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ANALYSIS STRATEGY CONFIGURATIONS IN RISK TAKING USING FUZZY SET QUALITATIVE COMPARATIVE ANALYSIS MODEL

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Abstract. Risk-taking is a key factor in corporate competitive advantage, and economic development. The type of strategic configuration that can drive high-level risk-taking is a problem worthy of attention. This study takes 2,219 listed firms in China as samples and performs a fuzzy set qualitative comparative analysis (fsQCA) to explore the linkage effect and path choice of strategic change, corporate social responsibility, innovation, diversification, and financialization with corporate risk-taking (CRT). It finds that: (a) a single strategy does not constitute a necessary condition for high-level CRT; (b) three types of adaptive schemes exist for high-level CRT, among which the risk-taking level is the highest under the path of "Innovation, diversification, and financialization"; and (c) the driving paths of CRT in different regions, industries, and ownership show obvious differences.

Keywords: risk-taking, corporate strategy, fsQCA, innovation, corporate social responsibility, strategic change, diversification, financialization.

JEL Classification: L16, L25, M14, O32.

Introduction

Risk-taking is the willingness and tendency of corporations to make large and risky resource commitments, those which have a reasonable chance of costly failure (Miller & Friesen, 1978). Risk-taking is reflected in the choice of venture capital projects in investment decision-making (Lumpkin & Dess, 1996). At the micro-level, risk-taking is the key factor for the success of enterprises, improvement of business performance and shareholder wealth, and enhancement of long-term competitive advantage (Koirala et al., 2020; Du & Kim, 2021). In fact, none of the businesses can get a reward without risk-taking in practice (Phan, 2021; Chen et al., 2022). At the macro-level, risk-taking is one of the fundamental driving forces

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for long-term and sustainable economic growth, accelerating capital accumulation in society, promoting technological progress, and improving social productivity (Llanos-Contreras et al., 2021; Jiang & Chen, 2021). Choosing high-risk investment projects brings higher returns to enterprises, and high-risk projects promote capital accumulation in society (Vural-Yavaş, 2021). For China's economy, in transition, it is particularly important to optimize and upgrade the economic structure, and promote sustained economic growth through "creative destruction" to achieve high-quality economic development and improve corporate risk-taking (CRT; Zhou et al., 2019; Zhu et al., 2022).

The corporate operation mode is based on strategies; to ensure their realization, the management reasonably allocates resources and makes various business decisions and investments. Since risk-taking is an important decision-making factor in corporate investment, corporate strategy can be used as a factor in the study of CRT (Ellouze & Mnasri, 2020; Vural-Yavaş, 2021; Zhu et al., 2022; Đặng et al., 2022).

Corporations adopt different strategies, and their business characteristics are vastly different, resulting in different levels of risk. Miles and Snow (2003) divide corporate strategy into three categories: offensive strategy, analytical strategy, and defensive strategy. Bentley et al. (2013) divide strategic choices into radical and conservative choices. Porter (1980) proposes a cost leadership strategy and differentiation strategy. These strategic classifications generally classify corporations into two categories to facilitate regression analysis and reduce endogeneity. However, in the actual operation of corporations, strategies are diversified. As for corporation long-term development, corporate social responsibility (CSR) and innovation require a continuous investment of a large number of funds and the cycle is long and the risk is large, which often leads to high operational risk (Ciftci et al., 2011; Chakraborty et al., 2019). In the aspect of corporation operations, diversification, and financialization will make an effect on resource allocation in a short time (Koirala et al., 2023; Bin-Feng et al., 2022). The strategic change represents a deviation of strategic positioning from the traditional strategic model of the industry (Kong et al., 2021).

Corporations implement several strategies to promote development, such as innovation and diversification strategies (Zhu et al., 2022; Ellouze & Mnasri, 2020). These corporate strategies have been widely used in the study of risk-taking (Banerjee & Gupta, 2017). Especially, in terms of short-term strategies, financialization and diversification are regarded as important paths to affect CRT (Ellouze & Mnasri, 2020; Bin-Feng et al., 2022). Concerning long-term strategies, innovation and CSR play an important role in CRT (Vural-Yavaş, 2021; Zhu et al., 2022). Yet, this limited research overlooks vital combinations with other environmental conditions needed for high risk-taking and understates the true causal complexity of what drives high risk-taking. Their research is too focused on either/or strategy (Du & Kim, 2021). According to the enterprise capability theory, dynamic capabilities, lead to flexibility and change advantages in the capability system. Strategic change has been verified to ensure a sustainable competitive advantage (Adiguzel, 2021).

In fact, there could be complementary or substitutive effects between the different strategies resulting in various high CRT paths (Lv et al., 2015; Ferris et al., 2017). In the earlier studies, linear regression analysis neglects the role of multiple strategic coordination (Banerjee & Gupta, 2017; Chakraborty et al., 2019) Through the fsQCA method, we could jointly

analyze the complex causation of CRT. The different strategies need to work together as determinants of CRT. We apply the fsQCA method to 2,219 listed firms in China. This study discusses the condition configuration and influence mechanism leading to CRT. Based on the theory of enterprise capability and using the fuzzy set qualitative comparative analysis (fsQCA) method, this study identifies the driving path for the improvement of CRT through the impact of strategic change, long-term strategies (CSR and innovation), and short-term strategies (diversification and financialization). Specifically, this study attempts to answer the following two questions: (1) what strategic combinations can promote CRT? (2) are there differences in CRT in different regions, industries, and ownership in China? It helps to broaden the perspective of research on CRT, deepen the understanding of the driving path and mechanism of CRT, and promote the realization of high-quality economic development.

This study contributes to a better understanding of the high CRT in emerging countries and makes several contributions to the strategic management literature. First, through the configuration method, we understand the strategic model of the CRT and combine the changes in the strategic environment through the balance of long-term strategy and short-term strategy. Traditional regression can only study the causal relationship of three variables at most, and can not reflect the strategic choice in a complex business environment (Park & Mithas, 2021). This paper refers to the method of fsQCA to effectively solve this problem and provides an overall perspective on the complex interaction and causal asymmetry between strategies leading to CRT. Second, the relationship between strategies is not one or the other. There are substitution and complementary effects between strategies, which is a discovery in the application of configuration methods (Bartkus et al., 2022). Third, different from the small case studies of QCA, this is a valid conclusion based on 8828 large samples in China (Fainshmidt et al., 2020).

1. Literature review and model construction

1.1. Risk-taking influencing factors

To date, research on the influencing factors of CRT has expanded from the macro-level to the micro-level, including the external environment, internal governance, and managers' characteristics. Most of the literature focus on the relationship between a single factor and CRT, such as economic policy uncertainty, management incentives, innovation, and CSR. Most of them seek quantity and statistical relationships. A few research work on a combination of these factors.

From the perspective of the external environment, first, the macroeconomic environment affects the risk-taking of individuals and enterprises. Political uncertainty has a negative and statistically significant impact on CRT (Llanos-Contreras et al., 2021). Economic policy uncertainty also positively affects CRT (Zhang et al., 2021a, 2021b). Second, in China, labor protection has a significant negative impact on enterprise risk choices (Jiang & Chen, 2021). Finally, informal systems such as culture and religion also have an important impact on corporate risk decision-making. A study found that stronger religious beliefs reduce CRT behavior and that a significant negative correlation exists between Italian CRT and religious beliefs (Cebula & Rossi, 2021).

From the perspective of corporate internal governance and agency theory, rational managers tend to avoid risks for their interests. Management incentives in the form of salary, equity, and promotion have become important means to improve CRT (Phan, 2021). The supervision mechanism, with the board of directors and owners as the main body, is also an important factor affecting CRT. Supervision factors such as the size of the board of directors (Wang, 2012) and major shareholders (Attig et al., 2013) also affect risk-taking. It has been confirmed that internal-control willingness lowered corporate risk-taking (Chen et al., 2022).

Based on the high echelon theory and behavioral finance theory, studies have analyzed the impact of CRT from the perspective of managers' characteristics, in which the dominant demographic characteristics of managers – including managers' age and gender – are related to CRT (Serfling, 2014; Yang et al., 2019; Biswas, 2021). High-ability executives have the propensities for less risk-taking (Alzugaiby, 2022). Entrepreneurs' interests and CRT have a significant positive correlation (Song et al., 2021). Roussanov and Savor (2014) found that single CEOs are more active in investment than married CEOs, and their stock returns fluctuate more violently. Managers who experience economic crises have a relatively conservative management style (Schoar & Zuo, 2017). In terms of managers' psychological characteristics, it has been verified that managers' overconfidence helps to improve CRT (Li & Tang, 2010; Ali & Tauni, 2021).

Enterprise risk is closely related to enterprise business strategy and financing decision-making (Hoskisson et al., 2017). Given the differences in the characteristics of enterprise behavior risk, scholars have also explored the action channels or influence paths of CRT from different perspectives of enterprise behavior. Research on the impact path of CRT usually focuses on decisions such as operations, investments, and financing. The increase in economic policy uncertainty improves risk-taking through the development of financialization, and product market competition (Zhang et al., 2021a). Bentley et al. (2013) found that radical corporate strategies lead to more serious financial reporting fraud, based on the U.S. securities market. Hutton et al. (2014) explored the impact path of executive characteristics on CRT from two aspects, innovation and debt. Lv et al. (2015) tested the role path of CRT from strategic decisions such as investment, merger and acquisition (M&A) diversification, R&D expenditure, and cash-holding rate. Foreign investment promotes corporate risk-taking (Đặng et al., 2022). Ferris et al. (2017) explored the impact path of R&D investment, diversified operation, debt, and working capital by verifying that CEO social capital improves CRT. Corporate strategy determines the direction of business activities, which may strongly affect CRT (Akbar et al., 2017).

1.2. Conceptual framework

From the above literature review, we find that the assumption of uniform symmetry between independent and dependent variables in the existing literature limits the choice of a risk-taking promotion path. CRT is interdependent rather than independent. In a real situation, CRT is a matching model of different conditions, resulting in different conditions for high- and low-level risk-taking. Existing studies have not paid attention to the causal complexity of CRT; thus, this study attempts to introduce the fsQCA method to explore the linkage effect of multiple strategies on CRT and reveal the interactive relationship among different strategies.

The enterprise capability theory holds that capability is the result of the long-term accumulation and learning of enterprises, which exists in strategic planning. These resources cannot be obtained or easily copied and are used to form a competitive advantage and realize higher risk-taking (Barney, 1991). This study constructs a theoretical model framework that affects CRT (see Figure 1). The conditional variables of the CRT include strategic change, long-term strategies (CSR, innovation), and short-term strategies (diversification, and financialization).

Strategic change. According to the enterprise capability theory, static capabilities can support enterprises in obtaining stability and efficiency advantages as well as dynamic capabilities, leading to flexibility and change advantages in the capability system (Helfat & Peteraf, 2003). The strategic change represents the degree to which the strategic positioning of each corporation in terms of internal structure, business model, and other multidimensional aspects deviates from the conventional strategic model of the industry (Tang et al., 2011). Corporations with a high level of strategic change prefer to abandon conventional strategies and resource allocation to develop strategies based on their own conditions (Kong et al., 2021). Different from specific strategies, strategic change will put the corporation into an environment of strategic fluctuation with high uncertainty.

The existing literature shows that enterprise resource allocation is an important factor in determining enterprise operational risk and information environment (Zhang & Rajagopalan, 2010). Scholars have suggested that strategic conformity benefit firms by providing more access to resources and reducing competitive risk (Zhao et al., 2017; Berrone et al., 2022). When the strategic change is significant, the corporation faces great financial risk (Haynes & Hillman, 2010). Differences in enterprise strategy and performance fluctuation are positively correlated (Tang et al., 2011). When enterprises adopt the conventional industry strategy, they face less risk and performance fluctuation. The adoption of a differentiation strategy increases the degree of uncertainty, resulting in huge performance fluctuations. However, some research support that strategic change can ensure a sustainable competitive advantage (Adiguzel, 2021). Strategic deviance and diversification positively affect enterprise resilience (Kong et al., 2021).

CSR (Corporate social responsibility). Risk management theory assumes that CSR produces a positive relationship that generates intangible assets or moral capital, providing insurance-like protection for enterprises. Similarly, Borghesi et al. (2014) show that CSR

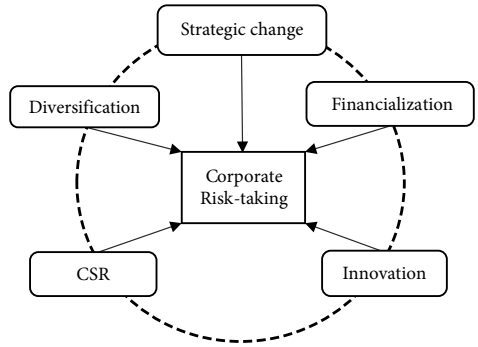

Figure 1. Framework conceptual model

investment is essentially part of an expansion strategy to create goodwill and form good political relations. Strategically speaking, CSR aims to maximize enterprise value and reduce enterprise risk. Nguyen and Nguyen (2015) indicate the positive influence of both CSR strengths and concerns on a firm's risk in American enterprises. Some research found that CSR activities reduce risk (Chakraborty et al., 2019; Ben Moussa et al., 2021; Vural-Yavaş, 2021), while other studies have argued that CSR can inhibit excessive risk-taking and reduce excessive risk aversion (Harjoto & Laksmana, 2018).

Innovation. Breakthrough innovation brought by R&D inevitably leads to performance fluctuations and potential risks (Comin & Mulani, 2009). It has been found that R&D intensity has a positive and significant impact on CRT (Gharbi et al., 2014; Banerjee & Gupta, 2017). Tsang et al. (2021) suggested that a greater level of employee innovation productivity enhanced managerial risk-taking. Also, Zhu et al. (2022) found that more green innovations increase CRT. However, some studies suggest that a negative correlation exists between innovation investment and enterprise risk. The future earnings volatility of enterprises with high R&D intensity is lower than that of enterprises with low R&D intensity (Ciftci et al., 2011), and compared with corporations with fewer patents, corporations with more patents have lower future earnings volatility (Pandit et al., 2011).

Diversification. The research conclusion of the influence of the characteristics of enterprise diversification on risk-taking is relatively unified, that is, the corporate with a higher degree of diversification has a higher level of CRT. It has been found that family businesses belonging to diversified groups, especially those operating in multiple industries, bear more risks (Ellouze & Mnasri, 2020). Diversification in M&A has been found associated with a high level of CRT (Koirala et al., 2023). Compared with focused enterprises, diversified enterprises show a greater tendency to expand through acquisition in an increasingly volatile situation; specifically, they show more adventurous behavior (Eisenmann, 2002). Olibe et al. (2008) shows a positive correlation between the degree of diversification of multinational enterprises in the United States and enterprise risk.

Financialization. Financialization refers to the behavior of entity enterprises that allocate funds to financial assets with a high degree of virtualization (Demir, 2009). Research suggests that the financialization of non-financial corporations has a negative impact on CRT, supporting the "crowding-out" effect (Wang & Mao, 2022). When an enterprise's investment portfolio is transferred to financial assets, it will have a negative impact on the investment in physical assets, that is, the investment in financial assets will crowd out the investment in physical assets and damage the development of the enterprise. Contrastingly, the other research support that enterprise financialization produces a positive reservoir effect. Compared with physical assets, financial assets have the characteristics of high liquidity and high reversibility. The reservoir effect holds that financial assets held by enterprises can improve asset liquidity, enhance financial stability, and smooth the operational risk of enterprises (Davis, 2018). Bin-Feng et al. (2022) found that a conservative working capital strategy diminishes corporate risk-taking. CRT is greater for firms with high operating leverage (Tian et al., 2022).

2. Methods

2.1. Research design

This study uses the fsQCA method to explore the causal complex mechanism of corporate strategy affecting risk-taking. FsQCA conducts a cross-case comparative analysis from the perspective of configuration and is committed to studying the interdependence and different combinations of cause and condition, which constitute multiple concurrent causalities (Rihoux & Ragin, 2009). Various strategic combinations of a corporation form different patterns, and QCA analysis is more conducive to a deeper understanding of the driving mechanism of risk-taking. Traditional regression methods rely on the assumption of equilibrium and normal distribution, and they focus on the linear and symmetrical relationships of individual variables. However, their endogenous problem does not exist in the QCA method. As it uses Boolean algebra, through the study of subset relationships, it does not lead to problems such as missing variable deviation and sample selection deviation (Fainshmidt et al., 2020).

According to the data type, the QCA can be divided into the clear set qualitative comparative analysis (csQCA), multivalued set qualitative comparative analysis (mvQCA), and fsQCA. Only fsQCA can handle continuous variables, and the conditional data in this study are continuous types; therefore, fsQCA was selected as the research method.

First, we use the fuzzy set to analyze the data. All variables will be imported fsQCA 3.0 software, and data will be converted into 0 to 1 by relying on theoretical and practical knowledge for calibration processing. The calibration process can transform variables into sets and assign set membership to cases so that the original measurement has an interpretable set meaning (Greckhamer, 2016). Second, analyze the necessary conditions and check the necessity of each condition one by one. Third, analyze the sufficient conditions for each condition that cannot be used as necessary conditions alone (Ragin, 2008). Set the consistency threshold and frequency threshold of variables based on the crisp truth table algorithm, and filter out the condition variables that are sufficient for the outcome variables with fsQCA3.0 software. Forth, boolean algebra minimization identifies the condition configuration that has the greatest explanatory power to the cases (Pappas & Woodside, 2021). This paper analyzes the combination of multiple combinations with five condition variables that have a decisive relationship with the outcome variable (CRT). The fsQCA 3.0 software builds high CRT configurations based on multiple solutions given by Boolean algebra and sets analysis operations (Schneider et al., 2010). Then we draw the corresponding configuration table. Fifth, analyze the combination of different condition variables vertically. And analyze the relationship between different condition variables horizontally (Bartkus et al., 2022). Identify the similarities and differences between the five strategic conditions in configurations, and complete the final simplification and classification of all configurations (Furnari et al., 2021). Finally, we test the robustness of the data results.

2.2. Sample and data collection

This study selected all A-share listed firms in stock markets from 2007 to 2018 as the initial research sample. The sample data of this study were mainly from the CSMAR, RESSET, and CCER databases. Some missing indicators were supplemented and checked through annual

reports on the website. Considering that China's new accounting standards were officially implemented in 2007, to avoid the impact of related changes, this study selected 2007 as the starting point to measure CRT. Since CRT measurement requires the enterprise's rate of ROA for three consecutive years – that is, CRT measurement in year t needs to use the data of year T-1, year t, and year t + 1 for three consecutive years – which requires the sample to have data for at least three consecutive years, this study used sample data from 2007 to 2019 for the calculation. After excluding the samples that did not meet the conditions, it was found that the range of CRT measurement indicators was mainly from 2007 to 2018. According to the research needs of this chapter, the initial research samples were screened and processed as follows: (i) because the financial industry is under the national financial regulation policy and great differences exist between the risk-taking policy and the non-financial industry, the samples of the financial industry were excluded; (ii) considering that the initial data of the corporation were vulnerable to various factors, the samples in the year of IPO were excluded; (iii) to eliminate the impact of abnormal operations and extreme values, the st and insolvent samples were excluded; and (iv) the missing samples of relevant data were eliminated. Additionally, considering the measurement of risk-taking, the samples whose ROA data did not meet the requirements for three consecutive years in the observation period were excluded. After processing, panel data composed of annual observations of 2,219 firms and 8,828 observations were obtained.

2.3. Variable measurement

2.3.1. Outcome variables

This study used the vertical volatility of listed firms' profits to measure CRT. Profit volatility reflects the dispersion of financial performance indicators of the same corporation in each year within a certain observation period (Faccio et al., 2016; Jiang & Chen, 2021). Specifically, in order to eliminate the impact of the economic cycle and industry, the ROA of the sample corporations in each year is adjusted according to the annual and industry average (Zhang et al., 2021a, 2021b). Then we used the standard deviation of industry-adjusted ROA over three overlapping years.

2.3.2. Condition variables

Strategic change (SC). In this paper, strategic change is defined as the change of resource allocation mode in multiple key strategic dimensions of an enterprise. According to this definition, the degree of strategic change is the degree of change in resource allocation mode over time in key strategic dimensions (Kong et al., 2021). Referring to the measurement method of strategic change in strategic management research (Zhang & Rajagopalan, 2010), this study used a composite measurement method that included six key strategic dimensions to measure the degree of strategic change: (1) advertising and publicity investment; (2) R&D investment; (3) Renewal degree of fixed assets; (4) Management expense input; (5) Inventory level; (6) Financial leverage. Standardize the absolute value and average of each indicator in the current period (t) and the previous period (t-1) and adjust it based on the industry. It has explained the deviation of the corporation's strategies with the industry and the previous year. The measurement includes the horizontal and vertical changes in the corporation's

strategies (Tang et al., 2011; Kong et al., 2021). The larger the index, the greater the corporation's strategic change.

Corporate social responsibility (CSR). Considering the availability and universality of data, and combining the data characteristics to avoid the basic data colinearity problem, this study took the corporate social contribution value as an alternative variable (Gong et al., 2021).

Innovation (RD). Considering the data characteristics and availability for replication studies, this study used R&D expenses scaled by total assets as a measure of innovation input (Giau Bui et al., 2021).

Diversification (HHI). This study used the branch owner business data provided by the Wind database and uses the Guidance on Industry Classification of Listed Companies issued by the China Securities Regulatory Commission in 2001 to divide the corporation's main business income. Following Feng et al. (2021), this study used the firm's Herfindahl–Hirschman Index to proxy for corporate diversification.

Financialization (FIN). Referring to Demir (2009) and Feng et al. (2021), we defined the degree of enterprise asset financialization as the percentage of corporate financial assets in total assets. Combined with Chinese accounting standards, corporate financial assets includes net held-to-maturity investment, trading financial assets, net available-for-sale financial assets, net investment real estate, and long-term equity investment into the category of financial assets.

2.3.3. Calibration

In fsQCA, each condition or result is regarded as an independent set, and each case has membership scores in these sets. Due to the increase in sample size, the familiarity with the sample is reduced, which makes it more and more difficult to extract and summarize calibration points based on cases. In order to overcome the problems of insufficient theory, lack of experience, and too many samples in the calibration process, and avoid and reduce the subjective bias (or result orientation) caused thereby (Garcia-Castro & Francoeur, 2016; Furnari et al., 2021). This study used the direct calibration method (Ragin, 2008) to convert the data into fuzzy set membership scores and used the objective quantile value to determine the positions of three qualitative anchor points (Greckhamer, 2016; Delmas & Pekovic, 2018). In this study, the quantile values of 90%, 50%, and 10% of the risk-taking, strategic change, CSR, innovation, diversification, and financialization were used as three qualitative anchor points of full membership threshold, crossover point, and full non-membership threshold, respectively. The results are shown in Table 1.

Table 1. Calibration for outcome and conditions

Sets	Fully in	Crossover	Fully out
Risking-taking (RISKTAKING)	5.3357	1.7371	0.5404
Strategic change (SC)	123.465	43.0395	13.9785
Corporate social responsibility (CSR)	21.9353	19.9954	18.5485
Innovation (RD)	0.0712	0.0308	0.0015
Diversification (HHI)	0.5898	0.1183	0.0048
Financialization (FIN)	0.1500	0.0222	0.0000

3. Results

3.1. Necessity analysis of the single condition

Before the condition configuration analysis, it was necessary to check the necessity of each condition individually. First, we tested whether a single condition (including its non-set) constituted a necessary condition for high-level risk-taking; in QCA, when a condition always existed with the occurrence of a result, it became a necessary condition for the result (Ragin, 2008). Consistency is an important test standard for necessary conditions; when greater than 0.9, it was the necessary condition for the result (Ragin, 2008).

Table 2 shows the test results of the necessary conditions for high-level risk-taking analyzed by the fsQCA 3.0 software. The consistency level of all conditions was less than 0.9; therefore, no necessary conditions affected high-level risk-taking.

Table 2. Analysis of necessary conditions

Conditions	High-level Risk-taking	
	Consistency	Coverage
fzSC	0.5767	0.5537
~fzSC	0.6234	0.6115
fzCSR	0.5875	0.5598
~fzCSR	0.6625	0.6090
fzRD	0.6071	0.6135
~fzRD	0.6480	0.5646
fzHHI	0.6357	0.5611
~fzHHI	0.5674	0.5650
fzFIN	0.5668	0.5955
~fzFIN	0.6679	0.5634

3.2. Sufficiency analysis of conditional configuration

According to the gap presented by the consistency score in the truth table (Schneider et al., 2010), the consistency threshold was determined as 0.825 in this study. Owing to a large number of samples, the case frequency threshold was set to 5 (Schneider & Wagemann, 2012). owing to the lack of evidence and theory that antecedent conditions affected the exact direction of the results, this study assumed that a single antecedent condition could lead to a high level of risk-taking. Table 3 shows the configuration analysis results for realizing high-level risk-taking. Following the symbolic expression of Ragin (2008), a solid circle (●) indicates that the condition existed, a cross circle (⊗) indicates that the condition was absent, and space indicates that the condition may or may not appear. The configurations in the table were arranged from left to right according to the consistency value. For a single configuration, the consistency values of the three configurations are 0.810, 0.805, and 0.803, respectively, which are higher than the generally accepted consistency standard of 0.75. The overall consistency of the three configurations is 0.76, which is also higher than the acceptable consistency level of 0.75, and the overall coverage is approximately 0.33.

Table 3. Configurations leading to high-level risk-taking

Configuration	1	2	3
SC	●	●	
CSR		⊗	⊗
RD	●		⊗
HHI	●	●	⊗
FIN	●	●	●
Raw coverage	0.2022	0.2155	0.2133
Unique coverage	0.0303	0.0281	0.0796
Consistency	0.8100	0.8053	0.8032
Solution coverage	0.325391		
Solution consistency	0.759947		

Configuration 1 shows a triple RD-HHI-FIN strategy, which means that the corporate with a high strategy change, focus on short-term strategy (diversified operations and financialization), and increase R&D investment leads to a high level of risk-taking. Configuration 2 represents a dual HHI-FIN strategy, which means that the corporate operations are diversified, and the level of financialization is high. Less social responsibility investment leads to higher risk-taking. Configuration 3 shows a dominant FIN strategy: although fewer investments are made in CSR with low innovation, this strategy pays attention to the operation of core products, and the high level of financialization leads to higher risk-taking.

By comprehensively comparing configurations 1 and 2, this study identifies the interactive relationship between conditions and the complementary relationship between strategic change, financialization, and diversification. In configurations 1 and 2, the three always appear simultaneously. When only one or two conditions appear, configurations 1 and 2 no longer exist, which shows that diversification and strategic change, as two important forces to promote financialization, can complement each other and form a joint force. An alternative relationship also exists between innovation in configuration 1 and low-level CSR. Three important forces play a role when innovation is high or investment in CSR is low. The former pursues more R&D investment, while the latter tends to reduce social responsibility investment; any of these characteristics leads to a high level of risk-taking. At the same time, the high financialization level in configuration 3 also needs to combine more conditions to form a sufficient condition combination of high-level risk-taking.

3.3. Analysis of differences between configurations

According to the statistics, the risk-taking level of configuration 1 is the highest of the three configurations, with a median of 5.81. Configuration 2 has the lowest risk-taking level, with a median of 1.96. The risk-taking level of configuration 3 is in the middle, with a median of 2.65. The nonparametric test results demonstrate that the risk-taking level of different configurations is significantly different (Kruskal–Wallis test, $p = 0.017 < 0.05$; see Table 4). The Kruskal–Wallis pairwise test shows that the significance after Bonferroni correction is

p = 0.013 < 0.05, and the risk-taking level of configuration 1 is significantly higher than that of configuration 2, while it shows no significant difference in risk-taking level between configurations 1 and 3 and configurations 2 and 3.

Table 4. Risk-taking nonparametric test

Croup	Risk-taking	Kruskal–Wallis test	
		χ^2	*P*
Configuration 1	5.81 (2.12~10.29)	8.150	0.017
Configuration 2	1.96 (0.71~3.55)		
Configuration 3	2.65 (1.70~6.24)		

Table 5. Configurations of controls leading to high risk-taking (consistency threshold = 0.835)

Configuration	High risk-taking
SC	●
CSR	
RD	●
HHI	●
FIN	●
Raw coverage	0.2022
Unique coverage	0.2022
Consistency	0.8100
Solution coverage	0.2022
Solution consistency	0.8100

3.4. Robustness check

First, the case number threshold was increased from 5 to 6, and the resulting configurations were the same. Second, Schneider and Wageman (2012) believe that the original consistency threshold selected by researchers determines the number of truth table rows (i.e., the number of configurations) in the minimization analysis process, thus affecting the final analysis results. Theoretically, after increasing the consistency threshold, the truth table included in the minimization analysis is reduced, and the number of cases is also reduced; therefore, it is difficult to simplify the configuration to the greatest extent. Finally, the new configuration is a subset of the configuration before adjustment. Based on this idea and the practice of Ordanini et al. (2014), the consistency threshold was raised from 0.825 to 0.835, and the analysis was carried out again with a more stringent threshold. The results of the analysis are presented in Table 4. At this time, the consistency of the overall solution was improved to 0.81, but the coverage of the overall solution was reduced to 0.20. By comprehensively comparing the configuration results at the consistency threshold levels of 0.835 and 0.825, it is found that the configuration in Table 5 is a subset of configuration 1 in Table 3, which shows the robustness of the research conclusions in this paper.

3.5. Analysis of risk-taking configuration of regional corporations

Due to economic development, geographical location, and resource endowment, strategy configurations may have varying degrees of impact on CRT. Therefore, according to the four regional divisions of Northeast, East, Central, and West China, this study classifies the full sample data and explores the differences in the risk-taking levels of corporations in different regions, as shown in Table 6.

There are four configurations of high-risk corporations in Northeast China. Configuration 1 is the same as that of the triple RD-HHI-FIN strategy. Configuration 2 is the diversification strategy while maintaining a low degree of strategic change, low social responsibility investment, and low R&D investment. Configuration 3 emphasizes a high degree of strategic change and long-term strategic support; this long-term strategy includes increasing investments in CSR and innovation to assist in diversified operations. In configuration 4, long-term strategy, diversification, and financialization go hand in hand. The four configurations show that corporations with a high risk-taking level in Northeast China pay more attention to diversification and long-term strategies. Northeast China has a large proportion of agricultural and industrial economies and rich natural resources; thus, the corporation should not only adopt more risk-taking but also pay attention to innovation and CSR and realize diversified operations by integrating resources.

The eastern coastal area has four configurations of high risk-taking. Configurations 5, 6, and 7 are similar to the three configurations in the total sample. Configuration 8 shows that innovation, diversification, and financialization drive high-level CRT. With the rapid economic development in the eastern coastal areas of China, corporations can take advantage of the development advantages of financial platforms to invest in financial instruments. Simultaneously, in the long run, it is necessary to increase risk-taking by increasing corporate investment in R&D and developing multi-category and multi-industry operations. Configuration 5 in the eastern region is the same as configuration 1 in the northeast region. Through the independent sample t-test, it was found that under the same path, the risk-taking level in the eastern region is significantly higher than that in the northeast region (see Table 7).

Table 6. Configurations leading to high-level risk-taking of regional corporates

Configuration	Northeast China				East China				Central China			West China	
	1	2	3	4	5	6	7	8	9	10	11	12	13
SC	●	⊗	●		●	●	⊗		●		⊗		
CSR		⊗	●	●		⊗	⊗	⊗	⊗	⊗	●	⊗	⊗
RD	●	⊗	●	●	●		⊗	●		⊗	●		●
HHI	●	●	●	●	●	●	⊗	●	●	⊗	●	⊗	
FIN	●			●	●	●	●	●	●	●	●	●	●
Raw coverage	0.1909	0.2044	0.1752	0.1891	0.2067	0.2119	0.1778	0.2164	0.2088	0.2266	0.1746	0.2754	0.2596
Unique coverage	0.0343	0.0741	0.0196	0.0321	0.0322	0.0286	0.0502	0.0289	0.0486	0.0825	0.0414	0.0720	0.0562
Consistency	0.8434	0.8717	0.8674	0.8380	0.8111	0.8043	0.8243	0.8043	0.8058	0.8118	0.8216	0.7642	0.7853
Solution coverage	0.3379				0.3361				0.3439			0.3316	
Solution consistency	0.8192				0.7558				0.7634			0.7543	

Table 7. Independent sample t-test of regional corporates' risk-taking

Group	Risk-taking	t-test	
		t	*P*
Configuration 1 of Northeast China	3.36±1.30	2.600	0.016
Configuration 5 of East China	6.91±5.87		

Among the three configurations of high risk-taking in the central region, configurations 9 and 10 have the same path as the total sample. Path 11 shows the characteristics of long-term strategy, diversification, and financialization. The central region makes use of its geographical advantages, relies on the Yangtze River economic belt and the "two horizontal and three vertical" transportation hubs, increases investment in CSR and innovation, develops multi-category and multi-industry operations, increases corporate financialization, and realizes higher risk-taking.

Western China has two configurations of high-level CRT. Configuration 12 is similar to configuration 3 of the total sample, with a high-level financialization strategy. Configuration 13 shows that corporations in the western region achieve higher risk-taking by improving R&D investment and financialization. With low CSR investment and a high financialization level, we enhance risk-taking by improving corporate innovation ability or focusing on the operation of major industries.

3.6. Analysis of risk-taking configuration in different industries

The industry fluctuations, structural adjustment, and scientific and technological development experienced by corporations subordinate to various industries affect corporate strategy formulation and risk-taking to varying degrees. Therefore, according to the regulations on the division of the three industries, this study divides the whole sample data into primary, secondary, and tertiary industries.

Table 8. Configurations leading to high-level risk-taking of primary industry, secondary industry, and tertiary industry corporates

Configuration	Primary industry			Secondary industry		Tertiary industry		
	1	2	3	4	5	6	7a	7b
SC	●		⊗	●				⊗
CSR	⊗	⊗	●	⊗	⊗		●	●
RD	●	⊗	●		⊗	●	●	●
HHI		⊗	●	●	⊗		●	
FIN	●	●	⊗	●	●	●		
Raw coverage	0.2102	0.2552	0.1755	0.1840	0.2158	0.3982	0.2504	0.2938
Unique coverage	0.0484	0.0804	0.0518	0.0197	0.0294	0.1279	0.0099	0.0308
Consistency	0.8548	0.8278	0.8406	0.7515	0.7488	0.7650	0.7884	0.8021
Solution coverage	0.3643			0.2101		0.4664		
Solution consistency	0.7960			0.7622		0.7501		

Table 8 shows three paths for the primary industry. Configurations 1 and 2 are similar to the path of the total sample. Configuration 3 shows an obvious long-term strategy to promote high-level risk-taking. China's primary industry – including agriculture, forestry, animal husbandry, and fishery – has gradually reduced its proportion in the economy, focusing on promoting the optimization of planting structure, the transformation and up-gradation of production mode, and the acceleration of the integration of the three agricultural industries. By promoting corporate innovation, increasing investment in CSR, and actively promoting diversified development, corporations take more risks in the primary industry.

The secondary industry has two paths that are the same as the total sample, namely the dual HHI-FIN strategy and the dominant FIN strategy. An obvious complementary relationship exists between low social responsibility and high financialization in the two paths, which always appear at the same time. For the industrial industry, maintaining the stability of cash flow is the key to risk-taking; putting too much capital into CSR is not conducive to risk-taking.

The three paths of high-level risk-taking in the tertiary industry are different from those of the total sample. Configuration 6 shows the dual drive of innovation and financialization to realize high risk-taking. Configuration 7 has two paths, both focusing on long-term strategy. 7a pays more attention to diversification, while 7b emphasizes a lower degree of strategic change, and the two play an alternative role. The nonparametric test results show significant differences in the risk-taking of the three paths of the tertiary industry, and the risk-taking in configuration 6 is significantly higher than that in configuration 7a. The path effect of innovation and financialization is the most obvious (see Table 9). The tertiary industry includes two major sectors: circulation and services. It provides residents with production and living services, implements a long-term stable strategy, pays attention to CSR and innovation, and can achieve higher risk-taking.

Specific to the manufacturing industry as the engine of economic growth, there are two high-level risk-taking pathways for manufacturing corporations and four for non-manufacturing corporations (see Table 10). The two paths of manufacturing corporations are the same as those of the total sample, configurations 2 and 3. As the key industry of the secondary industry, the strategic layout of manufacturing enterprises with high risk-taking is the same as that of the secondary industry. The two analysis results confirm each other. Promoting high-quality development in the manufacturing industry is the focus of China's current economic work. Path 2 reflects the importance of the reverse diversification strategy for corporate high-level risk-taking. Instead of pursuing diversification, we should explore the in-depth development path of the main corporate business areas, hold a high level of

Table 9. A nonparametric test of tertiary industry corporates' risk-taking

Group	Risk-taking	Kruskal–Wallis test	
		χ^2	*P*
Configuration 6	6.58 (3.21~9.58)	8.827	0.012
Configuration 7a	2.13 (1.63~4.72)		
Configuration 7b	3.75 (1.81~8.22)		

financialization and ensure cash flow, to realize the high-quality development of the manufacturing industry. The difference in path 5 between non-manufacturing enterprises and the total sample reflects that it attaches importance to innovation and strategic change and uses knowledge technology and more flexible strategies to increase risk-taking.

Specific to the high-tech industry supported by the state, two paths are the same as the total sample, namely configurations 2 and 3. On this basis, the high-tech enterprise path 7b is a high financial path that focuses on innovation; this is an important strategy for the development of knowledge- and technology-intensive high-tech enterprises, that is, for paying attention to innovation. Additionally, unlike high-tech enterprises, in path 10, non-high-tech industries pay attention to investments in CSR and diversified operations to increase risk-taking.

Table 10. Configurations leading to high-level risk-taking of different industry corporates

Configuration	Manufacturing		Non-manufacturing				High-tech			Non-high-tech		
	1	2	3a	3b	4	5	6	7a	7b	8	9	10
SC	●		●		●	●	●	⊗		●		
CSR	⊗	⊗		⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	●
RD		⊗	●	●		●			●		⊗	●
HHI	●	⊗	●		⊗		●	⊗	⊗	●	⊗	●
FIN	●	●	●	●	●	⊗	●	●	●	●	●	●
Raw coverage	0.2145	0.2144	0.3130	0.2187	0.2219	0.2083	0.2105	0.2222	0.2382	0.2193	0.2062	0.1953
Unique coverage	0.0795	0.0793	0.0842	0.0397	0.0419	0.0294	0.0634	0.0148	0.0222	0.0549	0.0666	0.0497
Consistency	0.7916	0.7957	0.7844	0.8325	0.8292	0.8312	0.7967	0.8006	0.7919	0.8141	0.8199	0.8129
Solution coverage	0.2938		0.4240				0.3255			0.3439		
Solution consistency	0.7604		0.7609				0.7507			0.7618		

3.7. Analysis of the risk-taking configuration of state-owned and private corporations

The strategic decision-making of state-owned enterprises is guided or influenced by the government. Compared with non-state-owned enterprises, state-owned enterprises usually have more abundant social resources, and this direct political connection can affect their risk-taking (Khaw et al., 2016). Considering the influence of different ownership factors, this study divides the samples into state-owned enterprises and private enterprises for further research.

In Table 11, state-owned enterprises have three high-level risk-taking paths that are similar to configurations 1 and 2 in the total sample. Among the three paths, enterprise strategic change and financialization are the core conditions. Compared with the total sample path, the high risk-taking level of state-owned enterprises does not emphasize the role of CSR. State-owned enterprises shoulder social responsibilities, such as ensuring employment and social stability, which are determined by the nature of ownership; therefore, the additional investment of state-owned enterprises in CSR becomes less important.

Table 11. Configurations leading to high-level risk-taking of state-owned and private corporates

Configuration	State-owned corporates			Private corporates	
	1a	1b	2	3	4
SC	●	●	●	●	⊗
CSR		⊗	⊗		⊗
RD	●	●		●	
HHI	●	●		●	⊗
FIN	●		●	●	●
Raw coverage	0.3005	0.2026	0.2095	0.2163	0.2100
Unique coverage	0.1291	0.0313	0.0382	0.0982	0.0919
Consistency	0.7797	0.8202	0.8128	0.7975	0.7818
Solution coverage	0.3699			0.3082	
Solution consistency	0.7579			0.7584	

Private enterprises have two high-level risk-taking paths that are the same as the total sample, namely configurations 1 and 3. As the core condition of the two paths, the financialization strategy reflects that abundant cash flow and flexible investment in financial instruments have a great impact on the risk acceptance of private enterprises and can effectively improve their risk-taking.

Conclusions

Using the fsQCA method, this study took 2,219 listed firms in China as samples for a condition configuration analysis, explored the linkage effect and driving path of strategic change, CSR, innovation, diversification, and financialization on CRT, and revealed the core conditions affecting CRT and its complex interactive essence. Overall, the five strategies of strategic change, CSR, innovation, diversification, and financialization cannot be taken as the necessary conditions for CRT alone. There are three driving pathways for high-level risk-taking, which can be summarized as the triple RD-HHI-FIN strategy, dual HHI-FIN strategy, and dominant FIN strategy. Among them, risk-taking was the highest under the first pathway. The first two configurations are suitable for corporates with high strategic change. High financialization is an important force for realizing high CRT.

Further analysis indicates that financialization is very important for western China, industrial corporations, and private corporates. "Innovation, diversification, and finance" applies to corporations in the eastern coastal areas. In the service industry of the tertiary industry, social responsibility is the key strategy to improve CRT. As a direct political connection, abundant social resources can affect state-owned CRT. The significant differences in the driving pathways of corporate high-level risk-taking further explain that the conditions causing the heterogeneity of CRT levels are significantly different.

Practical implications

The existence of multiple strategic concurrent synergies reveals the complex mechanism of risk-taking. This means that the corporation can focus on the adaptation between various strategies from an overall perspective to form a differentiated development path and formulate risk-taking promotion strategies in line with its actual situation and according to local conditions. Each corporation selects appropriate paths and targeted strategies according to its resource allocation, technical level, and industry characteristics to improve risk-taking.

Limitations and further research

This study has some limitations. First, risk-taking involves multiple dimensions, including operational risk-taking and financial risk-taking. Future research can measure risk-taking from multiple dimensions and further explore the strategic configuration of risk-taking in different dimensions. Second, the purpose of this paper was to study the complex interaction mechanism affecting corporate strategy through qualitative and quantitative comparative analyses; however, it did not explore its causes and effects through longitudinal case studies. Therefore, future research needs to combine case studies and interviews to explain the actual impact of corporate strategy on risk-taking and explore the dynamic mechanism between strategic configuration and risk-taking. Finally, limited by the availability of data, the research object of this study only included the listed firms, without considering corporations in other sectors, which limits the generalization of the research conclusions.

Author contributions

GY and XB conceived the study and were responsible for the design and development of the data analysis. SY was responsible for data collection and analysis. XB and SY were responsible for data interpretation. XB wrote the first draft of the article.

Disclosure statement

Authors declare no financial, professional, or personal interests from other parties.

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APPENDIX

Table A1. Sample selection

	Total
Full sample during 2007–2018	33659
Less	
Observations in the financial industry	5970
Observations in the year of IPO	3673
Abnormal operations and extreme values, the st and insolvent samples	4097
Observations with missing relevant data	3285
Observations less than three consecutive years	7806
Final sample	8828

Table A2. Statistical characteristics of the samples

Characteristics	Full sample		Characteristics	Full sample	
	n	%		*n*	%
Region			Industry		
Northeast China	328	3.72	Manufacturing	6441	72.96
East China	5960	67.51	Non-manufacturing	2387	27.04
Central China	1357	15.37	High-tech corporates	4230	47.92
West China	1183	13.40	Non-high-tech corporates	4598	52.08
Industry			Ownership		
Primary industry	130	1.47	State-owned corporates	3077	34.86
Secondary industry	7146	80.95	Private corporates	5344	60.53
Tertiary industry	1552	17.58	Mixed ownership	407	4.61