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## Research on Overseas Investment Performance of Chinese Construction Machinery Enterprises

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# Research on Overseas Investment Performance of Chinese Construction Machinery Enterprises

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**Abstract.** Manufacturing has been a particularly important bargaining chip between the major powers of the game between nations. At present, China's manufacturing industry has been in the top ranks of the world's manufacturing powerhouse after years of rapid development. However, there is still a considerable gap between China and European and American countries in a number of key technologies and key areas of manufacturing. Construction machinery manufacturing industry as an important part of manufacturing, it should be sure to drive through innovation and intelligence transformation, so we can catch up developed countries, achieving manufacturing powerhouse. Under the background of Chinese going out strategy, the study of the behavior of construction machinery, especially overseas investment behavior is more important.

## 1. Introduction

The construction machinery industry is one of the key areas encouraged by China. It has the characteristics of high degree of industrial correlation, strong ability to absorb employment, and intensive technical capital. It is an important guarantee for industrial upgrading and technological progress in all industries. It is also concentrated manifestation of the comprehensive strength of the state. At present, China has surpassed the United States, Japan and Europe and become the world's largest market for construction machinery. The reliability of Chinese products has been continuously improved, and the gap with international advanced level has been narrowing. Affected by the global financial crisis and the European debt crisis, the European market has shrunk, and European manufacturing giants have experienced decline of sales and profit margins, which has brought the opportunity to lower the valuation of target companies in the same industry. China's construction machinery giants have seized the opportunity of acquisition, such as Sany Heavy's acquisition of Puzmeister in Germany, Weichai Group's acquisition of Ferretti in Italy, Liugong's acquisition of Huta Stalowa Wola in Poland, and Xugong Group's acquisition of the world's second largest concrete machinery manufacturer Schwing.

The achievement of China's construction machinery industry which is formed under the background of China's "going out" strategy, especially after China's accession to the WTO. It is also the result of national level policy and industry level policy's support. In this paper, we use quantitative methods to analyze the performance of construction machinery in China, including financial performance analysis and capital market performance analysis.

The data sources in this paper mainly include the following three categories: the first category is the yearbook, including the China Foreign Economic Statistics Yearbook, China Foreign Direct Investment Statistics Bulletin, China Construction Machinery Industry Statistics Yearbook and so on; the second category is the announcement category of listed companies, mainly including foreign



investment announcements and related annotations.; the third category is industry news.

## 2. Analysis of overseas investment characteristics of construction machinery enterprises of China

*2.1 From the perspective of the timing of overseas investment, the characteristics of the reverse business cycle are presented.*

In 2008, the global financial crisis triggered by the U. S. subprime mortgage crisis. It caused that the enterprises in Europe and the United States take the initiative to shrink their balance sheets. In 2012, the European debt crisis continued to spread, uncertainties in world economic development increased, and global outflow of overseas direct investment decreased by 17% compared with the previous year. China's construction machinery enterprises seize this opportunity to implement the "going out" strategy against the economic cycle, and have achieved certain results.

For example, in September 2008, China Zoomlion (code: 000157) bid 370 million euros for a 60% stake in CIFA, Italy. In April 2012 Sany Heavy industry (code: 600031) bid 324 million euros for a 100% stake in Putzmeister, which is the world's first brand of concrete machinery.

*2.2 From the perspective of spatial dimensions, overseas investment areas are widely distributed in countries (regions).*

The overseas investment of Chinese construction machinery started late, and the scale of investment stock is far less than that of developed countries.

However, from the regional distribution, the overseas investment scope is wider, involving Europe, Southeast Asia, South America, Africa and North America. In terms of time dimension, 2008 is a watershed, before which more investments are in Southeast Asia, Africa and Latin America, and after which more investment in Europe and North America.

*2.3 From the perspective of overseas investment model, overseas construction is the main and overseas M&A is subsidiary.*

According to the statistics of overseas institutions of Chinese construction machinery enterprises, the following conclusions can be drawn: in terms of the mode of establishment of overseas construction machinery enterprises, it is accounted by 12% of the branches and 83.7% of the subsidiaries. The branches and subsidiaries accounted for 95.7%. While Only 4.0 percent of overseas Chinese construction machinery enterprises are joint ventures, and the proportion of overseas mergers and acquisitions is lower. So far, the M&A have occurred only 19 times. From the perspective of time dimension, 2008 is a watershed, before which the mode of overseas investment are mainly subsidiaries and branches, after which M&A and joint ventures are increased faster.

## 3. Financial performance analysis

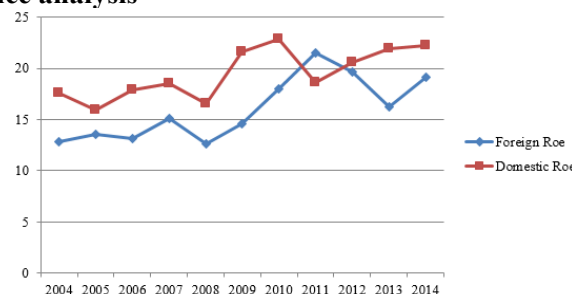


Fig 1. The trend of ROE in domestic market and in foreign market of overseas investment  
Fig1 shows the trend of ROE in domestic market and in foreign market. From the chart, we can see the following rules:

In general, the return on equity in foreign markets is lower than that in domestic markets, which is different from the intuitive feeling of most people. But the results are consistent with the results of Lu

et al. (2001), Li (2005) and Bobill (2008). This is due to the large number of factors involved in overseas investment, including Chinese enterprises, host country enterprises, international intermediaries and so on. At the same time, due to the institutional and cultural differences between the two countries, these will increase the communication cost, management cost and supervision cost of Chinese construction machinery enterprises, which will increase the difficulty of enterprises' operation. Therefore, its net assets yield is lower than the net asset yield of the domestic market.

The domestic market takes 2009 as a cut-off point. The rate of return on net assets in the domestic market showed a slow upward trend before 2008. The rate of return on net assets rose sharply between 2008 and 2009, which is shown by the steep increase of the slope graphically. This is highly related to the Chinese large-scale economic stimulus policy issued in 2009. After withdrawal of the large-scale stimulus policy, the return on net assets of enterprises gradually declined from the peak to the bottom in 2011, and then the return on net assets increased slowly.

The foreign market takes 2011 as a cut-off point. Before that, the rate of return on net assets (ROE) did not rise very fast, and even declined between 2007 and 2008. From 2008 to 2011, ROE rose rapidly, which was related to the global economic crisis after 2008. On the one hand, after the 2008 financial crisis, the Chinese government encouraged construction machinery enterprises to go out and scoop up, and gave them a series of fiscal and tax policies, thus reducing the related costs. On the other hand, from the market point of view, after the financial crisis, the demand for high-end construction machinery and equipment in various countries are decreased. And the demand changed to Middle-end construction machinery products. Because China's middle-end construction machinery products have an advantage in the international markets, which led to the rise in the return on net assets.

#### 4. Capital market performance analysis

##### 4.1 Method

In this paper, we use event study to measure the effect of overseas mergers and acquisitions of construction machinery enterprises of China. The normal return of stock is measured by the CAPM model. The model is as follows:

$$E(R_{it}) = R_{ft} + \beta_i(R_{mt} - R_{ft})$$

Among them,  $R_{ft}$  is the risk-free interest rate of the market;  $R_{it}$  is the return rate of the company  $i$  on the  $t$ -day;  $R_{mt}$  is the return rate of the market index, using the Shanghai stock index to calculate the corresponding index yield.

By calculating the above formula, the correlation coefficient can be solved, and then the CAPM model can be obtained.

$$R_{it} = \alpha + \beta_i R_{mt} + \varepsilon_i$$

On the basis of the normal return of the company's stock, the excess return of the listed company's stock is measured. The formula is:

$$AR_{it} = R_{it} - E(R_{it})$$

Among them,  $R_{it}$  is the actual rate of return on the  $t$  day of the company;  $AR_{it}$  is the excess rate of return on the  $t$  day of the company;  $E(R_{it})$  is the normal rate of return on the  $t$  day of the company.

According to the above-mentioned formulas, we can calculate the daily abnormal returns in the reaction interval of the market. Based on this, we can calculate the daily abnormal returns and the cumulative abnormal returns CAR of the company. The formula is:

$$CAR_t = \sum AR_t$$

##### 4.2 Empirical process

The empirical process specifically divided into the following four steps: (1) overseas M&A event date and its corresponding time window; (2) determining the normal rate of return for Chinese construction machinery companies; (3) calculating the excess rate of return for Chinese construction machinery companies; (4) statistical testing.

*(1) Overseas M&A event date and its corresponding time window*

This paper takes 31 trading days from the 15th trading day before the announcement of overseas M&A of Chinese construction machinery enterprises to the 15th trading day after the announcement as an event window to examine the impact of the announcement on their stock prices.

*(2) Determining the normal rate of return for Chinese construction machinery companies*

Taking the total of 120 days from the 151st transaction before the announcement to the 31st announcement as the estimation window, the relevant parameters of the market model are estimated as the estimation interval of the normal return of Chinese construction machinery enterprises.

$$R_t = \alpha + \beta R_{Mt} + \varepsilon$$

In the formula:  $R_{Mt}$  is the market return of t-day;  $R_t$  is the return of stock on t-day;  $\alpha$  is the systematic risk of stock; and  $\varepsilon$  is the random error term.

And  $R_t = (P_t - P_{t-1}) / P_{t-1}$ , where  $P_t$  is the t-day closing price after taking the company's dividend distribution factor into account;  $R_{Mt} = (I_t - I_{t-1}) / I_{t-1}$ , where  $I_t$  is the t-day Shanghai market stock index.

The formula of normal return is  $R_t = 0.0002 - 1.1152R_{Mt}$ , and specific statistical information is shown in Table 1. From the table 1, we can see that the regression coefficient of the Shanghai Stock Exchange Index is -1.115, Sig value is 0.000, pass the 1% significance level. So investors are not optimistic about the performance of overseas M&A of Chinese construction machinery enterprises.

Table 1 Summary of parameter statistics

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.001	0.001		0.185	0.853
$RM_t$	-1.115***	0.071	0.843	15.735	0.000

*(3) Calculating the excess rate of return for Chinese construction machinery companies*

The excess rate of return ( $AR_t$ ) is equal to the actual rate of return of the stock minus the normal rate of return, that is,  $AR_t = R_t - E(R_t)$ , and the cumulative excess rate of return ( $CAR_t$ ) is defined as  $CAR_t = \sum AR_t$ . The change of measured excess return and cumulative excess return is shown in Figure 2

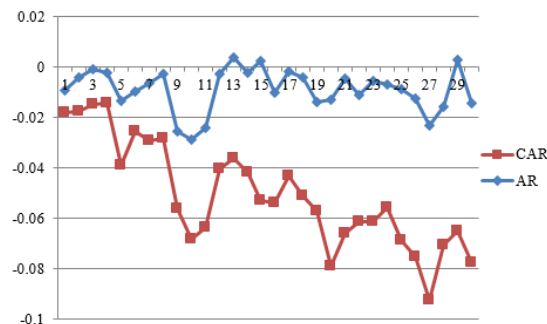


Fig 2. Trend charts of AR and CAR in window period

From the chart we can see the relative changes of the daily average excess earnings and cumulative excess earnings of the companies. The average excess yield AR of Chinese construction machinery enterprises is downward, and most of them are negative. The average cumulative excess return CAR of construction machinery enterprises also shows a downward trend, and its value is negative in the whole observation window period, indicating that overseas M&A is not good for the follow-up market performance.

*(4) Statistical testing*

The 15 trading days before and after the benchmark date were taken as the event windows for statistical testing. From Table 2, we can see that mean, median and other indicators of cumulative excess return changed significantly before and after the event, passed the 1% confidence level test.

Table 2 Descriptive statistical information

[-15,0]	[0,15]	Mean Difference	Median Difference Test

				Test	
Mean	Median	Mean	Median	(T—test)	(Z—test)
0.025	-0.022	-0.034	-0.037	-5.43***	-3.67***

As can be seen from Table 2, the average value before the announcement of overseas investment is 0.025, and after the announcement of overseas investment is - 0.034, and has passed the statistical test, indicating that investors are generally not optimistic about overseas M&A model of Chinese construction machinery companies.

## 5. Conclusion

According to the return on net assets in domestic and foreign markets of Chinese construction machinery enterprises, the rate of return on net assets in foreign countries is lower than that in domestic markets. This is due to the fact that there are more factors involved in overseas investment, including Chinese enterprises, host country enterprises, international intermediaries and so on. There are institutional and cultural differences between China and other countries; all these factors will increase the communication cost, management cost and supervision cost of Chinese construction machinery enterprises. Accordingly, the return on net assets in foreign countries is lower than the return on net assets of the domestic market.

Under the background of new normal economy in China, Chinese construction machinery enterprises should actively enhance their competitiveness, continue adapt to and dominate the new normal. In terms of improving the financial performance of enterprises, China's construction machinery enterprises can give full play to cost advantages, capital advantages and some technical advantages, actively carry out "project contracting + financing", "project contracting + financing + operation" and other cooperation modes. In terms of improving the synergy performance of the industrial chain, on the one hand, China's construction machinery enterprises can cooperate with the developed countries with high-end equipment manufacturing advantages, so we can form a joint effort to develop the third-party market; on the other hand, China's construction machinery enterprises can actively merge and acquire foreign construction machinery enterprises, so they can complement China's domestic market in management, technology and talent.

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