Make, Buy, or Ally? — A Configurational Approach to Governance Choices in Vertical Expansion

Abstract

Firms expand their vertical boundaries by obtaining ownership of relevant resources. There are three means by which firms can achieve this goal: internal development, mergers and acquisitions (M&A), and equity joint venture. From a transaction cost economics and resource-based view perspective, this study analyzed how resource characteristics, environmental conditions, and firms' capabilities influence their governance choices. By studying 30 cases involving architectural, engineering, and construction (AEC) firms and employing a fuzzy-set qualitative comparative analysis (fs-QCA) method, the findings of this study reveal that firms did not use configurational approaches when choosing to adopt one strategy over another. Rather, firms avoid to choose certain mean in a configurational approach. All the antecedents jointly influenced firms' governance choices; however, they did so in a way that led to the firms' rejection as opposed to implementation of one strategy. The results indicated that firms' relational capabilities could help them handle external transaction costs and help them identify and exclude strategies with the lowest efficiency. The findings revealed that firms did not choose internal development to avoid high internal transaction costs or expand rapidly into new business. Firms excluded M&A when the similarity between new and existing resources was high to avoid resource redundancy; when market uncertainty was high, they did so to avoid investment risks. Moreover, when high external transaction costs were evident due to interactions and interdependency between firms and their partners, firms tended to choose a more integrated strategy and excluded equity joint venture.

Practice contributions

This study can provide suggestions and references for architectural, engineering, and construction firms when they choose ways to expand vertical boundaries.

First, this study constructs a decision-making framework. In practice, many factors affect firms' boundary decisions. This study encourages firms to concentrate on three main aspects from the perspectives of efficiency and ability jointly. Resources characteristics, including resource tacitness and interdependence, will affect the efficiency of communication and coordination. Environmental conditions, including potential partners and environmental uncertainty, will affect the opportunistic tendency of partners, thus affecting transaction costs. Firms' capabilities, including resource similarity and relational capability, determine whether firms can effectively resist the possible transaction risks, and thus affects their decisions.

Second, this study shows that firms exclude an inappropriate way of obtaining resources among internal development, acquisition, and equity joint venture when some factors of resource characteristics, environmental uncertainty, and firms' capabilities are present at the same time. Firms can refer to the results of this study and exclude certain ways for vertical boundary expansion when corresponding condition combinations occur.

Keywords: internal development; M&A; equity joint venture; vertical expansion; governance choices

INTRODUCTION

In recent years, an increasing number of architectural, engineering, and construction (AEC) firms around the world have expanded their business boundaries towards upstream and downstream businesses; that is, they have engaged in vertical expansion of the industrial chain. In doing so, firms have been able to leverage their existing resources to provide buyers with a wider range of services over the project lifecycle. For example, McDermott International Inc. merged with Chicago Bridge & Iron Company to become a fully integrated technology, engineering, and construction solutions provider. China Southwest Architectural Design and Research Institute, a leading survey and design firm in China, expanded its construction business by recruiting professionals to provide the buyer with general contracting services that span the engineering, procurement, and construction of projects.

Firms expand their vertical boundaries by obtaining ownership of relevant resources. There are three main ways for firms to achieve this goal: internal development, in which firms' decisions do not rely on external resources combined with other firms and firms develop their required resources and capabilities based on their resource endowments and/or pursuing resources such as qualified specialists, materials, equipment independently from the market; mergers and acquisitions (M&A), the merging of two more or less equal firms as well as acquisition in which one firm has majority ownership of another firm; and equity joint ventures, in which at least two investors bring given assets to an independent legal entity and are paid for some or all of their contribution from the profits, or when a firm acquires minority ownership of another firm. Firms exhibit different patterns in their vertical expansion strategies, and a single firm may apply different methods of expansion to dissimilar businesses. The existing literature suggests that three classes of factors influence this choice, namely resource characteristics, environmental conditions, and firms' capabilities. Transaction risks stem from resources with distinct characteristics that are aligned with appropriate governance choices. For instance, when the target resources have a high level of specialized human asset intensiveness, M&A is more likely to induce cultural conflicts (Wang & Zajac, 2007). When the resources include a significant amount of tacit knowledge and the information is difficult to clearly express and communicate, M&A can help firms reduce transforming and contracting costs (Yang et al., 2010).

Firms operate in a certain environment and environmental conditions can cause transaction risks. Proper governance choices can help firms mitigate risks under certain environmental conditions. When facing intensive regulatory constraints, coercive pressures, and antitrust activities, firms tend to choose alliances rather than M&As to avoid potential penalties (McCann et al., 2016). When exogenous uncertainty is high, there is a lack of certainty as to whether the new business model will be accepted, and the uncertainty of investment return can be high. Under these circumstances, alliancing can maintain the flexibility of the firm (Villalonga & McGahan, 2005).

Firms' capabilities also influence their choices. If firms have superior capabilities and experience in a specific area, they can focus on this advantage to expand their vertical businesses (Karimi-Alaghehband & Rivard, 2020; Wang & Zajac, 2007). Few studies have included independent development in discussion. Some researchers have defined independent development as non-partnering and M&A and alliance as partnering, and subsequently discussed how factors influence whether firms choose partnering or non-partnering (Yang et al., 2010).

Firms' governance choices are influenced by various factors in combination. However, most of the extant studies have merely explored the net effect of factors on firms' governance choices, that is, the correlation between an individual factor and firms' inclination toward different governance choices. Few scholars have explored how various antecedent conditions of different categories jointly affect firms' decision-making. To explore the joint influence of resource characteristics, environmental conditions, and firms' capability on firms' governance choices, this study investigated 30 cases involving the vertical expansion of AEC firms. The case data were mainly obtained through interviews, questionnaires, and public archives. This study adopted the fuzzy-set qualitative comparative analysis (fs-QCA) method, which is based on the configuration perspective and set theory. It holds that causality depends on specific situations and configurations, and the research method focuses on what conditions or combinations of conditions are sufficient to explain the phenomenon of interest.

The findings from this study showed that no combination of antecedent conditions met the consistency requirements required for firms to choose a specific means of expanding the business scope of the vertical industrial chain. Rather, configurational approaches led to firms excluding a specific strategy. This study found that a firm's decision to choose internal development, M&A, or equity joint venture for the purposes of vertical expansion is affected by evaluations of resource characteristics, environmental conditions, and firms' resources in combination. These evaluations lead firms to exclude the strategies that are deemed inappropriate.

THEORETICAL FRAMEWORK

The governance choices for AEC firms to expand their upstream and downstream businesses are important issues in strategic management. Many scholars have discussed such choices through the lens of transaction cost theory and the resource-based view from different theoretical perspectives.

Vertical expansion in transaction cost theory

Transaction costs are different when firms govern transactions in diverse ways and are also affected by transactional characteristics. When transactional characteristics lead to higher transaction costs being associated with one governance choice over another, the firm is more likely to exclude this choice and choose an alternative strategy (Williamson, 1975).

Resource characteristics

Firms need to obtain new resources to expand their vertical businesses. Different firms will adopt different means of doing so in line with their specific resources. Therefore, resource characteristics represent an important factor in expansion strategies.

Firms are required to describe and measure resources when obtaining new resources. If there are many tacit resources, buyers will find it hard to interpret exactly what the resources are, measure how many are required, and detect whether they exhibit good qualities (Arrow, 1972; A. Eapen & R. Krishnan, 2019). As a result, firms experience measuring, identifying, and searching difficulties when obtaining tacit resources (Chuang et al., 2016). In a study of the variables that impact firms' decisions in regard to internal development, M&A, and equity joint venture strategies, Yin and Shanley (2008) found that tacit knowledge was difficult to express and communicate. The higher the level of tacit knowledge, the higher the transferring and contracting cost. Therefore, in these situations, firms are more likely to choose M&A, a choice of a higher degree of integration than equity joint venture to obtain new resources. In this study, tacit knowledge was deemed to be the knowledge accumulated by people through observation, imitation, and repeated interaction, which is complex, vague, and subjective (Crossan & Mary, 1996).

After firms obtain resources, they need to utilize and integrate them. To be effective, new resources may need to rely on and cooperate with existing resources on upstream or downstream activities. If there is any interdependency between the new resources and firms' existing resources, operating relevant activities will involve multiple interfaces. Moreover, parties cooperating on the interfaces may incur high negotiation and dispute resolution costs. In such a case, when firms use a less integrated approach to obtain resources, they may encounter higher transaction costs due to the different interests of the cooperating parties, information asymmetry, communication and understanding differences, etc. Governance choices that are characterized by a high level of hierarchy, such as internal development and M&A, offer superior coordination modes and information channels (Tushman & Nadler, 1978). In this study, resource interdependency captures the need to coordinate two groups of teams that combine their resources to accomplish an activity (Mayer & Salomon, 2006).

Environmental conditions

The number of potential partners in the market and environmental uncertainty will have a significant impact on the external transaction costs of firms, thereby affecting their governance choices.

The governance cost in a market is related to the number of suppliers in that market. The number of potential partners in the market directly affects the difficulty and cost of finding suitable partners. First, when there are few potential partners in the market, there will be insufficient competition among them, and the market may lack the relevant resources required by the firms involved. Second, if a firm chooses to cooperate with an external partner in the market, it will find it difficult to find a replacement for an existing partner. Hence, the partner may engage in opportunistic bargaining behaviors, such as increasing prices, leading to the firm encountering significant transaction risks (Pisano, 1990). In this case, firms are more likely to choose governance choices with a higher degree of integration because they could help to reduce transaction costs.

Firms expand their vertical businesses under certain environmental conditions. A high level of environmental uncertainty means that interfirm operations are more likely to be changed to a large extent and, thus, the most basic assumptions of cooperation may be challenged or abandoned. These changes can be detrimental to the value of firms' cooperation (Ketokivi & Mahoney, 2020). Simultaneously, when a firm cooperates with its partners in an uncertain environment, the cooperation and negotiation between firms will increase (Devlin & Bleackley, 1988; Dickson & Weaver, 1997). Transactions in uncertain environments are more likely to suffer from unexpected accidents than transactions in stable environments. These changes and unexpected accidents increase the opportunistic behavior of external partners because there is a positive correlation between environmental uncertainty and opportunism (Abdi & Aulakh, 2017; Leiblein, 2003; You et al., 2018). In this study, environmental uncertainty refers to the level and unpredictability of the environmental changes encountered by firms over time (Fink & Harms, 2012; Krishnan et al., 2006; Zhou & Poppo, 2010).

Vertical expansion in the resource-based view

Firms' abilities to utilize resources will influence the efficiency of different governance choices. These abilities include the capacity to utilize internal and external resources. When firms have resources that are similar to those required, the efficiency with which they leverage internal resources to independently develop the new ones is high. When firms have rich experience of cooperating with external partners, the efficiency with which they use external resources is high.

Firms' ability to independently develop new businesses by using internal resources is related to the similarity between new resources and their existing resources. When the new business is highly similar to the existing business of the firm, it has access to abundant information and relevant resource endowments to develop the new business. The similarity affects the production cost when the firm independently develops the new business. When the new business has a high similarity to the firm's existing business, the firm can choose internal development, the cost and difficulty of which are relatively low. When the similarity is low, the firm cannot adopt this governance choice and will encounter difficulties in independently developing it.

The firm's ability to use external resources to expand its business is related to its relational capabilities, which refer to the competencies of interfirm cooperation and interfirm-relationship management when combining resources with other firms (Lorenzoni & Lipparini, 1999). If a firm has rich experience in interfirm cooperation, it may have gained sufficient competence in contract design, supervision, and dispute settlement by training professionals, summarizing good practices, and designing relevant processes. This competence helps to reduce the transaction costs associated with external cooperation. Firms that lack relational capabilities are not familiar with interfirm cooperation and may find it difficult to effectively seize cooperation opportunities in the market, resulting in the need to invest more time and money in the process of finding and investigating potential partners. However, firms with rich relational capabilities are familiar with the relevant processes and have accumulated certain trust relationships and ties which enable them to reduce information asymmetry, avoid transaction risks, and reduce transaction costs.

In summary, from the perspectives of transaction cost theory and the resource-based view, this study focuses on three dimensions of factors that influence vertical expansion strategies: resource characteristics, environmental conditions, and firms' capabilities. Specifically, six factors, namely *resource tacitness*, *resource interdependency*, *the number of potential partners in the market* (hereafter, *potential partners*), *environmental uncertainty*, *similarity between the new resources and the firms' existing resources* (hereafter, *resource similarity*), and *the focal firm's relational* *capabilities* (hereafter, *relational capabilities*), are investigated as antecedent conditions for their joint influence on firms' governance choices when choosing between internal development, M&A, and equity joint venture strategies to expand their vertical businesses. Figure 1 shows configurational effects of resource characteristics, environmental conditions, and firm's capabilities on AEC firms' governance choices in vertical expansion.

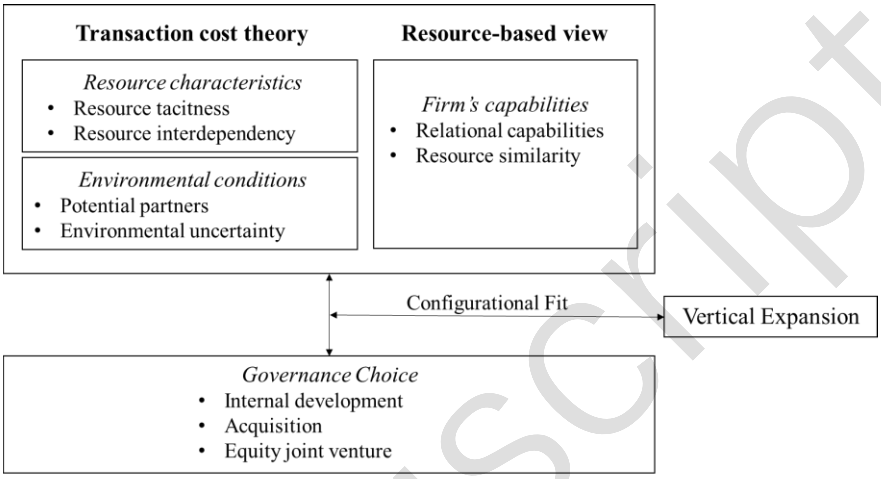

Fig. 1. Configurational effects in vertical expansion

RESEARCH METHODS

Sample and data collection

The analysis unit of this study was a firm's decision to select internal development, M&A, or equity joint venture for its vertical business expansion. The empirical focus was AEC firms. To ensure the reliability and validity of the study outcomes, detailed information about each case was required. As the researchers of this study only had access to Chinese firms, all firms in the sample are Chinese. Firms that had expanded their operations in the past 20 years were selected for inclusion, based on data available in public archives.

First, the researchers selected AEC firms with a history of at least ten years. Second, they contacted the personnel of the human resources department of each firm to ascertain whether they would be willing to participate in the investigation and interviews required for the research. If the firm agreed, the researchers subsequently asked the human resources department to recommend personnel in the strategic management department to participate in the preliminary interview. This interview enabled the researchers to identify whether the firm had expanded its business upstream and downstream. Where firms had expanded their business, the researchers sought to identify staff who had more than five years of work experience in the firm, who understood the business expansion strategy, and who were willing to undertake a one- to two-hour interview and fill in a questionnaire for the purposes of the study. This process culminated in the acquisition of data spanning the vertical business expansion of 30 AEC firms.

When expanding an upstream and downstream business, the firms involved in this study adopted one of three strategies: independent development, equity joint venture, or M&A. After each business expansion, the new business developed well in all cases, and no adverse impact on the firms' original businesses was observed. The firms involved in these 30 cases operated in different industries, including real estate, railway transportation, ports, energy, and mining. The main businesses of the firms involved in these 30 cases were also different, covering investment, design, construction, construction management, etc. All the firms were listed companies with a history of more than ten years. Details of these firms are shown in Table 1.

Table 1 Detailed information of sample firms

Sample firms	**Industry sector**	**Main extant business**	**New business**	**Means of expansion**	**Expansion year**
1	Real estate	Construction	Construction management	M&A	2014
2	Railway	Construction	Investment	Internal development	2018
3	Port	Construction	Investment	Equity joint venture	2019
4	Real estate	Construction	Development and operation	Internal development	2017
5	Port	Construction	Development and operation	Internal development	2014
6	Energy	Design	Investment	Equity joint venture	2016
7	Mining	Investment	Technology	Equity joint venture	2003
8	Mining	Investment	Development and operation	M&A	2003

9	Mining	Investment	Construction	M&A	2006
10	Power	Design	Research and development	Internal development	2019
11	Power	Construction management	Construction	Internal development	2018
12	Railway	Construction	Operation	Internal development	2017
13	Real estate	Investment	Construction	M&A	2021
14	Real estate	Investment	Construction	M&A	2015
15	Real estate	Investment	Construction	M&A	2016
16	Building	Consulting	Construction	Equity joint venture	2021
17	Energy	Design	Construction management	Equity joint venture	2021
18	Energy	Design	Construction management	Equity joint venture	2021
19	Building	Design	Whole process consultation	Internal development	2018
20	Building	Design	Construction management	Internal development	2015
21	Infrastructure	Construction	Investment	Equity joint venture	2020
22	Infrastructure	Construction	Investment	Equity joint venture	2021
23	Infrastructure	Raw material production	Construction	Equity joint venture	2022
24	Building	Construction	Construction management	M&A	2018
25	Power	Construction	Construction management	Equity joint venture	2021
26	Power	Construction management	Construction	M&A	2022
27	Power	Design	Construction management	Equity joint venture	2022
28	Power	Design	Whole process consultation	M&A	2018
29	Infrastructure	Design	Whole process consultation	M&A	2018
30	Infrastructure	Design	Construction management	Internal development	2015

This study collected data from interviews, questionnaires, and information published in the firms' annual reports and public archives. Having identified suitable interviewees in the manner described above, the researchers introduced the background of the topic to them so they could understand the meaning of the terms used during the interviews. Then, the researchers conducted one- to two-hour interviews with the interviewees through video conference. The interviews were recorded with the interviewees' permission. After each interview, the researchers transcribed the interviewees' responses. A questionnaire was also sent to each interviewee, which they were asked to complete within two days and then return it to the researchers. Through this process, this study collected relevant data and information spanning 30 cases.

Details of the interviews, questionnaires, and public information for measurement are provided below with a description of the measures.

Measures

Vertical expansion choice. The researchers asked the firms' managers to recall one vertical business expansion in their industrial chain. The researchers then inquired about the way each firm chose to obtain the resources required for the expansion. This study regarded each strategy – internal development, M&A, or equity joint venture – as a case to examine in more depth.

Resource tacitness. To measure the tacitness of the required resources the firms obtained as a result of adopting an internal development, M&A, or equity joint venture strategy, this study referred to the indications used by Hansen et al. (2005) to measure the tacitness of transferred knowledge. The indications include: (1) the difficulty of measuring the resources; (2) how well the resources are documented; and (3) how well resources can be communicated and transferred in writing. To assist the interviewees to fully understand the interview questions, the study questions were designed to make it easier for the interviewees to fill in the questionnaire. The interview questions designed to measure the tacitness of resources are listed in Table 2. Three researchers participated in each interview. One researcher explained and asked questions, while the other two recorded and manually transcribed the interview after each interview.

Resource interdependency. The interfaces between the new and existing business can create coordination and negotiation problems, especially when the resources are interdependent. According to Lin (2018), interdependencies between two businesses represent a mutual dependence, which refers to the sum of dependencies between actors from different businesses (Casciaro & Piskorski, 2005). To measure the dependency of one business sector on the other, this study employed the method developed by Jong et al. (2007) in the form of the following question: "How dependent are you on the other business sector for materials, means, information, etc. in order to carry out your work adequately?"

Potential partners. This variable was measured by one item in the questionnaire: "How many potential partners were in the market when the firm decided to expand its business (1=very few; 7=abundant)?"

Environmental uncertainty. Multiple measures can be used to capture environmental uncertainty but only a few are applicable to AEC firms. In their study of construction projects, Chen et al. (2015) and Long et al. (2014) developed three items to measure environmental uncertainties: 1) the stability of the external environment; 2) the predictability of the environmental conditions; and 3) the changing frequency of owners' requirements or preferences. To measure environmental uncertainty, this study included three items in the questionnaire, in line with the studies of Chen et al. (2015) and Long et al. (2014). Detail of the items is given in Table 2.

Resource similarity. Similarity was measured during the interview using three items: 1) resource similarity between the two businesses; 2) the number of resources to which the firm had access; and 3) the firm's experience in dealing with the new business. These items were included in line with the studies of Villalonga and McGahan (2005).

Relational capabilities. Relational capabilities refer to the firm's experience of coordinating with external partners. This variable was measured during the interview using two items adapted from the work of Wang and Zajac (2007). The researchers asked the managers to acquire information on the number of M&As and equity joint ventures the firm had engaged in over the last five years before the business expansion. *Relational capability* was measured by the sum of the number of M&As and equity joint ventures the interviewee disclosed.

The questions used to measure the items for similarity are shown in detail in Table 2.

Table 2 Measurements of variables

Antecedents and outcomes	Measurement
Resource tacitness	Interview questions: (1) The difficulty when observing and measuring the resources (2) Whether the focal firm could document the nature of resources objectively (3) Whether the resources could be communicated and transferred in writing
Resource interdependency	Interview questions: (1) How dependent were the firm's new resources on its existing resources? (2) How dependent were the firm's existing resources on its new resources?
Potential partners	Questionnaire (1=very limited; 7=abundant): How many potential partners were in the market when the firm decided to expand this business?
Environmental uncertainty	Questionnaire (1=totally disagree; 7=totally agree): (1) The external environment of the firm (such as economy, policy, and law) was unstable. (2) Predicting future environmental conditions was a big problem. (3) The company expected the market demand for this business would change greatly.
Resource similarity	Interview questions: (1) The richness of the firm's existing resources that could be used to establish new businesses. (2) The difficulty of using existing resources to establish the required resources. Firm's familiarity with the new business.
Relational capabilities	Interview questions: The number of M&As and equity joint ventures of the firm in the last five years before the business expansion.

Data Analysis with Fuzzy-Set QCA

This study used the fs-QCA method to explore the influence of six antecedents on firms' choices to expand new business through independent development, M&A, or equity joint venture. The fs-QCA method is a research method based on configurational perspective and set theory. It strives to integrate the advantages of case-oriented "qualitative" and variable-oriented "quantitative" analysis methods. According to the fs-QCA method, causality depends on specific situations and configurations, and it focuses on "multiple concurrent causalities" across cases, that is: 1) how a combination of multiple related conditions causes the result; 2) how multiple different condition combinations may produce the same result; and 3) how the existence or absence of a certain condition may cause the result. The fs-QCA method includes the necessity analysis of conditions on results and the sufficiency analysis of conditions on results, and it mainly focuses on sufficiency. It focuses on which conditions or combinations of conditions are sufficient conditions for the results.

Firms with similar capabilities may make different decisions under different resource characteristics and external environments. Moreover, different firms may make the same decisions under different environments and resource characteristics. The decisions of firms are affected and interacted with by multiple types of factors. Therefore, this paper uses fs-QCA to explore how resource characteristics, firm capabilities, and external environment affect firms' choice among independent development, M&A, and equity joint venture to expand new businesses in complex combinations and an interactional manner.

In order to achieve this goal, the data were analyzed three times. In the first analysis, the set of outcome variables consisted of independent development and non-independent development; in the second, the set of outcome variables consisted of M&A and non-M&A; and in the third, the set of outcome variables consisted of equity joint venture and non-equity joint venture.

Calibration of Set Memberships

In fs-QCA, all antecedents and outcomes in a case should be calibrated into set membership. The process transforms the primary data of antecedents and outcomes into set-membership scores. For example, a firm may have a high or low membership in the set of "high relational capabilities." Since antecedent and outcome data have distinct characteristics, we used different methods to calibrate the variables as follows.

First, due to the clear categories in the outcome variables, this study calibrated the outcome variables into crisp sets (either 1 or 0). In the first analysis, the outcome variables were internal development and non-internal development (in this study, non-internal development means M&A or equity joint venture), with internal development coded as 1 and non-internal development as 0. In the second analysis, the outcome variables were M&A and non-M&A (internal development or equity joint venture), with M&A coded as 1 and non-M&A coded as 0. In the third analysis, the outcome variables were equity joint venture and non-equity joint venture, with equity joint venture coded as 1 and non-equity joint venture coded as 0.

Second, since *resource similarity* was measured by qualitative data, as mentioned before, this study used a method called the Generic Membership Evaluation Template (GMET) to address the qualitative data in an fs-QCA. The method was first developed by Tóth et al. (2016) to support assigning fuzzy set values to qualitative data and therefore improve the transparency of the qualitative calibration process. As mentioned before, *resource similarity* was measured by relevant items to which the interviewees responded during the interview. Using the GMET, this study first carefully scrutinized and understood each interviewee's responses to the items designed to measure the variable, as mentioned above. In an interviewee's response to the items of *resource similarity*, for example (shown in Table 3), the membership is defined as high *resource similarity*. The first column of Table 3 shows the dimensions of items used to measure the variable, and the second column gives the context-specific description of the dimensions used in the interview.

Then, for each item, researchers determined the direction (column 3) and intensity (column 4) of each interviewee's response to the membership of each variable. The descriptions could relate either positively or negatively to membership of the set of "*resource similarity,*" which is specified in the direction/effect in the membership column. Moreover, the researcher could evaluate the intensity of each description as low, moderate, medium, or high. The descriptions differ in "weight" or relative importance within the narrative of the interview. Column 5 in the table shows the quotes to enhance case-specific understanding.

Third, the researchers evaluated the membership of the case in the "*resource similarity*" set, using a 6-value set which is indicated by a value between 1 and 0. The was followed by an explanatory section, that is, the "reason for the fuzzy-set attribution score." The score represents to what extent the cases studied were members of the set of a variable. "Full membership" (1) indicated that all the directions of the items were positive and the intensities were all above the medium. "Mostly but not fully in" (0.8) the membership indicated that most dimensions were positive, with the intensity above the level of low; only a few dimensions were positive with a low level of intensity. "More or less in" (0.6) the membership indicated that most dimensions were positive, with varying intensity; few were negative. "More or less out" (0.4) indicated that negative dimensions overrode positive ones but that some positive dimensions with above-low intensity were present. "Mostly but not fully out" (0.2) indicated that most dimensions were negative but some low-level positive dimensions were present. "Fully out" (0) indicated that all dimensions were of varying intensity in positive directions. GMET gives a structural way for researchers to evaluate the anchors of variables. The template developed in this method enables theory-informed decision making that is aligned with an in-depth qualitative approach.

Table 3 GMET for *high resource similarity*

GMET Case number: 1				
Membership of the "*high resource similarity*" set				
Overall case description from a relational fit perspective	The firm has rich engineering management experience that can be used for super-high-rise project management, but since contracting super-high-rise business in the U.S. requires rich social connections, it is difficult to build such resources through its own ability.			
Dimensions	Context-specific description	Direction/effect on membership	Intensity /relative importance	Illustrative quote(s)
The number of available resources	The richness of the firm's existing resources that can be used to establish new businesses	Positive	Moderate	Do we have any technical barriers? I thought about it carefully, but not really.
Resource similarity	The difficulty of using existing resources to establish the required resources	Negative	High	Before the M&A, we also had business in the U.S., but we still couldn't enter the field. If the Chinese want to carry out such a large-scale construction management project, no one really cares about them in the U.S.
Firm's experience	Firm's familiarity with the new business	Negative	High	We are not good at doing this. We had not contracted this kind of business in the U.S. before the M&A.
Set membership in a 6-value fuzzy set	0.4			
Reason for fuzzy-set attribution score	Various negative dimensions and a positive dimension with a moderate level of intensity can be identified (with an intense repudiation articulated of the similarity between the new operation and the firm's existing operations) to demonstrate that this case is "More or less out" of the set of "high *resource similarity*".			

Third, since *resource interdependency* was also measured by qualitative data, as mentioned before, this study used GMET to calibrate the qualitative data to determine membership of high resource interdependency. Details are given in Table 4.

Table 4 GMET for *high resource interdependency*

GMET Case number: 1				
Membership of the "*high resource interdependency*" set				
Overall case description from a relational fit perspective	The new business relies on the funds of the original business to obtain the payment guarantee of the contracted project, and the original business reduces the subcontracting price with the help of the new business, being mutually dependent.			
Dimensions	Context-specific description	Direction/effect on membership	Intensity/relative importance	Illustrative quote(s)
New resources' dependence on existing ones	How much dependence do the firm's new resources have on the firm's existing resources?	Positive	High	The new resources used the firm's funds to provide payment guarantees, some projects, HR functions, financial bookkeeping functions, etc. when conducting business
Existing dependence on new ones	How much dependence do the firm's existing resources have on the firm's new resources	Positive	Moderate	With the help of the new social resources, the firm reduced the price of subcontracting resources, which is of great help to the firm's original general contracting
Set membership in a 6-value fuzzy set	1			
Reason for fuzzy-set attribution score	All the dimensions are positive and the intensity of all was above medium, demonstrating that this case is a "full" member of the "*high resource interdependency*" set.			

Fourth, since *resource tacitness* was also measured by qualitative data, as mentioned before, this study used GMET to calibrate the qualitative data of membership of high resource tacitness. Details are shown in Table 5.

Table 5 GMET for *high resource tacitness*

GMET Case number: 1				
Membership of the “*high resource tacitness*” set				
Overall case description from a relational fit perspective	It is difficult to directly describe social resources, experiences, etc., and it is also difficult to observe and judge them. These resources are also difficult to state clearly in words.			
Dimensions	Context-specific description	Direction/effect on membership	Intensity/relative importance	Illustrative quote(s)
The difficulty of measuring the resources	The difficulty when observing and measuring the resources	Positive	High	It is difficult to directly describe what their experiences were
How well the resources are documented	Whether the focal firm can document the nature of resources objectively	Positive	Medium	The resources, or these things the firm wanted, were actually relatively vague concepts, which was equivalent to how much ability it had. When the ability is this kind of virtual ability, you can't use anything objectively to test it
How well resources can be communicated and transferred in writing	Whether the resources can be communicated and transferred in written	Positive	High	The required resources were not clearly listed in words
Set membership in a 6-value fuzzy set	0.8			
Reason for fuzzy-set attribution score	All the dimensions are positive, with two highly positive and a medium positive, indicating the case is “Mostly but not fully” in the “*high resource tacitness*” set.			

Fifth, to calibrate environmental uncertainty, this study used Ragins’s (2008) direct method of calibration, implemented in fs-QCA software. The approach is based on three qualitative anchors: full membership; crossover membership, which indicates the maximum ambiguity regarding membership of a case in the set; and full non-membership. The membership score is between 0 and 1. The researchers decided the anchors of each variable on the basis of their empirical and theoretical knowledge of the cases and context (Ragin, 2008). This study defined the anchors according to the recommendations of prior methodological research by Fiss(2011), Park et al.(2017), and Ragin(2008).

Environmental uncertainty was measured by a seven-point Likert scale. As the value of 4 in this scale indicates the set is neither "in" nor "out," this study defined 4 as the cross-over point. Since the value of 6 indicates a high level of satisfaction with the statement that the environmental uncertainty is high, and the value of 2 indicates a high level of dissatisfaction with this statement, this study defined 6 as the anchor of full membership in the high environmental uncertainty set and 2 as the anchor of full non-membership in this set. The level of environmental uncertainty of each case is the average of the three items used to measure the variable.

Sixth, this study used the same calibration method and anchors to calibrate the measurement of *relational capabilities*, as the variable was also measured by a seven-point Likert scale. The corresponding setting is a high level of *relational capabilities*.

Seventh, for the set of a high level of *potential partners*, since we measured the variable by accounting for the total number of each firm's potential partners in a case, this study defined the anchors according to the data distribution of all the cases. This study defined full membership as a number below the 10th percentile, crossover membership as a number just above the 50th percentile, and full non-membership as above the 90th percentile.

RESULTS

The results are shown in Table 6. A full circle means a condition is present, and a circle that is crossed out means the condition is absent. For example, the absence of high resource tacitness means that resource tacitness is not high (i.e., medium or low). A larger circle means the condition is a core condition, while a smaller one means it is peripheral. When no circle is shown in a condition, it means that the condition may be either present or absent.

Table 6 Results of the configurational approach

Antecedents		Non-internal development		Non-M&A	Non-equity joint venture
		A1	A2	B	C
Resource characteristics	High resource tacitness	•		•	●
	High resource interdependency	⊗	•		•
Environmental conditions	High number of potential partners	•	●	⊗	⊗
	High environmental uncertainty		⊗	●	•
The focal firm's resources	High similarity between new resources and the firm's resources	⊗	●	●	⊗
	High relational capabilities	•	•	•	•
Consistency		0.837	0.824	0.775	0.763
Raw Coverage		0.203	0.218	0.229	0.142
Unique Coverage		0.085	0.1	0.229	0.142
Overall Solution Consistency Overall Solution Coverage		0.84 0.30		0.77 0.23	0.76 0.14

When the result set was internal development, M&A, or equity joint venture, the consistency of the statement that the combination of antecedents is a subset of the result set was below the threshold of 0.75, which is suggested by Ragin (2008). The researchers exchanged the result set for its non-set. For example, in the non-set of internal development, firms did not choose internal development and may have chosen M&A or joint venture instead. In this case, the consistencies of all the configurational approaches were all above the threshold value (0.75).

Two configurational approaches, labeled A1 and A2, led to the choice of non-internal development or, in other words, to exclude the choice of internal development. In A1, the resources were in high tacitness and low interdependency. Firms' potential partners in the market were abundant. For firms' capabilities, firms had rich relational capabilities but lacked resources similar to the required new ones. In A2, resource dependency was high. There were abundant potential partners in the market and market uncertainty was not high. As regards capabilities, firms had high relational capabilities, and their existing resources had a high level of similarity with the required new ones.

As shown in Table 6, one configurational approach, labeled B, led firms not to choose M&A when looking for ways of obtaining new resource ownership. In this approach, resources had a high degree of tacitness. The number of potential partners for the focal firm was not high, and the market had high uncertainty. As regards firms' capabilities, firms had a high level of relational capabilities. Moreover, firms' existing resources had high similarities with new ones.

The approach labeled C in Table 6 led to the choice of a non-equity joint venture, indicating firms did not choose an equity joint venture. In this approach, resources had high tacitness and high interdependency. The market did not have a high level of potential partners for each focal firm and was highly uncertain. As regards firms' capabilities, firms' relational capabilities were not high and there was not a high similarity to the new resources sought.

DISCUSSION

As mentioned above, when a focal firm wants to obtain ownership of new resources, it has three main options to achieve that goal: internal development, M&A, and equity joint venture. Basically, the ultimate choice of the focal firm depends on multiple factors. This research is based on transaction cost economics and the resource-based view, and it focuses on resource characteristics, environmental conditions, and the firm's capabilities to investigate which configurations of antecedents, namely resource tacitness, resource interdependency, numbers of potential partners, environmental uncertainty, firm's relational capabilities, and similarity of firm's existing resources with the new resources, influence a firm's decision on how to obtain ownership of new resources.

As the results of this research show, when result variables were sets of internal development, M&A, or equity joint venture, the consistencies which demonstrate the statement "the set of the antecedent's combination is a subset of the result set" were all below the threshold of 0.75. Interestingly, when the researcher changed the result variables to non-internal development (any choice other than internal development), non-M&A (any choice other than M&A), and non-equity joint venture (any choice other than equity joint venture), the corresponding consistencies were all above the threshold of 0.75.

A1：Excluding internal development to avoid the high costs of learning from scratch

In the combination of antecedents of A1, resources have a high level of tacitness, leading to much obscure knowledge in explanations and communications. In this case, transferring knowledge and contracting with others will incur high costs (Eapen & Krishnan, 2019), bringing the focal firm some transaction risks. Meanwhile, the firm has rich relational capabilities to respond to external risks, learned and accumulated from former experience of M&As and equity joint ventures. Relational capabilities such as designing contracts, bargaining, and monitoring opportunistic behavior (Lin, 2018) can reduce the transaction costs due to resource characteristics. Coase (1972) supposed that when the similarity between transaction resources and the firm's own resources is low, the internal organizing costs will be high as the firm lacks experience and has to develop an organizational structure from scratch. As a result, if the firm chooses internal development to obtain new resources, it will incur many internal organizing costs. However, if the firm decides to obtain resources with the help of external partners through M&A or equity joint venture, it can effectively reduce the cost of organizational development within the firm.

Yang et al. (2010) hypothesized that when technological distance (the differences between the focal firm's existing technology and the new technology) is large, firms were inclined to choose internal development and avoid external relationships when looking for external resources because the high technical distance indicates that the firm is not familiar with new business and the transaction cost is high. This hypothesis is not supported by the result of their empirical data, but their result has similar indication as the result in this study. In this study, the configurational approach A1 shows that when the resource similarity is low (i.e., the technical distance is high), firms would not choose internal development because in this approach their rich experience of external investment can reduce the transaction costs. Also, there are many potential partners in the market which can reduce the opportunistic behaviors of partners by having the opportunity to exchange them. As a result, external transaction costs can be reduced but the low similarity means a high level of internal governance cost. Therefore, traditional research on the net effect of factors ignores the fact that corporate governance decisions are affected by various factors and does not fully consider the synergic influence of the latter.

In conclusion, the firm will exclude internal development when the internal organizing cost is high and external transaction costs can be reduced by the firm's relational capabilities.

A2: Excluding internal development to obtain resources rapidly

In the situation of A2, resources are highly interdependent, which may cause transactional risks to the firm because there will be more interfaces and negotiations between the two parties (Yeh et al., 2018). As regards the firm's capabilities, in this configurational approach, the firm has rich relational capabilities enabling it to deal with external transaction costs resulting from resource characteristics. At the same time, the firm already has similar resources to the new resources, which will help it to reduce internal organizing costs. Nagel et al. (2021) argued that such similarity can improve trust between partners, reducing difficulty and cost when drawing up a contract.

In this case, the cost for the firm to transact with an external partner and internal development is low in both cases. A firm that wants to carry out new business, however, especially in an environment with high uncertainty, prefers a choice that enables it to seize the opportunity and enter the new field rapidly. There are abundant potential cooperation partners in the market, showing that there are many suppliers in this field and possibly implying a high demand and increasing opportunity. The environmental uncertainty is low, indicating that the growth trend of the field is relatively stable. Tong and Li (2011) suggested that the level of growth opportunities in the industry can reflect the level of those related to corporate investment: Large growth opportunities indicate the high value of the underlying assets of the investment. At this time, firms can quickly grasp market opportunities by obtaining resources with the help of external forces. M&A and equity joint venture can help the firm achieve this goal. As a result, the firm will exclude internal development.

B: Excluding M&A to avoid resource redundancy and reduce investment risk

In configurational approach B, resources are highly tacit, the environment does not offer high numbers of potential partners and there is high uncertainty. Both resource characteristics and market environment bring certain transaction risks to the focal firm. In terms of ability, the firm has rich experience in external investment and thus the ability to deal with transaction risks. At the same time, firms have existing resources similar to the new ones sought, so the difficulty of internal development is low.

The high similarity between the firm's existing resources and the new ones indicates that firms already have relevant resources and capabilities for the new business. As M&A can cause the company to expand greatly, it may exhaust its resources and the company's resources may be redundant after M&A (Capron, 2016). Lee et al. (2011) believed that redundant resources may hinder the growth of firms. At the same time, with few potential partners in the market and high environmental uncertainty, the investment risk is large, and the uncertainty of return on investment is high. The M&A is a large one-time investment and irreversible; if it fails, it will bring great losses (Tong & Li, 2011).

Therefore, firms exclude M&A and consider the other two possible strategies. Using equity joint ventures, high similarity enables firms to leverage their high familiarity with the business to reduce the transaction costs in the process of cooperation and enhance the productivity of a contract or relational cooperation (Oh & Yoo, 2022). At the same time, equity joint ventures can allow firms to gradually invest and withdraw their capital at any time, reducing the risk of opportunism caused by fewer potential partners and high environmental uncertainty. By choosing internal development, firms can easily establish new businesses by taking advantage of the high similarity. The process of internal development is long and gradual, which also allows firms to take measures to deal with environmental uncertainty.

C: Excluding equity joint venture to reduce transaction costs generated from opportunism and frequent negotiation

In approach C, resources are highly tacit and interdependent. As a result, there are many interfaces when firms cooperate with external partners. The environment is highly uncertain and there are few potential partners. In this case, external partners are more inclined to show opportunism. In short, resource characteristics and the environment both bring many transaction costs to firms. As regards firms' capabilities, these are abundant, as firms have relational experience and can thus deal with transaction risks to some extent. Meantime, firms lack existing resources which are similar to the new ones sought, which means that they are not familiar with the business. In this case, although firms have a high level of interfirm transaction experience, it is difficult for them to deal with transaction risks arising from the uncertain environment and absence of potential partners. This result is consistent with existing research. Villalonga and McGahan (2005) found through analyzing empirical data that when the transaction risk is high due to high uncertainty and asset specificity, firms will prefer to choose a more integrated way of reducing transaction costs. Zhou and Wan (2017) suggested that when the interdependence between resources is high and the environment is highly uncertain, the need for frequent adjustment and negotiation between the two sides makes firms more inclined to act in a more integrated way. Configurational approach C leads to a high inclination among partners to show opportunism when obtaining ownership of new resources through equity joint venture. Firms will incur many transaction costs when trying to inspect opportunism, punish illegal actions, and hold frequent negotiations. Therefore, firms will not choose equity joint venture. Both internal development and M&A offer a high degree of integration of governance, helping firms to avoid the transaction costs caused by the high-opportunism tendency of partners when cooperating and the many negotiation processes when performing tasks.

Summary

The results show that when firms choose how to obtain ownership of new resources, they may not directly decide on one choice according to their situation. Rather, they take into account combinations of antecedents to exclude certain obviously inappropriate strategies, primarily because there are always similarities between each pair of choices, and in some situations, both choices may be suitable. To be specific, from a “making vs. buying” perspective, equity joint venture and M&A are ways of buying from external partners, and internal development is a way of making independently. Transaction costs differ between internal and external transactions, based on transaction characteristics (Yang et al., 2010). From a “different degrees of vertical integration” perspective, M&A and internal development are means of full integration, while equity joint venture is not. Resources do not fully belong to the focal firm. The cost of organizing an internal hierarchical system is different from the cost of managing interfirm relationships (Mahoney, 1992). From a “pace of investment” perspective, M&A means that the focal firm invests all at once, while equity joint venture and internal development enable firms to invest step by step, as the situation changes. A fast pace can enable the firm to focus on the field and seize opportunities rapidly, but it can also result in much risk (Tong & Li, 2011).

LIMITATIONS AND FURTHER RESEARCH OPPORTUNITIES

The research is not without some limitations. First, this study uses fs-QCA to integrate the advantages of the case-oriented “qualitative” method and variable-oriented “quantitative” analysis method, which entails high requirements for data collection. The case data collected in this paper include each firm’s background information, an analysis of the firm’s annual report, and interviews with relevant senior managers. This study also invited relevant senior managers to fill in a questionnaire. As this study was limited to the social resources to which the researchers had access, it collected case data from 30 Chinese companies, which may affect the generalizability of the results. If there are wider and richer data sources in future research, more cases can be included for analysis.

In addition, among the antecedents of this paper, those related to firms' capabilities and potential capabilities include external investment experience and the number of partners in the market, but firms have capabilities other than these two. Future research can further refine the type of firms' capabilities or include other kinds of capabilities to analyze their impact on firms' decision-making and how they interact with other factors.

CONCLUSIONS

This study has investigated three ways that firms choose to obtain ownership of new resources. The results show that when firms choose correctly, they exclude one strategy due to multiple antecedents instead of basing their decision about how to proceed on a single factor. This phenomenon is due to there being common advantages between each pair of two strategies of obtaining resource ownership; in some combinations of antecedents, both ways are suitable.

In summary, the results show that:

(1) When external transaction risk is relatively low, but internal development is difficult, which results in high independent development costs, M&A and equity joint venture can enable firms to avoid the higher costs incurred in internal development. In this case, firms will rule out internal development.

(2) When the cost of an external transaction and internal development are both low, and uncertainty in the environment is not high, obtaining resource ownership by developing

independently is a slower process than the other two ways. M&A and equity joint venture can help firms achieve their goals more rapidly, enabling firms to enter a new business field as soon as possible. In this case, too, firms will not choose internal development.

(3) If the environment is highly uncertain and the firm is familiar with the business which requires the new resources, M&A may cause resource redundancy in the focal firm. Firms will suffer more losses in an environment where there are many uncertainties. Therefore, the firm will choose internal development or equity joint venture over M&A.

(4) When the transactional risk is high because of resource characteristics and the market environment, equity joint venture can cause many interfaces among partners from different firms. As a result, it may cause higher transactional costs from negotiation, inspection, and dispute. Firms choose strategies with higher levels of integration to reduce transaction costs, such as M&A and internal development, and will thus not choose equity joint venture.

In conclusion, this study uses fs-QCA, which is a configurational approach, to investigate how resource characteristics, environmental conditions, and firms' capabilities influence firms' choice among internal development, M&A, and equity joint venture to obtain resource ownership. The results show that firms' governance decisions can be explained by both transaction cost theory and the resource-based view. The results offer a reference for multi-perspective decision-making for firms.

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