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Do Chinese Pharmaceutical Companies Compete With Intellectual Capital?--Evidence from 2001 to 2013

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Abstract

Is Chinese pharmaceutical company behavior like a high-tech companies in market competition? This paper empirically tested data of Chinese pharmaceutical firms from 2001 to 2013, and found out that: dislike high-tech companies, Chinese pharmaceutical firms have more perception to adopt normal but frequent competitive actions rather than highly innovative moves, and they prefers to start attack or respond basing on tangible resources similarity rather than intellectual capital. The test found out only medium Chinese pharmaceutical firms perhaps have more interests on innovation and adopt deviance moves.

Keywords: Pharmaceutical company, Resource Similarity, Competitive actions.

1. Introduction

High-tech companies have, comparing to other traditional companies, a special advantage basing on their high-tech and innovative resources and capabilities. In resource-based view, heterogeneous resources and capabilities consist of firm's sustained competitive advantages[1]. Therefore generally speaking high-tech industry occur competitions which associated with technology and products innovation. But Chen (1996) argued that, firms decide to attack or respond to their competitors basing on two characters, market commodity and resources similarity[2]. For market commodity, theories in market structure have proved its reliability, while resources similarity, since Chen argued, has seldom empirically examined. Chinese pharmaceutical industry, which relates to the safety and health of the nation, are high controlled by the government. Bureaucratic and policies system makes Chinese pharmaceutical firms don't have much choice in technological and products innovation. Most of Chinese pharmaceutical firms, especially SOEs, prefer to product in big scale those medicines which are almost authorized in other countries, or making Old Chinese medicines modernization. These will bring Chinese pharmaceutical firms backwards to traditional manufacturing industry, rather than a high-tech one. This paper, with testing data from Chinese successful pharmaceutical firms which listed in the Chinese stock market, attempted to analyze the competitive actions of Chinese pharmaceutical firms, and its association with the strategic resources of firm, the intellectual capital which representing the innovative capabilities, or the tangible resources.

2. Literature Review

2.1Competition Dynamics

Competition dynamics refers to "the process of inter-action in which a (few) firm(s) adopting a series of competitive actions causes responds from its competitors, and the responds also bring more responds for the former firm(s) " [3]. Theories of competition dynamics believe that, corporate strategies are dynamics. While choosing actions, a firm should consider the responds by its competitors. Therefore, firms should attack with deviance competition to make competitors hard to respond. Competitive deviance refers to firm competitive behavior's difference on combination and implement with competitors in the same period and industry[4]. It is the extension of competitive behavior complexity on dimension of industry. Researchers find that when firms compete in a way of strategic combination, firms enhancing the behavior diversification in strategic combination is beneficial to obtain unique competitive advantages, making competitors unprepared and unable to response[5]. However, there is few present research involved with the issue that what kind of organizational model can help firms effectively launch diversified competitive behaviors.

2.2Intellectual capital and Resources Similarity

Since late 1990s professionals and researchers in management began to attempt to define the IC components, there has been no generally accepted definition or classification of IC[6]. Stewart (1997) defined IC simply as "packaged useful knowledge"[7]. Edvinsson and Malone (1997) enriched the definition to "knowledge that can be converted into value"[8]. Researchers, by case studies and empirical surveys, found out that acquiring IC can help to enhance capabilities of organizational learning and innovation. Reed et al. (2006)[9] developed an IC-based theory that IC is en effective and efficient way to help firm achieve value added, and have higher performance. Thus IC is viewed as a strategic resource, which is the basis of firm gaining competitive advantage and superior financial performance.

3. Hypothesis

Competitive actions are the ones results to advantages, not resources and capabilities, even though the former are based on the latter. Scholars of competitive dynamics believe that the more frequently a firm brings out competitive actions, the more aggressive it is in the competitive market. And also, the more different the action adopted, the harder its competitor to respond. So higher deviance makes firm easier to gain advantages and build boundary for that advantages.

H1a: Frequency of actions has positive influence to performance.

H1b: Competitive deviance has positive influence to performance.

As Chen's (1996) theory, the strategic resources of two firms would prefers to attack and respond to each other basing on the sources similarity. If their strategic resources are highly similar, they are not prefers to start attacking and responding, but if their strategic resources are not highly similar, actions between them are easy to be started. Therefore, we put forward this theory and test: 1)in Chinese pharmaceutical industry, whether intellectual capital or tangible capital are the strategic resources that the similarity of which are sensitive to the competition and the performance; 2) whether resource similarity theory are reliable to decision of competitive actions, such as a firm should be frequently or differentially adopt action basing on the resources similarity to its competitors.

H2a: Similarity of intellectual capital has moderating effects between frequency of actions and performance.

H2b: Similarity of tangible capital has moderating effects between frequency of actions and performance.

H2c: Similarity of intellectual capital has moderating effects between competitive deviance and performance.

H2d: Similarity of tangible capital has moderating effects between competitive deviance and performance.

4. Research Designs and Results

4.1Data Gathering

This paper applied content analysis[4] for gathering and coding data about competitive actions and repertoire. This paper chose 13 Chinese pharmaceutical firms listed in Shanghai or(and) Shenzhen stock market as sample. Data from their annual reports and media reports since 2001 to 2013 (totally 169 samples of each firm in each year) are gathered, coded, and analyzed. Following the former studies[5], this paper categorized competitive actions into 8 types: investment or merger, cooperation and allies, proposing new products, proposing new technology, opening new store or entering new market, changing organizational structure or marketing system, changing prices, and taking public relationship activities.

4.2Variables:

Dependent Variable. This paper chose ROA as the index of dependent variable, the performance.

Independent Variable. 1)Frequency of Action: this paper calculated the frequency of each type of competitive action in each year of each pharmaceutical firms. 2)Competitive Deviance: according to the calculation method by former researchers[4], this paper adopts the formula as follows:

$$deviance = \sum_{i} (p_i - \overline{p_i})^2 \quad (2)$$

Where p_i represents the proportion of i types of competitive actions adopted by focused firms, while $\overline{p_i}$ represents the average proportion of these types of competitive actions adopted by all competitors in the whole industry.

Moderating Variables. 1)**Intellectual Capital:** This paper measured the intellectual capital with VAIC methods[10]. 2)**Tangible Capital:** This paper gather tangible capital of each firm from their annual reports. Both intellectual capital and tangible capital are calculated as minus the average level of the 13 firms in particular year, as to be the similarity.

Control Variables. This paper chose previous profit, and resources slack as control variables, while resources slack majorly measured by size, and years of born, and the current ratio of (proportion of current assets to current debts) firm.

4.3 Analysis Results

This paper applied multiple linear regression model with SPSS 16.0. The results of analysis are as Table 2. From Table 2, all models are significantly F tested, which means the regression models have good fitting degree. Moreover, Model 2ab and Model2cd both have higher R square adjusted values than Model 1, which refers all moderation effects are testified by the empirical analysis.

As Model 1, Frequency (FR) have significantly ($p<0.05$) positive effect on performance, thus H1a is accepted, however Deviance (DE) have significantly ($p<0.05$) negative effect on performance, thus H1b is rejected. As Model 2ab, intellectual capital (IC) and FR don't have significant interacting effects on performance, thus H2a is rejected, while tangible capital (TC) and FR have significantly ($p<0.05$) negative interacting effects on performance, represents H2b is accepted. Similarly in Model 2cd, intellectual capital (IC) and DE don't have significant interacting effects on performance, while tangible capital (TC) and DE have significantly ($p<0.05$) negative interacting effects on performance, which means H2c is rejected but H2d accepted.

Table 2 Multiple Linear Regression

	Model1	Model2ab	Model2cd
（Constant）	-.002 (-.065)	.009 (.761)	.008 (.584)
Control			
Size	9.015E-7 (.542)	9.390E-7 (.828)	4.802E-7 (.419)
Previous profit	7.335E-11*** (5.031)	1.147E-10*** (8.468)	1.162E-10*** (8.604)
Year of born	8.718E-5 (1.036)	.000 (1.673)	9.808E-5 (1.687)
Current ratio	-.002 (-.789)	.001 (.226)	.001 (.325)
Independent			
Frequency (FR)	.340* (2.147)	.144 (1.808)	.002 (1.580)
Deviance (DE)	-.284* (-2.469)	-.140 (-1.807)	.028 (1.130)
Moderating variable			
Intellectual capital(IC)		.092 (.948)	.253 (1.551)
Tangible capital (TC)		.043 (.427)	-.019 (-.218)
Interaction			
FR*IC		-.016 (-.125)	
FR*TC		-.220* (-1.984)	
DE*IC			-.705 (-1.407)
DE*TC			-.145* (-1.799)
R^2	.353	.367	.364
R^2 adjusted	.273	.326	.323
ΔR^2 adjusted		.053	.05
F value	4.37***	9.047***	8.912***

*** significant of regression is at the level of 0.001 (two-tail).
**. significant of regression is at the level of 0.01 (two-tail)
*. significant of regression is at the level of 0.05 (two-tail)

5. Conclusion

This paper tested the influence of competitive actions of Chinese pharmaceutical firms, and which resources, innovative or manufacturing, are the most important one in their competition. This paper has come out a series conclusion: 1) Chinese pharmaceutical firms have more perception to adopt normal but frequent competitive actions rather than highly innovative moves; 2) tangible capital, rather than intellectual capital, is regarded as strategic resources, whose similarity have moderating effects between competitive actions and performance; 3) as Chen, similarity of tangible capital have negative effects between frequency of action and performance, but have positive effects between deviance and performance, which means the higher similarity of a firm in tangible capital will have more endeavor on innovation and adopt deviance moves.

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