

Analysis of top Chinese contractors' developmental tracks and evaluation of their strategic selection of international construction markets

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Abstract: The past decade has witnessed a rapid development of the international construction market. This research aims to investigate top Chinese contractors' developmental tracks and evaluate their strategic selection of international construction markets over the period from 2001 to 2006, based on the modified Boston Consulting Group Matrix (BCG). Results from 2001 to 2005 indicate that Asia and Africa, which were "question marks" markets for top Chinese contractors (abbreviated as TCCs), have the most potential to become "stars" markets; other question marks markets such as the Middle East and Europe are found not to be of potential; "dogs" markets such as the U. S., Canada and Latin America should be relinquished progressively unless there is renewed growth opportunity over the next two years. Compared to developmental tracks of top contractors from some advanced countries, TCCs' investment and development strategy in Africa seems to be sustainable and intensive; TCCs' exit strategy for the Middle East appears determined and swift, while their strategy in Asia seems to be lacking in persistence. Furthermore, the data of 2006 indicates that TCCs improve their performance in Asia and Africa, and Africa has become a "stars" market for TCCs. This research sheds important lights and insights into the prevailing process of internationalization of TCCs and provides a strategic direction for their selection of international construction market. What is more, this research is also valuable to other Chinese contractors who are seeking the opportunity to enter the international construction markets.

Key words: international development; construction industry; developmental tracks; top Chinese contractors; China

1 Introduction

The past decade has witnessed a rapid development of the international construction market. Records indicate that for ENR's top 225 international contractors, revenue from projects outside the home countries rose 93.63% to US \$ 224 427.80 million in 2006^[1], up from US \$ 115 907.5 million in 2000^[2]. Undoubtedly, the international construction market plays an increasingly important role in the top construction firms' competitive advantage and their overall performance. At the same time, experts caution that international contractors should be selective in their choices of market in the midst of a global upturn in the construction industry^[3]. In this paper, top contractors refer to those international firms which are listed in ENR's top 225 international contractors, whose presence and ranking vary year to year.

Without considering geopolitical reasons, if contractors from a certain country are acquainted with a particular international construction market, their

chances of getting a bigger share from that market will be considerably enhanced. In other words, the degree of acquaintance of contractors from one country with a particular international construction market is likely to have a positive impact on the performance of existing and new contractors from that country. Therefore, the strategic selection of international construction markets is of great importance to current and new contractors venturing overseas. Despite the sharp increase in the number of top Chinese contractors (abbreviated as TCCs) in recent years, the average revenue generated by each firm is far less than their counterparts from the advanced countries^[1,2]. As latecomers to the international market, the appropriate strategic selection of international construction market thus becomes important for TCCs.

Some researches have been conducted to study the correlative problems of the international construction market and its selection strategy. Tulacz and Powers analyzed the factors which contributed to the formation of a global economy and the growth of the international

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construction market, pointing out that global stability provided global opportunities for construction^[4]. Tulacz reported on the performance of the United States' construction industry with respect to the international construction market and concluded that the international market had retained its allure^[5]. Based on ENR's sources, Wu, et al. analyzed the international construction market structure of top contractors and design firms from developed countries, including the U. K., France, Germany, U. S. and Japan, and separately calculated their market structure centralization^[6,7]. From a global perspective, Low and Jiang found a prevalent trend that construction markets in developing countries had become increasingly attractive and that contractors from these countries had also been increasingly involved in the international construction market; the model they created showed that construction multinational corporations from different nationalities demonstrated different patterns in the internationalization process^[8]. Comparing the construction industries in U. S., Japan, and the U. K., Xu, et al. suggested that the Chinese construction industry would need to accommodate appropriate international practices in order to develop a competitive industry^[9]. The study of Low, et al. indicated that although the TCCs had grown steadily, they were still in the initial stage of internationalization in the global market^[10]. Through case studies and literature review, Cheah and Chew presented a strategic development framework for Chinese contractors based on Western strategic management theories and pertinent characteristics of the China's construction industry, which applied to both the domestic and international markets^[11].

Notwithstanding that some related studies have already been performed, as latecomers to the international market, TCCs' international strategy has not been well studied hitherto. More studies on market-oriented strategy are needed to direct the selection of international construction market for TCCs. This research aims to investigate the TCCs' developmental tracks and evaluate their strategic selection of international construction markets over the period from 2001 to 2006, based on the modified Boston Consulting Group Matrix (BCG) model. Models are established based on the data from 2001 to 2005, and are tested by the data of 2006. The results shed important lights and insights into the prevailing process of internationalization of TCCs and provide a strategic direction for their selection of international construction market. What is more, this research is also valuable to other Chinese contractors who are seeking the opportunity to enter the international construction markets.

2 Methods

Boston Consulting Group Matrix (BCG) is founded as an important method of enterprises' strategic management^[12]. Meanwhile, some limitations of the BCG approach are discussed by Yi, such as the fixed 10% market growth and so on^[13]. In accordance with the characteristics of international construction market, the BCG model is modified in this study to analyze the strategic selection of the international construction market. The market growth is not at a fixed level but calculated according to the construction market development from 2001 to 2005. Furthermore, the BCG model is used longitudinally to analyze the developmental tracks for the first time, other than the traditional transverse perspective. Two variables, market growth and relative market share, are used in the modified BCG model. In this model, the x-axis is relative market share and the y-axis is market growth. All the relevant data are directly cited and calculated from ENR's sources^[1-3,14-17].

2.1 Relative market share

Relative market share (abbreviated as R) is calculated by the following expression:

$$R = C/O \quad (1)$$

Where R is relative market share; C is total international contracting revenue in a regional market of a country's top contractors; O is total international contracting revenue in this regional market of the main opponent country's top contractors.

If $R > 1$, it represents that the top contractors from this country have a maximal market share in this regional construction market. If $R = 1$, it means that the top contractors from this country have an equal market share compared to their main opponent's top contractors in this regional construction market. If $R < 1$, it implies that the market share of the top contractors from this country is less than their main opponent's top contractors in this regional construction market.

2.2 Market growth

Market growth (abbreviated as M) is the annual increasing rate of the international revenue in a specific international construction market, when compared to the international revenue of the year before. In this paper, the benchmark of market growth is the average annual increasing rate of all the international construction markets from 2001 to 2005, which is calculated as 10.11%. If $M \geq 10.11\%$, it represents that this specific international construction market's annual increasing rate is high. Similarly, if $M < 10.11\%$, it means that this specific international construction mar-

ket's annual increasing rate is low. This result appears to be close to the recommendation of fixed 10 % market growth for the conventional BCG model^[12].

2.3 BCG international construction market combination model

As Fig.1 shows, all the international construction markets are divided into four types by relative market share and market growth, which include dogs market, question marks market, stars market and cash cows market. Markets of different types are deemed to have different characteristics and development strategies.

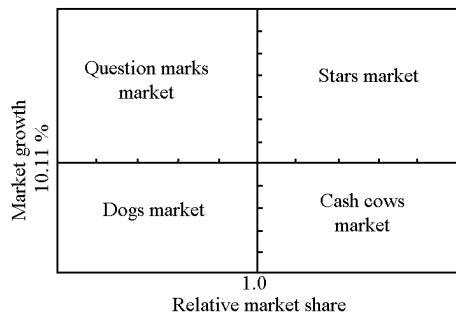


Fig.1 BCG international construction market combination model

Question marks market has a high growth rate but a low competitive status due to weak market share. High growth rate calls for a large capital outlay to support its development. On the other hand, low competitive status may just bring very little return. Thus, for this type of international construction markets it is best to adopt selective share-building strategy^[12]. In other words, more investment from top contractors of this country should be given to such types of international construction markets, which have the potential to become stars markets, to increase their market share, while those markets with no future should be abandoned.

Dogs market, which is a type of relatively saturated and intensely competitive international construction market means a low growth rate and low market share. The returns for top contractors of one country from this type of markets stay at a low level. These contractors from that country should seriously consider whether they have any reasons to stay or enter into this type of international construction markets. Otherwise, such type of international construction markets should be abandoned or withdrawn step by step.

Stars market has a rapid growth rate and strong market share. Because of its rapid development, more resources are needed to hold its market share. Still, it has a long term potential in market growth and profits, and therefore the possibility of becoming the capital

generators in the future. Therefore, more resources should be invested into this type of international construction market to consolidate the competitive advantage of top contractors from one country.

Cash cows market is saturated or breaking down, but top contractors from one country still have a relatively strong competitive status. These international construction markets have entered into the mature stage and have steady capital return. Harvesting strategy should be adopted to pursue the maximum of current profit. More investment from top contractors of one country should not be channeled to these international construction markets unless they have a new growth trend and tendency.

2.4 Longitudinal developmental tracks

Fig.2 shows an example of the longitudinal developmental tracks which link different points of the same international construction market for a country's top contractors' developmental process from 2001 to 2006. It is the first time that the BCG model is used longitudinally to deduce the developmental tracks of international construction market.

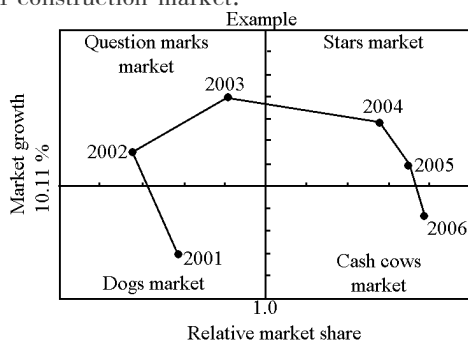


Fig.2 Example: developmental tracks of one country's top contractors in an international market

3 Analysis

This section analyzes the international construction market's developmental tracks and evaluates the strategic selection of top contractors from China as well as from other countries, using the modified BCG Model.

3.1 TCCs' BCG model

3.1.1 BCG international construction market combination model

According to ENR, the international construction market is divided into seven major regions, including the Middle East, Asia, Africa, Europe, U.S., Canada and Latin America. Based on the data of ENR from 2001 to 2006, the results of TCCs' *R* and *M* values are calculated, and indicated in Table 1.

Table 1 TCCs' R and M Values (Source: ENR, 2001 – 2006)

Year		Market						
		Middle East#1	Asia#2	Africa#3	Europe#4	U. S. #5	Canada#6	Latin America #7
2001	M	-16.24%	-12.20%	15.12%	-10.49%	0.00%	1.48%	-8.54%
	R	0.595	0.686	0.277	0.050	0.017	0.001	0.034
2002	M	14.07%	3.19%	26.31%	17.14%	-1.19%	-31.88%	-10.14%
	R	0.384	0.688	0.415	0.041	0.025	0.004	0.182
2003	M	68.95%	14.77%	13.60%	41.01%	-1.44%	6.64%	3.47%
	R	0.175	0.835	0.576	0.016	0.013	0.000	0.051
2004	M	54.45%	17.04%	12.87%	29.16%	0.08%	4.34%	-8.38%
	R	0.087	0.692	0.597	0.017	0.024	0.000	0.060
2005	M	10.78%	10.88%	5.99%	13.80%	9.56%	27.10%	32.62%
	R	0.124	0.564	0.891	0.007	0.008	0.001	0.066
2006	M	46.97%	18.96%	18.31%	4.77%	16.64%	26.69%	32.17%
	R	0.167	0.724	1.336	0.026	0.035	0.004	0.163

Accordingly, the TCCs' BCG international construction market combination models, from 2001 to 2005, are analyzed respectively as in the following.

As shown in Fig. 3, Africa is the only question

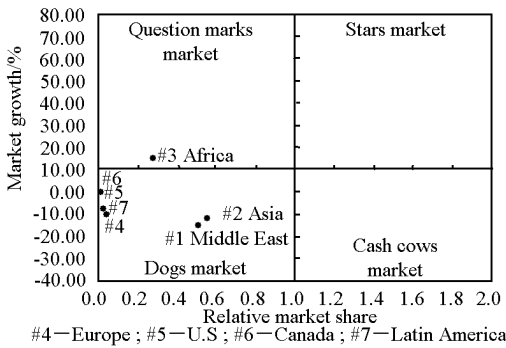


Fig. 3 TCCs' BCG combination model in 2001

marks market in 2001 for TCCs, while all the other regional construction markets are under dogs market. The year 2001 is bad for international Chinese contractors—a result of terrorist attacks on New York City and Washington and a softening U. S. economy which affects the international construction market [16]. Under such a backdrop, however, there is a rapid growth of 15.12 % in Africa. At the same time, the relative market share of Africa is higher than that of Europe, U. S. , Canada and Latin America. Thus, in the question marks market of 2001, Africa is the only international construction market which has the potential for Chinese contractors to further invest or enter into. What's more, among the international markets of dogs market, TCCs have a relatively strong and competitive capability in Asia and the Middle East where their relative market share is 0.686 and 0.595 respectively; but

their market growth has dropped 12.20 % and 16.24 % correspondingly. These two regions are the potential international construction markets under dogs market where selective investment should be considered when there is any sign of increasing growth trend. Other international construction markets of dogs market should be abandoned because these markets either grow slowly or even decline and TCCs have no competitive advantage in these regions.

As far as 2002 is concerned (the corresponding figure is omitted here), TCCs' three international construction markets—Africa, the Middle East and Europe enter into question marks market while others are still in dogs market. The market growth of Africa continues its healthy trend which has a 26.31 % rise against the year before. TCCs also continue their good performance in Africa, whose relative market share increases to 0.415. Undoubtedly, Africa is also the most potential international construction market to TCCs in 2002 and more Chinese international contractors should invest into this region to enhance their market share. Europe and the Middle East have rapid growth of 17.14 % and 14.07 % separately which manifest a good increasing tendency. However, the relative market share has dropped to 0.041 and 0.384 correspondingly. Europe is not a good selection for TCCs because of its fierce competition and apparently Chinese contractors have been aware of this. However, it seems that TCCs are not aware of the opportunities in the Middle East as the relative market share has dropped significantly. Under the dogs market, clearly, Asia is the most desired international construction market for TCCs who have increased steadily their relative market share as the re-

gion rebounded with a positive growth, making it a hopeful dogs market. Although Latin America's relative market share is rising to 0.182, its market is still saturated, with growth shrinking further by 10.14%. Thus, U.S., Canada and Latin America are still not good choices for Chinese international contractors at that time.

In 2003, Asia, Africa, the Middle East and Europe are all question marks market (the corresponding figure is also omitted here). Asia and Africa become the most appropriate investing markets, as Asia has a rapid growth rate of 14.77% and a relative market share of 0.835, making it the most probable market that has the potential to become a stars market; and Africa is next in line with a growth rate of 13.60% and relative market share of 0.576. The Middle East market is somewhat volatile, with a sharp rise of 68.95% in market growth and a disproportionate drop of relative market share to 0.175. Others, such as U.S., Canada and Latin America, remain dogs market, which Chinese international contractors should not pay much attention to.

Compared to 2003, the number and content of question marks market and dogs market for TCCs remain unchanged in 2004 (the corresponding figure is also omitted here). Question marks market still include Asia, Africa, the Middle East and Europe, while the U.S., Canada and Latin America still remain in dogs market. What is more, market growth of Asia continues its rising trend to 17.04% but its relative market share drops to 0.692. At the same time, however, TCCs' relative share of Africa increases slightly to 0.597 while its growth drops slightly to 12.87%. The prospect for the Middle East and Europe has declined somewhat, with growth rate slowing down to 54.45% and 29.16% correspondingly, and relative market share further erodes to 0.087 and 0.017 separately due to stiff competition. At the same time, U.S., Canada and Latin America still remain in the dogs market with extremely low relative market share and poor market growth, representing great risks to Chinese international contractors.

Fig. 4 illustrates the situation of TCCs in 2005. Africa becomes the dogs market for the first time and U.S. still remains in the same region. Others are in the question mark market, including Middle East, Asia, Europe, Canada and Latin America. Peter et al. opine that international contractors should exercise caution, seizing only the best out of the prevailing opportunities for market development^[3]. The market growth of Middle East, Asia, U.S. and Africa are 10.78%, 10.88%, 9.56% and 5.99% respectively, which

are very close to the benchmark of 10.11%. Furthermore, both Asia and Africa, which are major international markets for TCCs, have witnessed a falling trend. Although TCCs continue their good performance in Africa, where their relative market share rises to 0.891, the declining trend is discernible. Relative market share of TCCs in Asia reduces to 0.564 compared to 0.692 of 2004.

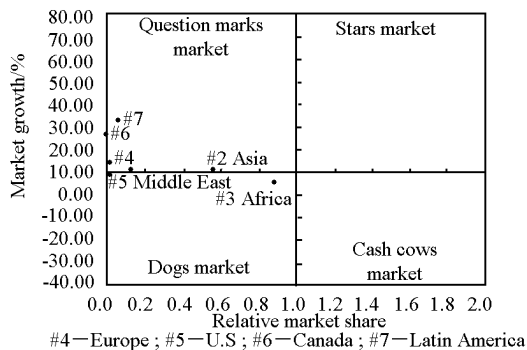


Fig. 4 TCCs' BCG combination model in 2005

In contrast to 2005, a notable change in 2006^[1] is that Africa has become the "stars" market for TCCs, with a rapid market growth of 18.31% and a relative market share of 1.336. And the performance of TCCs in Asia is enhanced further with a relative share to 0.724 (the corresponding figure is omitted here).

3.1.2 Developmental tracks in the international construction markets

Fig. 5 illustrates the developmental tracks of TCCs in the Middle East, Asia and Africa. The analysis and evaluation of these three international markets has great significance to Chinese international contractors.

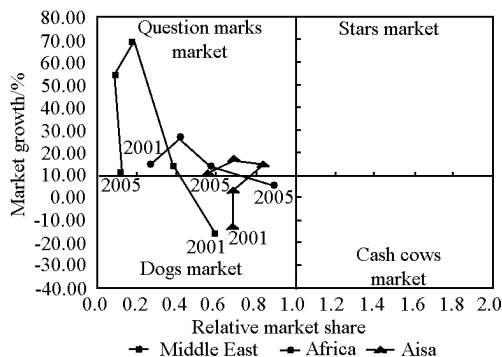


Fig. 5 TCCs' developmental tracks in the Middle East, Asia and Africa

Although the Middle East's market growth drops 16.24% in 2001, it has registered a rapidly increasing trend from 2002 to 2004. It appears that TCCs do not notice and exploit the opportunity to enhance their relative market share, which continues to decline

sharply from 0.595 in 2001 to 0.087 in 2004. TCCs' exit strategy in the Middle East appears determined and swift. Not unexpectedly, the underlying geopolitical climate might have impacted on it.

For the international construction market in Asia, TCCs have a stable relative market share which peaks at 0.835 in 2003. Asia has always been the most important international construction market for Chinese contractors. Undoubtedly TCCs have made great efforts to enhance their relative share in this market but it seems that their investment strategy and determination are not sufficiently persistent as their relative market share drops from 0.835 in 2003 to 0.564 in 2005, whereas the market growth registers a rapid increasing trend throughout 2001 to 2004 and a bit drop in 2005. Fortunately, the TCCs enhanced their performance in this market and the relative market share rises to 0.724 in 2006.

As indicated in Fig. 5, Chinese contractors' relative international construction market share from Africa is increasing rapidly but the market growth trend is slowing down from 2002 to 2005. Still, TCCs continuously enhance their relative market share from 0.277 in 2001 to 0.891 in 2005. The investment and development strategy seems to be sustaining and intense. Apparently, TCCs have been aware of this situation, the relative market share in 2006 rises to 1.336 which makes this market become a stars market for TCCs.

3.2 BCG developmental tracks of some other countries' top contractors

Some international construction developmental tracks of top contractors from the United States and France are analyzed as follows:

3.2.1 Top U. S. contractors' developmental tracks in the Middle East

Fig. 6 shows the top U. S. contractors' developmental tracks in the Middle East. In 2001, the relative market share of top U. S. contractors reaches 0.995 but the market growth has experienced a downtrend at that time; clearly their development in the Middle East is affected by this negative growth which causes the relative market share to drop sharply to 0.411 the next year. However, this poor outlook is reversed since 2002 when the market registers a rapid growth of 14.07%, leading to a strong performance of top U. S. contractors with relative market share of 2.428 and 4.775 in 2003 and 2004 respectively. Undeterred by temporary drop in market share, top U. S. contractors have persevered and adopted an aggressive strategy to expand their market share under the premise of a robust, growing market. Top U. S. contractors thus have exploited the market potential to turn it from the question

marks market to stars market and have since completely dominated the market. With the descending trend of this market in 2005, the relative market share of Top U. S. contractors drops to 2.449 in 2005 but the preponderant status still remains. In 2006, the market growth is 46.97 and the relative market share is calculated as 1.847.

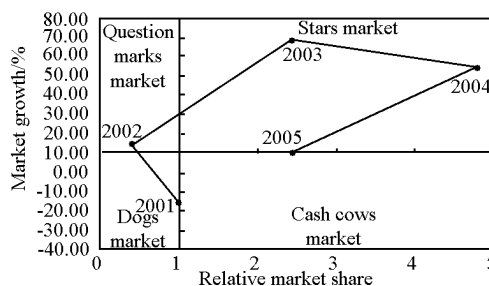


Fig. 6 Top U. S. contractors' developmental tracks in the Middle East

3.2.2 Top French contractors' developmental tracks in the Middle East, Africa and Europe

The developmental tracks of top French contractors in the Middle East, Africa and Europe are shown in Fig. 7.

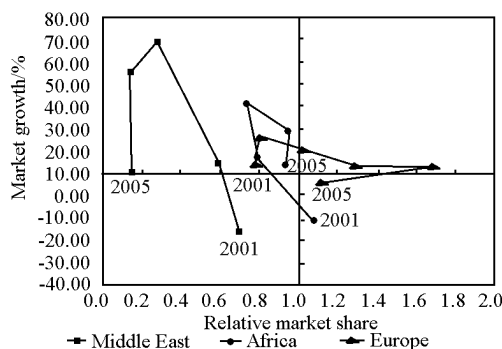


Fig. 7 Top French contractors' developmental tracks in the Middle East, Africa and Europe

As indicated, top French contractors' strategy tracks in the Middle East are similar to that of TCCs (Fig. 5). Unlike top U. S. contractors, top French contractors do not seize the opportunity of a rapidly rising market to enhance their relative market share, causing that to decline from 0.697 in 2001 to 0.146 in 2004. It appears that top French contractors' exit strategy in the Middle East is similar to that of Chinese contractors', which is determined and swift. Again, the underlying geopolitical reasons could have impacted upon it.

As indicated in Fig. 7, the direction of top French contractors' developmental tracks in Africa is more superior to that for Chinese contractors (Fig. 5). Top French contractors make huge investment into Africa due to the consistently rising market growth there from

2001 to 2004, making Africa the stars market for top French contractors in 2003 and 2004. With the descending trend of this market in 2005, the relative market share of top French contractors reduces to 1.122 in 2005, making it to become a cash cow market. Thus top French contractors have seized the market opportunity in Africa and adopt an aggressive investment and development strategy to create a strong competitive advantage in this market. In 2006, this market has become a “question marks” market as the relative share is reduced to 0.748.

In contrast to the African market, top French contractors seem to be unable to maintain their competitive advantage in the European market, which has changed from a cash cows market in 2001 to a question marks market from 2002 onwards, as shown in Fig. 7; their relative market share drops from 1.077 in 2001 to 0.736 in 2003. However, the rapid growth trend of European regional construction market has refocused their attention to this market, resulting in their relative market share rising to 0.938 again in 2005. As far as top French contractors are concerned, Europe has the potential to become a stars market in the near future and French contractors look set to continue their strong investment and development strategy to make this a reality. Although the market growth has a declining trend, the actual market size of Europe is very large compared to other international construction markets.

4 Results and discussion

Fig. 3 and Fig. 4 show the TCCs' BCG combination model in 2001 and 2005. Based on the previous analysis, Results indicate that Asia and Africa, currently “question marks” markets for top Chinese contractors, have the most potential to become “stars” markets; other question marks markets such as the Middle East and Europe are found not to be of potential; “dogs” markets such as the U. S. , Canada and Latin America should be relinquished progressively unless there is renewed growth opportunity over the next two years.

Fig. 5 illustrates TCCs' developmental tracks in the Middle East, Asia and Africa. Compared to developmental tracks of top contractors from some advanced countries, TCCs' investment and development strategy in Africa seems to be sustainable and intensive; it is even more so for top French contractors in Africa. TCCs' exit strategy in the Middle East, like that of the French contractors', appears determined and swift, in sharp contrast to the U. S. contractors who are very aggressive and have successfully dominated this market.

As for Asia, their investment strategy seems to be lacking in persistence. TCCs should emulate French contractors' strategy in Europe – to invest more into Asia to make it a stars market for Chinese contractors. As analyzed, other international construction markets are not good investment choice for Chinese international contractors.

5 Conclusion

The results suggest that Asia and Africa have the potential to become a stars market for Chinese international contractors in the near future. In particular, Chinese contractors should pay more attention to Asia and invest more aggressively there to enhance their competitive advantage and market share. The results of this research shed important lights and insights into the prevailing process of internationalization of TCCs and provide a strategic direction for their international construction market selection. What is more, this research is also valuable to other Chinese contractors who are seeking the opportunity to enter the international construction markets.

It is noted that this research is conducted at a country level, which can serve as a foundation for future research based on a company level. Such future research can incorporate the impact of the underlying geopolitical factors on the strategies and approaches taken by the companies to penetrate different international markets.

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