expressed that introducing the product is an essential step when attracting new clients. Before COVID-19 exploded, they always had the opportunity to present or demonstrate their software products to their potential customers face to face. In that way, they could directly show their customers the advantages of the products and answer their questions in the first instance. However, the outbreak of the pandemic made the business trip become a difficult task. Haijun expressed, *"Our clients are located in different areas in China, and due to COVID-19, sometimes we are unable to meet them face to face"*. To fix this problem, he tried to communicate with their potential clients online; however, the results did not meet expectations. He confessed, *"Many of our clients are not comfortable with video meetings or online calls. In fact, there is almost no way we could achieve cooperation simply by communicating online"*. In this situation, there weren't many choices other than to maintain their existing clients. Fortunately, they had a number of existing clients who were willing to trust them and continue to work with them. *"These loyal clients are the root of our company"*, Haijun said proudly, *"This experience has reinforced my belief that maintaining existing customers is vital to the business. With their support, the company can withstand many setbacks, such as this pandemic"*.

7.5.4.3 Reducing costs

As discussed earlier, the COVID-19 outbreak greatly reduced the income of SMEs, especially in the first half of 2020. For companies without sufficient financial accumulation or reserved budget, this pandemic has been fatal for their chances of survival in the market. For many, reducing costs has become a necessary measure to help sustain the company during the crisis.

From the analysis, two main cost-reducing methods were cited by the participants during the interviews: layoffs and pay cuts. However, for some of them, implementing these strategies may be a hopeless choice. Nancy stated, *"If we had any other choices, I would not make this decision"*. She described that the outbreak of COVID-19 had a significant impact on the company's financial position. In the first half of 2020, her company had almost no income due to reduced travel demand from the public. In the meantime, the large number of refund requests added to their already precarious financial situation. Faced with the company's poor financial performance, Nancy felt a huge amount of pressure. While the company's savings could help it hang on for a few months, if she could not find a good way to stabilise cashflow, the future survival of the business would be in serious danger. In order to prevent the business from getting into such a situation, Nancy decided to control the operating costs of the business, reduce the waste of

internal resources, and lay off some staff. She explained, *"I laid off employees in positions that were not as important to the growth of the company. For those who stayed, I also made some adjustments to their salaries in the first few months of 2020"*. Nancy admitted that layoffs and pay cuts could greatly hurt the work motivation of the employees, but under the impact of COVID-19, it might be the most efficient way to help the company reduce its financial pressure.

Xingyuan faced a similar scenario. He explained that there had been no major staff restructuring since the company's inception. Many of his employees had worked for him for many years and had seen the development of the business and his personal growth. Compared to a more formal relationship between a founder-entrepreneur and his employees, in his case, he and his employees were more like friends who struggled together. Therefore, for Xingyuan, it was a very difficult decision to lay off these employees in exchange for the company's survival. However, the increasing financial pressure of COVID-19 forced him to make this reluctant selection. He sighed helplessly, *"I did not want to give up any of my employees, but if I did not control operating costs by laying off staff, the survival of the company would be greatly affected. And if the company could not survive, then more employees would be impacted"*.

Different from Nancy and Xingyuan, Zuohua believed that appropriate redundancies and internal staff restructuring during the pandemic could have a positive effect on a company's development. He explained that his business has been growing rapidly since its inception. And until the pandemic outbreak, he had never implemented major redundancies. Such a stable working environment had led some of the staff to lose their sense of crisis and work motivation. He stated, *"They never considered that they might lose their jobs, and this made their work status become increasingly slack. Therefore, when the pandemic occurred, they were not able to adjust themselves quickly to match the company's pace"*. In this context, Zuohua decided to terminate some of the job roles. For him, this strategy could help the company save a considerable amount of cost; at the same time, the job vacancies created by this would also allow it to attract new and better talent after the outbreak. Haijun held a similar opinion and argued that streamlining a company's personnel structure can help in cutting some of the unnecessary internal costs. It can also bring some benefits to the company's further growth.

7.5.4.4 Improving competitiveness

As discussed earlier, for some participants, COVID-19 gave them an opportunity to discover some of the shortcomings within their company. In this context, how to seize the chance to fill in the gaps and further improve the market competitiveness of the company have become major considerations for the founder-entrepreneurs. Focusing on this point, Tong stated that COVID-19

had significantly slowed down the development of the market, which had also forced the company to temporarily stop its expanding process. However, from another perspective, the stagnation of the business also left the enterprise and the founder-entrepreneur with more time for self-improvement. In order to take full advantage of this opportunity, he resolutely decided to suspend most of the marketing and promotion projects and devoted the company's resources to the products' development and improvement. He described, *"Although COVID-19 highly impacted our company's business status, we could use this chance to improve our competitiveness. Since the current market conditions are not favourable to marketing, we could shift our efforts more to product development"*. Tong emphasised that for software SMEs, R&D and innovation capabilities are key factors in determining a company's competitiveness in the market. Based on this opinion, he led his team to conduct a series of research projects and bring some adjustments to their company's software products during the pandemic. As a result, Tong and his group finished a new product's design and testing in the first season of 2020, which was a lot earlier than the initial plan they had set. He felt proud about this achievement and claimed, *"From this aspect, COVID-19 even brought some benefits to my company's long-term development"*.

Kehao had a similar opinion and expressed, *"No matter how bad the market conditions are, companies with strong products and R&D capabilities can always survive"*. As the founder-entrepreneur of a software SME, he attaches great importance to the company's R&D capabilities and believes that owning products that cannot be easily replaced is the essential strategy to ensure the company's survival and success. There are many strategies that can be used to improve the operational side of a company. But the most important thing for a software company is to have good R&D capabilities. This will help in providing the most suitable services or products required by their clients. And only companies that can meet market demands on time will be able to retain customers and achieve long-term growth. In this context, during the COVID-19 crisis, he shifted the company's main efforts to the software's research and improvement. In addition, during the critical months of the pandemic, he also organised several online training sessions for his employees. He encouraged them to undertake some online lectures and read some professional books and articles, and organise online communication sessions at regular times of the week to share their learning experiences. He believed that these activities could motivate staff to improve their professional skills. Reviewing the experiences of 2020, Kehao pointed out, *"No matter what the market environment is, seizing the opportunity to improve the company's overall capacity is the most important strategy. Strong market competitiveness can help us overcome any risk and setback"*.

7.5.5 Reflections and self-improvement

A thorough and critical reflection after completing a project can help a company understand their strengths and weaknesses and can help with planning things better, especially in risk management. In the study, participants mentioned that they would conduct a detailed analysis and evaluation of the project outcomes and their handling strategies after the project is finished. For some successful cases, they will document effective risk strategies as a reference for future challenges. On the other hand, for projects with unsatisfactory results, they would carefully analyse the reasons for the losses and reflect on their own shortcomings in handling the project. Based on the results of the analysis, they would make up and improve on their own shortcomings to avoid similar losses in future operations.

Zuohua stated that the company's risk management capabilities have been improved through accumulated experience time and time again. He believed that the risk management process should not simply stop at the completion of the project. On the contrary, reflection at the end of a project is perhaps even more important for the long-term development of the business. He said, *"If we only focus on current problems without reviewing the past experience, we can hardly achieve significant self-improvement"*.

"I always tell my employees, the biggest risk is we cannot find out where the problem is", Haijun stated, *" In my opinion, the occurrence of some risks gives us the opportunity to recognise our shortcomings, which is beneficial for the long-term development of the business"*. He expressed that summarising experience is an essential strategy to help them turn challenges into opportunities for company development. It is useless to indulge in frustration after losses have been incurred. As the founder-entrepreneur, he should quickly adjust his negative emotions and reflect rationally on the reasons for the failure. Every mistake would reveal some shortcomings of the enterprise or their founder-entrepreneurs. Haijun said that he valued the opportunities to identify deficiencies that would give him the chance to improve the company's capabilities and win better market performance. Based on this view, he has set up a complete reflective process in his company. After a project has been completed, he will first give an overall evaluation of the employees' work based on the results of the project. At the same time, the employees involved in the project are asked to make a self-assessment of their own performance. Then, they will hold a group meeting to summarise the experiences brought about by the project. The meeting will have three main aspects. First, they will evaluate the project in general. Then, they will review the shortcomings of the project, for example, what mistakes could have been avoided? After that, they will summarise the points on which the enterprise can improve for future growth and use

this summary to build a company development plan. Sometimes, they will also forecast market trends and consider potential risks we might face. Haijun said, *"We will simulate several risk solutions based on experience, which will allow us to be more targeted when facing real challenges"*.

In response to the risks posed by COVID-19, founder-entrepreneurs have also made targeted reflections about the situation. Kehao identified the outbreak of the pandemic as an unpredictable risk that is difficult to completely avoid and control. However, founder-entrepreneurs could still gain some useful lessons for the development of their companies through this setback. To better summarise, he organised several management meetings to comprehensively assess and summarise the actions and measures taken by the company during the pandemic. Based on their analysis, he decided to enhance the company's risk tolerance in two main aspects: improving the efficiency of the company's operations, and increasing the risk budget. He described that COVID-19 made him aware of the advantages of working remotely. Before the pandemic, they had been mainly working in a traditional model. People were more familiar with working in physical offices, delivering information about their work through face-to-face communication. However, the COVID-19 outbreak forced them to attempt the online work mode. For this change, Kehao confessed that in the beginning, this new way of working was not widely accepted by the staff. He explained, *"The staff were always complaining about how difficult it was to work online and all wanted to get back to their original jobs as soon as possible"*. But gradually, they began to realise some advantages of remote working. Kehao pointed out that online communication tools could help them easily contact customers in a variety of locations and some office software could replace and simplify some of the complex paperwork generated during the company's operation. He believed that remote working would become mainstream and based on this view would try to implement the online working model in the subsequent development of the company. Haijun was also optimistic about the development of online work and noted that although it was not easy for many employees to adapt to a new working model, after a few months of attempts, he found that the staff were already proficient in using some online working tools. He emphasised, *"After adapting to working online, employees can increase their work efficiency to about the same level as usual. And in some specific respects, working online may be more efficient than traditional working models"*.

The financial pressure caused by COVID-19 also made Kehao very aware of the importance of resource accumulation for the company's stable growth. He highlighted the company should have a budget to cover unexpected risks and shocks. Otherwise, when faced with uncertain

setbacks such as COVID-19, the company's cashflow could be severely impacted. Nancy also supported this opinion and stated that after experiencing the pandemic, she had become more cautious in business management. She stated, *"I have increased the company's risk reserve and I will ask the finance department to store at least 15% of the annual profits of the business for emergencies"*. Same as Nancy, Xingyuan also made some adjustments in the financial allocation of his enterprise. He explained that before COVID-19, most of their company's profits were spent on the development of new projects and innovation, which led to them not having enough savings to face sudden risks. He admitted, *"This allocation of resources has allowed my company to have a good capacity for innovation and research and development, but when faced with an unexpected event such as the pandemic, I deeply appreciated the pressure and threat posed by the lack of savings"*. To improve this situation, Xingyuan expressed that he would reduce a portion of the company's innovation spending as a fixed reserve.

7.6 Chapter summary

Risk management is an important factor that greatly influences SMEs' development. Due to the limitation of size and resources, SMEs are easily exposed to market uncertainties and risks. Therefore, having good risk management strategies can be crucial for their survival. As risk management structure in SMEs tends to be simple, the personal decisions and judgements of the founder-entrepreneur may play an important role in the company's risk strategy. Depending on their risk attitudes and personality traits, they may react differently to different market risks, and these decisions can have a huge impact on the subsequent development of the business.

This chapter mainly discussed the risk management aspects of the nine cases and the findings show how SMEs in this study generally lacked a formal risk management structure. In most cases, risk management appeared to be the personal responsibility of the founder-entrepreneur. Most participants emphasised their need to control the final decision-making power in the risk management process. Today the competitive market brings with it a variety of risks both from internal and external sources, which highly test the entrepreneur's ability to take risks. Founder-entrepreneurs in these scenarios would undertake a range of risk strategies, aiming to reduce and control the potential losses and ensure the company's stable growth. In this process, the personal attributes of the founder-entrepreneur have a significant impact on his or her risk assessment and evaluation. The next chapter will discuss the founder-entrepreneurs' personality traits and risk attitude, and explore how these personal factors could influence risk strategies and decision making.

Chapter 8. Founder-Entrepreneurs' Personality Traits and Risk Attitudes

8.1 Chapter Overview

In the previous chapters, the importance of risk management in Chinese high-tech software SMEs and the role of founder-entrepreneurs were discussed. As individuals, it is very likely that founder-entrepreneurs' decision-making and personal judgement in certain situations will be influenced by not only their personality traits but their risk attitude. This chapter will explore and discuss the participants' personality traits and risk attitudes to build a deeper understanding of their choices of risk strategy and decision-making during business management and operation.

8.2 Risk Attitude of Founder-entrepreneurs

To understand how founder-entrepreneurs make critical decisions during risk management, it is important to know how they perceive certain risks and what their attitude is towards these risks. To study this, the researcher chose the 'Risk Questionnaire' published by Oxford Risk Research & Analysis Ltd (see Appendix 9) as part of her Phase 3 data collection. Following this questionnaire, follow-up interviews were conducted with the participants to explore how they reflect on their attitudes towards certain risks in their business venture.

Table 8.1 Risk Attitude of Participants

Case No.	Participant	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	SUM
C1	Kehao	1	3	4	3	3	3	2	5	5	2	31
C2	Xingyuan	4	4	4	4	3	3	2	5	5	4	38
C3	Ting	5	1	5	5	5	1	5	1	5	5	38
C4	Qiannan/Nancy	4	4	5	5	3	4	3	5	1	5	39
C5	Zuohua	2	4	4	4	4	2	2	1	4	4	31
C6	Haijun	1	3	3	1	1	3	1	3	5	3	24
C7	Pengyao	4	4	3	4	2	1	2	4	4	3	31
C8	Tong	2	3	5	5	5	5	2	5	5	5	42
C9	Yong	4	4	3	3	3	1	2	5	5	2	32

Lower risk (10-17)	Lower to medium risk (18-25)	Medium risk (26-33)	Medium to higher risk (34-41)	Higher risk (42-50)
--------------------	------------------------------	---------------------	-------------------------------	---------------------

Table 8.1 shows the results of the risk questionnaire. As seen, the risk attitude model classifies people's risk attitudes into five categories:

- Lower risk (10-17),
- Lower to medium risk (18-25),

- Medium risk (26-33),
- Medium to higher risk (34-41) and
- Higher risk (42-50).

From the analysis, Tong scored the highest with an overall of 42/50. Based on the interpretation of the risk questionnaire, anyone with such high scores is very comfortable with investment risks. They are willing to take losses and risks for long-term benefits and development. For them, seizing market opportunities might be more important than risk aversion. This was also evident during the follow-up interview where Tong reflected on his self-assessment. Talking about his risk attitude, Tong noted, *"I think I am the person who is willing to accept risks during the company operation"*. He explained that for software SMEs, innovation is a significant task that can greatly impact the company's market competitiveness. However, any innovative attempt is likely to be accompanied by unknown challenges and risks. As the founder-entrepreneur, if he worries too much about potential losses, he may miss out on the opportunities to develop and innovate. He said, *"As long as it does not affect the normal operations of the company, I am able to accept some short-term losses for the innovation of the project and the expansion of the company"*. He believed that his optimistic approach to risk has had a positive impact so far on the company's development. He added that he would consider the possibility of being more aggressive in future when it comes to the management of his business so as to facilitate growth rate.

Xingyuan (38/50), Ting (38/50), and Nancy (39/50) scored in the medium-to-higher-risk category. People in this category also tend to show a relatively positive and optimistic attitude when facing risks. Similar to people in the category of higher risk, they are relatively comfortable with some potential risks in the investment process and are willing to accept some short-term losses to gain long-term benefits. However, when confronted with major challenges that could have serious consequences, they usually undertake some detailed analysis before making a final decision. Ting in this context described himself as a risk-taker who could take a degree of risk for the expansion of the company. He stated, *"I understand that risk is something that has to be faced when starting a business. So, when market challenges occur, I am always much calmer than others"*. However, he also stressed that while it is necessary to maintain a positive attitude in the face of risk, sometimes the overconfidence of entrepreneurs can lead them to underestimate potential losses and thus make the wrong decisions. In order to avoid such mistakes, Ting expressed, *"I generally maintain a cautious and optimistic approach to manage the risks in the market. I would not simply choose a 'safe selection' to avoid all of the risks, but I also would not take overly aggressive decisions and put the company in crisis"*.

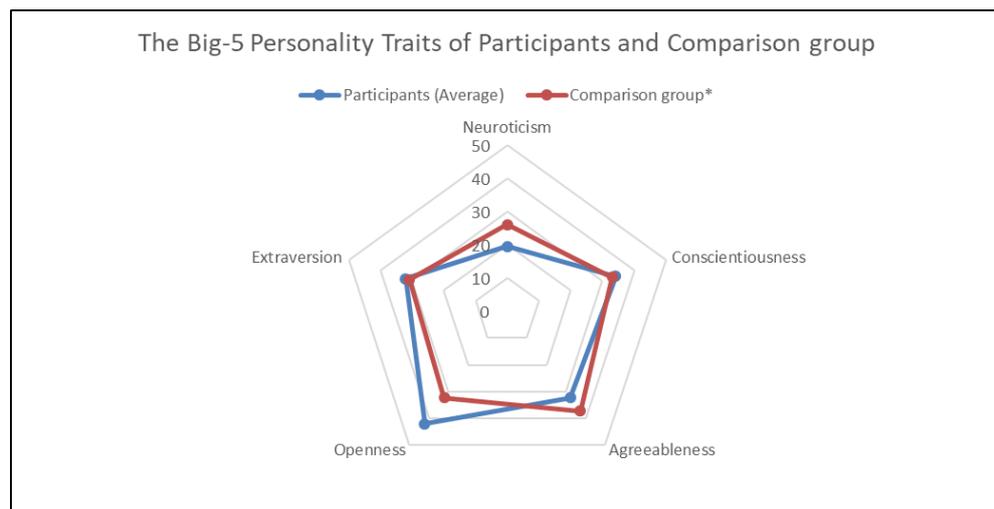
Nancy showed similar characteristics to Ting. In her opinion, risk-taking should be a common trait of founder-entrepreneurs. She explained that starting a business is inherently a risky endeavour. Compared to other career choices, anyone who becomes an entrepreneur is more likely to face a higher degree of risk. Hence, they will need to develop better risk management skills and a more positive mindset/attitude to handle the challenges that come with such roles. People who enjoy risk are more likely to choose this career path, Nancy explained, *“People who enjoy a stable life hardly ever choose to start their own business. Only those who are willing to accept challenges and uncertainty are more likely to set up their own business and succeed in the market”*. Talking about the balance of risk and opportunity, Nancy said that any activity related to product development can bring potential risks. As a founder-entrepreneur, if one is overly cautious about possible risks and losses and chooses not to experiment with new ideas and innovation, then that company’s position in the market will be hampered. Nancy noted that in today’s competitive market, a software SME can easily be replaced by competitors if they don’t keep themselves up-to-date and work on their competitive advantage. To prevent such situations, Nancy rarely chooses to abandon developing new and innovative ideas, unless the project is deemed to be risky and could potentially affect the company’s business operations. She said, *“Usually, I wouldn’t be too concerned about short-term losses on a project. But if the losses are too great, or even threaten the health of the company’s cashflow, I will decisively choose to discontinue the project”*. She highlighted that survival is fundamental. She is willing to accept some business risks, but these should be kept within limits so that they do not pose any threat to the survival of the organisation.

In this study, Haijun scored the lowest (24/50) and was classed in the lower-to-medium-risk category. People in this category are more cautious with their investments. Although they can accept a certain degree of risk, the potential loss should be limited to a relatively low level. In the interview, Haijun showed a more conservative approach to market risks. Due to his modest background, he is relatively sensitive to the capital of his business. He explained, *“I grew up in a small city and my family was not rich. My parents didn’t have enough money to support me in starting my own business, so funding has been one of the major challenges I’ve had to face since the beginning of my career. Therefore, I have to run my business carefully to avoid any unnecessary financial losses”*. In this context, Haijun always adopts some prudent strategies to ensure risks are kept at a minimum level. When talking about the dilemma between opportunity and risk, he acknowledged that a conservative risk attitude would slow down the company’s growth. However, he emphasised that the company’s survival is much more important than its development and said that when the company has accumulated enough resources, he may change his management strategy to pursue more market opportunities without the fear of risks.

8.3 How do Personality Traits Affect the Founder-entrepreneur’s Risk Strategies?

The Big-Five personality model was chosen for this study to assess founder-entrepreneurs’ personality traits and their influence on risk management and decision-making. However, some questions in the original inventory may not have the same interpretation for Chinese participants considering the cultural differences and language barriers involving the participants of this study. Hence, the researcher used a revised version of the original Big-Five personality model – the Chinese Big Five Personality Inventory Brief Version (CBF-PI-B) proposed by Wang, Dai and Yao (2010). Another factor is that the original inventory has 300 questions, which may not be practical for some of the founder-entrepreneurs given their busy work schedules. The Chinese Big Five Personality Inventory Brief Version created by Wang, Dai and Yao (2010) has 60 questions and these were some of the reasons why this was deemed more suitable for this study.

Figure 8.1 shows the overall distribution of the participants’ personality traits.



* The figure of comparison group is based on the study of Wang, Dai and Yao (2010 a, b, 2011).

Figure 8.1 Participants’ overall profiles within the Big-Five personality model

Compared with the comparison group, the founder-entrepreneurs show significant differences in Openness and Neuroticism. For the other three personality factors, Extraversion, Conscientiousness, and Agreeableness, participants performed similarly to the comparison group. Participants in this study generally had a high score for openness. This high level of openness directly influences entrepreneurs’ risk attitudes, leading them to easily adopt new challenges and grasp market opportunities. A lower score for neuroticism meant that participants were relatively less susceptible to emotions. They have the ability to remain calm even during crises such as facing setbacks and losses during the company’s operation. This can also be closely linked to the

entrepreneurs' risk tolerance. For the other three personality factors, Extraversion, Conscientiousness, and Agreeableness, the analysis showed no direct links between these traits and founder-entrepreneurs' risk management performance. However, there is evidence that shows how these factors may affect the founder-entrepreneurs' risk management styles. This has the potential to determine the entrepreneurial performance of the corresponding business to a certain extent. For example, lower agreeableness may cause entrepreneurs to be more inclined towards making decisions individually rather than working collaboratively with their teams. The next section will look at each of these personality traits in more detail.

8.3.1 Openness

Starting a business requires people to have the ability to seize opportunities in the market and create new value (Leutner *et al.*, 2014; Antoncic *et al.*, 2015; Şahin, Karadağ and Tuncer, 2019). In this context, entrepreneurs are usually described as innovative and creative people. They tend to score highly in their ability to pursue business opportunities (Antoncic *et al.*, 2015). For the high-tech software industry, this characteristic might be shown more significantly. In this study, all the participants generally scored highly in this category. They commonly demonstrated a positive attitude to new opinions and innovative ideas and were willing to make innovative and creative attempts during their company's operation, even though these attempts might bring some potential risks and losses.

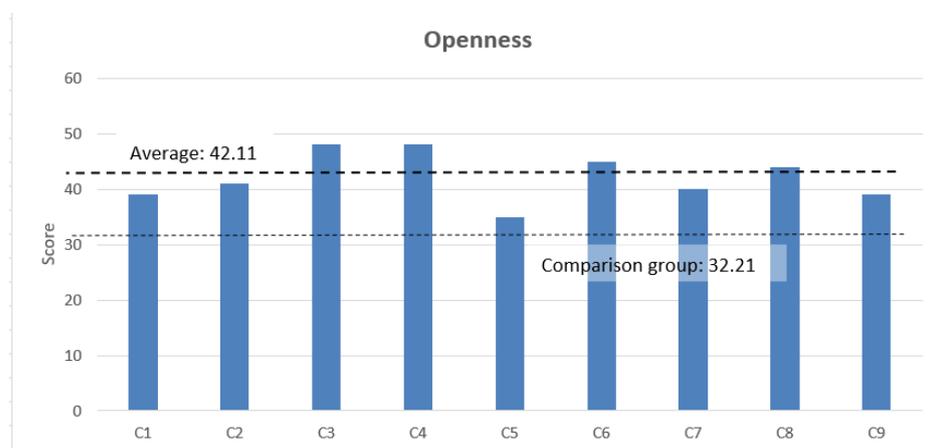


Figure 8.2 Participants' scores of openness

Figure 8.2 shows the participants' scores in terms of openness. As seen, the average score of the participants in this category is 42.11 (with the full score being 48), which is much higher than the figure of the comparison group. In the interviews, the participants demonstrated attitudes and opinions consistent with the test results. When discussing innovation and market risks, most participants expressed positive and open views. Some of them incorporated openness as one of

the main characteristics of entrepreneurs. For them, entrepreneurship is a career choice full of risks and uncertainties; only people who are willing to stand the challenges and potential losses decide to start their own businesses instead of following other stable career routes.

Kehao described himself as a person who is willing to face uncertainties. This openness personality trait highly influences his entrepreneurial style and company management strategies, especially when facing market challenges or pursuing innovative opportunities. He emphasised that for software SMEs, innovation and creativity are undoubtedly important drivers that affect a company's competitiveness in the market. In this context, as the founder-entrepreneur, he is also required to keep an open mind on some new technologies, products, and business models. *"It probably also relates to my personality, I feel that I'm more receptive to some new ideas than some of my friends and employees"*, he stated. Different from people who generally get nervous when faced with some challenges and uncertainties, for Kehao, novel perspectives and unpredictable market risks motivate and excite him.

"As an entrepreneur, I clearly understand that every decision might cause potential risks", Haijun said, *"however, I don't think we should give up any development opportunities to get stable growth"*. He stated that his openness makes him more sensitive to innovative ideas and market opportunities. At the same time, this personality trait also makes him more receptive to the uncertain outcomes of the risks and challenges of the market, which tends to be positive for the company's growth.

Nancy also gave a similar opinion. Her company runs an online platform and software products to offer business travel services to their users. In 2020, due to the outbreak of COVID-19, travelling was restricted all over the world, and her company faced several setbacks. She reflected, *"I could say that this was the biggest challenge since starting the business"*. As an SME, her company didn't have enough budget in hand to handle such crises. She acknowledged that this setback highly threatened the company's healthy cashflow. Despite the adverse conditions, Nancy still emphasised the importance of staying open-minded. She believed that there are still many potential opportunities in the market, and if the company wants to develop further, it will need to keep up with the changes in time. Too much hesitation and caution could hamper the company's growth, which could be fatal for software-based SMEs. For Nancy's company, having good innovation capabilities is one of the key factors that helps it to sustain its market competitiveness and pursue a bigger market share.

Compared with other participants, Zuohua got a relatively lower score in openness, which was closer to the comparison group. During the interview, he showed a conservative attitude towards

facing market risks. For him, due to the limited scale of his business, the risks it currently faces are easier to control. However, he also realised that as the company expands, it will face increasing challenges which would require it to adopt a more comprehensive risk control system. *“It’s not a simple task”,* he said, *“I do understand that if we want to get the high market competitiveness, sometimes we have to use some aggressive risk strategies. However, on the other hand, as an SME, just a few mistakes in decision-making may directly threaten our survival”.* In this case, Zuohua maintained the importance of market analysis and risk assessment. Before making big decisions or pursuing a new project, he will require his employees to make a detailed report, including market analysis, client feedback and needs, development budget, and potential risks. This process might be long, but it can effectively help the company avoid potential losses. He explained, *“I’m not an adventurous person, during the company operation, I also prefer safe and stable growth”.* He believed that as an entrepreneur, he has this responsibility towards his employees and other shareholders.

8.3.2 Neuroticism

Neuroticism is another important indicator of personality assessment in the Big-Five personality model, which represents individual differences in adjustment and emotional stability. Compared with people who score high in this category, people low on neuroticism tend to be self-confident, calm, objective, and not easily influenced by negative emotions (Zhao and Seibert, 2006). In this context, a lower score in neuroticism may be a positive factor for entrepreneurship. As discussed earlier, founder-entrepreneurs play an important role in the management of the company and in leading the general direction and operation. They have the responsibility to set the company direction for growth and make important decisions, especially when facing market challenges and risks. In their intense roles, having the ability to manage and control their emotions helps them in making objective judgements, even under pressure.

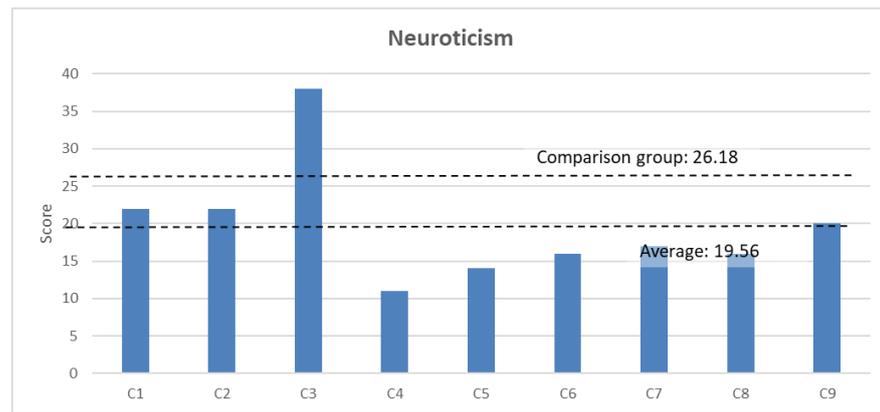


Figure 8.3 Participants' scores of neuroticism

Figure 8.3 shows how the average scores of the participants are significantly lower than the comparison group. This indicates that most participants in this study can manage their emotions well and can remain calm while handling crises and urgent matters. For example, Nancy described herself as an extrovert and said, *"I think I am a person who does not get easily entangled in negativity. My optimistic and resilient personality can support me in overcoming setbacks in the entrepreneurial process"*. In her opinion, the founder-entrepreneur should have a 'strong heart' to face the uncertainty of the market. As the centre of the company, the personal feelings of the founder-entrepreneur may directly affect the enthusiasm and atmosphere of the entire team. She argued that founder-entrepreneurs should be able to adjust themselves, especially when the company undergoes negative or challenging conditions. Only when they are emotionally stable enough do they have the energy to motivate their team. When talking about personality traits, Pengyao used a Chinese internet term, 'FoXi', to describe himself. He explained that 'FoXi' is a buzzword that originated on the Internet to describe people who remain calm in difficult or disappointing situations. In most cases, this type of person is not overly concerned with gain or loss. They do not strive too hard for achievement but rather follow or support a natural rhythm and working pace/style. This personality trait also is embodied in Pengyao's management style. He said, *"Because of my personality, I don't always require my staff to achieve better work performance. For me, I prefer to respect their own pace of work"*. He indicated that this personality also helped him get through the company's toughest times. He said that starting a business does not always go smoothly; in many cases, failures and losses are inevitable. As founder-entrepreneurs, the company's success or failure will have a direct consequence on their personal capital. In this context, compared to employees, founder-entrepreneurs bear much more psychological and financial pressure. Therefore, if they do not have good emotional management skills, they may find it difficult to fulfil this role. *"So, I think my personality really helps me a lot in this regard"*, he stated, *"because I don't care too much about losses, so I am*

able to adjust myself quickly when faced with some negative situations. I can bring myself back to a stable mental state in a short time, which allows me to make more objective judgements that can lead the company back on track”.

The importance of emotional stability is further exemplified by the performance of the founder-entrepreneur in dealing with COVID-19. During the interviews, most participants admitted the negative impact of COVID-19 on their company’s development. In order to survive the crisis, they had to slow down and adopt some strategies, such as layoffs and salary cuts, to reduce financial pressure. *“The COVID-19 outbreak completely disrupted our development plan”,* Xingyuan said, *“It really made me feel nervous. However, as the founder-entrepreneur, I had to calm down quickly”.* As he had the ability to manage and control his emotions, he did not suffer from emotional stress for very long despite the challenging times. He quickly developed a series of strategies to cope with the COVID-19 setbacks. He increased the frequency of communication with his employees and was proactive enough to hold an online group meeting within a week of the company’s forced shutdown during the national lockdown. In this meeting, he discussed the current situation and problems with the key managers of the company. They summarised the main risks that they might face in the upcoming months and focused on finding solutions for these problems. He noted, *“I know the situation may change, and these plans may not really work. But my stable performance and attitude can really make my employees feel more confident to face the uncertainty and challenges”.* For Nancy, as her business dealt with the travel industry, compared with other participants the challenges of COVID-19 were much more prominent for her company. In the interviews, while reflecting on the previous year’s performance and looking ahead to the further development of her company, Nancy appeared positive and confident. She stated that even during the hardest times, she still believed in her company and their potential to sustain these challenges and pursue further growth in the future. *“Nervousness, worry, or anxiety, these emotions are useless. They cannot make the situation better but worse. What I need is to cheer up, not to complain about why the problem happened every day”,* she said. As the leader, she does not spend too much time dealing with negative emotions. She also realised that her positive attitude also encourages her team, making them more motivated to focus on their current tasks instead of indulging in frustrations caused by COVID-19.

Ting was one of the participants who scored high in this category, even higher than the comparison group. He seemed to have struggled a lot under the pressure of COVID-19. He feels that 2020 has been the most difficult year of his entire entrepreneurial experience so far. He could not sleep well and suffered a lot of psychological pressure every day. He tried to ask for

help from his potential investors to solve the company’s financial shortage. However, due to COVID-19, many investors have become more cautious and decided to either delay or cancel their investment plans. *“Several times, after being rejected by investors, I even thought about giving up”*, he said. At that moment, the encouragement from his company partner played a significant role, which cheered him up and finally helped him get past that difficult phase. Recalling this experience, Ting admitted that he is a person who is easily influenced by external factors. And this trait always influenced his decisions during the company’s operation, especially when facing risks. For example, in the face of some new tasks, it is easy for him to worry too much about potential losses and missing development chances. *“I know my personality might hinder the company’s further growth, especially when facing significant setbacks and risks. I am trying to improve it, but it’s not an easy process”*, he explained.

8.3.3 Agreeableness

An agreeable person is fundamentally altruistic showing high compassion and the eagerness to help others. Some researchers believe that people with a higher level of agreeableness tend to have better work performance, especially in a group (Judge et al., 1999) However, Nicholson et al. (2005) pointed out a negative correlation between agreeableness and risk propensity. They argued that agreeable people may worry too much about the follow-up results which will make them hesitate and withdraw when facing risky decisions and challenges. In such scenarios, the entrepreneur who is usually regarded as a risk-taker might get a lower score than the comparison group in this category. Also, people with low scores may be more inclined to finish their tasks independently rather than in group.

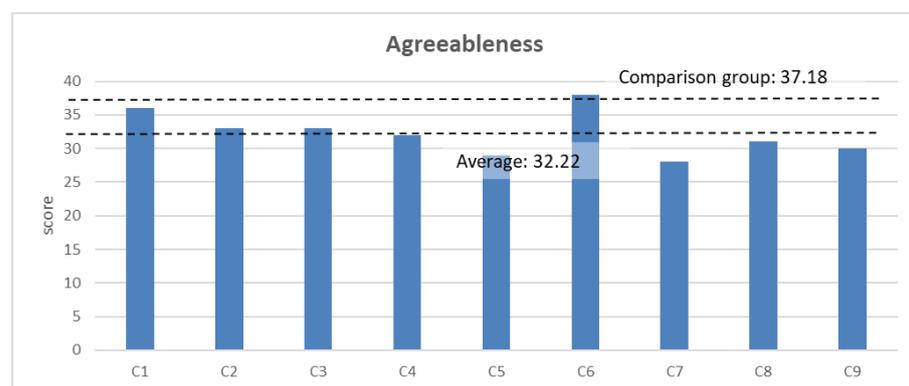


Figure 8.4 Participants’ scores of agreeableness

In the analysis of this study, there was not much of a difference in the scores for agreeableness between the participants and the comparison group. As Figure 8.4 shows, the average score of the participants in this category is slightly lower than that of the comparison group. During the

interviews, some participants showed a strong desire for independent decision-making and power control. And when faced with market risks, they preferred to carry out risk analysis and strategy development individually.

Kehao confessed that he is not an agreeable person, and in many cases, he can even come across as a bit stubborn and difficult to get along with in front of his staff. Throughout his entrepreneurial journey, he has hardly ever changed his mind because of the opinions of his team members. *“This does not mean that I do not respect and value the ideas of my staff”,* he explained, *“but in my opinion, the founder-entrepreneur should maintain the power to make the decision individually”.*

This view was supported by Tong, who believed that founder-entrepreneurs should have the courage to stand by their choices and judgements, even if they are misunderstood by others. He said that in most cases group communication was useful, as it can provide some different opinions and information and help him avoid personal bias. However, differences of opinion also frequently arise in a group. In such cases, if the founder-entrepreneur is too concerned with every member’s feelings, it can be difficult for him to make a final decision in a short time. *“The market will not leave us a long time to make decisions”,* he emphasised, *“An indecisive entrepreneur will always the company lose the development chances”.*

Zuohua introduced that in his company, when they need to make important decisions, employees always play the role of information providers, providing him with the latest market reports and customer feedback. After that, he would summarise and analyse this information, and make the final decision based on his personal experience and knowledge.

Compared with other participants, Haijun got a relatively higher score in this category. And during the interview, he also demonstrated a higher level of reliance on his group. During the decision-making process, he is always willing to hear his employees’ opinions and ideas. For him, employees are the people who are directly in touch with clients, and are more up to date on market trends and changes. Therefore, hearing their views is beneficial to him and could also help him get a lot of new inspirations for further development. He notes that working as a group improves reliability, *“Personal judgement can sometimes lead to some bias, working in a group can highly reduce this part of risk. My team members have their own advantages in their specific fields, I respect their opinions and feel proud to work with them”.*

8.3.4 Extraversion

Extraversion is another significant psychological indicator of the Big-Five personality model that

can assess people’s desire to interact with the external environment (Orhan and Scott, 2001). Figure 8.5 shows the participants’ scores in this category. As seen, in this study the average score of founder-entrepreneurs was close to that of the comparison group. The individual scores of entrepreneurs, however, are relatively scattered and do not show any obvious commonality. During the interviews, the researcher did not find anything significant that would highlight the influence of extraversion on entrepreneurs’ risk management strategies. However, there is some evidence to support that founder-entrepreneurs with higher levels of extraversion may be more adept at maintaining good relationships with stakeholders, including investors and customers. This may help their businesses to gain external support in the face of market challenges and risks.

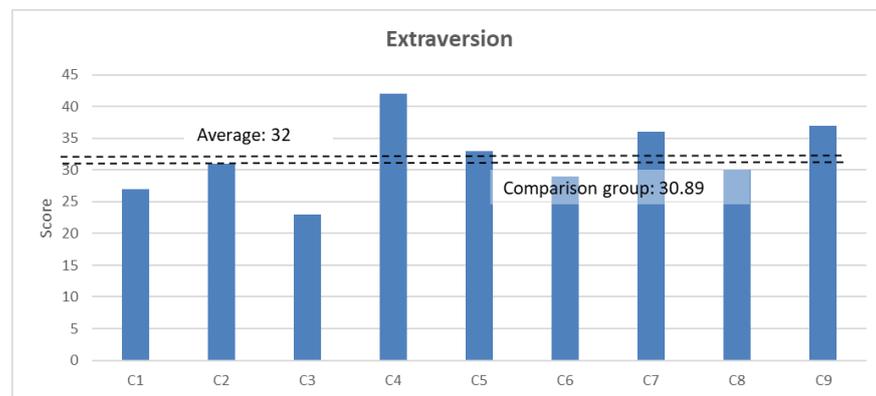


Figure 8.5 Participants’ scores of extraversion

For example, Nancy, who got the highest score in this category, used to work as a lecturer at a university. This work experience greatly improved her communication skills and has made her feel more comfortable in dealing with external social work. She stated, *“I get along well with my employees, clients, and suppliers. I think I have a talent for handling interpersonal relationships”*. As an outgoing person, she tends to be more easy-going with her leadership and management of the company’s overall work environment. In the interview, she described her company as a big family and said, *“I hope my employees can find a sense of belonging in the company. Only when we can make employees feel comfortable can the company really develop”*. Regarding the company’s risk performance, Nancy stated that although her good communication skills do not directly help the enterprise avoid market risks, the positive working atmosphere within the team makes the staff become more united in the face of external blows. She described, *“Our company suffered deplorable operational conditions during COVID-19, but even so, very few employees complained or chose to leave. I think this is related to the good internal relations of our team”*. At the same time, maintaining active links with investors has made it easier for Nancy to win external financial support. She said that since she had built up a strong relationship network with investors, getting investment has become much easier than before. Based on mutual

understanding and trust, she no longer has to spend a lot of time trying to convince investors of providing financial support. Sometimes, investors would even reach out to her, showing interest in her new projects and offering to help financially. Nancy expressed that this situation is certainly positive for the company's development, which greatly reduces the business's financial pressure and increases risk tolerance. She said, *"With the support of our investors, we have more money to do some innovative activities. Even if these attempts do not succeed, with their support, the consequences become not so difficult to bear"*.

Unlike Nancy, Tong got a relatively lower score in this category. In the interview, he also showed a different attitude to social activities and relationship-building in the interview. He explained that before starting the business, he used to work as a programmer for many years. This work experience developed him into a calm, quiet and unsociable character. He doesn't like to go to social events, as too many people would make him feel noisy and uncomfortable. *"Even for some business social events, I would ask my staff to attend instead of me"*, he said. However, in the Chinese market environment, joining social activities is an important channel to build connections with potential investors and co-operators. In this case, Tong's kind of personal traits have caused him some setbacks in gaining favour with investors. He described, *"For the first few years of the entrepreneurship, I barely reaped large amounts of external financial support. The development of the business mainly relied entirely on my personal capital accumulation and the business's own revenue. The limitation of capital leads the company cannot to achieve a quick expansion"*. He did not think this was a bad choice and believed the slow growth rate could help the company build a more solid market base. At the same time, because the company's development did not rely on external funding, Tong's control power would not be compromised by other forces. However, as the company further developed, the need for capital began to grow significantly. Tong expressed, *"When the enterprise had achieved its initial growth and had a steady flow of customers and income, I began to think about the further expansion and development of the company. I want to accelerate the pace of the company's growth, but this means that we will face greater market risks and challenges"*. He admitted that attracting external investment was necessary to achieve the next step for the enterprise. Although it was not easy for him, he has started to join some social activities to build connections with potential investors and other stakeholders.

However, people's willingness and enthusiasm to socialise might not exactly match their social performance in the world of work. This situation is shown significantly in Ting's case. In the interview, he described himself as a person who easily wins the trust of others. Due to this

strength, he has maintained good relationships with investors, clients, and business partners. He described, *“I get on well with my investors and partners, so when I had some setbacks in my business, they were willing to give me support and helped me through the difficult times”*. However, on the other hand, he revealed a lack of interest in social activities. He said, *“Although communication and socialising are not difficult for me, I don’t really enjoy these activities”*. For him, maintaining external relations is more like an essential task that he needs to finish. As the founder-entrepreneur, he is responsible for securing as much external support as possible for the business to ensure its smooth development. He expressed, *“For me, communication is a skill, not a hobby. But that’s okay, even though I’m not really a fan of social events, I can still handle relationships very well”*.

8.3.5 Conscientiousness

The final personality factor in the Big-Five personality model is the level of conscientiousness. For any type of work, a sense of responsibility is necessary. Researchers have found that the intensity of conscientiousness greatly affects one's work performance (Howard and Howard, 1995). For founder-entrepreneurs, these characteristics may lead them to be highly invested in the management of the company's daily operations. On the other hand, excessive conscientiousness may represent inflexibility and rigidity. Overly strong management may also increase the pressure on employees and entrepreneurs themselves to a certain extent. In this study, as Figure 8.6 shows, there is no significant difference between the conscientiousness of the participants and the comparison group. The analysis found no obvious evidence to draw a connection between risk strategies and the conscientiousness of founder-entrepreneurs. However, this personality factor might influence their entrepreneurial motivation and understanding of success, further affecting their risk attitude indirectly.

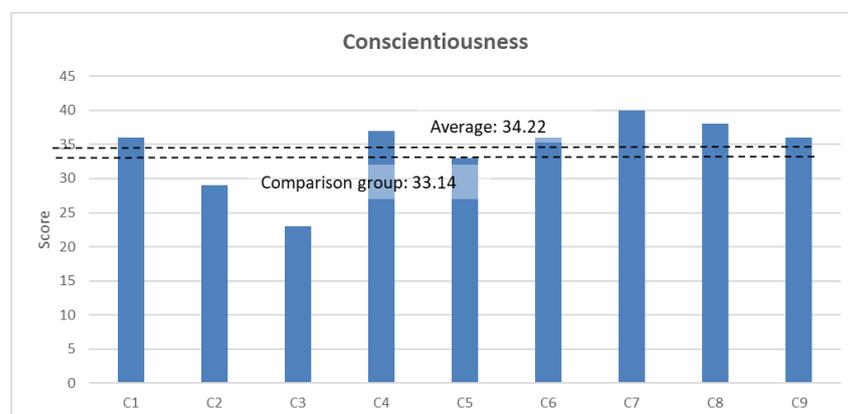


Figure 8.6 Participant's score of conscientiousness

Pengyao, who got the highest score (40/48) in conscientiousness in this study, explained that he usually works 42 hours a week. The number of hours might increase in the face of special events, such as new product launches or market surprises. *"Working until midnight is normal for me", he stated, "Since I began my entrepreneurship journey, I hardly enjoy a whole weekend"*. He argued that being a founder-entrepreneur has never been an easy job, although his daily work and engagement are not strictly supervised by others, this does not mean that he can be lax. *"The market will test your job"*, he stated, *"Besides, the efforts of entrepreneurs are the best incentive for employees"*. He carries out this view by his actions, in the daily running of the company, he is always the first person to come into the office and the last person to leave. He believed that his hardworking attitude could influence his staff, which gives the team a strong sense of cohesion and motivation in the face of market risks and challenges.

"Starting a business is a difficult task, which requires me to devote all my energy to it", Nancy stated. She likened herself to 'fuels' that need to burn themselves to motivate the enterprise's growth. She highlighted that in SMEs, being an entrepreneur is a complex job. Different from large enterprises with defined organisational structures and teams, SMEs generally suffer from inconsistent structure and management. In this context, founder-entrepreneurs must be clearly aware of the company's weaknesses and try to make up for these through their own efforts. Nancy explained that as the leader of an entrepreneurial firm, her responsibilities are not only limited to management. Especially in the first few years of the company's establishment, her work covered almost everything. She needed to check the company direction for growth, maintain external relationships, attract suitable talents, and build management standards and company regulations. At the same time, she was also required to deal with some detailed issues, such as office rents, salary payments, and so on. *"I think working hard is a basic condition of entrepreneurs"*, she stated, *"Someone who hopes to escape the pressures of work by starting a business will not succeed in the market"*.

Yong also got a relatively high score for conscientiousness, and his management style also reflects this aspect. In his company, group meetings are held every week to summarise business results and progress and formulate future development goals. Even during the COVID-19 outbreak, they maintained this routine. He emphasised the importance of setting goals and believed this method could help employees clarify the company's direction of development and make them more motivated towards their work. Kehao also shows a similar attitude: he had a very clear goal at the beginning of his business venture, and for him, all the work he does is aimed at achieving this goal. *"I know very well what I want to achieve, and because of it, I can*

always cheer myself up when facing challenges and setbacks", he said. While talking about risks, he expressed that if potential risks jeopardised his plans to achieve the ultimate goals, he would get more cautious and potentially spend more time doing detailed risk assessments. Otherwise, he is willing to take a higher level of risk to pursue market opportunities.

In the study, Xingyuan held a different attitude toward entrepreneurship. For him, one of the key reasons for starting a business is to seek another way of life. He hoped that entrepreneurship would make his life more interesting and challenging but not fill it with intense work. In this context, he noted, *"As the founder-entrepreneur, I do not want to push my group too hard to achieve so-called business success"*. In his opinion, the length of working hours should not be a significant criterion to assess the work performance of employees and entrepreneurs. On the contrary, a comfortable, egalitarian, and flexible environment may be more conducive to creativity and the generation of ideas. On the other hand, Xingyuan also admitted that as his desire for achievement was not as strong, his confidence and perseverance would be shaken when the business encountered significant setbacks. Using the outbreak of COVID-19 as an example, he stated, *"To be honest, at the height of the pandemic, I considered stopping my business. This was not only because my emotional control was relatively weak, but also because success didn't appeal to me as strongly"*. Ting shared a similar view with Xingyuan and claimed, *"There are so many things that are more important than work and success"*. In his opinion, people need to take on many different social identities and responsibilities. In this case, focusing only on his work and neglecting other responsibilities is also undesirable for him. In order to balance life and work, he stated that he would plan and organise his daily routine in advance. And every week, he schedules a certain amount of time off to escape work, and spends it with his family.

8.4 Chapter summary

This chapter discussed the personality traits and risk attitudes of founder-entrepreneurs in the Chinese high-tech software SMEs. Based on the analysis, people who score higher in Openness are more likely to show a more positive risk attitude. They are also more willing to make radical and adventurous decisions to explore potential opportunities and gains in their projects. Neuroticism is related to a person's ability to control their emotions, which further impacts their risk tolerance. In this study, participants generally got a lower score in this category, which means that they have the capability to successfully handle their personal emotions and not dwell on negative feelings for a long time. The interview results also supported this aspect. The participants explained that whenever their companies faced crises, they can adjust their emotions and remain calm and

objective so as to work towards finding a better solution/outcome. For agreeableness, extraversion and conscientiousness, no significant evidence could be identified from the analysis to draw a conclusive connection to the founder-entrepreneurs' risk strategies and decision making. However, the interviews with the participants did suggest that these personal characteristics may in fact impact one's working style, entrepreneurial motivation and understanding of success, thereby potentially affecting their risk attitude in an indirect manner.

Chapter 9. Discussion and Conclusion

The literature review and data analysis in this thesis have highlighted and discussed the important role of SMEs. According to the data from the World Bank, SMEs represent about 90% of businesses and provide more than 50% of employment worldwide (The World Bank, 2022). SMEs are the economic backbone of both developed and developing countries (Franco *et al.*, 2014; Altman and Sabato, 2007). In China, by the end of 2020, the number of SMEs had already reached 43.03 million (Blazyte, 2022), making up to about 95.68% of all registered companies (China Economic Network, 2021; National Bureau of Statistics of China, 2022). In this context, Chinese high-tech software SMEs have grown rapidly in recent years and have played an important role in China's national economy. Based on the report by the Ministry of Science and Technology of the People's Republic of China, by the beginning of 2022 the number of Chinese high-tech SMEs had already reached 320,000, creating more than five million jobs (Jin, 2022) and contributing to about 70% of technological innovations and more than 70% of innovation patents (Ministry of Science of China, 2019).

However, as discussed, SMEs are prone to various risks and challenges due to their characteristics such as limited resources and size constraints. As Islam, Tedford and Haemmerle (2008) note, every day, SMEs encounter internal and external challenges which highly impact their business performance and even threaten their survival. Their ability to handle risk might be much lower than large organisations (Lavia and Hiebl, 2015). During a crisis, while larger companies may be able to absorb some of the losses, for SMEs, the same setback could be fatal (Crovini, Santoro and Ossola, 2020). Therefore, having effective risk management strategies is important for SMEs to help them build their competitive advantage, cope with difficult scenarios, and increase their chances of survival and growth (Smit and Watkins, 2012; Brustbauer, 2016; Crovini, Santoro and Ossola, 2020). Unfortunately, the risk management process tends to be informal in most SMEs, with many lacking any dedicated department or staff to focus on risks (Islam and Tedford, 2012; Vargas-Hernández, 2011; Gao, Sung and Zhang, 2013; Brustbauer, 2014). In this context, founder-entrepreneurs usually take the role of the 'risk-taker', making all the critical decisions on risks and being responsible for developing the risk strategies for their business (Brustbauer, 2016).

As someone who has created and owns the business, the founder-entrepreneur generally holds the highest power in terms of making crucial decisions and managing the key operations and activities of their SME. In this case, their personal judgement, management style, and decision-making can directly impact the company's direction in terms of growth and market performance (Vermeulen

and Curseu, 2008; Picken, 2017; Jansen *et al.*, 2013). As Wingwon (2012) indicates, every stage of a company's development, starting from its inception to assessing market opportunities, is closely linked to the strategic decisions made by the founder-entrepreneur. Especially when faced with market uncertainties and challenges, the strategic decisions made by the founder-entrepreneurs can help their business to avoid potential losses and gain a better chance of survival and success.

Dollinger (2008) points out that *"The role that individuals play in entrepreneurship is undeniable. Each person's psychological, sociological, and demographic characteristics contribute to or detract from his or her abilities to be an entrepreneur"* (pp.21–22). Over the years, many researchers have studied the effects of personal characteristics, such as gender (e.g. Belás *et al.*, 2015; Mukhtar, 1998), educational background and skills (e.g. van der Sluis, Praag and Vijverberg, 2008; Maigida and Saba, 2013), and personality traits (e.g. Kerr, Kerr and Xu, 2018; Antoncic *et al.*, 2015) on entrepreneurs' decision-making, especially when facing market risks. However, there is still a lack of general consensus on how these factors can influence the entrepreneur's risk attitude and thus impact the company's performance. Especially regarding personality traits, there seems to be a lot of inconsistent opinions among researchers. Some point out that differences in culture and industry background might lead to a different impact of one's traits on their entrepreneurial performance (Mansor, Norbaya and Okazaki, 2016; Hussein and Abdel Aziz, 2017).

Chinese high-tech software SMEs have grown rapidly in recent years and their contribution to the economy and innovation is widely recognised. However, there is a lack of research on the risk management profiles and the important role of founder-entrepreneurs in such SMEs, especially during unprecedented events like COVID-19. This study focused on Chinese high-tech software SMEs to explore how founder-entrepreneurs' personal factors (including entrepreneurial motivation and personality traits) influence their decision-making and risk strategies and impact their company's survival and success. The main research question was:

- **How do founder-entrepreneurs from high-tech software SMEs in China manage risks and explore market opportunities?**

Based on this research question, this qualitative study utilised a constructionism perspective with the view that the founder-entrepreneurs could influence the development of social reality. This research believes that reality is dynamic. For example, the role of the founder-entrepreneur may change and evolve as the company develops, and their attitude toward risks may be influenced by factors such as their personal experience. Therefore, in order to gain a deeper and more comprehensive understanding of how entrepreneurs play an important role in the risk management process and how their personal characteristics influence their risk attitudes and

decision-making, this study conducted longitudinal case studies with nine successful Chinese high-tech software SMEs. The entire study was carried out in four main phases:

- Phase 1. General understanding of the cases;
- Phase 2. Impact of COVID-19 and response strategies;
- Phase 3. Personality traits and risk attitudes of founder-entrepreneurs;
- Phase 4. Update on risk management and the role of founder-entrepreneurs.

The empirical findings from this study make the following contributions to the literature on entrepreneurship and risk management:

- Understanding the key motivational factors that drive founder-entrepreneurs towards an entrepreneurial career;
- Exploring how founder-entrepreneurs from high-tech SMEs engage with the market and assess risks;
- Identifying and discussing the strategies used by founder-entrepreneurs to manage risks and explore new business opportunities;
- Discussing how certain personal traits of founder-entrepreneurs can influence their entrepreneurial activities in terms of decision-making and risk strategies.

9.1 What Drives Entrepreneurial Motivation?

Entrepreneurial motivation signifies the reason that leads a person to choose an entrepreneurial career path and start their own business. In this context, this study explored the 'pull motivations' and 'push motivations' among the nine participants. The data analysis showed that most participants were driven by pull motivations. They generally see starting a business as a self-directed pursuit, and a lot of them were attracted by the benefits and prospects that an entrepreneurial career can potentially bring, such as self-achievement, creating social value, and attaining a better lifestyle.

When discussing entrepreneurial motivations, most participants highlighted the influence of some of their internal factors, including personality, hobbies, and interests. During the interviews they discussed how some personal characteristics such as the ability to manage risks and challenges, having a good level of independence in their career, and having an outgoing and optimistic personality make them more suitable for an entrepreneurial career. It appears that a person with such characteristics might find it difficult to work in or adjust to an environment with a fixed work routine/pattern. This was the case for most of the participants in this study: they wanted to escape

that work routine, as it did not challenge or motivate them.

Many previous studies have seen income as a key motivation/driver that tends to attract people to an entrepreneurial route (e.g. Shepherd and Detienne, 2005; Stephan *et al.*, 2015; Carsrud and Brännback, 2011). However, in this study, almost all of the participants did not emphasise the importance of financial reward to their entrepreneurial choice. On the contrary, for some, the decision to start their own business was in fact a very risky career move as they had to give up highly paid corporate jobs in large organisations. In this context, some of the participants explained that compared with financial rewards, the spiritual satisfaction and intangible rewards that come with entrepreneurship have more meaning to them. It is with this view that they are willing to work in the software industry, with high initial investment and a long payback period.

In addition to internal factors, some external factors, such as the development of technology, market gaps and opportunities, and a viable entrepreneurial atmosphere can also drive one's entrepreneurial choices to a certain degree as seen in this study. Many participants noted that the opportunities brought in by market changes are crucial. With the rapid growth of the Chinese high-tech software industry, there seems to be a lot of new gaps and opportunities in the market. For those who are interested in starting their own business venture, such a market, full of potential, can certainly be attractive. Furthermore, the strong entrepreneurial atmosphere in Chinese society has also increased people's interest and desire to start their own business. Also, the government's attitude, and supportive measures and policies to encourage entrepreneurship, have enhanced the public's enthusiasm and desire for an entrepreneurial career path, thereby attracting more people to this route.

9.2 Risks Affecting SMEs

An SME's prospect for growth and development are frequently challenged by various risks. In this study, the risks faced by Chinese high-tech software SMEs were analysed from two main categories: internal risks and external risks. Zeng (2018) pointed out that compared with large organisations, SMEs are easily impacted by some external factors, such as changing market environment and challenges from competitors. This was supported by the findings of this study. Many of the participants indicated that the impact of the external environment was a major factor that posed a great deal of challenge to the growth of their business. In their opinion, SMEs' growth is highly dependent on a positive market environment. In an overall positive market, they can more easily identify market opportunities, recruit talent, and attract financial investment. However, in recent years, due to the pandemic and other international issues, the Chinese economy has slowed down

to some extent, putting a lot of pressure on the development of Chinese high-tech software SMEs, which, belonging to a relatively nascent industry, have to face the challenges brought in by increasing competition. To be relevant, they have to invest more to facilitate their innovation capabilities, which further increases financial pressure. Some participants, however, noted that there is an unfair competition in the Chinese software market to some extent due to issues such as plagiarism, copyright theft, malicious pricing pressures, and lack of clear regulation, which can be fatal for some businesses.

Among internal risks, the two prominent areas that were reflected among the participants were the limitations of a founder-entrepreneur's capabilities and the organisation's resources. Some researchers like Trevelyan (2011) point out that an important feature of SMEs is their informal management structure. In this context, the responsibilities of the SME founder-entrepreneur will be more complex and extensive and may cover almost all the operational processes of the firm (Bhide, 1996). There is a need for founder-entrepreneurs to acquire a range of skills and capabilities so as to have a better understanding of the business. However, not everyone is a natural entrepreneur. During the interviews, many participants admitted that they had some shortcomings with their capabilities and that these limitations posed some risks and hindrances to the development of their businesses. These limitations were mainly related to areas of technical knowledge, management capability, market analysis, and the ability to manage emotional stress and pressure. According to the participants, these limitations can directly impact the company's effectiveness in its day-to-day operations. For example, in one of the cases, due to the lack of professional software design knowledge, the participant faced some challenges when communicating with their technical group. This later resulted in unnecessary losses during the product development. In some cases, participants lacked management experience and were therefore unable to coordinate matters between team members effectively or resolve conflict, which ultimately resulted in the departure of some key staff members. There were also instances where the inability to analyse market trends and predict conditions led some of the participants to make incorrect decisions, which led to project failures and losses. Such steps could even the collapse the business in severe cases. The inability to handle pressure and manage one's mental health can also make founder-entrepreneurs prone to negative emotions, making it difficult to make rational and objective judgements. This was something that many of the participants identified as a major internal risk.

A distinctive feature of an SME as noted earlier is its small size, which makes it difficult for it to have an adequate accumulation of resources comparable to that of large enterprises (Brustbauer, 2016).

Researchers like Pandya (2012) highlight that resource limitations, including lack of capital, talent, and skills, are major constraints that could seriously affect the prospects of expansion and growth for SMEs. For Chinese high-tech software SMEs, this struggle for resources seems even more pronounced. Compared with enterprises in other sectors, high-tech software SMEs require a higher amount of initial investment to support their innovation activities, which significantly increases the company's financial pressure. Such financial constraints force many SMEs to limit their investment in promotional activities, which can result in their brand having a weaker presence or visibility in the market. In this context, SMEs might face further challenges to develop markets and attract talent. Many participants noted that even if they could offer lower prices with better services, they would still struggle to attract more customers due to stiff competition from the big companies. This situation also extends to employment. Some participants stated that even though their SMEs are willing to offer higher salaries and better benefits, working for a large company appears to be a preferred career choice for many jobseekers in China.

9.3 Impact of COVID-19 on High-tech Software SMEs

As a global health crisis, COVID-19 has had a serious impact on economic growth worldwide, triggering a number of negative impacts, including lower GDP growth and rising unemployment rates. For China, as the first country to be hit by the pandemic, the overall market environment as evident from this study has slowed down significantly due to COVID-19 over the past three years. And due to the 'dynamic zeroing policy', this impact is likely to continue for some time. For Chinese SMEs, COVID-19 is a major setback leading to a range of risks such as unpredictable market situations, decline in market demand, shortages of labour and skills, logistics issues, limitation of resources, and financial pressure. The founder-entrepreneurs from the nine SMEs in this study expressed the significant influences of COVID-19 on their company's development prospects. From the interviews, four main aspects were identified: changes in the mode of operation, declining market demand, increasing financial pressure, and growing emotional stress. Among them, the decline in market demand and the consequent increase in financial pressure has had the greatest impact on Chinese high-tech software SMEs. Some of the participants explained that as a result of the pandemic and the strict COVID policies adopted by the Chinese government, many people experienced a sharp drop in income during 2019–2021. This resulted in many prioritising their spending on vital activities, adjusting their consumption habits, and giving up unnecessary expenses to cope with the changing situation. Although software products can bring convenience and efficiency to people's lives, they cannot necessarily be classed as vital products or services in one's day-to-day life. Therefore, in an overall negative market environment, high-tech software SMEs have

generally faced a significant decline when it comes to market demand. What is surprising here is the response of founder-entrepreneurs to the changes in the mode of operation. Due to the characteristics of this industry, software SMEs, compared with other industry sectors, found it relatively easier to switch to an online working method. However, in this study, many participants expressed their concerns about the changes in the mode of operation and working during COVID-19. They believed that the online working model could highly impact the working atmosphere and efficiency of their group, and confessed that they are not willing to completely discontinue the traditional operation mode.

The increasing market uncertainty from the pandemic also appeared to have shaken the confidence of some of the participants in terms of their plans for the growth and expansion of their business. Many participants acknowledged being highly anxious, confused, and worried when making future plans for their business in such difficult times. During the interviews, many noted their concern about the long-term effects of the pandemic. Some confessed that, as SMEs, they might not be able to sustain such challenges long-term or cope with the pressure of repeated outbreaks of the pandemic. However, in some cases, COVID-19 also brought in some unique business opportunities. For example, some participants noted the changes in people's consumption habits during the pandemic such as increasing use of digital services such as online training and online delivery. Identifying these as prospective opportunities to capture new market segment, some of them launched new software products and services. These steps helped them to not only explore business opportunities but also maintain a steady cash flow during the unpredictable and difficult times of the pandemic. For all the participants, COVID-19 has been a significant test for them as founder-entrepreneurs but for some, this has also been an opportunity for their business to pursue some new strategies for growth and development.

9.4 Risk Management among SMEs

Today, organisations operate in an increasingly dynamic, complex, and unpredictable market, and risk management is becoming a prerequisite for their survival and success. As seen in this study, effective risk strategies can help a business to avoid potential losses and explore opportunities, thus achieving better market performance. However, having a relatively well-developed risk management system seems to be a bit of a luxury for SMEs. As evident from the literature, as well as the findings of this study, in most SMEs the risk management process tends to be informal. Due to resource constraints, SMEs generally lack the capacity to develop a relatively complex risk management system. All participants in this study agreed that they do not have any dedicated department or team in their companies that is solely responsible for risk control and management.

All of them emphasised that as the founder-entrepreneur, one of their essential roles is to make critical decisions associated with risks.

In the interviews, the participants discussed a range of risk strategies that they apply during the operation and management of their business. Based on the analysis, five main strategies were identified. These are selecting a clear direction for market growth; seeking external financial support and collaboration; risk evaluation; timely adjustment in the event of risk; and reflection and self-improvement.

Firstly, a clear business direction and market segmentation can help companies radically reduce the likelihood of encountering some of the risks. Many participants expressed their intention to avoid trading in some 'red ocean' markets to reduce the competitive pressure on their businesses. In their opinion, SMEs, especially in the start-up stages, have very limited resilience to risk and competition. In such cases, they should avoid head-to-head competition with competent enterprises as far as possible. In this case, finding a distinct gap in the market to conduct their business is perhaps one of the most fundamental and effective risk strategies.

To compensate for the lack of financial accumulation, some participants found alternate ways to attract external financial support, such as external investors or partners, to alleviate financial pressure and manage risks. However, some other participants were more cautious about this strategy. They emphasised the importance of retaining the power, as founder-entrepreneurs, for independent decision-making, arguing that the inclusion of external stakeholders would potentially constrain or limit their decision-making and strategy formulation, further influencing the overall direction of the company.

Risk evaluation is an essential step in risk management. In this study, participants generally acknowledged the importance of risk assessment for the company's development and sustainability in today's complex market. According to them, risk evaluation is highly dependent on the independent judgement and decision-making of the founder-entrepreneur. When working on a new project or business opportunity, the founder-entrepreneur should make a comprehensive assessment based on market trends, the capabilities of their organisation, and the potential for growth, so as to decide whether to go ahead. However, the development prospects can still be threatened by some unpredictable issues, such as the outbreak of COVID-19, something that no one could have predicted in their risk analysis. Therefore, the ability to be resilient and adjust the company's direction in time is a key factor for survival and in sustaining a steady operation and growth when faced with risks.

This strategy was evident among the founder-entrepreneurs in the study. Most of them pointed out that before COVID-19 broke out, they did not have any experience of preparing or responding to this type/level of risk. All they could do in such circumstances was to develop risk plans in a timely manner in order to reduce any further losses caused by the pandemic. For instance, some of them adjusted the development plan to match the changing market environment. In response to the decline in market demand, some participants turned their attention to the maintenance of existing customers and the cultivation of customer loyalty to ensure the stability of their sales volumes. In addition, some participants used salary cuts and layoffs to alleviate the financial pressure on their company during the pandemic. In some cases, participants saw the market stagnation brought in by the pandemic as an opportunity to refocus and improve their company's competitiveness and their ability to innovate.

A thorough and critical reflection after the completion of a project is also necessary, which can help SMEs improve their risk management capabilities, compensate for and improve their deficiencies, and avoid similar losses in their future operations. In the study, many participants mentioned that they would conduct a detailed analysis and evaluation of the project outcomes and the strategies used to handle the project activities after it is completed. For example, many of the SMEs in this study did not have sufficient risk budgets to deal with some unpredictable risks before experiencing the impact of the pandemic. This situation is understandable, for SMEs with limited capital accumulation, it may not be cost effective to set aside a fixed budget to prevent unpredictable losses from happening. Founder-entrepreneurs generally prefer to put their resources in some activities that can bring benefits to their business, such as product development and marketing. However, experiencing the setbacks of COVID-19, many participants realized the importance of setting the financial budget, and indicated that they would now increase their company's risk budget to address similar instances in the future. Although this action will not bring financial returns to their business in the short term, it will give them the possibility to survive the impacts of some significant risks.

9.5 Personality traits and risk strategies

When discussing risk strategies, it was found that even when they are faced with similar types of risk, different participants seem to have different perspectives on risk management and decision-making. For example, as discussed earlier, when facing the challenges of COVID-19, some of them noted the opportunities for the software industry presented by the pandemic and decided to launch new products and services to strive for better market performance. In contrast, some decided to slow down the pace of the company's development, using some relative passive strategies, such as salary cuts and layoffs, to reduce the company's financial pressures and to maintain its stable

operation.

Such differences may be related to the personality characteristics of the founder-entrepreneurs. Previous studies point out that individual differences in an entrepreneur's personal characteristics might lead to different entrepreneurial performances, especially when facing market risks and uncertainties (Kerr *et al.*, 2019). In this study, the Big-Five personality model was chosen to assess founder-entrepreneurs' personality traits and their influence on risk management and decision-making. According to the results, compared to the comparison group, which consisted of university participants, the most remarkable difference embodied by the participants was their degree of openness. People with a higher level of openness tend to accept new challenges and tasks; they show a more positive attitude towards market uncertainties and addressing challenges. They are more willing to take risks in order to seek potential market opportunities. As Figure 8.1 shows, the score of participants in openness is much higher, which implies that the entrepreneurs from these Chinese high-tech software SMEs are generally more willing to embrace innovative ideas. It may be related to the industry they are involved with, as high-tech software SMEs are susceptible to frequent market changes and trends. During the interviews, most participants emphasised the crucial role of innovation in business development. For them, perseverance in innovation is one of the most important instruments for improving the competitiveness of their businesses, despite the fact that innovation activities will always bear some form of risk.

In addition to common characteristics, this study also analysed the individual personality traits of the participants on a case-by-case basis. For example, Nancy from Hangzhou Flyby Network Technology Co., Ltd., who had the highest score in openness in this study, appeared to show a slightly aggressive risk attitude. For her, finding market opportunities was more important than controlling potential losses. She is also optimistic about the further development of her company. Even after some severe setbacks from the outbreak of COVID-19, she remains confident in the company's long-term growth and development. Compared with other participants, Zuohua from Zhejiang Ruxie Network Technology Co., Ltd. got a lower score in openness, and when talking about risks, he showed a cautious approach. During the interview, he did not show a great deal of ambition for the company's development but stressed the importance of survival. For him, avoiding market risks to maintain the company's stable operation is an important risk strategy during these critical phases.

Some conclusions can also be made about the influence of neuroticism on the participants' risk attitudes and decision-making. People who score low in this category have better capability to manage their emotions. This quality in their personality can indeed help them to be more objective

with their decision-making especially during crises and when facing risks and setbacks. In this study, all the participants generally got a lower score in this category, which implied that they have the capability to successfully handle their personal emotions and not dwell on negative feelings for a long time. The findings from the interviews also supported this aspect. The participants explained that whenever their companies face a crisis, they can adjust their emotions and remain calm and objective in order to work towards finding a better solution/outcome. This seems to be an important trait among founder-entrepreneurs as leaders of their organisation. However, Ting from Hangzhou Zhupai Information Technology Co., Ltd showed a completely different approach in this regard. He got a very high score in neuroticism. And this trait seems to affect his performance when facing risks. One example relates to the COVID-19 crisis: the outbreak of the pandemic disrupted his company's growth and prospects, which caused him great psychological stress. For a long time, he struggled with this. The situation did not improve until the outbreak in China was brought to some level of control.

Agreeableness is one of the personality traits that could influence work in a group context. Participants with a high degree of agreeableness will tend to rely more on their peers in the decision-making process, whereas those with lower scores are more inclined to make independent decisions. For agreeableness, extraversion and conscientiousness, no significant evidence could be identified from the analysis in this study to draw a conclusive connection to the founder-entrepreneurs' risk strategies and decision-making. However, the interviews with the participants seem to suggest that these personal characteristics may in fact impact one's working style, entrepreneurial motivation, and the understanding of success, thereby potentially affecting their risk attitude in an indirect manner.

Besides personality traits, a number of other personal factors, such as entrepreneurial motivation and personal capabilities, also appear to influence the risk strategies of the founder-entrepreneurs. For instance, participants who were driven by non-financial motives showed a higher level of risk tolerance and were more willing to take risks during their company operation. Participants who were confident in their personal abilities also showed a relatively positive attitude towards risks and believed in their ability to manage the challenges.

9.6 Contributions of the study

Overall, this study links two main research areas: risk management and entrepreneurship, it demonstrated the important role founder-entrepreneurs play in the risk management of SMEs. It provides a comprehensive discussion of how different personal traits work together and influence

entrepreneurs' decision-making and risk management skills, filling a gap in the existing research on SME risk management and high-tech SMEs in China. It also presents a detailed picture of high-tech software SMEs and their important contribution in China. Today, the overall unstable, unpredictable, and negative market environment from events such as COVID-19 greatly affects the normal development of SMEs and even threatens their survival. And in such a crisis-ridden environment, the judgement and decisions of the founder-entrepreneur can significantly determine the success or failure of an SME. Due to their important role in SMEs, founder-entrepreneurs tend to have an active role in market analysis and decision-making and are generally responsible for developing risk strategies. The findings from this study build an in-depth picture of how SMEs are coping with risks, including the challenges of COVID-19, and how their founder-entrepreneurs are working towards addressing them. For founder-entrepreneurs, how to face the challenges of the post-COVID-19 period is now an important question that needs to be considered.

This study has implications for SME entrepreneurs, small businesses, policymakers, and researchers. Firstly, this study highlights the importance of risk management among SMEs. It discusses some of the common risks faced by SMEs and presents some of the strategies that have been successfully used by some high-tech SMEs in China. For researchers, SME entrepreneurs and businesses, the findings from this study could act as a useful reference. Through this study, other entrepreneurs may gain useful insights on the risk strategies of Chinese high-tech software SMEs. Secondly, the findings show how different personal characteristics of founder-entrepreneurs may influence their understanding of the market, their risk strategies, and their decision-making. As one of the first studies to look at Chinese high-tech SMEs and the impact of COVID-19, this study makes an important contribution to the literature on the pandemic and risk management. The findings can help other businesses to understand how to manage COVID-19-related risks and facilitate their development. It can also help policymakers to find ways to help support small businesses in such a complex environment.

The study found some limitations in existing policies in China to support and protect the innovation and IP rights of small businesses. So, there is a need for the Chinese government to consider and investigate these limitations and find ways to improve regulations so as to create a more stable environment for the business operation of SMEs.

Chapter 10. Limitations and Further Recommendations

Limitations exist in every research project. In this study, the following are the key limitations based on the nature of the research methodology and the duration of the PhD programme.

- This research utilised a case study approach using mainly qualitative interviews, focusing on nine Chinese high-tech SMEs to understand their risk management and the role of founder-entrepreneurs. Although this research approach allowed the researcher to focus in depth on each 'case' and to retain a holistic and real-world perspective, there were some general limitations. The findings of case studies are often questioned for their lack of generalisability. This limitation is also reflected in this research. Although the researcher conducted multiple case studies to increase the robustness and persuasiveness of the findings, the small number of cases might not be adequate to claim generalisability of the findings. In addition, all the cases involved in this study are Chinese high-tech software SMEs. The findings and results of this study may have certain specificities and limitations when applied to other type of SME. This study discussed different personal factors of the founder-entrepreneurs and their impact on entrepreneurial activities, risk strategies and decision-making. However, these findings are based on the perspectives of the nine founder-entrepreneurs who participated in this study. There might be other factors that could influence decision-making and risk activities, which can only be studied potentially through a large-scale study using a quantitative approach.
- Another common controversy about case studies relates to subjective bias. Those who are critical of case studies often argue that case study researchers tend to use a number of 'subjective' judgements to understand and interpret the data (Patton, 1987; Yin, 2018). In such cases, the researcher's conclusions and findings might have a tendency to confirm the researcher's preconceived notions (Flyvbjerg, 2006). To reduce any bias, the researcher used multiple sources of evidence and established a chain of evidence during the data collection. The researcher also followed all ethical guidelines and used different forms of evidence to construct reliable and valid cases. Although every effort has been made to report all the evidence fairly, due to the nature of case studies, the interpretation of some of the qualitative data may also be influenced by the analytical skills and experience of the researcher.
- To better assess the personality traits of founder-entrepreneurs, this study used the Big-

Five personality model, one of the most well-known and popular personality models to have been widely used in entrepreneurship research (see Table 2.3). However, in this research, to help participants better understand the content of the questionnaire and avoid bias caused by cultural differences, the researcher utilised the Chinese Big Five Personality Inventory (CBF-PI), edited by Wang, Dai and Yao (2010a, 2010b, 2021). Compared with the Revised Neo Personality Inventory (NEO-PI-R) (Boyle, Matthews and Saklofske, 2008), which is widely used in academic studies, the CBF-PI is more simplified. More importantly, it has been developed specifically to assess the Chinese personality, and thus is more suited to Chinese culture. However, it also has its limitations. Although the editors have already determined the inventory's reliability and validity, and it has been utilised in some academic research, it is still a relatively new inventory for entrepreneurship research.

- One of the important parts of this study is that it explored the impact of COVID-19 on the development of Chinese high-tech software SMEs, discussing the risks they face and the strategies they have adopted in this particular period. Based on the analysis, the researcher pointed out that some participants' risk attitudes have changed after experiencing the COVID-19 outbreak and that these changes are very likely to influence the risk strategies of companies in the future. However, conducting further study on this is outside the scope and feasibility of the PhD project due to its limited timeline.

Based on the results and limitations of this study, further research could explore the following themes:

- Firstly, this study explores the risk management in Chinese high-tech software SMEs and the important role of founder-entrepreneurs in the development of risk strategies in these companies. However, existing studies have indicated that risk management structures and approaches may vary for SMEs in different sectors (e.g. Willquist and Törner, 2003; Rahman and Samin, 2021; Beqiri, 2020). Therefore, in further studies, researchers could focus on other industries to see what risks they face and how different their strategies are for risk management.
- Secondly, in this study, some personality factors, including entrepreneurial motivation, personality traits, and skills were discussed. However, these findings are based on case studies. As mentioned earlier, this research approach is limited due to its qualitative nature. Further studies could use some quantitative research methods, using large-scale surveys to get a more comprehensive data so as to generalise the findings and shed more light on the factors that influence entrepreneurs' risk and decision-making skills.
- In this study, the researcher compared the personality traits of founder-entrepreneurs with

comparison group, consisting mainly of students. While this comparison reflects to some extent the specific personality traits of entrepreneurs, in future studies, researchers may consider comparing entrepreneurs with people who have some social experience in organisations, such as managers.

- Regarding the study of COVID-19, as it was limited by the length of the PhD project, this study could only comment on the short-term impact of COVID-19 on Chinese high-tech software SMEs. Further research could explore the long-term impact of COVID-19 on SMEs, and in particular the Chinese high-tech software industry.

Reference list

- Abdulsaleh, A. M. and Worthington, A. C. (2013) 'Small and Medium-Sized Enterprises Financing: A Review of Literature', *International Journal of Business and Management*, 8(14). doi: 10.5539/ijbm.v8n14p36.
- Abid, T., Altal, M., Yousaf, U. and Bagram, M. M. M. (2012) 'Entrepreneur as an authentic leader: A study of small and medium sized enterprises in Pakistan', *Management Science Letters*, 2(7), pp. 2355–2360. doi: 10.5267/j.msl.2012.08.007.
- Abimbola, O. A. and Kolawole, O. A. (2017) 'Effect of Working Capital Management Practices on the Performance of Small and Medium Enterprises in Oyo State, Nigeria', *Asian Journal of Economics, Business and Accounting*, 3(4), pp. 1–8. doi: 10.9734/AJEBA/2017/35237.
- Acharyya, M. (2010) 'The role of operational risk and strategic risk in the enterprise risk management framework of financial services firms', *International Journal of Services Sciences*, 3(1), p. 79. doi: 10.1504/ijssci.2010.029865.
- Adam, N. A. and Alarifi, G. (2021) 'Innovation practices for survival of small and medium enterprises (SMEs) in the COVID-19 times: the role of external support', *Journal of Innovation and Entrepreneurship*. *Journal of Innovation and Entrepreneurship*, 10(1). doi: 10.1186/s13731-021-00156-6.
- Ahmad, H. M. (2010) 'Personality Traits among Entrepreneurial and Professional CEOs in SMEs', *International Journal of Business and Management*, 5(9), pp. 203–213. Available at: www.ccsenet.org/ijbm.
- Ahmad, N. H., Wilson, C. and Kummerow, L. (2011) 'Assessing the Dimensionality of Business Success: The Perspectives of Malaysian SME Owner-Managers', *Journal of Asia-Pacific Business*, 12(3), pp. 207-224.
- Alquier, A. M. B. and Tignol, M. H. L. (2006) 'Risk management in small- and medium-sized enterprises', *Production Planning and Control*, 17(3), pp. 273–282. doi: 10.1080/09537280500285334.
- Alrashidi, A. and Baakeel, O. (2012) 'The Impact of Operational Risk Management on the Financial Development and Economic Growth', *European Journal of Business and Management*, 4(5), pp. 15–21.
- Altinay, L. and Altinay, M. (2004) 'The influence of organisational structure on entrepreneurial orientation and expansion performance', *International Journal of Contemporary Hospitality Management*, 16(6), pp. 334–344. doi: 10.1108/09596110410550770.
- Altman, E. I. and Sabato, G. (2007) 'Modelling credit risk for SMEs: Evidence from the U.S. market', *Abacus*, 43(3), pp. 332–357. doi: 10.1111/j.1467-6281.2007.00234.x.

- Alves, J. C., Cheng, T. L., YuBo, L and Wei, H, (2020) 'Crisis Management for Small Business during the COVID-19 Outbreak: Survival, Resilience and Renewal Strategies of Firms in Macau', *Research Square*, pp. 1–29.
- Amit, R. and Muller, E. (1995) "'Push" and "Pull" entrepreneurship', *Journal of Small Business and Entrepreneurship*, 12(4), pp. 64–80.
- Antoncic, B., Kregar, T.B., Singh, G. and DeNoble, A.F. (2015) 'The Big Five Personality-Entrepreneurship Relationship: Evidence from Slovenia', *Journal of Small Business Management*, 53(3), pp. 819–841. doi: 10.1111/jsbm.12089.
- Attali, M.O. and Yemini, M. (2017) 'Initiating consensus: stakeholders define entrepreneurship in education', *Educational Review*. Routledge, 69(2), pp. 140–157. doi: 10.1080/00131911.2016.1153457.
- Audretsch, D. B. and Keilbach, M. (2004) 'Entrepreneurship capital and economic performance', *Regional Studies*, 38(8), pp. 949–959. doi: 10.1080/0034340042000280956.
- Awwad, M. S. and Al-Aseer, R. M. N. (2021) 'Big Five personality traits impact on entrepreneurial intention: the mediating role of entrepreneurial alertness', *Asia Pacific Journal of Innovation and Entrepreneurship*, 15(1), pp. 87–100. doi: 10.1108/apjie-09-2020-0136.
- Ayyagari, M., Beck, T. and Demircuc-Kunt, A. (2007) 'Small and medium enterprises across the globe', *Small Business Economics*, 29(4), pp. 415–434. doi: 10.1007/s11187-006-9002-5.
- Ayyagari, M., Demircuc-Kunt, A. and Maksimovic, V. (2011) 'Small vs. young firms across the world: contribution to employment, job creation, and growth', *World Bank Policy Research Working Paper Series*, (April), pp. 1–57. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1807732.
- Banerjee, R. (2014) 'SMEs, Financial Constraints and Growth', *BIS Working Paper*, (475).
- Barba-Sánchez, V. and Atienza-Sahuquillo, C. (2017) 'Entrepreneurial motivation and self-employment: evidence from expectancy theory', *International Entrepreneurship and Management Journal*. *International Entrepreneurship and Management Journal*, 13(4), pp. 1097–1115. doi: 10.1007/s11365-017-0441-z.
- Barrick, M. R. and Mount, M. K. (1993) 'Autonomy as a Moderator of the Relationships Between the Big Five Personality Dimensions and Job Performance', *Journal of Applied Psychology*, 78(1), pp. 111–118.
- Barrick, M. R., Mount, M. K. and Judge, T. A. (2001) 'Personality and Performance at the Beginning of the New Millennium: What Do We Know and Where Do We Go Next?', *International Journal of Selection and Assessment*, 9(1/2), pp. 9–30.
- Bartik, A., Bertrand, M., Cullen, Z.B., Cullen, E. L., Luca, M. and Stanton, C.T. (2020) 'How Are Small Businesses Adjusting to COVID-19? Early Evidence From a Survey', *SSRN Electronic Journal*. doi: 10.2139/ssrn.3570896.
- Bayaga, A. and Flowerday, S. (2010) 'A conceptual operational risk model for SMEs: Impact on organisational information technology', *Proceedings of the 2010 Information Security for South Africa Conference, ISSA 2010*. IEEE. doi: 10.1109/ISSA.2010.5588329.

- Beck, T., Demirgüç-Kunt, A. and Levine, R. (2005) *SMEs, Growth, and Poverty*. Cambridge. Available at: <http://www.nber.org/papers/w11224>.
- Belás, J. Ključnikov, A., Vojtovič, S. and Sobeková-Májková, M. (2015) 'Approach of the SME entrepreneurs to financial risk management in relation to gender and level of education', *Economics and Sociology*, 8(4), pp. 32–42. doi: 10.14254/2071-789X.2015/8-4/2.
- Bell, E., Bryman, A. and Harley, B. (2019) *Business research method*. 5th edn. Oxford: Oxford University Press.
- Beqiri, T. (2020) 'Health and safety at SMEs', *Quality - Access to Success*, 21(177), pp. 147–151.
- Bergner, S., Auburger, J. and Paleczek, D. (2021) 'The why and the how: A nexus on how opportunity, risk and personality affect entrepreneurial intention', *Journal of Small Business Management*. Routledge, 00(00), pp. 1–34. doi: 10.1080/00472778.2021.1934849.
- Bhide, A. (1996) 'The questions every entrepreneur must answer', *Harvard Business Review*, 74(November-December), pp. 120–130.
- Blazyte, A. (2022) *Number of small to medium-sized enterprises in China from 2012 to 2020 (in millions)**. [Online], Available at: <https://www.statista.com/statistics/783899/china-number-of-small-to-medium-size-enterprises/> [Accessed: 10 June 2022].
- Block, J., Sandner, P. and Spiegel, F. (2010) 'Do risk attitudes differ within the group of entrepreneurs?', *Academy of Management 2010 Annual Meeting - Dare to Care: Passion and Compassion in Management Practice and Research, AOM 2010*, (17587). doi: 10.5465/ambpp.2010.54497156.
- Block, J., Sandner, P. and Spiegel, F. (2015) 'How do risk attitudes differ within the group of entrepreneurs? The role of motivation and procedural utility', *Journal of Small Business Management*, 53(1), pp. 183–206. doi: 10.1111/jsbm.12060.
- Blome, C., Schoenherr, T. and Eckstein, D. (2014) 'The impact of knowledge transfer and complexity on supply chain flexibility: A knowledge-based view', *International Journal of Production Economics*. Elsevier, 147(PART B), pp. 307–316. doi: 10.1016/j.ijpe.2013.02.028.
- Bogna, F., Dell, G. and Raineri, A. (2018) 'Incorporating internal context into the design of occupational health and safety research and intervention programmes in SMEs', *Small Enterprise Research*. Taylor & Francis, 25(2), pp. 168–182. doi: 10.1080/13215906.2018.1479292.
- Booltink, L. W. A. and Saka-Helmhout, A. (2018) 'The effects of R&D intensity and internationalization on the performance of non-high-tech SMEs', *International Small Business Journal: Researching Entrepreneurship*, 36(1), pp. 81–103. doi: 10.1177/0266242617707566.
- Booth, A. L. and Nolen, P. (2012) 'Gender differences in risk behaviour: Does nurture matter?', *Economic Journal*, 122(558), pp. 56–78. doi: 10.1111/j.1468-0297.2011.02480.x.
- Borrego, M., Douglas, E. P. and Amelink, C. T. (2009) 'Quantitative, qualitative, and mixed research methods in engineering education', *Journal of Engineering Education*, 98(1), pp. 53–66. doi: 10.1002/j.2168-9830.2009.tb01005.x.
- Bourlès, R. and Cozarenco, A. (2018) 'Entrepreneurial motivation and business performance: evidence from a French Microfinance Institution', *Small Business Economics*, 51(4), pp. 943–963. doi: 10.1007/s11187-017-9961-8.

- Boyle, G. J. (1995) 'Myers-Briggs Type Indicator (MBTI): Some Psychometric Limitations', *Australian Psychologist*, 30(1), pp. 71–74. doi: 10.1111/j.1742-9544.1995.tb01750.x.
- Boyle, G. J., Matthews, G. and Saklofske, D. H. (2008) 'The Revised NEO Personality Inventory (NEO-PI-R)', *The SAGE Handbook of Personality Theory and Assessment: Volume 2 - Personality Measurement and Testing*, 2, pp. 1–717. doi: 10.4135/9781849200479.
- Bozionelos, N. (2004) 'The big five of personality and work involvement', *Journal of Managerial Psychology*, 19(1), pp. 69–81. doi: 10.1108/02683940410520664.
- Brandstätter, H. (2011) 'Personality aspects of entrepreneurship: A look at five meta-analyses', *Personality and Individual Differences*, 51(3), pp. 222–230. doi: 10.1016/j.paid.2010.07.007.
- Britzelmaier, B., Häberle, M. and Landwehr, M. (2015) 'Risk management in German small and medium-sized enterprises', *International Journal of Entrepreneurship and Small Business*, 24(4), pp. 548–571. doi: 10.1504/IJESB.2015.068642.
- Brockhaus, R. H. (1980) 'the Effect of Job Dissatisfaction on the Decision To Start a Business.', *Journal of Small Business Management*, 18(1), pp. 37–43.
- Bromiley, P., Rau, D. and McShane, M. (2015) 'Can strategic risk management contribute to enterprise risk management? A strategic management perspective', *The Routledge Companion to Strategic Risk Management*, pp. 140–156. doi: 10.4324/9781315780931-19.
- British Bankers' Association (BBA), International Swaps and Derivatives Association, PricewaterhouseCoopers LLP., RMA (1999), *Operational Risk- The next frontier*. London: RMA.
- Brockhaus, R.H. and P.S. Horwitz (1986) 'The psychology of the entrepreneur', In D.L. Sexton & R.W. Smilor (eds.) *The Art and Science of Entrepreneurship*, Cambridge, MA: Ballinger, 25-48.
- Brunninge, O., Nordqvist, M. and Wiklund, J. (2007) 'Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams', *Small Business Economics*, pp. 295–308. doi: 10.1007/s11187-006-9021-2.
- Brustbauer, J. (2014) 'Enterprise risk management in SMEs: Towards a structural model', *International Small Business Journal: Researching Entrepreneurship*, 34(1), pp. 70–85. doi: 10.1177/0266242614542853.
- Brustbauer, J. (2016) 'Enterprise risk management in SMEs: Towards a structural model', *International Small Business Journal: Researching Entrepreneurship*, 34(1), pp. 70–85. doi: 10.1177/0266242614542853.
- Bruyat, C. and Julien, P.-A. (2000) 'Defining the field of entrepreneurship', *Journal of Business Venturing*, 16(99), pp. 165–180. doi: 10.1016/S0883-9026(99)00043-9.
- Bryman, A. (2003) *Quantity and Quality in Social Research, Quantity and Quality in Social Research*. doi: 10.4324/9780203410028.
- Buculescu, M. M. (2013) 'Harmonization process in defining small and medium-sized enterprises. Arguments for a quantitative definition versus a qualitative one', *Theoretical and Applied Economics*, XX(9), pp. 103–114. Available at: <http://store.ectap.ro/articole/905.pdf>.
- Burnard, P. Gill, P., Stewart, K., Treasure, E. and Chadwick, B. (2008) 'Analysing and presenting qualitative data', *British Dental Journal*, 204(8), pp. 429–432. doi: 10.1038/sj.bdj.2008.292.

- Burrell, N. A. and Gross, C. (2017) 'Quantitative Research', in Allen, M. (ed.) *The SAGE Encyclopedia of Communication Research Methods*. Thousand Oaks: SAGE Publications, Inc, pp. 1378–1380. doi: 10.4135/9781483381411.
- Buttner, E. H. and Moore, D. P. (1997) 'Women's organizational exodus to entrepreneurship: Self-reported motivations and correlates with success', *Journal of Small Business Management*, (January 35.1), pp. 34–46.
- Bygrave, W. and Zacharakis, A. (2010) *Entrepreneurship*. 2nd edn, John Wiley & Sons, Inc. 2nd edn. Available at: Hoboken.
- Cambridge Dictionary (2019) *Meaning of Entrepreneur in English*, [Online] Available at: <https://dictionary.cambridge.org/dictionary/english/entrepreneur> [Accessed 27 2019].
- Cantillon, R. (1755) *An Essay on Commerce in General, Essay on the Nature of Commerce in General*.
- Carland, J. W. I., Carland, J. W. J., Carland, J. A. C., and Pearce, J. W. (1995) 'Risk taking propensity among entrepreneurs, small business owners and managers', *Journal of Business and Entrepreneurship*, 7(1), pp. 15-.
- Carraher, S. M., Buchanan, J. K. and Puia, G. (2010) 'Entrepreneurial Need for Achievement in China, Latvia, and the USA', *Baltic Journal of Management*, 5(3), pp. 378–396. doi: 10.1108/17465261011079767.
- Carree, M. A. and Verheul, I. (2012) 'What Makes Entrepreneurs Happy? Determinants of Satisfaction Among Founders', *Journal of Happiness Studies*, 13(2), pp. 371–387. doi: 10.1007/s10902-011-9269-3.
- Carsrud, A. and Brännback, M. (2011) 'What Do We Still Need to Know?', *Journal of Small Business Management* 2011, 49(1), pp. 9–26. doi: 10.1111/j.1540-627X.2010.00312.x.
- Cassell, C., Cunliffe, A. L. and Grandy, G. (2018) *The SAGE Handbook of Qualitative Business and Management Research Methods*. Edited by K. Smy. London: SAGE.
- Casualty Actuarial Society (2003) *Overview of Enterprise Risk Management, The CAS Enterprise Risk Management Committee*. doi: 10.1002/9781118386699.ch1.
- CCTV (2022) *Focus on Employment of University Graduates | Localities increase policy support to support SMEs to absorb more graduates*. [Online] Available at: <http://news.cctv.com/2022/06/12/ARTIkxz4Rbm6sLhRKOkC8Bxc220612.shtml> [Accessed 16 June 2022].
- Chakravarthy, B. and Lorange, P. (2008) 'Driving renewal: The entrepreneur-manager', *Journal of Business Strategy*, 29(2), pp. 14–21. doi: 10.1108/02756660810858116.
- Chan, K. Y. Uy, M. A., Chernyshenko, O. S., Ho, M. R. and Sam, Y. (2015) 'Personality and entrepreneurial, professional and leadership motivations', *Personality and Individual Differences*. Elsevier Ltd, 77, pp. 161–166. doi: 10.1016/j.paid.2014.12.063.
- Chandler, G. N. and Hanks, S. H. (1994) 'Founder Competence, the Environment, and Venture Performance', *Entrepreneurship Theory and Practice*, 18(3), pp. 77-89.

- Chapelle, A. (2019) *Operational Risk Management*. West Sussex: John Wiley & Sons, Ltd.
- Chapman, C. B. and Cooper, D. F. (1983) 'Risk analysis: Testing some prejudices', *European Journal of Operational Research*, 14(3), pp. 238–247. doi: 10.1016/0377-2217(83)90260-6.
- Cheng, Q., Kwok, C. L., Zhu, T., Guan, L. and Yip, P. S. F. (2015) 'Suicide communication on social media and its psychological mechanisms: An examination of chinese microblog users', *International Journal of Environmental Research and Public Health*, 12(9), pp. 11506–11527. doi: 10.3390/ijerph120911506.
- Chetty, R., Friedman, J. N., Hendren, N. and Stepner, M. (2020) 'How Did COVID-19 and Stabilization Policies Affect Spending and Employment? A New Real-Time Economic Tracker Based on Private Sector Data', *National Bureau of Economic Research*, 91(Working Paper 27431), pp. 1689–1699. Available at: <http://www.nber.org/papers/w27431>.
- China Centre for Promotion of SME Development (2019) *Yearbook of China Small and Medium Enterprises*. Beijing: Enterprise Management Publishing House.
- China Economic Network (2021) *Forging stronger resilience and promoting the innovation and development of small, medium and micro enterprises*. [Online] Available at: https://sme.miit.gov.cn/xwzx/jdxw/art/2021/art_6487cc049b40403e86a93b715977a597.html# [Accessed: 10 June 2022].
- Chiweshe, N. and Naude, M. (2017) 'A proposed operational risk management framework for small and medium enterprises', *South African Journal of Economic and Management Sciences*, 20(1), pp. 1–10.
- Clark, D. (2021) *Number of people employed by small and medium-sized enterprises (SMEs) in the United Kingdom from 2010 to 2021, by enterprise size*. [Online] Available at: <https://www.statista.com/statistics/936843/employment-by-smes-in-uk/> [Accessed 21 June 2022].
- Concordia, J. A. and Langford, M. (2000) 'THE FIVE-FACTOR MODEL OF PERSONALITY: ASSESSING ENTREPRENEURS AND MANAGERS', *Academy of Entrepreneurship Journal*, 6(1), pp. 6–17.
- Conger, J. A. (1998) 'Qualitative research as the cornerstone methodology for understanding leadership: Why qualitative research must play a pivotal role in leadership studies', *Leadership Quarterly*, 9(1), pp. 107–121.
- Conroy, G. and Soltan, H. (1998) 'ConSERV, a project specific risk management concept', *International Journal of Project Management*, 16(6), pp. 353–366. doi: [https://doi.org/10.1016/S0263-7863\(98\)00012-X](https://doi.org/10.1016/S0263-7863(98)00012-X).
- Cooney, T. M. (2005) 'Editorial: What is an entrepreneurial team?', *International Small Business Journal*, 23(3), pp. 226–235. doi: 10.1177/0266242605052131.
- Cravo, T. A., Gourlay, A. and Becker, B. (2012) 'SMEs and regional economic growth in Brazil', *Small Business Economics*, 38(2), pp. 217–230. doi: 10.1007/s11187-010-9261-z.
- Creswell, W. J. and Creswell, J. D. (2018) *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*, *Journal of Chemical Information and Modeling*. California.

- Crovini, C., Santoro, G. and Ossola, G. (2020) 'Rethinking risk management in entrepreneurial SMEs: towards the integration with the decision-making process', *Management Decision*, 59(5), pp. 1085–1113. doi: 10.1108/MD-10-2019-1402.
- Culkin, N. and Smith, D. (2000) 'An emotional business: a guide to understanding the motivations of small business decision takes. Qualitative Market Research', *Qualitative Market Research: An International Journal*, 3(3), pp. 145–157.
- Cunningham, J. and Lischeron, J. (1991) 'Defining Entrepreneurship', *Journal of small business management*, 29(1), p. 45.
- Cunningham, L. X. (2011) 'SMEs as motor of growth: A review of China's SMEs development in thirty years (1978-2008)', *Human Systems Management*, pp. 39–54. doi: 10.3233/HSM-2011-0736.
- Dawson, C. and Henley, A. (2012) "'Push" versus "pull" entrepreneurship: An ambiguous distinction?', *International Journal of Entrepreneurial Behaviour and Research*, 18(6), pp. 697–719. doi: 10.1108/13552551211268139.
- Deligianni, I., Sapouna, P., Voudouris, I. and Lioukas, S. (2022) 'An effectual approach to innovation for new ventures: The role of entrepreneur's prior start-up experience', *Journal of Small Business Management*. Routledge, 60(1), pp. 146–177. doi: 10.1080/00472778.2019.1698432.
- Diez, F., Duval, R., Fan, J., Garrido, J., Kalemli-Ozcan, S., Maggi, C., Martinez-Peria, M. and Pierri, N (2021) 'Insolvency Prospects Among Small-and-Medium-Sized Enterprises in Advanced Economies', *Staff Discussion Notes*, 2021(002). doi: 10.5089/9781513574561.006.
- Ding, D. and Zhang, R. (2022) 'China's COVID-19 Control Strategy and Its Impact on the Global Pandemic', *Frontiers in Public Health*, 10(March), pp. 1–10. doi: 10.3389/fpubh.2022.857003.
- Dollinger, M. J. (2008) *Entrepreneurship : strategies and resources*. Edited by L. Rubenstein. Lombard, Illinois U.S.A.: MARSH PUBLICATIONS.
- Driessen, M. P. and Zwart, P. S. (2006) 'The Entrepreneur Scan Measuring Characteristics and Traits of Entrepreneurs', *Maandblad voor Accountancy en Bedrijfseconomie*, (juli/augustus), pp. 382–391.
- Drucker, F. P. (1985) *Innovation and Entrepreneurship: Practice and Principles*. 1st ed London: Routledge.
- Druckman, D. and Bjork, R. A. (1991) *In the mind's eye: enhancing human performance*. Washington, D.C.: National Academy Press.
- Easterby-Smith, M., Thorpe, R. and Jackso, P. R. (2015) *Management and Business Research*. Edited by K. Smy. London: Sage Publications Ltd.
- Ellegaard, C. (2008) 'Supply risk management in a small company perspective', *Supply Chain Management*, 13(6), pp. 425–434. doi: 10.1108/13598540810905688.
- Emblemsvåg, J. and Kjølstad, E. L. (2002) 'Strategic risk analysis – a field version', *Management Decision*, 40(9), pp. 842–852. doi: 10.1108/00251740210441063.

Epstein, M. J. and Buhovac, A. R. (2006) *The reporting of organizational risks for internal and external decision making*, *The Society of Management Accountants of Canada and The American Institute of Certified Public Accountants*. Available at: http://www.zdruzenje-ni.si/db/doc/upl/risk_reporting_epstein_rejc_buhovac.pdf.

EU Publications Office (2015) *The SME definition*, *Publications Office of the European Union*,. doi: 10.2873/782201.

European Commission (2009) *Commission Staff Working Document. Luxembourg*. [Online] Available at: http://ec.europa.eu/competition/antitrust/sector_inquiry_swd_en.pdf [Accessed 17 July 2019]

European Commission (2022) *Entrepreneurship and small and medium-sized enterprises (SMEs)*. [Online] Available at: [https://ec.europa.eu/growth/smes_en#:~:text=Small%20and%20medium%2D-sized%20enterprise%20\(SMEs\)%20are%20the%20backbone,every%20sector%20of%20the%20economy](https://ec.europa.eu/growth/smes_en#:~:text=Small%20and%20medium%2D-sized%20enterprise%20(SMEs)%20are%20the%20backbone,every%20sector%20of%20the%20economy). [Accessed: 10 June 2022].

EU SME Centre (2018) *EU SMEs in China Policy Environment Report. Luxembourg*. [Online] Available at: <http://www.eusmecentre.org.cn/article/smes-china-policy-environment-report-2019-update> [Accessed 10 7 2019]

Fernandes, N. (2020) 'Economic effects of coronavirus outbreak (COVID-19) on the world economy Nuno Fernandes Full Professor of Finance IESE Business School Spain', *SSRN Electronic Journal*, ISSN 1556-5068, Elsevier BV, pp. 0–29.

Festing, M., Harsch, K., Schäfer, L. and Scullion, H. (2017) *Talent Management in Small- and Medium-Sized Enterprises*. Edited by D. G. Collings, K. Mellahi, and W. F. Cascio. Oxford University Press. doi: 10.1093/oxfordhb/9780198758273.013.13.

Filion, L. J. (2021) 'Defining the entrepreneur', in Dana, L. P. (ed.) *World Encyclopedia of Entrepreneurship*. Second Edi. Edward Elgar Publishing, pp. 72–83. doi: 10.5860/choice.50-0057.

Florio, C. and Leoni, G. (2017) 'Enterprise risk management and firm performance: The Italian case', *British Accounting Review*. Elsevier Ltd, 49(1), pp. 56–74. doi: 10.1016/j.bar.2016.08.003.

Flyvbjerg, B. (2006) 'Five misunderstandings about case-study research', *Qualitative Inquiry*, 12(2), pp. 219–245. doi: 10.1177/1077800405284363.

Funston, R. (2004) Avoiding the value killers. *Treasury and Risk Management*, Issue April, p. 11.

Furnham, A. (1996) 'The big five versus the big four: the relationship between the Myers-Briggs Type Indicator (MBTI) and NEO-PI five factor model of personality', *Personality and Individual Differences*, 21(2), pp. 303–307. doi: 10.1016/0191-8869(96)00033-5.

Franco, M., Santos, M. F., Ramalho, I. and Nunes, C. (2014) 'An exploratory study of entrepreneurial marketing in SMEs', *Journal of Small Business and Enterprise Development*, 21(2), pp. 265–283. doi: 10.1108/jsbed-10-2012-0112.

Fraser, J. and Simkins, B. J. (2010) *Enterprise Risk Management*. Edited by J. Fraser and B. J. Simkins. John Wiley & Sons, Inc.

- Gao, S. S., Sung, M. C. and Zhang, J. (2013) 'Risk management capability building in SMEs: A social capital perspective', *International Small Business Journal*, 31(6), pp. 677–700. doi: 10.1177/0266242611431094.
- Gao, Y. Zhang, D., Ma, H. and Du, X. (2020) 'Exploring Creative Entrepreneurs' IEO: Extraversion, Neuroticism and Creativity', *Frontiers in Psychology*, 11(August), pp. 1–12. doi: 10.3389/fpsyg.2020.02170.
- García, A. B. (2014) 'Analyzing the determinants of entrepreneurship in European cities', *Small Business Economics*, 42(1), pp. 77–98. doi: 10.1007/s11187-012-9462-8.
- Gartner, W. B. (1988) "'Who Is an Entrepreneur?' Is the Wrong Question", *American Journal of Small Business*, 12(4), pp. 11–32. Available at: <https://academic.oup.com/jcem/article-lookup/doi/10.1210/jc.2003-031037>.
- Garwe, D. K. and Fatoki, O. (2012) 'The impact of gender on SME characteristics and access to debt finance in South Africa', *Development Southern Africa*, 29(3), pp. 448–461. doi: 10.1080/0376835X.2012.706040.
- Gibson, T. and Vaart, H. J. va. der (2008) *Defining SMEs: A Less Imperfect Way of Defining Small and Medium Enterprises in Developing Countries*, *Brookings Institute Web*.
- Gilad, B. and Levine, P. (1986) 'A Behavioral Model of Entrepreneurial Supply', *Journal of Small Business Management*, p. 45.
- Gong, X. Long, B., Fang, K., Di, Z., Hou, Y. and Cao, L. (2016) 'A prediction based on clustering and personality questionnaire data for IGD risk: A preliminary work', in *2016 12th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery, ICNC-FSKD 2016*. IEEE, pp. 1699–1703. doi: 10.1109/FSKD.2016.7603433.
- Gorgievski, M. J., Ascalon, M. E. and Stephan, U. (2011) 'Small Business Owners' Success Criteria, a Values Approach to Personal Differences', *Journal of Small Business Management*, 49(2), pp. 207–232.
- Gorzeń-Mitka, I. (2015) 'Risk Management in Small and Medium – Sized Enterprises: a Gender-Sensitive Approach', *Problems of Management in the 21st Century*, 10(2), pp. 77–87. doi: 10.33225/pmc/15.10.77.
- Gourinchas, P. O., Kalemli-Özcan, Ş., Penciakova, V. and Sander, N. (2020) 'COVID-19 and SME Failures', *NBER Working Paper*, No. 27877. Available at: <http://www.nber.org/papers/w27877.pdf>.
- Govori, A. (2013) 'Factors affecting the growth and development of SMEs: Experiences from Kosovo', *Mediterranean Journal of Social Sciences*, 4(9), pp. 701–708. doi: 10.5901/mjss.2013.v4n9p701.
- GOV.CN (2022) *The need for "dynamic zeroing" as interpreted by leading experts*. [Online] Available at: http://www.gov.cn/xinwen/2022-04/16/content_5685474.htm [Accessed: 18 4 2022].
- GOV.UK (2012) *Mid-sized business*. [Online] Available at: <https://www.gov.uk/government/collections/mid-sized-businesses> [Accessed: 22 5 2019].

- GOV.UK (2017) *Innovation loans: what they are and how to apply*. [Online] Available at: <https://www.gov.uk/guidance/innovation-loans-what-they-are-and-how-to-apply> [Accessed 19 June 2022].
- GOV.UK (2022) *Coronavirus (COVID-19)*. [Online] Available at: <https://www.gov.uk/coronavirus> [Accessed 16 6 2022].
- Guan, W. J. and Zhong, N. S. (2022) 'Strategies for reopening in the forthcoming COVID-19 era in China', *National Science Review*, 9(3), pp. 4–5. doi: 10.1093/nsr/nwac054.
- Guertler, B. and Spinler, S. (2015) 'When does operational risk cause supply chain enterprises to tip? A simulation of intra-organizational dynamics', *Omega (United Kingdom)*. Elsevier, 57, pp. 54–69. doi: 10.1016/j.omega.2015.03.005.
- Gundolf, K., Gast, J. and Géraudel, M. (2017) 'Startups' innovation behaviour: an investigation into the role of entrepreneurial motivation', *International Journal of Innovation Management*, 21(7), pp. 1–26. doi: 10.1142/S1363919617500542.
- Haimes, Y. Y. (2009) 'On the Complex Definition of Risk: A Systems-Based Approach', *Risk Analysis*, 12(29), pp. 1647–1654.
- Han, X., Cao, Y., Jiang, N., Chen, Y., Alwalid, O., Zhang, X., Gu, J., Dai, M., Liu, J., Zhu, W., Zheng, C. and Shi, H. (2020) 'Novel Coronavirus Disease 2019 (COVID-19) Pneumonia Progression Course in 17 Discharged Patients: Comparison of Clinical and Thin-Section Computed Tomography Features During Recovery', *Clinical Infectious Diseases*, 71(15), pp. 723–731. doi: 10.1093/cid/ciaa271.
- Hangzhou eConage Technology Co.,Ltd. (2020) *ECM Collaborative Office (OA) and Collaborative Management Platform*. [Online] Available at: <http://www.worksite.com.cn/en/Productecm.html> [Accessed 9 November 2021].
- He, C. (2018) *Risk management in SMEs using data mining methods with financial and non-financial indicators*.
- He, J. and Ma, K. (2021) 'Enterprise Financial Risk Management and Control', *ACM International Conference Proceeding Series*, pp. 393–396. doi: 10.1145/3452446.3452547.
- Henschel, T. (2006) 'Risk management practices in German SMEs: An empirical investigation', *International Journal of Entrepreneurship and Small Business*, 3(5), pp. 554–571. doi: 10.1504/IJESB.2006.010543.
- Herriott, R. E. and Firestone, W. A. (1983) 'Multisite Qualitative Policy Research: Optimizing Description and Generalizability', *Educational Researcher*, 12(2), pp. 14–19. doi: 10.3102/0013189X012002014.
- High Technology Industry Development Center of China (2018), *Measures for handling corporate income tax preferential policies*. [Online] Available at: <http://www.innofund.gov.cn/zxqyfw/zcfg/201804/9488b8b9a08f47828ba050d8d61b3f02.shtml> [Accessed 6 July 2019]
- Hisrich, R. D. and Brush, C. (1984) 'The woman entrepreneur: Management skills and business problems', *Journal of Small Business Management*, 22(May), pp. 30–37. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1505240.

- Holton, G. A. (2004) 'Defining risk', *Financial Analysts Journal*, 60(6), pp. 19–25. doi: 10.2469/faj.v60.n6.2669.
- Horcher, K. A. (2005) *Essentials of Financial Management.*, John Wiley & Sons, Inc. Hoboken, New Jersey. doi: 10.2307/2977273.
- Hoselitz, B. F. (1951) 'The Early History of Entrepreneurial Theory', *Explorations in Entrepreneurial History*, 3(4), pp. 193–220.
- Hough, L. M., Eaton, N. K., Dunnette, M. D., Kamp, J. D. (1990) 'Criterion-Related Validities of Personality Constructs and the Effect of Response Distortion on Those Validities', *Journal of Applied Psychology*, 75(5), pp. 581–595.
- Howard, P. J. and Howard, J. M. (1995) 'The Big Five Quickstart: An Introduction to the Five-Factor Model of Personality For Human Resource Professionals', *Center for Applied Cognitive Studies.*, p. 21.
- Huang, Y., Baruah, B. and Ward, A. Tony (2021) 'How Chinese High-tech SMEs are coping with COVID-19 related risks?', in Tipurić, D. and Cindrić, L. (eds) *9th International OFEL Conference on Governance, Management and Entrepreneurship - Building Resilient Boards: Facing Emerging Challenges in Corporate Governance*. Dubrovnik, Croatia: OFEL international conference, pp. 63–78.
- Huisman, D., and W. J. De Ridder. (1984) '*Vernieuwend Ondernemen*', Innovative Business. Utrecht: SMO.
- Hussein, S. N. A. and Abdel, H. H. (2017) 'The big five personality dimensions as a predictor of entrepreneurial status in Egypt', *International Journal of Entrepreneurship and Small Business*, 32(4), pp. 423–443. doi: 10.1504/IJESB.2017.087830.
- Hutton, G. and Ward, M. (2021) *Business Statistics*, House of Commons Library. London.
- Islam, A. and Tedford, D. (2012) 'Risk determinants of small and medium-sized manufacturing enterprises (SMEs) - an exploratory study in New Zealand', *Journal of Industrial Engineering International*, 8(1), pp. 1–13. doi: 10.1186/2251-712X-8-12.
- Islam, M. A., Tedford, J. D. and Haemmerle, E. (2008) 'Managing operational risks in Small- and Medium-Sized Enterprises (SMEs) engaged in manufacturing - An integrated approach', *International Journal of Technology, Policy and Management*, 8(4), pp. 420–441. doi: 10.1504/IJTPM.2008.020167.
- Ismail, I., Husin, N., Rahim, N. A., Mat, R. C. and Kamal, M. H. M. (2016) 'Entrepreneurial Success Among Single Mothers: The Role of Motivation and Passion', *Procedia Economics and Finance*. Elsevier B.V., 37(16), pp. 121–128. doi: 10.1016/s2212-5671(16)30102-2.
- Jannati, S. and Khalaf, S. (2021) 'Running Small Businesses: Measuring the Impact of Household- and State-Level Conscientiousness on Entrepreneurship', *SSRN Electronic Journal*, June 22, p. 45. doi: 10.2139/ssrn.3871874.
- Janney, J. J. and Dess, G. G. (2006) 'The risk concept for entrepreneurs reconsidered: New challenges to the conventional wisdom', *Journal of Business Venturing*, 21(3), pp. 385–400. doi: 10.1016/j.jbusvent.2005.06.003.

- Janowski, A. and Szczepańska-Przekota, A. (2022) 'The Trait of Extraversion as an Energy-Based Determinant of Entrepreneur's Success—The Case of Poland', *Energies*, 15(13), pp. 1–21. doi: 10.3390/en15134533.
- Jansen, R. J. G., Curşeu, P. L., Vermeulen, P. A. M., Geurts, J. L. A., and Gibcus, P. (2013) 'Information processing and strategic decision-making in small and medium-sized enterprises: The role of human and social capital in attaining decision effectiveness', *International Small Business Journal*, 31(2), pp. 192–216. doi: 10.1177/0266242611406762.
- Jasmine, M., Ravivarman, G., Vinoth, G. C. and Buvnesh K. (2021) 'Prevalence and Pattern of Musculoskeletal Problem among Software Engineers in a Private Firm, Chennai- A Cross Sectional Study', *Indian Journal of Public Health Research & Development*, 12(1), pp.517-523. doi: 10.37506/ijphrd.v12i1.13899
- Jennings, P. and Beaver, G. (1997) 'The Performance and Competitive Advantage of Small Firms: A Management Perspective', *International Small Business Journal*, 15(2), pp. 63–75
- Jin, G. (2022) *Technology-based SMEs have a lot of potential*. [Online] Available at: http://paper.ce.cn/jjrb/html/2022-01/23/content_457033.htm [Accessed: 20 June 2022].
- John, O. P., Naumann, L. P. and Soto, C. J. (2008) 'Paradigm shift to the integrative Big Five Trait taxonomy: History, measurement, and conceptual issues', in *Handbook of personality: Theory and research*, pp. 114–158.
- Kaplan, S. and Garrick, B. J. (1981) 'On The Quantitative Definition of Risk', *Risk Analysis*, 1(1), pp. 11–27. doi: 10.1007/BF00134104.
- Katongole, C., Ahebwa, W. M. and Kawere, R. (2013) 'Enterprise success and entrepreneur's personality traits: An analysis of micro- and small-scale women-owned enterprises in Uganda's tourism industry', *Tourism and Hospitality Research*, 13(3), pp. 166–177. doi: 10.1177/1467358414524979.
- Kerr, S. P., Kerr, W. R. and Dalton, M. (2019) 'Risk attitudes and personality traits of entrepreneurs and venture team members', *Proceedings of the National Academy of Sciences of the United States of America*, 116(36), pp. 17712–17716. doi: 10.1073/pnas.1908375116.
- Kerr, S. P., Kerr, W. R. and Xu, T. (2018) 'Personality Traits of Entrepreneurs: A Review of Recent Literature', *Foundations and Trends® in Entrepreneurship*, 14(3), pp. 279–356. doi: 10.1561/03000000080.
- Khalique, M. (2011) 'Do Malaysia and Pakistan are Suitable for a Comparative Study of SMEs: An Intellectual Capital Perspective?', *Interdisciplinary Journal of Contemporary Research in Business*, 3(8), pp. 98–107.
- Kim, W. C. and Mauborgne, R. (2005) 'Value innovation: A leap into the blue ocean', *Journal of Business Strategy*, 26(4), pp. 22–28. doi: 10.1108/02756660510608521.
- Kim, Y. and Vonortas, N. S. (2014) 'Managing risk in the formative years: Evidence from young enterprises in Europe', *Technovation*. Elsevier, 34(8), pp. 454–465. doi: 10.1016/j.technovation.2014.05.004.

- Kirkwood, J. (2009) 'Motivational factors in a push-pull theory of entrepreneurship', *Gender in Management*, 24(5), pp. 346–364. doi: 10.1108/17542410910968805.
- Kirzner, I. M. (1973), *Competition and Entrepreneurship*. Chicago: The University of Chicago Press.
- Kirzner, I. M. (2009) 'The alert and creative entrepreneur: A clarification', *Small Business Economics*, 32(2), pp. 145–152. doi: 10.1007/s11187-008-9153-7.
- Knight, F. H. (1921) *Risk, Uncertainty and Profit*. Boston and New York: Houghton Mifflin Company.
- Kobe, K. and Schwinn, R. (2018) 'Small business GDP, 1998–2014', *Small Business Administration, Office of Advocacy*, (December). Available at: <https://cdn.advocacy.sba.gov/wp-content/uploads/2018/12/21060437/Small-Business-GDP-1998-2014.pdf>.
- Komla, A., Yawo, G. and Abankwa, R. (2014) 'Factors Influencing Risk Management Decision of Small and Medium Scale Enterprises in Ghana', *Contemporary Economics*, 8(4), pp. 397–414. Available at: <http://dx.doi.org/10.5709/ce.1897-9254.153>.
- Koolman, G. (1971) 'Say's Conception of the Role of the Entrepreneur', 38(151), pp. 269–286.
- Korunka, C., Frank, H., Lueger, M. and Mugler, J. (2003) 'The Entrepreneurial Personality in the Context of Resources, Environment, and the Startup Process— A Configurational Approach', *Entrepreneurship Theory and Practice*, 1 January, pp. 23–42.
- Kotaskova, A., Belas, J., Bilan, Y. and Khan, K. A. (2020) 'Significant Aspects of Managing Personnel Risk in the SME Sector', *Management and Marketing*, 15(2), pp. 203–218. doi: 10.2478/mmcks-2020-0013.
- Kozubíková, L., Belás, J., Bilan, Y. and Bartoš, P. (2015) 'Personal characteristics of entrepreneurs in the context of perception and management of business risk in the SME segment', *Economics and Sociology*, 8(1), pp. 41–54.
- Kozubíková, L., Dvorský, J., Cepel, M. and Balcerzak, A. P. (2017) 'Important characteristics of an entrepreneur in relation to risk taking: Czech Republic case study', *Journal of International Studies*, 10(3), pp. 220–233. doi: 10.14254/2071-8330.2017/10-3/16.
- Kuratko, D. F., (2014), *Entrepreneurship: Theory, Process, and Practice*. Mason, OH, USA: South Western Cengage Learning.
- Kuratko, D. F., Hornsby, J. S. and Naffziger, D. W. (1997) 'An examination of owner's goals in sustaining entrepreneurship', *Journal of Small Business Management*, 35(1), pp. 24–33.
- Langowitz, N. and Minniti, M. (2007) 'The Entrepreneurial Propensity of Women', *Entrepreneurship Theory and Practice*, 31(3), pp. 341–365. doi: 10.1111/j.1540-6520.2007.00177.x.
- Lau, A. (2020) 'New technologies used in COVID-19 for business survival: Insights from the Hotel Sector in China', *Information Technology and Tourism*. Springer Berlin Heidelberg, 22(4), pp. 497–504. doi: 10.1007/s40558-020-00193-z.
- Lee, J. and Kwon, H. B. (2017) 'Progressive performance modeling for the strategic determinants of market value in the high-tech oriented SMEs', *International Journal of Production Economics*. Elsevier, 183(October 2016), pp. 91–102. doi: 10.1016/j.ijpe.2016.10.014.

- Leutner, F., Ahmetoglu, G., Akhtar, R. and Chamorro-Premuzic, T. (2014) 'The relationship between the entrepreneurial personality and the Big Five personality traits', *Personality and Individual Differences*. Elsevier Ltd, 63, pp. 58–63. doi: 10.1016/j.paid.2014.01.042.
- Li, F. (2019) 'The financial management of small and medium-sized enterprises', *Guangdong Sericulture*, 53(2), pp. 32–33. doi: 10.3969/j.issn.2095-1205.2019.02.17
- Li, W. (2006) *Small and medium-sized enterprises are innovative and have obtained 65% of our domestic invention patents*. [Online]
Available at: http://www.gov.cn/jrzg/2006-02/04/content_177412.htm
[Accessed 20 June 2022].
- Lieberman-Yaconi, L., Hooper, T. and Hutchings, K. (2010) 'Toward a model of understanding strategic decision-making in micro-firms: Exploring the Australian information technology sector', *Journal of Small Business Management*, 48(1), pp. 70–95. doi: 10.1111/j.1540-627X.2009.00287.x.
- Lim, S. and Envick, B. R. (2013) 'Gender and entrepreneurial orientation: A multi-country study', *International Entrepreneurship and Management Journal*, 9(3), pp. 465–482. doi: 10.1007/s11365-011-0183-2.
- Lima, P. F. de A., Crema, M. and Verbano, C. (2020) 'Risk management in SMEs: A systematic literature review and future directions', *European Management Journal*. Elsevier Ltd, 38(1), pp. 78–94. doi: 10.1016/j.emj.2019.06.005.
- Little Ian, M., Mazumdar, D. and Page Jr, J. (1987) 'Small Manufacturing Enterprises: A Comparative Analysis of India and Other Economies', *Journal of Development Studies*. Oxford: Oxford University Press, April 1.
- Liu, G. (2022) *The Ministry of Science and Technology has shown hard and practical measures to support the innovation and development of science and technology-based SMEs*. [Online]
Available at: <http://finance.people.com.cn/n1/2022/0608/c1004-32441121.html>
[Accessed 18 10 2022].
- Lloyd-Reason, L. and Mughan, T. (2002) 'Strategies for internationalisation within SMEs: The key role of the owner-manager', *Journal of Small Business and Enterprise Development*, 9(2), pp. 120–129. doi: 10.1108/14626000210427375.
- Lönnqvist, J. E., Verkasalo, M., Walkowitz, G. and Wichardt, P. C. (2015) 'Measuring individual risk attitudes in the lab: Task or ask? An empirical comparison', *Journal of Economic Behavior and Organization*. Elsevier B.V., 119, pp. 254–266. doi: 10.1016/j.jebo.2015.08.003.
- López, L. O. and Hiebl, M. R. W. (2015) 'Management Accounting in Small and Medium-Sized Enterprises: Current Knowledge and Avenues for Further Research', *Journal of Management Accounting Research*, 27(1), pp. 81–119. doi: 10.2308/jmar-50915.
- Lowrance, W. W. (1980) 'The Nature of Risk', in *Societal Risk Assessment*. Boston, MA: Springer US, pp. 5–17. doi: 10.1007/978-1-4899-0445-4_1.
- Lu, L., Peng, J., Wu, J. and Lu, Y. (2021) 'Perceived impact of the Covid-19 crisis on SMEs in different industry sectors: Evidence from Sichuan, China', *International Journal of Disaster Risk Reduction*, 55(24). doi: 10.1016/j.ijdrr.2021.102085.

- Lu, Y., Wu, J., Peng, J. and Lu, L. (2020) 'The perceived impact of the Covid-19 epidemic: evidence from a sample of 4807 SMEs in Sichuan Province, China', *Environmental Hazards*, 19(4), pp. 323–340. doi: 10.1080/17477891.2020.1763902.
- Lundberg, T. and Melander, S. (2019) 'Key Push and Pull Factors Affecting Return to Work Identified by Patients With Long-Term Pain and General Practitioners in Sweden', *Qualitative Health Research*. doi: 10.1177/1049732319837227.
- Ma, Z., Liu, Y. and Gao, Y. (2021) 'Research on the impact of COVID-19 on Chinese small and medium-sized enterprises: Evidence from Beijing', *PLoS ONE*, 16(12 December), pp. 1–22. doi: 10.1371/journal.pone.0257036.
- MacCrimmon, K. R., Wehrung, D. A. and Stanbur, W. T. (1986) *Taking Risks: The Management of Uncertainty*. New York: Free Press.
- Machmud, S. and Sidharta, I. (2014) 'Entrepreneurial Motivation and Business Performance of SMEs in the SUCI Clothing Center, Bandung, Indonesia', *DLSU Business & Economics Review*, 25(2), pp. 63–78.
- Mador, M. (2000) 'Strategic Decision Making Process Research: Are Entrepreneur and Owner Managed Firms Different?', *Journal of Research in Marketing and Entrepreneurship*, 2(3), pp. 215–234. doi: 10.1108/14715200080001547.
- Maigida, J. F. and Saba, T. M. (2013) 'Entrepreneurial Skills in Technical Vocational Education and Training as A strategic Approach for Achieving Youth Empowerment in Nigeria', *International Journal of Humanities and Social Science*, 3(5), pp. 303–310.
- MAN, T. W. Y. and LAU, T. (2000) 'ENTREPRENEURIAL COMPETENCIES OF SME OWNER/MANAGERS IN THE HONG KONG SERVICES SECTOR: A QUALITATIVE ANALYSIS', *Journal of Enterprising Culture*, 08(03), pp. 235–254. doi: 10.1142/S0218495800000139.
- Mansor, N., Norbaya, S. Y. and Okazaki, K. (2016) 'Risk Factors Affecting New Product Development (Npd) Performance in Small Medium Enterprises (Smes)', *International Journal of Recent Research and Applied Studies*, 27(1), pp. 18–25. Available at: www.arpapress.com/Volumes/Vol27Issue1/IJRRAS_27_1_03.pdf.
- Masters, R. and Meier, R. (1988) 'Sex differences and risk-taking propensity of entrepreneurs', *Journal of small business management*, 26(1), pp. 31–35. doi: 10.1021/j100579a004.
- Mawardi, M. K. and Sujarwoto (2021) 'Risk-Taking Behavior and Entrepreneurship Intention in Indonesia', in *Proceedings of the 3rd Annual International Conference on Public and Business Administration (AICoBPA 2020)*, pp. 34–39. doi: 10.2991/aebmr.k.210928.008.
- Mazzarol, T. (2003) 'A model of small business HR growth management', *International Journal of Entrepreneurial Behaviour & Research*, 9(1), pp. 27–49. doi: 10.1108/13552550310461036.
- Mccarthy, B. (2000) 'The cult of risk taking and social learning: a study of Irish entrepreneurs', *Management Decision*, 38(8), pp. 563–574.
- McClelland, C. D. (1961) *The achieving society*. London: D. VAN Nostrand Company. Inc.
- McMullen, J. S. and Shepherd, D. A. (2006) 'Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur', *A Psychological Approach to Entrepreneurship: Selected Essays of Dean A. Shepherd*, 31(1), pp. 132–152. doi: 10.4337/9781783479801.00007.

- Mei, H., Ma, Z., Jiao, S., Chen, X., Lv, X. and Zhan, Z. (2017) 'The sustainable personality in entrepreneurship: The relationship between Big Six personality, entrepreneurial self-efficacy, and entrepreneurial intention in the Chinese context', *Sustainability (Switzerland)*, 9(9), pp. 5–8. doi: 10.3390/su9091649.
- Mensah, E. K., Asamoah, L. A. and Jafari-Sadeghi, V. (2021) 'Entrepreneurial opportunity decisions under uncertainty: Recognizing the complementing role of personality traits and cognitive skills', *Journal of Entrepreneurship, Management and Innovation*, 17(1), pp. 25–55. doi: 10.7341/20211711.
- Ministry of Science of China (2019) *The 2019 National Science and Technology Work Conference was held in Beijing*. [Online] Available at: http://www.most.gov.cn/ztlz/qgkjgzh/2019/2019zxd/201901/t20190110_144712.htm [Accessed: 14 7 2019].
- Mkubukeli, Z. and Cronje, J. (2018) 'Pull and Push Elements of Entrepreneurship in South Africa: A Small-Scale Mining Perspective', *Journal of Entrepreneurship & Organization Management*, 07(03). doi: 10.4172/2169-026x.1000252.
- Moreira, D. F. (2016) 'The Microeconomic Impact on Growth of SMEs When the Access to Finance Widens: Evidence from Internet & High-tech Industry', *Procedia - Social and Behavioral Sciences*. The Author(s), 220(March), pp. 278–287. doi: 10.1016/j.sbspro.2016.05.500.
- Mondragón-Vélez, C. (2009) 'The probability of transition to entrepreneurship revisited: Wealth, education and age', *Annals of Finance*, 5(3–4), pp. 421–441. doi: 10.1007/s10436-008-0117-3.
- Mortan, R. A., Ripoll, P., Carvalho, C. and Bernal, M. C. (2014) 'Effects of emotional intelligence on entrepreneurial intention and self-efficacy', *Revista de Psicología del Trabajo y de las Organizaciones*. Colegio Oficial de Psicólogos de Madrid, 30(3), pp. 97–104. doi: 10.1016/j.rpto.2014.11.004.
- Mueller, S. L. and Thomas, A. S. (2001) 'Culture and entrepreneurial potential: A nine country study of locus of control and innovativeness', *Journal of Business Venturing*, 16(1), pp. 51–75. doi: 10.1016/S0883-9026(99)00039-7.
- Mukhtar, S. M. (1998) 'Business Characteristics of Male and Female Small and Medium Enterprises in the UK: Implications for Gender-based Entrepreneurialism and Business Competence Development', *British Journal of Management*, 9(1), pp. 41–51. doi: 10.1111/1467-8551.00074.
- Müller, E. and Zimmermann, V. (2009) 'The importance of equity finance for R&D activity', *Small Business Economics*, 33(3), pp. 303–318. doi: 10.1007/s11187-008-9098-x.
- Murad, Z., Sefton, M. and Starmer, C. (2016) 'How do risk attitudes affect measured confidence?', *Journal of Risk and Uncertainty*, 52(1), pp. 21–46. doi: 10.1007/s11166-016-9231-1.
- Myers, I. B., Mccaulley, M. H., Quenk, N. L. and Allen L. H. (1998) *A Guide to the Development and Use of the Myers-Briggs Type Indicator*. Third Edit. Palo Alto, California: CONSULTING PSYCHOLOGISTS PRESS, INC.
- National Bureau of Statistics of China (2018a) *2017 China Small and Medium Industrial Enterprise Operation Report*. [Online] Available at: http://www.lwzb.gov.cn/pub/lwzb/gzdt/201804/t20180428_4876.html [Accessed: 30 5 2019].

National Bureau of Statistics of China (2018b) *High-tech Industry (Manufacturing) Classification (2017)*. [Online] Available at: http://www.qhtjj.gov.cn/method/201801/t20180105_52281.html [Accessed: 12 7 2019].

National Bureau of Statistics of China (2018c) *High-tech Industry (Services) Classification (2018)*. [Online] Available at: http://www.stats.gov.cn/statsinfo/auto2073/201805/t20180509_1598331.html [Accessed: 12 7 2019].

National Bureau of Statistics of China (2022) *2022 China Statistical Yearbook*, Beijing: China Statistics Press.

Nelson, T. (2003) 'The persistence of founder influence: Management, ownership, and performance effects at initial public offering', *Strategic Management Journal*, 24(8), pp. 707–724. doi: 10.1002/smj.328.

Nicholson, N., Soane, E., Fenton-O'Creevy, M. and Willman, P. (2005) 'Personality and domain-specific risk taking', *Journal of Risk Research*, 8(2), pp. 157–176. doi: 10.1080/1366987032000123856.

Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-jabir, A., Iosifidis, C., Aghae, M. and Agha, R. (2020) 'The socio-economic implications of the coronavirus pandemic (COVID-19): A review', *International Journal of Surgery journal*, 78(January), pp. 185–193.

Noorderhaven, N., Thurik, R., Wennekers, S. and Stel, A. (2004) 'The Role of Dissatisfaction and per Capita Income in Explaining Self- Employment across 15 European Countries', *Entrepreneurship Theory and Practice*, 28(5), pp. 447–466.

North, D., Baldock, R. and Ekanem, I. (2010) 'Is there a debt finance gap relating to scottish SMEs? A demand-side perspective', *Venture Capital*, 12(3), pp. 173–192. doi: 10.1080/13691061003658670.

North, D. and Smallbone, D. (2002) 'Innovative Activity in SMEs and Rural Economic Development: Some Evidence from England', *European Planning Studies*, 8(1), pp. 87–106. doi: 10.1080/096543100110947.

Nunes, P. M., Serrasqueiro, Z. and Leitão, J. (2012) 'Is there a linear relationship between R&D intensity and growth? Empirical evidence of non-high-tech vs. high-tech SMEs', *Research Policy*, 41(1), pp. 36–53. doi: 10.1016/j.respol.2011.08.011.

Nyström, K. (2008) 'The institutions of economic freedom and entrepreneurship: Evidence from panel data', *Public Choice*, 136(3–4), pp. 269–282. doi: 10.1007/s11127-008-9295-9.

Ogarcă, L. R. (2010) 'Features of the Decision-Making in SMEs', *Annals of University of Craiova-Economic Sciences Series*, 3(38), p. 20. Available at: http://feaa.ucv.ro/annals/v3_2010/0038v3-028.pdf.

Ojiaku, O. C., Nkamnebe, A. D. and Nwaizugbo, I. C. (2018) 'Determinants of entrepreneurial intentions among young graduates: perspectives of push-pull-mooring model', *Journal of Global Entrepreneurship Research*. *Journal of Global Entrepreneurship Research*, 8(1). doi: 10.1186/s40497-018-0109-3.

Oláh, J., Virglerova, Z., Popp, J., Kliestikova, J. and Kovács, S. (2019) 'The assessment of non-financial risk sources of SMES in the V4 countries and Serbia', *Sustainability (Switzerland)*, 11(17), pp. 1–19. doi: 10.3390/su11174806.

Orhan, M. and Scott, D. (2001) 'Why Women Enter Into Entrepreneurship', *Women in Management Review*, 16(5), pp. 232–243. Available at: <http://www.emeraldinsight.com/doi/pdfplus/10.1108/09649420110395719>.

Oxenfeldt, A. R. (1943). *New Firms and Free Enterprise*. Washington DC: American Council on Public Affairs

Pareras, L. M. (2021) 'Your career as an entrepreneur', *Physician Leadership Journal*, 8(3), p. 14.

Parnell, J. A., Long, Z. and Lester, D. (2015) 'Competitive strategy, capabilities and uncertainty in small and medium sized enterprises (SMEs) in China and the united states', *Management Decision*, 53(2), pp. 402–431. doi: 10.1108/MD-04-2014-0222.

Perlman, A., Sacks, R. and Barak, R. (2014) 'Hazard recognition and risk perception in construction', *Safety Science*. Elsevier Ltd, 64, pp. 13–21. doi: 10.1016/j.ssci.2013.11.019.

Perry, S. J., Penney, L. M. and Witt, L. A. (2008) 'Coping with the constraints of self-employment: A person-situation model of entrepreneurial burnout', *Academy of Management 2008 Annual Meeting: The Questions We Ask, AOM 2008*. doi: 10.5465/ambpp.2008.33636328.

Picken, J. C. (2017) 'From founder to CEO: An entrepreneur's roadmap', *Business Horizons*. 'Kelley School of Business, Indiana University', 60(1), pp. 7–14. doi: 10.1016/j.bushor.2016.09.004.

Piedmont, R. L. (1998) *The Revised NEO Personality Inventory: Clinical and Research Applications, The Springer Series in Social/Clinical Psychology*. Available at: <http://ebooks.cambridge.org/ref/id/CBO9781107415324A009%5Cnhttp://link.springer.com/10.1007/978-1-4899-3588-5>.

Ping An Digital Economic Research Center (2020) *China's SMEs Amid the Pandemic: Facing cash flow problems and awaiting government aid*, Beijing. Available at: http://www.pingan.cn/app_upload/file/official/SMEReport2020.pdf.

Pratama, R. W. and Kristanto, H. (2020) 'Effects of the Neuroticism and Agreeableness Personality Types on Entrepreneurial Intention with Subjective Norm as Moderator', *Expert Journal of Business and Management*, 8(1), pp. 57–66.

Purohit, D. P., Siddiqui, N. A., Nandan, A. and Yadav, B. P. (2018) 'Hazard recognition and risk perception in construction', *International Journal of Applied Engineering Research*, 13(10), pp. 7639–7667. doi: 10.22214/ijraset.2020.31583.

Raad, B. D. (2000) *The Big Five Personality Factors*. Seattle: Hogrefe & Huber Publishers.

Radner, R. and Shepp, L. (1996) 'Risk vs. profit potential: A model for corporate strategy', *Journal of Economic Dynamics and Control*, 20(8), pp. 1373–1393. doi: 10.1016/0165-1889(95)00904-3.

Rahman, M. N. A. and Samin, N. L. H. (2021) 'Risk Assessment of Occupational Safety & Health (OSH) Hazards at Small and Medium Enterprise (SME)', *Mechanical and Manufacturing Engineering*, 2(2), pp. 343–353.

- Rauch, A. and Frese, M. (2007) 'Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success', *European Journal of Work and Organizational Psychology*, 16(4), pp. 353–385. doi: 10.1080/13594320701595438.
- Ray, D. M. (1994) 'The role of risk-taking in Singapore', *Journal of Business Venturing*, 9(2), pp. 157–177. doi: 10.1016/0883-9026(94)90007-8.
- Reijonen, H. (2008) 'Understanding the small business owner: What they really aim at and how this relates to firm performance: A case study in North Karelia, Eastern Finland', *Management Research News*, 31(8), pp. 616–629. doi: 10.1108/01409170810892172.
- Ren, Z. (2021) *Ren Zeping: Research on the current situation of China's small, medium and micro enterprises in 2021*. [Online] Available at: <http://finance.sina.com.cn/zl/china/2021-12-20/zl-ikyamrmz0029687.shtml> [Accessed: 18 4 2022].
- Ritsilä, J. and Tervo, H. (2002) 'Effects of Unemployment on New Firm Formation: Micro-Level Panel Data Evidence from Finland', *Small Business Economics*, 19, pp. 31–40.
- Rosa, R., Dierssen, H. M., Gonzalez, L. and Seibel, B. A. (2008) 'Large-scale diversity patterns of cephalopods in the Atlantic open ocean and deep sea', *Ecology*, 89(12), pp. 3449–3461. doi: 10.1890/08-0638.1.
- Rothmann, S. and Coetzer, E. P. (2003) 'THE BIG FIVE PERSONALITY DIMENSIONS AND JOB PERFORMANCE', *Journal of Industrial Psychology*, 29(1), pp. 68–74. doi: 10.4102/sajip.v29i1.88.
- Rubinstein, Y. and Levine, R. (2017) 'Smart and illicit: who becomes an entrepreneur and do they earn more?', *Quarterly Journal of Economics*, 132(2), pp. 963–1018. doi: 10.1093/qje/qjw044.Advance.
- Rusu, S., Isac, F., Cureteanu, R. and Csorba, L. (2012) 'Entrepreneurship and entrepreneur: A review of literature concepts', *African Journal of Business Management*, 6(10), pp. 3570–3575. doi: 10.5897/ajbm11.2785.
- Ryan, R. M. and Deci, E. L. (2000) 'Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions', *Contemporary Educational Psychology*, 25(1), pp. 54–67. doi: 10.1006/ceps.1999.1020.
- Şahin, F., Karadağ, H. and Tuncer, B. (2019) 'Big five personality traits, entrepreneurial self-efficacy and entrepreneurial intention: A configurational approach', *International Journal of Entrepreneurial Behaviour and Research*, 25(6), pp. 1188–1211. doi: 10.1108/IJEBR-07-2018-0466.
- Sahinidis, A. G., Tsaknis, P. A., Gkika, E. and Stavroulakis, D. (2019) 'The Influence of the Big Five Personality Traits and Risk Aversion on Entrepreneurial Intention', in Kavoura, A., Kefallonitis, E., and Theodoridis, P. (eds) *Strategic Innovative Marketing and Tourism, 8th ICSIMAT*. Northern Aegean, Greece, pp. 215–224. doi: 10.1007/978-3-030-36126-6.
- Sarwar, D., Sarwar, B., Raz, M. A., Khan, H. H., Muhammad, N., Azhar, U., Zaman, N. and Kasi, M. K. (2020) 'Relationship of the Big Five Personality Traits and Risk Aversion with Investment Intention of Individual Investors', *Journal of Asian Finance, Economics and Business*, 7(12), pp. 819–830. doi: 10.13106/JAFEB.2020.VOL7.NO12.819.

- Saunders, M., Lewis, P. and Thornhill, A. (2009) 'Understanding research philosophies and approaches', in *Research Methods for Business Students*, pp. 122–161.
- Saunders, M., Lewis, P. and Thornhill, A. (2016) *Research Methods for Business Students*. Seventh ed. Pearson Education.
- Savlovschi, L. I. and Robu, N. R. (2011) 'The Role of SMEs in Modern Economy', *Economia. Seria Management*, 14(1), pp. 277–281. doi: 10.1242/jcs.101.1.35.
- Say, J. B. (1880) *A Treatise on Political Economy*. New York: Claxton, Kemsens & Haffelfingee.
- Schjoedt, L. and Shaver, K. G. (2007) 'Deciding on an Entrepreneurial Career: A Test of the Pull and Push Hypotheses Using the Panel Study of Entrepreneurial Dynamics Data', *Entrepreneurship Theory and Practice*, 31(5), pp. 733–752. doi: 10.1111/j.1540-6520.2007.00197.x.
- Schumpeter, J. A. (1949) *The Theory of Economic Development: An Inquiry Into Profits, Credit, Interest, and the Business Cycle*, Social Science Electronic Publishing. Cambridge, MA: Harvard University Press.
- Segal, G., Borgia, D. and Schoenfeld, J. (2005) 'The motivation to become an entrepreneur', *International Journal of Entrepreneurial Behaviour and Research*, 11(1), pp. 42–57. doi: 10.1108/13552550510580834.
- Shane, S., Locke, E. A. and Collins, C. J. (2003) 'Entrepreneurial motivation', *Human Resource Management Review*, 13(2), pp. 257–279. doi: 10.1016/S1053-4822(03)00017-2.
- Shepherd, D. A. and Detienne, D. R. (2005) 'Prior Knowledge, Potential Financial Reward, and Opportunity Identification', *ENTREPRENEURSHIP THEORY and PRACTICE*, January, pp. 91–112.
- Shepherd, D. A. and Patzelt, H. (2018) *Entrepreneurial Cognition: Exploring the Mindset of Entrepreneurs*. Cham: Springer International Publishing. doi: 10.1007/978-3-319-71782-1.
- Shir, N., Nikolaev, B. N. and Wincent, J. (2018) 'Entrepreneurship and well-being: The role of psychological autonomy, competence, and relatedness', *Journal of Business Venturing*. Elsevier, (March 2017), pp. 0–1. doi: 10.1016/j.jbusvent.2018.05.002.
- Sluis, J., Praag, M.V. and Vijverberg, W. (2008) 'EDUCATION AND ENTREPRENEURSHIP SELECTION AND PERFORMANCE: A REVIEW OF THE EMPIRICAL LITERATURE', *Journal of Economic Surveys*, 22(5), pp. 795–841. doi: 10.1111/j.1467-6419.2008.00550.x.
- Ślusarczyk, B. and Grondys, K. (2019) 'Parametric conditions of high financial risk in the SME sector', *Risks*, 7(3), pp. 1–17. doi: 10.3390/risks7030084.
- Slywotzky, A. J. and Drzik, J. (2005) 'Countering the Biggest Risk of All', *Harvard Business Review*, 83(4), pp. 78–88. doi: 10.1111/j.0955-6419.2005.00352.x.
- Smit, Y. and Watkins, J. A. (2012) 'A literature review of small and medium enterprises (SME) risk management practices in South Africa', *AFRICAN JOURNAL OF BUSINESS MANAGEMENT*, 6(21), pp. 6324–6330. doi: 10.5897/ajbm11.2709.
- Smith, D. G. (2020) *Coronavirus May Be a Blood Vessel Disease, Which Explains Everything*. [Online] Available at: <https://elemental.medium.com/coronavirus-may-be-a-blood-vessel-disease-which-explains-everything-2c4032481ab2> [Accessed 23 10 2020].

Sosnovska, O. and Zhytar, M. (2018) 'Financial Architecture As the Base of the Financial Safety of the Enterprise', *Baltic Journal of Economic Studies*, 4(4), pp. 334–340. doi: 10.30525/2256-0742/2018-4-4-334-340.

Stephan, U., Hart, M., Mickiewicz, T. and Drews, C. (2015) *Understanding Motivations for Entrepreneurship*. Aston Business School, Birmingham, Department for Business, Innovation and Skills.

Stoner, C. R. and Fry, F. L. (1982) 'the Entrepreneurial Decision: Dissatisfaction or Opportunity.', *Journal of Small Business Management*, 20(April), pp. 39–44. Available at: <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=5265714&site=ehost-live>.

Stuart, J. (1991) 'Strategic flexibility for high technology manoeuvres: a conceptual framework', *Journal of Management Studies*, 28(1), pp. 69–89.

Sun, T., Zhang, W., Dinca, M. S. and Raza, M. (2021) 'Determining the impact of Covid-19 on the business norms and performance of SMEs in China', *Economic Research-Ekonomska Istrazivanja*. Routledge, 0(0), pp. 1–20. doi: 10.1080/1331677X.2021.1937261.

Sweeting, P. (2011) *Financial Enterprise Risk Management*. 1st edn. New York: Cambridge University Press.

Tandoc, E. C. and Lee, J. C. B. (2022) 'When viruses and misinformation spread: How young Singaporeans navigated uncertainty in the early stages of the COVID-19 outbreak', *New Media and Society*, 24(3), pp. 778–796. doi: 10.1177/1461444820968212.

Tervo, H. (2006) 'Regional unemployment, self-employment and family background', *Applied Economics*, 38(9), pp. 1055–1062. doi: 10.1080/00036840500400053.

The World Bank Group (2020) *Global Economic Prospects, June 2020*. World Bank, *The Financial Crisis and the Global South*. World Bank. Washington: The World Bank. doi: 10.1596/978-1-4648-1553-9.

The World Bank (2022a) *Small and Medium Enterprises (SMEs) Finance*. [Online] Available at: <https://www.worldbank.org/en/topic/smefinance> [Accessed 21 June 2022].

The World Bank (2022b) *World Development Indicators*. [Online] Available at: <https://datacatalog.worldbank.org/search/dataset/0037712> [Accessed 17 June 2022].

Thoms, P., Moore, K. S. and Scott, K. S. (1996) 'The relationship between self-efficacy for participating in self-managed work groups and the big five personality dimensions', *Journal of Organizational Behavior*, 17(4), pp. 349–362. doi: 10.1002/(SICI)1099-1379(199607)17:4<349::AID-JOB756>3.0.CO;2-3.

Thu, T. and Phan, H. (2018) 'Strategic Risk Determinants Influencing Growth of SMEs : The Case of Vietnam', 9(10), pp. 102–108.

Trevelyan, R. (2011) 'Self-regulation and effort in entrepreneurial tasks', *International Journal of Entrepreneurial Behaviour and Research*, 17(1), pp. 39–63. doi: 10.1108/13552551111107507.

Tvede, L. and Faurholt, M. (2018) *Entrepreneur: Building Your Business from Start to Success*. West Sussex: John Wiley & Sons.

- Tyszka, T., Cieřlik, J., Domurat, A. and Macko, A. (2011) 'Motivation, self-efficacy, and risk attitudes among entrepreneurs during transition to a market economy', *Journal of Socio-Economics*, 40(2), pp. 124–131. doi: 10.1016/j.socec.2011.01.011.
- United States International Trade Commission (2010) *Small and Medium-Sized Enterprises: Overview of Participation in U.S. Exports*, U.S. International Trade Commission. doi: Investigation No. 332-508.
- US SBA Office of Advocacy (2021) *2021 Small Business Profile*, U.S. Small Business Administration: Office of Advocacy. Available at: [http://www.sba.gov/sites/default/files/files/UnitedStates13\(1\).pdf](http://www.sba.gov/sites/default/files/files/UnitedStates13(1).pdf).
- Usai, A., Scuotto, V., Murray, A., Fiano, F. and Dezi, L. (2018) 'Do entrepreneurial knowledge and innovative attitude overcome "imperfections" in the innovation process? Insights from SMEs in the UK and Italy', *Journal of Knowledge Management*, 22(8), pp. 1637–1654. doi: 10.1108/JKM-01-2018-0035.
- Vargas-Hernández, J. G. (2011) 'Modeling Risk and Innovation Management', *Advances in Competitiveness Research*, 19(3&4), pp. 45–57. Available at: <http://www.ainfo.inia.uy/digital/bitstream/item/7130/1/LUZARDO-BUIATRIA-2017.pdf>.
- Vasiev, M., Scuotto, V., Murray, A., Fiano, F. and Dezi, L. (2020) 'How COVID-19 pandemics influences chinese economic sustainability', *Foresight and STI Governance*, 14(2), pp. 7–22. doi: 10.17323/2500-2597.2020.2.7.22.
- Venkatesh, S. and Muthiah, K. (2012) 'SMEs in India : Importance and Contribution', *Asian Journal of Management Research*, 2(2), pp. 792–796.
- Vermeulen, P. A. M. and Curseu, P. L. (2008) *Entrepreneurial Strategic Decision-Making: A Cognitive Perspective*, *Entrepreneurial Strategic Decision-Making: A Cognitive Perspective*. doi: 10.4337/9781848444034.
- Veugelers, R., Ferrando, A., Lekpek, S. and Weiss, C. T. (2019) 'Young SMEs as a Motor of Europe's Innovation Machine', *Intereconomics*, 54(6), pp. 369–377. doi: 10.1007/s10272-019-0855-7.
- Vosloo, W. B. (1994) *Entrepreneurship and Economic Growth*. Pretoria: HSRC Publishers.
- Wadhwa, V., Aggarwal, R., Holly, K. and Salkever, A. (2009) 'Anatomy of an entrepreneur: Family background and motivation', *Kauffman Foundation Small Research Projects Research*, July, pp. 1–20.
- Walker, R. (2015) 'The Increasing Importance of Operational Risk in Enterprise Risk Management', *The Journal of Enterprise Risk Management (JERM)*, 1(1), pp. 82–96.
- Walliman, N. (2014) *Research Methods: The Basics*, *Research Methods: The Basics*. doi: 10.4324/9780203836071.
- Walter, S. G. and Heinrichs, S. (2015) 'Who becomes an entrepreneur? A 30-years-review of individual-level research', *Journal of Small Business and Enterprise Development*, 22(2), pp. 225–248. doi: 10.1108/JSBED-09-2012-0106.
- Wang, Meng-cheng, Dai, X. and Yao, S. (2010) 'Development of Chinese Big Five Personality Inventory(CBF-PI) : Theoretical Framework and Reliability Analysis', *Chinese Journal of Clinical Psychology*, 18(5), pp. 545–548. doi:10.16128/j.cnki.1005-3611.2010.05.012.

- Wang, M., Dai, X. and Yao, S. (2010) 'Development of the Chinese Big Five Personality Inventory (CBF-PI) II : Validity Analysis', *Chinese Journal of Clinical Psychology*, p. 687~690. doi: 10.16128/j.cnki.1005-3611.2010.06.030.
- Wang, M., Dai, X. and Yao, S. (2011) 'Development of the Chinese Big Five Personality Inventory (CBF-PI) III: Psychometric Properties of CBF-PI Brief Version', *Chinese Journal of Clinical Psychology*, 19(4), pp. 454–457. doi: 10.16128/j.cnki.1005-3611.2011.04.004.
- Watson, J., Newby, R. and Woodliff, D. (2011) *WORK AND OWNER SATISFACTION: IMPLICATIONS FOR PERFORMANCE MEASUREMENT*. [Online] Available at: https://www.researchgate.net/publication/267809577_WORK_AND_OWNER_SATISFACTION_IMPLICATIONS_FOR_PERFORMANCE_MEASUREMENT by [Accessed 20 2 2019].
- Watson, K., Hogarth-Scott, S. & Wilson, N., 1998. Small business start-ups: success factors and support implications. *International Journal of Entrepreneurial Behavior & Research*, No.4, pp. 217-238.
- Wayne, L. (1983) 'The meaning of entrepreneurship', *American Journal of Small Business*, VIII (2), pp. 47–57. Available at: <https://csistg.gsb.stanford.edu/sites/csi.gsb.stanford.edu/files/TheMeaningofsocialEntrepreneurship.pdf>.
- Wei, L. and Moyer, M. G. (2008) *The Blackwell Guide to Research Methods in Bilingualism and Multilingualism*, Blackwell Publishing Ltd. Oxford. doi: 10.1017/S0272263109990052.
- Wennekers, S. and Thurik, R. (1999) 'Linking Entrepreneurship and Economic Growth', *Small Business Economics*, 13(1), pp. 27–55.
- Wickham, P. A. (2001) *Strategic Entrepreneurship*. Edinburgh: Philip Wickham.
- Willquist, P. and Törner, M. (2003) 'Identifying and analysing hazards in manufacturing industry - A review of selected methods and development of a framework for method applicability', *International Journal of Industrial Ergonomics*, 32(3), pp. 165–180. doi: 10.1016/S0169-8141(03)00061-1.
- Wingwon, B. (2012) 'Effects of Entrepreneurship, Organization Capability, Strategic Decision Making and Innovation toward the Competitive Advantage of SMEs Enterprises', *Journal of Management and Sustainability*, 2(1). doi: 10.5539/jms.v2n1p137.
- Woldie, A., Leighton, P. and Adesua, A. (2008) 'Factors influencing small and medium enterprises (SMEs): An exploratory study of owner / manager and firm characteristics [J]', *Banks and Bank Systems*, 3(3), pp. 5–13.
- Wong, T. and Williams, N. (2022) *China Covid: Protests continue in major cities across the country*. [Online] Available at: <https://www.bbc.co.uk/news/world-asia-63771109> [Accessed 30 11 2022].
- World Health Organization (2020) *Timeline: WHO's COVID-19 response*. [Online] Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline> [Accessed 23 10 2020].

- World Health Organization (2022) *WHO Coronavirus (COVID-19) Dashboard*. [Online] Available at: <https://covid19.who.int> [Accessed 4 August 2022].
- Wuhan Municipal Health Commission (2019) *The report of Wuhan Municipal Health Commission on the current situation of the pneumonia epidemic in our city*. [Online] Available at: http://wjw.wuhan.gov.cn/xwzx_28/gsgg/202004/t20200430_1199588.shtml [Accessed 23 10 2020].
- Yago, G. and White, J. M. (2014) 'Transatlantic Innovations in Affordable Capital for Small- and Medium-Sized Enterprises Prospects for Market-Based Development Finance', (November).
- Yan, X. (2018), *Research on the Driving Force of Internationalization Growth of SMEs Based on Global Value Chain*. Chengdu: Southwestern University of Finance and Economics Press.
- Ye, Q., Wang, B. and Mao, J. (2020) 'The pathogenesis and treatment of the "Cytokine Storm" in COVID-19', *Journal of Infection*, 80(January), pp. 607–613.
- Yin, R. K. (2018) *Case study research and applications : design and methods*. Sixth edit, SAGE Publications. Sixth edit. Los Angeles.
- Yoshino, N. and Hesary, F. T. (2018) 'The Roles of SMEs in Asia and Their Difficulty in Assessing Finance', *ADBI Working Paper*, 1(911), pp. 1–52. Available at: <https://www.adb.org/sites/default/files/publication/474576/adbi-wp911.pdf>.
- Young, E. C. and Welsch, H. P. (1993) 'Major elements in entrepreneurial development in central Mexico', *Journal of Small Business Management*, 31(4), p. 80.
- Zainal, Z. (2007) 'Case study as a research method', *Jurnal kemanusiaan bil*, 9, pp. 1–6.
- Zhang, Y., Duysters, G. and Cloudt, M. (2014) 'The role of entrepreneurship education as a predictor of university students' entrepreneurial intention', *International Entrepreneurship and Management Journal*, 10(3), pp. 623–641. doi: 10.1007/s11365-012-0246-z
- Zhao, H. and Seibert, S. E. (2006) 'The big five personality dimensions and entrepreneurial status: A meta-analytical review', *Journal of Applied Psychology*, 91(2), pp. 259–271. doi: 10.1037/0021-9010.91.2.259.
- Zhao, H., Seibert, S. E. and Lumpkin, G. T. (2010) 'The relationship of personality to entrepreneurial intentions and performance: A meta-analytic review', *Journal of Management*, 36(2), pp. 381–404. doi: 10.1177/0149206309335187.
- Zhu, Y., Wittmann, X. and Peng, M. W. (2012) 'Institution-based barriers to innovation in SMEs in China', *Asia Pacific Journal of Management*, 29(4), pp. 1131–1142. doi: 10.1007/s10490-011-9263-7.
- Zutshi, A., Mendy, J., Sharma, G. D., Thomas, A. and Sarker, T. (2021) 'From challenges to creativity: Enhancing smes' resilience in the context of covid-19', *Sustainability (Switzerland)*, 13(12), pp. 1–16. doi: 10.3390/su13126542.
- Zwan, V.D. P., Thurik, R., Verheul, I. and Hessels, J. (2016) 'Factors influencing the entrepreneurial engagement of opportunity and necessity entrepreneurs', *Eurasian Business Review*. Springer International Publishing, 6(3), pp. 273–295. doi: 10.1007/s40821-016-0065-1.

Appendix List

Appendix 1. The Definition of SME in China

(National Bureau of Statistics, 2018)

Industry	Index	Unit	Large	Middle	Small	Micro
Agriculture, forestry, animal husbandry and fishery	Annual Income(Y)	10,000yuan	$Y \geq 20000$	$500 \leq Y < 20000$	$50 \leq Y < 500$	$Y < 50$
Industrial	Employee number(X)	People	$X \geq 1000$	$300 \leq X < 1000$	$20 \leq X < 300$	$X < 20$
	Annual Income(Y)	10,000yuan	$Y \geq 40000$	$2000 \leq Y < 40000$	$300 \leq Y < 2000$	$Y < 300$
The construction industry	Annual Income(Y)	10,000yuan	$Y \geq 80000$	$6000 \leq Y < 80000$	$300 \leq Y < 6000$	$Y < 300$
	Total Assets(Z)	10,000yuan	$Z \geq 80000$	$5000 \leq Z < 80000$	$300 \leq Z < 5000$	$Z < 300$
Wholesaling	Employee number(X)	People	$X \geq 200$	$20 \leq X < 200$	$5 \leq X < 20$	$X < 5$
	Annual Income(Y)	10,000yuan	$Y \geq 40000$	$5000 \leq Y < 40000$	$1000 \leq Y < 5000$	$Y < 1000$
Retail	Employee number(X)	People	$X \geq 300$	$50 \leq X < 300$	$10 \leq X < 50$	$X < 10$
	Annual Income(Y)	10,000yuan	$Y \geq 20000$	$500 \leq Y < 20000$	$100 \leq Y < 500$	$Y < 100$
Transportation	Employee number(X)	People	$X \geq 1000$	$300 \leq X < 1000$	$20 \leq X < 300$	$X < 20$
	Annual Income(Y)	10,000yuan	$Y \geq 30000$	$3000 \leq Y < 30000$	$200 \leq Y < 3000$	$Y < 200$
Warehousing	Employee number(X)	People	$X \geq 200$	$100 \leq X < 200$	$20 \leq X < 100$	$X < 20$
	Annual Income(Y)	10,000yuan	$Y \geq 30000$	$1000 \leq Y < 30000$	$100 \leq Y < 1000$	$Y < 100$
The postal service	Employee number(X)	People	$X \geq 1000$	$300 \leq X < 1000$	$20 \leq X < 300$	$X < 20$
	Annual Income(Y)	10,000yuan	$Y \geq 30000$	$2000 \leq Y < 30000$	$100 \leq Y < 2000$	$Y < 100$
The lodging industry	Employee number(X)	People	$X \geq 300$	$100 \leq X < 300$	$10 \leq X < 100$	$X < 10$
	Annual Income(Y)	10,000yuan	$Y \geq 10000$	$2000 \leq Y < 10000$	$100 \leq Y < 2000$	$Y < 100$
The restaurant industry	Employee number(X)	People	$X \geq 300$	$100 \leq X < 300$	$10 \leq X < 100$	$X < 10$
	Annual Income(Y)	10,000yuan	$Y \geq 10000$	$2000 \leq Y < 10000$	$100 \leq Y < 2000$	$Y < 100$

Information transmission industry	Employee number(X) Annual Income(Y)	People 10,000yuan	$X \geq 2000$ $Y \geq 100000$	$100 \leq X < 2000$ $1000 \leq Y < 100000$	$10 \leq X < 100$ $100 \leq Y < 1000$	$X < 10$ $Y < 100$
Software and information technology services	Employee number(X) Annual Income(Y)	People 10,000yuan	$X \geq 300$ $Y \geq 10000$	$100 \leq X < 300$ $1000 \leq Y < 10000$	$10 \leq X < 100$ $50 \leq Y < 1000$	$X < 10$ $Y < 50$
Real estate development and management	Annual Income(Y) Total Assets(Z)	10,000yuan 10,000yuan	$Y \geq 200000$ $Z \geq 10000$	$1000 \leq Y < 200000$ $5000 \leq Z < 10000$	$100 \leq Y < 1000$ $2000 \leq Z < 5000$	$Y < 100$ $Z < 2000$
The property management	Employee number(X) Annual Income(Y)	People 10,000yuan	$X \geq 1000$ $Y \geq 5000$	$300 \leq X < 1000$ $1000 \leq Y < 5000$	$100 \leq X < 300$ $500 \leq Y < 1000$	$X < 100$ $Y < 500$
Rental and business services	Employee number(X) Total Assets(Z)	People 10,000yuan	$X \geq 300$ $Z \geq 120000$	$100 \leq X < 300$ $8000 \leq Z < 120000$	$10 \leq X < 100$ $100 \leq Z < 8000$	$X < 10$ $Z < 100$
Others	Employee number(X)	People	$X \geq 300$	$100 \leq X < 300$	$10 \leq X < 100$	$X < 10$

Appendix 2. Research Approach of SME Risk Management Study

Author	Research title	Research Methodology	Research Sample	Research focus
Qualitative				
Crovini, Santoro and Ossola (2020)	Rethinking Risk Management in Entrepreneurial SMEs: Towards the Integration with the Decision-making Process	A multiple case study	3 entrepreneurial SMEs	<ul style="list-style-type: none"> • How do entrepreneurial SMEs consider and manage risk? • How does risk management impact entrepreneurs' decision-making?
Mccarthy (2000)	The cult of risk taking and social learning: a study of Irish entrepreneurs	A longitudinal case study (3 years), using semi-structured interview	9 cases from an Irish SME (Over 30 interviews were held with the entrepreneur, managers, company employees in the company)	<ul style="list-style-type: none"> • Is risk a function of personality or is it shaped by contextual forces over time? • How is risk managed by entrepreneurs during the process of forming a business strategy?
Forsman (2008)	Business development success in SMEs: a case study approach	Multiple case study, using interviews, documents and observations	4 SMEs	<ul style="list-style-type: none"> • How to evaluate the business success in SMEs? • How development projects initiated to improve the business performance of SMEs have been successful?
Ellegaard (2008)	Supply risk management in a small company perspective	Case study using interview	11 small business owners	<ul style="list-style-type: none"> • How do owners of small manufacturing companies manage risk during the operation of their company?
Ahmad and Seet (2009)	Understanding business success through the lens of SME founder-owners in Australia and Malaysia	Semi-structured interviews	20 entrepreneurs from Australia and Malaysia	<ul style="list-style-type: none"> • How to measure success in SMEs?
Zhu, Wittmann and Peng (2012)	Institution-based barriers to innovation in SMEs in China	Interviews	82 top managers and owners from 41 SMEs	<ul style="list-style-type: none"> • Explore the key institution-based barriers to innovation in Chinese SMEs

Gao, Sung and Zhang (2013)	Risk management capability building in SMEs: A social capital perspective	Semi-structured interviews	25 individuals	<ul style="list-style-type: none"> Risk management (RM) and risk management capability building in small and medium sized enterprise (SMEs)
Zhao and Ha-Brookshire, (2014)	How Did You Survive in the First Five Years? Secrets to Success Described by Apparel New Ventures in China	Interview	16 entrepreneurs from Chinese SMEs	<ul style="list-style-type: none"> How can SMEs survive in a competitive market?
Franco <i>et al.</i> , (2014)	An exploratory study of entrepreneurial marketing in SMEs The role of the founder-entrepreneur	Case study using interviews and documentary analysis	2 SMEs	<ul style="list-style-type: none"> Determine the importance and role of entrepreneurial marketing in SMEs.
Usai <i>et al.</i> , (2018)	Do entrepreneurial knowledge and innovative attitude overcome “imperfections” in the innovation process? Insights from SMEs in the UK and Italy	Case studies using interviews	A UK SME and an Italian SME	<ul style="list-style-type: none"> Explore the relationships between entrepreneurial knowledge, the attitude of innovate and the company’s innovate performance.
Tan, Sugiarto and Budhijono (2021)	Family Business and Risk Management: Perspectives of SMEs Entrepreneurs in Indonesia	Case study approach using in-depth semi-structured interviews were conducted	7 family SMEs	<ul style="list-style-type: none"> Specific risks in family small-medium enterprises (SMEs). How these SMEs manage these risks to sustain and expand?
Quantitative				
Brustbauer (2016)	Enterprise risk management in SMEs: Towards a structural model	Questionnaire	311 entrepreneurs	<ul style="list-style-type: none"> What are the prerequisites for the implementation of enterprise risk management? Applied ERM (enterprise risk management) approaches and their impact on strategic direction Provides an initial exploratory attempt at an enterprise risk management model for SMEs.

Antoncic <i>et al.</i> , (2015)	The Big Five Personality– Entrepreneurship Relationship: Evidence from Slovenia	Structured interviews	546 individuals from Slovenia	<ul style="list-style-type: none"> Which personality trait can influence people's entrepreneurial activities?
(Kotaskova <i>et al.</i> , 2020)	Significant Aspects of Managing Personnel Risk in the SME Sector	Questionnaire	822 respondents (639 owners, 183 top managers)	<ul style="list-style-type: none"> What are the important factors that influence the perception of risk among people in the SME sector?
Dvorsky <i>et al.</i> , (2021)	Business risk management in the context of small and medium-sized enterprises	Questionnaire	454 entrepreneurs	<ul style="list-style-type: none"> Review the impact of entrepreneurs' attitudes toward the defined business risks on the perception of the future of small and medium-sized enterprises (SMEs).
Rehman and Anwar (2019)	Mediating role of enterprise risk management practices between business strategy and SME performance	Questionnaire	327 Pakistani SMEs	<ul style="list-style-type: none"> The importance of business strategy in SME performance with the mediating role of enterprise risk management.
Kozubíková <i>et al.</i> (2017)	Personal characteristics of entrepreneurs in the context of perception and management of business risk in the SME segment	Questionnaire	449 owners of SMEs	<ul style="list-style-type: none"> Examine the relationship between personality characteristics and approach to the perception and management of business risks.
Glowka, Kallmünzer and Zehrer, (2021)	Enterprise risk management in small and medium family enterprises: the role of family involvement and CEO tenure	Questionnaire	116 CEO of SMFES	<ul style="list-style-type: none"> The impact of CEO tenure and family involvement as moderators on the ERM – performance relationship.
Norton and Moore (2006)	The influence of entrepreneurial risk assessment on venture launch or growth decisions	Questionnaire	53 respondents (30 entrepreneurs, 23 non-entrepreneurs)	<ul style="list-style-type: none"> The difference in risk-taking between entrepreneurs and non-entrepreneurs.
Lu <i>et al.</i> (2020)	The perceived impact of the Covid-19 epidemic: evidence from a sample of	Online questionnaire and structured interviews	Questionnaire with 4807 SMEs	<ul style="list-style-type: none"> The challenges faced by SMEs during the COVID-19 outbreak.

	4807 SMEs in Sichuan Province, China		Interview with 203 individuals	
Mixed method				
Ray (1994)	The role of risk-taking in Singapore	Questionnaire and unstructured interview	Unstructured interview with 15 people from New Zealand Questionnaire with 30 Chinese entrepreneurs and 44 Singaporean managers and engineers	The differences between entrepreneurs and non-entrepreneurs in terms of the risks involved in the decision to become an entrepreneur.
Reijonen (2008)	Understanding the small business owner: what they really aim at and how this relates to firm performance A case study in North Karelia, Eastern Finland	Case study using questionnaire and interview	Questionnaire: 30 owner managers Interview: 45 owner managers	How micro-entrepreneurs perceive success and how this perception affects the growth of their businesses.

Appendix 3. Research Consent Form



Research Consent Form

Research Project Title:

How do Founder-Entrepreneur from successful SMEs survive in the high-tech software market in China?

Researcher:

I would like to thank you for taking the time to participate in my research study. My name is Yanzhi Huang, a PhD student in the University of York (Department of Electronic Engineering) and I am interested in learning about your experiences as a founder-entrepreneur in your company.

My project focuses on the role of founder-entrepreneurs in Chinese high-tech software SMEs, the exposure to different risks they face in the highly competitive high-tech market and the connection between risk management and company success. I will be using your company as a case study to explore some of these areas in my research. From the overall analysis, this study will aim to develop SMEs' risk management strategies and the role of founder-entrepreneurs in that context.

This interview should last approximately an hour. I will be recording this interview session on an audio recorder as it will assist me in analysing your responses more accurately. The data will be stored in a password protected university computer/laptop and will be stored until the end of the PhD study. All your responses will be used only for this research purposes and the output will be used for my PhD thesis and some publications in subject-related journals and conferences.

You have the full right to not answer any question that you are uncomfortable with and you can end the interview at any time of your choosing.

I, the participant, confirm that:

I have been briefed about this research project and its purpose and agree to participate

I have discussed any requirements for anonymity or confidentiality with the researcher

I have been briefed about how the interview data will be stored during the research

I agree to this interview to be audio-taped

Participant's name and signature:

Researcher's name and signature:

Date:

Appendix 4. Research Consent Form (Chinese Version)

UNIVERSITY OF YORK
Department of Electronic Engineering

研究同意书

研究项目名称:

How do Founder-Entrepreneur from successful SMEs survive in the high-tech software market in China?

研究者:

感谢您抽出宝贵的时间参与我的研究。我的名字叫黄彦芝，是约克大学（电子工程系）的一名博士研究生，我有兴趣了解您作为公司的创始人兼企业家的经历。

我的项目重点关注创始人企业家在中国高科技软件中小企业中所起到的作用，并专注于分析在先进高度竞争的高科技市场环境下，中小企业面临的各种风险，以及风险管理与公司成功之间的联系。我将以贵公司为例进行研究，以探索我研究中的某些领域。从总体分析的角度来看，本研究旨在发展中小企业的风险管理策略以及在此背景下创始人-企业家的角色。

这次采访大约持续一个小时。我将在录音机上记录这次面试环节，这将有助于我更准确地分析您的回答。数据将存储在受密码保护的大学计算机/笔记本电脑中，并将存储到博士研究结束为止。您所有的答复将仅用于此研究目的，输出将用于我的博士学位论文以及与主题相关的期刊和会议上的某些出版物。

您有权对任何让您感到冒犯或突兀的问题保持沉默，如果这次采访让您感到不适，您可以随时要求中止这次谈话。若您对上述信息已知晓且愿意接受，请在下方签署认同文件。

我，作为访谈参与者在此确认：

1. 我已获悉此研究项目及其目的，并同意参加
2. 我已经与研究人员讨论了任何匿名或保密要求
3. 我已获悉在研究过程中将如何存储采访数据
4. 我同意这次采访可以录音

受访者签名：陈柯如

研究者签名：黄彦芝

日期：17. 12. 3.

Appendix 5. First Round Interview Guide

Interview guide for Founder-entrepreneur from Chinese SMEs

Part 1: Demographic Information

- Name of the organization:
- The year this organization was established:
- How many employees have you currently got in this organization?
 - 0-49
 - 50-249
 - Over 250
- What is your highest level of education qualification?
 - High School
 - College degree
 - Graduate degree
 - Post-graduate degree
 - Others
- What is your age?
 - Less than 25 years
 - 25-35 years
 - 36-45 years
 - 46-55 years
 - 56-65 years
 - More than 65 years

Part 2: General operation and management of the company

General questions

- Could you please tell me little bit about your company?
- Can you tell me little bit about your journey as an entrepreneur and the process of setting up your own company?
- What were the main challenges you faced at the initial stages of your business?
- What are your day-to-day responsibilities in this company?

Theme: Personal skills:

- Did you have any other working experiences prior to this role?
- Tell me little bit about your education background? Do you have any kind of software engineering or business management related degree?
- Does your education qualification(s) play any role in successfully running the business?
- In your opinion, which kind of skills are important for a founder-entrepreneur to run a business?

Theme: Personal motivations:

- Why did you choose to run your own business?
- What are your key sources of motivation in this company?
- With your role as a founder-entrepreneur in this organization, how do you keep yourself motivated? (*Decision making, risk attitude...*)
- What do you consider to be your biggest accomplishment so far in this company? (Further prompt: *So far, what are you most proud of?*)
- As you know, not every project is a success. So, in the unlikely event of a failure, how do you build up resilience and facilitate motivation among your employees?
- Do you think your entrepreneurial experiences have any impact on your personal motivation? If so, how?

Theme: Risk management:

- Firstly, I want to ask you: Do you think you are somebody who enjoys bearing risks? Are you a risk taker?
- Do you think your motivation and your personalities have any influence to your decision-making approaches/strategies when faced with some risks or challenges?
- In your company, do you have any risk management policies?
- As a founder-entrepreneur, how important is it for you to evaluate and understand risks associated with your business?
- What is your role in this company's risk management process? How involved are you?
- With your company, what are the types of risks you are exposed to?
- In your opinion, which of these risks are more likely to influence your company's day-to-day operation and survival?

- Could you please share with me some examples of risks you have faced in this company?
- My next question is, how do you evaluate risks?
- What strategies do you apply to deal with potential risks?
 - How successful have these strategies been?
- How do you measure the success of your risk strategies?
- Any example of risks that you really struggled to manage as a company?
- Do you have any risk transfer strategies?
- In the event of an exposure to a risk, what steps or measures do you take as a company?
- Do risks influence your decision making process in this company's operation? If so, in what ways?

Theme: Innovation engagement:

- How important is innovation in your software based company?
- As a founder-entrepreneur of an SME, what differences do you think you face in terms of challenges or risks in innovation related activities as compared to larger organizations?
- Could you please describe the main process of innovation in your company?
- How involved are you with the process of innovation in this company?
- In your opinion, which process of innovation related activity faces the highest risk?
 - Are there any risks involved with innovation? If so, please explain.
- In your company, do you have any policies or measures to encourage innovation activities? What innovation strategies do you actively facilitate here in this organization?
- How do potential risks influence your company's engagement and attitude towards innovation activities? (Example: changing customers' needs and uncertainties of the market.)
- How do you manage the risks associated with innovation?

Theme: The connection between risk management and company success:

- How important is success to you?
- How do you measure your 'company success'? What parameters would you consider in informing your achievement of 'success' for this company?
- What role does risk management strategies play in your company's survival and success? Please explain.

Appendix 6. Second Round Interview Guide

Interview question structure – Impact of Covid-19

1. Firstly, what do you feel about COVID pandemic?
2. What's the impact of COVID-19 on your business?
 - a. What kinds of risks have you been exposed to due to COVID-19?
3. What's the impact of COVID-19 to the software industry?
4. How did you evaluate the market performance in this half-year?
5. How has COVID-19 changed the way you and your employees work? (Examples – for prompting if needed: Employees working from home; Employer not being able to meet employees face-to-face; employees not being able to easily socialise with other employees, etc.)
6. As you shared before, because of the COVID-19, you have to work at home in last few months. So, what do you think about this working method?
 - Can your employees and clients accept/adapt this working method?
 - What kind of influences have brought by these working method to your working efficiency or work enthusiasm?
7. Have you experienced any additional challenges brought by these new ways of working? [What kinds of risks brought by this working method to your daily management and communications? (For example, causing some bias when talking with your group or clients)]
8. How do you feel about these additional risks? How have they affected you and the way you think about your business – for now and the longer term future?
9. What strategies are you using in your company to manage these risks and reduce the loss due to COVID-19?
10. Have you looked into how your close competitors are managing risks due to COVID-19?
11. As we know, the impact of COVID-19 is still lasting, so, what's your overall plan for the next step?
12. After COVID-19, do you have any new understanding of risk management? Or do you collect any new experiences of risk management? Can you explain it for me?
13. Do you think this situation will change your risk attitude? If yes, how?
14. After COVID-19, do you plan to reset the company aims/vision and development plan? Do you have a new understanding of your company success?

Appendix 7. Chinese Big-Five Personality Inventory Brief Version (CBF-PI-B)

(Chinese Version)

中国大五人格问卷简版

指导语：下面是一些描述人们性格特点的句子，请根据每个句子与您的性格相符程度在相应的数字上画圈。

例如：“在集体活动中，我是个活跃分子”非常恰当的描述您，那么请您在“6=完全同意”上画圈，依此类推。每个人的性格各不相同，所以答案没有对错之分，请根据您的实际情况作答。

1=完全不符合，2=大部分不符合，3=有点不符合，4=有点符合，5=大部分符合，6=完全符合

- | | |
|---|-------------|
| (1) 我常感到害怕 | 1—2—3—4—5—6 |
| (2) 一旦确定了目标，我会坚持努力地实现它 | 1—2—3—4—5—6 |
| (3) 我觉得大部分人基本上是心怀善意的 | 1—2—3—4—5—6 |
| (4) 我头脑中经常充满生动的画面 | 1—2—3—4—5—6 |
| * (5) 我对人多的聚会感到乏味 | 1—2—3—4—5—6 |
| (6) 有时我觉得自己一无是处 | 1—2—3—4—5—6 |
| (7) 我常常是仔细考虑之后才做出决定 | 1—2—3—4—5—6 |
| * (8) 我不太关心别人是否受到不公正的待遇 | 1—2—3—4—5—6 |
| (9) 我是个勇于冒险，突破常规的人 | 1—2—3—4—5—6 |
| (10) 在热闹的聚会上，我常常表现主动并尽情玩耍 | 1—2—3—4—5—6 |
| (11) 别人一句漫不经心的话，我常会联系在自己身上 | 1—2—3—4—5—6 |
| (12) 别人认为我是个慎重的人 | 1—2—3—4—5—6 |
| * (13) 我时常觉得别人的痛苦与我无关 | 1—2—3—4—5—6 |
| (14) 我喜欢冒险 | 1—2—3—4—5—6 |
| * (15) 我尽量避免参加人多的聚会和嘈杂的环境 | 1—2—3—4—5—6 |
| (16) 在面对压力时，我有种快要崩溃的感觉 | 1—2—3—4—5—6 |
| (17) 我喜欢一开头就把事情计划好 | 1—2—3—4—5—6 |
| * (18) 我是那种只照顾好自己，不替别人担忧的人 | 1—2—3—4—5—6 |
| (19) 我对许多事情有着很强的好奇心 | 1—2—3—4—5—6 |
| (20) 有我在的场合一般不会冷场 | 1—2—3—4—5—6 |
| (21) 我常担忧一些无关紧要的事情 | 1—2—3—4—5—6 |
| (22) 我工作或学习很勤奋 | 1—2—3—4—5—6 |
| (23) 虽然社会上有些骗子，但我觉得大部分人还是可信的 | 1—2—3—4—5—6 |
| (24) 我身上具有别人没有的冒险精神 | 1—2—3—4—5—6 |
| (25) 在一个团体中，我希望处于领导地位 | 1—2—3—4—5—6 |
| (26) 我常常感到内心不踏实 | 1—2—3—4—5—6 |
| (27) 我是个倾尽全力做事的人 | 1—2—3—4—5—6 |
| (28) 当别人向我诉说不幸时，我常感到难过 | 1—2—3—4—5—6 |
| (29) 我渴望学习一些新东西，即使它们与我的日常生活无关 | 1—2—3—4—5—6 |
| (30) 别人多认为我是一个热情和友好的人 | 1—2—3—4—5—6 |
| (31) 我常担心有什么不好的事情要发生 | 1—2—3—4—5—6 |
| * (32) 在工作上，我常只求能应付过去便可 | 1—2—3—4—5—6 |
| (33) 尽管人类社会存在着一些阴暗的东西（如战争、罪恶、欺诈），
我仍然相信人性总的来说是善良的。 | 1—2—3—4—5—6 |
| (34) 我的想象力相当丰富 | 1—2—3—4—5—6 |
| (35) 我喜欢参加社交与娱乐聚会 | 1—2—3—4—5—6 |
| * (36) 我很少感到忧郁或沮丧 | 1—2—3—4—5—6 |
| (37) 做事讲究逻辑和条理是我的一个特点 | 1—2—3—4—5—6 |
| (38) 我常为那些遭遇不幸的人感到难过 | 1—2—3—4—5—6 |
| (39) 我很愿意也很容易接受那些新事物、新观点、新想法 | 1—2—3—4—5—6 |
| (40) 我希望成为领导者而不是被领导者 | 1—2—3—4—5—6 |

星号为反向计分。

Appendix 8. Chinese Big-Five Personality Inventory Brief Version (CBF-PI-B) (English Version)

Introduction:

Here are some sentences that describe people's personalities. Circle the Numbers according to how well each sentence matches your personality.

For example, if the sense "In group activities, I am an active person" is a good description of you, so circle "6" as your answer, which means, "complete agreement". Every people's personality is different, so there is no right or wrong answer to these questions. Please answer according to your actual situation.

1= completely inconsistent, 2= mostly inconsistent, 3= somewhat inconsistent,

4= somewhat consistent, 5= mostly consistent, 6= completely consistent

(1) I always feel afraid.	1--2--3--4--5--6
(2) Once I have set my goal, I will persist in working hard to achieve it.	1--2--3--4--5--6
(3) I think most people are basically well-intentioned.	1--2--3--4--5--6
(4) My mind is always full of vivid pictures.	1--2--3--4--5--6
* (5) I get bored with parties full of people.	1--2--3--4--5--6
(6) Sometimes I feel I am useless and can do nothing.	1--2--3--4--5--6
(7) I usually make my decision after careful consideration.	1--2--3--4--5--6
* (8) I don't care much about people being treated unfairly.	1--2--3--4--5--6
(9) I'm an adventurous person who willing to break the regulation.	1--2--3--4--5--6
(10) At lively parties, I often take the initiative and enjoy myself.	1--2--3--4--5--6
(11) I always take care of what other people say and relate it to myself. Even sometimes it's meaningless.	1--2--3--4--5--6
(12) I have always been considered as a cautious person by others.	1--2--3--4--5--6
* (13) I often feel that other people's pain has nothing to do with me.	1--2--3--4--5--6
(14) I enjoy to take risks.	1--2--3--4--5--6
* (15) I try to avoid parties with large crowds and noisy environments.	1--2--3--4--5--6
(16) I feel almost breaking down when I facing pressures	1--2--3--4--5--6
(17) I like to plan things at the beginning.	1--2--3--4--5--6
(18) I'm the kind of person who only takes care of myself and doesn't worry about others.	1--2--3--4--5--6
(19) I have a strong curiosity about many things.	1--2--3--4--5--6
(20) When I participate, the atmosphere will not be cold.	1--2--3--4--5--6
(21) I often worry about insignificant things.	1--2--3--4--5--6
(22) I work or study very hard.	1--2--3--4--5--6
(23) Although there are some cheats in society, I think most people are believable.	1--2--3--4--5--6
(24) I have an adventurous spirit in me that others haven't.	1--2--3--4--5--6
(25) I want to be the leader in a group.	1--2--3--4--5--6
(26) I often feel insecure inside.	1--2--3--4--5--6
(27) I am a person who does everything as much as I can.	1--2--3--4--5--6
(28) I often feel sad when people tell me their misfortunes.	1--2--3--4--5--6

(29) I am eager to learn something new, even if it is useless for my daily life.	1--2--3--4--5--6
(30) I am generally thought of as a warm and friendly person.	1--2--3--4--5--6
(31) I often worry about something bad to happen	1--2--3--4--5--6
(32) In my work, I often only want to be able to cope with it.	1--2--3--4--5--6
(33) Although there are some terrible things in human society (such as war, crime, fraud), I still believe that human nature is generally kind.	1--2--3--4--5--6
(34) My imagination is quite rich	1--2--3--4--5--6
(35) I like to go to social and recreational parties	1--2--3--4--5--6
(36) I rarely feel melancholy or depressed.	1--2--3--4--5--6
(37) Being logical and organized is one of my characteristics.	1--2--3--4--5--6
(38) I often feel sorry for those who have suffered misfortune.	1--2--3--4--5--6
(39) I am willing and easy to accept new things, new opinions and new ideas.	1--2--3--4--5--6
(40) I want to be a leader rather than be led	1--2--3--4--5--6



Risk Questionnaire

Why should I use the Risk Questionnaire?

Understanding your attitude to investment risk is an important factor in making a decision about investments.

The questionnaire has been designed to measure investment risk tolerance, which is your emotional response to changes in the value of your investments. Your attitude to investment risk is just one factor you should take into account so it is essential to have a discussion with your adviser to consider, amongst other things, your actual ability to withstand changes in the value of your investments (capacity for loss), your financial goals and risks other than investment risk.

The questionnaire is not suitable if you are unwilling to take any investment risk. You should let your adviser know if you think that you fall into this category.

How should I use Risk Questionnaire?

The risk questionnaire is provided to enable a conversation about risk tolerance between you and your adviser.

You can complete the attached questionnaire with your answers and pass it to your adviser, who will calculate your risk score.

Following discussion of your answers with your adviser, you can then agree your risk level. You do not necessarily need to select the same level as indicated by the risk questionnaire if, for example, other factors such as your capacity for loss indicate that another category is more appropriate for you. Additionally, the questionnaire is designed to assess your overall investment risk tolerance. You may decide to take more or less investment risk for a particular investment.

What are the limitations of the Risk Questionnaire?

The questionnaire will help you to understand your attitude to investment risk but it is important to understand that there are some limitations.

- Education, not advice – this tool is a guide for illustrative purposes only
- Limits – this tool doesn't look at other factors, such as your stage of life, your financial goals or the size of financial loss you are able to withstand
- Think bigger – risk is just one of the things you need to consider when you're making investment decisions. For example, the term of your investment and whether you might want to access your investments before the end of this term are also important
- Talk to an expert – discuss the results with your adviser before taking action

Who are Oxford Risk?

Oxford Risk Research & Analysis Ltd are an independent company who are acknowledged experts in risk profiling. Their risk analysis expertise and tools are utilised by a wide range of financial services companies and in the UK alone over 1500 assessments are conducted each day using Oxford Risk questionnaires.

Client Name:

Risk questionnaire	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1 My friends would say that I am cautious.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 I prefer my money to be safe from risk.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 I have put money in a risky investment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 I have experienced considerable gain from a risky investment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 I have been extremely risky in my past with financial investments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Even if I could get high returns, I would prefer not to invest my money in something that might decline in value.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Being financially cautious is important to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 I would never make a high-risk investment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 Maximising long-term investments is my goal, and I would be willing to accept dramatic, short-term drops in value to achieve this.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Unlikely	Somewhat unlikely	Neither likely nor unlikely	Somewhat likely	Likely
10 Overall, how likely is it that you would take a significant financial risk?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

▼ Your adviser will enter your risk score below, this allows you to choose your risk level ▼		
Using your risk score, please choose which risk level you believe suits you best:	Risk score	Select risk level
Higher risk - A risk score of (42-50) would put you in the higher risk category. People in this category are very comfortable with investment risk. They aim for high long-term investment returns and do not overly worry about periods of poorer performance in the short to medium term. Ordinarily these portfolios can be subject to the full extent and frequency of stock market fluctuations.	50	<input type="checkbox"/>
Medium to higher risk - A risk score of (34-41) would put you in the medium to higher risk category. People in this category are relatively comfortable with investment risk. They aim for higher long-term returns and understand that this can also mean some sustained periods of poorer performance. They are prepared to accept significant fluctuation in value to try and achieve better long-term returns.	42	<input type="checkbox"/>
Medium risk - A risk score of (26-33) would put you in the medium risk category. People in this category are balanced in their attitude towards risk. They don't seek risky investments but don't avoid them either. They are prepared to accept fluctuations in the value of their investments to try and achieve better long-term returns. These portfolios will be subject to frequent and at times significant fluctuations in value.	34	<input type="checkbox"/>
Lower to medium risk - A risk score of (18-25) would put you in the lower to medium risk category. People in this category are relatively cautious with their investments. They want to try to achieve a reasonable return, and are prepared to accept some risk in doing so. Typically these portfolios will exhibit relatively modest yet frequent fluctuations in value.	26	<input type="checkbox"/>
Lower risk - A risk score of (10-17) would put you in the lower risk category. People in this category are conservative with their investments. They prefer taking a small amount of risk to achieve modest or relatively stable returns. They accept that there may be some short term periods of fluctuation in value.	18	<input type="checkbox"/>
	10	<input type="checkbox"/>
Your risk score		<input type="text"/>

Client signature:

Date:

Appendix 9 (b). Follow-up Interview Questions on risk attitude

- Last year, we discussed some questions on risk management. Now looking back at your experiences, has your understanding of risks changed over the year? If so, in what context and how?
- From a general perspective, can you please describe your risk attitude to me?
- Do you enjoy the risks and uncertainties during your company operations?
- As an entrepreneur, how likely are you to try some new issues or projects that you may not know much about?
- How do you assess and understand the relationship between risks and opportunities?
- Are you willing to take relatively higher risks to earn market benefits? Please explain your views.
- When facing a new project or market opportunity, which out of these would you care more: further potential benefit or current cost and risk? Please explain your views.
- In your company, do you have a specific budget for innovation related activities or investment? If so, how much approximately in terms of percentage does it occupy in your company's budget allocation?
- Do you think your risk attitude will change or evolve in future with the company further development/after gaining more experience in this role?

Appendix 10. Fourth Round Interview Guide

General Questions on risk attitude

- In general, how do you handle risks and uncertainties in your day-to-day company operations?
- You have been working in this company for over X years now....Now looking back, how would you describe your confidence with risk management in your organization?
- What factors have helped you to build this confidence with risk management?
 - Alternate: What has impacted your confidence with risk management?
- What factors can help you to further build your confidence with risk management?
- How do you handle risks compared to when you were new to your role? Can you give some examples reflecting your management of risks in different circumstances?

Impact of Covid on risk perception

- Last year, we had some general discussions on risk management. Now, year 2020 has been an exceptional year....How has your perception and understanding of risk changed this year compared to 2019?
- Has Covid 19 had any influence on your understanding of risks and risk management?
- Today, how do you engage with the market and keep yourself up-to-date with any potential risks?
 - How do you analyze risks?
- Has the market changes or impact from Covid-19 brought any new business opportunities for your company?
- How do you explore business opportunities under such challenging market environment?
- How willing are you to take relatively higher risks today to utilise market benefits?

Innovation and investment

- As the founder-entrepreneur of software SME, what does 'innovation' mean to you? How would you define it in your organization?
- What's the impact of innovation to your company's development? (such as impact on market competitiveness)
- What is the biggest challenge or risk during the company's innovation process?
- In your company, do you have a specific budget dedicated for innovation activities or investment?
 - If you so, how do you decide the allocated percentage in relation to your company's income?
- Before you decide to run a new project or work on a new product/concept, what kind of market research or assessment do you undertake?
 - Can you explain this process of market research followed in your organization?
 - What factors would you consider in this process?

- How do you engage your employees with this process?
- How does that help you to avoid potential risks? Can you give examples where your market research led to successful identification of risks?
- How do you engage your employees with the process of risk management?
 - What training opportunities do you provide to your employees?
- As an entrepreneur, how often do you take up new issues/projects or challenges that you may not necessarily have a deep understanding of?
- Have you changed any of your innovation strategies during the COVID-19?
- When dealing with a new project or market opportunity, which is your biggest priority- is it the potential benefit or is it the cost and associated risks?
- Under what circumstances are you willing to take a high risk with a given market opportunity?
- Do you think your risk attitude has changed over the years?
 - If so, what factors have brought these changes? Can you please explain?
- Going forward, how would you improve your company's ability to successfully manage risks? What steps and measures will you use?