The Impact of the Type of Diversification of Listed Construction Enterprises in China on Corporation Performance

Yi-Hsin Lin and Ying-Ying Li

Abstract—The construction industry is the pillar industry in China, accounting for about 6% of the gross domestic product. Along with changes in the external environment of the construction industry in China, the construction firm faces fierce competition. The paper aims to investigate the relationship between diversified types of construction firm and its performance in China. Based on generalist and specialist strategy in organizational ecology, we think a generalist organization can be applied to an enterprise with diversified developments, while specialist groups are extended to professional enterprises .This study takes advantage of annual financial data of listed construction firm to empirically verify the relationship between diversification and corporation performance establishing a regression equation to econometric analysis. We find that: 1) Specialization can significantly improve the level of profitability of listed construction firms, and there is a significant positive relationship with corporate performance; 2) The level of operating performance of listed construction enterprises which engage in unrelated diversification is higher than those with related diversification; 3) The relationship between state-owned construction firms and corporate performance is negative. The more the year of foundation is, the higher performance will be; however, the more the year of being listed, the lower performance will be.

Keywords—Diversification, Specialization, Construction Firm, Performance.

I. INTRODUCTION

THE construction industry is the pillar industry in China, accounting for about 6% of the gross domestic product (GDP). Along with changes in the external environment of the construction industry in China, the construction firm faces fierce competition [1]. As a result, it requires, more than ever, improving performance level to seek development. According to statistics provided by the State Statistical Bureau, the output value of domestic construction firms is high, but the production efficiency is lower than that of foreign countries. Fig. 1 demonstrates that the total value has been increasing year by year, in terms of single enterprise average value of the domestic construction firms and foreign capital construction enterprise from 1995 to 2009, and the former is higher than the latter.

Thus the domestic enterprise contributes more to the

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development of economy than the foreign capital enterprise. Fig. 2, for per capita GDP of construction enterprise which is an important embodiment of enterprise efficiency, shows that the production efficiency of our domestic enterprise improved steadily, but there is still a gap in comparison with the foreign capital enterprise.
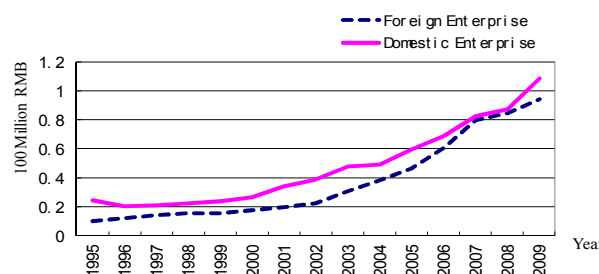

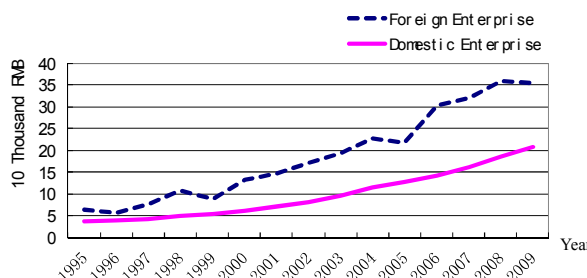Fig. 1 Output Value for Single Construction Corporation

Fig. 2 Per Capita Output Value of Construction firms

Hannan and Freeman [2] put forward the idea of organizational ecology which provided a new perspective for the emergency, development, maturation and death of research organization. In organizational ecology, Niche theory points out that the generalist and the specialist have different matching degrees in different situations and environments. The niche width of the generalist (the number of organization that occupies the advantage position) has the characteristic of diversified development and the higher the suitability of the environment, the higher the performance. This paper aims to investigate the relationship between diversified types of construction firm and its performance in China.

World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:7, No:6, 2013

Enterprises implement diversification strategy which takes the advancement of external competition and internal resources as the major considerations. First of all, China is experiencing the transition from a planned economy to a market economy, and it is in an emerging economic system; secondly, after joining the WTO, it develops the "going out" strategy; lastly, the financial crisis and the instability of legal policy increase risk, but enterprise diversification can help balance development and spread risk. Meanwhile, along with the development of an enterprise, the resources are changing; the enterprise has different financial resources, resource management and human resources when the organization is just established and when it is growing and mature [3].

Diversified strategy can enhance the competitive advantage of an enterprise, and it can help the enterprise make the best of existing resources to achieve product expansion, from the professional to related diversification and even not related diversification. Different diversified types produce different performances, so does the development strategy of diversification which possesses its unique industrial characteristics in distinct environment.

This study aims to achieve the following two goals.
1) To investigate the relationship of diversified types of listed construction firms in China and their performance;
2) To establish a model of the relationships between diversified types of China's listed construction firms and corporate performance, which is verified through regression analysis.

The development of the performance of construction firm plays a significant role in the course of the country. From the microscopic point, the risk caused by blind expansion of a single enterprise can be avoided, and the evaluation system of construction firm diversification strategy can be improved so as to provide theory support for it. From macroscopic sense, such study also in a large extent promotes the development of China's national economy and effectively avoids the waste of resources.

II. LITERATURE REVIEW

This study, based on niche theory, a generalist and specialist strategy in organizational ecology, takes advantage of annual financial data of listed construction firm to empirically verify the relationship between diversification and corporation performance.

A. Niche Theory Based On the Organizational Ecology

The isomorphism theory points out that when the environment is unstable, the organization would form a general structure that adapts not only to a single environment. That is to say, in a certain stable environment, the organization will develop a specialist strategy, or otherwise, a generalist [2]. Even Hannan and Freeman [2] analyze how stability of the environment supports for the specialist and generalist by using a fitness function , and adopted three points: 1) when the circumstances are stable, whether in the fine-grain environment or coarse-grain environment, the specialist strategy is better than the generalist strategy; 2) When the environment is not

stable, and if there is no significant variation in the environmental requirements, the generalist strategy is preferred to the specialist strategy, whether in the fine-grain environment or coarse-grain environment; 3) When the environment is unstable, and if there is significant variation in environment requirements, the specialist strategy is preferred; Otherwise, in the coarse-grain environment, the generalist strategy precedes the specialist strategy. In this paper, a generalist organization can be applied to an enterprise with diversified developments, while specialist groups are extended to professional enterprises.

B. Diversification

The diversification strategy was first proposed by the American scholar Ansoff [4], who defined diversification dynamically and stressed that diversification was to introduce new products went into new markets. Integrating the previous research on diversification, this paper defines diversification as a developing strategy through which a company manages more than two different kinds of products or services simultaneously.

Most scholars extend the point of Rumelt [5] that the diversification of products can be classified into five types: single diversification, vertical diversification, magisterial diversification, related diversification and unrelated diversification. Tao et al. [6] redefined diversification in the construction industry as single business (SB), related business (RB) and unrelated business (UB) from the point of core ability. In the construction industry, a single business refers to a company that develops business in only one area while a related business sets foot in some related areas [7]. An unrelated business refers to a company that involves the upstream and downstream industry of construction or totally unrelated industry.

C. Organization Performance

Organizational performance comprises the quantity, quality, efficiency and profits associated with tasks completed by an organization in a period [8]. Indices of organizational performance vary according to different research and it will be more comprehensive from the stakeholders' view in market economy which China is now aiming at [1]. The main index for an economic entity in the market economy is financial performance, especially the profits, profit rate and income.

D. The Relationship between Diversification and Corporation Performances

The empirical study of diversification and corporation performance has long been a hot issue. In 1960s and 1970s, most scholars believed that diversification could overcome the shortcomings of specialization and help companies get higher performance with lower risk; economy value could be created through resource distribution which would promote the efficiency of core competeness. However, in the 1990s, many scholars testified that diversification would reduce the company value through empirical analysis. After 2000, many scholars started to query the previous research data and methods, believing the performance of diversification production is mixed and only in certain circumstance can diversification create value [9]. Academic circles have never

World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:7, No:6, 2013

reached an agreement on the relationship between diversification and corporation performance.

At the beginning, Rumelt [5] suggested that related business (associated and disaccord) diversification has a higher performance than other diversifications and disaccord business diversification has the highest performance while uncorrelated diversification has the lowest.

Related business has a stronger positive effect on corporation performance. Chang et al. [9] studied the development of 54291 companies from 1993 to 2006 from the DEA database and the results showed the relationship between different kinds of diversification and production efficiency: a related business would promote productivity while an uncorrelated business would reduce productivity [5].

Despite this, some scholars believe an unrelated business has a stronger positive effect on corporation performance. Bettis and Hall [10] testified that an unrelated business has a positive correlation with corporation performance while a related business has a negative one. Federcio [11] declared that a company with diversification would create stockholder value and unrelated diversification would do better.

There is no remarkable relationship between diversification and corporation performance. With 593 listed companies as samples, Yao [12] studied the relationship between the degree of diversification, ownership structure and economic performance. The study showed there is no dominate relation between degree of diversification and return on equity but there is a negative relationship between the degree of diversification and assets return rate; the ratio of national stock does not have a strong influence on company performance.

From the review above and the current condition of the construction industry, two hypotheses are proposed.

H1. The corporation performance of a construction related enterprise is higher than that of a single-business enterprise in China.

H2. The corporation performance of a construction related business is higher than that of an unrelated business in China.

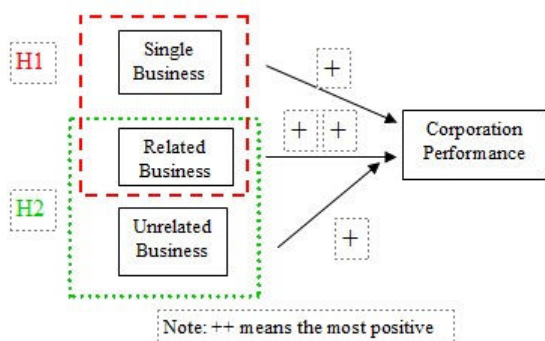The empirical model is also depicted as shown in Fig. 3.

Fig. 3 The diagram of the econometrics model

III. METHOD

This paper will establish a regression equation and perform econometric analysis based on a theoretical model.

A. Sample

We selected the listed companies under the category of "construction and materials" in the Shanghai and Shenzhen stock markets. There are 72 companies in total, with one eliminated because of the unknown year of foundation.

B. Data

We selected the corporate annual reports of sample companies from 2001 to 2010 in Juchao Information Database and transfer the unit into Company Year. 429 Company Years are obtained from a total of 495 due to fuzzy definitions and incomplete data.

C. Measures of variables

1. Measurement of the Independent Variables

Although many scholars concentrate on diversification, the measurement of variables is not unified for the various purposes. Tao [6] modified the classification index of Rumelt [5] according to the advantages and shortcomings as well as the characteristics of construction industry. The definition of the types of diversification is shown in Fig. 4.

SR (Specialization Ratio) = (the sale of the biggest program/ total sales)*100%

RR (Related Ratio)= (the sale of a series of related program/ total sales)*100%

Dummy variables are used in the measurement. If SR≥95%,the company is considered to be using a single business strategy, and hence SB=1,RB=0,UB=0;If SR<95%,RR≥70% ,it is considered to be using a related business strategy, and hence SB=0,RB=1,UB=0;if RR<70%,it is considered to be using a unrelated business strategy, and hence SB=0,RB=0,UB=1.
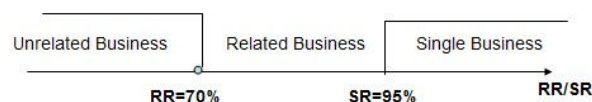

Fig. 4 The definition of the types of diversification

2. Measurement of the Dependent Variables

Financial indices are used to measure the performance in this study, which mainly involves the index of earning ability measured with Return on Assets (ROA) and the management efficiency measured with Total Assets Turnover Ratio (TATR).

3. Measurement of the Control Variables

AGE_1: the natural year of foundation, AGE_2: the natural year of being listed. These two variables are the controlling variables of the age of the companies. The logarithm of assets and the logarithm of total sales are controlling variables of the size of the companies. Financial lever (FL) coefficient: the ratio of liability and total assets. The growth rate of GDP is from the national statistical bureau.GOV (the type of company) is represented with dummy variables, for State-owned enterprise, GOV=1, otherwise, GOV=0.

World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:7, No:6, 2013

D. Model

Using the above variables, we establish the following multiple linear regression model.

$$Y=C+\beta_1*SB+\beta_2*RB+\beta_3*UB+\gamma_1*AGE_1+\gamma_2*AGE_2+\gamma_3*logasset+\gamma_4*logsale+\gamma_5*LF+\gamma_6*GOV+\gamma_7*GDP+u$$

where Y: the performance; C: constant; u: the measurement error.

IV. RESULTS

Because the independent variables are all dummy variables, we have to first use UB for the base to establish Model 1 and, Model 3. Then we use RB for the base to establish model 2 and Model 4. The results are shown in Table I.

TABLE I
STATISTICS FOR MODEL TEST

variables	ROA		TATR	
	Model 1	Model 2	Model 3	Model 4
SB	2.04**	1.80***	0.09*	0.16***
RB	0.22		-0.07*	
UB		0.29		0.06*
AGE$_1$	0.11***	0.11***	0.0001	0.0001
AGE$_2$	-0.59***	-0.59***	-0.02***	-0.02***
Log asset	-8.48***	-8.46***	-1.42***	-1.41***
Log sale	6.85***	6.82***	1.51***	1.51***
LF	-2.68***	-2.68***	0.16***	0.16***
Gov	-2.34***	-2.33***	-0.15***	-0.14***
GDP	0.22	0.22	0.02	0.01
R^2	0.49	0.49	0.73	0.73
Adj R^2	0.47	0.47	0.72	0.72
F	42.82***	42.83***	122.98***	122.8***
n	429	429	429	429

* $p<0.10$.; ** $p<0.05$.;*** $p<0.01$(Two tailed)

The results show that for Model 1, the correlation coefficient for SB is 2.04, and the P-value is less than 5%, indicating a specialized enterprise's return on assets 2.04 higher than unrelated diversification, which is only significant at the 5% level against the two-tailed alternative. For Model 2 the correlation for SB is 1.8, and the P-value is less than1%, indicating a specialized enterprise's return on assets 1.8 higher than related diversification, which is only significant at the 1% level. In brief, for profitability, the SB's correlation coefficient is positive and significant. That is to say the specialized listed construction firms in China have a higher level of profitability than companies with related diversification and unrelated diversification. However the coefficients for RB and UB in Model1 and model 2 are not opposite, and therefore we cannot draw a relationship between related diversification and unrelated diversification. The R^2 and Adj. R^2 of Model 1 are 0.49 and 0.47, and the Model 2 is the same. Therefore, statistically, according to the Adj. R2 in the study, the conclusion can be obtained: The independent variables together explain 47% of the dependent variable.

Similarly, for Operating Ability of Enterprise, in Model 3 and Model 4 the correlation coefficient for SB is positive and significant. And to RB, the coefficient for UB is positive at the 5% significance level, which shows that the highest performance for Operating Ability is specialization, followed by the unrelated diversification and the last being related diversification.

At the same time, we can see that the correlation coefficient of Gov is significantly negative, indicating that there is significant negative relationship between state-owned construction companies and corporate performance. And GDP are positive, but not significantly. Company size and age have an uncertain relationship with corporate performance. For AGE$_1$, the coefficients are significantly positive, indicating that the longer the company is established, the higher the level of profitability the company has. But for AGE$_2$ the coefficients are negative, indicating that the listed life and corporate performance have negative relationship. As for the company size, when measured in terms of assets, the relationship with corporate performance is significantly negative, but when measured in terms of sales, the relationship is significantly positive.

V. DISCUSSION AND CONCLUSIONS

With a deeper understanding of the market economic system and a clearer view of international trends, the construction enterprises that want to win in the fierce competition must maintain their level of profitability and operating level. Therefore, it is particularly important to choose a suitable strategy to develop. According to the results of this study, China's listed construction enterprise must adhere to the specialization strategy at this stage. First, we generally believe that specialized enterprises have the advantage of economies of scale, economies of scope and market power. Specialized enterprises focus on a single business in the long-term, resulting in their core competitiveness. It is easy to shape the competitiveness in the industry and to maintain a high level of profits. What's more, specialized enterprises have the maturity and stability characteristics. It is worth emphasizing that specialized enterprises can make full use of the partnership. Second, specialized businesses have less risk. Among other things, the construction is characterized by its high cost and uncertainty. Once the project fails, the enterprise may also go bankrupt. Engaging in their familiar territory can reduce the risk. Specialization especially for small and medium-sized enterprises can promote stability and development. Third, unlike the traditional industries, most of the construction enterprises have a relatively short history. And they do not have the qualifications for diversification. Moreover, due to the dispersion of internal resources, even if a company tries to diversify, its level of profitability is not as high as a specialized business. Fourth, the total asset turnover reflects the transfer speed of all the assets from input to output, showing the quality and efficiency of the total assets of the enterprise management. It is an important indicator of operational efficiency of an enterprise. A highly diversified business can effectively use their diverse resources to diversify production. Inventories are also diverse, easy to circulation.

Through research we get the following conclusions. First, Hypothesis 1 is rejected. Specialization can significantly improve the level of profitability of listed construction

World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:7, No:6, 2013

enterprises, and there is a significant positive relationship with corporate performance. Therefore, at this stage the construction enterprises in China need to identify their core competitiveness to improve their market share of superior products and form economies of scale to develop stably. Second, Hypothesis 2 is also not be verified. The level of operating performance of listed construction enterprises which engage in unrelated diversification is higher than those with related diversification. In order to seek long-term development, China's construction enterprises should keep the core business as well as develop unrelated business so as to sustain a long-term competitive advantage. Third, the relationship between state-owned construction enterprises and corporate performance is negative. The more the year of foundation is, the higher performance will be; however, the more the year of being listed, the lower performance will be. There are some limitations. The main limitation of this research is that the data for diversification rely on a certain degree of subjectivity. Diversification should be measured by a variety of methods.

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