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# Managerial cognition: the sources of sustainable competitive advantage in hypercompetition

## A case study

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### Abstract

**Purpose** – Based on the theory of bounded rationality, the purpose of this paper is to explore the role played by top managerial management cognition in firms' efforts to obtain and maintain competitive advantage in a dynamic environment.

**Design/methodology/approach** – A research framework of the relations between environment changes, management cognition, strategic actions, organizational capability evolution and organizational performance is built. Data are collected through interviews, internal documents, and external documents and consequently a qualitative database is built to construct a causal map between environment, cognition, strategic actions, and organizational capability. Then by applying this causal map, a case study analysis of Vanward Group is carried out to explore its management cognition, strategic actions, and organizational capability in a dynamic environment.

**Findings** – The research propositions were tested and confirmed that top managerial management cognition is of bounded rationality and in dynamic environment it exerts direct and critical effect on their firms' strategic actions and organizational capability. Further discussion is extended to the roles played by institutional factors in organizational strategic decision process and the roles of top management in organizational dynamic capability.

**Research limitations/implications** – The generalizability of this paper's conclusions to other firms is to be tested by large sample quantitative research.

**Practical implications** – The research confirms the bounded rationality perspective in strategic management, and explores in depth the formation, evolution, and functions of top management cognition in a dynamic environment. It also emphasizes the non-economic factors related to the continuous acquisition and maintenance of competitive advantages in a dynamic environment.

**Originality/value** – The paper releases the economic assumptions underlying industrial structure theory and resource-based views by emphasizing the effect of top management cognition on organizational strategic actions and organizational capabilities. It further enriches the institution-based view by illustrating how institutional environment affects top management cognition and consequently affects the changes in organizational strategic actions and organizational capability. Thus, the institutional context for organizational strategic decision making is emphasized. The paper contributes to research in dynamic capability by emphasizing top management roles in developing dynamic capability.

**Keywords** Competitive advantage, Managers, Cognition, Strategic management, China

**Paper type** Research paper



How do enterprises acquire and maintain competitive advantage in hypercompetition? The existing theories place emphasis on the effect of strategic behavior (Caves *et al.*, 1984; Porter, 1980) and the particular resources and capabilities (Wernerfelt, 1984; Barney, 1991; Eisenhardt and Martin, 2000). However, some researchers consider the effect of top managers in acquiring and maintaining competitive advantage. Then they relaxed the economic assumption of structure view and resource-based view (RBV). Hamel and Prahalad (1994) pointed out that the cognition factor of managers should be paid more attention in researching uncertain and complex managerial problems. It means that researchers should make clear a presupposition that top managers are bounded rationality in researching the competitive advantage in hypercompetition.

Focusing on the idea of boundary rationality, we explored the mechanism that the cognition of top managers affects the process of acquiring and maintaining competitive advantage. There are three sub-questions: the theoretical study of managerial cognition based on the view of boundary rationality; why and how managerial cognition affects strategic behavior, then affects the acquiring and maintaining of competitive advantage; and why and how managerial cognition affects the evolution of organizational capability then affects the acquiring and maintaining of competitive advantage.

The problem involved contextuality and dynamics: the process of enterprises' development and acquiring competitive advantage is dynamic (Helfat *et al.*, 2007). Statistics study at a point of time is not suitable for the research into how and why enterprises conduct the adjustment of strategic behavior and the evolution of organizational capability, because it involves adjustment to the changes of environment. The shaping and development of managerial cognition is situational. Affected by the characteristic of environment (Nadkarni and Barr, 2008), it is necessary to study managerial cognition combined with the characteristic of environment and enterprises. For this, we must explain that: how the environment changes; when environment changes, and the case study is suitable for researching on the interactive relationship between enterprise and environment (Yin, 1994).

Referring to the general principle, procedure, and method of case study, we should: propose the theoretical framework by initially studying existing literature based on defining specific problem; construct an isotropy researching database by interview, internal material and literature; based on the isotropy database, construct the cause-and-effect diagram about environment, cognition, behavior and organizational capability; and verify the proposition by cause-and-effect diagram, and refine researching discovery.

## 1. Research framework

### 1.1 Boundary rationality and top manager's managerial cognition

Compared to, top manager's boundary rationality is prominent in hypercompetition environment. In a static environment, changes of environment are linear and predictable (Eisenhardt and Martin, 2000; Bogner and Barr, 2000). The industry structure is relatively static. Top managers can get complete information easily. However, all of these have changed. Top managers cannot understand the environment clearly and deeply, because of the fast, unpredictable and non-linear changes, the vague boundaries of the market and non-determinacy of participators.

Therefore, top managers must understand the environment, construct strategic problems and make decisions by managerial cognition. "Managerial cognition" in this

paper is the pattern that is formed in the long-term process of business. This pattern, so-called cognitive schema, causal schema or mental models, depends on the perspective and understanding that is found by the experiences before. And it is based on the manager's knowledge and experience and has the characteristic of repeatability. Essentially, it is a kind of pattern, and is called "cognition pattern", "cognition inertia" (Walsh, 1995). Being the cognition pattern of managers, managerial cognition involves the knowledge structure of managers, how managers use this knowledge to think, and the behavioral standard.

Owing to the selectivity of cognition, top managers always pay attention to the environmental changes which they have noticed, and neglect those which they have not noticed. What impacts the decision making is not the original information but the information that was selected and processed by managerial cognition. Therefore, due to the dynamics of environment and the boundary rationality, top managers simplify the characteristic of external competitive environment based on managerial cognition, then make strategic decisions based on it:

- P1.* In a hypercompetition environment, the boundary rationality of strategic management mainly reflects on the boundary rationality of top managers; and it impacts the process of simplifying the characteristics of an external competitive environment, and strategic decisions made based on it.

### *1.2 Managerial cognition and strategic behavior in a hypercompetition environment*

Decision making needs necessary information and logic. From the perspective of boundary rationality, top managers are concerned about, understand and respond to environmental events, then impact strategic behavior. The ways that managerial cognition impacts strategic behavior are:

- *Information searching.* Managerial cognition provides the standard that top managers perceive, focus, and understand information (Nadkarni and Narayanan, 2007).
- *Information diagnosis.* Managerial cognition provides the interpretive mode of information, and decides how the information will be understood, and whether it will be listed on the strategic schedule (Dutton and Jackson, 1987).
- *Behavior choice.* Managerial cognition simplifies the complexity of the relationship among factors and forms the special casual relationship between factors and behavior (Weick, 1979).

In addition, managerial cognition affects the effectiveness of an enterprise's strategic action (Nadkarni and Narayanan, 2007). Managerial cognition will cause cognition inertia. If the attention focus of top managers is too concentrated, strategic behavior will be restricted by strategic pattern past of past. Then top managers will exclude acquiring new knowledge and implementation of new strategy (Reger and Palmer, 1996). In a hypercompetition environment, the more factors top managers pay attention to, the more adaptive an enterprise will be:

- P2.* In a hypercompetition environment, managerial cognition of top managers is the intermediary between environmental changes and strategic behavior;

changes of strategic behavior depend on changes of managerial cognition, not changes of environment.

### 1.3 Managerial cognition and evolvement of organizational capability

Managerial cognition is the main factor that promotes capability forming (Gavetti and Levinthal, 2000; Gavetti, 2005; Schreyogg and Kliesch, 2007). Managerial cognition forms the dominant logic and cognition inertial (Gavetti and Levinthal, 2000), then causes the trend of convention strengthening, then promotes the concentrating of capability. In a hypercompetition environment, the key to acquiring and maintaining competitive advantage is to focus on the dynamic mechanism of convention (Schreyogg and Kliesch, 2007). Managerial cognition reaches the objective of organizational capability evolution by reinforcing the “behavioral convention” of dynamic capability. Dynamic capability is one kind of organizational capability, and essentially is one kind of routine. The dominant logic and cognition inertial is formed by emphasizing product development, resources reorganization, knowledge innovation, external study of the perspective of managerial cognition, and then constructing dynamic capability by the trend of capability reinforcement. Dynamic capability can detect, control, revise and develop capabilities by the capability development model (Schreyogg and Kliesch, 2007), then complete the process of organizational capability evolution:

P3. In a hypercompetition environment, the evolution of organizational capability also depends on changes of cognition.

In sum, managerial cognition of top managers impacts the strategic behavior and evolutionary of organizational capability; who then acquires and maintains competitive advantage? We construct a research framework to reflect the relationship among managerial cognition, strategic behavior, and organizational capability in a hypercompetition environment.

Figure 1 is the theoretical model of the relationship among managerial cognition, strategic behavior, and organizational capability. The innovation of this model is that: based on structure theory and RBV, managerial cognition is introduced and becomes intermedia. Its significance is: we loosen the economic assumptions of perfect information and complete rationality of decision maker. And it mainly reveals the effect

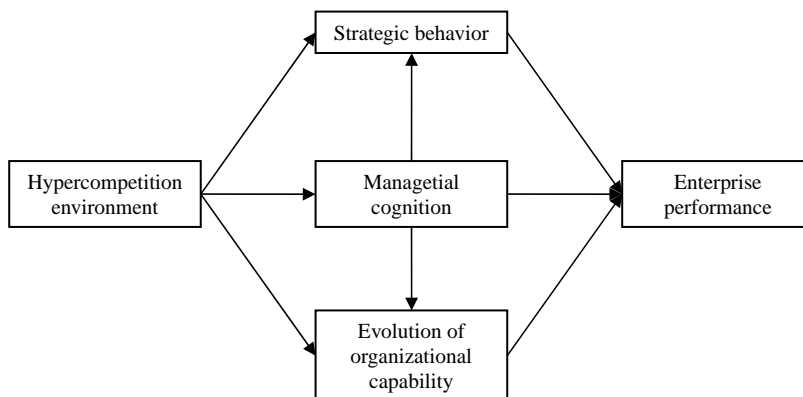


Figure 1. Theoretical model of the relationship among managerial cognition, strategic behavior, and organizational capability

of boundary rationality and managerial cognition of top managers in a hypercompetition environment, and how managerial cognition impacts strategic behavior and the evolution of organizational capability. The key points are that in a hypercompetition environment:

- the boundary rationality of strategic management mainly reflects on the boundary rationality of top managers;
- the changes of strategic behavior depend on the changes of top managers; and
- the aim of evolution of organizational capability can be reached by top manager reinforcing the “behavior convention”.

## 2. Research design

### 2.1 Enterprise choice

Based on the research problem, the chosen enterprise must: be in complex and multivariant environment; been founded more than ten years (Baron and Bielby, 1980); be a non-diversified enterprise (Nadkarni and Barr, 2008); and have obvious competitive advantage compared to competitors in the same industry.

Based on these standards, we choose Vanward Group, the most successful enterprise in the gas heater industry. There are two points which must be considered:

- (1) *The characteristics of the gas heater industry.* Since the first gas heater was produced in China in 1979, there were four periods in this industry, involve direct emission, mandatory emission, balance, cooling. In this industry, technology changes very fast, and so does product update. From the perspective of industrial competition, the competition of this industry is stiff. All of these meet the demands of this research.
- (2) *Typicality of the sample.* Vanward Group was founded in the time of the “Big four” monopoly in 1993. Its produces updates very fast. It quickly developed in the competitive environment. Especially after strategic adjusting in 2006, Vanward Group developed at the rate of 35 percent per year, even in the period of financial crisis. Ultimately, it became the benchmark in the industry. Since it is found, developed in gas heater industry, the income of gas heater sales makes up 70 percent of its total revenue, which meets the demand for a non-diversified enterprise. The development of Vanward Group reveals that it is appropriate to the problem of sustainable development in a fast-changed industry. It has the characteristic of typicality and particularity, which meet the demands of case study (Pettigrew, 1990).

### 2.2 Data collection

We restored the historical events, studied how Vanward Group acquires and maintains competitive advantage in a hypercompetition environment by interview, researched internal texts of Vanward Group and reviewed external literature such as internet, media and periodicals. From July 2008, the research team interviewed with the related staff of Vanward Group face-to-face or on the phone. Moreover, the internal material of Vanward Group is a source of data, especially its internal newspaper *Vanward Paper*. The development of Vanward is recorded in this newspaper. In addition, we collected reports and second-hand data about the development of the gas heater industry, Vanward Group and its competitors by internet, media, and periodicals. Then, the isotropy research data were formed.

### 2.3 Reliability and validity

(1) *Construct validity*. We guarantee construct validity in three ways. First, multi-sourced triangulation: we acquired data sources from interview, internal texts from Vanward, external literature to ensure the multitude of data. Second, construct evidence chain: based on interview and data analysis, we defined managerial cognition, strategic behavior and the evolution of organizational capability of Vanward Group by causal map and time series research to make the data have the characteristics of continuity and logicity. Third, we had conversations with the managers of Vanward to ensure the phenomena in the paper.

(2) *Internal validity*. We state the possible theory, and construct research model and series of propositions. Then, we analyze whether the theory, proposition, and research data matched to ensure internal validity of this research.

(3) *External validity*. We reported the research result to the students of MBA and EMBA, and had discussions with them about the case. The result got support of most of them.

(4) *Reliability*. We constructed a database comprising the recordings and documentation of interviews, internal Vanward data, external data, and journal articles to increase reliability of this research (Yin, 1994).

### 2.4 The way and procedure to construct causal map

This research involves the development process since Vanward was founded in 1993, and need to explore the causality between factors. Therefore, the key of this research is how to analyze case data more clearly and logically. Based on the suggestion of Weick (1979), we construct the causal map about managerial cognition of Vanward, strategic behavior and evolution of organizational capability on the base of analyzing the case data; then based on the causal map, we analyzed the case deeply. In this way the research will be more systematic and the process and result can be verified. We construct the causal map following Axelrod's (1976) method:

- identify related sentences;
- draw original graph;
- classify theories by existing theoretical framework; and
- amend causal map.

The difference between the causal map in this paper and that of Nadkarni and Narayanan (2007), Nadkarni and Barr (2008), and Eggers and Kaplan (2009) is that we reserve detailed information in every sentence in the final causal map for further analysis.

## 3. Case analysis and discussion

We constructed the causal map about environment, managerial cognition, strategic behavior, and evolution of organizational capability in the manner of Axelrod (1976). In this process, the Kendall modulus of related sentences is  $W = 0.79$ ; original map is  $W = 0.85$ . The Kendall modulus of theoretical framework is  $W = 0.87$ . All of these mean that this research is reliable.

To verify research proposition, we analyzed the case from three aspects. We explore:

- (1) The formation and changes of managerial cognition of Vanward to make clear the meanings of boundary rationality in a hypercompetition environment.

- (2) The strategic behavioral characteristic in the same environment and different managerial cognition, and the characteristic in different environment and the same managerial cognition, then analyze the effect of managerial to strategic behavior.
- (3) The relationship between managerial cognition and formation and evolution of dynamic convention and static convention, to analyze the effect of managerial cognition on evolution of organizational capability.

*3.1 The formation and evolution of managerial cognition and construction and answer to strategic problem of Vanward*

*3.1.1 Formation of managerial cognition at Vanward Group.* As depicted in Table I, the formation and evolution of managerial cognition of top managers in Vanward is impacted by the technological and institutional environments.

(1) The original managerial cognition is determined by the individual character and background of top managers in Vanward. The formation of managerial cognition of Vanward Group is impacted by the individual character and background of top managers. Vanward was found by Lu Chuqi in 1993. He, so-called “legend of guizhou”, is obsessed with technology and has much experience of technology. In 1987, Lu Chuqi invented the technology of pulse ignition lighter, and became the supplier of MACRO. In 1992, he invested yuan 600,000 to develop the first ultra-thin automatic water-controlled gas heater in China. Compared to other gas heaters in China, this kind of gas heater is more advanced, safe, and convenient. The technological background of Lu Chuqi and his obsession with technology make the cognition focus on “technology innovation” since Vanward was founded.

(2) Good performance in the early stage strengthens the cognition of technology innovation. When the new product of Vanward entered the gas heater market, its sales exceeded yuan 100 million. In 1994, Vanward developed a strong ultra-thin row of 10

2000-2004	<ul style="list-style-type: none"> <li>(1) The profits and survival space of gas heater industry are restricted</li> <li>(2) Large appliance companies entered the industry</li> <li>(3) The challenge from international brands after joining the WTO</li> </ul>	Searching for new profit growth point	OEM Focus on serilizer Enter the industry of small kitchen appliance Enter the industry of car parts and chemistry	The same cognition decides the same strategic behavior in different environment
Since 2004	<ul style="list-style-type: none"> <li>(1) The price of raw material increases</li> <li>(2) Energy crisis</li> <li>(3) Changes of consumer demand</li> <li>(4) Strengthening of government restrictions</li> <li>(5) Financial crisis</li> </ul>	Acquiring the constant capability of profit	Setting up three technical centres Brand Channel	Different cognition decides different strategic behavior in the same environment

**Table I.**  
Characteristics of environment, managerial cognition, and strategic behavior since 2000

liters microcomputer automatic gas water heater which was the first one in China and reached the international advanced level. This product was listed as national “Star and Fire Plan” again and 430,000 were sold in a year. Owing to technology innovation, the production and sales of Vanward doubled per month from August 1993 to August 1994. The company became one of the top three companies in the industry. Vanward considered the huge market space from technology innovation was owing to success at the early stage, and treated it as the key weapon of company. Vanward set up technology innovation as the company standard, further strengthening the cognition of “technology innovation”.

(3) Consumer demand and the effect of national law made top managers of Vanward emphasize the quality and safety of their products. Owing to the potential safety hazard of direct-delivered gas heaters, the gas heater industry suffered a hard shock. The substitution of gas heater-electric water heater was seen as reliable by consumers because of its safety, and occupied more market share. On May 1, 2000, the government announced a new law of “banning”. The sales of direct-delivered gas heaters was forbidden. The gas heater industry shrank completely.

The shrinking of the industry restricted the fast development of Vanward. Top managers of Vanward considered the key problem was the potential safety hazard. Therefore, they paid more attention to the quality and safety of gas heaters. This shows that the characteristic of environment impacted the managerial cognition of Vanward, which emphasizes on safety and quality of products based on technology innovation.

### *3.1.2 The first change of managerial cognition at Vanward.*

(1) The entrance of large appliances companies and international brands, decline in profits of the gas heater industry and feedback of bad performance make managerial cognition transfer from product focusing to finding new profit growth points. At the beginning of the twenty-first century, due to over-competition in the large appliances industry, large appliance companies began to find high-profit industry. Large appliances companies like Hair, Kelon, and Midea entered the gas heater industry strongly, and occupied certain market share. Moreover, with China entering the World Trade Organization (WTO), gas heater enterprises also faced the challenges of international brands.

The competition in gas heater industry was increasingly intense due to large appliances brands, international brands, and industry brands. The profits and survival of Vanward were being eroded due to its single product. The developing speed was declining compared to that at its beginning. Especially in 1999-2001, the developing speed declined from 100 percent at the beginning to about 10 percent. Top managers of Vanward considered that they must find a new profit point beyond the gas heater industry to maintain high speed development. The managerial cognition of Vanward transferred from focusing on technology and quality of products to paying attention to how to find a new profit point beyond the gas heater industry.

(2) The diversification behavior of a benchmarking enterprise. The focus of finding new profit point was reflected in the causal logic of “opportunity-pluralism”. The diversification thinking of Vanward was impacted by the behavior of benchmarking – the diversification of competitors. At the end of 2000, Hair stepped from electric water heaters to gas heaters, and further developed solar water heaters. Also, MACRO, the benchmarking enterprise in the same industry, began to diversify. The diversification behavior of these benchmarking enterprises strengthened the belief in diversification.



Therefore, Vanward was searching for opportunities outside the industry, entered a more profitable industry to acquire high profit.

### 3.1.3 The second changes of managerial cognition at Vanward.

(1) The feedback of bad performance, the changes in characteristics of technology and institution environment lead to negation of existed cognition. From 2001 to 2003, based on the idea of diversification and the cognition of “searching for a new profit growth point”, Vanward developed multi-direction. The performance increased 50 percent a year. However, the development was restricted in 2004, and especially in 2005. The feedback of bad performance made top managers of Vanward begin to think about whether there was anything wrong in their developing idea.

Therefore, top managers of Vanward began to research the environment characteristics to consider their cognition. By market investigation and study, Vanward believed that the characteristics of the market involved: first, as the price of raw materials increased constantly, so did the cost of gas heater factories; second, it is energy crisis; third, consumer demand weakens the price of products. Instead, consumers paid more attention to brand, function, service, appearance; fourth, the government strengthened the restrictions, and carried out the standard of efficiency forcibly to enhance the technical threshold. Based on these market characteristics, the existing managerial cognition of Vanward could no longer maintain high speed development.

(2) Intervention of external experts promoted the formation of new cognition of Vanward. All of above made top managers of Vanward consider that existing cognition could no longer maintain development. In 2005, Lu Chuqi asked “will Vanward exist in the market after five years?” He invited external experts to answer this question. After evaluating the resources and capabilities of Vanward, experts considered that Vanward must transfer their thinking from price competition to value competition, from “searching new profit growth point” to “acquiring the constant capability of profit”. And Vanward should pay attention to technology, brand and channel based on capability. Intervention of external experts promoted the formation of new cognition at Vanward. Since 2006, Vanward began to pay attention to “the capability of constant profit”, freed themselves from the strategy of diversification, transferred to strategic focus, and concentrated on production of gas appliances.

3.1.4 Managerial cognition impacts the focus and understanding of top managers to external environment. The strategic problem and the logic to answer the problem is formed based on it. Managerial cognition decides the focus and understanding of top managers to external environment. The strategic problem and the logic to answer the problem is formed based on it. We listed managerial cognition, strategic problems, and the basic logic of answer to these problems by stages.

As depicted in Table II:

- From 1993 to 2000, based on the cognition of “focusing on the function of produce”, Vanward focused on environmental characteristics like technological development, the quality standard of government and industry and changes in consumer demands, and constructed the strategic problem of how to develop fast by single products. Moreover, the basic logic of the answer to this problem was formed under this cognition, which was high technology, high quality, good service, and low cost.
- From 2000 to 2006, the cognition of Vanward transferred from “focusing on the function of products” to “searching for new profit growth point”. This change led

to the transfer of the strategic problem from “how to develop fast by single product” to “how to develop fast when the profit of single product was declined”. And the basic logic of strategic problem is diversity.

- Since 2006, Vanward’s cognition transferred to acquiring constant capability of profit. They paid more attention to economic circumstances, public policy, the nature of the gas heater industry and the characteristics of consumers. The strategic problem of Vanward is how to “become the leader of gas heater industry and construce the base of gas appliance manufacturer in the world”. The basic logic of answer to the problem is value competition, focusing on technology, brand, and channel.

All of above supports *PI*. The theoretical revelations are listed below:

*Revelation 1.* In a hypercompetition environment, top managers are not rational men in the hypothesis of economics, but are boundary rational. That reflects that managerial cognition of top managers decides understanding to the environment, then decide construction of strategic problem and answer to strategic problem. However, the cognition of top managers changes, and is impacted by technical and institutional factors in the environment. When the environment changes, top managers should change their managerial cognition on their own initiative to adapt to the changes of the environment. In this way can they acquire constant competitive advantage.

*3.2 The relationship among environment, managerial cognition, and strategic behavior*  
Changes in environment, cognition, and strategic behavior since 2000 are listed in Table I.

*3.2.1 The same cognition leads to the same strategic behavior in different environments.* Based on the difference of environment, the period since 2000 is divided into two stages: first, from 2000 to 2004. The characteristic of this stage is that the profit and survival space of the gas heater industry is restricted and large appliances companies and international brands entered the gas heater industry; second, since 2004. The characteristics of this stage are that the price of low material increased continually, the energy crisis, the financial crisis, changes of consumer demand, and the strengthening of government restrictions. We found that from 2000 to 2006, though the environment changed tempestuously, the strategic behavior stayed the same owing to the same managerial cognition.

Stage	Managerial cognition of top managers	Strategic problem	The basic logic of answer to this problem
1993-2000	Focusing on the function of products	How to develop fast by single product	High technology, high quality, good service, low cost
2000-2006	Searching for new profit growth point	How to develop fast when the profit space is restricted	Diversity, international
Since 2006	Acquiring constant capability of profit	How to become the leader of gas heater in China	Value competition, focus on technology, brand and channel

**Table II.**  
Managerial cognition, strategic problem, and the basic logic of answer to this problem

*3.2.2 Different cognition leads to different strategic behavior in the same environment.* Since 2004, the characteristics of this stage are that the price of raw material increased continually, the energy crisis, the financial crisis, changes in consumer demand and the strengthening of government restrictions. Owing to Vanward's change of cognition, the strategic behavior of Vanward is different. As depicted in Table II, from 2004 to 2006, based on the cognition of "searching for new profit point", Vanward entered the unfamiliar industry of auto parts and plastic processing; in 2006, Vanward set up the cognition of "acquiring the constant capability of profit", then abandoned the strategy of diversity and focused on promotion of product value, which is reflected by: strategic adjustment – they concentrated resources on the core of gas heaters, prioritizing gas heater products; brand promotion; constant innovation of gas heater technology; and promotion of consumer value. The strategic behavior after 2006 met the environment characteristics. The sales increased 35 percent in 2006 and 40 percent in 2007. Even when the retail sales of gas heaters only increased 0.38 percent in China in 2008, Vanward sales increased 35 percent. The phenomenon shows that different cognition leads to different strategic behavior in the same environment.

The above analysis supports *P2*. The theoretical revelations are listed below:

*Revelation 2.* In a hypercompetition environment, changes in strategic behavior are decided by changes of managerial cognition, not directly by environment. In a hypercompetition environment, the key to adjusting to the environment is changes of top managers' cognition. The validity of responding to the environmental changes is decided by cognition.

### *3.3 The relationship between managerial and evolution of organizational capability*

*3.3.1 The cognition of focusing on innovation led to shaping of Vanward's dynamic convention.* From formation of Vanward Group, the cognition of innovation was set up. The cognition of focusing on innovation made Vanward form the capabilities of technological and managerial innovation. Active exploration of management innovation: as a private enterprise, Vanward Group began to reform its family business operation mode by adopting corporation mode, and achieved establishing an ownership structure of internal control of share holding and external share owning. Consequently, it realized a governance mode of family ownership and socialized operation and thus solved creatively the dilemma of development and security of private enterprise. Vanward was early in the industry to employ professional managers and thus promote scientific management, and to realize zero liability by funding through issuing shares to outsiders.

*3.3.2 Dynamic convention of Vanward leads to evolution of static management.* The theory of dynamic capability believes that dynamic convention shapes and prompts the evolution of static convention to adjust to the continually changing environment and acquire constant competitive advantage (Schreyogg and Kliesch, 2007; Wang and Ahmed, 2007). The case of Vanward gives evidence of the point, as shown below:

- Technical innovation and the technical advantage at the early stage of Vanward: at the early stage when Vanward was founded, Vanward had the innovative capability of breakthrough technologies.

- Managerial innovation and the capability of cost control: Vanward acquired the capability of cost control by managerial innovation.
- Technical innovation, managerial innovation, and the capability of quality and safety: Vanward strengthened the safety and quality of gas heaters by improved capability of technical innovation. This capability is shown in the development of new products, and continuous improvement of product quality and product function.
- Technical innovation and technical advantage of gas heater: after 2005, the capability of technical innovation infiltrated to all gas heater products of Vanward, and shaped the capability of permeability innovation; Vanward integrated the technical force inside or outside the enterprise, and shaped the capability of integrative innovation by the mode of production-study-research. Based on the three technical centers, Vanward shared no affect to develop the core technology related to energy saving, environmental protection, and emission reduction.
- Managerial innovation and capabilities of brand and channel: after cognition changes in 2006, Vanward enhanced the capabilities of brand and channel by managerial innovation.

Analysis above supports *P3*. The theoretical revelations are listed below:

*Revelation 3.* In a hypercompetition environment, evolution of organizational capability is decided by changes of managerial cognition and the evolution of organizational capability is made by top managers strengthening the behavioral convention. In a hypercompetition environment, the strengthening of and changes to behavioral convention are the key to organizational capability adjusting to changes of environment: the strengthening of behavioral convention prompts the formation of dynamic capability; when managerial cognition changes, the boundary resource is impelled to concentrate to where top managers pay attention to. Then organizational capability that adjusts to the environment is formed.

#### 4. Conclusion and suggestion

Based on the causal map, we analyzed the effect of managerial cognition to strategic behavior and evolution of organizational capability in a hypercompetition environment by studying the case of Vanward.

##### 4.1 Basic conclusions

*Conclusion 1.* In a hypercompetition environment, the boundary rationality of strategic management reflects on the boundary rationality of managerial cognition of top managers; managerial cognition of top managers is critical to strategic behavior and evolution of organizational capability. Top managers are boundary rational.

The bounded rationality perspective in strategic management emphasizes the roles played by top management cognition in organizational strategic actions and the evolution of organizational capabilities in a dynamic environment (Bogner and

Barr, 2000). Specifically, in a dynamic environment, top management has bounded rationality and can neither have perfect cognition of the environment, nor a completely predict others' behavior. However, the evolution of organizational strategic actions and capability rely on top management cognition. Management cognition informs top management of what information is important, what information to attend to, what strategy is recognized by its environment, what actions other members in its field will take, and whether its own actions will be supported or opposed by the public. These help top management to analyze and interpret the happenings and its environment, and prompt them to make decisions and take effective actions:

*Conclusion 2.* In a hypercompetition environment, changes of strategic behavior are decided by changes of managerial cognition, not directly by changes of environment. The validity of responding to the environmental changes is decided by cognition.

By applying bounded rationality to the industrial structure theory, it can be discovered that top management cognition plays a very important role in the relation between organizational strategic management and its environment (Eggers and Kaplan, 2009). Namely, it is not environment characteristics, but management cognition that acts on organizational strategic actions in a dynamic environment, and a firm's strategic response to environmental changes depends on top management cognition change. Firm strategic adjustment is decided by the entrepreneurs, but what affects the firm operation is never the objective environment or resources, the perceived environment or resources. Based on their perception of the environment characteristics and changes, entrepreneurs make and compare different decisions. Thus, top management cognition limits their search and understanding of environment, and consequently it is not environment, but top management cognition that affects a firm's strategic actions:

*Conclusion 3.* In a hypercompetition environment, evolution of organizational capability is decided by cognition and the evolution of organizational capability is made by top managers strengthening the behavioral convention.

By applying bounded rationality to the RBV, it can be discovered that top management cognition plays a very important role in organizational capability development. This is, to some degree, a response to the researches of Gavetti and Levinthal (2000), Gavetti (2005), and Augier and Teece (2009). Vanward Group's case shows it is Vanward top management's focus on innovation and the nurturing of it, leading technological and management innovation capability, that helps it to respond effectively to abrupt environmental changes by cultivating new capability.

#### 4.2 Extended discussion

*Discussion 1.* There are two ways that determine institutional factor impacting strategy: impacting strategic decision as an external factor; and being internal force, institutional factor internalizes in managerial cognition to impact strategic decision. This is the basic internal logic of strategic management of sociology.

Peng (2002) proposes the institution-based view of strategic management by stating that strategic choice is not only determined by the industry situation and firms' specific resources, but also top management reactions to the formal and informal institutional factors. Besides industrial competition, firm resources and capability, institutional environment becomes an exogenous variable for firm strategy. However, Meyer *et al.* (2009) ask, "by what means do institutions affect the change of firm strategy?" Based on sociological theories and bounded rationality, this paper proposes that institutional factors are endogenous variables and their regulatory, normative, and cognitive factors are internalized in top management cognition and thus they affect firm strategic decisions:

*Discussion 2.* Top managers occupy an important position in the research framework of dynamic capability. Managerial cognition of top managers plays a basic role in developing dynamic convention, selecting and developing static convention, and bringing evolution of organizational capability into correspondence with changes of environment.

This paper's conclusions are similar to those of Augie and Teece's (2009) research. For a long time, the dynamic capability theory has not integrated top management and ignored the managerial factors in capability evolution. Research shows the roles played by top management should be integrated into the dynamic capability research framework. Top management cognition is an important part of dynamic capability. Top management cognition propels the evolution of dynamic capability by emphasizing and shaping dynamic customs, and change in management cognition is the source of organizational adaptation to environmental changes. In sum, top management cognition plays a fundamental role in nurturing and developing dynamic customs and in choosing and developing static customs to align firm capability evolution with environmental change. In a dynamic environment, management cognition inertia leads to organizational strategic action inertia and capability rigidity. To conclude, changes in management cognition are fundamental for firm strategic flexibility and organizational capability evolution in a dynamic environment.

#### 4.3 Innovation and limitation

We make clear the point of boundary rationality in strategic management, proposed the propositions then verified them. Further, we revealed the formation, change and effect of managerial cognition in a hypercompetition environment. We highlighted the non-economic factors in acquiring and maintaining constant competitive advantage in a hypercompetition environment. The conclusion loosened the hypothesis of structure theory and RBV, emphasizing the effect of cognition on strategic behavior and organizational capability.

The paper also enriches the research of institution basic theory, resolving the problem of how institutional environment impacts the changes of strategic behavior. We believe that institutional environment impacts changes of strategic behavior and evolution of organizational capability by impacting cognition of top managers. And the paper depends the institutional basic based on it.

The conclusion of this paper reveals that the role of top managers should be highlighted in the research of dynamic capability. We should expand the framework of existing research on capability, providing advice to future researchers.

The limitation of the paper is that we have not verified the universality of conclusions. Whether our conclusions are applicable to other enterprises needs further large sample data research.

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