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An Empirical Study on Listed Companies Merger Synergies

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Abstract

M&A is not only playing an important role in optimizing the allocation of resources and promoting the economic development, but also is important component of enterprise external growth. Synergy is not only the significant reason of M&A; at the same time，it is an essential measure standard of success or failure. This paper argues that the internal measurement model and abnormal returns methodology to measure are all not adapted to our special economic environment; therefore, this paper sets up the measurement model of synergistic effect based on financial index of accounting methods, and the M&A events from 2004 to 2006 in China was listed for the inspection analysis of the synergistic effect. Finally, based on the empirical results relevant suggestions were put forward.

Key words: listed companies; M&A; synergistic effect

1. Introduction

Merger and acquisition is an important part of the enterprise development. Experts and professionals from domestic and abroad have mainly researched M&A synergies in three points: internal measurement model, study based on stock price changes, and accounting research method based on performance changes. The paper evaluates the synergistic influence of listed companies in China through accounting method based on performance changes.

2. Model construction and the selection of indicators

2.1 The theoretical basis of model construction

American experts in M&A say that synergy is the whole part after M&A in performance of merging company and target company and the achievement that surpass market expectations when the merging company and target company operate alone. This paper will construct econometric model of M&A

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synergy strictly based on the definition above. The more accurate definition of M&A is the whole part of merge and acquisition.

2.2 Construction of econometric model

2.2.1 Define the relevant symbol

A represents acquisition company, B represents target company, S_{yn} represents synergy effect, and F_{AS} and F_{BS} respectively represents actual performance score of company A and B after merging and acquisition. F_A and F_B represent achievement score computing at original increasing speed of company A and B if there is no merging and acquisition.

2.2.2Econometric model of synergistic effect

(1) The M&A econometric model is $S_{yn} = F_{AS} - (F_A + F_B)$

(2) The formula of acquisition synergy

① The merging company will not make target company classified into consolidated financial statement. The econometric model is $S_{yn} = (F_{AS} + F_{BS}) - (F_A + F_B)$

② If it meets the standard of two cases about merging and acqusition in thirty-third tready of ASBE formulated in 2006 by Treasury Department, merging company will make target company into consolidated range, and the synergetistic formula is $S_{yn} = F_{AS} - (F_A + F_B)$

which can be simplified as $S_{yn} = F_T - (F_A + F_B)$,

F_T represents total performance of both sides after trade.

(3) Selection of performance indicators

①ROA=net profit/total assets balance

②ROE=net profit/average balance of Shareholders' rights

③Earning per share=net profit/total equity. This number reflects a company's profitability

④The ratio of main business income and total assets=the main business income/average balance of total assets

⑤Cash flow of operating activities per share=operating cash flow/weighted average number of shares.

The score functions we create is $F_i = \alpha_{ij}f_{ij} + \alpha_{ij}f_{ij} + \alpha_{ij}f_{ij} + \alpha_{ij}f_{ij} + \alpha_{ij}f_{ij}$ （$i = 1,2,3,4,5; j = 1,2,3,4,5$）

F_i is the scores that i-th company gets； α_{ij} is variance contribution of i-th company and j-th factor; f_{ij} is the scores i-jth factor gets.

3. Empirical analysis

3.1 Data sources

This paper chooses fourteen cases during 2004 to 2006 of M&A from GUOTAI JUNAN securities database service center CSMAR as samples, meeting the standards below to choose sample companies: listed companies belong to consolidation by merger; asset acquisition and share transfer are issued by CSMAR database; the merging company and target company have been listed for three years before the M&A. It is a several-merging-and-acquisition-trade event if the one acquisition company has merged many target companies in one year, if one acquisition company and one target company have engaged in several merger and acquisition in different years, which shall be treated as the same merger and acquisition trade event. Because of the particularity in financial operation and banking, this paper has excluded this kind of merger and acquisition events in listed companies. The transactions account for more than 10% of target company total shares, which is an important trade event for both sides. The transactions have an obvious effect on financial statements data in both sides.

3.2 Empirical analysis

The calculation of M&A synergy

This paper used the statistic analysis software of SPSS13.0 to calculate the M&A synergy, and the calculation process is as below:

①The prediction score function F_A that acquisition company forecasts according to expected growth speed.

The year of causing M&A: $F_{Ai}^0 = 0.58804 f_{i1} + 0.20129 f_{i2} + 0.20071 f_{i3} + 0.00634 f_{i4} + 0.00362 f_{i5}$

The first year after M&A: $F_{Ai}^1 = 0.58614 f_{i1} + 0.20214 f_{i2} + 0.20086 f_{i3} + 0.00568 f_{i4} + 0.00518 f_{i5}$

The second year after M&A: $F_{Ai}^2 = 0.58394 f_{i1} + 0.20310 f_{i2} + 0.20162 f_{i3} + 0.00645 f_{i4} + 0.00488 f_{i5}$

The third year after M&A: $F_{Ai}^3 = 0.58203 f_{i1} + 0.20398 f_{i2} + 0.20241 f_{i3} + 0.00713 f_{i4} + 0.00445 f_{i5}$

②The prediction score function F_B that target company forecasts according to expected growth speed.

The year of causing M&A: $F_{Bi}^0 = 0.41391 f_{i1} + 0.32870 f_{i2} + 0.20870 f_{i3} + 0.03941 f_{i4} + 0.00927 f_{i5}$

The first year after M&A: $F_{Bi}^1 = 0.37627 f_{i1} + 0.33667 f_{i2} + 0.20770 f_{i3} + 0.05779 f_{i4} + 0.02157 f_{i5}$

The second year after M&A: $F_{Bi}^2 = 0.36760 f_{i1} + 0.31569 f_{i2} + 0.20803 f_{i3} + 0.05816 f_{i4} + 0.05052 f_{i5}$

The third year after M&A: $F_{Bi}^3 = 0.35517 f_{i1} + 0.29013 f_{i2} + 0.20865 f_{i3} + 0.09274 f_{i4} + 0.05331 f_{i5}$

③ The actual scores of performance in acquisition company $F_{AS:}$

The year causing M&A: $F_{ASi}^0 = 0.56511 f_{i1} + 0.22105 f_{i2} + 0.20161 f_{i3} + 0.00970 f_{i4} + 0.00253 f_{i5}$

The first year after M&A: $F_{ASi}^1 = 0.57385 f_{i1} + 0.20105 f_{i2} + 0.20060 f_{i3} + 0.01535 f_{i4} + 0.00915 f_{i5}$

The second year after M&A: $F_{ASi}^2 = 0.57585 f_{i1} + 0.21479 f_{i2} + 0.20125 f_{i3} + 0.00432 f_{i4} + 0.00379 f_{i5}$

The third year after M&A: $F_{ASi}^3 = 0.55378 f_{i1} + 0.21009 f_{i2} + 0.20832 f_{i3} + 0.01919 f_{i4} + 0.00862 f_{i5}$

④ The actual score of performance in target company:

The year causing M&A: $F_{BSi}^0 = 0.26275 f_{i1} + 0.25748 f_{i2} + 0.23128 f_{i3} + 0.20856 f_{i4} + 0.03992 f_{i5}$

The first year after M&A: $F_{BSi}^1 = 0.49186 f_{i1} + 0.22310 f_{i2} + 0.21631 f_{i3} + 0.05742 f_{i4} + 0.01130 f_{i5}$

The second year after M&A: $F_{BSi}^2 = 0.54287 f_{i1} + 0.21277 f_{i2} + 0.20064 f_{i3} + 0.03866 f_{i4} + 0.00506 f_{i5}$

The third year after M&A: $F_{BSi}^3 = 0.48610 f_{i1} + 0.25908 f_{i2} + 0.23895 f_{i3} + 0.01396 f_{i4} + 0.00190 f_{i5}$

Thus, we can compute the total scores corresponding years of merger and acquisition companies on both sides, and then calculate the synergy score of the year causing M&A, the first, second and third year after M&A, according to the function $S_{yn}^n = F_T^n - (F_A^n + F_B^n)$. S_{yn}^n is synergy effect scores in n-th year; F_A^n and F_B^n are respectively the expected achievements of company A and B; n represents years, ($n = 0,1,2,3$)

3.3 The empirical analysis results

3.3.1 Overall synergy effect

In general, Figure 4-1 shows that merger and acquisition produces positive synergy effect in short time, but in the long term, it produces negative synergy effect.

The figure shows definitely that the synergy scores decreased greatly in the second and third year after merger and acquisition. Although we observe the sample of M&A just in a short time, we still get the same points consistent with many scholars and experts.

3.3.2 The type of M&A and the synergy

M&A can be classified into horizontal mergers, vertical mergers and mixed mergers according to business relationships on both sides. Theoretically, the risk of mixed mergers is higher than the risk of non-mixed. In addition, the efficiency theory also indicates that mixed mergers can not improve the interests of enterprises and companies. It is the conduction of management personnel who is to reduce self-risk.

The empirical analysis in this paper displays the synergy effect that different types of merger and acquisition activities display diversity. (Figure 4-1 and Figure 4-2)

3.3.3Associated M&A and synergy effect

This paper probed into the relationship of associated M&A and synergy effect.

The results indicate that non-associated trade produces positive synergy effect. Although it drops later, generally it produces positive synergy effect. Despite that the non-associated business causes negative synergy effect, it also drops greatly in the later time. The results are different with the viewpoints of PAN Jin and CHEN Hong-min (2005), who contend that if enterprises and companies adopt associate merger and acquisition, their performance interests raise obviously, and it is better than companies adopt non-associate merger and acquisition. And the points of TANG Jian-xin, HE Hong (2005) and WANG Fu-sheng are in compliance. This paper agrees that the associated merger and acquisition may be affected by human factors, (the intervention of government authorities and personal factor of decision makers in enterprises) leading to this condition. And it ignores non-human factor, which reduces the synergy effect of associated merger and acquisition.

3.3.4 Government intervention and synergy effect

The results shows (Figure 4-1 and Figure 4-4) that merger and acquisition government authorities intervention causes negative synergy effect, although it rises in short time, remaining decline during following second and third years. While non-government intervention M&A gains positive synergy effect generally, it remains stable and rises in long period.

Figure 4-1 M&A classification of synergy average score and positive ratio

M&A Classification	S_{yn}^{n}	S_{yn}^{0}	S_{yn}^{1}	S_{yn}^{2}	S_{yn}^{3}
Total synergy	Average score	0. 04818	0. 00506	−0. 06964	−0. 19207
	Positive ratio	0. 64290	0. 57000	0. 50000	0. 42860
Horizontal M&A	Average score	0.15000	0.12927	-0.29303	-0.28943
	Positive ratio	0.57140	0.71430	0.42860	0.42860
Vertical M&A	Average score	−0. 22000	−0. 17000	0. 20000	−0. 25000
	Positive ratio	0. 75000	0. 25000	0. 75000	0. 50000
Mixed M&A	Average score	0. 16000	0. 07695	0. 09777	0. 11661
	Positive ratio	0. 66670	0. 66670	0. 33330	0. 33330
Non-associated business	Average score	0. 21650	0. 11850	0. 01040	0. 02960
	Positive ratio	0. 70000	0. 60000	0. 60000	0. 50000
Associate business	Average score	−0. 37260	−0. 17890	−0. 26960	−0. 74610
	Positive ratio	0. 50000	0. 50000	0. 25000	0. 25000
Government intervention	Average score	−0. 51000	−0. 29000	−0. 81000	−1. 26000
	Positive ratio	0. 50000	0. 33333	0. 16670	0. 00000
Non-government intervention	Average score	0. 16000	0. 08000	0. 10000	0. 12000
	Positive ratio	0. 75000	0. 75000	0. 62500	0. 75000

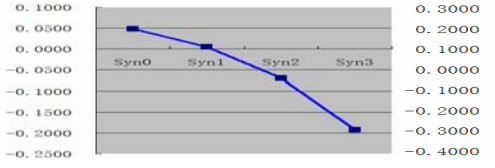

Figure 4-1 sample total synergy charting

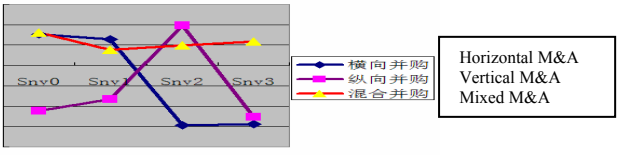

Figure 4-2 M&A classification and synergy

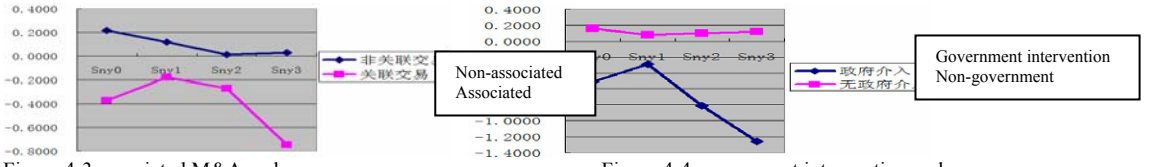

Figure 4-3 associated M&A and synergy Figure 4-4 government intervention and synergy

Specification: S_{yn}^{0}, S_{yn}^{1}, S_{yn}^{2}, S_{yn}^{3} respectively represents the average in the M&A year, the first, second and third year after M&A**,** the average is the arithmetic of total score, indicating relative change in the whole cooperate performance. Positive ratio is a rate the number of companies that difference of the whole score is positive occupied in total samples.

4. Implications

4.1 Pay attention to synergy trap

Some enterprises blindly pursue the big scale and expansion in geographical areas, which engage in merger and acquisition not only in their industries, but also in other sectors, purchasing blindly mixed merger and acquisition. This blind action ignores two important problems: one is the boundary property of corporate, the other is that enterprises diversification are often associated with high risks.

4.2 Consolidate the system integration after M&A

During the integration of late merger and acquisition, it is influenced not only by external competitors, but also internal resistance. In addition, M&A integration itself involves wide areas, including interaction and interrelation of each system and operation link. The mistakes of any part may lead to failure of merger and acquisition. Therefore, it is vital and necessary to strengthen the integration in late M&A. Firstly, we should formulate the integration plan in details. Secondly, implement merger and acquisition. Finally, we should take valid control to make sure that the integration has been successfully implemented.

4.3 Redefine the role of government plays in M&A

The government as the holder of state-owned enterprises and companies directly involves in M&A transaction pricing decisions. And as market supervisor it also has approval power, holding public authority. Therefore, the government plays the roles of athletes and judgment, which leads to M&A subject dislocation that the government becomes main part of market instead of enterprises. The direct consequence is that government authority implements arbitrarily arranged M&A based on the achievements and self-interest. The man-made factor of production flow regulation, distorting the M&A price, leading low efficiency of merger and acquisition, is not conducive to resource optimal allocation. This is the major reason why the merger and acquisition synergy efficiency is low.

The results of empirical analysis show that it causes negative synergy for M&A intervened by government. Although it rises in the first year, it remains to drop in following years. However, non-government intervention M&A has positive synergy, remaining stable and raising in a long term. Thus, the government should redefine its role in M&A, acting as protector, and return enterprises M&A into market self-regulation.

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