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The Relationship between Dynamic Capabilities, Marketing Capabilities, and Environmental Turbulence: An Empirical Study from China

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Abstract

This study proposes a model and attempts to illustrate the relationship between the frequency of dynamic capability utilization and marketing capabilities, and how market, technology, and competitor turbulence may affect these relationships. The findings suggest that in a highly turbulent environment, frequent use of sensing and integration capabilities may cause certain changes in the impact of marketing capabilities, and in a highly competitive environment, marketing capabilities are positively correlated with company performance. The sample consists of 212 enterprises of China with a three-year vertical data span. The partial least square program Smart-PLS was used for data analysis. The careful management of dynamic capabilities (i.e., relational, sensory, and inclusive) is required to address environmental conditions to achieve capacity alignment and ultimately enhance performance. Our findings demonstrate that relationship capabilities are valuable to the organization and might even help improve its sensing and integrating capabilities. In a highly competitive environment, marketing capabilities contribute the most to company performance. The more frequent the environmental turbulence, the higher the impact of integration capabilities on marketing capabilities. This situation necessitates the organization's usage of dynamic capabilities to modify its marketing approach effectively between stable and turbulent environments.

Keywords: Relational, Sensing, Integrative, Marketing, Dynamic Capabilities, Company Performance

JEL Classification Code: L10, M16, M31

1. Introduction

With strategic management theorists conceiving of the resources of enterprises as the basis of competitive advantage, the resource-based view (RBV) has become one of the most popular business growth approaches (Barney, 1991). The RBV addresses the concept of dynamic capabilities to explain how businesses adapt to fast changes in consumer requirements and business conditions (Turel et al., 2017). Scholars have indicated that a company's long-term competitive advantage is based on its ability to identify and integrate talent and

resources, as well as its dynamic capacity to innovate. (Camison & Villar-Lopez, 2014).

Businesses with strong dynamic capabilities are more successful in entrepreneurship through improving marketing capabilities and collaborating with other businesses. Dynamic capacities have been classified into several kinds in the literature. The DC dimensions in this study are compatible with Mikalef and Pateli (2017). The capacity to recognize, analyze, and seek possibilities in the environment is referred to as sensing (Pavlou & El Sawy, 2011). When an opportunity for innovation is identified, the company organizes and integrates both internal and external operational processes. The capacity to integrate individual knowledge into the unit's increased operational skills is referred to as integration (Pavlou & El Sawy, 2011). According to Czakon (2009), "relational capabilities are numerous, complex, heterogeneous, and equifinal," with governance, asset, knowledge management, value chain management, and other abilities, resources, structures, and processes as components (p. 60). Relational capabilities, in particular, include the capacity to absorb skills from others, integrate and connect the technical aspects of a vast number of businesses, and combine existing skills to

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produce new knowledge (Lorenzoni & Lipparini, 1999), learning and innovation, asset orchestration, bargaining, contractual competence, efficient governance, and incentive alignment (Teece, 2007). Within an organization, several antecedents of relational competencies can be identified. They are found in the willingness to devote resources, knowledge, and cooperation (Czakon, 2009).

In particular, the capacity to sense and integrate capabilities depends, through external and internal relations, on information, or the acquisition of resources. Therefore, in close relations with other companies, institutions, individuals, and internal employees, the relational capacity of companies has a fundamental role. We have acknowledged that networking and alliances have a significance to appreciate the dynamic of connections (Brass et al., 2004; Nohria & Garcia-Pont, 1991) and the necessity for additional investigation into the function played by these ties (Capaldo, 2007). Sensing abilities could detect a larger opportunity for change and creativity and then search for solutions (Gulati & Gargiulo, 1999). Whenever these companies feel the need for external solutions, their ties tend to assist them; relationship capacity enables constant internal and external contact, thus making it easier to obtain and share critical information and resources (Ingram & Inman, 1996).

McGrath and O'Toole (2008) describe relational competence as a firm's ability to interact proactively with a wide range of related players to intentionally exchange knowledge, develop possibilities, and improve joint processes, such as integration and innovation. Consequently, new dynamic capabilities are built on top of relational capacity. Therefore, the higher the level of relational competence, the better the sensing capability, absorptive capacity, and integrative capability work, allowing the creative process to be completed from beginning to end. In the past, studies on dynamic capabilities and their impact on marketing capabilities have been conducted but only a few studies are available on how relationship capacity indirectly affects the marketing capacity via other dynamic capabilities. By developing a new approach, this research will investigate the link between relational capabilities and other dynamic capabilities (sensing ability, integrative ability). We are attempting to discover and investigate how relational capabilities influence marketing capabilities indirectly by influencing other dynamic capabilities.

2. Literature Review and Hypothesis Development

2.1. Resource-Based View (RBV) and Dynamic Capability View (DCV)

The importance of firm position and resource advantage as a source of superior business performance in

competitiveness is emphasized by RBV. On the other hand, these fixed competitive advantages have been chastised for disregarding resource-related issues such as how resources are generated, integrated, and released within the company (Eisenhardt & Martin, 2000; Wade & Hulland, 2004).

DCV emphasizes resource and capability creation, adoption, and renewal of capabilities by using a process approach to connect enterprises' resources and the changing their business environment. It is thought that a company's long-term competitive advantages must include the ability to re-configure its current resources and capabilities to respond to technological change and the changing environment. Employees tend to enhance knowledge creation through the interplay of processes of information usage, self-reflection, and customer feedback, which ultimately increases management innovation results (Kittikunchotiwut & Siriyota, 2021). The RBV provides a set of necessary criteria to achieve competitive advantage, but it does not indicate how that advantage is achieved. Similarly, it does not go into great depth on how businesses get a competitive edge in a changing environment (Zhou & Li, 2010). According to researchers, DCV evolved from the firm's RBV, where RBV focuses on resource selection (choosing resource combinations) and dynamic capabilities focuses on resource renewal (integrate resources into new combinations of operational capabilities) (Pavlou & El Sawy, 2011). Traditional RBV underestimates the importance of turbulence in the environment; as a result, the DCV fills this gap as a more practical approach to deal with turbulence in the environment (Nevo & Wade, 2011; Pavlou & El Sawy, 2011). The DC perspective of the business provides an effective theoretical foundation to understand how organizations distinguish and compete, and how they develop and integrate their processes to retain their competitive advantages (Mikalef & Pateli, 2016).

Table 1 lists the features of the key writers who address DC in this study, including their personal definitions and the research model employed. Despite the lack of uniform terminology in the research examined here, the steps that make up the DCV are present in all models.

2.2. Hypothesis Development

2.2.1. The Fundamental Role of Relational Capability

Relational capabilities improve the capacity to communicate and exchange vital knowledge while seeking outside relationships (Lorenzoni & Lipparini, 1999). According to this the present study, a company's relational competency can aid in the adoption process in management innovation. Sensing possibilities, for example, is more likely to occur as a result of interaction within relationships and seeking current management processes outside of

Table 1: Literature Review

Years	Authors	Model for Dynamic Capability	Definition for Dynamic Capability
1997	Teece et al. (1997)	Build Integrate Reconstruction	Through the reconstruction of functional competencies, resources, and abilities, a company's capacity to access the market changes.
2002	Zollo and Winter (2002)	Generation Combination Reconstruction	A pattern of collective action in which an organization creates and adjusts its operational procedures to enhance its effectiveness.
2002	Zahra and George (2002)	Acquisition Assimilation Transformation Exploitation	The hunt for external information kicks off the interior rebuilding process. External knowledge is assimilated from basic knowledge, allowing for changes in primary knowledge and the exploitation of new chances for improvement.
2007	Wang et al. (2007)	Absorption Creation Storage Application	Changing, refreshing, and utilizing knowledge-based company resources are all part of a group of knowledge-management operations. The competitive advantage of a company is developed via constant modifications and enhancements to the company's knowledge base.
2011	Zheng et al. (2011)	Acquisition Generation Combination	Internal competencies are improved and adjusted by a process of seeking out and acquiring external information. This gained information encourages the creation of new knowledge inside the company, which is then integrated with the firm's knowledge base, resulting in changes.
2013	Denford (2013)	Creation Integration Reconfiguration Replication Development Assimilation Synthesis Imitation	The concept combines three aspects to produce eight capabilities: internal vs. external sourcing, exploration vs. exploitation emphasis, and combinative vs. absorptive capacity (p. 187).
2015	Han and Li (2015)	Sensing Seizing Reconfiguration	The framework suggests looking for new information that is either internal or external in origin. The organizational knowledge is absorbed and transformed from the obtained information, facilitating the reconfiguration of internal capabilities.

relationships, which is more likely to rely on relational abilities to acquire essential information. (Lin & Su, 2014). More information sources are available where there are because of diverse relationships that, satisfy the requirement for a diversified understanding of innovative management techniques (Lin & Su, 2014); in the hunt for a larger diversity of inflection points, even a huge number of weak interactions is valuable (Granovetter, 1973, 1985). To obtain additional information from partners, suppliers, and consumers, it is crucial to maintain and strengthen relationships with them (Sawatnarakul & Roopsing, 2021). Firms with strong relationship management skills may seek internal integration of significant diversity, such as management strategy innovation (McGrath & O'Toole, 2008).

Relational capability, according to McGrath and O'Toole (2008), comprises a company's capacity to connect proactively with a broad collection of related actors to intentionally communicate knowledge, develop opportunities, and improve collaborative processes such as integration and innovation. Relational skills thus serve as a foundation for other dynamic abilities; as relational competence improves, so does sensing and integrative capability, thus allowing the management innovation process to progress from concept to implementation. On this premise, the following hypotheses are proposed:

H1: *The relational capability of an organization positively influences its sensing capability.*

H2: *The relational capability of an organization positively influences its integrative capability.*

2.2.2. The Role of Sensing Capability

Sensing capability entails searching and exploring a variety of technologies and marketplaces (Teece, 2007). It symbolizes a company's potential to understand customers, competitors, and the overall market environment (Day, 1994). This ability may be demonstrated through many kinds of methods: maintaining connections with consumers, suppliers, and institutions; joining professional associations; and adhering to best practices. Following the detection of market possibilities, in reaction to market developments, the company may need to restructure its capabilities to match the changing environment (Jantunen et al., 2005; Teece 2007). Firms that often utilize sensing procedures can increase their market knowledge and comprehension of both unexplored markets and their current client base (Slater & Narver, 2000). An enterprise's sensing capabilities may have an influence on the whole adoption process in management innovation. They can also help a company to minimize uncertainty and seize opportunities by predicting issues and suggesting solutions at various stages of the process (Gebauer, 2011). As a result of this research, companies can begin evaluating management practices, conduct an outside search, sense potential risks and rewards of innovations in proposal establishment, perceive employees' attitudes toward adopting management practices, predict progress and effectiveness of the innovation, and make any necessary management innovation adjustments using sensing capabilities. The following hypothesis was developed on the basis of this premise:

H3: *The sensing capability of an organization positively influences its marketing capabilities.*

2.2.3. The Role of Integrative Capability

O'Reilly and Tushman (2008) suggested that companies with operational competencies can gain competitive advantages for a limited time, but that long-term success requires re-allocating resources and transitioning from established to new and expanding business sectors. By increasing communication and cooperation among various individuals or functional units, resource integration capabilities improve an enterprise's coordinating flexibility. It can not only make it easier to absorb new techniques and information from outside sources, but it can also help to propagate such techniques and knowledge throughout an organization.

Teece (2007) suggested that if the assets cannot be absorbed from external opportunities, the company must develop its own dynamic capability. When it comes to specialized duties, resource integration capacity improves

an organization's coordination flexibility by facilitating communication and collaboration across various individuals or functional units. The enterprise becomes more focused and capable of bringing market-changing ideas to fruition. Furthermore, by integrating new external techniques and experience with what the enterprise already possesses, new market knowledge applications will be even more efficient. New products might be created to satisfy client demands, thereby resulting in improved performance. As incentives arise throughout the company, market breakthrough innovation will be more noticeable. The following hypothesis is presented on this basis.

H4: *The integrative capability of an organization positively influences its marketing capabilities.*

2.2.4. Moderating Roles of Environment Turbulence (Market, Competitor, and Technological)

Under steady conditions, frequent sensing and the addition of knowledge reserves to operational capabilities are expected to have fewer favorable effects. Moreover, stable settings tend to encourage the continued use of established talents (Leonard-Barton, 1992; Teece, 2007), meaning that integrative marketing capability is likely to occur only when there is a capacity gap. In more stable circumstances, the favorable relationship between the frequent usage of dynamic skills and marketing capacities will vanish (Schilke, 2014). When confronted with fierce competition, businesses must adjust their capabilities to capitalize on opportunities and mitigate dangers (Makadok, 2001). On account of the increased causal uncertainty in such situations, sensing and integration have become more useful. Teece (2007) contends that at greater levels of technological turbulence, dynamic capabilities become more essential because businesses must integrate numerous discoveries and recombine existing technologies.

Marketing capabilities may help companies to decrease the uncertainty created by technological turbulence (Li & Calantone, 1998). The importance of frequent scanning for a firm's marketing skills increases with a result of growing technological turbulence (Calantone et al., 2003). Therefore, we predict that when there are fluctuations in the market, competition, and technological environment, the frequency of sensing and integration will be more closely related to marketing capabilities than in a stable environment. The more unpredictable the environment, the higher the organization's management structure should be (Fuadah, 2021). As previously stated, companies use enterprises' dynamic capabilities on a more or less regular basis to define the integration of their marketing and/or technology skills and to create a viable remedy to a capacity gap. The following hypotheses are presented on this basis.

H5: Greater (market, competitor, and technological) turbulence positively moderates the relationship between sensing and marketing capabilities.

H6: Greater (market, competitor, and technological) turbulence positively moderates the relationship between integrative capabilities and marketing capabilities.

The research framework of this study is illustrated in Figure 1.

3. Research Methods

3.1. Sampling and Data Collection

Since 1978, China has become the world’s top manufacturing country and one of the major producers of goods and services. To attain and sustain great performance in the dynamic and competitive environment of economic transformation and upgrading, Chinese enterprises must nurture dynamic skills, expand domestic consumption, expand the international market, and promote new industrialization. Using information on the official website of the Ministry of Commerce of China, we selected more economically developed companies in the central and eastern regions of China as the survey subjects. From this list, we selected 1,000 companies with a business life of no less than three years and no fewer than 20 employees as our sampling frame. We randomly selected 300 out of 1,000 firms as the targets of our questionnaire. We used the Tencent questionnaire as our survey tool and sent questionnaires to target companies through WeChat and email. The target respondents for the questionnaire were the company’s managers and internal company personnel with a good understanding of the company’s operations. At the very least, the respondent had to have the ability to make a credible and factual evaluation of the organization’s

operating conditions. It took the respondents a approximately three weeks to the complete the questionnaire. We believe that if the time limit for answering the questionnaire had been extended, we might have received more responses. In total, 249 questionnaires were completed, and 212 (85 percent) were deemed valid. Invalid questionnaires were so mainly due to the following reasons:

- (1) Fewer than 83 percent of the total questions were answered.
- (2) The answers to all the questions under a certain construct topic were almost the same.

3.2. Measurement of Variables

Measurement models are classified as either reflecting or formative when operationalized (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001). To decide on which model to use, we followed the logic of Jarvis et al. (2003) and conducted an in-depth review of related research and pre-testing with senior management. This study used validated scales, especially those obtained from empirical investigations, to verify the reliability and validity of the measuring instruments. To measure enterprise-scale (total assets and total revenues) and factors including environment turbulence, dynamic capability, and marketing capability, a seven-point Likert scale was used.

Relational capability: Relational capability was based on the studies of Adler and Kwon (2002) and Subramaniam and Youndt (2005). We summarized the operational definition as an effective external network with a central position, a close relationship with the government and institutions, cooperative relationships with other firms, an effective internal network, and a trust-based internal network.

Sensing capability: The construction of sensing ability is realized from previous research, such as that of Wang and

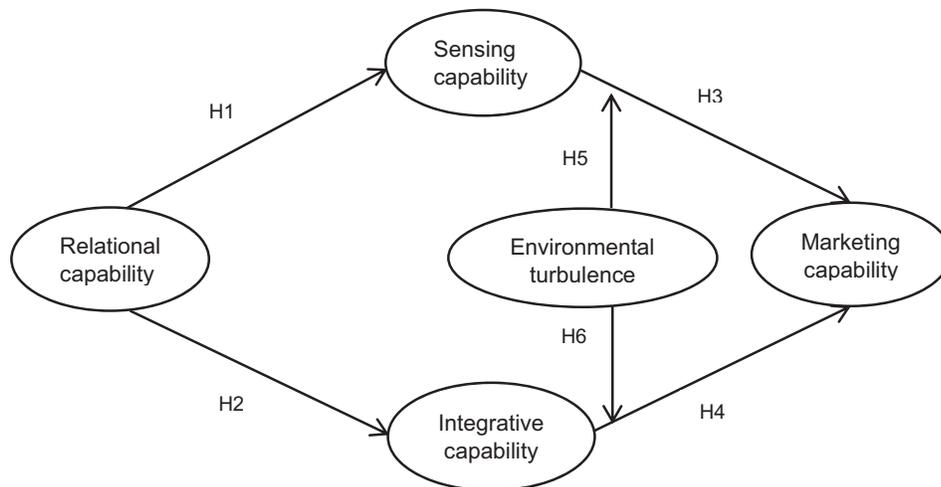


Figure 1: Research Model

Ahmed (2007) and Wu et al. (2012). Therefore, we summarized the operational definition as manager's experience and knowledge, the number of paths for information transmission from external changes, and the number of paths for bottom-up information transmission, information selection, new opportunity detection, and response.

Integrative capability: Integrative capability is based on Kogut and Zander (1992) and Liao et al. (2009). We summarized the operational definition as resource identification, a system for resource transfer, and the effectiveness of vertical and horizontal communication and cooperation.

Marketing capabilities: Marketing capabilities are based on DeSarbo et al. (2005). We summarized the operational definition as market knowledge renewed on time, control and access to distribution channels, advantageous relationships with customers, and established customer base. We asked respondents to assess the strength of their company's marketing capabilities in comparison to those of rivals in 2021 (on a seven-point reflecting interval scale ranging from "strongly disagree" to "strongly agree"), and the amount of development over the preceding three years.

Environmental turbulence: We assessed the speed and frequency of technological change, the scope of technological opportunity, and the difficulty of technological forecasting in determining technological turbulence. Changes in consumer preferences, ease of anticipation marketplace changes, and shifting customer bases were used to measure market turbulence. The competitive turbulence index measures the overall level of competition, the intensity of promotion and price wars, companies' capacity to match competing offers, and the rate at which competitors move. The real index is based on the reflecting scales developed by DeSarbo et al. (2005). Three questions were used to measure each of the three aspects, with "strongly disagree" and "strongly agree" as anchors.

4. Results

A PLS analysis was used to provide the findings of an exploratory path model that contains a number of hypothesized associations and the total variances of the composite components (Hair et al., 2013). Structural equation modeling (SEM) can estimate and assess the models mentioned above using the given data. PLS-SEM appears to be a feasible alternative to covariance-based SEM (CB-SEM) for developing theoretically justified cause-effect connection models (Hair et al., 2012, 2013). PLS-SEM and Smart-PLS 3.0 were used in this investigation (Hair et al., 2012, 2013). PLS-SEM guidelines were followed (Gudergan et al., 2008; Hair et al., 2012, 2013; Reimann et al., 2010; Sarstedt et al., 2014). The study used a two-stage evaluation method: (1) measurement model assessment (outer model), and (2) structural model estimate (inner model) and hypothesis testing.

First, to evaluate the quality of the measuring instruments for constructs, a confirmatory factor analysis was performed to examine the reliability, convergent validity, and discriminant validity of all components in the model. The PLS composite reliability estimate, which reflects construct internal consistency, was used to establish construct reliability. Second, convergent and discriminant validity were determined using factor loadings and average variance extracted (AVE) scores. Convergent validity, which is computed using item loadings, is a measure of how closely a collection of items shares a substantial amount of variance.

4.1. Assessment of the Measurement Model

The study employed a reflective measuring approach for all components since the indicators of each construct were connected and interchangeable (Hair et al., 2013). Stage 1 of the research involved establishing the constructs' reliability and validity. The findings are summarized in Table 2.

Model fit measures

A model's overall goodness-of-fit (GoF) should be the basis for model evaluation. The data contain more information than the model when the model fails to match the data. Global model fit can be assessed in two non-exclusive ways: by means of inference statistics, that is, so called tests of model fit, and through the use of fit indices, that is, an assessment of approximate model fit (Lee et al., 2021). The standardized root mean square residual is good if < 0.08 (saturated model: 0.063, estimated model: 0.078)

The chi-square value of a PLS path model with df degrees of freedom, assuming a multinormal distribution, is $(N - 1) * L$, where N is the number of observations and L is the maximum likelihood function as given by Lohmoller (1988). The degree of freedom (df) is defined as $(K2 + K)/2 - t$, where t is the number of independent variables used to estimate the model's implied covariance matrix and is the number of manifest variables in the PLS path model (saturated model: 701.251, estimated model: 735.735).

Normed Fit Index is good if > 0.90 (but using this measure is rare, so it is often not reported).

Indicator reliability

Table 2 shows that individual indicator reliability levels (i.e., loading²) are more than the minimum allowed level of 0.4 and around the recommended level of 0.7 for all indicators, except for MT-1 for Environment turbulence (0.268) and TT-2 for Environment turbulence (0.047) which had adverse effects on the construct measures' convergent validity and internal consistency reliability. Therefore, they were deleted.

Table 2: Results Summary for Reflective Outer Models

Variables	Indicators	Loadings	Indicator Reliability	Composite Reliability	Average Variance Extracted
Relational capability	RC-1	0.799	0.638	0.897	0.636
	RC-2	0.752	0.566		
	RC-3	0.767	0.588		
	RC-4	0.831	0.690		
	RC-5	0.835	0.697		
Sensing capability	SC-1	0.811	0.658	0.904	0.652
	SC-2	0.826	0.682		
	SC-3	0.785	0.616		
	SC-4	0.823	0.677		
	SC-5	0.792	0.627		
Integrative capability	IC-1	0.764	0.583	0.891	0.673
	IC-2	0.826	0.682		
	IC-3	0.832	0.692		
	IC-4	0.855	0.731		
Marketing capability	MC-1	0.845	0.714	0.876	0.639
	MC-2	0.751	0.564		
	MC-3	0.823	0.677		
	MC-4	0.776	0.602		
Environment turbulence	CT-1	0.644	0.414	0.870	0.522
	CT-2	0.700	0.490		
	CT-3	0.750	0.562		
	MT-1	0.518	0.268 (<0.4 Deleted)		
	MT-2	0.739	0.546		
	MT-3	0.705	0.497		
	TT-1	0.714	0.510		
	TT-2	0.219	0.047 (<0.4 Deleted)		
	TT-3	0.798	0.637		

Internal consistency reliability

PLS-SEM proponents (Hair et al., 2012, 2013; Sarstedt et al., 2014) have proposed using ‘composite reliability’ instead of ‘Cronbach’s alpha’ to evaluate internal consistency dependability. Hair et al. (2013) defined values between 0.60 and 0.70 as “acceptable in an exploratory study,” values between 0.70 and 0.95 as “adequate to good,” and values over 0.95 as “problematic.” All the numbers in Table 2 were > 0.6, thus indicating internal consistency dependability.

Convergent validity

Convergent validity assesses how well a concept converges with its indicators by using the Average Variance

Extracted (AVE) to explain the variance of the items. All construct AVE values were higher than the threshold of 0.5 permitted by Hair et al. (2013).

Discriminant validity

To prove discriminant validity, Fornell and Larcker (1981) recommended that the square root of the AVE for each latent variable must be greater than the correlation values with all other latent variables. Table 3 indicates that discriminant validity has been proven for all the components based on the correlation matrix. Discriminant validity determines the extent to which a construct is empirically distinct from the other constructs in the path model.

Table 3: Discriminant Validity

Formell-Lacker Criterion	Relational Capability	Sensing Capability	Integrative Capability	Marketing Capability	Environment Turbulence
Relational capability	0.798		–	–	–
Sensing capability	0.835	0.807	–	–	–
Integrative capability	0.756	0.790	0.820	–	–
Marketing capability	0.733	0.729	0.782	0.800	–
Environment turbulence	0.591	0.564	0.637	0.652	0.665

4.2. Estimation of the Structural Model

Collinearity

Collinearity was investigated using variance inflation factor (VIF) values. The VIF values for all independent variables varied from 1 (relational capability) to 3.295 (integrative capability), thereby suggesting that collinearity had no effect on the outcomes because they were all < 5 . (Hair et al., 2013).

Figure 2 shows the measurement model of this research (RC, relational capability; SC, sensing capability; IC, integrative capability; MC, marketing capability; CT, competitor turbulence, MT, market turbulence; TT, technology turbulence). Moderating Effect 1 represents *Hypothesis 5*, and Moderating Effect 2 represents *Hypothesis 6*.

Figure 2 also shows the results from the bootstrapping procedure (212 cases, 5000 samples, no sign changes option). The R^2 for the dependent variables of marketing capability revealed that the three dynamic capabilities explained 68.7% of the variance in the dependent variables. The R^2 values for sensing capability and integrative capability indicated that relational capability explained 69.7% and 57.1% of their variance, respectively.

Despite the low percentage, bootstrapping findings showed that relational capability had a positive and significant impact on the other two capabilities. Figure 2 and Table 4 indicate that relational capability had the strongest effect on sensing capability ($\beta = 0.835$, $p < 0.000$, $t = 29.532$), followed by integrative capability ($\beta = 0.756$, $p < 0.000$, $t = 16.120$). Therefore, H1 and H2 were strongly supported. Integrative capability had the strongest positive moderating effect on marketing capability ($\beta = 0.447$, $p < 0.000$, $t = 5.586$), followed by sensing capability ($\beta = 0.245$, $p < 0.000$, $t = 3.556$). Hence, H4 was moderately supported, and H3 was weakly supported.

The results show that the first four hypotheses were supported. We now focus on the last two hypotheses: environmental turbulence's moderating impact on the connection between dynamic and marketing capacities. Environmental turbulence weakly moderates the relationship between sensing capability and marketing capability

($\beta = 0.195$, $p < 0.05$, $t = 2.276$), and environmental turbulence weakly moderates the relationship between integrative capability and marketing capability ($\beta = 0.160$, $p < 0.1$, $t = 1.869$). Hence, H5 and H6 are supported.

5. Discussion and Conclusion

5.1. Effects of Dynamic Capabilities on Marketing Capabilities

This study contributes to the research on managerial marketing capabilities and how they are influenced by sensing and integrative capabilities. First, the dynamic capability perspective was combined with strategic marketing capability research. We discovered that dynamic capabilities, as indicated by sensing and integrative processes, have a favorable influence on marketing capacities, which in turn have a large positive effect on company performance. Second, our findings provide a better understanding of how environmental turbulence affects organizational capacity. We concur with the emerging notion that, regardless of turbulence, dynamic capabilities exist in all environments (Zahra et al., 2006). Firms in unstable settings may profit from the usage of dynamic capabilities on a regular basis to keep their marketing and technology capabilities competitive.

We can conclude that when the level of environmental turbulence is at three different degrees, the degree of influence of sensing capability and integrative capability on marketing ability is different. Environmental turbulence moderates the relationship between sensing capability and marketing capability. When the environmental turbulence becomes more frequent, sensing capability affects marketing capability insignificantly. However when the environment changes more slowly, marketing ability is strongly affected by the sensing capability. This phenomenon is the opposite of another moderating relationship. As the environment changes with increasing frequency, integrative capability increasingly strengthens marketing ability. Rather than focusing on the direct effects of environmental turbulence on dynamic capabilities and assessing its possible moderating effect, we find that the effects of sensing and integrative

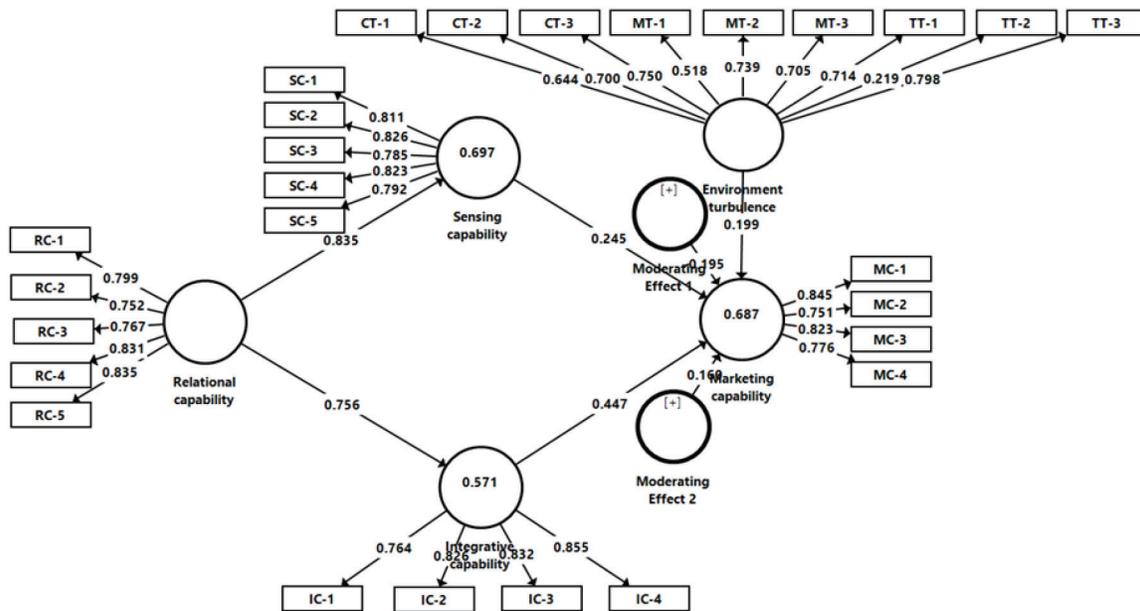


Figure 2: Measurement Model

Table 4: Hypothesis Test Results

Hypothesis	Path Coefficient	t-value	p-value	Supported	Standard Deviation (STDEV)	Original Sample (O)	Sample Mean (M)	f square
H1: Relational capability → Sensing capability	0.835	29.532	0.000	Yes (Strong effect)	0.028	0.835	0.834	2.304
H2: Relational capability → Integrative capability	0.756	16.120	0.000	Yes (Strong effect)	0.047	0.756	0.757	1.331
H3: Sensing capability → Marketing capability	0.245	3.556	0.000	Yes (Weak effect)	0.069	0.245	0.246	0.070
H4: Integrative capability → Marketing capability	0.447	5.586	0.000	Yes (Moderate effect)	0.08	0.447	0.445	0.193
H5: Moderating Effect 1 → Marketing capability	0.195	2.276	0.023	Yes (Weak effect)	0.085	-0.195	-0.19	0.034
H6: Moderating Effect 2 → Marketing capability	0.160	1.869	0.062	Yes (Weak effect)	0.086	0.16	0.15	0.026

capabilities (i.e., dynamic capabilities) on marketing capabilities are both negative and positive, regardless of the degree of market, competitive, and technological uncertainty.

When environmental turbulence becomes more frequent, the influence of perception ability on marketing ability becomes weaker, and the correlation between frequent perception ability and marketing ability is not very strong.

Therefore, under frequent environmental turbulence, perception ability after reaching a certain level will no longer continue to exert an important influence on marketing capabilities. As we have verified, integration capabilities play an increasingly important role in the improvement of marketing capabilities in the case of frequent changes in the external environment. For businesses functioning in

competitively dynamic contexts, the beneficial impacts of sensing and integrative capability on marketing capabilities, and therefore their worth, are higher. When companies face fierce competition, integrative capability has a much greater link with marketing skills.

The relational capability of an enterprise determines how many resources and how much information can be obtained from the outside, which affects the sensing and integrative capabilities of the organization to a very large extent. When a firm has stronger ties with external partners and other related organizations and has a central position in the relationship network, the enterprise generally obtains external information in a timely manner and perceives changes in the external environment. Close contact with the outside can promote the perception and acquisition of new knowledge and abilities by the enterprise. Moreover, close and effective internal communication networks are more conducive to the transmission and integration of information within the enterprise. We also show that specific configurations of capacities are subject to goals that may alter market, technical, and competitive volatility (Miller & Chen, 1994).

5.2. Managerial Implications

Our results have interesting practical implications. Managers who aim to harmonize marketing capabilities in their companies with the changing market environment should realize that the careful management of dynamic capabilities (i.e., sensing and integrative) is essential in the context of environmental conditions to achieve capability alignment and ultimately performance improvement. Our findings indicate that managers must consider the specific turbulence source that affects their company because sensing and inclusive processes improve and differently align marketing capability with environmental turbulences, depending on the turbulence source.

Our study further shows that marketing capabilities impact the use of sensing and integrative processes by a company. Resources are not intrinsically superior to the development and utilization of sensory and integrative capacities. Sensing ability will no longer have a positive impact on marketing ability after the external environmental turbulence reaches a certain peak and may have a negative impact on marketing ability as the environment changes more drastically. On the contrary, when the external environment changes more frequently, the company's integration capabilities will have a more important positive impact on marketing capabilities.

5.3. Limitations and Directions for Further Research

The subject of our survey was only 249 companies, the data subject of analysis was only 212 companies, and the

longitudinal span of the data we surveyed covered only three years, so this is not a very strong data result. As the data collection process varies for different industries, an industry cannot be described as a typical. Moreover, the companies are located in different regions of China, so they cannot be used as a model for any particular region to analyze the causal relationship between dynamic capabilities and marketing capabilities.

Our statistics are cross-sectional and only cover certain companies; therefore, caution should be taken when drawing conclusions about cause and effect. Thus the data should not be construed as unambiguous proof of causal links. To strengthen the underlying linkages, research may include industry-specific analyses to strengthen the underlying links. Considering the nature of these linkages, we also suggest that further insights may arise from research into changing marketing capabilities resulting from market sensing and integrative skills over time. Studies on longitudinal data should also examine how the dynamic skills that underlie dynamic deployment frequency are self-enhancing. In addition, although we have made a significant effort to validate our building systems and gather our data, there is still a possibility of non-identified bias in assuring the quality of our self-reported survey data.

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