

**Risk Perception and Strategic Decisions:
Qualitative Analysis Based on Top Management Team's
Characteristics in Chinese LNG Import Sector**

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Declaration

I declare that I have composed this thesis myself and that it embodies the results of my own research. Where appropriate, I have acknowledged the nature and extent of work carried out in collaboration with others included in the thesis.

Shufang Huang

ABSTRACT

Global energy demand continues to rise, positioning liquefied natural gas (LNG) a crucial component in enabling China's energy transition. Within the international LNG market, China is already a major participant. However, China's LNG importers face the critical challenge of making long-term procurement decisions in an increasingly uncertain environment—a key element in ensuring the security and stability of the nation's energy supply.

This study adopts a qualitative research design guided by grounded theory. Semi-structured interviews serve as the primary data collection tool. Interviews were conducted with Top Management Team (TMT) members from leading Chinese LNG importing companies, covering state-owned, private, and joint ventures. The study explores factors that shape TMT's strategic decision making and develops a strategy decision making framework aimed at strengthening energy supply security. Central to this framework is the role of TMT risk perception, with a specific analysis of its connections with TMT characteristics such as industry networks, business experience, cognitive style, and self-actualization needs.

The findings reveal that TMT characteristics do not directly influence long-term LNG procurement strategies—encompassing contract duration, pricing mechanisms, and procurement models. Instead, their impact is indirectly shaped by risk perception across four dimensions: geopolitical, market, logistics, and policy risks. Additionally, organizational type—state-owned, private, or joint venture—shapes the relationship between TMT traits and risk perception, reflecting the contextual differences in decision-making dynamics.

This research offers substantial theoretical and practical contributions. Theoretically, it enriches Upper Echelons Theory by clarifying how risk perception connects TMT characteristics and strategic outcomes, while also extending risk perception theory to the organizational strategy level within the energy import sector. Practically, the proposed framework provides actionable insights for Chinese LNG importers to optimize TMT composition, enhance risk perception, and improve strategic decision-making in long-term procurement. It also informs policymakers in crafting differentiated energy policies that support China's sustainable development of its LNG industry and bolster national energy security.

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CHAPTER 1 Introduction

1.1 Introduction

Chapter 1 outlines the structure of this dissertation. It starts with the research background and the key term definitions, followed by the problem statement that justifies the necessity of this research. Subsequently, the research objectives and research questions are presented. Then, the chapter elaborates on the theoretical framework underpinning the research, concluding with a discussion of the study's significance and contributions.

1.2 Background of the Research

1.2.1 Current Situation of Global and Chinese Energy Demand

According to the International Energy Agency's (IEA) Global Energy Assessment, global energy demand is projected to grow by 2.2% in 2024. This represents a significant acceleration from the annual average growth rate of 1.3% observed between 2013 and 2023. Furthermore, global electricity consumption is projected to accelerate further between 2025 and 2027, increasing from 27178 terawatt hours in 2022 to 32542 terawatt hours in 2027, an increase of nearly 20%. The growth rate will reach 4.3% in 2023-2024, and the compound annual average growth rate from 2025 to 2027 will be about 3.9%, higher than the 2.5% in 2022-2023. From a regional

perspective, there are differences in energy demand among different regions. Among them, the Asia Pacific region leads the global electricity demand growth, with electricity demand reaching 15452 terawatt hours in 2023-2024, an increase of 5.9%, exceeding the global average level during the same period (IEA, 2025). From the perspective of energy structure, the demand for all major energy varieties and technologies will show an increasing trend in 2024, with renewable energy emerging as the primary contributor to this incremental growth, followed by natural gas.

China's demand for energy is very strong and has consistently maintained strong growth. In 2023, China's total energy consumption reached approximately 5.41 billion tons of standard coal, reflecting a year-on-year increase of 5.7% (National Bureau of Statistics, 2024; IEA, 2024). Although this growth rate is projected to slow to below 3% in 2024, China is still expected to account for over 30% of the global growth in energy demand (BP Energy Statistics, 2024). In the same year, total electricity consumption stood at 9,852.1 billion kilowatt-hours (kWh), up 6.8% year-on-year. The power generation by industrial enterprises above the designated size contributed 9,418.1 billion kWh to this total. A sectoral breakdown reveals that electricity consumption by the primary industry was 135.7 billion kWh, representing a year-on-year increase of 6.3%. The electricity consumption of the secondary industry reached 6387.4 billion kilowatt hours, a year-on-year increase of 5.1%; The electricity consumption of the tertiary industry reached 1834.8 billion kilowatt hours, a year-on-year increase of 9.9%; The daily electricity consumption of urban and rural

residents reached 1494.2 billion kilowatt hours, increase of 10.6% year-on-year (National Bureau of Statistics, 2025).

The reason why China has a strong demand for energy is mainly driven by three core factors: population growth, increasing urbanization rate, and economic growth, coupled with factors such as industrial structure upgrading, consumption pattern transformation, and digital economy development. From the perspective of population growth, China has a population base of 1.4 billion (National Bureau of Statistics, 2024). Even if the rate of growth slows down, the total amount is still huge, and residents' daily energy consumption (electricity, gas, transportation, etc.) continues to grow. China's population is expected to peak between 2025-2030, with a peak of more than 1.44 billion, and then slowly decline (China Petroleum Economic and Technological Research Institute, 2017). From the perspective of urbanization rate, China's urbanization rate has steadily increased, currently reaching 66.2%. It is forecast that by 2050, China's urbanization rate would reach 72%, and the urban population will approach 1 billion (National Bureau of Statistics, 2024). With the increase of urbanization rate, energy consumption in buildings and transportation has surged. Building energy consumption (air conditioning, heating, lighting) accounts for 20% of the total energy consumption in society. For every 1% increase in urbanization, building energy consumption increases by about 1.5%. From the perspective of economic growth, the Chinese economy experienced medium to high growth before 2020, with an average annual growth rate of around 6.7%; Medium speed growth

from 2021 to 2035, increased by around 5% per year, on average; Stable growth from 2036 to 2050, increased by around 3.5% per year, on average (National Bureau of Statistics, 2024). With the expansion of economic scale and the synchronous growth of energy demand, industry remains the key source for the energy consumption, also the transformation for high energy consuming industries is slow.

1.2.2 Current Natural Gas Demand Situation in the World and China

Let us now examines the current state of natural gas demand in both the international context and China. According to the International Energy Agency (IEA), rising global electricity consumption has made the power sector the principal driver of accelerated energy demand growth. Consequently, renewable energy has become the leading source for meeting new electricity demand. While renewables lead this expansion, the surge in overall electricity consumption is driving increased use of all sources, including natural gas, coal, and nuclear power.

Among fossil fuels, natural gas enjoyed the highest growth rate in demand. In 2024, the global natural gas consumption has increased by 115 billion cubic meters annually compared to the previous year, with a growth rate of 2.7%, significantly higher than the average annual growth level of 75 billion cubic meters in the past 10 years. In comparison, the growth rate of oil demand has significantly slowed down, with a global annual increase of 0.8% in oil demand, and its proportion in global energy

demand has fallen below 30% for the first time (IEA, 2025).

According to the "2050 World and China Energy Outlook" released from the Economic and Technological Research Institute of China National Petroleum Corporation, global natural gas demand is projected to reach 5.6 trillion cubic meters by 2050. This represents a 61% increase from 2015 levels, making natural gas the fastest-growing fossil fuel during this period, with an average annual growth rate of 1.4% from 2016 to 2050. The Asia-Pacific region is expected to be the primary driver of this growth, contributing 40.5% of the global increase. Demand is rising across all sectors, with the transportation sector exhibiting the most rapid expansion at an average annual rate of 2.2%. The power generation sector and residential demand have contributed the most, accounting for 34.3% and 22.5% of the total increase, respectively. North America has always had the highest natural gas production, accounting for over 24%, while the Middle East, CIS region, and Asia Pacific region account for 20%, 20%, and 16%, respectively.

The natural gas demand in China is also very strong and has strategic significance. China boasts a vast population and has witnessed remarkable economic success over the past few decades. This sustained growth has substantially improved the quality of life for its people. However, this rapid development has concurrently emerged as a significant environmental challenge, positioning China as the world's largest emitter of CO₂ that necessarily switch from coal-dominated to sustainable energy system (Li

& Taeihagh, 2020). China is currently processing natural gas industry energy reform, and accelerating the natural gas development which is demonstrating a strategic significance (Dong, et al., 2017). In recent period, Chinese natural gas demand increased extraordinary because policy pushes to improve the air quality. In China, natural gas is playing an increasingly important role by substituting coal in industrial applications, powering urban residential boilers, and serving the power sector (IEA, 2024). The following table 1-1 present the fact showing natural gas' growth trend under China's energy mix. Given this trend, its share in the national energy mix is expected to continue rising, with a promising and significant potential for future growth, especially under China's current energy transition trend.

Table 1-1: 1990 - 2020 China's energy consumption mix BP (2021)

Year	Coal	Oil	Natural Gas	Nuclear	Hydroelect ricity	Renewable
1990	76.2	16.6	2.1	0.7	4.4	0
1995	74.6	17.5	1.8	0.1	5.9	0.1
2000	67.0	23.6	2.5	0.2	6.6	0.1
2005	69.1	21.0	2.9	0.5	6.3	0.2
2010	70.5	17.6	4.0	0.7	6.7	0.5
2015	63.7	18.6	8.2	2.2	8.2	1.8

2020	57.0	18.9	8.2	2.2	8.5	5.2
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Source: BP Statistical Review of World Energy (1990, 1995, 2000, 2005, 2010, 2015, 2020)

In 2024, the proportion of natural gas in China's primary energy consumption will remain at around 9% (with a consumption of 422.2 billion cubic meters, equivalent to 340 million tons of oil equivalent). Affected by macroeconomic factors, emerging industries, and the decline in international gas prices, the annual natural gas consumption has a year-on-year increased of 7.8% . The current landscape of China's natural gas consumption is distributed across several key sectors, namely urban gas, industrial fuel, power generation, and the chemical industry, which collectively dominate the demand structure. Looking ahead, the country's energy demand structure is projected to align with global trends by shifting steadily toward cleaner and low-carbon sources. The share of coal is expected to decline continuously over the coming decades, while the proportion of natural gas is anticipated to achieve significant growth. It is anticipated that natural gas will surpass oil as a major energy source around the mid-century period, which highlights the rising significance of natural gas in shaping China's future energy system, as the country advances toward low-carbon energy transition and rationalizes its energy mix.

1.2.3 China's Liquefied Natural Gas Imports: An Overview

Moving on China's current situation of LNG imports, China is now a leading global LNG importer with substantial import volumes. Since 2020, China has imported over 100 million tons of natural gas annually, with an import amount of approximately 460 billion yuan. In 2024, China will import approximately 132 million tons of natural gas, ranking first globally; The import amount reached 463.75 billion yuan, accounting for 2.52% of the total import trade for the year (General Administration of Customs, 2024).

China's imported natural gas is mainly divided into two categories: liquefied natural gas (LNG) and gaseous natural gas. The research focuses on LNG. Natural gas could be transported over long distances as in the form of liquid, known as liquefied natural gas, or LNG. To convert natural gas into its liquid phase, it must be cooled to -160°C under atmospheric pressure. This gas-to-liquid transformation—when the initial temperature of the natural gas is approximately 15°C —results in a volume reduction of roughly 600:1. Such a significant volumetric shrinkage enables the cost-effective transportation of large energy quantities over both long and short distances, utilizing specially designed seaborne tankers and onshore trucks. (IGU, 2024; GIIGNL, 2024).

In contrast to pipeline natural gas, liquefied natural gas (LNG) features tradability across global markets. Over the past five decades, the global LNG trade volume has

maintained an average annual growth rate of 11%, expanding from 2.6 million tons (MT) in 1971 to its current global scale. Since the 1990s, the number of LNG importing markets worldwide has increased approximately fivefold, with the most notable growth occurring between 2009 and 2016 (Figure 1). Furthermore, the rising demand of market flexibility has driven the share of spot and short-term LNG trade to climb from 5% in 2000 to 36.6% in 2021 (IEA).

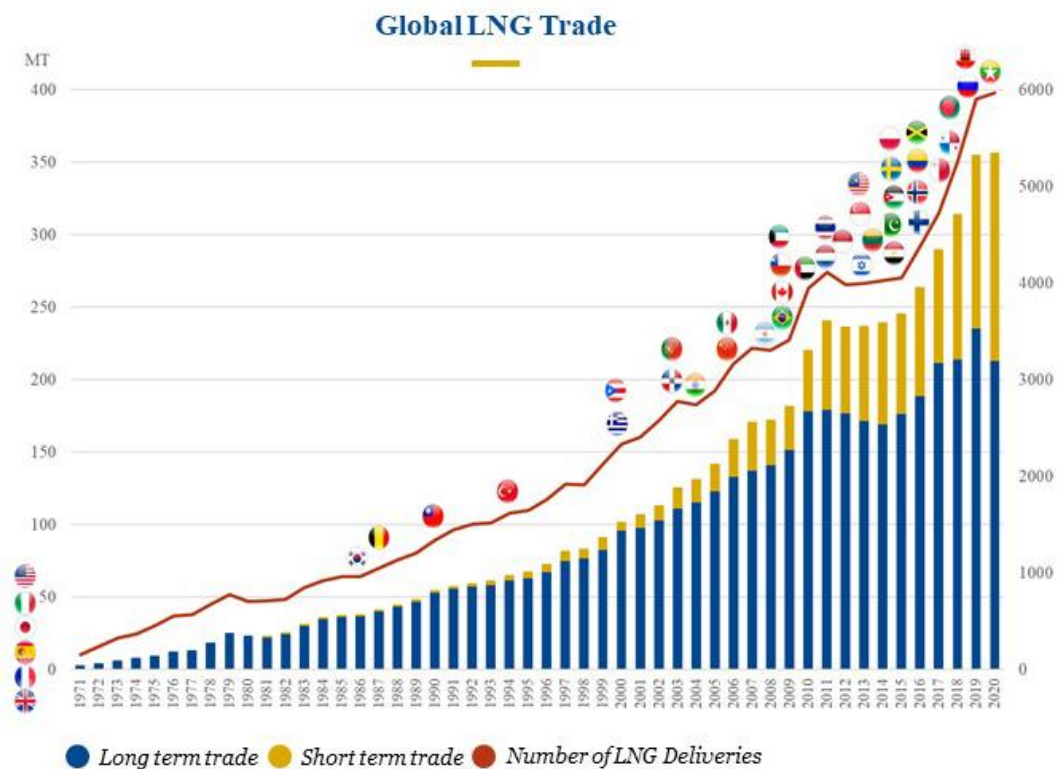


Figure 1-1: Global LNG Trade

Source: GIIGNL

Major LNG flows in 2022

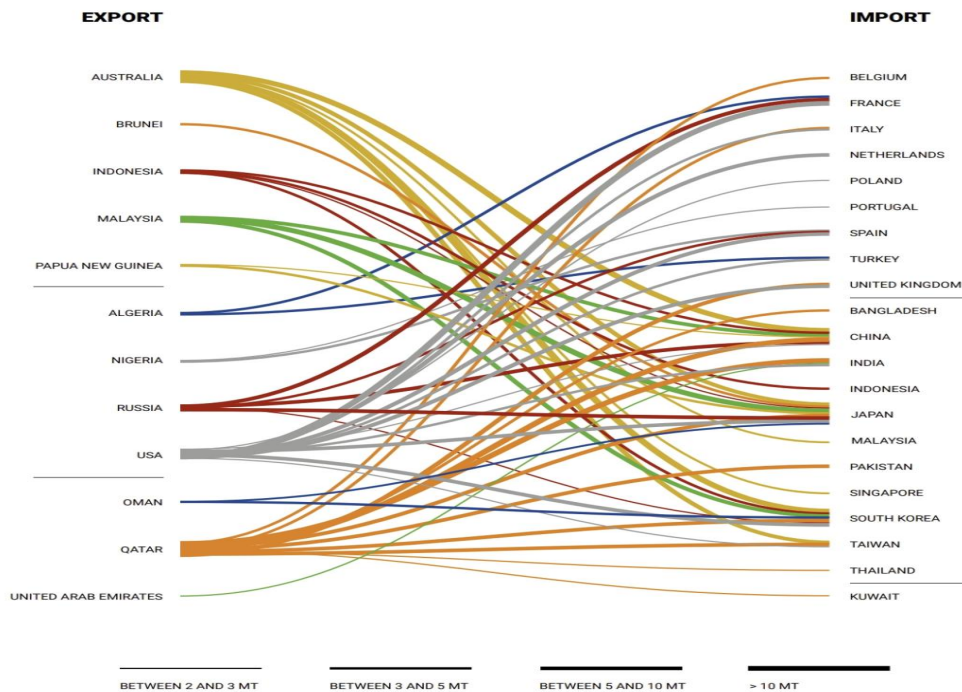


Figure 1-2 LNG Routes

source: GIIGNL

Until the late 1990s, the LNG industry remained a niche sector, operating primarily in the Asia-Pacific region. However, with the advent of the 21st century, global LNG demand surged amid what could be described as a "perfect storm"—driven by the worldwide boom in industrial and commercial activities, which in turn fueled a growing appetite for energy resources globally. From the year 2000 to year 2008, the industry of LNG had entered to an emerging growth with big supply growth from a number of growing LNG production supplies. LNG exporting countries of LNG increased to 15 in 2008 from 8 in 1996. To meet the requirement of the increasing LNG importer and exporter, more companies joined the LNG market. The prospects

of natural gas are so promising that the International Energy Agency (IEA) has hailed the 21st century as the "Golden Age of Gas." Its global demand is projected to surge significantly: from accounting for 25% of the world's total energy supply mix in 2010, natural gas is expected to account for over 50% by 2035. (IEA,2024).

For China, the sources of its liquefied natural gas (LNG) imports are highly diversified, with major suppliers including Russia, Australia, Qatar, the United States, and other countries. According to the data, China imported 76.65 million tons of LNG in 2024, up 7.7% year-on-year. The import amount was 313.6 billion yuan, down 0.8% year-on-year (General Administration of Customs, 2024). In recent years, China's LNG import amount, import quantity and unit price are shown in table 1-2 below.

Table 1-2 China 's LNG import volume table (2015-2024)

	Import amount (billion yuan)	Imports (million tons)
2015	546	1963
2016	591	2606
2017	996	3813
2018	1784	5378
2019	1976	6025
2020	1618	6713
2021	2850	7893

2022	3488	6344
2023	3161	7132
2024	3136	7665

Data source: China General Administration of Customs

1.2.4 The Lag of Related Research

It can be seen from the above that the global energy demand continues to grow, and China is driven by the three core factors of population growth, urbanization rate and economic growth, and the demand for energy is more vigorous. China's energy demand structure will align with the global development trend, moving steadily toward cleanliness and low-carbonization, with the proportion of natural gas set to rise consistently. As the world's largest LNG importer, China's LNG import enterprises play a pivotal role in this transition. Serving as the core entities of import trade, these enterprises span various sizes and industry types, encompassing state-owned enterprises (SOEs), private enterprises and joint ventures.

From the perspective of research status, researchers have not treated China's LNG industry in much detail, and there is a lack of micro-research on LNG import companies. In LNG import companies, the success or failure of strategic decisions on LNG procurement is directly related to the profitability, market competitiveness and sustainable development ability of enterprises. However, because LNG procurement

involves long-term contracts, high investment and complex international environment, companies often face greater uncertainty in making strategic decisions. The factors influencing strategic decision-making are diverse and complex. For instance, they are closely intertwined with the characteristics of the top management team (TMT), requiring in-depth analysis to identify the underlying mechanisms. Nevertheless, significant gaps remain in existing research, highlighting an urgent need to expand the scope of relevant studies.

1.3 Main Objective and Problem Statement

1.3.1 Main Objective

We now proceed to articulate the core objective of this research. The primary objective of this dissertation is to investigate the impact of top management team (TMT) characteristics on risk perception and strategic decision-making within China's LNG import enterprises. It aims to clarify the mediating effect of risk perception between TMT characteristics and strategic decision and the moderating role of organisational type in this pathway.

Research objectives to be addressed:

RO1: Exploring the impact of different characteristics of the TMT on risk perception

in Chinese LNG import companies;

RO2: Exploring the risk perception impact of the top management team on strategy decisions in Chinese LNG import enterprises;

RO3: Exploring the mediating effect of risk perception between top management team characteristics and strategic decision among Chinese LNG import companies;

RO4: Exploring the moderating role of organizational type in the relationship between top management team characteristics, risk perception, and strategic decision in Chinese LNG import companies.

The correspondence between problem statement, research questions and research objectives are shown in Figure 1-3.

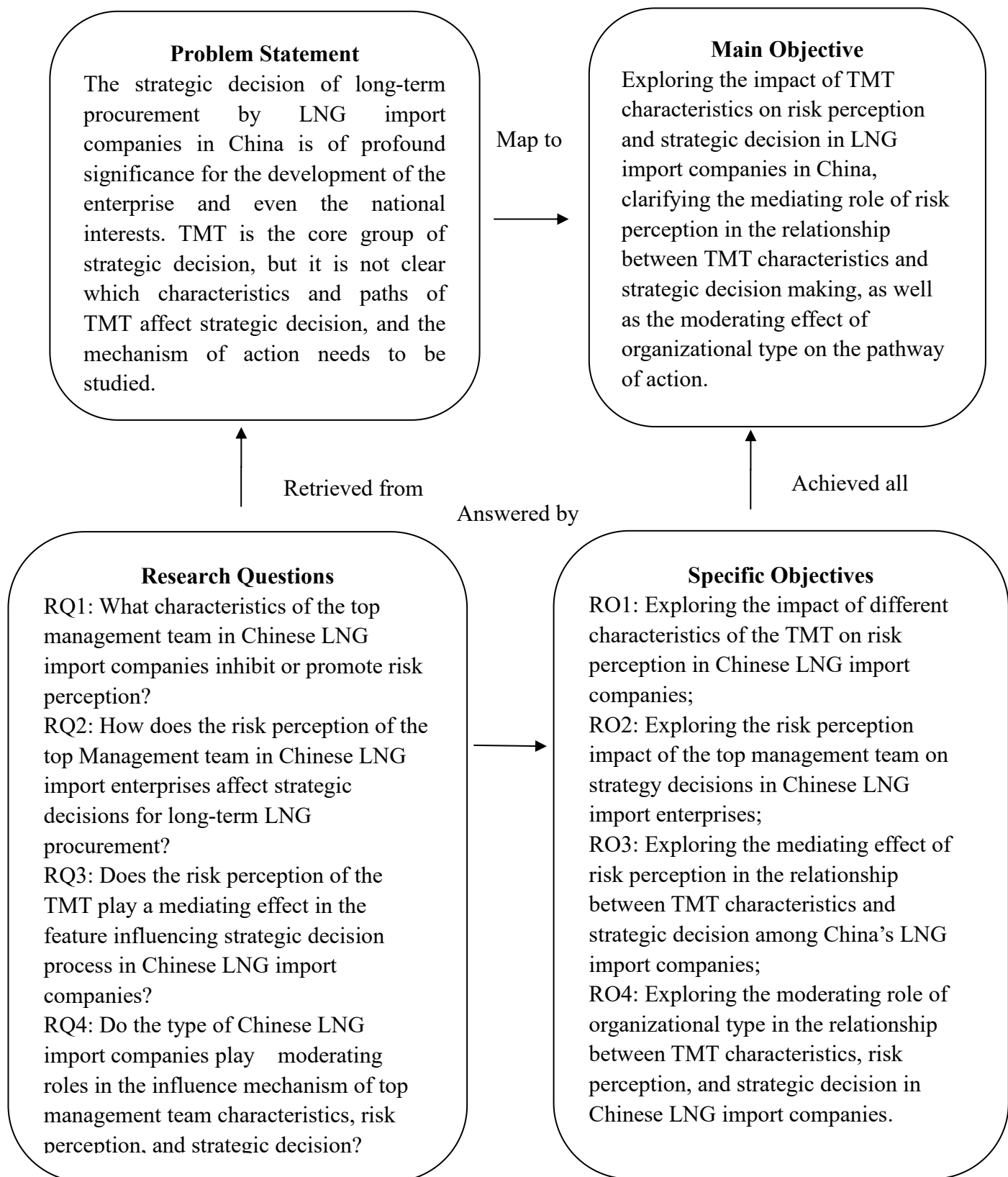


Figure 1-3 The correspondence between Problem Statement, Research Questions and Research Objectives

1.3.2 Problem Statement

The strategic decision to make long-term procurement by LNG import companies in China is significant to develop the enterprise and national interests. The TMT is the core group responsible for strategic decision-making, but it is unclear which characteristics and paths of TMT affect strategic decisions. Lack of research on the mechanism of action, especially the exploration from a risk perspective.

LNG, as an important component of clean energy, plays a vital role for optimizing Chinese energy structure mix and promoting the achievement of the carbon peaking and carbon neutrality goals. Over the past decade, alongside with the continuous growth in China's domestic natural gas demand, LNG imports have been increasing year by year, and China has emerged as the world's largest importer of liquefied natural gas (LNG). In this context, the strategic decisions of LNG import companies not only affect their own survival and development, but also have a profound impact on national energy security and energy structure optimization. LNG is a kind of energy product with high added value and high technical content. Its supply chain involves many links from exploration and development, liquefaction, transportation to receiving terminal from resource countries to importing countries. The whole process has long cycle, large investment and high risk. Especially in the process of signing long-term Sales and Purchase Agreement (SPA), enterprises need to predict and judge the market demand, price trend, transportation cost and policy environment in the next

few years or even decades. This uncertainty makes the strategic decision-making process challenging.

(1) Top Management team characteristics and risk perception

Within China's LNG import companies, when formulating a long-term LNG procurement strategy, the top management team should not only consider the financial status and market competitiveness of the company, but also need to comprehensively evaluate the changing trend of the external environment. For example, fluctuations in international oil prices may directly affect the procurement costs of LNG, while geopolitical risks may affect the stability of the supply chain. The Chinese government attaches great importance to energy security, which also makes LNG import companies must take into account the balance between national interests and corporate interests in strategic decision-making. In this complex decision-making environment, the top management team's cognitive ability, professional experience, knowledge structure, industry contacts and other factors, may have an important influence on the strategic choice of companies.

As the core group of corporate strategic decision-making, the composition characteristics of top management team often determine the response of enterprises in the face of uncertainty. Studies have shown that the age, educational background, professional field, management experience, industry experience and organizational

culture of the top management team will affect their perception and judgment of risk. The theoretical underpinnings for these findings are rooted in the upper echelons perspective, most notably established by Hambrick and Mason's (1984) foundational work, which has laid the conceptual foundation. This line of exploration has been advanced through a lineage of research, including the influential studies of Bantel and Jackson (1989) and Wiersema and Bantel (1992), and was later synthesized and expanded upon by Carpenter et al. (2004).

For example, executives with rich industry experience and international vision may be more inclined to adopt a robust strategy, and in a more risk-tolerant executive team, companies may be more inclined to assume higher market risks to obtain potential benefits. In the LNG import industry, the professional background of the top management team is particularly critical. Since the LNG business involves many fields such as international trade, energy finance, logistics and transportation, if the top management team has professional knowledge and practical experience in related fields, it will help them to more accurately identify and evaluate various risks. In addition, the demographic diversity of the top management team (such as gender, nationality, professional background, etc.) may also affect its risk perception model. Diversified teams may bring different perspectives and ways of thinking, so as to enhance the adaptability and innovation ability of enterprises in dealing with complex risks.

However, the current research on how the characteristics of the top management team of LNG import companies affect risk perception is still limited. Most of the existing research centers on the top management team (TMT) behavior for general enterprises. Although the theoretical validity of Upper Echelons Theory is well-established in general management literature (Hambrick & Mason, 1984; Carpenter et al., 2004), its application to high-risks industries like LNG importing is scarce. Existing energy risk studies (e.g., Jiang & Holburn, 2018; Soltani et al., 2022) primarily address macro-governance and market dynamics, while the specific link between TMT demographics and risk perception in this context has seldom been the primary focus. This identified gap definitively anchors the contribution of this research.

Moreover, the prior studies focuses more on macro market analysis or technical and economic evaluation, and less on the micro level of enterprises. Therefore, it is necessary to systematically analyze the link between top management team characteristics and risk perception, especially under the contextual setting of China's LNG import companies, to explore which characteristic factors can promote or inhibit executives' perception of risk, and then affect their strategic decisions.

(2) Risk perception and strategic decisions

Risk perception is a key link in the process of strategic decision-making, which reflects the top management team's subjective judgment and understanding of the

risks faced by the enterprise. In the decision-making of LNG long-term procurement strategy, the risk perception level of the top management team directly determines whether the enterprise is willing to accept the procurement plan with high risk and high return, or tends to choose a more conservative strategy. For example, if the top management team believes that the risk of international oil price fluctuations is greater, it may tend to sign more fixed-price long-term contracts; on the contrary, if the risk perception is low, it may be more inclined to adopt floating price contracts in order to obtain higher profits when future prices rise.

However, risk perception is not simply “high” or “low”, but is shaped by multiple factors, including the risk preference of individual executives, the cultural atmosphere within the enterprise, industry practices and shifts in the external institutional and market environment. In the corporate culture that emphasizes sound operation, the top management team may be likely to exhibit a stronger propensity to avoid risks; in innovation-oriented enterprises, executives may be more willing to take certain risks to pursue competitive advantages. Changes in government policies will also significantly affect executives' risk perception. When the government introduces policies to encourage the development of clean energy, LNG import companies may pay more attention to the stability of long-term procurement strategies, thereby reducing their sensitivity to short-term market fluctuations.

Although a large amount of research has explored the impact of risk perception on

strategic decision-making, most studies are mainly based on Western corporate backgrounds and lack in-depth analysis of Chinese domestic enterprises. Chinese LNG import companies are generally deeply influenced by government policies, and their strategic decisions are not only driven by market factors, but also constrained by national energy strategies and policy guidance. Therefore, it is necessary to combine the actual situation of Chinese LNG import companies to explore the mechanism of risk perception and how the top management team influences this process through characteristics.

(3) The role of organizational type

As an important dimension of organizational characteristics, organizational type may play a moderating role between TMT characteristics, risk perception and strategic decision-making. Large LNG import companies usually have a better management system, richer resource reserves and stronger risk resistance, which makes them more flexible and forward-looking in strategic decision-making. By contrast, small and medium-sized enterprises may be relatively weak in information acquisition, financial strength and risk management capabilities, so it is easier to adopt conservative strategies in the face of complex risks.

Specifically, the type of the organization may affect the relationship between the characteristics of the top management team and strategic decision-making through the

following paths: First, large enterprises and state-owned companies usually have a more professional top management team, and members may have higher education, richer industry experience, and a broader international perspective, which helps to improve the accuracy of their risk perception. Secondly, large enterprises and state-owned companies may have more sound risk management mechanisms and data analysis capabilities, so that they can more effectively use data to support risk assessment in the decision-making process, thereby reducing misjudgments caused by information asymmetry. Finally, large enterprises and state-owned companies usually have more advantages in policy coordination and market negotiation, and are more capable of addressing the uncertainty of international markets, especially, state-owned companies are under directly supervision by government, and hold more social responsibility, thereby enhancing the initiative and forward-lookingness of their strategic decisions making.

However, the existing studies on the role of organizational type in top management team (TMT) characteristics, risk perception and strategic decision-making is still insufficient, especially against the backdrop of Chinese LNG import industry. Given that China's LNG import market is dominated by large state-owned enterprises (SOEs), and the number of private enterprises is small, the existing research is mostly focused on state-owned enterprises, and there is a lack of systematic comparison of differences between enterprises of different types. Therefore, it is necessary to further explore the role of organizational type in this influence mechanism, so as to reveal the

similarities and differences between enterprises of different types during the strategic decision-making process, and provide more targeted reference for policymakers and enterprise executives.

Hence, the following research questions/problems to be addressed:

RQ1: What characteristics of the top management team (TMT) in Chinese LNG import companies inhibit or promote risk perception?

RQ2: How does the risk perception of the top Management team in Chinese LNG import enterprises affect strategic decisions for long-term LNG procurement?

RQ3: Does the risk perception of the top management team play a mediating role in the feature influencing strategic decision process in Chinese LNG import companies? In other words, do the the top management team's characteristics affect their strategic decision by influencing risk perception?

RQ4: Does the type of Chinese LNG import companies exert a moderating effect on the influence mechanism of top management team characteristics, risk perception, and strategic decision? In other words, does the influence between the characteristics of the top management team, risk perception, and strategic decision vary depending on

the type of the enterprise?

1.4 Theoretical Framework

The research is applying the qualitative research grounded theory to derive the decision-making process through interviews with senior management teams.

The subject of this research is the top management team (TMT) of a Chinese liquefied natural gas import companies. The Chinese liquefied natural gas import companies involved in the research cover companies of different sizes and types in LNG industry in the context of China, covering the state-owned enterprises, private companies and joint ventures.

China is the world's largest importer of LNG, with an import volume of 71.32 million tons in 2023, accounting for 21% of the global LNG trade volume, and increasing to 76.65 million tons in 2024 (General Administration of Customs, 2024).

The research object of this thesis covers different types LNG import companies. Based on the perspective of risk perception, this thesis explores the mechanism through which top management team (TMT) characteristics affect strategic decision-making and analyzes the role of different organizational types in the influence mechanism.

Definition of Key terms

The title of the research is “Risk Perception and Strategic Decisions: Qualitative Analysis Based on Top Management Team's Characteristics in Chinese LNG Import Sector: Qualitative Analysis Based on Risk Perception”. This research mainly involves three key terms: the first is “top management team characteristics”, the second is “strategic decision”, and the third is “risk perception”. To begin with, this section conducts a systematic definition of the three key constructs and elaborates on their logical connections with the research framework.

The first key concept is “top management team characteristics”. An executive team is a group composed of individual executives with different backgrounds. Hambrick et al. (1984) believed that a company is a comprehensive reflection of various aspects of its executives, and the characteristics and functional attributes of the top management team determine the actions and performance results for the company. Guided by upper echelons theory, the competitive behavior of a company is a comprehensive reflection of the cognition, judgment, and decision - making of the top management team (Certo et al., 2006). Given the research context of Chinese LNG import enterprises, the top management team (TMT) is delineated with reference to Nielsen (2010), based on either the list of senior executives in official public documents (e.g., annual reports) or the authoritative information on core decision-making teams provided by the company’s CEO during interviews. This article defines the top management team as all senior executives who play a crucial role in the company's major strategic issues. As the decision - making core of the enterprise, the top management team participates

in the formulation of major strategic plans and the initiation of actions. The composition and characteristics of its internal members directly affect the final decisions and the execution of actions (Li, 2023). Consistent with prior research (Kilduff et al., 2000), the core construct for measuring the attributes of internal members within the top management team (TMT) is defined as "TMT characteristics" — a comprehensive concept encompassing the heterogeneous individual traits and collective attributes of the core decision-making team, and many scholars have focused their research on this, trying to analyze the influence of the people behind corporate behavior (Deng et al., 2021). With reference to Carpenter et al. (2004), and tailored to the research context of Chinese LNG import enterprises, TMT characteristics are operationalized as the comprehensive heterogeneous attributes of TMT members, focusing on industry-specific dimensions: (1) basic demographic traits (age, gender, educational background, and functional background); (2) professional and experiential traits (organizational tenure, LNG industry experience, international contract negotiation experience, and technical expertise in gas storage and transportation). For instance, compared with Chief Executive Officers (CEOs) with longer tenures, new CEOs are more inclined to initiate strategic updates (Weng and Lin, 2014). Some scholars have also incorporated cognitive differences and differences in social capital in the relationship networks owned by members of executive teams into the connotation of executive team characteristics (Shipilov and Danis, 2006). These differences will to some extent reflect the differences in perception levels, behavioral choices, and value judgments among members of the top

management team, which would directly influence the decision - making process of the top management team and the competitive actions of the enterprise. In addition, the background characteristics of executive team members (such as overseas background and financial background) have gradually attracted the attention of scholars. The characteristics of the top management team are the direct manifestation of the potential experience, cognitive foundation, and values of the members of the top management team. Since the potential experience, cognitive foundation, and values of the top management team have a significant impact on the strategic decision - making of the organization, the characteristics of the top management team can directly affect the strategic decision - making of the company (Yang and Wang, 2014; Cui et al., 2019).

The second term is “strategic decision”. Strategic Decision Making is a foundational and core construct in the fields of management and strategic research, referring to the systematic choices made by organizations in an uncertain environment to allocate key resources, determine competitive positioning, and set organizational development directions to achieve long - term goals. Different scholars have put forward different interpretations based on differences in theoretical perspectives. Henry Mintzberg proposed in “Five Ps for Strategy” that strategic decision - making is a "conscious planning process", emphasizing the systematic evaluation of the internal and external contexts via tools for instance the SWOT analysis, the formulation for clear goals and action paths.

This classic view holds that decision - makers should maintain a high degree of rationality, but Mintzberg also points out that there may be an “emergent strategy” in actual decision - making, where the strategic direction is dynamically adjusted with changes in the environment. Porter (1996) emphasized that the essence of strategic decision - making is to “choose a unique value proposition” and determine a differentiated positioning through the analysis of industrial structure and competitive advantages. Consistent with the resource-based view (RBV) (Barney, 1991), the core of strategic decision-making lies in the identification, acquisition, and optimal allocation of valuable, rare, inimitable, and non-substitutable (VRIN) resources — resources that constitute the foundation for an enterprise’s sustainable competitive advantage. Drawing on the resource-based view (RBV) (Barney, 1991), the core of strategic decision-making for Chinese LNG import enterprises lies in identifying and allocating industry-specific VRIN resources — such as exclusive LNG receiving terminal access rights, long-term supply contracts with major global suppliers, and professional technical capabilities in gas storage and transportation—to address high environmental uncertainty and policy sensitivity. Drawing on the dynamic capabilities view (Teece et al., 1997), some scholars argue that strategic decision-making for Chinese LNG import enterprises should prioritize dynamic capabilities—such as the ability to reconfigure import source portfolios, adjust long-term contract structures, and integrate low-carbon technology resources — to adapt to the dual dynamics of global energy market volatility and domestic low-carbon policy adjustments. The cognitive and behavioral school believes that strategic decision - making in a rapidly

changing environment is not entirely rational but relies on heuristic rules and real-time information processing (Eisenhardt, 1999). Drawing on such cognitive-behavioral perspective, strategic decision-making for Chinese LNG import enterprises — operating in an environment characterized by global energy price volatility, geopolitical uncertainty, and frequent policy adjustments — is not entirely rational. Instead, it relies on industry-specific heuristic rules (e.g., experience-based judgment of price trends, simplified risk assessment frameworks) and real-time information processing (e.g., dynamic tracking of supply-demand dynamics, rapid policy interpretation) to balance decision efficiency and effectiveness.

The third core term is "risk perception". Consistent with prior research (Sitkin & Pablo, 1992; Mullins & Forlani, 2005), risk perception is generally defined as a decision-maker's subjective assessment and cognitive judgment of the nature, likelihood, and potential impacts of risks inherent in a specific context or decision scenario. This could be tailored to the research context of Chinese LNG import enterprises, "risk perception" could be defined as the top management team's (TMT) subjective assessment and cognitive judgment of industry-specific risks—such as international LNG price volatility, geopolitical conflicts, policy adjustment risks, and supply chain disruptions—in the process of strategic decision-making. Solovic (1987) first defined Risk Perception, stating that it is people's subjective judgment of risk. According to the definition in the Oxford Dictionary, risk is the "likelihood of loss",

which refers to “whether an event has occurred” and “the potential losses that an event may cause” (He, 2022). However, in reality, it has been found that the probability of risk events occurring and the potential losses have little marginal impact on individual decision - making (Slovic, 1967), while the direct impact on decision - making is the subject's risk judgment or risk perception. Since then, risk perception has gradually attracted the attention of the academic community, and a series of studies have been conducted on its characteristics and influencing factors. The degree of risk perception is not only affected by the risk itself (the likelihood of the target event materializing and the severity of potential adverse consequences) but also varies owing to differences in the subject's capability to grasp the insights and assess risks (Barron, 1976; Weber and Milliman, 1997; Slovic, 2000; Li et al., 2009; Zeng, 2015).

The theoretical framework guiding the research is presented under Figure 1-4. It posits a conceptual model that explains the formation of strategic decisions within an organizational context. It integrates key constructs from Upper Echelons Theory and behavioral decision-making literature to propose a mediated relationship.

The core proposition of this framework is that the Top Management Team (TMT)’s characteristics do not directly determine strategic decisions. Instead, their influence is mediated by the top management team's collective Risk Perception. This central

pathway suggests that the demographic and psychological composition of the TMT (e.g., age, tenure, functional background, education, and experiences) shapes its members' interpretation of strategic situations, particularly their assessment of uncertainty and potential losses or gains. This interpreted reality, encapsulated in their Risk Perception, subsequently becomes the primary cognitive driver behind the formulation and selection of Strategic Decisions, such as those related to company's strategic decisions making.

Furthermore, the framework acknowledges that organizational contexts are not uniform. Hence, it incorporates Organizational Type as a moderating variable. This construct is to impact the strength of the relationship within the core mediation model. For instance, the link between TMT Characteristics and Risk Perception, or between Risk Perception and Strategic Decisions, may be significantly different in state owned enterprise compared with private company, it may impose different constraints and incentives that alter how TMT characteristics are translated into risk perceptions and, ultimately, their strategic decisions making.

In summary, this framework provides a multi-layered explanation for strategic decision-making:

1. Direct Relationship: A foundational link between TMT Characteristics and Strategic Decisions is implied, consistent with classic Upper Echelons Theory.

2. Mediation: The model advances this theory by proposing that Risk Perception is the central cognitive mechanism that transmits the influence of TMT characteristics onto strategic outcomes.

3. Moderation: The model is contextualized by proposing that the entire process is contingent upon the Organization's Type, enhancing its explanatory power across different organizations.

This integrated model forms the foundation for the research, aiming to advance a more nuanced comprehension of the cognitive processing processes and contextual contingencies that underpin strategic decision-making, thereby enriching the theoretical landscape of existing theory application in Chinese LNG importing industry.

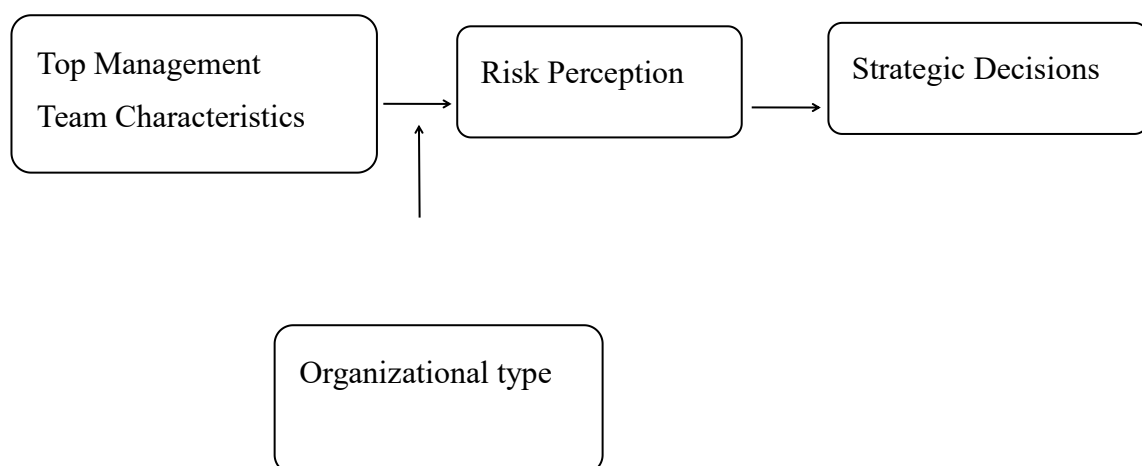


Figure 1-4 Theoretical Framework Diagram

1.5 Significance of the Research

1.5.1 Theoretical Contribution

First, this research has expanded the theoretical boundaries of strategic management and organizational behavior. It focuses on the relationship between the characteristics of the executive team and strategic decision - making in the LNG import industry, especially from the perspective of risk perception, which has important theoretical value in the fields of strategic management and organizational behavior. Traditional strategic management theory focuses more on the influence of macro factors for example the external context, market structure, and resource capabilities on strategic choices, and has less in - depth exploration of how the internal characteristics of the top management team shape the strategic behavior of the organization. Although research on the characteristics of executive teams has gradually increased in recent years, most of it focuses on general enterprises or cases in Western contexts, lacking systematic research on Chinese domestic enterprises, especially the energy industry. This research constructs a more refined theoretical framework by introducing the mediating variable of “risk perception”, namely “executive team characteristics → risk perception → strategic decision - making”. This model not only helps to understand how the top management team makes strategic judgments in an uncertain environment but also provides a new theoretical path for subsequent research. In addition, the study further introduces “organizational type” as a moderating variable to identify the differences and similarities in the strategic decision - making process of

enterprises of different sizes, thereby enriching the study content in the relationships between organizational type and the strategic behavior.

Second, it deepens the understanding of the strategic decision - making mechanism of energy enterprises. The energy industry has a high degree of uncertainty, high investment, and a long cycle. Especially in the field of LNG imports, companies need to face multiple challenges such as fluctuations in international oil prices, geopolitical risks, policy changes, and rising transportation costs. These factors make the strategic decision - making process of LNG import companies complex and uncertain. As the core force of decision - making, the cognition, experience, and preferences of the top management team largely determine how the enterprise responds to these risks. Existing literature on strategic decision - making in energy enterprises mostly focuses on external environmental factors such as policies and regulations and international market dynamics, while paying less attention to internal factors, especially the cognitive and psychological characteristics of the top management team. This research starts with the characteristics of the top management team, in addition, combines the mediating role of risk perception to reveal how the top management team makes strategic choices under the external environment with complex multi-dimensional uncertainties, providing a new theoretical perspective for understanding the strategic decision - making mechanism of energy enterprises.

This context-based empirical research focusing on China's institutional characteristics could help build theoretical models with stronger local explanatory power, in addition, effectively avoid practical research biases arising from mechanically copying Western mature theories and applying Western enterprise decision-making logic directly to China's policy-restrained LNG industry. Specifically, such biases mainly manifest in ignoring national energy strategy constraints, neglecting policy-oriented decision preferences of state-owned enterprises, and failing to capture the differentiated risk judgment logic brought by China's unique ownership structure.

Finally, it promotes the application of risk perception theory in strategic decision - making. Risk perception is an indispensable part of the strategic decision - making process, which reflects the decision - makers' subjective judgment and understanding of the risks faced by the enterprise. However, current research on risk perception mostly focuses on the individual level, and insufficient attention has been paid to team-level risk perception and its mechanism of influence on strategic decision-making — leaving the "black box" between team cognitive processes and organizational strategic outcomes partially unopened. This research breaks through this limitation and explores how the risk perception of the top management team as the whole affects its strategic choices, thereby expanding the application scope of risk perception theory.

1.5.2 Practical Contribution

First of all, it provides a reference for Chinese LNG import companies to refine the strategic decision - making abilities. In the LNG import industry, the success or failure of strategic decision-making is directly tied to an enterprise's profitability, market competitiveness, also the sustainable development capabilities of the enterprise. However, because LNG procurement involves long - term contracts, high investment, and a complex international environment, companies often face great uncertainty when making strategic decisions. Therefore, how to improve the risk perception ability of the senior management team, enhance its adaptability to the complex environment and decision - making level, has become an urgent problem for enterprises to solve. By analyzing the relationship between the characteristics of the top management team and risk perception, this research provides a theoretical basis for enterprises to identify and cultivate top management teams with good risk awareness. By accurately identifying the key characteristics of the top management team, enterprises can optimize the structure of the top management team according to these characteristics and improve their overall decision - making quality. Through the outcome of this study, enterprises could understand better of the advantages and disadvantages of their top management team and formulate corresponding training plans, talent introduction strategies, and organizational structure adjustment plans accordingly, so as to enhance the strategic decision - making ability of enterprises in a complex environment.

Secondly, it will foster the high-quality and sustainable development of the energy sector and help Chinese energy companies move towards internationalization. China is in a critical stage of energy structure transformation. As an important part of clean energy, LNG will assume an increasingly pivotal role in the future energy system, serving as a "key bridge" for low-carbon transition, a cornerstone of energy security, and a critical enabler for renewable energy integration. By analyzing the link between the characteristics of the top management team, risk perception, and the strategic decision - making, this research provides a scientific decision - making basis for enterprises, helps to improve the strategic management level of enterprises in a complex context, and provides practical guidance for the high - quality development of the energy industry. By optimizing the structure of the top management team and improving the risk perception ability, LNG import companies can more effectively cope with market fluctuations and policy changes, thereby achieving stable development. On the other hand, with the increasing influence of Chinese energy companies in the global energy market, more and more LNG import companies have begun to enter in the international market. This research is helpful for enterprises to strengthen the international construction of the top management team, improve their ability of risk identification and response, so as to occupy a favorable position in the fierce international market competition.

Finally, it provides a foundation to the government agencies to facilitate energy regulations and policies. The Chinese government pays great attention to energy security as well as the optimization on the energy structure. In recent years, A suite of supportive policies has been formulated and implemented to support the development of clean energy. As an important carrier of clean energy, LNG has received strong policy support. By analyzing the relationships between the characteristics of the top management team, risk perception, and the strategic decision - making of LNG import companies, this research can help the government more accurately understand the behavior logic of enterprises in the process of policy implementation. For example, if the research shows that the risk perception of the top management team is low, then they may tend to sign long - term contracts, the government can consider how to guide enterprises to reasonably evaluate risks and avoid improper resource allocation due to excessive risk aversion when formulating relevant policies. Moreover, the study also points out that organizational type has a moderating effect between the characteristics of the top management team and strategic decision - making, which means that the government should take into account the differences of enterprise types of enterprises when formulating energy policies and adopt differentiated policies to achieve more effective policy effects.

1.6 Outline of the Study

This research consists of six chapters:

Chapter 1 presents the introduction and the roadmap for the chapter, defines terms, presents the problem statement to explain the importance of the research, and puts forward the research objectives as well as the research questions.

Chapter 2 provides the reviews of the literature related to the topic for this research.

Chapter 3 of this dissertation outlines the methodological framework employed in the study, encompassing the philosophical research stance, research approach, definition and rational of the case study design, profile of research participants, pilot study implementation, detailed data collection procedures, data analysis strategies, methodological rigor enhancement measures, and ethical considerations throughout the research process.

Chapter 4 presents the findings and analysis from the empirical case study, with tables and figures to elaborate on the details.

Chapter 5 is the Discussion and Contributions. It will start with a brief summary of the findings, focus on expounding the key points related to the topic, and discuss the results with reference to the core findings from the literature review process. It will also outline the theoretical model and highlights the contributions.

Chapter 6, "Conclusions, Recommendations, and Future Research," serves as the final chapter of the dissertation. It summarizes the key research findings, elaborates on theoretical and practical implications, acknowledges research limitations, and puts forward targeted suggestions for future research to lay a foundation for subsequent explorations in the field.

CHAPTER 2 Literature Review

2.1 Introduction

The literature review section is designed to form a solid theoretical foundation to this research. In this chapter delves into the core concepts of this study—top management team (TMT) characteristics, risk perception, strategic decisions, and Behavioral Decision Theory (BDT)—while further examining the connotation and classification of organizational type. By systematically organizing and analyzing the findings of previous scholars on the relationships between these variables, this chapter identifies gaps in existing research, laying the groundwork for the current study.

2.2 Strategic Decision-Making in the Energy Sector

Mintzberg, Theoret, and Raisinghani (1976, p. 246) defined strategic decisions as critical choices that shape organizational development and determine success or failure, as they involve significant actions, resource commitments, and precedent-setting (Dean & Sharfman, 1996; Walters & Bhuian, 2004; Elbanna & Child, 2007a). These decisions are often unconventional, unstructured, far-reaching, and uncertain, spanning all organizational functions, requiring substantial financial investment, and exerting long-term impacts (Shrivastava & Grant, 1985; Eisenhardt & Zbaracki, 1992; Mintzberg et al., 1976).

For energy sector enterprises, strategic decisions are particularly critical due to the industry's high capital intensity, long investment cycles, and close ties to national energy security. Conventional wisdom suggests that when a strategic decision normally is deemed pivotal to an enterprise' direction, the organization tends to gather extensive information and use structured, quantitative techniques to evaluate it—implying a positive correlation between decision importance and rationality in the decision-making process (Judge & Miller, 1991; Nooraie, 2008). In contrast, Dean and Sharfman (1993a) challenged this established perspective, contending that there is no inherent nexus between the importance of a strategic decision and its rationality. This challenge ignited a scholarly debate that dovetails with the core propositions of Behavioral Decision Theory (BDT)—a paradigm shift from traditional rational choice theories. Unlike theories predicated on the assumption of full rationality, BDT emphasizes that decision-makers operate under conditions of bounded rationality, with their judgments and choices systematically shaped by cognitive biases, information asymmetries, and contextual constraints.

Energy security stands as a core strategic priority for any sovereign state, defined by the sufficiency of domestic energy resources, the alignment between energy supply and national energy demand, the stability and resilience of energy supply chains, and the affordability of energy access, and dependence on energy imports and exports. It directly impacts a country's economic growth, strategic autonomy, and human development (Tatotra, 2018). Decisions related to ensuring energy security, such as

long-term LNG procurement, are thus typical of strategic decisions. Xia et al. (2023) emphasized that long-term LNG contracts are essential strategic tools for Chinese LNG import companies, as they not only ensure stable supply but also optimize import efficiency—even if they do not always offer immediate price advantages. Such contracts balance supply security and economic benefits, highlighting their irreplaceable value in strategic decision-making.

Against the backdrop of China’s comprehensive energy transition, strategic decisions in the LNG sector face unique complexities. China’s dual goals for carbon peak and carbon neutrality have elevated its status of LNG as a transition fuel, while its growing role as the world’s largest LNG importer (General Administration of Customs, 2024) means that procurement decisions must also account for global market volatility, geopolitical tensions, and domestic policy adjustments. From a BDT perspective, these complexities amplify the “bounded rationality” of TMTs—executives cannot process all available information or anticipate all potential risks, leading to decisions shaped by cognitive shortcuts (e.g., relying on past experience to assess future market trends) rather than purely rational analysis. This underscores the need to explore the factors shaping strategic decision-making in Chinese LNG import companies, particularly from the perspective of TMT behavior and behavioral decision mechanisms.

2.3 Behavioral Decision Theory (BDT) and Its Relevance to TMT Decision-Making

2.3.1 Theoretical Foundations of BDT

Behavioral Decision Theory (BDT) emerged in the mid-20th century as a counterpoint to the “rational choice model” dominant in economics and management research. Pioneered by scholars such as Herbert Simon (1955), Daniel Kahneman, and Amos Tversky (1979), BDT's core premise is that human decision-makers operate under bounded rationality—they lack the cognitive capacity, time, and complete information to evaluate all possible alternatives and outcomes, and thus rely on simplified decision rules (heuristics) and are influenced by cognitive biases.

Simon (1955) introduced the concept of “satisficing” to describe how decision-makers seek alternatives that meet a minimum threshold of acceptability, rather than optimizing for the “best” possible outcome. This is particularly pertinent to TMTs in the LNG industry, where the complexity of global supply chains, long contract cycles, and multi-dimensional risks (e.g., geopolitical, market, policy) makes “optimization” practically impossible. For example, a TMT evaluating long-term LNG contracts may prioritize suppliers that meet basic criteria (e.g., stable political environment, minimum contract length) rather than spending years analyzing every potential supplier globally.

Kahneman and Tversky (1979) further expanded BDT with Prospect Theory, which

explains how decision-makers evaluate outcomes relative to reference points (e.g., past contract prices, industry benchmarks) rather than absolute values. They identified two key biases: loss aversion (the subjective pain caused by losses is more intense compared with the pleasure of equivalent gains) and diminishing sensitivity (the marginal impact of gains or losses decreases as their magnitude increases). In the LNG context, loss aversion may lead TMTs to avoid short-term spot trading—even if it offers lower prices—because the risk of sudden price spikes (a “loss” relative to a fixed contract price) feels more threatening than the potential savings. Diminishing sensitivity, meanwhile, could cause TMTs to underestimate the impact of small, incremental changes in policy (e.g., minor adjustments to import tariffs) until those changes accumulate into a significant cost burden.

Subsequent research rooted in Behavioral Decision Theory (BDT) has identified a diverse array of cognitive heuristics and biases that systematically shape organizational decision-making processes — particularly in high-uncertainty contexts where information asymmetry and cognitive constraints are prevalent. Tversky and Kahneman (1974) outlined three foundational heuristics:

First, availability heuristic: Decision-makers judge the likelihood of an event according to how easily the examples come to mind. For LNG TMTs, this might mean overestimating the risk of supply disruptions following a high-profile geopolitical event (e.g., a conflict in a major LNG-exporting region), even if the event has no

direct impact on their suppliers.

Secondly, representativeness heuristic: Decision-makers categorize events based on how similar they are to a “typical” case. For instance, a TMT may assume a new LNG supplier is reliable simply because it resembles a past reliable supplier (e.g., from the same country of origin), ignoring unique risks (e.g., the new supplier's project development constrained or limited production capacity).

Finally, anchoring and adjustment heuristic: Decision-makers rely heavily on an initial piece of information (the “anchor”) when making subsequent judgments. In LNG contract negotiations, this could mean a TMT anchors on the first price offered by a supplier and makes only small adjustments, even if market data suggests a lower price is feasible.

These heuristics and biases are not “errors” but adaptive responses to complexity. However, they can lead to suboptimal strategic decisions—especially in high-stakes, uncertain environments like the LNG sector. For TMTs, understanding how BDT mechanisms influence their risk perception and procurement choices is critical to improving decision quality.

2.3.2 BDT in Organizational Contexts: From Individual to TMT-Level Decision-Making

While BDT was initially developed to explain individual decision-making, scholars have increasingly applied it to organizational contexts—particularly to TMT decision-making, where collective cognitive processes and group dynamics interact with individual biases (Bazerman & Moore, 2013; Starbuck & Milliken, 1988).

Starbuck and Milliken (1988) introduced the concept of organizational information processing biases, arguing that TMTs are not just collections of individual decision-makers but systems that develop shared heuristics and biases. For example, a TMT with a long-serving CEO may develop a “status quo bias”—a preference for maintaining existing procurement strategies (e.g., relying on the same suppliers) because the CEO's past success reinforces the belief that 'what worked before would work again.' This shared bias can persist even if new market data (e.g., emerging suppliers with lower prices) suggests a change is needed.

Bazerman and Moore (2013) expanded this by examining groupthink as a BDT phenomenon in TMTs. Groupthink occurs when a desire for consensus overrides critical evaluation of alternatives, leading to overconfidence in the team's decisions and dismissal of dissenting views. In the LNG sector, groupthink could lead a TMT to approve a long-term contract without fully assessing logistics risks (e.g., port

congestion) because most members agree the contract aligns with 'industry norms.' This is particularly common in homogeneous TMTs—where members share similar backgrounds and cognitive styles—because diverse perspectives that might challenge heuristics are absent.

Another key BDT concept in TMT decision-making is emotional contagion (Barsade, 2002). Emotions—such as anxiety about market volatility or optimism about new policy support—spread quickly among TMT members, shaping collective risk perception. For example, if a senior executive expresses anxiety about geopolitical tensions in the any country or region, other TMT members may adopt this anxiety, leading to a collective overestimation of supply risk and a rush to sign long-term contracts with alternative suppliers. Conversely, optimism about China's “dual carbon” policies could lead a TMT to underestimate the cost of green LNG procurement, as positive emotions diminish sensitivity to potential financial losses.

BDT also helps explain how TMTs handle ambiguity—a defining feature of LNG procurement, where outcomes (e.g., future LNG prices, policy changes) are not just uncertain but often unknowable (Fischhoff et al., 1982). Under ambiguity, TMTs rely more heavily on heuristics and social cues (e.g., what competitors are doing) than on data. For example, if multiple Chinese LNG import companies switch to hybrid procurement models (a mix of the long-term contracts and mid-term and spot deal), a TMT may adopt the same model not because it aligns with their specific risk profile,

but because the behavior of peers provides a “safe” heuristic for navigating ambiguity.

Despite its relevance, BDT has been underutilized in research on energy sector TMTs—especially in the Chinese LNG context. Most of the existing studies focus on Western enterprises or general industries, ignoring how China's unique institutional environment (e.g., state-owned enterprise governance, policy-driven energy transitions) interacts with BDT mechanisms. For example, State Owned Enterprise (SOE) TMTs in China may face stronger pressure to “satisfice” with policy-aligned decisions (e.g., prioritizing green LNG procurement) than to optimize for cost, amplifying bounded rationality. Private enterprise TMTs, by contrast, may be more influenced by loss aversion due to greater market pressure to avoid financial losses. This gap highlights the need to integrate BDT into the study of Chinese LNG import company TMTs, as it provides a critical lens for understanding how cognitive processes and biases shape strategic decisions.

2.4 Upper Echelons Theory (UET) and TMT Characteristics

2.4.1 Theoretical basis: Upper Echelons Theory

Upper Echelons Theory (UET), a paradigm-shifting framework introduced by Hambrick and Mason (1984), is a cornerstone of organizational behavior and strategic management research. Its core proposition is that TMT characteristics—for example age, education, professional experience, tenure, and the values—exert a significant

impact on corporate strategic decisions and its performance. Unlike traditional strategic management theories that focus on external environmental factors or organizational structure, UET shifts attention to the “human factor” arguing that organizational behavior and outcomes are reflections of TMT members' cognition, judgment, and decision-making (Certo et al., 2006)—a premise that aligns with BDT's focus on cognitive processes.

Hambrick and Mason (1984) emphasized that TMT members' personal backgrounds and experiences shape their understanding of the external environment and evaluation of opportunities, thereby guiding strategic choices. From a BDT perspective, these backgrounds act as “cognitive filters” that influence which heuristics and biases dominate decision-making. For example, executives with extensive industry experience may rely more on the representativeness heuristic (judging new suppliers based on past experiences), while those with cross-industry or international backgrounds may be more likely to challenge status quo biases and promote innovation.

Additionally, TMT structure—such as the similarity or diversity of member backgrounds—affects decision-making processes. High similarity may lead to groupthink (a BDT phenomenon), limiting strategic diversity and innovation, while moderate diversity stimulates creative thinking and improves decision quality by introducing alternative heuristics (Hambrick & Mason, 1984). For instance, a TMT

with both finance and operations backgrounds may balance the anchoring bias (common in finance, where past prices anchor negotiations) with a focus on logistics feasibility (common in operations), leading to more balanced procurement decisions.

Subsequent studies have expanded UET by exploring the relationship between specific TMT characteristics and corporate outcomes. Hitt et al. (2001) found that executive age correlates with corporate risk-taking: older managers tend to be more cautious (exhibiting stronger loss aversion, per BDT), while younger managers are more willing to adopt radical strategies. Wang et al. (2006) highlighted that executives with MBA degrees are more likely to adopt data-driven and market-oriented strategic decision-making styles—potentially reducing reliance on heuristics like availability, as data provides a more objective reference point. These findings confirm that TMT characteristics not only influence individual decision-making but also indirectly determine organizational performance in market competition, with BDT mechanisms mediating the link between characteristics and decisions.

2.4.2 Classification of Top Management Team Characteristics

TMT characteristics refer to the configuration of heterogeneous attributes (e.g., demographic traits, cognitive styles, professional capabilities) among top management team members (Cuypers et al., 2022), which collectively influence the team's strategic decision-making and organizational performance outcomes. Synthesizing previous research, these characteristics can be categorized into three main types: diversity

characteristics (e.g., educational diversity), aggregation characteristics (e.g., average educational level), and background characteristics (e.g., overseas experience) (Krause & Whitler, 2022; Nielsen, 2010). Among these, TMT diversity has received the most attention, with scholars proposing various classification frameworks (Joshi, 2009; Wei & Yang, 2021).

TMT heterogeneity—often used interchangeably with diversity in some studies—refers to the degree of difference in characteristics (e.g., age, gender, tenure, functional background) among TMT members (Joshi, 2009; Harrison & Klein, 2007). Social classification theory and information processing theory are the two primary frameworks used to explain the impact of TMT diversity. Social classification theory argues that executives categorize themselves and others based on similarity, forming in-groups and out-groups. This process can lead to conflicts and reduced information sharing, harming decision efficiency (Guillaume et al., 2017; Hutzschenreuter & Horstkotte, 2013; Ndofor & Sirmon, 2015). In contrast, information processing theory posits that diversity enhances information integration, as members with different backgrounds provide unique perspectives, supporting more innovative strategic decisions (Carton, 2012; Richard et al., 2019).

Aguinis et al. (2011) further classified TMT diversity into relationship-oriented and task-oriented types. Relationship-oriented diversity is according to the observable demographic characteristics (e.g., age, race, gender) and leads often to emotional

conflicts and the political behavior, undermining team cooperation. Task-oriented diversity, by contrast, relates to knowledge, skills, and capabilities (e.g., tenure, education, functional background) and promotes knowledge integration and collaboration (Hutzschenreuter & Horstkotte, 2013; Kaczmarek et al., 2012). For example, a TMT with diverse functional backgrounds (e.g., finance, operations, international trade) is better equipped to address the complex challenges of LNG procurement, as members can contribute expertise in pricing negotiations, supply chain management, and cross-border transactions.

Harrison and Klein (2007) proposed another classification: diversity based on separation, classification, and difference. Separation-focused diversity refers to differences in beliefs, attitudes, or values (e.g., risk preference), often measured using standard deviation. Classification-focused diversity relates to differences in member types (e.g., professional background), measured using the Blau index, and promotes information sharing. Difference-focused diversity refers to disparities in social assets (e.g., power, status), measured using the coefficient of variation (Wei et al., 2016). In the context of Chinese LNG import companies, this classification is particularly relevant: state-owned enterprise TMTs may exhibit lower separation diversity in risk preference (due to policy constraints), while joint venture TMTs may have higher classification diversity (due to Sino-foreign member backgrounds).

However, existing classifications have limitations. Many studies treat TMT

characteristics as static, ignoring dynamic changes (e.g., how tenure accumulation affects experience). Additionally, few studies integrate “soft” characteristics such as self-actualization needs or cognitive style into classification frameworks—gaps that this research aims to address by focusing on four TMT characteristics (industry network, business experience, cognitive style, self-actualization) relevant to Chinese LNG import companies.

2.5 Strategic Decision and Top Management Team Characteristics

The TMT's role in corporate strategic decision-making has long been a focus of strategic management research (Carpenter et al., 2004). As the core human resource of an enterprise, the TMT is responsible for formulating and implementing strategies, making it a key driver of strategic decisions (Hambrick & Mason, 1984; Weng & Lin, 2014). UET emphasizes that TMT members' values and cognitive foundations—reflected in demographic characteristics comprising education, profession, and industry experience—shape strategic choices (Hambrick & Mason, 1984).

Empirical researches have confirmed the relationships between specific TMT characteristics and strategic decisions. Bloom (1980) found that TMT average age influences group decision-making processes in hospitals, with younger members demonstrating stronger cognitive abilities to perceive and respond to opportunities (Li,

2014). Wiersem and Bantel (1982) noted that as the increases of age, executives' flexibility drops, leading to greater rigidity and resistance to any change—older executives may be less sensitive to external environmental changes and more likely to avoid risky decisions. In the LNG sector, this implies that younger TMTs may be more willing to adopt flexible procurement models (e.g., spot trading), while older TMTs may prefer long-term contracts to minimize risk.

Tenure is another critical characteristic. TMT members' tenure affects their familiarity with the enterprise's “common language” and cognition, shaping strategic choices (Hambrick & Mason, 1984; Finkelstein & Hambrick, 1990; Zenger & Lawrence, 1989). Longer tenure enhances social integration within the team, reducing conflicts, promoting knowledge sharing, and increasing stability (Finkelstein & Hambrick, 1996; Eisenhardt & Schoonhoven, 1990; Katz, 1982). For Chinese LNG import companies, TMTs with long tenure may have a deeper understanding of domestic policy trends and supplier relationships, leading to more informed procurement decisions. However, excessive tenure may also lead to complacency—Schweppes (1988) and Wiemar & Bantel (1992) found that moderate tenure diversity improves team effectiveness by balancing experience and fresh perspectives.

Educational level reflects TMT members' cognitive styles and values, influencing their thinking and decision-making behavior (Hitt & Tyler, 1991). Bantel and Jackson (1989) demonstrated that TMTs with higher average educational levels obtain more

effective information, collect strategic resources more efficiently, and make more rational decisions. These executives also exhibit stronger learning abilities and adaptability, enabling them to navigate complex environments (e.g., international LNG price fluctuations) and make accurate strategic positioning (Tihanyi, 2000; Pesels & Yang, 2000). Cho, Hambrick, and Chen (1996) added that higher educational levels among TMT members accelerate strategy implementation and improve responsiveness to external stimuli. In the Chinese context, TMTs with advanced degrees in energy economics or international trade may be better equipped to analyze global LNG market trends and negotiate favorable contract terms.

Despite these findings, gaps remain. Most studies focus on general industries or Western enterprises, with few examining the Chinese LNG sector. Additionally, existing research often explores individual TMT characteristics in isolation, ignoring their combined effects. For example, an executive with both international business experience and a finance background may have a unique risk perception that differs from someone with only one of these characteristics. This research addresses these gaps by analyzing the combined impact of four TMT characteristics (industry network, business experience, cognitive style, self-actualization) on strategic decisions in Chinese LNG import companies.

2.6 Strategic Decision and Risk Perception

Risk stands as a core concern in strategic decision-making, particularly in the energy sector—characterized by high capital intensity, geopolitical sensitivity, and complex cross-border supply chains. Within the realm of supply chain management, risk is defined as uncertainty that disrupts the matching of supply and demand, typically associated with adverse outcomes such as supply shortages, cost overruns, or operational disruptions (Christopher & Lee, 2004; Spekman & Davis, 2005; Paulson, 2005; Wang & Bode, 2006). However, scholars remain divided on whether risks should be categorized as expected or unexpected. For instance, Christopher and Lee (2004) classified events such as wars, strikes, and terrorist attacks as unexpected disruptions, emphasizing their low predictability and high impact on supply chain stability. while Robert et al. (2006) argued that some risks (e.g., supplier quality deficiencies) can be anticipated. Ou Tang and Nurmaya Musa (2011) offered a more comprehensive definition, describing supply chain risk as high-impact, low-probability events that harm the organization—a definition particularly relevant to the LNG sector, where geopolitical conflicts or port congestion can disrupt long-term procurement plans.

Risk perception refers to decision-makers' subjective assessment of risks (Sitkin & Pablo, 1992; Mullins & Forlani, 2005). Slovic (1987) was the first to define it as people's subjective judgment of risk, and subsequent studies have shown that risk

perception—rather than objective risk probability or potential losses—directly influences decision-making (Slovic, 1967). Barron (1976), Weber and Milliman (1997), and Slovic (2000) emphasized that risk perception varies based on decision-makers' information-gathering abilities and risk assessment skills. For TMTs in Chinese LNG import companies, risk perception shapes their evaluation of long-term procurement options: a TMT with high geopolitical risk perception may prioritize contracts with politically stable suppliers, while one with low market risk perception may opt for spot trading to capitalize on price fluctuations.

Empirical studies have confirmed the link between risk perception and strategic decisions. K. Grant et al. (2014) found that risk perception influences decision-makers' actions, leading to outcomes that may deviate from expectations. Duanmu (2011) noted that TMTs consider multiple factors when forming risk perceptions, including external environmental changes, business experience, industry structure, and global trends—all of which shape strategic choices. Ron, Baron, et al. (2016) and Wennberg (2016) added that TMTs with different risk perceptions adopt distinct decision-making styles: risk-averse TMTs prefer conservative strategies (e.g., fixed-price long-term contracts), while risk-tolerant TMTs may pursue innovative approaches (e.g., hybrid pricing mechanisms).

In the Chinese LNG sector, risk perception is shaped by unique factors. China's status as the world's largest LNG importer means TMTs must balance market dynamics with

national energy security goals (Li & Taeihagh, 2020). Policy changes—such as adjustments to import quotas or environmental regulations—also influence risk perception (Dong et al., 2017). For example, when the Chinese government introduces policies to promote clean energy, TMTs may perceive lower long-term policy risk, leading to increased investment in long-term LNG contracts. However, existing research often overlooks these context-specific factors, focusing instead on Western corporate environments. This study addresses this gap by exploring how TMT risk perception—shaped by Chinese institutional and industry contexts—influences long-term LNG procurement decisions.

2.7 Risk Perception and Top Management Team Characteristics

2.7.1 TMT's Industry Network and Risk Perception

Industry networks refer to the repetitive, continuous relationships that enterprises establish with other organizations and the external environment to acquire resources (Park & Luo, 2001). Wu et al. (2014) emphasized that strong industry networks enable enterprises to access diverse information, enhance market visibility, and reduce uncertainty. For TMTs, industry networks provide a critical foundation for risk perception—executives with extensive networks can obtain real-time information on market trends, policy changes, and supplier dynamics, enabling more accurate risk assessment.

TMTs with broad industry networks benefit from multiple information channels, including supplier partnerships, industry associations, and international forums. Park and Luo (2001) found that enterprises with strong network ties are better able to anticipate risks, as they receive early warnings from network partners. For example, a Chinese LNG import company with close relationships with international suppliers may learn about potential supply disruptions (e.g., geopolitical tensions in exporting countries) in advance, allowing the TMT to adjust procurement strategies. Additionally, industry networks facilitate knowledge sharing—TMTs can learn from peers' experiences, reducing the likelihood of misjudging risks (Tungju Wu et al., 2017).

However, existing research has limitations. Most studies focus on the quantity of network ties rather than their quality—for example, a TMT with a few high-trust supplier relationships may have more accurate risk perception than one with numerous superficial connections. Additionally, few studies explore how network structure (e.g., centrality in the industry network) affects risk perception. This research addresses these gaps by examining how the breadth, depth, and quality of TMT industry networks shape risk perception in Chinese LNG import companies.

2.7.2 TMT's Business Experience and Risk Perception

Business experience refers to the knowledge and skills that TMT members

accumulate through their careers, including industry experience, international business experience, and risk management experience. Nielsen (2010) argued that executives with extensive business experience could be able to predict the outcomes of strategic decisions better, as they can draw on past experiences to evaluate risks. In the LNG sector, this means TMTs with experience in international procurement or market volatility are more likely to accurately assess risks such as price fluctuations or supply chain disruptions.

Tenure is a key component of business experience. Fredrickson and Quinton (1989) coined the term "creeping rationality" to describe how longer tenure leads TMTs to conduct more thorough situation diagnoses, generate more alternatives, and align decisions with corporate strategy. Schweppes (1988) and Greening & Johnson (1996) found that tenure diversity improves team effectiveness, as members with varying tenures bring different perspectives to risk assessment. For example, a TMT with both long-tenure executives (who understand the company's historical risk exposure) and new executives (who bring fresh market insights) may form a more balanced risk perception.

International business experience is another critical dimension. Murrar et al. (2011) noted that TMT members with global experience share their knowledge within the team, forming a collective mental model that guides risk assessment. Executives who have worked in overseas energy companies are familiar with international LNG

transaction processes, contract terms, and cross-cultural communication, enabling them to identify potential risks (e.g., legal differences in contract enforcement) that less experienced executives may overlook (Nielsen, 2010). In Chinese LNG import companies, TMTs with international experience are better equipped to navigate the global market, reducing the risk of costly mistakes in long-term procurement.

Despite these findings, existing research often treats business experience as a single construct, ignoring differences in experience type. For example, experience in risk management may have a more direct impact on risk perception than general industry experience. This study addresses this gap by analyzing three dimensions of business experience—industry tenure, international experience, and risk management experience—and their combined effects on TMT risk perception.

2.7.3 TMT's Cognitive Style and Risk Perception

Cognitive style is defined as TMT members' preferred ways in thinking, processing information, and making judgments. Santos and Garcia (2006) described cognitive style as the external manifestation of TMTs' cognitive understanding, shaped by their experiences. Hambrick et al. (2015) and Naranjo-Gil (2016) added that cognitive style encompasses executives' mental models, which influence how they select and interpret information, ultimately shaping risk perception and strategic decisions.

Two primary cognitive styles are relevant to TMT decision-making: analysis-driven and emotion-driven. Analysis-driven TMTs rely on data, logical reasoning, and systematic analysis to assess risks (Bantel & Jackson, 1989). They may use quantitative tools such as scenario simulation or sensitivity analysis to evaluate the potential impact of risks (e.g., price fluctuations on procurement costs). In contrast, emotion-driven TMTs depend on intuition, experience, and interpersonal trust when forming risk perceptions (Glaser & Strauss, 1967). They may prioritize subjective judgments—such as trust in a supplier—over objective data, leading to different risk assessments.

Cognitive diversity within TMTs also influences risk perception. Miller et al. (1998) argued that cognitive diversity increases the potential for conflict and reduces decision comprehensiveness, while Olson et al. (2007a) noted that it can lead to more balanced risk assessments by incorporating multiple perspectives. For example, a TMT with both analysis-driven and emotion-driven members may avoid the extremes of over-reliance on data or intuition, forming a more realistic risk perception. In Chinese LNG import companies, cognitive diversity is particularly valuable, as it enables TMTs to address the complex, multi-faceted risks of long-term procurement.

However, existing research often overlooks the impact of organizational context on cognitive style. For example, state-owned enterprise TMTs may be more likely to adopt analysis-driven cognitive styles due to policy requirements for transparency and

accountability, while private enterprise TMTs may rely more on emotion-driven styles to respond quickly to market changes. This study addresses this gap by exploring how cognitive style interacts with organizational type to shape TMT risk perception.

2.7.4 TMT's Self-actualization Value and Risk Perception

Self-actualization, a foundational concept proposed in Maslow's hierarchy of needs (Maslow, 1954), refers to TMT members' desire to achieve their full potential, pursue challenging goals, and realize personal and professional values. Hitt, Miller, and Colella (2009) found that executives with strong self-actualization needs set challenging objectives for themselves, rather than accepting goals set by others. These executives are often ambitious, competent, and eager to demonstrate their capabilities—traits that influence risk perception and strategic decision-making.

TMTs with high self-actualization needs may exhibit greater risk tolerance, as they view risky decisions as opportunities to demonstrate their abilities and achieve strategic goals. Miller et al. (1988) found that CEOs who seek achievement and tackle challenges make more rational strategic decisions, balancing risk and reward. For example, a TMT with strong self-actualization needs may be willing to sign long-term contracts with new suppliers to expand the company's market share, despite the inherent risks. In contrast, TMTs with low self-actualization needs may prioritize stability, avoiding risky decisions to minimize potential failures.

However, the relationship between self-actualization and risk perception is moderated by organizational type. Francioni et al. (2015) found that in small private enterprises, executives' self-actualization needs have a stronger impact on risk perception, as decision-making authority is concentrated in a few individuals. In contrast, in large state-owned enterprises, TMTs' self-actualization needs may be constrained by policy requirements and collective decision-making processes (Papadakis & Barwise, 2002). It explains that the influence from self-actualization to risk perception varies across Chinese LNG import companies of different types—an area that existing research has largely ignored.

2.8 Mediating Role of Risk Perception

In recent years, the mediating role of risk perception in the relationship between TMT characteristics and strategic decision-making has garnered growing scholarly attention —particularly in high-uncertainty contexts such as the energy sector. Early studies centralized in the direct impact of TMT demographic characteristics in their strategic choices, but scholars have since recognized that risk perception serves as a critical intermediary, linking TMT attributes to decision-making behavior (Hambrick & Mason, 1984).

Smith et al. (2016) found that TMTs' industry experience influences their risk perception of market uncertainty, which in turn shapes strategic decisions. Executives

with extensive industry experience tend to have lower risk perception, leading to more conservative strategies, while inexperienced executives may overestimate risks, resulting in delayed or avoidant decisions. This suggests that risk perception translates TMT characteristics into actionable strategic choices—without understanding risk perception, it is difficult to fully explain how TMT attributes affect organizational outcomes.

Zhang et al. (2018) further verified this mediating effect by exploring TMT heterogeneity and strategic change. They found that TMTs with diverse gender, age, or educational backgrounds exhibit varied risk perceptions, which influence the innovation and flexibility of strategic decisions. For example, a heterogeneous TMT may have conflicting risk perceptions, leading to more balanced strategic choices that balance risk and reward. This highlights that risk perception in addition to mediate the link between the TMT characteristics and strategic decisions, it also shapes team dynamics and decision-making processes.

Liu and Chen (2020) expanded this research by incorporating emotional intelligence into the framework. They found that executives with high emotional intelligence can more accurately identify and manage uncertainty, forming more rational risk perceptions that promote forward-looking strategies. This suggests that risk perception is influenced by both TMT characteristics (e.g., emotional intelligence) and external factors (e.g., market changes), and that its mediating role is

context-dependent.

In the Chinese LNG sector, the mediating role of risk perception is particularly significant. TMT characteristics—such as industry network, business experience, cognitive style, and self-actualization—shape how executives perceive geopolitical, market, logistics, and policy risks. These risk perceptions, in turn, guide strategic decisions on long-term LNG procurement, such as contract term selection and pricing mechanism adoption. However, existing research often overlooks the unique context of Chinese LNG import companies, focusing instead on general industries or Western enterprises. This research fills this gap via verifying the mediating role of risk perception among the Chinese LNG sector, integrating local institutional and industry-specific factors.

2.9 Moderating Role of Organizational type

Organizational characteristics—including size, type (ownership structure), and governance mechanism—influence the relationship between TMT characteristics, risk perception, and strategic decisions (Papadakis et al., 1998, 2020; Rajagoplan et al., 1993, 1997). Among these, organizational type are the most critical moderating variables, as they shape TMTs' access to resources, decision-making authority, and strategic objectives.

Organizational type affects TMTs' risk perception and strategic choices. Jansen et al. (2013) found that in small and medium-sized enterprises (SMEs), TMTs' experience has a stronger impact on decision effectiveness when executives are confident in their judgments, while in large enterprises, experience has a more muted effect due to formalized decision-making processes. For Chinese LNG import companies, large enterprises (e.g., state-owned national oil companies) have more resources to invest in risk management systems, enabling TMTs to make more informed decisions. SMEs, by contrast, may lack these resources, leading TMTs to rely more on personal experience and industry networks when forming risk perceptions.

Organizational type—specifically, ownership structure—exerts a more pronounced moderating effect. Papadakis et al. (1998) found that state-owned and private enterprises differ significantly in strategic decision-making dimensions, including risk perception and goal orientation. State-owned enterprises (SOEs) are often driven by national energy security goals and social responsibility, leading TMTs to prioritize policy compliance and supply stability (Li & Taeihagh, 2020). Private enterprises, by contrast, focus on profitability, leading TMTs to be more sensitive to market risks (Dong et al., 2017). Joint ventures (JVs) balance the goals of Chinese and foreign shareholders, leading TMTs to form complex risk perceptions that integrate both market and policy factors.

In the Chinese LNG sector, these differences are particularly evident. SOE TMTs may

perceive lower policy risk due to their close ties to the government, leading to more long-term contracts. Private enterprise TMTs, facing greater market pressure, may perceive higher price risk, leading to more flexible procurement models (e.g., spot trading). JV TMTs, with access to both Chinese policy insights and international market expertise, may have more balanced risk perceptions, adopting hybrid strategies (e.g., a mix of long-term contracts and spot purchases). However, existing research often treats organizational type as a control variable rather than a moderating variable, failing to seek how it shapes the link between TMT characteristics and the risk perception. This study addresses this gap via examining the moderating role of organizational type (SOE, private, JV) in Chinese LNG import companies.

2.10 Gaps in the Literature

While substantial advancements have been made in research on TMT characteristics, risk perception, and strategic decisions, several critical gaps remain, particularly in the context of Chinese LNG import companies.

First, existing research lacks industry-specific focus on the LNG sector. Most studies on TMT characteristics and strategic decisions focus on general industries (e.g., manufacturing, technology) or broad energy sectors (e.g., oil and gas), with few examining the unique challenges of LNG import companies. The LNG industry's high capital intensity, long contract cycles, and global supply chains create distinct risk

environments that require specialized analysis—for example, geopolitical risks have a more direct impact on LNG procurement than on many other industries. Additionally, China's role as the world's largest LNG importer translates that TMTs must balance market dynamics with national energy security goals, a context that existing research often ignores.

Second, the mediating role of risk perception is not fully understood in the Chinese context. While scholars have verified risk perception as a mediator in Western corporate environments (Smith et al., 2016; Zhang et al., 2018), few studies explore how this mediating effect operates in Chinese enterprises—particularly those in state-dominated sectors like energy. China's institutional environment, including government policy interventions and state-owned enterprise governance, shapes TMT risk perception in unique ways. For example, SOE TMTs may prioritize policy risk over market risk, altering the mediating path of risk perception. Existing research often overlooks these context-specific factors, leading to incomplete theoretical frameworks.

Third, the moderating role of organizational type is under-researched. Most studies compare state-owned and private enterprises in general terms, but few explore how organizational type influences the relationship between TMT characteristics and risk perception. In the Chinese LNG sector, SOEs, private enterprises, and JVs have distinct strategic objectives, resource access, and decision-making processes—factors

that shape how TMT characteristics (e.g., industry network, business experience) translate into risk perception. For example, JV TMTs' international experience may have a stronger impact on risk perception than that of SOE TMTs, due to JVs' greater exposure to global markets. Existing research fails to address these differences, limiting the practical relevance of findings.

Fourth, existing research often uses quantitative methods to explore correlations between variables, but qualitative studies—needed to capture the subjective, context-dependent nature of risk perception—are scarce. Grounded theory — a qualitative research methodology developed by Glaser and Strauss (1967) — is particularly well-suited to exploring complex, has rarely been applied to study TMT risk perception in the LNG sector. This means that the “black box” of how TMTs form risk perceptions and make strategic decisions remains largely unopened, particularly in the Chinese context.

Finally, existing research focuses on static relationships between variables, ignoring dynamic changes over time. TMT characteristics (e.g., tenure, experience) and risk perceptions (e.g., responses to geopolitical events) evolve over time, but few studies explore how these changes affect strategic decisions. In the LNG sector, where long-term contracts span decades, understanding dynamic relationships is critical to developing effective decision-making frameworks.

2.11 Summary

This chapter has systematically reviewed the literature on TMT characteristics, risk perception, strategic decisions, and organizational factors, identifying key theoretical frameworks and empirical findings. It has underscored the significance of Upper Echelons Theory for explaining the link between the TMT characteristics and strategic decisions, as well as the role of risk perception as a mediator. Additionally, it has explored how organizational type moderate these relationships.

The literature review has further pinpointed significant gaps, including the lack under industry-specific research on the Chinese LNG sector, incomplete understanding of risk perception's mediating role in the Chinese context, under-researched moderating effect of organizational type, scarcity of qualitative studies, and focus on static rather than dynamic relationships. These gaps underscore the need for the current research, which employs grounded theory to explore how TMT characteristics influence risk perception and strategic decisions in Chinese LNG import companies, while examining the moderating role of organizational type. By addressing these gaps, this research aims to provide contribution to both theoretical development and practical application in the fields of strategic management, organizational behavior, and energy policy.

Building upon the above identified research gaps, the following section clarifies the

academic positioning of this qualitative inquiry and elaborates its core theoretical contributions established through grounded theory-based empirical exploration within relevant research domains.

2.12 Positioning of the Study and Theoretical Contribution

Against the backdrop of China's ongoing energy transition and its status as the world's largest liquefied natural gas (LNG) importer, this study advances existing scholarship by addressing critical gaps in top management team (TMT) risk perception and strategic decision-making. Three core theoretical contributions are established in this research.

First, existing literature on energy market risk has predominantly conceptualized risk as an objective, externally driven market phenomenon, with limited attention to its social construction at the executive level (Bryce et al., 2024; Palermo et al., 2017). Risk is framed not only as a threat but also as an opportunity, shaped by boardroom interpretations, institutional logics, and organizational culture (Bednarek et al., 2021). This thesis fills this gap by delving how Chinese LNG TMTs socially construct geopolitical, market, logistics, and policy risks, and how these constructed perceptions drive long-term procurement strategies.

Second, Upper Echelons Theory (UET) research has largely focused on direct

relationships between TMT demographic traits and firm outcomes, with insufficient attention to cognitive mediating mechanisms such as risk perception (Carpenter et al., 2004). This study extends UET by empirically validating risk perception as the critical cognitive bridge between TMT characteristics—industry network, business experience, cognitive style, and self-actualization—and strategic decisions in the LNG sector.

Third, existing qualitative explorations on energy strategic decision-making lack elite-oriented and contextually grounded theoretical construction rooted in non-Western institutional environments. Responding to calls for context-sensitive behavioral energy research (Li & Taeihagh, 2020), this thesis develops a contextualized model of risk perception and strategic decision-making suitable for Chinese LNG enterprises, and further distinguishes contextual disparities arising from different organizational types including state-owned enterprises, private firms and joint ventures.

Collectively, this research contributes to a growing body of work that conceptualizes risk as a socially constructed duality of threat and opportunity within complex institutional environments (Bryce et al., 2024; Bednarek et al., 2021), while extending UET into the strategically vital and policy-driven Chinese energy sector.

CHAPTER 3 Methodology

3.1 Introduction

In reviewing the literature in Chapter 2, it revealed that to timely secure long term LNG supply into China is a major interest to different types of companies in China. This not only support Chinese companies secure their long-term demand, but also helps international suppliers to develop their market shares in China. However, for organizations in China, to make strategy decisions with large capital investment and long-term duration is evolving big risks, and the risk perceptions from top management team in companies would play an important role when they make such decisions. This chapter details the qualitative grounded theory methodology adopted for the study. Consistent with interpretivist epistemology and constructivist ontology, the research follows rigorous auditability standards (Aguinis & Solarino, 2019; Harley & Cornelissen, 2022; Lincoln & Guba, 1985) to ensure transparency and analytical rigor. This research adopts an exploratory approach, as it critically analyzes the factors influencing top management teams' (TMTs) risk perception during strategic decision-making — with a specific focus on factors that further shape long-term LNG procurement decisions within China's LNG industry.

The following research questions were formulated accordingly:

- 1) What characteristics of the top management team in Chinese LNG import companies inhibit or promote risk perception?
- 2) How does the risk perception of the top Management team in Chinese LNG import companies affect strategic decisions for long-term LNG procurement?

- 3) Does the risk perception of the top management team play a mediating role in the feature influencing strategic decision process in Chinese LNG import companies?
In other words, do the the top management team's characteristics affect strategic decision by influencing risk perception?
- 4) Does the type of Chinese LNG import companies play a mediating role in the influence mechanism under top management team characteristics, risk perception, and strategic decisions?

In this chapter, the research methodology is discussed in detail, along with the rationale underlying the research design. Chapter 3 further provides explanations and justifications for the selection of each methodological component, as well as a detailed account of how the research was conducted. Specifically, through a systematic literature review, six widely applied variables in the field of strategic decision-making processes were identified, including the external environment, industry networks, business experience, TMT characteristics (encompassing functional experience and cognitive style), TMT self-actualization values, and organizational type. This identification helps ensure that all potential dimensions relevant to the research phenomenon were considered during the data collection, coding, and thematic analysis processes.

The structure of this chapter is organized as follows: Section 3.1 presented a holistic overview of the study's research methodology. Section 3.2 elaborated on the philosophical research paradigm underpinning this investigation. Section 3.3 justified the selection of the core research strategy and delineates its analytical logic. Section 3.4 defined the overall analytical workflow adopted for data processing and thematic

analysis. Section 3.5 addressed researcher reflexivity and positional awareness to enhance research transparency. Section 3.6 detailed the pilot study undertaken to validate the feasibility, rationality and applicability of the research design prior to the main fieldwork. Section 3.7 illustrated the systematic design and optimisation of the semi-structured interview protocol. Section 3.8 specified the participant recruitment criteria and sampling strategies implemented in the main study. Section 3.9 clarified the data collection methods and standardised operational procedures. Section 3.10 systematically demonstrated the multi-stage qualitative data analysis process based on grounded theory. Section 3.11 established the rigorous trustworthiness criteria adopted to guarantee the robustness and credibility of the qualitative findings. Section 3.12 elaborated on the research ethical guidelines and operational arrangements, ensuring full compliance with institutional and academic ethical standards. Finally, Section 3.13 summarised the complete methodological framework of the study.

This study also complies with standard grounded theory reporting norms established by Kaufmann & Denk (2011). In judging inductive qualitative research quality, this research follows diversified evaluation perspectives proposed by Corley et al. (2021), matches appropriate theory-building pathways in line with Gehman et al. (2018), distinguishes rational application boundaries of qualitative research templates summarized by Köhler et al. (2022), and abides by interpretive research academic norms emphasized by Chapman (2018), so as to fully enhance the methodological standardisation and overall academic rigor of this grounded theory research.

3.2 Research Paradigm

The study explores the complex dynamic relationship between the characteristics, risk perception and strategic decision-making of the top management team in China's liquefied natural gas (LNG) importing companies. This issue is deeply rooted in the grand background of China's unique energy strategic security, global market volatility and geopolitical game. The study adopts an interpretivist, constructivist paradigm (Grix, 2002; Bryman & Bell, 2015). LNG procurement decisions are socially constructed and context-dependent, with risk perception shaped by TMT experience, industry networks, cognitive frames, and institutional logics. Its essence is to explore how a specific group of senior managers understand, interpret and respond to unprecedented uncertainties in their shared social and organizational context, and ultimately make far-reaching strategic choices.

In the face of such a research core full of situational specificity, process and subjective interpretation, the objectivity, value neutrality and hypothesis testing methods advocated by the traditional positivist research paradigm are inadequate, because it is difficult to penetrate the surface phenomenon and capture the subtle, interactive and continuous construction of the meaning context in the black box of decision-making. Therefore, the research consciously abandons the ontological view that regards social reality as an objective existence in philosophy, and turns to embrace the research paradigm of Interpretivism. Taking it as the core, the research takes the ontology of constructivism and the epistemology of Symbolic Interactionism as the cornerstone of the theory, and then chooses Grounded Theory as the qualitative research methodology to realize the research intention. It aims to form a substantive

explanatory theory which can truly reflect to practice for China's LNG import industry from the rich first-hand empirical data.

The philosophical foundation of the research first comes from the thinking of the essence of reality, that is, the ontological position. the research firmly believes that the social world is not a collection of pre-existing objective entities waiting to be discovered, but is jointly constructed by people in it through continuous social interaction and meaning giving. This ontological view of constructivism guides us to re-examine the core concepts of “top management team (TMT) characteristics”, “risk perception” and “strategic decision-making”. They are not simple variables that can be measured in isolation. For example, the meaning of “industry network” is not fixed. It is constantly activated, interpreted and reshaped in the process of team discussion, debate and consensus formation. Similarly, the “risk” inherent in the “strategic decision-making for long-term LNG procurement” is not an absolute, mathematical probability. It is deeply dependent on how executives combine the lessons of their past careers, the interpretation of China's energy policy, and the judgment of international seller behavior to jointly negotiate and construct a collective understanding. In this regard, when top management teams need to make strategic decisions for their organizations to decide whether to purchase long-term LNG, there are different explanations for the factors that affect their risk perception. Therefore, it provides information for the research philosophy for interpretivism (Grix 2002; Bryman and Bell 2015; Braun and Clarke 2013; Saunders, Lewis and Thornhill, 2016). To put it more clearly, what the research aims to find out is how executives of Chinese LNG companies collaboratively construct social realities about “who we are”, “what

we face” and “how we should do” in their specific organizational and institutional fields.

This ontological stance inevitably requires an epistemology that matches it, namely how we understand and acquire knowledge about this “constructed reality”. Interpretive epistemology provides us with the answer. It advocates that so as to gain a true understanding of the social phenomena, researchers must delve into the life world of the subjects being studied, and through close interaction and dialogue, understand the subjective meaning they assign to their actions and experiences. The research is not just about collecting data, but also an effort to engage in a deep hermeneutic dialogue with the research subject. The relationship between researchers and subjects is not one of subject object opposition, but rather a fusion of perspectives (Thornberg & Dunne, 2019). The theoretical literacy of researchers and the practical experience of the subjects are intertwined and collide in interactions such as interviews, jointly giving rise to new understandings. Here, symbolic interactionism provides a more precise lens, emphasizing that meaning originates from social interaction, and people take action based on their understanding of the meaning of things. Placing this viewpoint in the context of the research implies that executive decision-making is not simply the sum or linear output of individual traits, but rather the continuous definition, questioning, adjustment, and reconfirmation of the meaning of "risk" through language, symbols, and ongoing interactions (such as meetings, informal communication, crisis response) within the team's "arena of meaning", which in turn nurtures strategic responses that are considered "appropriate". Therefore, knowledge is not discovered in the research, but is co-created through the researcher's wholehearted interpretation process.

3.3 Research Methodology

Known from the above analysis, the research intends to adopt the research paradigm of interpretivism, rather than the research paradigm of positivism. They represent two completely different philosophical positions of viewing to the world and acquiring expertise. At the methodological level, there are significant differences in the research methods of the two paradigms (see table 3-1). Interpretivism mainly adopts qualitative methods, emphasizing background and situation, aiming to understand phenomena and explore meaning, experience and process in depth. Its representative methods mainly include grounded theory, phenomenology, ethnography, narrative research and so on.

Against this methodological spectrum, Grounded theory (Strauss & Corbin, 1990) is selected to develop a contextualized theory of TMT risk perception and strategic decision-making in Chinese LNG importing companies. The analysis follows three core stages: open coding, axial coding, and selective coding.

Table 3-1 Representative research methods of interpretivism and positivism

	Interpretivism	Positivism
Methodology (on the 'how to study' approach)	Interpretive and dialectical, mainly using qualitative methods, aims	Experimental, operational, mainly using quantitative methods, designed to verify

	to understand the phenomenon, in-depth exploration of meaning, experience and process, emphasizing the background and situation.	the hypothesis, looking for causality, control variables, so that the study can be repeated, can be promoted.
Representative Methods	Grounded Theory; Phenomenology; Ethnography; Narrative Research	Experimental Design; Survey Research; SEM;
Data Sources	qualitative data in the natural context: interviews, focus groups, field notes, texts, etc.	structured data: questionnaires, scales, experimental control variables, statistical records, etc.
Data Analysis Methods	topic analysis, coding, theoretical disengagement, continuous comparison	statistical analysis (regression, variance, factor analysis), hypothesis testing, model fitting
Theoretical Mode of Production	Bottom up: Derive theories from data, and theories evolve with the development of data	Top-down: first theoretical assumptions, and then data validation or correction

The most suitable method for the research situation was selected from the representative method of the interpretive paradigm. The characteristics of each method and the analysis for the applicability of this research are shown in the following table 3-2. Phenomenology can deeply capture the individual 's inner feelings of risk, but it focuses on the structure of individual consciousness, and it is difficult to explain the dynamic process of cognitive integration, power negotiation and collective decision-making within the team. Although Ethnography is good at presenting the behavioral logic in the real field, it often falls into the dilemma of rich details and insufficient theoretical abstraction due to its emphasis on immersive observation and long-term participation, and cannot effectively extract the common rules across cases; narrative Research tends to present meaning construction with stories as the carrier. Although it helps to understand how executives give legitimacy to decision-making through narration, its analysis units are mostly single individuals or events, lacking a systematic review of the interaction between variables at the team level. In contrast, Grounded Theory has more methodological advantages. It can systematically extract key concepts and categories from the original data from the bottom up, and on this basis, construct an explanatory relationship model, so as to realize the substantive revelation of the deep mechanism of “feature-perception-decision” (Mohajan et.al., 2023.)

Table 3-2 A comparative analysis of the applicability of each method of interpretivism

	Advantages	Limitation	Matching degree with the Research
Grounded Theory	Support concept induction and inter-category relationship modeling ; it emphasizes continuous comparison and theoretical saturation to enhance reliability and validity ; key mediating variables can be identified.	High requirements for researchers (strong coding ability and reflective consciousness)	Very compatible, it can not only deeply understand individual cognition, but also connect team characteristics with strategic output, ultimately forming an interpretable theoretical model
Phenomenology	Dig deep into the individual 's subjective experience of “risk perception” and reveal its internal structure	Focusing on the perspective of a single subject, it is difficult to integrate the interactive logic at the team level; neglecting the	Partly applicable, but can not explain the team collective behavior mechanism

		institutional constraints of strategic decision-making	
Ethnography	It can observe the decision-making practice in the real scene and capture the informal rules and power operation.	Long data collection cycle and high cost; it is difficult to refine the theoretical framework that can be promoted; emphasis on description rather than causal mechanism.	Auxiliary is strong, but not suitable as the dominant method.
Narrative Research	Reveal how executives construct identity and decision-making legitimacy through stories.	It is often limited to a single case and lacks the ability of cross-case comparison and category	It can be used as a supplementary material, but it is difficult to form a system model.

		abstraction; the theory generation is weak.	
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Hence, grounded theoretical methodology has become the best choice. It is not just a set of operational techniques; it is the concrete embodiment of the interpretive paradigm in methodology. Unlike positivism, which pursues universal laws and emphasizes causal relationships between variables, interpretivism holds that reality is diverse, subjective, and constantly constructed and redefined by individuals in specific social interactions. Therefore, grounded theory does not presuppose theoretical frameworks or assumptions, but rather starts from real-world data and gradually extracts theoretical models that can explain the essence of phenomena through systematic qualitative analysis, especially the three-level encoding process (open encoding, axial encoding, and selective encoding). The core value of this method lies in its respect for the complexity and diversity of the research subjects, allowing researchers to obtain in depth understanding on how participants perceive risks, interpret environmental changes, and make strategic responses in natural contexts.

Grounded theory (Glaser & Strauss, 1967) is a systematic qualitative research methodology for building theory through conceptual analysis. It is particularly suited to investigating under-explored phenomena, as it enables the discovery of potential antecedents and fundamental elements that are not yet well understood (Strauss &

Corbin, 1998). McLeod (2001, p. 4) stated that it is never been achievable of a complete scientific understanding on the human being's world. To achieve at a level of truth which could make difference that can open up to a new potential on understanding is a best practice. Such methodological framework is approach of qualitative, which is a style of research that is concentrated on the approach centered on grounded theory is distinguished by its focus on conceptual development and theory construction, rather than the testing of pre-existing theories (Glaser & Strauss, 1967).

Grounded theory is a general scientific methodology concerned with the generation, elaboration, and refinement of social science theories, and it adheres to the foundational criteria of good science: generalizability and consistency (Haig, 2003).

Drawing on grounded theory, Strauss and Corbin (1994) contend that data can be leveraged to generate new theories, thereby supporting the phenomenological approach. However, they also note that if existing theories are deemed relevant to the research context, such theories may be elaborated upon and modified through the exploration of new data. This process is facilitated by constant comparison, conceptually driven questioning, theoretical sampling, and systematic coding procedures.

At its core, grounded theory revolves around interlocking constructs, with the purpose of developing inductive theory from data. Such theory can then be theoretically elaborated and assessed for fitness for purpose within specified constraints (Glaser &

Strauss, 1967). The reason behind is that, the data collection, analysis and the resultant theory generation has a reciprocal relationship, in that the researcher, rather than commencing with a theory that has to be verified, commences with an area of study and allows relevant theoretical conceptual constructs to emerge from the process (Strauss and Corbin, 1990).

Grounded theory studies employ rigorous data coding procedures, which are designed to enhance the validity of data interpretation. A defining requirement of this process is that:

“joint collection, coding, and analysis of data is the underlying operation for theory generation, coupled with the notion of theory as process... These activities should blur and intertwine continually, from the beginning of an investigation to its end” (Glaser & Strauss, 1967, p. 43).

Since Glaser and Strauss' 1967 co-publication, personal differences have emerged between the two scholars regarding the application of grounded theory. Glaser (1994, 1998) argues that researchers should adopt a more creative, less procedural approach to the methodology, emphasizing that defining and addressing the research aim depends purely on the perceptions of interview and questionnaire respondents, as well as the researcher's own insights. In contrast, Strauss (Strauss & Corbin, 1990) advocates for a linear process, permitting researchers to predetermine the general focus of inquiry before engaging with the research topic. Expanding on this, Strauss and Corbin (1994) note that grounded theory demands specific competencies from researchers—including the ability to step back and critically analyze situations, think

abstractly, remain sensitive to respondents' words and actions, and recognize inherent biases. Despite these disagreements, both approaches share a common foundational framework for grounded theory: the interactive, iterative development of concepts, categories, and propositions.

Grounded theory employs three non-sequential analytical steps to support theory development: data collection, data ordering, and data analysis. Data analysis itself encompasses three interrelated processes — from which sampling procedures are derived—and these processes often overlap with those of:

“.....open coding, where data is broken open to identify relevant categories; axial coding, where categories are refined, developed and related; and selective coding, where the core category, or central category that ties all other categories in the theory together, is identified and related to other categories” (Strauss and Corbin, 1990, p 17).

However, Hitchcock and Hughes (1989) urge researchers to maintain a balance between their own interpretive constructions and the empirical realities of the research context. They argue this balance is best achieved by continually asking: “ What is really going on? ” Furthermore, they advise adopting a skeptical stance toward any categories either brought to the research a priori or emerging early in the process— guidance that was integrated into the present study.

In the present study, Strauss and Corbin's (1990, 1994) approach to grounded theory is more appropriate, as the researcher possesses the capacity to step back and critically

analyze situations to think abstractly, sensitive to the words and actions of respondents and be able to recognize the tendency for bias.

Research with the qualitative approach is according to the observation and interpretation human's perception in different matters and also it would take the snapshot of the human's perception (Guba, 1990; Guba& Lincoln, 1994; Nowman, 1994). Qualitative data were collected through interviews, telephone interviews, and focus groups. Additionally, to develop the theoretical framework and address the research questions, the researcher first gathered preliminary data, followed by iteratively repeating these data collection and analysis steps until no new insights emerge from the synthesized information (Glaser & Strauss, 1967).

This study had employed Tencent Online Interviews to collect data from Top Management Teams (TMTs) across various Chinese LNG companies. The research aims to develop a framework that enhances decision-making for long-term LNG procurement, thereby supporting energy supply security and company development objectives. Specifically, it focuses on how TMTs' risk perceptions influence the strategic decisions of Chinese LNG buyers, with a detailed analysis of the relationships between TMTs' risk perceptions and their experiential characteristics, industry networks, professional experience, cognitive style, self actualization and organizational type.

Additional secondary data were gathered from industry and academic sources, including the International Energy Agency (IEA), the International Group of Liquefied Natural Gas Importers (GIIGNL), Wood Mackenzie (Woodmac), IHS

Markit, the World Economic Forum (WEF), The Economist, Poten & Partners, China-focused literature, management journals, other academic journals, and company-specific publications.

3.4 Analysis Workflow

The analytical process adheres to a structured audit trail (Aguinis & Solarino, 2019; Lincoln & Guba, 1985) to ensure methodological transparency, traceability, and analytical rigor, which aligns with the interpretivist and constructivist paradigm of this study. The analytical process adheres to a structured audit trail:

The analytical process adheres to a structured audit trail:

Research Design → Ethics Approval → Participant Recruitment → Semi-structured Interviews → Transcription → Open Coding → Axial Coding → Selective Coding → Theoretical Sufficiency → Model Development → Validity and Reliability Testing.

3.5 Reflexivity and Positional Awareness

Reflexivity was a critical component of this qualitative study. As Mann (2016) articulates, “reflexivity involves examining yourself as researcher and also your research relationships” (p. 27). As an industry insider with over 20 years of LNG experience, the researcher acknowledges potential biases inherent in the research process. To address this, mitigation strategies were implemented, including maintaining a detailed reflexivity journal (Collins & McNulty, 2020), conducting

independent co-coding with a grounded theory expert, employing data triangulation, and carrying out member checking. Reflexivity is fully documented within this chapter to ensure methodological transparency, aligning with qualitative research standards for rigor and auditability. To operationalize this principle, the researcher kept a reflexive diary to systematically record personal feelings, emerging ideas, potential biases, and subjective leanings, and continuously monitored how these factors might shape the entire research procedure. Through critical self-reflection, the researcher recognised the necessity of prioritising participants' emotional comfort and willingness to share authentic views. This understanding was incorporated into subsequent interview arrangements and interview guide revision, which effectively improved interview rapport and overall research validity.

A core principle of professional doctoral research lay in reflexivity, which denoted critical self-awareness of the researcher's personal position and its potential impacts on the whole research process.

The researcher acted as an insider-researcher in this study, who had accumulated more than twenty years of working experience across the global energy industry. Relevant working experiences covered both buyer-side and seller-side LNG transaction businesses, as well as practical involvement in LNG terminal operation management and cross-border international procurement affairs. Such dual professional identity brought distinctive research advantages together with inevitable methodological challenges.

As a seasoned industry insider, the researcher obtained convenient and privileged access to senior TMT members working in Chinese LNG import enterprises, most of whom had maintained long-term professional connections. Meanwhile, rich industrial experience enabled the researcher to form an in-depth intuitive understanding of industry operational logic and professional academic jargon.

Such inherent advantages greatly facilitated the establishment of mutual trust and smooth communication during offline and online interview procedures. Participating executives were willing to elaborate on their implicit practical concerns, such as worries about potential supply chain interruptions caused by fluctuating international trade relations, which were usually concealed from external researchers without industry backgrounds. For example, senior managers from private LNG enterprises frankly stated their profit-oriented and short-term focused procurement decision logic. The acquisition of such in-depth insider information effectively improved the internal validity and practical industry relevance of this empirical study.

Nevertheless, close industrial immersion also posed threats to research objectivity. Long-term career experience had shaped the researcher's fixed thinking frameworks, which prioritised data-based and quantitative-oriented LNG procurement logic. This inherent professional tendency easily led to subjective bias in interview question design, original transcript interpretation and qualitative coding procedures.

For instance, the researcher initially ignored the core value of experience-based intuitive judgment within private enterprise senior management teams, since such decision-making logic contradicted the researcher's long-standing preference for

quantitative risk assessment. In the early stage of open coding, the researcher once classified interview content related to supplier trust and relational cooperation as trivial descriptive information, until subsequent interview data gradually confirmed that experience-based intuition constituted a vital driving factor shaping risk perception among private enterprise executives.

In summary, the whole reflexive adjustment process did not aim to completely abandon the insider research identity, but to rationally utilise contextual insider advantages under rigorous academic constraints. The insider professional background supplied sufficient practical industry insights, while systematic reflexive control mechanisms guaranteed overall methodological rigor. This research practice further proved that exploring complicated enterprise strategic decision-making phenomena required both sufficient on-site industrial immersion and proper objective analytical distance.

3.6 Pilot Study

3.6.1 Sample for Pilot Study

A pilot assessment was conducted to verify two critical criteria: first, that the research questions were framed in a way that interviewees could clearly understand; and second, that their responses would directly address the research questions—ultimately ensuring the collection of relevant data and optimizing the efficiency of the primary data-gathering process.

This study conducted twenty interviews with managers and Top Management Teams (TMTs) from diverse types of Chinese energy companies. As Turner (2010) argues, pilot interview participants should closely mirror the demographic and contextual criteria of the main study's sample. Consequently, two participants were recruited for the pilot phase, leveraging the researcher's industry network connections. Permission to participate was secured via telephone communication with potential interviewees from various Chinese liquefied natural gas (LNG) importing companies, and signed informed consent forms were collected prior to data collection. The demographic characteristics of the pilot participants are summarized in Table 3-3.

Table3- 3: The participants' demographic characteristics

Participant	Position	Organization Type	Industry Experience	Background of Education
A	Supply Manager	Stated-owned	11 years	Undergraduate
B	Securities Affairs Representative	Private	More than 5 years	Master

To ensure the validity of this study, a set of semi-structured interview questions was developed, drawing on established items from prior research. These questions were designed to capture key socio-demographic variables, including age, sex, marital status, and political ideology. For data collection, in-person interviews were employed

— a technique widely recognized as highly suitable for qualitative inquiry, as it facilitates deep insights from individuals with direct experience of the phenomenon under study (Collingridge & Gantt, 2008; Wimpenny & Gass, 2000). Prior to the main study, a pilot interview was conducted to refine the questions and practice interview techniques.

3.6.2 Data Collection Methods: Semi-Structure Interviews

The pilot interview for this study was conducted in August 2024 via Tencent Meeting, scheduled at the participant's convenience. Prior to the session, informed consent was obtained. The interview was recorded through written notes and the platform's built-in feature. In line with the recommendations of Jacob and Furgerson (2012) that interviews should not exceed 90 minutes to respect participants' time, and aided by the established rapport between the researcher and the participant, the session lasted approximately 35-45 minutes and was conducted in a quiet and comfortable setting.

The interview began with a bit of ice breaker conversation; it turned out that a buildup of comfortable rapport with the interviewees would generate better responses. (Jacob and Furgerson, 2012). With participant consent, all interviews were recorded using the Tencent Meeting application. This was done to ensure the accurate collection of all information, as English was not the first language of the participants. Throughout the interview, the researcher also monitored the time to ensure the session would adhere to the agreed schedule and minimize disruption to the participant.

The pilot study aimed to assess the appropriateness of the interview questions and gather preliminary feedback on the research's viability. The interview was predominantly conducted in Chinese, with only occasional use of English. This linguistic approach created a more casual atmosphere, which was instrumental in obtaining in-depth feedback from interviewees who were not entirely comfortable speaking English.

3.6.3 Interview Outline

The first two questions were designed to initiate the interview by having the interviewees introduce their educational and professional backgrounds, as well as their tenure in the LNG industry. These questions were also oriented toward having them articulate their views on natural gas's position in China's energy mix over the next 10 to 20 years. Coherent comprehension: it is a strategic decision of Chinese liquefied natural gas buyers to make long-term procurement decisions, and the decision is made in the risk environment.

The detailed interview questions can be viewed in the following section:

1. Can you please make a brief introduction about yourself, covering education and career background, your tenure experience in LNG industry, and any other information you would like to share?
2. How do you view the role of natural gas and LNG in China's current energy

mix and in the next 10 to 20 years?

3. What are the factors do you view affecting Chinese LNG buyers' long term LNG procurement? And can you highlight a few as the key ones?
4. Do you consider making long term LNG procurement is a strategy decision for the organization? How much risk and what that risk is to make such decision? How do think Top Management Team can management the risk?
5. How do you view Top Management Team's risk perception impact in company's long term LNG procurement? The risks can be classified as High, Medium and Low. What will be the impacting factors in TMT's risk perception from your view? For example: business experience, tenure in the position, network in the industry, and or any others?
6. And how do you view the TMT's risk perception will impact your strategy decision making, here, in term of making decision to buy or not to buy long term LNG?

3.6.4 Key Themes Identified in Data Analysis

While keeping the research questions at the forefront, the initial codes were identified. Extensive listening and reading efforts supported the researcher in reviewing, modifying these initial codes, and incorporating additional codes — such as the example provided above. The supporting quotes and selected codes are presented in the table below, organized into two columns: the first column elaborates on the selected codes, while the second column provides illustrative examples. Notably, the additional codes were also derived from a pilot study.

Table 3-4 Examples of the Supporting Quotes to Codes, and Combing Codes into Themes

Quotes	Codes	Themes
- Natural gas plays an important role in the energy mix in China	-Natural gas as a transition fuel	Natural gas fundamental in China
-the market is growing with natural gas demand in China	-Important role	
-can compete with diesel and gasoline in the heavy-duty trucking sector, there are more and more liquefied natural gas trucks in China	-Competitive position in the market	
- transition role in China's energy mix		
-its demand will continue growing till		

2040 in China - natural gas supports China's target on carbon neutral and carbon peak objectives.		
- as its impact is long-term, with huge investment, and offers reliable supply to the company; - The top management team will be very careful before they make the procurement decision in the specific energy industry cycle. - if the company can secure a good price of long-term supply, it will support the good development of the company in the long run, and put the company in an advanced position in the market; -the long-term contract duration is not only very long but also needs to consider the stable supply, it will be very difficult to find an alternative supply in a short time, hence, to decide on signing a long-term supply contract	-Long term impact -Impact company's market position -Impact company development -Huge capital input	Strategic decision making

is a strategic decision making. It will represent the competitiveness of a company. Being competitive in the market is a very important competitive factor.		
- price will be the key factor and the forecast of the price in the long term - Reliable supply over the long term - its competing fuel technologies development, the electric car development, and market share are continuing the growth. -government policy is supporting natural gas development in China. - If the external environment is relatively mild, or if there are favorable policies or other factors, then the perceived risk perception point of executives may be smaller. That is to say, he may feel that this will make it easier for him to make such decisions,	- Favorable price -Supply reliability -Government policy -Industry cycle	External factors

or that the overall environment is not good, so his risk perception will be stronger -I think when executives make decisions, they will review the development and changes of this industry in the past. Secondly, we will consider the future market trend of this price, whether it will be in an upward or downward phase.		
- it should be important that the top management has industry experience, as they had experienced the price fluctuations, and understood the impact on the company so that they would have gained a deeper understanding of risk. - top management would review the overall market situation, and with an understanding of the development trend, decide if the company needs to buy long-term liquefied natural gas	-understanding of the industry - ability to evaluate the industry cycle	Top Management Team's industry experience
- Private company would not be able to	-Restriction of private	Company Type

compare with state-owned companies, I don't have that much ability to hedge. So this price risk includes this one-time long-term capital investment. -For this private enterprise, it would be the personal factor which is the boss may play a dominant role in decision-making. Unlike state-owned companies, in which the management team would play an important role, instead of individual. - Because in the long run, it is not just about signing a contract, but also involves storage at the port, loading, and unloading operations, transportation between the port and the marketing locations, and a series of supporting facilities that need to be kept up to complete such a contract. So I think this risk is difficult for us to overcome. Firstly, it is impossible to avoid, and secondly, it is also very difficult to control. We will consider	company -State-owned companies' better position -Private companies treat price as the key State-owned companies consider other factors rather than just price	
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many measures, but it does require careful evaluation. -Because we are a private enterprise, basically it is the boss who makes such decisions. The boss and the team will discuss, but he is the person who directly makes decisions and takes risks. He may only consider the price level, but for state-owned enterprises, there may be many factors that influence them, other diplomacy, or other factors.		
-Other factors, such as education, can also have a certain impact, as this education represents one's ability to receive and process information. These things are not just about having industry experience; you also need the ability to digest and absorb this experience. At the same time, this industry experience also extends to networking. After all, having been in this industry for a long time, both upstream and downstream will have a	-Better education supports management's ability to better understand the industry	Top Management's characteristics experience

lot of channel resources to understand these risks, including personnel from the same industry. So I think factors such as management experience, education, and network connections will have a significant impact on the perception of this risk.		
- If the long-term contract is implemented during the top management team's terms in their position, they will be more motivated to make strategic decisions, as they would benefit from the outcome;	- Decision will be made if the supply will be under management's effective tenure period	Top management team's tenure
-For example, I think it's because there is such a great demand in the downstream market that I invested in such infrastructure. That's like the three national oil companies, it was only with this resource that you were allowed to build facilities in history. Many companies may build their facilities before purchasing this resource. After my facility is built, I	-The company will be motivated to decide to procure if they own receiving facilities -	The company's receiving facilities preparation

still need the corresponding long-term resources to ensure the return rate of the facility I invested in.		
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3.6.5 Reflections on Research Practice

Following the pilot study, several key lessons were identified. First, prior to the interviews, the interviewees' English proficiency was not thoroughly assessed. As a result, additional time was required to explain the meaning of questions to ensure interviewees could respond comfortably and accurately. To address this gap, future interviews should include a pre-assessment of participants' English competence, and a Chinese translation of the interview protocol should be prepared in advance. Second, when time constraints were a concern, skipping the warm-up phase to dive directly into the core topics led to a rushed process. This inadequate preparation failed to allow interviewees sufficient time to reflect on each question, potentially impacting the depth and quality of their responses, this had been addressed by adding another 10 minutes for the interview period to obtain more supporting material. Third, it would be good to make a summary after each question was discussed to ensure the researcher got the correct understanding of the feedback from the interviewees.

3.6.6 Implications for Research Practices

The pilot study enabled the researcher to assess whether the interview questions elicited appropriate responses, verify that the interview protocol aligned with the research questions, and test the functionality of Tencent Meeting for meeting recording purposes. Furthermore, the pilot study facilitated the development of the researcher's interview inquiry skills, while fostering familiarity with and comfort in executing the interview protocol. (Hassan, Schattner & Mazz, 2006)

In summary, the pilot study was conducted in an orderly manner, and its outcomes confirmed that the interview protocol was well-aligned with the research objectives. Additionally, the researcher's interview skills were both validated and enhanced through the implementation of the pilot interviews.

3.6.7 Impact Statement

The main findings of the research include the top management team is the one that makes strategy decisions. For restate the main findings: Begin by restating the main findings of the study that is generated from the above literature review, the company's strategic decision for purchasing long term LNG is made by company's top management team, and before they make the procurement decision, there are risks facing them, their risk perception would be influenced by the external environment, industry network, characteristics experience, and cognitive style, and their

self-actualization value and organizational structure. Guided by the influence of various factors on their risk perception, the top management team (TMT) would make differentiated decisions regarding the target — specifically, to purchase it, reject the purchase, or place the decision on hold.

The pilot study also revealed certain limitations. Given that the interview questions were administered in English, not all interviewees possessed sufficient English proficiency to fully comprehend the content. Consequently, additional time was required to clarify linguistic ambiguities and ensure interviewees grasped the intended meaning of the questions.

3.7 Design of Interview Questions

In the Pilot Study, an interview outline has been proposed. Summarize the problems in the Pilot Study and further improve the interview outline. Finally, the detailed interview questions were designed and could be viewed in the following section:

1. Can you please provide a brief introduction about yourself, including your education and career background, your tenure experience in the LNG industry, and any other information you would like to share? How do you view the role of natural gas/LNG in China's current energy mix and the next 10 to 20 years?
2. What risk factors do you think the company may face when purchasing LNG? How does the executive team judge these risks? How to manage these risks? Risk

can be divided into high, medium and low. In your opinion, what are the influencing factors of the risk perception of the top management team?

3. What do you think are the characteristics of your company's executive team? Is it different from other companies? What characteristics do you think may affect the perception of each risk factor? How to make an impact?
4. Do you consider LNG procurement as a strategic decision of the company? What are the contents of decision-making? What are the factors that affect the decision results? How do you think top management team's risk perception will affect your strategic decisions?
5. How do you view the impact of company type (state-owned / private / joint venture) on company development? Does the type of company affect the perception of risk by the executive team? What is the impact on LNG procurement decisions?
6. Regarding the major procurement projects within your organization, such as LNG long term procurement, could you elaborate on the end-to-end process from initial demand identification to the final decision making? As well as the division of responsibilities among the key participants, such as senior management, the procurement department, and the legal affairs team?
7. When a conflict arises between policy requirements, such as environmental standards, and market costs, for example securing a lower price, how does your team typically navigate this tension? Could you walk me through the discussion process and the primary considerations for ultimately reaching a consensus?

3.8 Research Participants in the Main Study

According to the research scope, the Chinese LNG import companies involved in the research cover companies of different sizes and different types in the industry, contents state-owned enterprises (SOEs), private companies and joint ventures. At present stage, China's LNG import industry remains dominated by state-owned enterprises (SOEs), but private companies and foreign capital are breaking the monopoly, and the trend of diversified competition is obvious. Joint ventures would play a bridge role for international cooperation and resource integration. The three complement each other and together constitute the diversified pattern of China's LNG import market.

In order to comprehensively explore the link between top management team characteristics and the strategic decision-making of LNG import companies in China, and to test the role of company type in it, and considering the operability, this thesis will select two to four enterprises from each of state-owned enterprises(SOEs), private companies and joint ventures as the case enterprises for the interview, as shown in table 3-5 below.

Table 3-5 Interviewed case enterprises

	Enterprise	Essential Characteristics
	Number	

State-owned enterprise	1	State-owned enterprises are the leading force in China's LNG imports. They have high market concentration, strong resource acquisition capabilities and market influence. They have multiple related projects overseas, and the critical big capital investment in infrastructure such as LNG receiving terminal facilities. They bear the responsibility of national energy supply.
	2	
	3	
	4	
Private enterprise	5	Private enterprises mainly serve the local market or specific user groups, alleviating the market pressure of state-owned enterprises. Although these enterprises are relatively small in scale, they have certain advantages in flexibility, innovation and market response speed, especially in the spot market, distributed gas supply, regional market and other aspects.
	6	
	7	
Joint venture	8	Sino-foreign joint ventures are representatives of China 's LNG import
	9	

		industry with a high degree of internationalization. They enhance China's bargaining power and resource acquisition ability in the international market through technology introduction, resource integration, and cooperative development.
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The primary method employed in this study is in-depth interviews, which serve as the core means of collecting raw data to support the application of grounded theory. Among the nine multi-type LNG import companies, each company had been interviewed three representative senior management team members, and a total of 20 sample interview data have been obtained. These enterprises, as key market participants, hold a combined market share of around 60% in China's LNG import market, which enhances the generalisability of the research results by reflecting the mainstream market dynamics and strategic decision-making logic of the industry. In fact, the number of samples of grounded theory should be determined by whether the theory is saturated (Glaser, 1992, 1998, 2001; Stern, 2001), but the saturation state of the theory cannot be judged at the beginning of the study, so it can only be judged empirically. According to the study of Fassinger (2005), the sample is between 20 and 30. Therefore, the 20 interview materials are appropriate. Purposive sampling was used to recruit 20 TMT members from nine Chinese LNG importing companies,

comprising four state-owned enterprise (SOE), three private enterprise, and two joint venture (JV) executives. Eligibility criteria included a minimum of five years of LNG industry experience and senior management responsibilities. Participants were recruited via industry referrals, WeChat, and email. Interviews lasted 35–45 minutes.

The detail of the interviewees' information is presented in the table 3-6 as below:

Table 3-6 Basic information of interviewee

No.	Company type	Enterprise Number	Position	Industry Tenure	Interview duration (minutes)
I1	State owned energy enterprise	GQ-NY-01	Supply Department General Manager	15	45
I2	Comprehensive state-owned enterprise	GQ-ZH-01	Vice President	3	35
I3	State owned energy enterprise	GQ-NY-02	Trading Manager	5	40
I4	State owned energy enterprise	GQ-NY-01	Trading Director	10	45
I5	Joint Venture	HZ-01	Procurement Manager	8	40
I6	Comprehensive state-owned enterprise	GQ-ZH-02	Supply Department General Manager	2	35
I7	State owned energy enterprise	GQ-NY-02	Supply Manager	12	45
I8	Comprehensive state-owned enterprise	GQ-ZH-01	Lead Procurement Negotiator	18	45
I9	State owned energy enterprise	GQ-NY-01	Deputy Director	9	40
I10	State owned energy enterprise	GQ-NY-02	Supply Director	15	45
I11	Private energy enterprise	SQ-NY-01	Trading Manager	6	40
I12	Comprehensive private enterprise	SQ-ZH-01	Assistant President	5	35
I13	Comprehensive state-owned enterprise	GQ-ZH-02	Planning Manager	12	40
I14	State owned energy enterprise	GQ-NY-01	Senior Negotiator	15	45

I15	State owned energy enterprise	GQ-NY-02	Director	12	45
I16	Comprehensive Private energy enterprise	SQ-ZH-01	International Business Lead	8	40
I17	Comprehensive State owned energy enterprise	GQ-ZH-02	Procurement Director	13	45
I18	Joint Venture	HZ-02	Head of Supply	6	40
I19	Private energy enterprise	SQ-NY-02	Trading Manager	5	45
I20	Joint Venture	HZ-02	Department Manager	12	40

A semi-structured interview guide was developed (Appendix B), focusing on TMT background, risk perception, and long-term procurement decision-making. Core themes included industry experience, network resources, cognitive style, self-actualization, geopolitical risk, market risk, logistics risk, policy risk, contract terms, pricing mechanisms, and procurement models.

This study investigates the factors influencing the top management team (TMT)'s risk perception during the formulation of long-term LNG procurement strategies. Specifically, it explores how these influential factors shape TMT risk perception and, in turn, impact long-term LNG procurement decisions across organizations of different types. Given the research focus on the TMT's risk perception and its effect on long-term LNG procurement decisions, the study recruited participants from a broad spectrum of organizations, encompassing different ownership structures (state-owned, private, and joint-venture) in the LNG industry in China and focus on above department management level, namely, the international procurement department general manager, the risk control department general manager, the company vice president, the deputy general manager of the company, the procurement

and trading managers from private companies, joint ventures and state-owned companies, as they engage and implement the companies long term LNG procurement process closely. The recruitment of a UK University (the participants) in doing/working on the research had to meet the following three criteria: work in the LNG industry and organizations (i.e., marketing manager, trading managers, procurement department general managers, vice presidents, assistant CEOs), Participants were selected based on their willingness to engage in the research and their capacity to provide actionable data and insightful information for analysis. Given their direct involvement in the LNG procurement process, they were anticipated to contribute valid, in-depth insights. Due to geographical constraints—with participants distributed across China from northern to southern regions—fieldwork was conducted via semi-structured online interviews on Tencent Meeting, rather than in-person interactions. The main study ultimately included 20 participants (i.e., 20 interviewees), all of whom possessed substantial experience in both the formulation of long-term LNG procurement decisions and relevant organizational management.

This study employed purposive sampling (also referred to as judgmental sampling), a technique wherein researchers consciously select participants based on their prior knowledge of the research questions and objectives. While this sampling method does not aim to produce a statistically representative sample, it offers an efficient and straightforward approach to capturing diverse perspectives or responses relevant to the research focus. Purposive sampling was adopted due to there is quite limited number of LNG buyers in China who is actively in the international market and with the capabilities to procure long term LNG, in total, such kind of companies currently

in China is less than 20, and the researcher is with extensive network in China's LNG buyers industry and monitor closely on buyers' movement in the international market. It helps to target specific criteria or characteristics, making it ideal for the research that require specialised participants.

So, the potential participants were first contacted using the researcher's personal connections. Some suggested their colleagues to the researcher. After that, The researcher contacted potential participants via WeChat and email. The majority of them agreed to participate in the study, while others declined due to internal company policy restrictions. To ensure and maintain the anonymity of all participants, each research participant was assigned a pseudonym (e.g., Interviewee 1, Respondent 1) throughout the entire research process, including data collection, data analysis, and the reporting and discussion of findings.

Several challenges emerged during the research process. Primarily, due to significant physical distancing constraints and the need to accommodate participants' time availability and convenience, the study adopted Tencent Meeting for online interviews instead of in-person interactions. Nevertheless, the core research objectives, methodological framework, and ethical protocols remained intact. Accordingly, data for the main study were collected via Tencent Meeting's online interview function, followed by thematic analysis of the gathered data—enabling the timely completion of the research project. That said, a notable limitation is that online interviews

precluded the researcher from observing participants' non-verbal cues (e.g., facial expressions), which might have provided supplementary contextual insights. Additionally, drawing on lessons from the pilot study, some interview questions were revised and translated into Chinese to enhance participants' comprehension. These revised and translated questions were peer-reviewed and validated by three academic colleagues to ensure accuracy and appropriateness. Potential participants were first contacted using the researcher's personal connections. After that, the researcher contacted them through emails. Apart from those participants, the researcher used WeChats and emails to recruit research participants in which all staff member details, such as department, name and email address on a university chosen for a research website were listed and were contacted via the emails by researcher. Ethical considerations were prioritized throughout the entire main study, in strict adherence to academic research ethics standards. Prior to the commencement of data collection, the researcher formally sought and obtained written informed consent from all participants. Importantly, participants retained the right to withdraw from the study voluntarily at any stage without providing a justification, and such a decision would not incur any adverse consequences for them.

Furthermore, a rigorous research process was implemented throughout the entire DBA project. Specifically, the four criteria for ensuring data trustworthiness proposed by Lincoln and Guba (1985)—credibility, transferability, dependability (or reliability), and confirmability (as detailed in Section 3.10)—were strictly adhered to. The

researcher maintains confidence in the validity of the data.

3.9 Data Collection Method and Procedure

Strict data security protocols and encrypted storage measures were adopted. All interview materials were preserved with restricted access to protect participants' confidential information.

Semi-structured online interviews via Tencent Meeting served as the exclusive data collection method. This well-recognised research technique possesses five core advantages supported by prevailing academic views:

- 1) Flexibility in implementation: This approach allowed flexibility not only in the wording of questions and the sequence of administration but also enabled participants to provide in-depth, detailed responses. Critically, it created space for discussing unanticipated topics — issues important to participants that were not pre-designed in the interview guide or foreseen by the researcher (Braun & Clarke, 2013).
- 2) Exploratory depth: It facilitates the researcher in probing and unpacking participants' viewpoints on the focal research topics (Blumberg, Cooper & Schindler, 2014), thereby capturing granular data on individuals' lived experiences and subjective opinions.
- 3) Rich in data output: This method facilitated the collection of large volumes of

context-rich information, which is invaluable for exploring complex phenomena (Jankowicz, 2016).

- 4) Interactive calcification: It enabled the researcher to elicit more detailed responses through targeted probing and prompting, while also clarifying any ambiguities that emerged during the interview process—ensuring the accuracy of the collected data (Gilbert & Stoneman, 2016).
- 5) Adaptability to contextual needs: Unlike more rigid data collection approaches (e.g., structured interviews or questionnaires), semi-structured interviews allowed the researcher to revise existing questions or develop new ones when contextual appropriateness demanded it (Saunders, Lewis & Thornhill, 2016).

The use of semi-structured interviews enhanced both the researcher's confidence in conducting the interviews and the overall rigor of the study. Furthermore, the pilot study served as valuable practice that helped refine the researcher's qualitative inquiry skills, thereby strengthening the credibility of the research to a notable extent.

The questions in the interview schedule were prepared beforehand and were determined by the research questions. The questions were then discussed with the supervisor and ambiguous questions were revised, irrelevant questions were eliminated, and other important questions emerging from the pilot study were deliberately considered and added. The amended interview schedule is presented in Appendix A and B.

Subsequently, interviews were conducted with key management personnel from diverse organizational types in China's LNG industry, including national oil companies (NOCs), private enterprises and joint ventures (JVs), all of whom possess extensive professional experience in the sector.

The primary objectives of these interviews were threefold: first, to refine the interview techniques and procedures for subsequent formal data collection; second, to expand and deepen the research scope by incorporating multi-stakeholder perspectives; and third, to complement the content analysis conducted in Phase 1, thereby laying a more robust foundation for the overall research analysis.

To ensure the representativeness of market participants, interviewees were strategically selected from various enterprise types within China's LNG industry, with a focus on achieving sufficient sample coverage across the sector. Notably, interviews offer a unique advantage in capturing complex, in-depth data from individual participants — data that would be difficult to obtain through other research methods (Cavana et al., 2001, p. 138).

As previously noted, data collection in this study relied on a single primary method: semi-structured online interviews conducted via Tencent Meeting.

Prior to the formal interviews, participants were contacted via email to confirm the scheduled time — with arrangements tailored to their convenience, which each

participant could arrange for themselves, but it was in a safe, quiet and private room where the interview was unlikely to be disturbed and the quality of a digital voice recorder would not be reduced (Saunders, Lewis, and Thornhill 2016).

Prior to conducting the formal interviews, the researcher—acting as the interviewer—familiarized herself with the interview protocol and gained a thorough understanding of the formulation logic underlying the study’s core research questions. This preparation not only enhanced her confidence and capacity to communicate effectively during the interviews but also enabled her to maintain focus on the research focus and guide the conversations constructively, ensuring alignment with the key inquiry objectives.

Additionally, despite the interviews being audio-recorded for comprehensive data capture, the researcher prepared physical note-taking materials to document emerging key insights, unexpected perspectives, or non-verbal cues (e.g., pauses, emphasis) in real time. Such supplementary note-taking served to complement the audio records and reduce the risk of omitting critical contextual information during subsequent data transcription and analysis.

When conducting in-depth interviews with senior executives of LNG import companies, so as to ensure the operability, professionalism and effectiveness of information acquisition, the interviews had been conducted through online meetings

with the help of Tencent Conference APP. This approach can not only overcome geographical constraints and improve the efficiency of interviews but also ensure the flexibility of the interview process and the integrity of data collection.

The interview process was primarily divided into three core phases: (1) Preparation before the interview. Before the formal interview, full preparation is carried out, including determining the interviewee, formulating the interview outline, booking time, technical test and so on. Communicate with the interviewees by email or telephone, clarify the purpose, schedule and technical platform of the interview, and send relevant information in advance so that the interviewees can be prepared. Before the interview, the equipment test is carried out to ensure the stability of the network, the clarity of audio and video, and to avoid the influence of technical problems on the quality of the interview. (2) The specific implementation of the interview process. The interview begins with a brief opening statement. The host introduces the purpose, process and confidentiality of the interview to establish a sense of trust. During the interview, the host followed the pre-designed outline to guide the interviewees to explore the practical experience and strategic thinking of their enterprises in LNG procurement. During the interview, the host conducted appropriate follow-up questions based on the respondents' answers to dig deeper information. After the interview, the host thanked the interviewees and explain the follow-up data collation, results feedback and other related arrangements. At the same time, respondents had also been asked whether they were willing to provide supplementary materials or

participate in follow-up discussions to enhance the comprehensiveness and accuracy of the study. (3) Handling after the interview. After consulting the interviewees, the recording equipment was used during the interview. The interview records had been transcribed into transcripts, and preliminary induction and classification had been carried out for subsequent analysis.

During the interview, as the host, the following aspects were focused on: (1) Maintain a neutral attitude and avoid subjective evaluation or guidance of the respondents' answers. (2) Good at listening. Be a good listener and respondent, give the interviewees enough time to express their views, and do not interrupt their speech. In the face of different interviewees, different response strategies are adopted. For example, some interviewees like to speak out. In the interview, as long as a question is thrown out, it was a voluble answer. In this case, it is necessary to properly remind him of the limited time, answer the core information, and be simple and true, not to "add fuel to vinegar"; some interviewees like to be silent, so it is necessary to guide the respondents to answer more detailed information. The open question can be decomposed into specific and clear small questions for him to answer, and more questions of questioning nature should be prepared. (3) Grasp the questioning skills. Questioning should be clear and concise, avoiding the use of vague or ambiguous language. According to the respondents' answers, we can flexibly adjust the way of asking questions and ask questions in time to obtain more in-depth and comprehensive information.

Each interview lasted 35 – 45 minutes, with the core objective of capturing participants’ in-depth perspectives on the research topic. A digital voice recorder was used to document the full content of each interview conversation — provided that participants had given prior written consent (see Appendix C). This audio-recording approach was particularly necessary given that English is not the participants’ first language, as it ensured no critical information was omitted due to potential linguistic or conversational nuances.

All participants who agreed to take part in the study were initially given the participant information sheet (see Appendix A) which included a brief overview of the research project, the length of an interview, the use of a digital voice recorder, their anonymity and confidentiality, and their rights as research participants. However, prior to the commencement of each interview, these key details (including privacy protection measures, recording purposes, and withdrawal rights) were re-communicated to participants to ensure their privacy and data security. Participants were also afforded the opportunity to raise questions or seek clarifications (Bryman & Bell, 2015)—a step designed to establish the study’s credibility and foster trust with interviewees.

During the interviews, an online stopwatch was utilized to monitor the duration, ensuring the process did not unduly disrupt participants’ work schedules. Extensions were only granted if participants voluntarily requested to continue the conversation.

Notably, several practices proved effective in encouraging participants to express themselves fully: establishing a positive rapport, adopting an empathetic listening stance, taking real-time notes when unexpected insights emerged, and demonstrating curiosity about participants' perspectives. These actions signaled to participants that their ideas were valued, recognized as meaningful contributions to the study's knowledge base, and ultimately strengthened the trust and rapport between the researcher and interviewees.

When interviewing the participants, lessons learned from the pilot study and the literature were applied:

- a) Showing a warm/friendly manner to put the participants at their ease and to help create rapport and trust (Braun and Clarke 2013; Bryman and Bell 2015).
- b) Balancing act between attentively listen and note-taking what the participants say.
- c) Being open-minded to different ideas and unexpected discoveries arising.
- d) Utilization of open-ended questions to encourage participants to freely define, describe, and elaborate on their experiences, perspectives, and reasoning (e.g., addressing "what," "how," or "why" questions). Concurrently, specific closed-ended questions were employed as introductory prompts when initiating discussions on targeted interview topics—for instance, “Could you tell me about your organization’s long-term LNG procurement decision-making process? ” (Saunders, Lewis & Thornhill, 2016).
- e) Deployment of probing questions to follow up on initial responses, seeking deeper

explanations, contextual details, and nuanced meanings. Examples of such probes include: “In what specific ways did this factor influence your risk perception?” “Can you provide an example to illustrate this, if possible?” and “What does this experience mean for your team’s decision-making?” (Bryman & Bell, 2015; Saunders, Lewis & Thornhill, 2016; Creswell & Creswell, 2018).

f) Maintenance of a friendly, approachable tone throughout the interviews to foster open communication and sustain constructive dialogue.

g) Provision of sufficient time for participants to reflect on questions and formulate thoughtful responses, avoiding rushed interactions that might limit the depth of insights.

h) Deliberate avoidance of leading questions (i.e., questions that imply a desired answer) and refraining from correcting or guiding participants’ responses—ensuring the authenticity and objectivity of the data collected.

Given that conducting in-depth interviews requires intense focus on both verbal content and non-verbal cues, the research schedule was structured to include only one participant interview per day (Braun & Clarke, 2013). Each interview was transcribed verbatim as soon as possible following its completion. This timely transcription enabled the researcher to “reflect on and adjust your interviewing style and questions” (Rubin & Rubin, 1995, cited in Braun & Clarke, 2013, p. 91) prior to commencing subsequent interviews—facilitating iterative refinement of the interview process and enhancing data quality.

Through this preparation, the language barrier could also be minimized. Furthermore, mutually jotting down notes during the interview proved beneficial for cross-checking the transcription for accuracy and consistency. Lastly, a thank you email for agreeing to take part in the study was sent to every participant soon after the interview. Those were intended to avoid any bias that may affect the reliability and validity of the data obtained.

3.10 Data Analysis and coding

3.10.1 Data Analysis

In Phase 1, data were collected through desk-based research and content analysis of relevant websites. This process identified broad, generic factors influencing the long-term LNG procurement decisions of Chinese LNG buyers (covering the 2002 – 2022 period), categorized into micro-environmental and macro-environmental dimensions.

Building on these Phase 1 findings—specifically the factors identified through desk research and content analysis—the study proceeded to the interview phase to validate, refine, and deepen understanding of these preliminary factors. Subsequently, data analysis was structured into four sequential stages, aligned with the inductive logic of grounded theory:

- 1) Coding: The primary objective of this stage was to identify "anchors" (i.e., key thematic elements) within the data, enabling the systematic capture of core viewpoints and information from interviews and Phase 1 materials.
- 2) Concept Formation: Codes with similar semantic content or thematic relevance were clustered into distinct concepts. This step aimed to synthesize fragmented coding results into more abstract, cohesive units of analysis.
- 3) Category Development: Concepts sharing consistent logical connections or theoretical relevance were further grouped into broader categories. This stage involved generating preliminary theoretical insights by identifying patterns and relationships across concept clusters.
- 4) Category Integration: The final stage entailed integrating these categories to construct a comprehensive analytical framework that details the research subject—specifically, the mechanism through which identified factors influence Chinese LNG buyers' long-term procurement decisions.

The data analysis in grounded theory is inseparable from the data collection process, a principle embodied by constant comparative analysis and theoretical sampling. Researchers collect qualitative data—via open-ended interviews, archival records, or observations—and simultaneously interpret it, allowing the emerging findings to shape subsequent data gathering. This collected data is transferred into transcripts.

The categories or themes are compared and further refined by data until there are only a few strong categories or themes remaining. The initial coding phase began with a

line-by-line analysis of the raw data, a process known as open coding. The interview transcripts were reviewed multiple times to be fractured into discrete excerpts, which were then summarized into preliminary themes or concepts. In the subsequent stage, these initial concepts were constantly compared with further data collection to identify similarities and differences. This iterative process of defining and summarizing the data helped shape the emerging theory.

A preliminary analysis of the pilot interview data, though limited in scope, enabled the identification of six key factors. These factors — the external environment, organization type, TMT tenure, TMT experience in the LNG industry and international business, and the company's preparation of receiving facilities — appear to shape top management's risk perception and, consequently, their long-term LNG procurement decisions.

3.10.2 Coding

Open Coding

Transcripts were coded line-by-line through a systematic, inductive approach consistent with grounded theory principles, yielding 186 initial descriptive labels. These initial labels were then thematically consolidated and refined into 45 distinct concepts, reflecting the subjective interpretations and contextual nuances of the TMT' s risk perceptions and decision-making processes.

Axial Coding

Concepts were thematically grouped and refined into 14 subcategories, which were further clustered into four overarching main categories based on their contextual relevance and thematic consistency. The code tree, reflecting the inductive logic of grounded theory, is structured as follows:

1. TMT Characteristics

- Industry Network
- Business Experience
- Cognitive Style
- Self-Actualization

2. Risk Perception

- Geopolitical Risk
- Market Risk
- Logistics Risk
- Policy Risk

3. Strategic Decisions

- Contract Term
- Pricing Mechanism
- Procurement Model

4. Organizational Type

- State-owned Enterprise
- Private Enterprise
- Joint Venture

Concepts were thematically grouped and refined into 14 subcategories, which were further clustered into four overarching main categories based on their contextual relevance and thematic consistency. The complete hierarchical code tree covering all coding levels is presented in the table 3-7 below.

Table 3-7 Integrated Hierarchical Coding Framework

Core Category	Main Category	Subcategory	Initial Open Codes
Risk Perception Mediated LNG Procurement Decision-making	TMT Characteristics	Industry Network	Inter-firm connection, resource linkage, industrial information sharing
		Business Experience	Trade practice, project operation, industrial management experience
		Cognitive Style	Risk preference,

Core Category	Main Category	Subcategory	Initial Open Codes
			analytical thinking, experiential judgement
		Self-Actualization	Corporate development, brand promotion, industrial value pursuit
	Risk Perception	Geopolitical Risk	Regional situation fluctuation, cross-border supply uncertainty
		Market Risk	Price swing, demand change, competitive pressure
		Logistics Risk	Transportation constraint, delivery schedule uncertainty
		Policy Risk	Regulatory adjustment, industry policy change
	Strategic	Contract Term	Short-term deal,

Core Category	Main Category	Subcategory	Initial Open Codes
	Decisions		long-term supply agreement
		Pricing Mechanism	Floating price, fixed price, benchmark pricing
		Procurement Model	Bulk purchasing, batch replenishment, joint procurement
	Organizational Type	State-owned Enterprise	State-owned operational mode, policy-oriented layout
		Private Enterprise	Profit-driven operation, flexible business strategy
		Joint Venture	Mixed management, cross-party interest coordination

Selective Coding

Risk perception emerged as the core categorical bridge within the theoretical framework, organically connecting TMT characteristics and strategic decision-making processes. This category was inductively derived from the interview data, reflecting how TMT members' subjective interpretations of risk mediate the relationship between their inherent attributes and final strategic choices. Meanwhile, organizational type emerged as a contextual category that shapes and contextualizes the dynamic interplay between TMT characteristics and risk perception.

Co-coding Process

An independent grounded theory expert coded 30% of interview transcripts to safeguard methodological rigor in qualitative analysis. The inter-coder reliability coefficient was between 0.855 and 0.910, reflecting high consistency in coding judgements. All divergent coding views were fully negotiated and discussed until collective consensus was achieved, and the unified coding results were confirmed as the final coding scheme. This process complies with the inductive nature of grounded theory (Harley & Cornelissen, 2022) and adheres to qualitative research paradigms instead of rigid quantitative criteria. The finalized codes were subsequently integrated into the researcher's overall coding framework, serving as the fundamental basis for subsequent axial coding and selective coding.

3.11 Criteria for Ensuring Research Rigour

3.11.1 Internal Validity

The internal validity of a study, which is fundamentally shaped by its research design, measures the trustworthiness of its findings and the degree to which they are free from

the influence of extraneous variables. Via the interview, most of the key factors identified from the interview match the findings from the literature review, that the external environment, organization size/type, top management team's tenure, top management team's working experience in the LNG industry, and international business experience will impact their strategy decision making, however, an additional factor was also been identified for further review, which is the company internal facility resources preparation situation.

3.11.2 External Validity

The findings derived from the interviews exhibit potential for transferability to broader contexts within China ' s LNG industry. Beyond validating the study ' s conclusions, this transferability underscores the practical relevance of the research—demonstrating that the identified factors influencing long-term LNG procurement decisions can be applied to real-world scenarios, such as guiding strategic decision-making for LNG buyers, industry policymakers, and relevant stakeholders.

3.11.3 Reliability

To ensure the reliability of the research, since the interview was carried out via Chinese language communication, the interview questions were translated from English to Chinese, and the Tencent online interview transcripts were translated from Chinese into English, researcher used the Baidu translate to do the preliminary translation and validated the details by the researcher to ensure the reliability.

3.11.4 Theoretical Saturation

Theoretical saturation is explained to the fact that in the process of data collection and the analysis, when new data could no longer provide new information or substantively supplements existing theories, it is believed that the theory has become mature and stable and has reached a “saturated” state. In other words, when continuing to collect data cannot further enrich or modify the existing theory, it could be judged that such theory has reached saturation. This is an important step to ensure the reliability and rigor of grounded theory methodology.

First, the theoretical saturation test helps to avoid prematurely stopping data collection. In the research process of grounded theory, data collection is usually ongoing until there is a repeated information pattern, that is, the so-called 'coding saturation'. At this point, researchers should confirm whether new concepts, categories or relationships can be extracted from the existing data by repeatedly reviewing the existing data. If not, it shows that the current theory is comprehensive enough to stop data collection.

Secondly, the theoretical saturation test is a key means to verify the integrity of the theory. By continuously comparing data from different sources, researchers can identify potential vulnerabilities or uncovered areas in the theory. For example, if it is found in subsequent interviews that some phenomena cannot be explained by existing theories, then it is necessary to re-examine and adjust the theoretical structure to enhance its explanatory power and scope of application.

Finally, the theoretical saturation test also has the effect of improving the credibility of the research. In academic research, the reliability of a theory often depends on whether it can withstand repeated tests of data. Only after the theory reaches saturation, the research results are more convincing and more in line with the “bottom-up” construction logic emphasized by grounded theory. It is worth noting that the judgment of theoretical saturation is not absolute, but based on the researcher's professional judgment and system analysis. Different researchers may determine whether the theory is saturated at different stages. Therefore, in the course of the study, an open and critical attitude should be maintained, saturation assessment should be carried out regularly, and relevant basis should be recorded to enhance the transparency and reproductability of the study.

In summary, the theoretical saturation test is an indispensable part of the grounded theory model construction process. It not only supports to ensure the integrity and the trustworthiness of the constructed theory, , but also provides the basis for scientific decision-making for researchers, making the final theory more explanatory and practical. Data collection ceased at 20 interviews, achieving theoretical sufficiency (Naeem et al., 2024). No new categories or relational patterns emerged in the final four interviews. In the actual operation of the research, the researchers took the theoretical saturation test as a routine task throughout the entire study process to achieve the core goal of grounded theory-extracting a universal theoretical framework from empirical data.

3.12 Addressing Ethical Issues

I conceptualize this research as adhering to rigorous ethical standards. Guided by core ethical principles, the study is conducted on a voluntary basis, with integrity and transparency embedded throughout all stages. To ensure the ethical integrity of the research process, every procedure is executed with meticulous care and prudence.

Ethical clearance was obtained from the University of Stirling, Reference: GUEP 2024 15177 14215. Written electronic informed consent was collected from all participants prior to data collection (Appendix C). All participants were anonymized (I1 – I20), and company identities were masked to protect confidentiality. Data were stored in encrypted, password-protected files and deleted post-analysis.

First and foremost, strict adherence to academic integrity is ensured by accurately citing and acknowledging all secondary data and information utilized in this research. This includes providing complete and standardized references for all sources (e.g., academic literature, industry reports, policy documents) in accordance with the citation guidelines, thereby avoiding plagiarism and upholding the credibility of the research.

Second, for first hand collected data and information, for example, regarding any interviews, before it starts, the research background should be explained clearly, any risks and topics which I am planning to carry out with those people who agree to participate in the research, to obtain the permission from them for myself to carry out

this research works. Anticipating potential participant concerns regarding privacy, several measures had been implemented to uphold ethical standards throughout this study. It is foreseeable that some individuals may feel uncomfortable disclosing personal identifiers—such as their full names, job titles, or organizational affiliations—in the research publication. Others may object to having their communication recorded. To mitigate such concerns, all identifiable information had been anonymized in the final manuscript.

Furthermore, participants retain the right to withdraw from the study at any point—whether after hearing the initial explanation of the research, during the interview, or prior to final data inclusion. In all such cases, their decision would be fully respected, and no recording of the one-on-one interview would take place without first obtaining their explicit and informed consent.

Third, all data and information collected that relate to individuals or organizations had been processed and presented in a fully anonymized format.

Fourth, it is imperative to implement stringent measures to protect the security and privacy of all collected information. This aligns with legal obligations under regulations such as the General Data Protection Regulation (GDPR), which mandates the safeguarding of personal data through principles of anonymity and security throughout the entire research process.

Lastly, the research should be ensuring to be original, with no plagiarize, and intellectual property must be respected.

Neuman (2011, p. 143) emphasizes that adhering to ethical principles is a fundamental professional obligation for researchers, which must be maintained even if the research participants themselves are unaware of these standards. Furthermore, when gathering data, researchers are required to transparently communicate all potential risks and benefits to participants (Punch, 1998). Upholding these principles extends to data management: all physical materials, such as audio recordings and printed transcripts, must be stored in a locked cabinet at the researcher's premises, while all digital files (e.g., NVivo documents) must be saved on a password-protected computer.

3.13 Summary

This chapter has delineated the methodological framework employed in this thesis, encompassing the research paradigm, strategy, the researcher's role, pilot study, participant selection, data collection and analysis procedures, as well as considerations of rigor and ethics. The subsequent chapter will transition from the presentation of raw empirical data to the detailed findings and analysis. The first and second order themes which emerged from the empirical data will be presented and discussed.

CHAPTER 4 Findings and Analysis

4.1 Introduction

This chapter conducts qualitative analysis, mainly using in-depth interviews to collect qualitative data, and using grounded theory to analyze data. Through the bottom-up step-by-step coding, the key concepts, categories and their relationships are extracted, the theoretical model is derived, and an in-depth analysis is made.

This chapter presents the empirical findings from the grounded theory analysis of 20 semi-structured interviews with TMT members from Chinese SOE, private, and JV LNG importing companies. Four core categories emerged: TMT characteristics, risk perception, strategic decisions, and organizational type. Consistent with Rockmann & Vough (2024), claim tables are used to present key findings alongside supporting quotes and analytical themes.

4.2 Empirical Findings: Claim Tables

This section presents the core research findings through standardized claim tables, which correspond to the four core categories extracted from grounded theory coding, and verify the theoretical relationships through original interview quotes and thematic analysis. Specific empirical evidence is displayed in the following tables.

Table 4-1 Claim 1: TMT industry networks shape information access and risk awareness

Claim	Supporting Quotes	Theme
Broad, stable industry networks reduce perceived geopolitical and policy risk.	“We have long-term ties with major exporters and government departments, so we can anticipate policy shifts early.” (I4, SOE Trading Director)	Industry network → information advantage → lower policy/geopolitical risk perception
Weak networks increase uncertainty and reliance on external signals.	“Private firms lack government connections; we react rather than predict.” (I11, Private Trading Manager)	Limited network → higher uncertainty → elevated risk perception

Table 4-2 Claim 2: Cognitive style differentiates risk framing

Claim	Supporting Quotes	Theme
Analytical TMTs prioritize data-driven risk assessment.	“We model scenarios; risk is measurable.” (I3, SOE Trading Manager)	Analytical style → quantitative risk perception
Intuitive TMTs rely on experience and trust.	“We trust our partners; risk is about relationship stability.” (I12, Private Assistant President)	Intuitive style → relational risk perception

Table 4-3 Claim 3: Cognitive style differentiates risk framing

Claim	Supporting Quotes	Theme
Analytical TMTs prioritize data-driven risk assessment.	“We model scenarios; risk is measurable.” (I3, SOE Trading Manager)	Analytical style → quantitative risk perception
Intuitive TMTs rely on experience and trust.	“We trust our partners; risk is about relationship stability.” (I12, Private Assistant President)	Intuitive style → relational risk perception

Table 4-4 Claim 4: Risk perception mediates TMT characteristics and strategic decisions

Claim	Supporting Quotes	Theme
Geopolitical risk perception drives contract	“High geopolitical risk pushes us to sign	Geopolitical risk → long-term contracts

term choices.	long-term deals.” (I1, SOE Supply GM)	
Market risk perception shapes pricing preferences.	“Price volatility makes us prefer floating terms.” (I19, Private Trading Manager)	Market risk → flexible pricing

Table 4-5 Claim 5: Organizational type moderates risk perception

Claim	Supporting Quotes	Theme
SOEs prioritize policy risk; private firms focus on market risk.	“SOEs prioritize national supply security; private firms chase margins.” (I7, SOE Supply Manager)	Ownership → risk priority differences
JVs balance global and local risks.	“We bridge international standards and Chinese policies.” (I18, JV Supply Head)	JV → balanced risk perce

Based on the above summarized empirical evidence, this study further elaborates the whole process of grounded theory coding in detail in the next section.

4.3 Qualitative Coding

4.3.1 Open Coding

After the interview process, 20 complete interview data were finally obtained. The original data is saved in the form of recording, and the recording is converted into text through speech recognition software. After manual proofreading, a written record of in-depth interviews is formed. After eliminating invalid information, without changing the original meaning, the sentence is used as the analysis unit to correct some sentences that do not conform to logic or grammar, and try to use declarative

sentences as the main part. Next, the qualitative coding process will be carried out.

Open coding is the first step (Glaser, 1978). The initial coding should be closely related to the data, and it is necessary to think about “what are these data about” (Glaser & Strauss, 1967) what do these data indicate? What does the data claim? Which theoretical category does the specific data point to? (Glaser, 1978). The code used to encode should be kept open, action-preserving, simple and accurate, able to quickly browse data and compare data, etc. (Casey Cametz, 2009). The application of open coding in grounded theory frequently employs a line-by-line technique, wherein data is broken down and conceptualized through iterative labeling to ascertain the attributes and dimensions of emergent concepts. Of paramount importance in this phase are two methodological tenets. Firstly, the commitment to *in vivo* coding—the direct adoption of participants’ unique lexicon — ensures the fidelity of their perspectives and mitigates interpretive bias (Cao et al., 2014). Secondly, the strategic use of gerunds, which reflect ongoing action, is advocated. This approach, endorsed by Glaser (1978), maintains proximity to the raw data and actively facilitates the process of conceptual abstraction.

In this way, careful word-by-word coding from the very beginning is conducive to the realization of the two criteria of grounded theoretical analysis: fit and relevance. After labeling-conceptualization, through constant comparison, we can further focus on coding to explore the relationship between concepts and extract a higher-order

abstract category. This categorization step makes coding more directional, selective and abstract conceptual. It should be noted that in order to ensure the maximum rationality of the extraction of concepts to categories, it is necessary to determine the properties and dimensions of categories (Li Zhigang, Li Xingwang, 2006; Qian Kun and Sun Rui, 2014). The researchers undertook the open coding process by labeling, conceptualizing, and categorizing the interview data, each step serving to elevate the analytical abstraction. This procedure was driven by a continuous interrogation of the data, whereby different segments and materials were constantly compared and corroborated. Iterative reflection through memo-writing further ensured that the emerging concepts and categories were refined into a coherent and consistent theoretical structure. Because the interviewees are senior managers with high education, high cognition and high ability, some concepts are often directly mentioned in their sentences. In order to fully retain the original meaning, the concepts they mentioned are used as far as possible, and if it is not appropriate, it is replaced by similar concepts recognized by the research. Finally, 186 labels (defining phenomena), 45 concepts, and 14 categories were identified.

Table 4-6 Open Coding: Labeling - Conceptualization (only part of the process is shown)

Original interview statement	Labeling (defining phenomenon) Conceptualization
------------------------------	---

As a state-owned enterprise, our	(1)	Resource	
company's top management team is still	integration		
strong in grasping and utilizing resources,	(2)	Market	1.Industry
and has enough strength to integrate all	information input	resource	
resources (1). In the international market,	(3)	Professional	acquisition
who has the information, who has the	talent support	capability	
initiative, we have invested a lot of	(4)	Company Social	
manpower and financial resources in this	Responsibility		
regard (2). Our team has experts familiar			
with the international market who play a			
key role in the negotiation and			
procurement process (3). Another factor			
which is also important for us to consider			
is our company social responsibility that			
we need to fulfill (4).			
Our company has maintained long-term	(5)	Multi-channel	2.Breadth of
cooperative relations with multiple	information	information	
international suppliers, and information	acquisition	communication	
exchange is very frequent, so we can	(6)	Cross-platform	channels
grasp the market dynamics at the first	information		
time (5). The top management team not	exchange		

only communicates smoothly internally, (7) International but also obtains industry information network expansion through multiple channels such as (8) industry associations and forums (6). We Multi-information often participate in international LNG integration exhibitions, establish contacts with enterprises in different countries, and expand the sources of information (7). In the decision-making process, we take into account the views of the government, advisory bodies and partners to ensure that the information is comprehensive (8).

I think the stability of the partnership is (9) Stabilize network 3.Stability of very important, one of the important resources cooperative characteristics of LNG senior (10) Long-term basis networks management team, is to have a wide and for cooperation stable network resources (9). We have (11) Cooperation established long-term and stable resilience partnerships with suppliers from major (12) Relationship LNG exporters, and this foundation of maintenance trust gives us an advantage in the mechanism

negotiations (10). The company has a (13) Emergency long history of cooperation with some coordination international energy companies, and can capability maintain good communication and collaboration even when the market fluctuates (11). We regularly hold high-level exchange visits and strategic talks with partners to consolidate bilateral relations (12). In emergencies, our partners are often the first time to respond and provide support, reflecting a high degree of trust and understanding (13).

Our company's executive team often (14) Monitor policy 4. Monitor, participates in seminars to be aware the (15) Understand understand and latest national policies (14). Time to policy compliance with time and also regularly, our top (16) Obtain policy in the management team will be gathering government support industry together to conduct a section to get (17) Compliance understanding of any new policies, and coordination ability understanding of the new policies impact to our company development (15) . In

the process of LNG import approval, good communication with local governments is the key to ensure the smooth progress of the project (16). On the issue of compliance with international procurement, we are in close contact with downstream customs, ministry of commerce and other departments to ensure that the operation is in line with national regulations (17).

Several of our executives have worked in (18) Industry cycle 5.Long-term the energy industry for more than 20 cognitive ability experience in the years and have a deep understanding of (19) Risk industry the cyclical fluctuations in the LNG pre-judgment market, which supports us to be more tendency robust in our decision-making (18). (20)

Executives who have experienced Experience-driven multiple market troughs are more inclined risk identification to adopt a conservative but prudent (21) strategy in the face of uncertainty (19). Experience-oriented The long-term experience accumulated in decision-making

the industry enables us to identify model potential risks faster and formulate response plans in advance(20). Our top management team often relies on years of accumulated industry judgment when formulating import strategies, rather than relying solely on data analysis (21).

Many of our senior management team (22) Familiarity of 6.International have worked for overseas energy international market operation companies and are familiar with transaction process experience international LNG transaction processes (23) Cross-border and contract terms (22). When dealing risk identification with cross-border procurement, capability executives with international experience (24) International can more effectively identify potential procurement risks and develop coping strategies (23). practical experience We have participated in many (25) Intercultural international LNG tenders, and this Communication practical experience has given us an Skills advantage in the negotiations (24). The complexity of the international market

requires executives to have cross-cultural communication skills, which is essential for strategy implementation (25).

Our top management team has (26) price volatility 7.Risk experienced several violent fluctuations in coping ability management LNG prices over the past few years, (27) Strategic practice which has allowed us to focus more on Resilience experience risk hedging when formulating (28) Risk procurement strategies (26). When management responding to changes in the international mechanism political situation, executives with risk participation management experience can adjust their (29) Reflections on strategic direction more quickly (27). Risk Lessons

There is a special risk management mechanism within the company, and executives often participate in relevant training and case review (28). We have suffered losses due to inadequate assessment of geopolitical risks, which has prompted us to place greater emphasis on the risk assessment process in

subsequent decisions (29).

When we make LNG procurement (30) Data-driven 8. Analyzing
decisions, we usually first conduct a large purchasing decisions driven
amount of data modeling and market (31) Quantitative decision-making
trend analysis to ensure that the decision Analysis Orientation preferences
is well-founded (30). Top management (32 Scenario
teams are more likely to rely on simulation
quantitative analysis rather than application
experience or intuition to make judgments (33) Data Sensitivity
(31). Before signing a long-term Awareness
procurement agreement, we conduct
multiple rounds of sensitivity analysis to
assess financial and operational risks
under different scenarios (32). In our
strategy formulation process, data
analysis is the core link, and executives
have high requirements for the accuracy
of data (33).

As an executive team, we sometimes (34) Trust-oriented 9.Emotion-driven
make purchasing decisions based on trust purchasing decision
in our partners, even if the data is not decision-making preference

optimal (34). In the face of sudden market (35) Empirical
changes, executives tend to rely on Intuition
intuition and past experience to make Dependence
quick decisions (35). There is a close (36) Interpersonal
relationship between the top management trust affects
of the company, and this sense of trust decision-making
often affects our position in long-term (37) Subjective
contract negotiations (36). Although we Judgment Priority
also have data analysis support, in the
end, we still pay more attention to
whether the 'feeling' is appropriate. (37).

When we make LNG procurement (38) Multi-factor 10.Systematic
decisions, we will consider multiple comprehensive thinking ability
factors such as price, transportation, consideration
geopolitics, and energy policy, rather than (39) Cross-sectoral
just looking at a single indicator (38). collaboration
When formulating strategies, the top awareness
management team pays attention to (40)
starting from the whole, coordinating Multidimensional
resources of various departments, and risk assessment
avoiding local optimization leading to capabilities

global damage (39). When evaluating an (41) Strategic global import project, we will systematically view analyze it from multiple dimensions such as supply chain stability, market risk, and financial return (40). Our strategic planning is not short-term, but is based on a long-term understanding of the ecology of the entire industry (41).

For our company, we have been trying (42)	Digital	11. Awareness of
to introduce digital tools to optimize the	procurement practice	innovation and
LNG procurement process, such as using (43)	Procurement	acceptance of
AI for price forecasting and supplier	model innovation	change
evaluation (42). In the face of market (44)	Green	
changes, we are willing to adjust the	transformation	
traditional procurement model and	consciousness	
explore more flexible short-term contracts (45)	Willingness to	
and spot trading methods (43). The	experiment with	
company encourages top management	change	
teams to focus on new technologies in the		
industry, such as green LNG procurement		
strategies in the context of carbon		

neutrality (44). Even in high-risk situations, we are willing to try new modes of cooperation to enhance the resilience of the supply chain (45).

As an executive, I attach great importance (46) Strategic Impact 12. Personal to making influential strategic decisions Perception sense of in LNG procurement, and this sense of (47) Risk coping professional achievement keeps me engaged (46). In achievement achievement the face of market uncertainty, it is an experience important embodiment of my professional (48) Mission-driven value to be able to avoid risks for the career satisfaction enterprise through my own judgment and (49) Sense of experience (47). Promoting the belonging to transformation of the company to green international project energy not only conforms to the industry success trend, but also makes me feel the realization of my personal mission (48). Participating in international LNG project negotiations and successfully landing is one of the most fulfilling moments in my career (49).

We hope to enhance the company's voice (50) Willingness to 13. Want to build in the global energy market by shape industry industry influence participating in the development of standards international LNG standards (50). In the (51) Sustainable procurement process, we are not only development concerned about the cost, but also want to leadership establish a benchmark image of (52) Industry sustainable development in the industry platform (51). The company's top management participation actively participates in industry (53) Regional associations and forums to enhance our market guidance professional influence in the LNG field intention (52). By establishing strategic cooperation with major exporting countries, we hope to play a greater guiding role in regional markets (53).

As an executive, I would like to maintain (54) Market 14. Pay attention a high degree of decision flexibility in the contingency to LNG procurement process in order to autonomy decision-making respond quickly to market changes (54). (55) Independence at autonomy

Although the company has an overall the executive level strategic direction, we are more inclined (56) Professional to have more autonomy in the specific judgment is implementation (55). When formulating preferred procurement strategies, the top (57) Internal management team believes in their own evaluation is professional judgment rather than relying dominant solely on headquarters instructions (56). (58) Tendency of We focus on reflecting the decision-making professionalism and experience of the independence team in decision-making, rather than being overly interfered by external factors (57). In the face of complex market environment, we prefer to rely on the internal evaluation system to make decisions, rather than passively accept external recommendations (58).

LNG procurement faces a lot of (59) Strategic 15.Desire to uncertainty, and we are more willing to Project Preferences challenge participate in strategic and complex LNG (60) High-difficulty complex projects procurement projects, which can bring a negotiation

greater sense of achievement (59). In the willingness
face of the difficult international LNG (61) Tendency of
negotiations, we are excited and cross-domain
motivated to promote the implementation cooperation projects
of the project (60). There is a general (62) Ability
tendency at the top of the company to improvement-driven
accept major projects involving task selection
multinational cooperation, policy (63) Complex
coordination and market uncertainty (61). environmental
We want to take on a more challenging adaptability
role in the procurement strategy to
enhance the professional competence of
individuals and teams (62). Completing a
project with limited resources and a
complex environment is an important
measure of our ability (63).

In grounded theory, the refinement and categorization of concepts is an important step
in constructing a theoretical framework. Through continuous comparison,
classification and abstraction, a number of related concepts can be grouped into
higher-level categories to reflect their common essential characteristics and structural
relationships. For example, the four concepts of “industry resource acquisition ability”,

the breadth of information communication channels", "the stability of cooperative relationship network", "Monitor, understand and compliance with policy in the industry" can be refined into a more superior category: Industry Network. Industry Network refers to the collection of various resource elements and their connection methods that enterprises have in a specific industry and can provide support for their strategic decision-making and operation. These resources include but are not limited to information, contacts, policy support, supply chain relations, etc., and their value is to enhance the competitiveness, anti-risk ability and strategic flexibility of enterprises. In the LNG industry, if the top management team has a strong "industry network", it may be manifested as: having the ability to flexibly adjust the procurement strategy (strong ability to obtain industry resources); it can quickly obtain information on international LNG price fluctuations (wide channels of information communication); maintain good relations with the governments of major exporting countries (contact with key government departments); it has a stable supplier network (stable cooperative relationship network) on a global scale. These four concepts are summarized into the category of "industry network" to enhance integration and avoid treating each concept in isolation, but to understand the resource layout and network structure of enterprises in the industry as a whole.

According to this idea, 45 concepts are further condensed into 14 categories, presented in Table 4-7.

Table 4-7 Open Coding: Categorization

Conceptualization	Categorization
1.Industry resource acquisition capability	Industry network
2.Breadth of information communication channels	
3.Stability of cooperative networks	
4. Monitor, understand and compliance with policy in the industry	
5.Long-term experience in the industry	Business experience
6.International market operation experience	
7.Risk management practice experience	
8.Analyzing driven decision-making preferences	Cognitive style
9.Emotion-driven decision preference	
10.Systematic thinking ability	
11.Awareness of innovation and acceptance of change	
12.Personal sense of professional	

achievement	Self-actualization
13. Want to build industry influence	
14. Pay attention to decision-making autonomy	
15. Desire to challenge complex projects	
16. Worrying about the political instability of major suppliers	Geopolitical risk
17. Pay attention to the tension in international relations	
18. Pay attention to price volatility	
19. Concerns about sharp changes in exchange rates	Market risk
20. Vigilance against competitor behaviour	
21. Consideration of transport corridor security	Logistics risk
22. Assess the impact of port congestion	
23. Worry about the lack of capacity	
24. Pay attention to the tightening of	

domestic environmental protection Policy risk
policies

25. Assess changes in import quota
restrictions

26. Worry about tax policy adjustment

27. Long-term contracts Contract term

28. Spot purchases

29. Mid-term contracts

30. Cost-plus pricing Pricing mechanism

31. Oil-indexed pricing

32. Index-based pricing

33. Market-based pricing

34. Centralized procurement Procurement model

35. Decentralized procurement

36. Joint procurement

37. Supervised by the SASAC State-owned enterprise

38. Undertake social responsibility

39. The decision-making process is

relatively complex.

40. Profit goal orientation is clear	Private enterprise
--------------------------------------	--------------------

41. More flexible market response

42. The decision-making chain is relatively short.
--

43. Joint management of Chinese and Joint venture foreign shareholders
--

44. Harmonization of different cultural backgrounds

45. Integrating resources and technological advantages
--

4.2.2 Axial Coding

Axial coding builds directly upon the foundation of open coding by systematically exploring the diverse connections between conceptual categories. The aim is to discover and establish relationships, subsequently developing a core category by elaborating on its properties and dimensions (Corbin & Strauss, 1990; Glaser & Strauss, 2009). As Strauss (1987) conceptualized, this process establishes "a close network of relationships around the axis of a category." The purpose of axis coding is

to classify, synthesize and organize a large amount of data, and rearrange them in a new way after open coding (Creswell, 1998). On how to discover and clarify the relationship between conceptual categories, Strauss & Corbin (1998) designed a structural framework, including the following: 1 conditions, the environment or situation that forms the structure of the phenomenon under study; 2 action / interaction, the routine or strategic response of the research object to the theme, event or problem; 3 Results, namely the consequences of action / interaction. This structural framework is very typical, but strict dependence on the framework will also limit the way of understanding and cognition, thus limiting the code constructed, but making the grounded theory difficult to deal with (Robrecht, 1995). Therefore, through axial coding, a core category can be systematically linked to its subcategories by employing specific relational paradigms. As detailed by Strauss and Corbin (1998), these include causality, contextual conditions, strategic relationships, and functional relationships, among others.

After 14 categories are obtained, through a variety of methods, considering the connection paradigm, the relationship between each other is analyzed, and the related category set is developed into the main categories. Ultimately four main categories are obtained, as presented in Table 4-4. The four main categories are: Top Management Team Characteristics, Risk Perception, Strategic Decisions and Organizational type.

Table 4-8 Spindle Coding : Main Category

Category	Main Category	Interpretation
Industry network	Top Management Team Characteristics	The ability characteristics of top management team in resource integration, industry relationship network construction and so on.
Business experience	Team Characteristics	Accumulation of top management team in industry experience, international market operation and risk management
Cognitive style		Top management team's decision-making thinking preference (analysis-driven / emotion-driven) and systematic and innovative thinking ability
Self-actualization		Top management team' personal professional motivation (sense of achievement, influence pursuit, willingness to challenge complex projects, etc.)
Geopolitical risk		Top management team' sensitivity and attention to geopolitical risks (supplier politics, international relations)

Market risk	Risk Perception	Top management team's vigilance and evaluation tendency to market volatility (price, exchange rate, competition)
Logistics risk		The top management team's anticipation and concern about supply chain risks (transportation safety, capacity, port congestion)
Policy risk		Top management team's awareness of monitoring and responding to policy risks (environmental protection, quotas, taxation)
Contract term	Strategic Decisions	The strategic choice of senior management team in the selection of procurement contract term (long-term / medium-term / spot)
Pricing mechanism		Top management team's strategic choice in pricing (cost markup / oil price / market index)
Procurement model		The top management team's strategic choice in the procurement model (centralized / decentralized / joint procurement)
State-owned	Organizational	The ownership of assets of enterprises owned

enterprise	type	or controlled by the state or local governments is owned by the state, which is usually greatly influenced by government policy guidance and supervision.
Private enterprise		The property rights of enterprises established and operated by private or non-public capital investment belong to private shareholders and are not directly controlled by the government.
Joint venture		Enterprises jointly funded by two or more investors of different nature usually include Sino-foreign joint ventures, Sino-foreign cooperation and other forms.

4.2.3 Selective Coding

Selective coding represents a more advanced and complex stage that follows axial coding. Its purpose is twofold: first, to systematically identify and refine a core category from the existing categories, integrating conceptual categories under a broader theoretical framework; second, to establish connections around this core category using a "storyline" that coherently explains all phenomena observed in the data (Corbin & Strauss, 1990; Glaser & Strauss, 2009). Notably, Glaser (1978) even contended that this process can sometimes render axial coding unnecessary, as it

effectively "reunites fragmented stories" to achieve a coherent analytical narrative.

At this stage, through continuous comparison, the core category is finally determined, and the internal relationship between the main category and the subcategory is determined. This relationship is first presented in the model framework Figure 4-1. This is a logical framework initially obtained after coding by grounded theory, and whether it is established needs to be tested. At this point, a complete “story line” emerges: among China's LNG import companies. Top Management Team Characteristics-Industry network, Business experience, Cognitive style, Self-actualization have a significant impact on its risk perception - Geopolitical risk, Market risk, Logistics risk, Policy risk. This study proposes a framework wherein risk perception shapes strategic LNG procurement decisions (covering contract term, pricing mechanism, and procurement model). Within this framework, risk perception functions as the conduit through which TMT characteristics influence decision-making. Additionally, the organizational type — State-owned Enterprise, Private Enterprise, or Joint Venture — serves as a key moderator, conditioning the impact of TMT characteristics on the formation of risk perception.

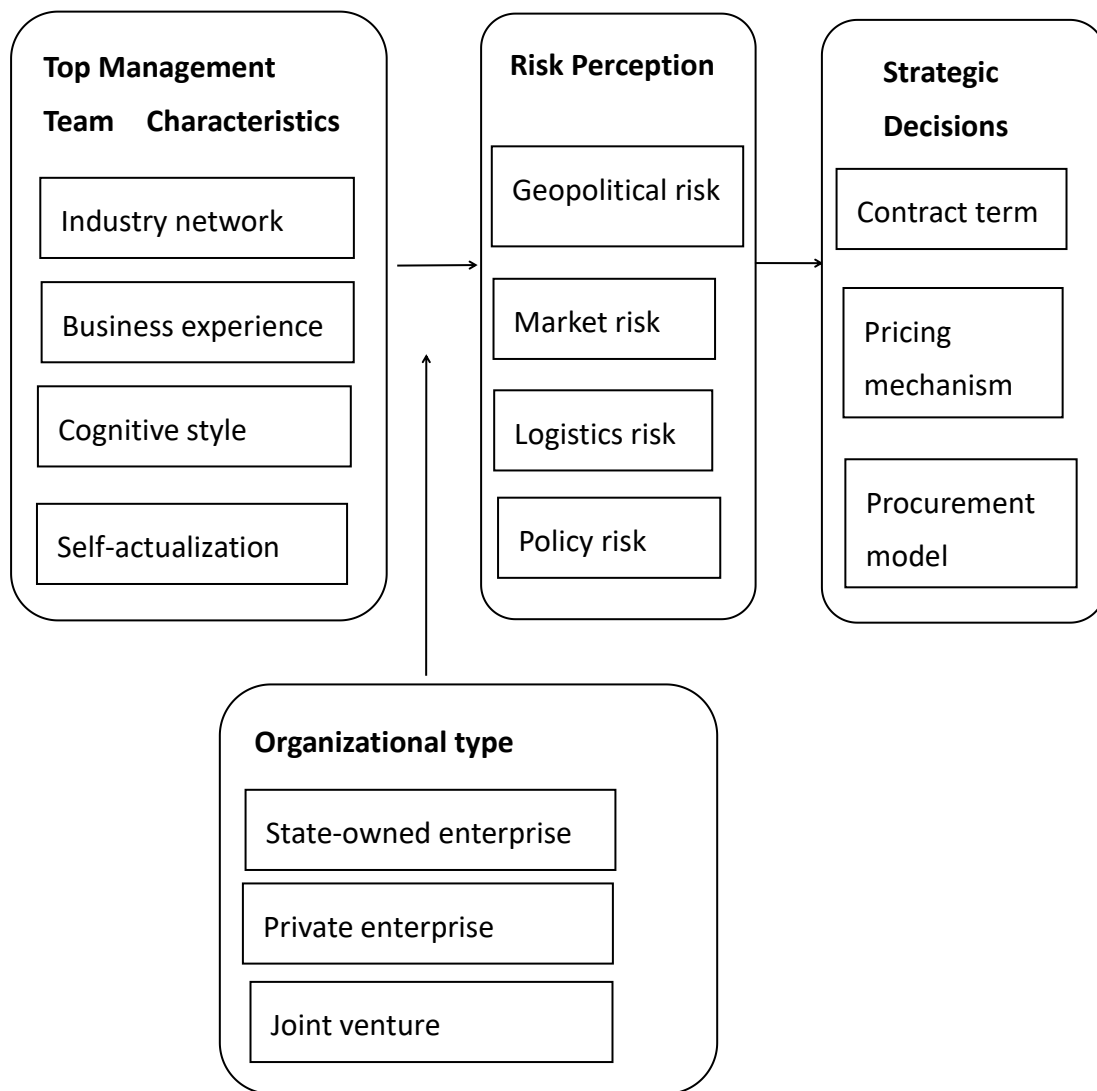


Fig.4-1 The theoretical model diagram derived from the grounded theory

4.4 Reliability and Validity Test and Theoretical Saturation Test

Figure 4-1 is the result of the three-layer coding of grounded theory. Whether the framework is established still needs to be tested. These tests mainly include reliability test, validity test and theoretical saturation test. After the verification process, Figure 4-1 is modified to obtain the final model framework.

4.4.1 Reliability Test

The so-called reliability is simply the reliability and consistency of the results. The academic terms of reliability are common in quantitative research. With the improvement of the scientific nature of qualitative research, many qualitative researchers are no longer entangled in the concept, and have adopted the concept of reliability, which is more practical for the test of substantive issues (Wang, 2017). Kamaz (2009) proposed the quality criteria for evaluating the grounded theory of constructivism, including credibility, originality, resonance and usefulness, which are considered to be the most comprehensive criteria to evaluate the quality of grounded theory research (Corbin, Strauss, 2015). It can be seen that the reliability test has increasingly become a necessary part of the grounded theory.

The reliability for the grounded theory research method mainly refers to whether the grounded process can be repeated and get the same coding results. Since the grounded theory process is completely completed manually, it is bound to be interfered by subjective differences (Walker& Myrick,2006) . In the research, the grounded process is dominated by the author, and the concepts and categories are obtained through the layer-by-layer coding of the interviews with the top management team of China's liquefied natural gas import companies. In order to test the reliability, the author also invited an expert who is proficient in grounded theory to participate in the coding process. The expert is a well-known university in China, and has published many

papers on grounded theory in core journals at home and abroad. It has a high theoretical reserve and rich operational experience. After the same coding process, the internal consistency formula is used to compare the coding results, so as to measure the level of coding consistency.

The classical internal consistency calculation method is: the “intersection ($\cap$)” of the encoder's coding results on each category of content is divided by the “union ($\cup$)” of the encoder's coding resulted on each content category (Pang, 2011). According to Insch (1997), the consistency coefficient above 0.9 is a good level, and between 0.8 and 0.9 is an acceptable level. If the consistency coefficient is low, it should be discussed. If it still feels meaningless after discussion, it should be eliminated. After calculation, the coding consistency level of grounded theory in the research is presented in Table 4-5. It could be seen from the table that in the main category of “Top Management Team Characteristics”, the coding consistency coefficient result is 0.855, which is acceptable. On the main category of “Risk Perception”, the coding consistency coefficient is 0.910, which is at a good level; in the main category of “Strategic Decisions”, the coding consistency coefficient is 0.890, which is acceptable; in the main category of “Organizational type”, the coding consistency coefficient is 0.867, which is acceptable.

Table 4-9 Reliability test of grounded theory

	Coding consistency coefficient
Top Management	0.855
Team Characteristics	
Risk Perception	0.910
Strategic Decisions	0.890
Organizational type	0.867

4.4.2 Validity Test

A successful generation process of grounded theory requires good validity, and the direction of reliability test is also to ensure validity. Validity generally means “the accurate interpretation for the conclusion (internal validity) as well as the universality of the conclusion (external validity)” (Wiersma, 1997). In qualitative research, the concept of validity focuses more on evaluating the degree to which the research results are consistent with the actual research, and can be replaced by “trustworthy”, rather than focusing on the evaluation of the method itself like quantitative research (Chen, 2001). So as to ensure the validity of grounded theory research, the research adopts a variety of methods, including triangle verification, continuous comparison, extended participation, researcher introspection and so on.

(1) Triangulation verification

The primary point of ensuring validity is to ensure that the data obtained is true. If the original information is wrong, the research will inevitably lack validity. As mentioned above, the research uses multiple sources of data to form triangulation, and multi-source data complement and verify each other (Sarker & Lee, 2003). The main materials of coding are interview materials. In the process of coding, with the help of the external and the internal second-hand materials and observation records, not only the interview materials are reviewed, but also the empirical understanding of the research objects is enhanced, which provides inspiration, clues and reflection for coding.

For the nine LNG import companies involved in the interview, on the one hand, collect public information through official websites, Internet news, etc., on the other hand, collect internal reporting documents, publicity manuals, training manuals, etc. as much as possible to obtain internal information. Organize these data, and compare and analyze the interview content of the top management team. If there is a contradiction in the content, it is verified by a return visit. The researcher tried to listen to several internal meetings of the enterprise, recorded the whole process in detail, and compared and supplemented the interview content of the top management team.

(2) Constant Comparison

Constant Comparison is one of the most important ideas of grounded theory and is regarded as the essence of grounded theory (Glaser & Strauss, 1967). The so-called

continuous comparison is to collect and analyze while collecting, data collection and data analysis are synchronized to achieve the purpose of constantly bringing order out of chaos and refining theory.

In the research, when interviewing 20 senior management team members, we used the method of collecting and analyzing while collecting, so that the entire process is not linear, instead, it is a continuous cycle of “collecting data-forming theory-re-collecting data-perfecting theory”. After conducting interviews with each executive, the interview recordings are converted into text data for coding and analysis in an efficient manner; after interviewing the next executive, the new information obtained was compared with the categories or categories formed based on the existing data. If a new category appears, the theory is revised; the data obtained from the following interviews are also coded and analyzed, and compared with the results of the previous cumulative correction, and the ambiguity and loopholes of the coding are continuously eliminated and repeated. At about the 23rd interview, the theoretical framework was basically formed, and all the main categories in Figure 4-1 appeared. After the subsequent interview data, no new concepts, categories or relationships appeared. In the research, no matter which data unit or step is coded, the method of continuous comparison is used. the research compares at any level of analysis, comparing the similarities and differences between data and data, data and concepts, concepts and concepts, concepts and categories, categories and categories, etc., in order to achieve the best coding results.

In order to make a better continuous comparison, researchers have insisted on writing memorandums from the beginning of collecting data and writing code to the whole process of concept, category and theory. This practice allows researchers to retain the comparisons and connections they have made throughout, recording all the thoughts and inspirations. Many fresh ideas are presented through mapping, trying to clarify the various possible relationships that arise during the rooting process. The writing of the memorandum not only makes the whole research process more rigorous, orderly, rule-based and efficient, but also makes the analysis more transparent, thorough and abstract. At the same time, it also constantly promotes the author to explore the internal, unspoken and condensed empirical significance. It can be said that the writing of the memorandum serves a pivotal role in advancing the formation for the grounded theory of the research.

(3) Extend participation

The research was well prepared before the grounded process and kept in touch with the participants after collecting data. Before the formal interviews with senior executives, they were communicated with them by telephone, WeChat or e-mail. On the one hand, to establish a good relationship of trust with them, prompting them to be prepared to reduce their tension, anxiety or perfunctory emotions may bring “data distortion” ; on the other hand, we should have a knowledge of the participants’ personality and other aspects in advance to deal with the unexpected situations that may occur during the interview process, and design different interview skills in

advance according to the difference between personality and expression ability.

In addition, when screening samples of LNG import companies, one condition is to be able to return visits. In the course of the research, there were many visits, because in the process of converting the recording into text, some sentences were found to be unworkable, unclear or contradictory, which were ignored by the researcher for various reasons in the interview process. In the process of encoding statements, vulnerabilities are found on some statements again. In this regard, the author returned to the early research object to make a return visit, to repair these problems and loopholes, to clarify the empirical significance, to re-explore those problems that may have been brought over by the grass, or to explore those problems that are not so clear that they can not be identified or expressed in the early stage. Through this targeted return visit, the interview data is complete and accurate.

(4) Introspection of researchers

Qualitative research is difficult to avoid human subjectivity. In the process of grounded theory in the research, whether it is the researcher's in-depth interview with the sample of senior management team members, or the process of data collation and coding, it may inadvertently bring their own values or cognitive biases. For example, when listening to the views that are consistent with the author's three views during the interview, it may continue to ask, and when hearing the views that are contrary to the researcher's three views, it may inadvertently ignore, or even distort the original

meaning of the interviewee in subsequent processing. In order to reduce this problem, the author keeps self-reflection in the whole process, reminds himself whether he is disturbed by his own cognition, reflects on the performance of this process in time after a process, and tries to keep himself objective and neutral, so as to mitigate the impact of existing biases on the research findings.

4.4.3 Theoretical Saturation Test

Theoretical saturation testing serves as a critical criterion for determining whether to continue or terminate the sampling process in grounded theory research. Defined as a core methodological benchmark, theoretical saturation occurs when the collection of new data fails to yield additional theoretical insights, uncover novel dimensions of the core theoretical constructs, or enrich the existing theoretical framework (Fei, 2008). At this stage, the emerging theory is deemed sufficiently comprehensive and robust, as further sampling would not contribute meaningfully to its refinement or depth. Saturation is not to see the same pattern again and again, but the event produces different attributes of the pattern till no further new attributes of the pattern appear again (Glaser, 1992). Some grounded theorists (Glaser, 2001; Stern, 2001) argued that sampling should be done until the class is saturated, which replaces the traditional sample size - the sample size that conforms to the saturation logic may be very small.

In the research, the number of samples of theoretical saturation cannot be predicted at

the beginning of the study, and a lot of planning and negotiation work must be carried out in advance in the process of interviews with senior management teams. Practical operation requires that the number of samples must be determined at the beginning, so the research determined the number of 20 samples from the relevant experience (Fassinger, 2005). In the subsequent data collection and coding process, the method of continuous comparison is used to continuously enrich the concepts, categories and relationships. It is found that a perfect theoretical framework has been formed when the 23rd employee is interviewed, and no new concepts, categories or relationships have emerged in the subsequent interview materials. If we consider the 23rd management as a node of theoretical saturation, then the remaining 4 managements can be regarded as the object of internal test. Nevertheless, the research believes that it is still necessary to further test the theoretical saturation to ensure that the research conclusions are correct. Therefore, we will use the member test and the use of theoretical sampling to add new data to test the theoretical saturation.

(1) Membership test

Membership test is to allow interviewee involved in the grounded process to review research data and conclusions. The text of the interview recording was provided to 20 respondents from 9 LNG import companies together with the research conclusions. Ask if and to what extent the conceptual categories and interrelationships of self-actualization, business experience, cognitive style, industry network, top management team characteristics, risk perception, strategic decisions, organizational

type, etc. are consistent with their experience. Seek their feedback and ask if there is a supplement. After the member test, it is found that these conceptual categories are affirmed by them, and the relationship between them is also widely supported.

(2) Using theoretical sampling to increase new data

To assess whether theoretical saturation has been achieved, this study employs theoretical sampling to incorporate additional samples, with the aim of verifying and refining the emerging theory through newly collected data. Notably, theoretical sampling differs fundamentally from probability sampling approaches: it is neither a random selection of participants from a predefined population nor a sampling strategy designed to ensure representativeness within a specific group. Instead, it develops theory and tests theory via sampling to confirm if the generated theory is appropriate for new data. Theoretical sampling can be used either in the early stage of the study or in the late stage, as long as there are categories to guide the sampling. Under the guidance of the formed concepts, genera and relationships, the research conducted a theoretical sampling. Through active contact and screening, three LNG import companies were selected in the natural gas industry, one is a state-owned enterprise, one is a private enterprise, and one is a joint venture. In-depth interviews were carried out with a total of 9 of their two or three senior management team members, as shown in Tables 4-6 as follows. For the purpose of interview recording, it is strictly converted into text according to the norms and processed in strict accordance with the coding process. Through theoretical sampling, two points are finally determined: first, the

nine additional interview materials can support the concepts, categories and relationships that have been constructed in the research, and can explain the whole content of the relevant experience; secondly, the newly added interview materials cannot extract new concepts, categories and relationships, and there are no loopholes beyond definition. It can be judged that the theory is saturated.

Table 4-10 New samples used to test the theoretical saturation

Serial number	Organization type	Number of interviews
21-23	State-owned Energy enterprise	3
24-26	Private Energy enterprise	3
27-29	Joint venture	3

4.5 Analysis

Through in-depth interviews and grounded theory, the research systematically analyzes and refines the original data with the help of three-level of coding technology (open coding, axial coding and selective coding). In this process, researchers gradually identify representative core concepts and key categories, and deeply explore their internal logical relationships, so as to construct a theoretical model with clear structure and clear hierarchy (Fig.4-1). The model not only reflects

the complexity and dynamics of the research object in the real situation, but also reflects the interaction mechanism between the variables. In order to further verify the scientific and rationality of the theoretical model, the study used reliability and validity testing methods, including inter-coder consistency analysis, triangle verification strategy, continuous comparison, etc., to ensure the stability and accuracy of the research results. In the meantime, the completeness and explanatory power of the model are confirmed by continuously collecting and analyzing the data until the theoretical saturation has been reached. The empirical results show that the theoretical model has high academic value and practical guiding significance, which can effectively explain the relevant phenomena and offered a solid theoretical basis to the follow-up research.

(1) Qualitative analysis based on grounded theory answers RQ1 (What characteristics of the top management team in China's LNG import companies inhibit or promote risk perception? RO1 (Exploring the influences of different characteristics of the top management team on risk perception in Chinese LNG import companies) is realized.

The results of grounded theory show that the characteristics of the top management team of China's LNG import companies play an critical role in the influencing factors of strategic decision-making and risk perception. After refining, there are four main characteristics of LNG top management team that affect risk perception and strategic decision-making: industry network, business experience, cognitive style,

self-actualization. Industry network reflects the ability characteristics of top management team in resource integration and industry relationship network construction. Business experience reflects the accumulation of top management team in industry experience, international market operation and risk management. Cognitive style reflects the decision-making thinking preference (analysis-driven / emotion-driven) and systematic and innovative thinking ability of top management team. Self-actualization reflects the personal professional motivation of top management team (sense of achievement, pursuit of influence, willingness to challenge complex projects, etc.).

First of all, as an important resource characteristic of top management team, industry contacts have a notable impact on their risk perception. Executives with extensive and high-quality industry contacts can obtain information such as market dynamics, policy changes and potential competitors' movements earlier, so as to have a certain early warning ability before risks occur. This information advantage enables them to judge the possibility and severity of risk more accurately, and then form a more rational and forward-looking risk perception. In addition, industry contacts also provide diversified perspectives and experience sharing channels, which help executives avoid the limitations of a single perspective in risk judgment and enhance their ability to tolerate and respond to uncertainty.

Secondly, business experience is one of the core variables that affect executives' risk

perception. Rich business experience enables executives to compare and analyze the current situation based on past experience, so as to more effectively identify potential risks and assess their impact. Experienced executives usually have strong market sensitivity and crisis management capabilities, and can quickly identify risk signals in a complex market environment and adjust decision-making strategies accordingly. At the same time, business experience also enhances the ability of executives to predict the consequences of risk, so that they show a stronger sense of control and confidence in dealing with uncertainty, thereby reducing excessive anxiety or blind avoidance of risk.

Thirdly, cognitive style determines the way executives think in information processing and risk judgment. Executives with different cognitive styles may have very different perception results when facing the same risk situation. For example, executives who tend to analytical cognitive style pay more attention to data and logical reasoning, and tend to explore the multi-dimensional impact of risk from a systematic standpoint. Executives with emotional cognitive style may rely more on experience and subjective judgment, and are more susceptible to emotions and external environment. Therefore, cognitive style directly affects the breadth of risk identification, the depth of judgment and the choice of coping strategies, and then shapes the overall risk perception tendency.

Finally, as a high-level psychological motivation, the demand for self-realization has

an internal driving effect on executives' risk perception. Executives with strong self-actualization needs often pursue the realization of personal values and career achievements. This internal driving force urges them to pay more attention to long-term goals and strategic significance in the decision-making process, rather than just short-term risk aversion. In the face of high-risk decisions, such executives may be more willing to take moderate risks to achieve a higher level of strategic objectives, thus showing higher tolerance and forward-looking in risk perception. However, this psychological tendency may also lead them to underestimate the risk in some cases, especially in the absence of sufficient information or external pressure.

In summary, industry contacts provide the key information and situations needed for perceived risk; business experience gives the ability to interpret this information and assess its risk implications; cognitive style determines the internal mode of processing information and forming risk judgment. The need for self-realization sets the ultimate background board and motivation filter for risk perception. These characteristics are intertwined and work together to form a unique and stable cognitive schema for the top management team in the face of complex market environment, which provides an important psychological and behavioral basis for subsequent strategic decision-making.

(2) Qualitative analysis based on grounded theory answers RQ2 (How does the risk perception of the top management team in Chinese LNG import companies affect

strategic decisions for LNG procurement? RQ2 (Exploring the impact of risk perception of the top management team on strategy decisions in Chinese LNG import companies) was realized.

The results of grounded theory show that the risk perception of top management team can significantly affect the strategic decision of purchasing long term LNG. Through interviews and the refinement of concepts and categories, the perception of risk by the top management team of LNG import companies is mainly manifested in the cognition of geopolitical risk, the view of market risk, the understanding of logistics risk, and the perception of policy risk. Specifically, it refers to the sensitivity and attention of the top management team to geopolitical risks (supplier politics, international relations), the vigilance and evaluation tendency of the top management team to market fluctuations (price, exchange rate, competition), the prediction and concern of the top management team to logistics risks (transportation safety, capacity, port restriction), and the monitoring and response consciousness of the top management team to policy risks (environmental protection, quotas, taxation).

The perception level of these risks will affect the final strategic decision of TMT, and the strategic decision is mainly manifested in the decision of Contract term, the decision of Pricing mechanism and the decision of Procurement model. In other words, strategic decisions include the strategic choice of the top management team in the selection of LNG procurement contract term (long-term/medium-term/spot); the

strategic choice of the top management team in LNG pricing (cost markup/oil price / market index); the strategic choice of senior management team in LNG procurement mode (centralized/decentralized /joint procurement).

First, the top management team's perception of geopolitical risks significantly affects its decision-making on the duration of LNG procurement contracts. Geopolitical risks mainly involve the political stability of supplier countries, the tension of international relations and the possibility of regional conflicts. These factors may directly affect the continuity and security of LNG supply. When top management teams are highly sensitive to geopolitical risks, they are more inclined to choose long-term contracts to lock in a stable source of supply, thereby reducing the risk of supply disruptions due to political instability or changes in the international situation. It could also be explained that when the supplier's country demonstrated they have stable political environment and international relationship, this will comfort the buyers' top management team and support their risk perception to be low and to make procurement strategic decision. On the contrary, if the perception of geopolitical risk is high, it may be more inclined to adopt short-term or spot procurement but not long term procurement to maintain flexibility and respond to market fluctuations.

Secondly, the top management team's view of market risk directly affects its choice of LNG pricing mechanism. Market risks mainly include price fluctuations, increased market competition, the development trend of Oil price, and US Henry Hub. If the top

management team have low risk perception on oil pricing compared Henry Hub pricing, they may decide to choose oil linked pricing, vice versa. Or the top management consider to mitigate both Oil linked pricing and Henry Hub pricing, they would choose the suppliers who would offer them Henry Hub pricing.

Thirdly, the top management team's perception of logistics risk has an important impact on the decision-making of its procurement model. Logistics risks cover many aspects such as transportation safety, capacity allocation, and port congestion. Especially in LNG trade, if the buyer chooses FOB contract, the complexity and high cost of transportation make it a key consideration. When the top management team has a strong perception of logistics risk, they are more inclined to adopt centralized procurement or joint procurement mode to enhance the controllability and synergy of the supply chain and reduce the possible delays or losses in the transportation process. On the contrary, if the perception of logistics risk is weak, it may choose decentralized procurement to take advantage of the competitive advantage between different suppliers, but this may also lead to increased difficulty in supply chain management and increase overall operational risk.

Finally, the top management team's perception of policy risk directly affects its compliance and adaptability in the procurement strategy. Policy risks include environmental regulations, quota restrictions, tax policies, etc. These policy changes may have a profound impact on the cost structure, operation mode and market access

of LNG procurement. When the top management team is highly concerned about policy risks, they are more likely to choose flexible procurement models and actively communicate with government agencies to ensure that strategic decisions are policy-oriented, while reducing the uncertainty caused by policy changes through diversified procurement channels. On the contrary, if the perception of policy risk is insufficient, policy dynamics may be ignored in strategic decision-making, resulting in greater compliance risks in future operations.

To sum up, the perception level of top management team on geopolitical, market, logistics and policy risks constitutes the core basis for its strategic decision-making in LNG procurement. These risk perceptions not only shape the executive team's cognitive framework of risk, but also guide them to make corresponding strategic choices in terms of contract term, pricing mechanism and procurement mode, which ultimately affect the market competitiveness, operational efficiency and sustainable development ability of enterprises. Therefore, an in-depth understanding of the formation mechanism of top management team risk perception and its impact on strategic decision-making is of great significance for improving the risk management ability and strategic decision-making quality of LNG import enterprises.

(3) Qualitative analysis based on grounded theory answers RQ3 (Does the risk perception of the top management team play a mediating role in the feature influencing strategic decision process in Chinese LNG import companies? In other

words, do the characteristics of the top management team affect strategic decision by influencing risk perception?). RO3 (Exploring the mediating role of risk perception between top management team characteristics and strategic decision in Chinese LNG import companies) is implemented.

Through grounded theory, especially selective coding, and establishing the connection between core categories in a “story line” way, it is found that risk perception plays an intermediary role in the process of top management team’s characteristics affecting strategic decision-making. This process can be understood as: the individual and collective characteristics of the top management team (such as industry contacts, business experience, cognitive style and self-actualization needs) affect their tendency and behavior choice in strategic decision-making by shaping their perception and judgment of various types of risks. In other words, the characteristics of the top management team do not directly determine the strategic decision-making, but indirectly guide and adjust the direction and way of strategic decision-making through its psychological mechanism of risk perception.

First of all, the characteristics of the top management team determine the depth and breadth of its risk perception. For example, executives with rich business experience often have stronger risk identification capabilities and are more sensitive to potential risks such as market fluctuations, policy changes, or supply chain disruptions; executives with a wide range of industry contacts may have easier access to external

information, resulting in a more comprehensive and forward-looking risk judgment. These characteristics together constitute the subjective cognitive basis of the top management team's risk, which makes it show different risk preferences and coping strategies in the face of uncertainty.

Secondly, as an intermediary variable, risk perception connects the relationship between top management team characteristics and strategic decision-making. When the top management team has a higher perception of a certain type of risk (such as geopolitical risk or logistics risk), they are more inclined to adopt evasive or defensive strategic decisions, such as signing long-term contracts to lock in supply, adopting cost-plus pricing mechanisms to reduce the risk of price fluctuations, or choosing centralized procurement to enhance supply chain control. On the contrary, if the risk perception of the executive team is weak, it may be more inclined to flexible and open procurement models, such as spot procurement or decentralized procurement, in pursuit of higher market response speed and flexibility. This difference shows that risk perception plays a bridge role between top management team's characteristics and strategic decision-making, in addition, is the psychological driving factor behind decision-making behavior.

Finally, risk perception will also affect the top management team's trade-off logic and prioritization in strategic decision-making. Distinct types of top management teams may produce very different evaluation results for the same decision based on their

unique risk perception framework. For example, executives with strong self-actualization needs may be more willing to take certain market risks to achieve strategic goals, while more conservative executives may emphasize risk aversion. This difference is not only due to different personal motivations, but also affected by their sensitivity to risk and assessment methods, which further highlights the mediating role of risk perception in the decision-making process.

In summary, risk perception plays an important mediating role between top management team characteristics and strategic decision-making. It not only reflects the subjective judgment of the executive team on the uncertainty of the internal and external environment, but also largely determines how they balance the pros and cons, choose the path and action plan in the process of strategy formulation. Therefore, in the study of the impact of top management team's characteristics on corporate strategic decision-making, we must pay full attention to the role of risk perception, and regard it as an important link between organizational structure, individual characteristics and strategic behavior. Only by deeply understanding this intermediary mechanism can we more fully reveal the psychological and behavioral logic of top management team's strategic decision-making in complex environments.

(4) Based on the qualitative analysis of grounded theory, The following questions were answered RQ4: Does the type of Chinese LNG import companies play a dominating role in the influence mechanism of top management team characteristics,

risk perception, and strategic decision? In other words, does the influence between the characteristics of the top management team, risk perception, and strategic decision vary depending on the type of the enterprise? RO4(Exploring the moderating role of organizational type in the relationship between top management team characteristics, risk perception, and strategic decision in Chinese LNG import companies) is realized.

In the current LNG import industry in China, the types of enterprises are highly clear and representative, mainly including state-owned enterprises, private companies and joint ventures. These three types of enterprises have significant differences in organizational structure, governance mechanism, strategic objectives and resource allocation, which in turn affect the constitution and characteristics of their senior management teams. Based on the observation of interview data and practical practice, grounded theory research further reveals a key finding: different types of enterprises play a critical regulatory role in the process of the influence of top management team characteristics on risk perception. This conclusion not only deepens our understanding of the strategic decision-making mechanism of enterprises, but also offers a new perspective for the research of risk management and organizational behavior of different types of enterprises.

To begin with, the top management team of state-owned enterprises usually has strong policy orientation and stability, and its members are mostly from the background of the system or long-term service to the national energy system. Executives of these

companies tend to have a high accumulation of industry contacts, business experience and policy sensitivity, so their risk perception is more inclined to focus on policy risks, geopolitical risks and compliance issues. As state-owned enterprises bear the important function of social responsibility, their executives are more inclined to adopt conservative strategies in the face of uncertainty, such as signing long-term contracts, choosing cost-plus pricing mechanisms, and adopting centralized procurement models to ensure supply stability and policy compliance. Therefore, in state-owned enterprises, the characteristics of the top management team, such as industry contacts and policy sensitivity, have a more prominent impact on risk perception, and further guide them to show a stronger risk aversion tendency in strategic decision-making.

Secondly, private enterprises are more flexible and market-oriented in operating mechanisms, and their executive teams are usually composed of professionals with strong market awareness and business experience. Such enterprises pay more attention to profitability and market competitiveness, so their executives are more inclined to economic risks such as market fluctuations, price changes and logistics efficiency in terms of risk perception. In private companies, the impact of executives' business experience and cognitive style on risk perception is particularly evident. They are more prone to sensitivity toward capture market opportunities and quickly adjust their strategies, such as choosing flexible spot procurement methods and adopting pricing mechanisms based on oil prices or market indices to respond to market changes. Hence, the characteristics of the top management team of private

enterprises emphasize more on market adaptability in shaping risk perception, thus promoting their higher flexibility and innovation in strategic decision-making.

Finally, as a product of Sino-foreign cooperation, the top management team of joint ventures often has both local and international perspectives. It needs to take into account the local policy environment and adapt to the operating rules of the international market. The top management team of such enterprises may present diversified characteristics in terms of industry contacts, cognitive style and self-realization needs, and their risk perception is also more complex and dynamic. For example, joint venture executives may seek a balance between geopolitical risks and policy risks, and combine domestic and foreign experience in pricing mechanisms and procurement models to form a more flexible strategic decision-making path. Therefore, in joint ventures, the impact of top management team characteristics on risk perception is not only regulated by internal factors, but also deeply influenced by external partner culture, management philosophy and market positioning.

To sum up, different types of enterprises play an important role in regulating the impact of top management team characteristics on risk perception. Due to the differences in organizational attributes, strategic objectives and governance structures, state-owned companies, private companies and joint ventures have significant differences in the distribution of their senior management teams in terms of industry contacts, business experience, cognitive style and self-realization needs, thus forming

different risk perception models. This difference not only affects the top management team's identification and assessment of risk, but also directly determines its preference and behavior choice in strategic decision-making. Therefore, when analyzing the relationship between top management team characteristics and strategic decision-making of LNG import companies in China, it is necessary to fully consider the key variable of enterprise type in order to achieve more accurate and comprehensive theoretical construction and practical guidance.

4.6 Summary

This chapter uses the grounded theory method to carry out qualitative research. Through in-depth interviews with 20 top management team members from three types of enterprises, the first-hand data was obtained and three-level coding was used (open coding → axial coding → selective coding) to generate a theoretical framework. TMT characteristics do not directly determine LNG procurement decisions. Instead, they shape risk perception across geopolitical, market, logistics, and policy dimensions, which in turn drive strategic choices. Organizational contexts further mediate and condition such relational dynamics, giving rise to differentiated decision-making rationalities among state-owned, private and joint-venture enterprises within the industry. The model reveals that TMT characteristics (industry network, business experience, cognitive style, self-actualization) indirectly affect strategic decision-making (decision-making on contract term, pricing mechanism and

procurement model) through risk perception (perception of geopolitical risk, market risk, logistics risk, policy risk). And the state-owned enterprise / private enterprise / joint venture moderates this influence path. Through the test of reliability and validity and the verification of theoretical saturation, the research ensures the rigor and explanatory power of the conclusion, and provides a theoretical framework and practical enlightenment for understanding the decision-making mechanism of Chinese LNG enterprises.

CHAPTER 5 Discussion and Contributions

5.1 Introduction

This chapter synthesizes and interprets the research findings outlined in Chapter 4, moving toward a comprehensive understanding of the study's contributions. It begins by summarizing and critically discussing the key results, linking them back to the research questions and objectives. The key theoretical model underpinning the research is explained in detail, clarifying its structure and the novel insights it offers. The discussion then extends to practical implications, outlining how the findings can be applied by Chinese LNG import companies, managers, and policymakers. Additionally, the methodological contributions of the study—including the innovative application of grounded theory—are examined. Finally, the chapter acknowledges the research's limitations and put forward directions for future research.

5.2 Discussion

This research focuses on the Top Management Teams (TMTs) of Chinese LNG import companies, covering enterprises of different types (state-owned enterprises [SOEs], private enterprises, joint ventures [JVs]) to capture the diversity of China's LNG industry. Based on gaps in existing literature and practical industry needs, four research questions were proposed, and qualitative research was conducted using grounded theory. In-depth interviews with 20 TMT members from 9 enterprises

generated first-hand data, which were analyzed through three-level coding (open, axial, selective) to extract 186 labels, 45 concepts, 14 categories, and 4 main categories. The intrinsic relationships between these categories were explored, a “story line” was constructed, and a complete theoretical model was built. Reliability tests, validity tests, and theoretical saturation tests confirmed the model's completeness and explanatory power.

5.2.1 Key Findings on TMT Characteristics and Risk Perception

The study identified four key TMT characteristics that influence risk perception in Chinese LNG import companies: industry network, business experience, cognitive style, and self-actualization. These characteristics interact to shape TMTs' perception of four core risks: geopolitical risk, market risk, logistics risk, and policy risk.

Consistent with Bryce et al. (2024), risk perception in Chinese LNG firms is socially constructed rather than objective. Industry networks shape information access and risk calibration, echoing Palermo et al.'s (2017) findings on institutional complexity. Business experience aligns with Bednarek et al. (2021), who argue experience frames risk duality as both threat and opportunity.

- Industry network: TMTs with broad, high-quality industry networks—including strong relationships with suppliers, industry associations, and government

agencies—exhibit more accurate risk perception. For example, SOE TMTs, which often have close ties to government departments, are better able to anticipate policy changes (e.g., adjustments to import quotas), reducing policy risk perception. Private enterprise TMTs, by contrast, rely more on supplier networks to gather market information, lowering their market risk perception. This finding aligns with Park and Luo's (2001) research on industry networks but extends it by highlighting the role of network quality (not just quantity) in risk perception—TMTs with trusted, long-term network ties are more likely to obtain reliable information, leading to more informed risk assessments.

- **Business experience:** TMTs with extensive industry tenure, international business experience, and risk management experience form more balanced risk perceptions. Executives with over 10 years of LNG industry experience, for instance, are better able to identify cyclical market trends, reducing their perception of price risk. TMTs with international experience—common in JVs—are familiar with cross-border transaction processes and geopolitical dynamics, lowering their perception of supply chain risk. This supports Nielsen's (2010) findings on international experience but adds nuance by showing that experience type matters: risk management experience has a more direct impact on logistics and geopolitical risk perception than general industry experience.

- **Cognitive style:** Analysis-driven TMTs—prevalent in SOEs—rely on data and

scenario analysis to assess risks, leading to more conservative risk perceptions. Emotion-driven TMTs—common in private enterprises—depend on intuition and supplier trust, resulting in more flexible risk perceptions. For example, SOE TMTs may use historical price data to model long-term cost risks, while private enterprise TMTs may trust key suppliers to mitigate short-term supply risks. This finding expands Santos and Garcia's (2006) research on cognitive style by linking it to organizational type, showing that institutional context shapes how cognitive styles translate into risk perception.

- Self-actualization: TMTs with strong self-actualization needs—characterized by a desire to achieve strategic goals and demonstrate professional competence—exhibit higher risk tolerance. JV TMTs, which often face pressure to balance Chinese and foreign shareholder expectations, are more inclined to pursue innovative procurement strategies (e.g., hybrid pricing mechanisms) to prove their effectiveness, leading to lower risk perception of novel approaches. This aligns with Miller et al.'s (1988) research on achievement motivation but highlights the moderating role of organizational type—self-actualization has a stronger impact on risk perception in JVs than in SOEs, where policy constraints limit strategic flexibility.

5.2.2 Key Findings on Risk Perception and Strategic Decisions

Risk perception directly guides TMTs' strategic decisions on long-term LNG procurement, which focus on three dimensions: contract term, pricing mechanism, and procurement model.

- Geopolitical risk perception: TMTs with high geopolitical risk perception—common in SOEs and JVs—prefer long-term contracts with politically stable suppliers to ensure supply security. TMTs with low geopolitical risk perception—often in private enterprises—may opt for shorter-term contracts to maintain flexibility. This finding extends Xia et al.'s (2023) research on long-term contracts by linking contract term choices to specific risk perceptions, rather than general cost considerations.

- Market risk perception: TMTs with high market risk perception—prevalent in private enterprises—adopt flexible pricing mechanisms (e.g., spot-indexed pricing) to respond to price fluctuations. Those with low market risk perception—common in SOEs—prefer fixed-price or oil-indexed contracts to stabilize costs. For instance, a private enterprise TMT used spot trading to capitalize on 2023's lower international LNG prices, while an SOE TMT chose oil-indexed pricing to avoid budget volatility. This aligns with K. Grant et al.'s (2014) findings on market risk and decision-making but adds context-specific insights for the Chinese LNG sector.

- Logistics risk perception: TMTs with high logistics risk perception—common in all enterprise types—adopt centralized or joint procurement models to enhance supply

chain control. For example, several TMTs reported using joint procurement with other companies to secure priority access to port facilities, reducing congestion risk. TMTs with low logistics risk perception may use decentralized procurement to leverage supplier competition. This finding addresses a gap in existing research, which has rarely explored logistics risk in LNG procurement decision-making.

- Policy risk perception: TMTs with high policy risk perception—predominant in SOEs—prioritize contracts that align with national energy policies (e.g., green LNG procurement). Those with low policy risk perception—often in private enterprises—may focus more on cost efficiency. For example, an SOE TMT invested in carbon-neutral LNG projects to comply with China's "dual carbon" goals, while a private enterprise TMT prioritized low-cost contracts. This highlights the unique role of policy in shaping Chinese LNG procurement decisions, a factor often overlooked in Western-focused research.

5.2.3 Mediating Role of Risk Perception

The study confirmed that risk perception plays a critical mediating role between TMT characteristics and strategic decisions. TMT characteristics do not directly influence procurement decisions; instead, they shape risk perception, which in turn guides strategic choices. For example, an SOE TMT's strong industry network (characteristic) enables it to access policy information, reducing policy risk perception (mediator),

which leads to the choice of long-term, policy-aligned contracts (decision). This mediating effect aligns with Smith et al.'s (2016) and Zhang et al.'s (2018) findings but is unique in its focus on the Chinese LNG sector—showing that policy risk perception is a more prominent mediator in SOEs, while market risk perception is more critical in private enterprises.

5.2.4 Moderating Role of Organizational Type

Organizational type (SOE, private, JV) exerts a moderating effect on the relationship between TMT characteristics and the risk perception. SOE TMTs' industry networks and policy-focused cognitive styles lead to lower policy risk perception; private enterprise TMTs' business experience and market-focused cognitive styles reduce market risk perception; JV TMTs' international experience and balanced cognitive styles result in more moderate risk perceptions across all dimensions. For example, an SOE TMT's government network reduces policy risk perception more than a private enterprise TMT's network, while a JV TMT's international experience lowers geopolitical risk perception more than an SOE TMT's experience. This moderating effect addresses a gap in existing research, which has rarely explored how ownership structure shapes the TMT characteristic-risk perception link.

5.3 Theoretical Model and Contributions

Based on qualitative analysis using grounded theory, this research constructs a refined, context-specific theoretical model (Figure 4-1) that explains the relationship between TMT characteristics, risk perception, strategic decisions, and organizational type in Chinese LNG import companies. The model not only clarifies the specific elements of each construct but also identifies direct effects, mediating roles, and moderating effects, deepening existing theoretical frameworks and addressing key research gaps.

5.3.1 Advancing Upper Echelons Theory

This study systematically unpacks the "cognitive black box" in how TMT characteristics influence strategic decisions, significantly enhancing the explanatory power of Upper Echelons Theory (UET) in the energy sector. Traditional UET focuses on the direct link between TMT demographic characteristics (e.g., age, education) and strategic outcomes but lacks in-depth exploration of intermediate psychological processes—especially risk perception in complex, global industries like LNG.

This research identifies risk perception as the core mediating path linking TMT characteristics (industry network, business experience, cognitive style, self-actualization) to LNG procurement decisions (contract term, pricing mechanism, procurement model). It explains how TMT members, through their unique experience, networks, and values, shape their interpretation of geopolitical, market, logistics, and

policy risks—ultimately driving specific procurement choices. For example, TMTs with strong self-actualization needs perceive lower risk in innovative strategies, leading to more flexible procurement models. This finding connects abstract TMT characteristics to concrete strategic behaviors, providing a dynamic "characteristics → cognitive process → decision" chain that evolves UET from a static correlation model to a more nuanced, context-aware framework.

Additionally, the study expands UET by integrating organizational type in the role of a moderating variable. It shows that the impact of TMT characteristics on risk perception varies by ownership structure—SOE TMTs' industry networks have a stronger effect on policy risk perception, while private enterprise TMTs' business experience more significantly influences market risk perception. This addresses UET's traditional neglect of institutional context, making the theory more applicable to state-dominated economies like China.

5.3.2 Expanding Risk Perception Theory

This research advances risk perception theory from the single micro-level to the level of organizational strategic, while developing a risk dimension structure tailored to the LNG import industry. Previous risk perception studies have focused on individual consumers or specific disaster scenarios; research on organizational-level risk perception—especially for TMTs in global energy sectors—remains scarce.

Through grounded theory, the study defines four core risk constructs specific to China's LNG import context: geopolitical risk (supplier political stability, international relations), market risk (price fluctuations, exchange rate changes), logistics risk (transportation safety, port congestion), and policy risk (environmental regulations, import quotas). This structure provides a foundation for subsequent risk measurement and modeling in the LNG sector—for example, researchers can use these dimensions to develop quantitative risk assessment tools.

More importantly, the study positions risk perception as a central hub connecting TMT characteristics and strategic decisions, empirically verifying its transmission role in organizational decision-making. It shows that risk perception is not just a descriptive concept but a critical cognitive basis for strategy formulation—TMTs with different risk perceptions prioritize different procurement objectives (e.g., supply security vs. cost efficiency). This elevates risk perception theory's relevance to corporate strategy, enriching the theoretical connotation of organizational risk management.

5.3.3 Integrating Organizational Context into Strategic Leadership Research

The research pioneeringly incorporates organizational context (specifically ownership structure) into the analytical framework of TMT characteristics and risk perception,

enriching the application of contingency theory in strategic leadership research. It identifies organizational type as a key moderating variable that systematically adjusts the intensity and mode of TMT characteristics' impact on risk perception.

This finding has two key theoretical implications: First, it confirms that TMT characteristics do not exist in isolation but are embedded in specific institutional environments. SOE TMTs, driven by social responsibility and policy goals, prioritize policy and geopolitical risks; private enterprise TMTs, focused on profitability, are more sensitive to market risks; JV TMTs, balancing dual institutional logics, form more complex risk perceptions. Second, it explains strategic behavior differences between enterprises of different ownership types in China's transitional economy. Different from existing literature that emphasizes the direct link between ownership and performance, this research delves into the cognitive antecedents of decision-making, revealing how ownership structures shape TMTs' "risk perception filters" to influence final choices. This provides a paradigm for "contextualized" strategic leadership research, making findings more relevant to non-Western institutional environments.

5.3.4 Addressing Industry-Specific Research Gaps

This study fills the gap in energy sector risk perception research, which has traditionally focused on macroeconomic factors (e.g., market volatility, geopolitics)

while neglecting the micro-foundations of strategic cognition within firms (Aissaoui, 2016). By constructing a middle-range theoretical model that integrates TMT characteristics, risk perception, organizational type, and strategic decisions, the research provides a solid empirical basis rooted in Chinese LNG import practice.

The model's industry-specific focus is critical: LNG's unique attributes—high capital intensity, long contract cycles, global supply chains—create risk environments that differ from other energy sectors. For example, geopolitical risks have a more direct impact on LNG procurement than on oil procurement, owing to the concentration of LNG production in a limited number of countries. This study's findings, such as the link between international experience and geopolitical risk perception, are thus uniquely relevant to LNG companies.

Additionally, the model has potential universality, offering a transferable framework for strategic decision studies in other high-risk, high-uncertainty industries (e.g., critical minerals, cross-border renewable energy procurement). It also provides a clear blueprint for future large-sample quantitative tests—researchers can use the model's constructs to develop surveys and test relationships statistically.

5.4 Implications for Practice

The study's findings have direct practical implications for Chinese LNG import companies, TMT members, and policymakers. By translating theoretical insights into

actionable strategies, these implications can help enhance the efficiency and resilience of China's LNG procurement, supporting national energy security and the energy transition.

5.4.1 TMT Profiling and Development for LNG Import Companies

Chinese LNG import companies can use the four key TMT characteristics (industry network, business experience, cognitive style, self-actualization) to develop targeted TMT profiling tools, moving beyond traditional metrics (e.g., academic background, seniority) to identify capability gaps.

- SOEs: Prioritize TMT members with strong government and industry association networks to enhance policy risk perception. For example, an SOE could recruit executives with experience in China's National Development and Reform Commission (NDRC) or the International Gas Union (IGU) to improve access to policy and global market information. Additionally, SOEs should balance analysis-driven cognitive styles with self-actualization needs—training executives to use data analysis while encouraging innovative approaches to align with national clean energy goals. A specific action could be organizing cross-departmental workshops with policy experts to help TMTs interpret new regulations (e.g., carbon tax policies) and integrate them into procurement strategies.

- Private enterprises: Focus on TMT members with extensive market experience and supplier networks to improve market risk perception. For instance, a private enterprise could hire executives with a background in LNG spot trading to enhance responsiveness to price fluctuations. Private enterprises should also diversify cognitive styles—combining emotion-driven intuition (useful for rapid decision-making) with analysis-driven data skills (to mitigate excessive risk-taking). A practical step could be partnering with research institutions (e.g., China Petroleum Economic and Technological Research Institute) to provide TMTs with market trend analysis, supplementing their intuitive judgments.

- JVs: Emphasize TMT members with international business experience and cross-cultural communication skills to balance global and local risk perceptions. For example, a Sino-foreign JV could recruit executives with experience in Western energy companies to navigate international contract negotiations and geopolitical dynamics. JVs should also foster self-actualization needs by assigning high-visibility projects (e.g., green LNG procurement), motivating TMTs to balance shareholder goals. A specific strategy could be organizing quarterly "global best practices" workshops, where TMT members learn from international peers and apply insights to local procurement decisions.

5.4.2 Structured Risk Perception Audits for Procurement Decisions

Before making major long-term LNG procurement decisions (e.g., signing multi-year contracts), companies should institutionalize a structured Risk Perception Audit process to ensure comprehensive, data-informed risk assessment.

- Step 1: Individual risk mapping: TMT members independently rate the likelihood and impact of the four core risks (geopolitical, market, logistics, policy) using a 1–5 scale, documenting their underlying assumptions (e.g., "I rate geopolitical risk high due to tensions in the Middle East"). This step surfaces individual biases and ensures diverse perspectives are considered.
- Step 2: Collective discussion and validation: Facilitate a workshop to compare risk maps, resolve discrepancies, and test assumptions against objective data. For example, if a TMT member perceives high logistics risk due to port congestion, the team could review data from China's General Administration of Customs on port throughput and congestion rates. Companies should also invite external experts (e.g., logistics consultants, policy analysts) to provide independent insights, reducing internal bias.
- Step 3: Action plan development: Based on the audit, develop targeted risk mitigation strategies. For example, if the audit identifies high market risk, the TMT could adopt a hybrid pricing mechanism (combining fixed and spot prices) to balance

cost stability and flexibility. If logistics risk is high, the TMT could diversify transport corridors (e.g., adding Arctic shipping routes as an alternative to traditional routes).

- **Post-decision review:** Conduct a review 6–12 months after the decision to assess the effectiveness of risk mitigation strategies. For example, if a TMT chose a long-term contract to reduce geopolitical risk, the review could assess whether supply remained stable during periods of international tension. This iterative process ensures the Risk Perception Audit remains relevant and improves over time.

5.4.3 Context-Tailored Decision Protocols by Organizational Type

Leveraging the moderating effect of organizational type, companies should design targeted decision-making protocols to align TMT risk perception with strategic goals. To establish a symbiotic relationship—where SOEs guarantee foundational supply and private firms optimize marginal flows—creates a more resilient and efficient national LNG supply system.

- **SOEs:** Establish a "Policy Risk Task Force" consisting of TMT members and government relations experts to monitor regulatory changes. The task force should meet quarterly to update the TMT on policy trends (e.g., import quota adjustments) and assess their impact on procurement decisions. To mitigate supply volatility and price risks, it is recommended that state-owned enterprises adopt a procurement strategy predominantly based on long-term contracts. This core volume should be

supplemented with a smaller, flexible portion of spot purchases. Within a comprehensive national LNG strategy, state-owned enterprises (SOEs) and private players should assume distinct yet complementary roles, informed by their respective strengths and mandates. SOEs, bearing the primary responsibility for energy supply security, should anchor their procurement portfolios in long-term contracts. This ensures a stable, predictable and reliable supply base — the bedrock of systemic resilience. A modest, strategic allocation to spot markets can be maintained to cultivate market acumen and inject flexibility.

- Private enterprises: Private enterprises can leverage their agility to operate more actively in the spot and short-term markets. This activity enhances overall market liquidity and helps to discover and capitalize on arbitrage opportunities. Private enterprise can create a 'Market Risk Committee' to review aggressive procurement strategies. . The committee should include TMT members and financial analysts to stress-test strategies against price volatility and cash flow constraints. Private enterprises should also expand industry networks through alliances with other LNG buyers—for example, joining a purchasing consortium to negotiate better spot prices and share logistics resources. A specific action could be partnering with 2–3 other private enterprises to jointly procure LNG, reducing transportation costs and improving access to spot markets.

- JVs: Develop a shared risk assessment manual with unified criteria for risk

likelihood and impact, ensuring Chinese and foreign TMT members have a common "risk language". The manual should include case studies of successful cross-border procurement decisions (e.g., hybrid contracts) to align risk perceptions. JVs should also hold quarterly cross-cultural communication training to address differences in cognitive styles—for example, training foreign executives on Chinese policy-making processes and Chinese executives on international contract negotiation practices.

5.4.4 Policy Implications for Energy Regulators

For Chinese energy policymakers, the findings provide micro-foundational insights to build a more stable, resilient LNG import environment.

- Differentiated policy guidance: When promoting market-oriented reforms (e.g., liberalizing spot trading), provide private enterprises with clearer guidance and longer transition periods to avoid panic decisions. For example, the government could issue a "spot trading roadmap" for private enterprises, outlining step-by-step requirements for risk management systems and regulatory compliance. This would reduce private enterprises' perceived policy risk and encourage their participation in the spot market.
- Industry-wide risk sharing platform: Lead the development of a national LNG risk information sharing platform, integrating data on geopolitical dynamics, market prices, port logistics, and policy changes. The platform should be accessible to all LNG

import companies, in particular, small and medium-sized enterprises (SMEs) with limited resources and experiences. For example, the platform could provide real-time updates on port congestion, enabling TMTs to adjust transportation plans and reduce logistics risk perception.

- TMT capacity building programs: Support high-end talent training programs for LNG TMTs, including cross-ownership executive exchanges. For example, the government could fund a program where company executives who are new in the LNG industry to spend 3 months in overseas reputable universities to study market-driven decision-making.. This would promote the sharing of risk management best practices and enhance the overall strategic decision quality of the industry.

- Incentives for green LNG procurement: Introduce incentives (e.g., tax breaks, import quota preferences) for companies that adopt green LNG procurement strategies, aligning TMT risk perception with national carbon neutrality goals. For example, companies that source 30% or more of their LNG from carbon-neutral projects could receive a 5% reduction in import taxes. This would reduce TMTs' perceived cost risk of green procurement and accelerate the energy transition.

5.5 Methodological Contribution

Through rigorous and innovative application of grounded theory, combined with

systematic reliability, validity, and theoretical saturation tests, the research offers a paradigmatic example to study complex organizational phenomena—especially for exploring the "black box" of TMT cognition, situational contingency, as well as strategic decision-making in the energy sector. Its methodological contributions lie in deepening the application of grounded theory and offering a replicable solution to the challenge of capturing dynamic cognitive processes and context-specific decision logic.

5.5.1 Advancing Grounded Theory Application in Management Research

This study adheres to Strauss and Corbin's (1990, 1994) procedural grounded theory tradition, which emphasizes structured coding steps (open, axial, selective) and theoretical saturation testing—rather than Glaser's (1992) classical approach, which prioritizes "natural emergence" and opposes rigid procedures. This choice was critical for unpacking the complex "TMT characteristics → risk perception → strategic decisions" chain, as it provided a systematic framework to organize qualitative data while allowing for theoretical flexibility.

The study successfully integrated the moderating effect of organizational type into the grounded theory model, a step rarely taken in previous management research. By comparing TMT data across SOEs, private enterprises, and JVs, it identified how organizational context shapes the interaction between TMT characteristics and risk

perception—for example, how SOE TMTs' industry networks have a stronger impact on policy risk perception. This demonstrates the value of the Strauss-Corbin paradigm in analyzing multi-level, context-dependent phenomena, bridging the methodological divide between procedural and classical grounded theory schools.

Additionally, the study balanced procedural rigor with theoretical emergence. It used systematic tests (e.g., inter-coder consistency coefficients ranging from 0.855 to 0.910) to ensure reliability, while remaining open to new concepts and categories during data collection. For example, the category of "self-actualization" emerged unexpectedly from interview data, highlighting the importance of flexibility in grounded theory. This practice provides a model for integrating rigor and adaptability in management research, addressing criticisms of grounded theory's subjectivity.

5.5.2 Capturing Tacit Knowledge Through Layered Coding

The research applies grounded theory's three-level coding to the highly abstract, dynamic chain of "TMT characteristics → risk perception → strategic decisions" overcoming the limitations of traditional methods (e.g., questionnaires, secondary data) in capturing executives' tacit knowledge and complex decision logic.

- Open coding: Treated TMT narratives with a high degree of openness, decomposing interview transcripts word-by-word to extract initial concepts. For example, the

concept of "industry network" emerged from executives' descriptions of "maintaining long-term relationships with suppliers" and "participating in industry forums". This step avoided bias from pre-conceived theoretical frameworks, ensuring concepts were grounded in real-world data.

- Axial coding: Classified scattered concepts into logical relationships (e.g., causal conditions, action strategies) to form coherent categories. For instance, the concepts of "supplier relationship stability" "government policy monitoring", and "industry association participation" were grouped into the category of "industry network". This step organized fragmented data into meaningful clusters, revealing the underlying structure of TMT risk perception.

- Selective coding: Centered on the core story line ("how risk perception connects TMT characteristics and strategic decisions") to integrate all core categories into a logically consistent theoretical model. This step ensured the model was both comprehensive and parsimonious, capturing the essential relationships without unnecessary complexity.

This coding process provided an operational roadmap for studying "how executive cognition translates into organizational action", showing how managers' "experience-based narratives" can be elevated to theoretically generalizable components. For example, TMTs' descriptions of "relying on past market fluctuations

to judge future risks” were coded into the concept of "business experience” which was then linked to “market risk perception” and "pricing mechanism decisions” This demonstrates how grounded theory can capture tacit knowledge that quantitative methods often miss, enhancing the depth of management research.

5.5.3 Enhancing Qualitative Research Rigor

The study systematically integrated and strengthened reliability, validity, and theoretical saturation tests—addressing common criticisms of grounded theory's lack of rigor and setting a benchmark for high-quality qualitative research in the energy sector.

- Reliability: Used inter-coder consistency analysis to minimize the impact of individual bias. Two researchers independently coded the same interview data, with consistency coefficients ranging from 0.855 (TMT characteristics) to 0.910 (risk perception)—meeting or exceeding the acceptable standard of 0.8 (Insch, 1997). Discrepancies were resolved through discussion, ensuring coding results were objective.

In terms of validity, multiple strategies were employed to ensure validity, which are including:

Firstly, Triangulation: Combined interview data with corporate reports, industry

statistics, and observation records to verify findings. For example, an SOE TMT's claim about "policy-driven procurement decisions" was cross-checked with public NDRC policy documents.

Secondly, continuous comparison: Synchronized data collection and analysis, comparing new interview data with existing categories to refine the model. This ensured the model evolved with data, rather than being imposed a priori.

Thirdly, extended participation: Conducted return visits to clarify ambiguous information—for example, following up with a private enterprise TMT to confirm their approach to spot trading.

Fourthly, researcher introspection: Maintained a reflexivity journal to document assumptions and biases, reducing the impact of the researcher's background in the energy sector on data interpretation.

In terms of theoretical saturation, sampling was stopped only when new data no longer generated new concepts or categories—saturation was achieved after 23 interviews, with 4 additional interviews confirming stability. The study further verified saturation through member checks (20 interviewees confirmed category validity) and theoretical sampling (9 additional interviews with 3 new enterprises). This rigorous saturation testing ensures the model is comprehensive and not limited

by sample size.

CHAPTER 6 Conclusions and Future Research

6.1 Introduction

Chapter 6 concludes the study by synthesizing its main findings, highlighting its contributions to theory and practice, and setting out implications for managers, policymakers, and other stakeholders. It begins by restating the research aim and research questions, ensuring alignment with the research's outcomes. The chapter then summarizes the key empirical findings, emphasizing their relevance to Chinese LNG import companies. Next, it elaborates on the study's theoretical, methodological, and practical contributions, followed by a critical reflection on limitations. Finally, it proposes targeted directions for future research—framing limitations not as weaknesses but as opportunities to advance scholarship in the field of strategic management and energy policy.

6.2 Key Findings

This study systematically explores the intricate relationship between Top Management Team (TMT) characteristics, risk perception, and strategic decision-making in China's LNG import sector. The core conclusion is that TMT characteristics—specifically industry network, business experience, cognitive style, and self-actualization—do not directly determine LNG procurement strategic decisions. Instead, they exert influence by shaping the TMT's collective perception of four critical risks: geopolitical, market,

logistics, and policy risks. This risk perception acts as the central mediating mechanism. Furthermore, organizational type (state-owned enterprise [SOE], private enterprise, joint venture [JV]) significantly moderates this influence, underscoring the critical role of institutional context in Chinese LNG procurement decisions.

Table 6-1 summarizes how the research addresses its research questions (RQ) and research objectives (RO) through grounded theory:

RQ	RO	Implementation Path
RQ1: What TMT characteristics in Chinese LNG import companies inhibit or promote risk perception?	RO1: Explore the impact of different TMT characteristics on risk perception.	Adopt a bottom-up grounded theory approach, using three-level coding (open → axial → selective) to extract core concepts/categories from interview data, establish their internal relationships, and construct a theoretical model to clarify how TMT characteristics (e.g., industry network, business experience) shape risk

		perception.
RQ2: How does TMT risk perception affect LNG procurement strategic decisions?	RO2: Explore the impact of TMT risk perception on strategic decisions.	Through axial and selective coding, identify the four-dimensional structure of risk perception (geopolitical, market, logistics, policy) and its specific effects on strategic decisions (contract term, pricing mechanism, procurement model).
RQ3: Does risk perception mediate the relationship between TMT characteristics and strategic decisions?	RO3: Explore the mediating role of risk perception.	Via selective coding, construct a 'story line' where TMT characteristics influence risk perception, which in turn guides strategic decisions—verifying risk perception as a mediating variable through theoretical saturation tests and member

		checks.
RQ4: Does organizational type moderate the mechanism linking TMT characteristics, risk perception, and strategic decisions?	RO4: Explore the moderating role of organizational type.	Compare TMT data across state-owned, private, and joint ventures to identify how organizational context adjusts the impact of TMT characteristics on risk perception (e.g., state-owned TMTs prioritize policy risk, private TMTs focus on market risk).

6.2.1 Synthesis of Key Findings

The study's findings can be synthesized into three core insights:

1. TMT characteristics shape risk perception through multiple pathways: Industry networks provide information access, reducing uncertainty; business experience enhances risk assessment capabilities; cognitive style determines information processing logic; self-actualization influences risk tolerance. These pathways interact—for example, a JV TMT with strong international experience (business

experience) and a balanced cognitive style may perceive lower geopolitical risk, leading to more flexible contract terms.

2. Risk perception translates into strategic decisions based on risk type: Geopolitical risk perception drives contract term choices; market risk perception shapes pricing mechanisms; logistics risk perception influences procurement models; policy risk perception aligns decisions with regulations. This translation is context-dependent—SOEs prioritize policy and geopolitical risks, while private enterprises focus on market risks.

3. Organizational type moderates the entire mechanism: SOEs, private enterprises, and JVs differ in TMT characteristics, risk perception priorities, and strategic preferences. SOEs leverage government networks to manage policy risk; private enterprises use market experience to navigate price volatility; JVs balance global and local risks. This moderation ensures the model reflects the diversity of China's LNG industry.

6.3 Implications for Professional Practice and Adoption Considerations

In refining the TMT Profiling Tool, enterprises can add a cross-functional collaboration assessment to evaluate how well TMT members coordinate with other departments (e.g., logistics, finance, legal) in risk management. For example, a TMT

with strong industry networks but poor collaboration with the legal department may overlook contract clause risks (e.g., ambiguous force majeure terms) when negotiating international procurement deals. The assessment can include criteria such as "frequency of cross-departmental risk workshops" and "alignment of departmental risk reports with TMT decisions". To address gaps in collaboration, enterprises can implement "cross-departmental rotation programs" for TMT members, allowing them to work in logistics or finance departments for 1–2 months. This hands-on experience helps TMTs better understand the operational risks faced by other teams, leading to more holistic risk perception and more informed procurement decisions.

The Risk Perception Audit process can be extended to include post-decision reviews to measure the effectiveness of risk mitigation strategies. After a procurement decision is implemented (e.g., signing a long-term contract), the TMT conducts a review 6–12 months later, comparing the actual outcomes (e.g., cost fluctuations, supply stability) with the risk predictions made during the audit. This review identifies gaps in the audit process (e.g., overestimating the impact of policy changes) and updates the risk assessment framework accordingly. For example, if a post-review finds that logistics risk was underestimated due to unaccounted for extreme weather events, the audit framework can add a "climate risk" sub-dimension to logistics risk assessment, incorporating data from meteorological agencies on extreme weather

frequency in key shipping routes. This iterative improvement ensures that the Risk Perception Audit remains relevant and effective over time.

When addressing adoption barriers related to tacit knowledge and cultural norms, enterprises can create a "tacit knowledge repository" to document the experience-based insights of senior TMT members. This repository can include video interviews, case studies, and decision-making anecdotes (e.g., "How we adjusted procurement strategies during the 2022 European energy crisis"). The repository is integrated into the TMT Profiling Tool and Risk Perception Audit process, allowing new TMT members to learn from past experiences and ensuring that tacit knowledge is not lost due to personnel turnover. Additionally, enterprises can organize "mentorship programs" where senior executives (with extensive tacit knowledge) guide junior TMT members through real-time risk assessment and decision-making. This hands-on mentorship helps junior executives internalize tacit knowledge while aligning their risk perception with the enterprise's cultural norms. For example, a senior executive could walk a junior member through the process of interpreting subtle policy signals—an skill often based on years of experience rather than explicit rules—helping the junior member develop similar judgment over time.

Regarding the small and medium-sized LNG companies with limited resources to implement full-scale tools, phased adoption plans can be developed. The first phase

focuses on the most critical component (e.g., the Risk Perception Audit for market risk, which directly impacts cost control), using simplified templates and free industry data. The second phase expands to include TMT capability assessment for key roles (e.g., procurement managers), and the third phase implements the full suite of tools. This phased approach reduces the initial resource burden and allows enterprises to demonstrate quick wins (e.g., cost savings from improved market risk perception) to secure buy-in for further investment. Industry associations can provide pre-built, customizable templates for each phase, further lowering the barrier to adoption for small enterprises.

6.3.1 Practical Tools and Frameworks

1) TMT Profiling Tool

Enterprises can use the four key TMT characteristics (Industry Network, Business Experience, Cognitive Style, Self-Actualization) to assess their TMT's risk perception capabilities. A sample assessment framework is presented in Table 6-2:

Characteristic	Assessment Criteria	Action to Address Gaps
Industry Network	- Breadth of connections (suppliers, government agencies, industry associations)- Timeliness of	- Recruit executives with diplomatic or industry association experience- Establish regular

	information acquisition	communication mechanisms with key stakeholders
Business Experience	- Years of LNG industry experience- Experience with international negotiations/crisis management	- Provide cross-departmental training (e.g., logistics, policy)- Hire consultants with international LNG transaction experience
Cognitive Style	- Preference for data-driven vs. experience-driven decision-making- Ability to conduct systematic risk analysis	- Train executives in scenario simulation and data modeling- Balance the team with both analytical and intuitive thinkers
Self-Actualization	- Alignment of personal goals with corporate strategic objectives- Willingness to tackle complex projects	- Link executive incentives to long-term strategic goals (e.g., green LNG procurement)- Assign high-visibility projects to enhance sense of

		achievement
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2) Risk Perception Audit Process

Before major procurement decisions (e.g., signing a long-term contract), enterprises should implement a 3-step Risk Perception Audit:

Step 1: Individual mapping: TMT members independently rate the likelihood and impact of the four core risks (1–5 scale) and document their underlying assumptions (e.g., "I rate geopolitical risk high because of tensions in the specific regions").

Step 2: Collective discussion: Facilitate a workshop to compare maps, surface divergent views, and test assumptions against objective data (e.g., industry reports on port congestion).

Step 3: Action plan: Develop targeted measures to address key risks (e.g., "Reduce logistics risk by diversifying transport corridors").

6.3.2 Addressing Adoption Barriers

The adoption of these tools will face three key barriers—addressed below with targeted strategies:

1) Power and Politics

Revealing divergent risk perceptions may threaten senior leaders (e.g., a CEO's emphasis on long-term contracts may conflict with other executives' concerns about market risk). To mitigate this:

- Frame the Risk Perception Audit as a "collective intelligence tool" rather than a "performance evaluation", emphasizing that it aims to reduce blind spots, not apportion blame.
- Ensure senior leaders (e.g., the CEO) champion the process by publicly sharing their own risk maps and welcoming divergent views.

2) Time and Resource Constraints

Senior executives face intense time pressure, and structured processes (e.g., the Risk Perception Audit) may be perceived as inefficient. To address this:

- Pilot the process with a small, high-impact decision (e.g., a medium-term contract negotiation) to demonstrate value—e.g., “The audit identified a logistics risk that saved \$500k in transportation costs”.
- Streamline the process by using digital tools (e.g., online risk mapping platforms) to reduce meeting time.

3) Tacit Knowledge and Cultural Norms

Much TMT decision-making relies on tacit knowledge ("we've always done it this way"), and formal frameworks may be seen as "codifying art into science" To overcome this:

- Involve long-serving executives in designing the tools (e.g., the TMT Profiling Tool) to ensure they reflect real-world practice.
- Use case studies from within the enterprise to illustrate how the tools enhance decision-making (e.g., "The 2022 Risk Perception Audit helped us avoid a costly contract during a price spike").

6.4 Limitations and Future Research

Notwithstanding this research strives for rigor, it has limitations arising from constraints in time, resources, and methodology. These limitations, however, delineate clear avenues for future research improvement - framed as opportunities to build on current findings and to enhance the model's robustness and generalizability.

6.4.1 Qualitative Methodology Limitations and Future Quantitative Validation

The qualitative grounded theory approach is strong for model construction but cannot statistically verify causal relationships with the same rigor as quantitative methods. For example, while the study identifies risk perception as a mediator between TMT characteristics and strategic decisions, it cannot statistically confirm the strength of this mediating effect or rule out alternative explanations (e.g., external market

pressure). Additionally, the study's sample—20 TMT members from 9 enterprises—while sufficient for grounded theory, limits the generalizability of findings to all Chinese LNG import companies. Future research should adopt a mixed-methods design: use surveys and structural equation modeling (SEM) to collect data coming from 200+ TMT members of Chinese LNG import companies, quantitatively testing the model's relationships. Detail steps could be:

Firstly, quantitative phase: To investigate with additional emerging buyers in China's LNG import market, a survey to be designed based on the established theoretical model. Data could be collected with a sample of over 200 Top Management Team (TMT) members, which justifies the sampling frame as the new entrants are increasingly shaping market dynamics. Use structural equation modeling (SEM) to test:

- 1) The direct effect of TMT characteristics on risk perception.
- 2) The mediating role of risk perception between TMT characteristics and strategic decisions.
- 3) The moderating effect of organizational type.

Secondly, cross-validation: compare quantitative results with the qualitative findings to refine the model (e.g., adjusting the dimensions of "cognitive style" based on survey data).

This approach will strengthen causal inference and address the limitation of qualitative research in generalizability.

6.4.2 Static Model and Future Longitudinal Research

The current model presents a 'snapshot' of the decision-making mechanism but does not fully capture the dynamic evolution of TMT characteristics (e.g., experience accumulation, cognitive style changes), risk perception (e.g., shifts in response to geopolitical events), and strategic decisions over time. In reality, TMTs adjust their risk perception and decisions as the market environment evolves—for example, the 2022 European energy crisis may have altered TMTs' contract term preferences. Future longitudinal studies—tracking TMT composition, risk perception, and decisions over 3–5 years—could capture this dynamic interaction. Such studies could also explore how external events (e.g., policy changes, price spikes) moderate the model's relationships, enhancing its relevance to real-world market dynamics.

Future research should conduct a 3–5 year longitudinal study with the following elements:

- Sample: Track 10–15 LNG import companies (covering all organizational types) over time, when the market continues expansion with emerging buyers joining the LNG industry in China.
- Data collection: Conduct annual interviews with TMT members, supplemented by corporate reports and market data.

- Analysis: Explore how TMT characteristics (e.g., new executives joining), external events (e.g., a geopolitical crisis), and internal changes (e.g., a shift to green energy) alter risk perception and strategic decisions.

This will reveal the dynamic evolution of the model—for example, whether a TMT's "business experience" becomes more influential in risk perception after a market crisis.

6.4.3 Limited Generalizability and Future Cross-Context Testing

The findings are rooted in the specific context of Chinese LNG import industry, which is characterized by strong government influence, rapid growth, and a mix of SOEs, private enterprises, and JVs. While the model's core logic (e.g., risk perception as a mediator) may be transferable to other high-risk industries, it cannot be directly generalized to other countries or sectors with different institutional environments. For example, LNG import companies in Europe, where regulatory frameworks and market structures differ significantly, may have TMTs that prioritize environmental policy risk over market risk. Future research should test the model in other contexts—such as Chinese renewable energy enterprises or European LNG importers—to refine its generalizability.

Future research should test the model in other contexts to enhance generalizability:

Other industries: High-risk, capital-intensive sectors (e.g., critical minerals, cross-border renewable energy procurement) to determine if the TMT characteristics-risk perception-strategic decision framework applies.

Other countries: LNG import markets with different institutional environments (e.g., Europe, Japan) to explore how factors like regulatory frameworks or market structure adjust the model.

Other organizational types: Small and medium-sized LNG enterprises (not covered in this research) to test if the model scales to smaller organizations with limited resources.

Cross-context testing will help identify the model's "core logic" (e.g., risk perception as a mediator) and context-specific adjustments (e.g., European TMTs prioritizing environmental risk over policy risk).

6.4.4 Clarity and Accessibility: Future Knowledge Translation

To enhance the thesis's impact on practitioners, future work should focus on knowledge translation:

- Practitioner-friendly summaries: Develop a 2-page "Executive Brief" highlighting key tools (e.g., the Risk Perception Audit) and case examples.

- Workshops: Deliver training workshops for LNG company executives to teach them how to use the TMT Profiling Tool and Risk Perception Audit.
- Digital tools: Partner with technology firms to develop a mobile app for the Risk Perception Audit, making the process more accessible for time-constrained executives.

6.5 Final Conclusion

Adopting a grounded theory qualitative approach, this study clarifies the internal mechanism linking TMT characteristics, differentiated risk perception and corporate strategic decisions, and verifies the moderating effect of organizational ownership type. The findings extend Upper Echelons Theory to the energy trade context, complement empirical qualitative research on energy risk cognition, and generate practical implications for LNG enterprise operation and industrial policy formulation.

This study contributes to both academic knowledge and professional practice by unpacking the relationship between TMT characteristics, risk perception, and strategic decision-making in China's LNG import sector. The core theoretical contribution is the identification of risk perception as a mediating mechanism linking TMT characteristics to strategic decisions, and organizational type as a moderating variable—advancing Upper Echelons Theory and risk perception theory. The practical

contribution lies in actionable tools (e.g., TMT Profiling Tool, Risk Perception Audit) tailored to the Chinese LNG sector, helping enterprises enhance risk response capabilities and strategic decision quality.

While the study has limitations (methodological, static model, limited generalizability), these provide clear directions for future research. By adopting mixed-methods designs, conducting longitudinal studies, and testing the model in other contexts, researchers can further refine the framework and enhance its generalizability. For practitioners, the tools and strategies outlined in this study offer a path to translate theoretical insights into tangible improvements in LNG procurement decision-making—ultimately supporting the sustainable development of China's LNG import industry and enhancing national energy security.

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APPENDICES

Appendix A: Participant information sheet

Participant Information Sheet

1. Research Project Title

Top Management Team and Strategic Decision-Making in Chinese LNG Importing Companies: A qualitative analysis from the perspective of risk perceptions

2. Background, aims of project

Making liquefied natural gas (LNG) procurement decisions is crucial for Chinese LNG buyers to meet their long-term demand. This thesis aims to identify and analyze the factors that affect the decisions made by the Top Management Teams (TMT) of Chinese LNG buyers. Specifically, this study will focus on how TMTs' experiences and social networks affect their risk perceptions and further influence the long-term LNG procurement decisions in different sizes of organizations. Based on interviews of TMT members in Chinese LNG organizations, as well as the data of the long-term LNG supply deals executed by Chinese LNG buyers between 2002 and 2023, this thesis strives to develop a decision-making framework that will enhance the long-term LNG procurement decisions, and more generally, the strategic decisions of Chinese LNG buyers.

My background could be summarized that I have been working in oil & gas industry for more than 20 years in the areas covering onshore/offshore projects, LNG terminals, also as LNG Buyer and Seller. I am mature individual with extensive LNG commercial and shipping knowledge and experiences, and with well net-worked in the LNG industry.

My DMan research is funded by myself.

3. Why have I been invited to take part?

You have been invited because you are the Top Management Team member of your companies, and you involve deeply in the process of company's term LNG procurement process.

4. Do I have to take part?

No. You do not have to take part.

If you do decide to take part, you can withdraw your participation at any time without needing to explain and without penalty by advising the researcher of this decision.

If you withdraw we will not collect any more data from you. However, any data collected up until the point that you withdraw will be kept and used in the data analysis.

You will be given this information sheet to keep and be asked to.

5. What will happen if I take part?

You will need to complete an interview.

The interview should take approximately 45 minutes to 1 hour.

You will be asked to return 2 times, the study will take place either in a relaxed environment or over the phone, and will not be followed up visits.

6. Are there any potential risks in taking part?

The participants might perceive a risk that their knowledge will be shared with competitors who will then gain a competitive advantage over their company.

Potential participants might be concerned that information they give could disadvantage their job and their company. However, any company's sensitive information will not be discussed.

7. Are there any benefits in taking part?

There will be no payment for taking part in this project. All the interviewees will be invited through student's personal relationships and partners in the LNG industry, in return, the research findings will be shared to them as compensation.

8. What happens to the data I provide?

I am carrying out this study as part of my personal studies towards the completion of my degree.

9. Will the research be published?

This research will be published as a PhD. I am also considering published in journals and at conferences.

10. Who has reviewed this research project?

The ethical approaches of this project have been approved via The University of Stirling [General University Ethics Panel/NHS, Invasive & Clinical Research Ethics Committee/ Animal Welfare and Ethics Review Body].

11. Who do I contact if I have concerns about this study or I wish to complain?

Student: Shufang Huang, email: shufang.huang@stir.ac.uk

Supervisor: Dr. Lu Li, email: lilu@ucass.edu.cn

Supervisor: Dr. Kevin Grant, email: kevin.grant@stir.ac.uk

Thank you for your participation.

Appendix B: Interview Questions

A semi-structured interview

1. Can you please provide a brief introduction about yourself, including education and career background, your tenure experience in LNG industry, and any other information you would like to share?
2. How do you view the role of natural gas/LNG in China's current energy mix and in the next 10 to 20 years?
3. What are the factors do you consider affecting Chinese LNG buyers' long term LNG procurement? And can you highlight a few as the key ones?
4. Do you consider making long term LNG procurement as a strategy decision for organization? How much risk and what that risk is to make such decision? How do think Top Management Team can management the risk?
5. How do you view Top Management Team's risk perception impact in company's long term LNG procurement? The risks can be classified as High, Medium and Low. What will be the impacting factors in TMT's risk perception from your view? For example: business experience, tenure in the position, network in the

industry, any others?

6. And how do you view the TMT's risk perception will impact your strategy decision making, here, in term of making decision to buy or not to buy long term LNG?

Appendix C: Electronic Consent Form for studies

where no personal data are collected

Research Project Title: Top Management Team and Strategic Decision-Making in Chinese LNG Importing Companies: A qualitative explanation from the perspective of risk perceptions

[GUEP]/ [NICR] Approval Number [GUEP 2024 15177 14215]

Please tick box	
I confirm that I have read and understood the information sheet explaining the research project and I have had the opportunity to ask questions about the project.	
I understand that my participation is voluntary and that I am free to withdraw at any time during the study without giving a reason, and without any penalty. I understand that if I withdraw no more data will be collected from me. However, any data collected up until the point that I withdraw may be kept and used in the data analysis.	
I understand that my responses will be kept anonymous and I give permission for members of the research team to have access to my anonymised responses.	
I agree to take part in this study	