

Analysis on the Financial Performance of OFDI Based on Principal Component Analysis: The Case of Sinomine Resource Group Company

Qian Yang and Gang Fang*

Business school, Beijing Institute of Fashion Technology, Beijing, China

Keywords: SINOMINE, Outward Foreign Direct Investment, Principal Component Analysis, Financial Performance.

Abstract: Sinomine Resource Group Co., Ltd (SINOMINE) is taken as the case object in order to better measure the influence of OFDI of resource-based enterprises on corporate performance. With the help of SPSS software and principal component analysis method, this paper tests the financial performance of its OFDI. The study shows that the overall financial performance of the company is good, but its profitability needs to be improved. In addition, this article summarises the characteristics of SINOMINE's overseas expansion in two phases by looking at its OFDI activities since its listing. The first phase of the company's location selection mainly focused on Asian and African countries, while the second phase of overseas expansion focused on the European and American markets.

1 INTRODUCTION

At the beginning of the 21st century, Chinese resource-based enterprises began to gradually move towards the international market and actively participate in the competition and resource redistribution in the world resource market. SONG (2013) points out that Chinese resource-based enterprises' outward direct investment is mainly resource-oriented, and Sinomine Resource Group Co., Ltd (SINOMINE) is one of the important enterprises in China's "going out" solid mineral exploration technology service industry. The company has established a dominant position in the international market for integrated geological services, and has strengthened its control over global mineral resources through direct investments in foreign mining companies, mainly through greenfield investments and cross-border mergers and acquisitions.

In this paper, to explore the financial performance of SINOMINE's outward foreign direct investment (OFDI), the principal component analysis in SPSS (Statistical Product and Service Solutions) was used to further reduce the number of financial indicators to a smaller number of comprehensive evaluation

indicators. HUANG (2010) points out that the idea of dimensionality reduction can be used to transform multidimensional parameter indicators into several low-dimensional principal component indicators. Principal component analysis provides a visual and comprehensive picture of the performance of SINOMINE as a result of its continued overseas expansion.

2 INTRODUCTION OF SINOMINE

Founded in 1999, SINOMINE's main businesses include solid mineral exploration technology services and mineral rights development, rare metals development and utilization, and lithium new energy, etc. In 2014, SINOMINE was listed on the Shenzhen Stock Exchange, becoming the first A-share listed company in China's geological exploration services.

Since its establishment, SINOMINE has been actively responding to China's "the belt and road" policy and vigorously exploring overseas markets. The company has more than 20 subsidiaries at home and abroad and owns a total of 95 mining rights worldwide, mainly in Canada, Zambia and Zimbabwe.

* Corresponding author

With a global presence in more than 40 countries and regions in Asia, Africa, Europe, America and Oceania, SINOMINE has developed a good market reputation and a bright future with its rich experience in the field of overseas solid mineral exploration.

3 ANALYSIS OF THE CURRENT SITUATION OF SINOMINE OFDI

The overseas expansion of resource-based enterprises is characterised by geographical selection. The current reserves of major metals and non-metallic minerals are mainly located in four countries and regions, namely the United States, Canada, Australia and South Africa, which has a great influence on the layout of SINOMINE's overseas expansion. From SINOMINE's overseas expansion steps since its listing in 2014, this paper divides its overseas expansion into two main phases, with 2014 to 2017 being the first phase and 2018 to date being the second phase. The division is mainly based on the first statistics of rare light metals business such as lithium salts and caesium rubidium salts under the main business of SINOMINE's annual report in 2018, which accounted for 23.61% of the total operating revenue, gradually equal to the share of businesses such as solid mineral exploration (23.94%). further overseas expansion in 2019 made the rare light metals business account for 42.55% of the total operating

revenue The business will become a major revenue generator.

3.1 First Phase of Expansion 2014-2017

From 2014 to 2017, SINOMINE's choice of location for overseas expansion was mainly focused on Asia and Africa. The first phase of expansion was concentrated in Africa, particularly in Zambia (as shown in Figure 1).SINOMINE has been working with Zambia for a long time, mainly with the Zambian ministry of education, the army and hospitals, and has undertaken some of the country's major international projects while helping to repair local schools and some infrastructure, contributing to the development of the local economy.

The Zambian business has been the main source of revenue generation for SINOMINE's overseas operations for the last four years, accounting for an average of 48.6% of total revenue over the four years. However, as SINOMINE expanded into other African countries such as Zimbabwe, Congo and Uganda, the share of the Zambian business in the overall overseas business trended downwards. Albania, which has rich mineral resources in Europe and is an important country along the "belt and road" route, has also become an important step in SINOMINE's overseas expansion.

The highest proportion of SINOMINE's major operating revenue was from solid mining exploration and technical services. In 2015, the company's revenue declined significantly, mainly due to the

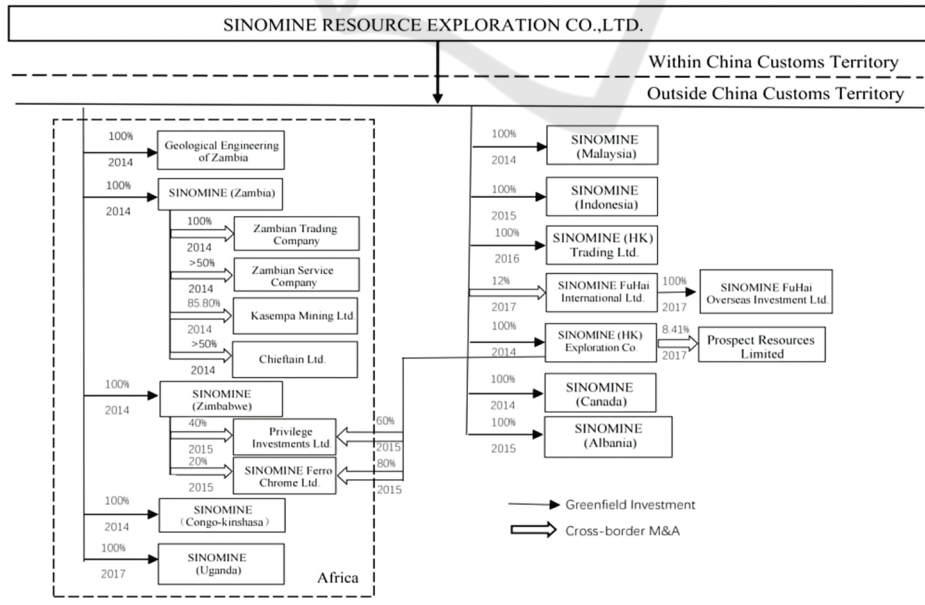


Figure 1: 2014-2017 SINOMINE Overseas Subsidiaries and Holding Companies.

continued downturn in the global mining market and the devaluation of the Zambian currency, which is the main source of overseas revenue generation, resulting in a reduction in consolidated revenue due to translation differences in foreign currency financial statements. In 2016, SINOMINE established a dedicated international trading company and the proportion of international trade revenue has increased year on year since then.

In 2017, supported by the accelerated global economic recovery and the phased stabilisation of the Chinese economy, prices of most global metal products continued to shake out higher, especially for bulk commodities such as copper, aluminium, zinc and lead, which all rose by more than 20% in aggregate during the year, and prices of minor metal varieties related to new energy and materials also surged, as the global mining market started a new development cycle.

3.2 Second Phase of Expansion 2018-Present

With the accumulation of international experience, SINOMINE has become more and more proficient in expanding its business abroad and has gradually started to enter some of the American countries. In 2017, SINOMINE acquired Dongpeng New Materials Company in China, which marked the gradual focus on rare and light metals, and in 2019, SINOMINE established a wholly-owned subsidiary, SINOMINE(Hong Kong, China). In the same year,

SINOMINE acquired Gabot Special Fluids Division, and through its 100% holding in Gabot Special Fluids Division, it ventured into the United States, the United Kingdom, Mexico, Canada and other countries. It is worth noting that the 2017 annual report did not yet have the revenue amount of the operating details of rare light metals, the following year the enterprise began to specialise in the statistics of the project accounted for as much as 23.61%, second only to the share of solid mineral exploration business. In 2020, the operating revenue of rare light metals business has reached 54.85%, the share of solid mineral exploration business began to decrease.

The acquisition of Gabot's Specialty Fluids Division in 2019 enabled SINOMINE to acquire the mineral rights to Tanco in Canada, making it the world's largest mining company to mine cesium garnets. The world's available cesium garnet resources are currently concentrated in three main mining areas, including the Bikita mine in Zimbabwe, the Tanco mine in Canada and the Sinclair mine in Australia. The Bikita mine supplies raw materials to SINOMINE's subsidiary, Dongpeng company, and to Arbor in the USA. This acquisition not only gives SINOMINE 126 international patents for the deep processing and application of cesium resources, but also gives it control over 75% of the world's cesium resources. This breaks the monopoly of foreign companies in the energy industry and establishes SINOMINE's global pricing power in the cesium resource chain. This has greatly enhanced SINOMINE's industry position in the world energy community.

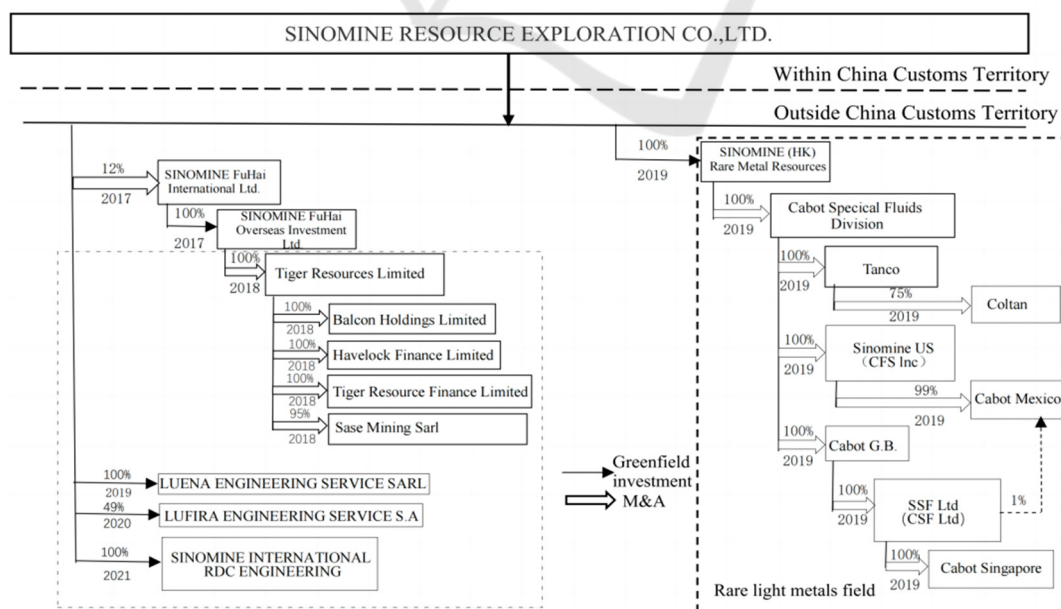


Figure 2 2018-2021 SINOMINE Overseas Subsidiaries and Holding Companies

4 ANALYSIS OF SINOMINE'S FINANCIAL PERFORMANCE

Resource-based companies cannot show very significant financial performance as quickly as consumer-based companies after an acquisition. In order to study the long-term corporate development of SINOMINE, this paper uses principal component analysis to analyse the financial performance of SINOMINE from 2014 to 2021.

4.1 Data Sources and Description of Indicators

This article obtains data from sina finance and selects SINOMINE quarterly financial indicators from 2014 to 2021. Due to some missing data in 2014, some quarterly indicators with incomplete data were excluded, and 28 sets of data samples were finally retained. Based on WANG et al. (2014), this paper focuses on three aspects of profitability, solvency and operating capacity, and selects nine indicators to analyse the financial performance of SINOMINE after several outward direct investments in recent years. In this paper, the indexes are appropriately revised according to the positive treatment of the moderate indexes of corporate financial indicators by Xu et al. (2000). The index of gearing ratio is mainly adjusted based on Equation $X_i = 1/|X_i|$ ($i=1, 2, \dots, n$).

Table 1: Main financial indicators.

Profitability	Return on Equity (X_1)
	Rate of Return on Total Assets (X_2)
	Return on Assets (X_3)
Solvency	Current Ratio (X_4)
	Acid-test Ratio (X_5)
	Cash Ratio (X_6)
	Asset-liability Ratio (X_7)
Operating capacity	Total Assets Turnover (X_8)
	Accounts Receivable Turnover Ratio (X_9)

4.2 Empirical Analysis

The 336 financial data were measured by SPSS.26 software. The test results from the KMO and Bartlett's test showed that the value of KMO was 0.680. YANG et al. (2020) concluded that a KMO value greater than 0.6 met the requirements for factor analysis. The Bartlett sphericity test significance was 0.000, which was less than the significance level of 0.05, so the data could be continued for factor analysis.

In this paper, the three common factors with eigenvalues greater than one were extracted using principal component analysis, with variance contribution rates of 40.423%, 35.451% and 15.005% respectively, and the cumulative total variance contribution rate was 90.879%. The three common factors selected in this paper can cover the information contained in the nine indicators and basically meet the calculation criteria.

Table 2: Total Variance Explained.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.827	42.524	42.524	3.827	42.524	42.524	3.638	40.423	40.423
2	3.191	35.453	77.977	3.191	35.453	77.977	3.191	35.451	75.874
3	1.161	12.902	90.879	1.161	12.902	90.879	1.350	15.005	90.879
4	0.456	5.065	95.944	--	--	--	--	--	--
5	0.199	2.209	98.152	--	--	--	--	--	--
6	0.080	0.890	99.043	--	--	--	--	--	--
7	0.066	0.739	99.781	--	--	--	--	--	--
8	0.014	0.150	99.932	--	--	--	--	--	--
9	0.006	0.068	100.000	--	--	--	--	--	--

As can be seen from Table 3, the two indicators with the largest loadings in common factor F1 are total assets margin and return on net assets, which mainly reflect the profitability of the enterprise and are therefore named profitability factor. The two indicators that contribute the most to the loadings of common factor F2 are the quick ratio, the current ratio

and the cash ratio, which mainly measure the solvency of the enterprise and are therefore named the debt service factor. The largest contributor to common factor F3 is the accounts receivable turnover ratio, and is therefore named the operating capacity factor.

Table 3: Component Score Coefficient Matrix.

Name	F1	F2	F3
X ₁	0.250	0.018	0.057
X ₂	0.248	0.007	0.061
X ₃	0.282	-0.022	-0.291
X ₄	-0.008	0.307	-0.033
X ₅	0.014	0.306	-0.091
X ₆	-0.074	0.284	0.319
X ₇	0.130	0.186	-0.559
X ₈	0.276	-0.036	-0.089
X ₉	0.039	0.092	0.543

The formula for calculating the principal component factor is $F_n = b_1X_1 + b_2X_2 + \dots + b_nX_n$. The formula for scoring the overall financial performance evaluation indicators is $F = W_1 \times F_1 + W_2 \times F_2 + W_3 \times F_3$. Where is W_1, W_2, W_3 determines the weighting of each composite indicator based on the cumulative variance contribution.

In terms of profitability indicator F1, there was little overall volatility (as shown in Table 5). SINOMINE's larger profitability indicator in 2015 was mainly due to the continued downturn in the

Table 4: Principal component factor scores and composite scores.

Date of report	F1	F2	F3	F
2014-12-31	-0.0263	0.4479	0.4170	0.2319
2015-03-31	-0.1099	0.4801	0.4689	0.2158
2015-06-30	-0.0161	0.3206	0.2549	0.1600
2015-09-30	-0.0914	0.5382	0.5170	0.2547
2015-12-31	0.0394	0.2112	0.1596	0.1263
2016-03-31	-0.0467	0.2150	0.1919	0.0948
2016-06-30	0.0240	0.1441	0.0806	0.0802
2016-09-30	0.0017	0.1539	0.1250	0.0814
2016-12-31	0.0487	0.1681	0.1126	0.1059
2017-03-31	-0.0251	0.1370	0.1092	0.0603
2017-06-30	0.0350	0.0966	0.0381	0.0595
2017-09-30	0.0122	0.0979	0.0713	0.0554
2017-12-31	0.0642	0.1232	0.0583	0.0863
2018-03-31	-0.0206	0.1161	0.0913	0.0512
2018-06-30	0.0119	0.1573	0.1211	0.0866
2018-09-30	0.0081	0.0787	0.0568	0.0437
2018-12-31	0.0090	0.1957	0.1741	0.1091
2019-03-31	-0.0296	0.1755	0.1623	0.0821
2019-06-30	0.0194	0.1041	0.0703	0.0608
2019-09-30	0.0041	0.1299	0.1142	0.0714
2019-12-31	0.0124	0.1740	0.1501	0.0982
2020-03-31	-0.0337	0.1824	0.1682	0.0839
2020-06-30	-0.1067	0.5549	0.5702	0.2631
2020-09-30	-0.1205	0.5878	0.6165	0.2775
2020-12-31	-0.0871	0.5606	0.5776	0.2753
2021-03-31	-0.1210	0.5656	0.5853	0.2634
2021-06-30	-0.1310	0.7309	0.7525	0.3511
2021-09-30	-0.0482	0.4243	0.4395	0.2166

global mining market and the contraction of the geological exploration business. During this period, the main overseas revenue came from the Zambian region, where the devaluation of the Zambian currency led to a reduction in consolidated earnings due to translation differences in foreign currency financial statements. 2019 saw the acquisition of Canadian cesium metal mineral rights, helping the company to gain control of the global cesium resource chain. In 2020, however, SINOMINE's business is impacted by the global outbreak of the New Crown epidemic and profitability does not

improve effectively and tends to decline. 2021, when the epidemic is effectively controlled, SINOMINE's profitability increases. Foreign direct investment by resource-based companies does not tend to improve performance significantly in a short period of time, as mineral exploration takes a long time, so the overall profitability effect is not good in the short term.

In terms of solvency indicator F2, SINOMINE's solvency was low for a long time due to the high OFDI activity after the IPO. The company's revenue from the rare metals business increased significantly in 2019, which led to higher solvency, and the

company's debt maturity in 2021, which led to lower solvency, so there were large fluctuations. It is worth mentioning that frequent overseas expansions have led to a rise in the company's operating income and a strengthening of debt servicing capacity. In terms of operating capacity indicator F3, the successive overseas expansions since SINOMINE's IPO have increased the pressure on the company's operations. However, with the accumulation of international experience, SINOMINE's overall operating position is good.

In terms of the composite indicator F, there was an overall downward trend in the indicator from 2014 to 2016. From 2017 to 2019, the overall score is stable, with SINOMINE consolidating its solid exploration while starting to strategically target lithium and rare metals in the context of an accelerating global economic recovery. In 2020, SINOMINE's overall financial performance will be significantly higher as it takes control of most of the world's metallic cesium claims. In 2021, the company's significant decline is mainly due to the maturity of its debt, which will need to be repaid. Overall, SINOMINE's OFDI in recent years has improved the company's long-term financial performance.

5 CONCLUSIONS

This paper examines the status of SINOMINE's OFDI since its IPO. The analysis shows that SINOMINE's early OFDI was mainly in mineral-rich regions in Africa, while its later OFDI was mainly in rare metals, with a shift from Africa to Canada, Australia and the United States. In terms of long-term financial performance, SINOMINE's profitability has not been satisfactory since its IPO, but the numerous OFDIs have increased the company's international experience and improved its operating and debt servicing capacity. The global impact of the new crown epidemic in 2020 has caused a significant decline in the overall performance of resource-based companies. According to the study, overall profitability will show an upward trend in 2021 and financial performance is expected to improve in the future.

SINOMINE's overseas subsidiaries and holding companies are located in many countries and regions such as Africa, Southeast Asia, Central Asia and Southern Europe, and are exposed to risks such as exchange rate changes, political unrest and institutional issues that may affect the revenue of overseas operations. Therefore, it is important to

improve the risk warning mechanism to prepare for possible risks in advance and to reduce the series of negative impacts caused by risks. Secondly, from the perspective of financial consolidation, SINOMINE's foreign investment activities are relatively frequent. In particular, there are several acquisitions taking place at the same time in the same year, making it more difficult for the company to integrate its finances. The company can introduce a digital management system to improve its ability to manage and analyse its assets through the digital transformation of its finances. From the perspective of resource integration, enterprises should optimise the allocation of resources, including natural resources, human resources and resources with unique advantages, etc. SINOMINE can strengthen the integration efforts of the upstream and downstream industrial chains and can integrate the logistics system to improve operational efficiency.

ACKNOWLEDGEMENTS

Support by: "Beijing Higher Education Undergraduate Teaching Reform Innovation Project" project (Project No.: 202110012004); "The first batch of new liberal arts research and reform practice projects of the Ministry of Education" project (Project No.: 2021140009); Beijing Education Science "14th Five-Year Plan" Project for 2021" project (Project No.: 3067-0001).

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