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Studies on Time-Lag Effect of Corporate Performance Influenced by Competitive Strategy

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Abstract

Corporate performance has been analyzed by using quarterly economic data between 1st Quarter of 2003 and 1st Quarter of 2011 shown in the listing companies of the Chinese medical biologicals after implementing the formulated strategy. Studies show competitive strategy influenced corporate performance to some extent brings about time-lag effect and differentiation strategy influenced corporate performance related Duration of Lag inferior to that of Lowcost strategy; at the same time, competitive strategy has a long-term effect on corporate performance, with differentiation strategy influenced Duration of Lag in corporate performance which is more longer than that of Lowcost strategy. Finally, from test results we can also conclude that it is more difficult for implementing differentiation strategy than for Lowcost strategy, even bringing about highly risks and there is little possibility to succeed after being implemented.

Key words: Differentiation strategy; Lowcost strategy; Coporate performance; Time-Lag effect

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INTRODUCTION

How corporate strategy and behavior may have an effect on corporate performance is always one of the highlights on studies in the areas of strategic management. Since 1980, Strategic management scientist, Michael E. porter announced three strategies for fundamental competition, and he even raised an upsurge of research on competitive strategy and corporate performance (Dess & Davis, 1984; PAN *et al.*, 2007).

Whether or not competitive strategy has an effect on corporate strategy is a research subject mainly in the traditional literature, including various types of strategies influenced on corporate performance (Kumar *et al.*, 1997; LIU & XU, 2008), few scholars took any further step towards when corporate performance would be generated after implemented this strategy as well as how long could it be influenced, etc.. In other words, there is no study on the "Time-lag effect" of the strategy implementation. In recent years, many scholars have introduced time dimension when studying strategic management (Tyrone *et al.*, 2010; Farrah Merlinda Muharam *et al.*, 2011), thus obtaining this concept of strategic options. This theory, to some extent, was considered as included the nature of Time-Lag for strategy. But it was not clearly specified this concept of strategy for "Time-Lag effect", even less for analyzing differentiation of Duration of Time-Lag in different types of strategies. At the same time, from the actual practices, only after they recognize the existence of Duration of Time-Lag and have a certain understanding of most of differentiation of Duration of Time-Lag caused by various strategic types, could it be estimated to obtain data of cash flow and financial status correctly, on the basis of this, to make a decision on managing issues or an investment could be regarded as more scientific, more possible to make a success. Therefore, studying competitive strategy influences the Duration of Time-Lag obtained from corporate performance has not only its significant theory value, but also imperious realistic significance.

In consideration of, at the same time, pharmaceutical and biological products in this industry has been one of new one supported by government in recent years and priority areas of government-announced "the Twelfth Five-Year Plan" which plays an important role in promoting an independent innovation capability and the Structural Transformation as well as optimization. Many studies had demonstrated the strategies of differentiation and Lowcost to be used in the industry of pharmaceutical and biological products as major modes for setting up core competitive advantages (ZHAO & GUO, 2009) and these two competitive strategies can be clearly differentiated each other in the industry of pharmaceutical and biological products (William *et al.*, 2003). Therefore, this article is intended for analyzing strategic Duration of Time-Lag in theory and solid evidence. As a result, it can enrich the contents related with system of corporate performance in the strategy as an investment decision-making basis for strategic management in the enterprise and valuable investor.

1. THEORETICAL ANALYSIS AND RESEARCH HYPOTHESIS

As corporate performance is the resultant of strategic option and distribution of resource, from time series we can see that, corporate performance lags behind strategic option, thus, an influence on corporate performance by present strategy may has an effect on Duration of Time-Lag. As a result, weighing corporate performance by strategic vision will be necessary for highly focusing on time lagging nature. This lagging efficiency can only be obtained after identifying long-term collected data, Lawrence (1986) had studied how corporate financial performance has an relation with Strategic Planning System, and it turned out that there was a coherence between strategic planning system from external long-term outlook and shareholder's ten-year total revenue and also found that this planning system has a positive relation with 4-year average revenues in the enterprise. Differentiation strategy aims at creating an atmosphere differed from the competitors in the aspects of corporate brand images, technical features, services, sales network and etc., based on research and development or set up an improved channel of distribution so as to form a competitive advantage. Lowcost strategy is deemed the cost control as its target, relying on the formed mass production as economic basis on cost control and management fees, considering the expenses at each chain in the enterprise decreased as low as possible (Porter, 1986) in order to set up its competitive advantages on the basis of reduction of costs and expenses. In general, the enterprise implemented differentiation strategy will be necessary for overcoming product-based differentiation as well as customer's honesty which it requires to make more investments on funds and time. The corporate performance can be achieved in such a long time under the control of differentiation strategy that it is necessary for setting up a famous brand image, an improved distribution of channel as well as excellent service system, with a group of honest customers in hand. However, in order to implement Lowcost strategy, by achieving mass production and reducing the costs and expenses concerning research and development, service, promotion, advertisement and etc. we can harvest in direct benefits in a short time of period. Therefore, we then put forward the assumption 1 as follows:

H1a: Competitive strategy influenced corporate performance expresses out a certain degree of Time Lag;

H1b: Differentiation strategy may have a longer influence on Duration of Time Lag in corporate performance than Lowcost strategy.

According to all the viewpoints made from school of thoughts on resource, there are five fundamental requirements can bring about sustainable competitive advantages which it consists of those resources to be proven as valuable, rare, unable to simulate, difficult to be replaced, and that can be achieved by the investment that is lower than its own value (Barney, 1991; Peteraf, 1993). Lowcost strategy is mainly purport to control the costs and expenses in the production operations, sales promotion as well as other aspects so as to create corporate competitive advantages by reducing them, but this competitive mode may be simulated by competitors, because they are situated in a similar external environment and can simulate its management, production methods so as to reduce the costs in this enterprise, the follower' effect caused by simulating majority of competitors enables their products losing competitive advantages in its corresponding product market, thus it is very difficult to achieve an expected effect. Compared with it, differentiation strategy can be developed to enable the enterprise to have its own peculiar features by research and development, brand image, service and logistic systems, which the clients or customers can distinguish them from other competitors, once corporation differentiation image established, such as: it is very difficult for competitors to simply simulate management mode of a famous brand and to achieve an expected strategic effect, although we make an investment for such simulation it can be difficult for returning its equivalent benefits. From the above analysis we may conclude that, those implementing differentiation strategy are more likely to achieve sustainable competitive advantages when comparing with those implementing Lowcost strategy. To sum up, we can conclude the following assumption 2:

H2a: Competitive strategy may have a certain long-term effect on corporate performance;

H2b: Differentiation strategy influenced the time of duration in corporate performance will be longer than that of Lowcost strategy. In other words, Differentiation strategy is deemed as more sustainable for winning over competitive advantages.

2. RESEARCH DESIGN

2.1 Varible Definition

2.1.1 Dependent Variable

This article adopts the return on assets (ROE) to weigh corporate performance. Not only can ROE reflect indexes be recognized as international generality for return on assets, but it can also reflect a comprehensive resultant by using corporate debt paying and managing capabilities with powerful comprehensive ability and having a higher representativeness, fully reflecting corporate management performance. ROE data can be easily obtained in facilitate with calculation.

2.1.2 Explanatory Variable

Explanatory variable in this article was derived from Porter's competitive strategy, which it consisted of three types respectively called as strategies of cost leadership, differentiation and focus. As focus strategy is deemed as winning over cost leadership or differentiation in such certain, relatively narrow area that it can only be used in regional market, this article can only be concentrated on these two basic strategies. On the basis of predecessor's integrated research achievements, combined with China's actual situation as well as research subjects in this article, with reference to the measurements for indexes of competitive strategy made by David *et al.* (2002), LIU Ruizhi and XU Chaoyang (2008) as well as ZHANG Xizhen, this article adopted return on assets, turnover of fixed assets as well as work efficiency of employee for measuring the degree of Lowcost strategy in the listing company. At the same time, this article made use of operating margin, period expenses, R&D expense ratio, market/book values to measure a degree of differentiation.

2.1.3 Control Variable

For correctly reflecting competitive strategy influenced on corporate performance, this article adopted such four control variables as corporate size, financial leverage, net amount of cash flow caused by management activities as well as market share, in which enterprise scale could be measured by use of natural logarithm generated from total corporate assets.

2.2 Model and Data

This article mainly utilized VAR and pulse response functions to be considered as to study time-lag effect arising from corporate performance influenced by competitive strategy. VAR model would be stipulated in details as follows:

$$\begin{bmatrix} perf_{1,t} \\ lowcost_{2,t} \\ differ_{3,t} \end{bmatrix} = C + A_1 \begin{bmatrix} perf_{1,t-1} \\ lowcost_{2,t-1} \\ differ_{3,t-1} \end{bmatrix} + ... + A_P \begin{bmatrix} perf_{1,t-p} \\ lowcost_{2,t-p} \\ differ_{3,t-p} \end{bmatrix} + B \begin{bmatrix} size_{1,t} \\ leverage_{2,t} \\ oncf_{3,t} \\ mshare_{4,t} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \\ \varepsilon_{3,t} \end{bmatrix} \tag{1}$$

In the Equation (1), t = 1, 2,…, T, *perf* means Return on Equity (ROE) in the corporate performance, it is calculated through industry regulation, combined with standardized treatment; *lowcost* is the score obtained from degree factor of Lowcost; *differ* means the score to be received from differentiation degree factors. On the basis of VAR model and by use of pulse response function inspect various types of strategies influenced on the degree and time of duration influenced by corporate performance.

This article adopted the listing companies for the production of pharmaceutical and biological products as the examples in the 1st quarter of 2003 and 2011, these examples after being treated finally obtained 70 companies as research subjects. Data was mainly derived from CSMAR, while part of lost data needed to be compensated were obtained from the interim and annual statements issued by listing companies in the websites owned by SSE, SZSE as well as Stockstar.

3. RESULTS AND ANALYSIS OF SOLID EVIDENCES

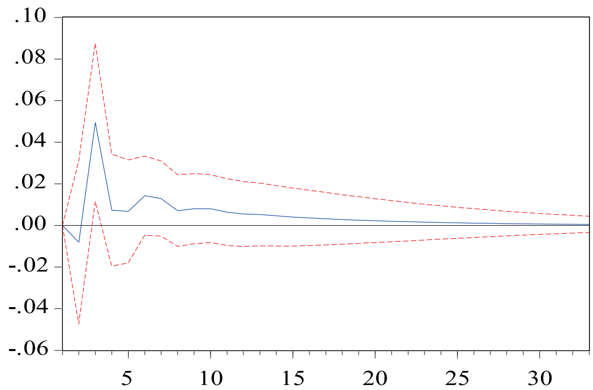
First of all, the confirmatory factors had been analyzed to obtain the results, showing it is more appropriate for asset turnover ratio and fixed capital turnover ratio to be used in measuring Lowcost strategy, R&D expense ratio, market/book values and periodical cost rate in the differentiation strategy. Meanwhile, in favor of the results obtained from the factors, 79 companies to be used as examples could be classified in view of strategies, finally obtaining 32 examples used in the strategies of Lowcost, 35 for differentiation strategy and 12 for unclearly defined strategic orientation.

Follow on, in favor of E-views 6.0 data analysis software, all the Lowcost and differentiation samples could be used for setting up VAR model and respectively given standard deviation-sized impacts so as to achieve pulse response diagram related with the rational model on competitive strategy and corporate performance. Taken differentiation strategy SZ000566 and Lowcost SZ000522 as samples to be used for analysis, the estimated results for both of VAR model parameters could be successively shown in Equation (2) and (3).

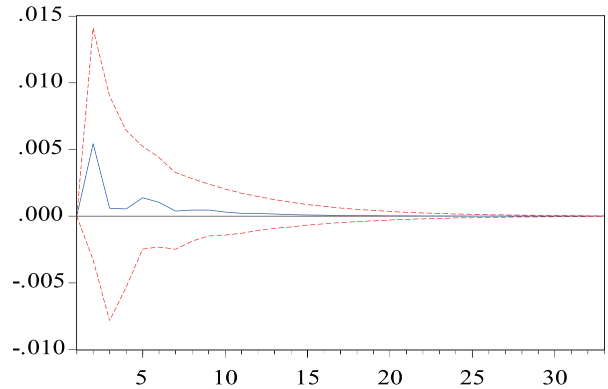
On the basis of the above VAR model, we carried out pulse response analysis for achieving pulse response diagram in the corporate performance caused by the impacts from competitive strategy, shown in Figure 1:

$$\begin{bmatrix} perf_{1,t} \\ lowcost_{2,t} \\ differ_{3,t} \end{bmatrix} = \begin{bmatrix} -1.746 \\ -133.695 \\ -35.621 \end{bmatrix} + \begin{bmatrix} 0.022 & -0.000 & 0.040 \\ 3.277 & -0.790 & 0.919 \\ 4.475 & 0.437 & 0.752 \end{bmatrix} \begin{bmatrix} perf_{1,t-1} \\ lowcost_{2,t-1} \\ differ_{3,t-1} \end{bmatrix} + \begin{bmatrix} -0.236 & 0.021 & 0.022 \\ -2.044 & 0.168 & -0.138 \\ 0.646 & 0.171 & 0.034 \end{bmatrix} \begin{bmatrix} perf_{1,t-2} \\ lowcost_{2,t-2} \\ differ_{3,t-2} \end{bmatrix} + \begin{bmatrix} 0.081 & 0.262 \\ 6.143 & 23.815 \\ 1.644 & -3.596 \end{bmatrix} \begin{bmatrix} size_{1,t} \\ mshare_{4,t} \end{bmatrix} \quad (2)$$

$$\begin{bmatrix} perf_{1,t} \\ lowcost_{2,t} \\ differ_{3,t} \end{bmatrix} = \begin{bmatrix} 6.011 \\ 131.542 \\ 33.611 \end{bmatrix} + \begin{bmatrix} -0.158 & 0.004 & -0.028 \\ -4.235 & 0.094 & -0.753 \\ -3.295 & 0.009 & 0.224 \end{bmatrix} \begin{bmatrix} perf_{1,t-1} \\ lowcost_{2,t-1} \\ differ_{3,t-1} \end{bmatrix} + \begin{bmatrix} -1.096 & 0.017 & 0.175 \\ -25.579 & 0.527 & 4.479 \\ -9.758 & 0.126 & 1.586 \end{bmatrix} \begin{bmatrix} perf_{1,t-2} \\ lowcost_{2,t-2} \\ differ_{3,t-2} \end{bmatrix} + \begin{bmatrix} 0.288 & 0.000 \\ 6.271 & 0.000 \\ 1.607 & 0.000 \end{bmatrix} \begin{bmatrix} size_{1,t} \\ mshare_{4,t} \end{bmatrix} \quad (3)$$



Figurela.Impulse Response of Differentin Strategy to Corporate



Figurelb.Impulse Response of Low Cost Strategy to Corporate Performance(SZ00522)

Figure 1
Impulse Response of Competitive Strategy to Corporate Performance

From Figure 1a we can see that, the corporate performance (ROE) appears to be decreased from the 1st to 2nd phase when impacting on differentiation strategy by standard deviation in this phase. Furthermore, it is quickly increased up to the 3rd phase and achieves the peak value. That is to say, here it is the largest impacts to be achieved to influence on corporate performance in the 3rd phase after differentiation strategy is implemented. With the time went on, the impact influence will then be gradually weakened till the 33rd phase when it is still kept in existence. This demonstrates that, after implementing corporate differentiation strategy, it can have a positive influence on corporate performance, but cannot be immediately happened till the 2nd phase, fully reflecting the features on Time Lag in the corporate performance influenced by competitive strategy. So we can conclude that Duration of Time Lag will then be 2 after analyzing. At the same time, this also testifies that the strategy influenced corporate performance will not be immediately disappeared, but was lasting for a period of time to form a longer persistence effect, the samples in this example cannot be stopped under influence by the impacts until the last phase, and the corporate strategy influenced on corporate performance can last for 31 phases (33-2). But, from Figure 1b we can conclude that Duration of time for sample SZ000522 will be 1, duration of time: 13.

From analysis and to sum up all the Lowcost and differentiation samples by the same mode we can conclude that:

(1) In the differentiation samples, the samples with Duration of time as 1 occupies 40.00% of total samples, the samples with Duration of time as 2 occupies 33.33%, and over 2 occupies 26.67%; in Lowcost samples, the samples with Duration of time as 1 occupies 65.63% of total samples, Duration of time as 2 for 28.13% and over 2 for 6.24%. It is obvious that, in the industry of pharmaceutical and biological products, exactly the behavior of corporate strategy influenced corporate performance can be existed in a certain time-lag effect, and also the listing companies implementing Lowcost strategy, compared to that implementing differentiation strategy, brings about short-term influence on corporate performance. As a result, Assumption 1 is testified as accepted.

(2) In the differentiation samples, the samples with duration of time as 0-8 phases occupies 16.66% of total samples, duration of time as 9-15 phases as 26.67% and

over 16 as 56.67%; but, in the Lowcost samples, the samples with duration of time as 0-8 phases occupies 59.37% of total samples, duration of time as 9-15 phases as 25.00% and over 16 as 15.63%; it can be seen from this, that, in the industry of pharmaceutical and biological products, the listing companies implementing differentiation strategy, compared to that implementing Lowcost strategy, can last for a longer time than that of corporate performance. That is to say, the former has a longer period of time for sustainable profitability to be achieved that that of the latter, as a result, it can be considered to have ability for keeping long-term growth. Assumption 2 has been testified as accepted.

(3) At the same time, the conclusion has also shown that: in the enterprises implementing differentiation strategies, this strategy to be used in sample enterprises SZ002107, SZ00216 and SZ002198 has an irregularly influence on corporate performance, with an influencing extent largely fluctuated, while the strategy to be executed in sample enterprises SH600129 and SH600518 even have a negative influence on corporate performance. However, the sample enterprise implementing Lowcost strategy appears basically no such phenomenon as happened. This demonstrates that, in the industry of pharmaceutical and biological products, compared to Lowcost strategy, the differentiation strategy is deemed as even more difficult to be executed with larger risks remained than that of the latter, the possibility that brings us to success will be lower than the latter. As a result, one possible explanation for this will be made: it is an Hi-Tech, labor concentrated industry for pharmaceutical and biological products, which needs to be highly invested with highly risks and benefits (Jommi *et al.*, 2007; Andrew *et al.*, 2011). However, the listing company of pharmaceutical and biological products implementing differentiation strategy should be paid more investment on research and development so as to increase periodicity, enabling the enterprise facing with more risky than that implementing Lowcost enterprise. Therefore, the degree of difficulties to be executed makes greatly discount on the effects of strategic implementation.

4. CONCLUSION AND ENLIGHTENMENT

This article has studied the listing companies as examples in the industry of pharmaceutical and biological products, and discussed the influence of competitive strategy on long-term corporate performance in our listing companies. Studies has shown that: the feedback effect for corporate performance against behavior of strategy could not be appeared till kept for a certain period of time, and differentiation strategy influenced Duration of Time-Lag of corporate performance could last for a slightly longer period of time than that of Lowcost strategy; Competitive strategy could have a long-term effect on corporate performance, and differentiation strategy influenced duration of time of corporate performance could keep an even longer period of time; it was more difficult for differentiation strategy to be executed than that of Lowcost strategy, as there must be faced with more risks, so there was a little possibility to be success.

As a result, this article has given us two enlightenments as follows:

(1) Both Lowcost and differentiation strategies have their own advantages and disadvantages, Lowcost strategy with short-term time lag can quickly bring about corporate cash flow and improvement of corporate short-term financial status, however, once differentiation strategy successful performed, it should have a longer sustainable effects on corporate performance, which is more conducive to set up long-term competitive advantages. As a result, in the enterprises of pharmaceutical and biological products for implementation of selected strategies makes their respective advantages as complementary to each other as possible. An effect on "You can sell the cow and drink the milk" can be realized by using cost leadership and differentiation strategies and both of them for reconstruction and optimization.

(2) If the competitive advantages are required to keep its existence in the enterprise, it should be necessary for performing the activities of value creation the competitor cannot be simulated, no matter if differentiation or Lowcost strategies can be executed, it must be carefully prevented the competitor from simulation, of course, needless to say, this case is also more appropriate for the enterprise with Lowcost strategy. This requires the enterprise to be integrated for many activities when executing competitive strategy. This is not only a key to keep a competitive advantage, but it is also a fundamental solution to keep this advantage. Competitor is required to simulate a set of hook-ups activity, which is deemed as much more difficult for a certain sales rules, keeping a manufacturing technique or duplicate the features on the products. The competitive strategy set up by way of activities system or competitive strategy to be established can be more endurable than that set up on a single activity.

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APPENDIX

To sum up and analysis for pulse response diagram of all the low cost as well as differentiation samples, Table 1 and 2 can be concluded:

Table 1
Conclusion of Empirical Results for Low Cost Samples

Serial No.	Code No.	Duration of time-lag (response start point)	Time of convergence (response end point)	Duration of time
1	SZ000522	1	14	13
2	SZ000153	5	7	2
3	SZ000078	2	33	31*
4	SZ000538	2	8	6
5	SZ000597	1	6	5
6	SZ000739	1	7	6
7	SZ000756	1	4	3
8	SZ000919	1	4	3
9	SZ000990	1	4	3
10	SH600332	2	11	9
11	SH600420	1	6	5
12	SH600422	2	8	6
13	SZ002099	1	5	4
14	SH600062	1	2	1
15	SH600085	1	31	30
16	SH600196	1	24	23
17	SH600211	1	26	25
18	SH600216	1	9	8
19	SH600222	2	11	9
20	SH600267	1	9	8
21	SH600297	2	5	3
22	SH600436	1	2	1
23	SH600521	2	9	7
24	SH600535	2	16	14
25	SH600664	1	10	9
26	SH600713	1	8	7
27	SH600789	1	33	32*
28	SH600796	1	5	4
29	SH600849	1	7	6
30	SH600866	2	17	15
31	SH600976	3	13	10
32	SH601607	1	10	9

Note: ① asterisk (*) means that duration of the time tends not close to 0 till the last phase.

Table 2
Empirical Results for Differentiation Sample

Serial No.	Code No.	Duration of time-lag (response start point)	Time of convergence (response end point)	Duration of time
1	SZ000566	2	31	29
2	SZ000590	2	33	31*
3	SZ000661	2	33	31*
4	SZ000766	1	21	20
5	SZ000788	1	22	21
6	SZ000790	3	24	21
7	SZ000809	1	12	11
8	SZ000915	1	32	31*
9	SZ000999	1	32	31*
10	SZ002007	1	18	17
11	SZ002020	1	28	27*
12	SZ002022	1	19	18
13	SZ002030	3	11	8
14	SZ002118	2	18	16*
15	SH600079	3	27	24
16	SH600161	3	6	3
17	SH600201	1	28	27
18	SH600276	2	17	15
19	SH600285	2.5	6	3.5
20	SH600380	1	13	12
21	SH600513	3	7	4
22	SH600530	2	9	7
23	SH600557	1	14	13
24	SH600572	2	29	27*
25	SH600594	2	15	13
26	SH600666	3	33	30*
27	SH600750	1	17	16
28	SH600812	3	17	14
29	SH600867	2	14	12
30	SH600869	2	11	9

Note: ① asterisk (*) means that duration of the time tends not close to 0 till the last phase. ② there are totally 35 samples, but it has irregular effects on corporate performance influenced by differentiation strategy for sample SZ002107, SZ002166 and SZ002198, fluctuated largely. The influence of differentiation strategy on corporate performance always keeps as negative for these two samples SH600129 and SH600518. There are 30 effective samples after deleting the above five samples.