

The Expansion of Chinese Construction Companies in the Global Market

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Chinese contractors are increasingly playing a significant role in the global construction market. This paper provides a comprehensive study of the global expansion of Chinese construction companies as a result of Chinese open-door policies, by describing the developments from 1950 through 2008, highlighting the achievements, and identifying the main constraints preventing them from playing a more effective and efficient role in the global construction market. The development of Chinese construction companies in the global market was divided into three periods: the first period from 1950 through 1978, the second period from 1979 through 2001, and the third period from 2002 through 2008. In each period, the autonomy of Chinese construction companies, along with their achievements and problems were studied. Besides, the new business environment after accession to the World Trade Organization (WTO) and the analyses on Chinese foreign economic cooperation using the data since 1979 were conducted. The results of this paper can help the U.S. construction companies become more familiar with the Chinese construction companies and therefore more competitive in the global construction market.

Key Words: China, Construction Company, Global Market, Contracting Value, Turnover

Introduction

Background

The development of Chinese construction enterprises in the global market can be traced back to 1950s when the Chinese government provided economic and technical aid to other developing countries (Low and Jiang, 2003). During this period, the international involvement of Chinese construction firms was mainly for financial aid projects in some developing countries with funds provided by the Chinese government. The Chinese construction industry started to change in the early 1980s with the introduction of economic reforms and the open-door policies. On August 13, 1979, Chinese State Council introduced an Act in which Chinese specialized companies were allowed to invest in other countries (Low and Jiang, 2003). At the central government level, the government agencies started to introduce regulations to set the basic ground rules. At the enterprise level, the entities were gradually given flexibility to operate as commercial entities (Chen, 1998). Since the early 1990s, some of the largest state owned construction enterprises have gained experience in the international market. Subsequently, provincial-level and some other regional companies were allowed to obtain licenses for contracting overseas. After China accession to the World Trade Organization (WTO), more than 1,600 Chinese companies have the required qualifications to carry out international engineering and construction contracts (Reina and Tulacz, 2004).

Purpose

Some studies have been completed on the subject of the global expansion of Chinese contractors. Low and Jiang (2003) conducted an analysis of 35 Chinese contractors on the list of the Top 225 International Contractors in 2000 to evaluate their achievements. Low et al. (2004) compared the performance of top British and Chinese contractors based on the OLI+S model, which incorporated the ownership (O), location (L), internalization (I) and specialty (S) factors. Alden and Davies (2006) investigated the rise of Chinese multinationals in Africa. Zhao et al. (2009) employed a SWOT analysis in combination with qualitative research to analyze the situation of Chinese contractors in the international market. Huang and Bai (2010) presented an overview to the development of the Chinese construction industry after the Culture Revolution and compared the characteristics of the Chinese and U.S. construction industries. While these studies are either out of date or only focused on a particular area, none of the studies have been found to analyze the global expansion of Chinese construction companies as a whole and to cover

the developments from 1950 to now. Thus, this paper is written to fill the knowledge gap through data analysis on market size and regions.

Literature Review

The First Period from 1950 through 1978

Prior to the economic reform in 1978, all construction enterprises were owned by the state and its agencies. The enterprises had little autonomy with regarding to choice of projects, which were assigned by the government and achieved through administration means. Staffs were assigned by government to enterprises which were responsible for meeting the lifelong social needs of them. Besides, the supply of materials, equipment, credit and other services were also provided by the government through a quota system (Chen, 1998). The whole industry thus could be viewed as a single large enterprise with a centralized hierarchical organization in which resources, products and services were allocated almost exclusively by administrative means. In November 1978, Chinese first international construction enterprise—China Construction Engineering Corporation was established. In this period these financial aid projects did not technically constitute part of the international construction market for the following reasons: (1) these were not motivated by the market place or profit-driven for the firms; (2) all project costs and other expenditure were funded by the Chinese government; and (3) firms participated in the projects were not involved in any decision-making activities. However, during this period, the Chinese construction enterprises involved in these projects gained basic information about the international market and helped to train many personnel who played an important role when China opened its door to the world (Low and Jiang, 2003).

The Second Period from 1979 through 2001

During this period, the Ministry of Foreign Economic Relations and Trade (MOFERT) was responsible for overseas contracting business, giving approval for the enterprises to work overseas and taking general administration roles for the Chinese construction enterprises abroad (Chen, 1998).The Chinese construction industry started to reform in the early 1980s following Chinese open-door policies. Soon after, SOEs at the central government level were able to obtain licenses to bid for projects in the international market. Meantime, some of the largest SOEs were established such as: China Road and Bridge Corporation, China Civil Engineering Construction Corporation, China International Water and Electric Corporation, China National Complete Plant Import and Export Corporation, etc. Large scale SOEs were supervised by the newly established Office of Large Scale State-Owned Enterprises under the State Council (Low and Jiang, 2003). Chinese foreign contracting services included the following industries: residential, petrochemical, transportation, manufacturing, water supply and drainage, water conservancy and electric power, etc, which almost covered all the fields in international construction market. With the global expansion of Chinese construction companies, about 219,900 construction workers were sent abroad by 1994. At the end of 2001, the cumulative dollar amount of overseas contracts since 1976 was reported to be $127.87 billion, of which the 2001 figure alone was $16.45 billion (Department of Foreign Economic Cooperation 2002). While engaging in international construction, equipment made in China was also exported in large volume. The total export value of equipment and material that accompanied overseas construction projects in 2000 was $875.59 million (Department of Foreign Economic Cooperation 2001). This also helped the development of the construction industry at home as well (Chen, 1998). However, the price-war among Chinese companies in some traditional markets of developing countries such as Pakistan, Iraq, and other Middle Eastern and African countries commenced with their expansion overseas.

The Third Period from 2002 through 2008

The accession to the WTO in 2001 offered new opportunities for Chinese construction companies to conduct businesses in those countries that were traditionally against the entry of Chinese firms. This also provided Chinese contractors the legal mechanism to protect their benefits. Any disputes or unfair treatments could be settled by applying WTO principles (Zhao et al., 2009). After China was formally admitted to the WTO on December 11, 2001, more than 1,600 Chinese companies had the required qualifications to carry out international engineering and construction contracts, but the dominant ones are large state-owned enterprises such as China State Construction Engineering Corp (CSCEC). The total contracting value of the 47 Chinese construction companies that ranked within the ENR "Global 225" in 2003 contributed 60 percent of the total international contracting value of all Chinese companies (Reina and Tulacz, 2004). For the types of work, during this period, international projects were

mainly concentrated in building construction, communication and transportation, petrochemical industry, and power industry (Li et al., 2001). On the other hand, during the negotiations between China and other WTO member countries regarding Chinese entry into the WTO, some of the countries required China to open its construction market to foreign companies, especially those from Japan, the United States, and Europe (Xu et al., 2005). The agreement was that foreign companies would be allowed to set up wholly owned enterprises in China five years after China entry to the WTO (Low and Jiang, 2003). As a result, the Chinese construction companies would face increasing competition in the domestic market, as Chinese construction market was becoming rapidly internationalized.

Methodology

Data Collection

Data on the global expansion of Chinese construction companies from 1979 through 2008 were collected from the China Statistical Yearbook 1996 through 2009. The statistic data include: number of countries with contracts signed, number of contracts, contracting value, turnover (equals revenue) fulfilled, and turnover by regions. The scope of the statistic data covers construction projects, labor services, and design and consultation services in foreign countries. Construction Projects refer to projects undertaken by Chinese contractors through the bidding process in the international market. Labor Services refer to the activities of providing technology and labor services to employers or contractors in the forms of receiving salaries and wages. The business income of labor service cooperation is the income in the form of wages and salaries, overtime pay, bonuses and other remuneration received from the employers during the reference period. Design Consultation refers to projects with income for technical services provided to overseas clients (China Statistic Year Book 2009).

Data Analysis

Data for this research will be processed and projected using a time series plot. A time series plot is a graphical representation of the data trend, which can be used to analyze prediction. This analysis is also called regression analysis. Through regression analysis, the trend can be extended in the plot beyond the existing data in order to predict the future value. R squared value (ranging from 0 to 1), also known as coefficient of determination, is an index measuring the fitting degree of the prediction. Its value can indicate the fitting degree between the estimated value from the plot and the corresponding existing data. The higher the fitting degree is, the higher the reliability of the prediction is. During the data analysis, the type of prediction functions will be chosen depending on the R squared value. In addition, the analysis in this paper has not taken currency inflation into account.

Results

Expansion from 1979 through 2001

Market Size

As presented in Table 1, Chinese construction companies carried out international projects in only 11 countries during 1976 to 1979. After the open-door policies, this number grew gradually at an average of 8 countries per year, up to the highest amount of 188 by 1998. Meantime, the total number of contracts jumped from 43 to 39,400, increased by about 900 times, the contracting value reached 16.5 billion USD, increased by about 300 times, and the turnover surpassed 12 billion USD, increased by about 70 times.

On a stand-alone basis, for the construction projects, the percentage in total contracting value increased and after 1983 tended to be stable in the range between 75% and 90%, and similarly the turnover rose gradually to 8.90 billion USD that accounted for 73.3% of the total turnover. For labor services, the contract number contributed 80% to 90% in overall contracts from 1990 to 2001, the proportion in total contracting value was in the range of 11% to 45%, and the turnover increased constantly at an average growth rate of 278 million USD per year since 1990. In

comparison with labor services and construction projects, both contracting value and turnover of design consultation were relatively insignificant from 1995 to 2001.

Table 1

Construction Projects, Labor Services and Design Consultation from 1976 through 2001

Year	Number of Countries with Contracts Signed	Construction Projects			Labor Services			Design Consultation			Total Contract Number	Total Contracting Value	Total Turnover Fulfilled
		Contract Number	Contracting Value	Turnover Fulfilled	Contract Number	Contracting Value	Turnover Fulfilled	Contract Number	Contracting Value	Turnover Fulfilled			
1976-1979	11	33	0.35	NA	10	0.18	NA	NA	NA	NA	43	0.53	NA
1980	16	138	1.40	1.23	34	0.45	0.47	NA	NA	NA	172	1.85	1.70
1981	36	250	2.76	NA	113	2.28	NA	NA	NA	NA	363	5.04	NA
1982	38	195	3.46	1.89	119	1.61	1.59	NA	NA	NA	314	5.07	3.48
1983	40	280	7.99	3.15	180	1.25	1.37	NA	NA	NA	460	9.24	4.52
1984	52	344	15.38	4.94	396	1.99	1.29	NA	NA	NA	740	17.37	6.23
1985	71	465	11.16	6.63	458	1.49	1.72	NA	NA	NA	923	12.65	8.35
1986	83	486	11.89	8.19	458	1.70	1.54	NA	NA	NA	944	13.59	9.73
1987	95	616	16.48	11.14	833	2.41	1.46	NA	NA	NA	1,449	18.89	12.60
1988	103	642	18.13	12.53	1,484	3.59	1.77	NA	NA	NA	2,126	21.72	14.30
1989	124	776	17.81	14.84	2,324	4.31	2.02	NA	NA	NA	3,100	22.12	16.86
1990	122	920	21.25	16.44	4,255	4.78	2.23	NA	NA	NA	5,175	26.04	18.67
1991	147	1,171	25.24	19.70	7,267	10.85	3.93	NA	NA	NA	8,438	36.09	23.63
1992	159	1,164	52.51	24.03	8,241	13.35	6.46	NA	NA	NA	9,405	65.85	30.49
1993	158	1,393	51.89	36.68	10,212	16.11	8.70	NA	NA	NA	11,605	68.00	45.38
1994	171	1,702	60.28	48.83	15,789	19.60	10.95	NA	NA	NA	17,491	79.88	59.78
1995	178	1,558	74.84	51.08	17,397	20.07	13.47	366	1.81	1.33	19,321	96.72	65.88
1996	178	1,634	77.28	58.21	22,723	22.80	17.12	534	2.65	1.64	24,891	102.73	76.96
1997	181	2,085	85.16	60.36	25,743	25.50	21.65	614	2.90	1.82	28,442	113.56	83.83
1998	188	2,322	92.43	77.69	23,191	23.90	22.76	442	1.40	0.89	25,955	117.73	101.34
1999	187	2,527	101.99	85.22	18,173	26.32	26.23	426	1.71	0.90	21,126	130.02	112.35
2000	181	2,597	117.19	83.79	20,474	29.91	28.13	494	2.33	1.34	23,565	149.43	113.25
2001	NA	5,836	130.39	88.99	33,358	33.28	31.77	206	0.88	0.63	39,400	164.55	121.39

Note: 1. Adapted from the China Statistical Yearbook 2009; 2. Contracting Value and Turnover Fulfilled (100 million USD)

Regions

Table 2 shows turnover in different regions classified based on types of contracts from 1998 through 2001. Asia was the largest market that turnover was 72% of the total turnover in average per year. Africa was the second largest market for Chinese contractors, with the average turnover of 1.77 billion USD and average percentage of 15.3% per year. On the other hand, the proportion of construction projects undertaken in Africa was higher than in Asia. The turnover fulfilled in the other four overseas regions were relatively small at less than 0.5 billion USD per year except for the years 2000 and 2001 in the European market.

Expansion from 2002 through 2008

Market Size

After the accession to the WTO, Chinese construction companies continued to exploit the global market as shown in Table 3. By the end of 2008, the contract number of overseas projects was more than 160,000, increased by 4.7 times, the contracting value reached 113 billion USD, increased by 5.3 times, and the turnover surpassed 65 billion USD, increased by 3.5 times compared with the numbers of 2002.

Viewed in isolation, for the construction projects, the contract number increased since 2003 and peaked at 12,996 in 2006, the contracting value exceeded 100 billion USD which accounted for 92.5% of total contracting value, and the turnover increased from 11.2 billion USD to 56.6 billion USD. For labor services, the contact number exceeded

150,000 in the last two years, which accounted for more than 96% of the total contract number, and the contracting value increased constantly from 2.8 billion USD to 7.5 billion USD during this period. Compared with labor services and construction projects, the contract number, contracting value and turnover fulfilled of design consultation were all insignificant.

Table 2

Turnover in different regions from 1998 through 2001

Region （USD 10000）		Asia	Africa	Europe	Latin America	North America	Oceanic & Pacific Islands	Others	Inner Country	Total
1998	Construction Projects	532,231	187,064	23,880	10,376	11,107	9,969	3,625	146,064	924,316
	Labor Services	154,764	14,414	24,623	4,837	20,390	4,790	1,558	13,584	238,960
	Design Consultation	3,021	434	420	90	681	204	NA	9,197	14,047
	Total	690,016	201,912	48,923	15,303	32,178	14,963	5,183	168,845	1,177,323
	Percent in Total	58.6%	17.2%	4.2%	1.3%	2.7%	1.3%	0.4%	14.3%	100.0%
1999	Construction Projects	450,209	182,770	12,593	7,184	10,367	11,950	4,414	172,745	852,232
	Labor Services	171,100	20,312	17,102	6,969	22,534	6,250	1,429	16,572	262,268
	Design Consultation	3,410	547	921	213	187	21	8	3,651	8,958
	Total	624,719	203,629	30,616	14,366	33,088	18,221	5,851	192,968	1,123,458
	Percent in Total	55.6%	18.1%	2.7%	1.3%	2.9%	1.6%	0.5%	17.2%	100.0%
2000	Construction Projects	479,477	109,621	35,446	16,820	12,914	12,322	3,817	167,480	837,897
	Labor Services	191,227	18,514	18,398	6,293	23,312	4,253	3,432	15,827	281,256
	Design Consultation	2,960	586	395	103	195	41	NA	9,103	13,383
	Total	673,664	128,721	54,239	23,216	36,421	16,616	7,249	192,410	1,132,536
	Percent in Total	59.5%	11.4%	4.8%	2.0%	3.2%	1.5%	0.6%	17.0%	100.0%
2001	Construction Projects	466,288	152,406	56,367	26,284	24,542	10,487	3,990	149,593	889,957
	Labor Services	218,806	22,225	20,159	6,379	16,676	3,244	256	29,946	317,691
	Design Consultation	4,443	617	162	49	243	54	119	596	6,283
	Total	689,537	175,248	76,688	32,712	41,461	13,785	4,365	180,135	1,213,931
	Percent in Total	56.8%	14.4%	6.3%	2.7%	3.4%	1.1%	0.4%	14.8%	100.0%

Note: Adapted from the China Statistical Yearbooks 1999 through 2002

Table 3

Construction Projects, Labor Services and Design Consultation from 2002 through 2008

Year	Construction Projects			Labor Services			Design Consultation			Total	Total	Total
	Contract Number	Contracting Value	Turnover Fulfilled	Contract Number	Contracting Value	Turnover Fulfilled	Contract Number	Contracting Value	Turnover Fulfilled	Contract Number	Contracting Value	Turnover Fulfilled
2002	4,036	150.55	111.94	30,163	27.52	30.71	262	0.8	0.87	34,461	178.91	143.52
2003	3,708	176.67	138.37	38,043	30.87	33.09	308	1.8	0.88	42,059	209.30	172.34
2004	6,694	238.44	174.68	53,271	35.03	37.53	347	3.5	1.47	60,312	276.98	213.69
2005	9,502	296.14	217.63	63,410	42.45	47.86	321	3.6	2.27	73,233	342.16	267.76
2006	12,996	660.05	299.93	94,386	52.33	53.73	362	4.1	3.29	107,744	716.48	356.95
2007	6,282	776.21	406.43	161,457	66.99	67.67	501	10.3	4.90	168,240	853.45	479.00
2008	5,411	1,045.62	566.12	157,682	75.64	80.57	788	8.9	4.48	163,881	1,130.15	651.16

Note: 1. Adapted from the China Statistical Yearbook 2009; 2. Contracting value and Turnover fulfilled (100 million USD)

Regions

Table 4 shows the turnover of Chinese contractors in different regions from 2002 through 2008. On average during this period, total turnover was 32.6 billion USD per year, including construction projects 83.8%, labor services 15.4%, and design consultation 0.8%. As for different regions, Asia accounted for 49.8% at 16.1 billion USD, Africa accounted for 22.4% at 8.2 billion USD, Europe accounted for 8.3% at 2.6 billion USD, Latin America accounted

for 4.7% at 1.6 billion USD, North America accounted for 2.5% at 0.7 billion USD, and Oceanic & Pacific Islands accounted for 0.8% at 0.3 billion. Except for North America, in the other five regions, the turnover of the Chinese contractors increased by different degrees from 2002 through 2008. As previous period, Asia and Africa were still the two largest markets, and their growth rates of turnover increased each year, from 15.8% and 36.2% in the beginning to 40.0% and 58.3% in the end, respectively. As for Europe and Latin America, their growth rates of turnover also increased at the beginning, but dropped in 2007 and 2008. North America was the only market where turnover declined by 10.6% during this period.

Table 4

Turnover in different regions from 2002 through 2008

Region （USD 10000）		Asia	Africa	Europe	Latin America	North America	Oceanic & Pacific Islands	Others	Inner Country	Total
2002	Construction Projects	573,791	181,357	90,931	34,722	57,304	9,116	19,025	153,112	1,119,358
	Labor Services	203,360	19,579	17,801	6,197	14,423	3,057	1,099	41,625	307,141
	Design Consultation	3,548	1,359	2,007	35	465	43	394	872	8,723
	Total	780,699	202,295	110,739	40,954	72,192	12,216	20,518	195,609	1,435,222
	Percent in Total	54.4%	14.1%	7.7%	2.9%	5.0%	0.9%	1.4%	13.6%	100.0%
2003	Construction Projects	692,664	260,125	116,053	64,800	16,105	5,564	27,309	201,116	1,383,736
	Labor Services	208,131	22,256	25,042	6,090	14,529	2,979	232	51,622	330,881
	Design Consultation	3,073	888	431	27	278	77	129	3,873	8,776
	Total	903,868	283,269	141,526	70,917	30,912	8,620	27,670	256,611	1,723,393
	Percent in Total	52.4%	16.4%	8.2%	4.1%	1.8%	0.5%	1.6%	14.9%	100.0%
2004	Construction Projects	814,158	381,310	139,367	80,789	24,872	9,474	8,055	288,804	1,746,829
	Labor Services	229,675	18,231	25,049	6,548	12,265	1,976	362	81,223	375,329
	Design Consultation	6,862	2,472	53	33	23	10	178	5,109	14,740
	Total	1,050,695	402,013	164,469	87,370	37,160	11,460	8,595	375,136	2,136,898
	Percent in Total	49.2%	18.8%	7.7%	4.1%	1.7%	0.5%	0.4%	17.6%	100.0%
2005	Construction Projects	931,788	609,222	213,281	141,309	43,246	7,035	8,895	221,548	2,176,324
	Labor Services	259,950	15,388	29,809	5,204	8,806	1,970	58,342	99,091	478,560
	Design Consultation	15,320	2,808	1,971	225	73	96	44	2,184	22,721
	Total	1,207,058	627,418	245,061	146,738	52,125	9,101	67,281	322,823	2,677,605
	Percent in Total	45.1%	23.4%	9.2%	5.5%	1.9%	0.3%	2.5%	12.1%	100.0%
2006	Construction Projects	1,377,173	932,406	342,337	191,296	120,856	30,681	4,532	NA	2,999,281
	Labor Services	300,661	15,198	37,261	5,188	7,686	1,373	163	169,744	537,274
	Design Consultation	21,401	7,329	1,464	558	98	64	101	1,927	32,942
	Total	1,699,235	954,933	381,062	197,042	128,640	32,118	4,796	171,671	3,569,497
	Percent in Total	47.6%	26.8%	10.7%	5.5%	3.6%	0.9%	0.1%	4.8%	100.0%
2007	Construction Projects	2,035,295	1,237,608	358,596	287,786	98,526	41,838	4,609	NA	4,064,258
	Labor Services	316,754	21,650	47,079	3,565	8,302	1,459	163	277,740	676,712
	Design Consultation	35,350	10,199	968	1,022	1,193	245	6	NA	48,983
	Total	2,387,399	1,269,457	406,643	292,373	108,021	43,542	4,778	277,740	4,789,953
	Percent in Total	49.8%	26.5%	8.5%	6.1%	2.3%	0.9%	0.1%	5.8%	100.0%
2008	Construction Projects	2,890,266	1,974,905	329,932	299,547	58,825	106,830	863	NA	5,661,168
	Labor Services	332,889	24,435	51,888	3,790	5,327	2,141	73	385,148	805,691
	Design Consultation	28,716	10,555	2,796	1,415	407	842	40	NA	44,771
	Total	3,251,025	2,009,895	384,616	304,752	64,559	109,813	976	385,148	6,511,630
	Percent in Total	49.9%	30.9%	5.9%	4.7%	1.0%	1.7%	0.0%	5.9%	100.0%

Note: Adapted from the China Statistical Yearbooks 2003 through 2009

Projection

The projection of the future development of the Chinese construction companies in the global market was based on the following assumptions: (1) the growth rate of turnover or revenues will keep similar as current values and no major global economic recession will happen; (2) political policies of the regions, where the projects are located, will remain stable and no military conflicts will occur; (3) enough resources will be available to support the growth

of Chinese construction companies; (4) currency inflation is not taken into account. Projection of market size was conducted using polynomial functions, which will largely match the growth of existing data.

Figure 1 displays the projection of total turnover fulfilled by Chinese construction companies. A cubic polynomial curve can be developed to accurately match the change of total turnover from 1980 to 2008 ($R^2 = 0.9524$). In addition, the curve can be extended to project future growth. The polynomial function is:

$$y = 0.0914x^3 - 2.9381x^2 + 29.521x - 61.411 \quad (1)$$

where

x = year

y = total value of turnover fulfilled in 100 million USD.

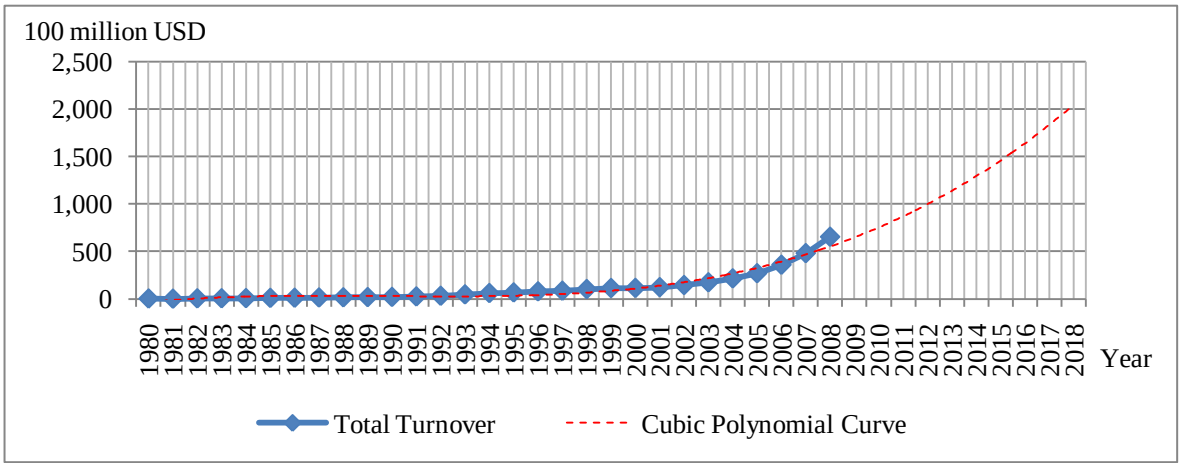

Figure 1 Projection of total turnover fulfilled

Conclusions and Recommendations

Conclusions

The Expansion from 1979 through 2001

1. Chinese construction companies expanded their market all over the world (more than 180 countries or regions).
2. The market size was increasing steadily in all aspects: the contract number of overseas projects increased by about 900 times; the contracting value increased by about 300 times; and the turnover increased by about 70 times during this period.
3. Asia was the largest market for Chinese construction companies and the turnover in this market was 72% of the total turnover in average during this period; while Africa was the second largest market for Chinese contractors, but the proportion of construction projects in Africa was higher than that in Asia.
4. Except for Asia and Africa, the market share of Chinese construction companies in other overseas regions was relatively small at less than 11% in average during this period.

The Expansion from 2002 through 2008

1. After the accession to the WTO, Chinese construction companies continued to exploit the global market. By the end of 2008, the contract number of overseas projects reached 160,000, increased by 4.7 times; the contracting value reached 113 billion USD, increased by 5.3 times; and the turnover surpassed 65 billion USD, increased by 3.5 times.
2. Asia was still the largest market for Chinese construction companies, although the turnover share dropped a little at about 50% of the total turnover in average during this period.

3. Africa was still the second largest market for Chinese contractors. In addition, the percentage of turnover increased the most in this period, from 14.1% to 30.9%.
4. In terms of the turnover, projection using polynomial functions suggests that the overseas projects undertaken by Chinese construction companies will continue to increase in the future.

Recommendations

Recommendations for Future Research

This research presents the analysis of the global expansion of Chinese construction companies from 1979 through 2008 without considering the problems that these companies were facing or will encounter in the near future. Further study should focus on what challenges, such as environmental and safety issues, Chinese companies will be facing in the future expansion if these companies continue to grow at their current tendency; and how these companies will compete against foreign construction companies in the global market. On the other hand, data analysis was conducted in general and limited areas such as contracting value and turnover fulfilled. Thus, analysis on more specific fields is recommended for future study such as quality, productivity, safety, and project management.

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