Research on Financial Risk Comprehensive Evaluation of CNPC based on AHP

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Abstract. This study establishes a comprehensive evaluation system of 15 financial indicators of four categories in the petroleum industry by using analytic hierarchy process (AHP). By comparing the financial indicators of each two levels, the corresponding judgment matrix is constructed, and the total weight ranking is obtained by normalization. The efficiency coefficient method is used to standardize the score of each financial indicator, and then the financial risk evaluation value is obtained by combining the weight coefficient. This paper makes a detailed analysis of the three problems of CNPC, which are more liabilities, poor short-term repayment ability and slower expansion of enterprises, and puts forward corresponding rationalization suggestions.

Keywords: China National Petroleum Corporation (CNPC), Financial Risk, AHP, weight, Comprehensive evaluation.

The petroleum industry is strategically related to the national energy security, so it has attracted worldwide attention. In recent years, international oil prices have been depressed because of over-exploitation and oversupply of oil. In China, the petroleum industry belongs to the national pillar industry. How to avoid the risk in the market or reduce the risk to the lowest point, and then improve the economic efficiency of enterprises, is an urgent problem to be solved. Fifteen key financial indicators are selected as the index system model of financial risk identification for PetroChina; secondly, according to the importance of 15 financial indicators for PetroChina, a corresponding judgment matrix is constructed by means of expert scoring. The specific financial data of petroleum industry (PetroChina, CNOOC, Sinopec) from 2015 to 2017 are searched, and the evaluation index principles of petroleum industry are obtained by statistical calculation. Evaluate the financial risk status of PetroChina and put forward reasonable suggestions to avoid market risk.

1. Establishing a Comprehensive Evaluation System Model

(1) The comprehensiveness of the indicators. (2) The importance of indicators. (3) The scientificity of the indicators. (4) Principle of operability.

According to the detailed regulations of the performance evaluation of state-owned enterprises in 1999 "State-owned Capital Performance Evaluation System"[6], combined with the requirements of petroleum industry for petroleum companies, this paper gives 50 questionnaires to experts, auditing units and university teachers in petroleum enterprises for screening and statistics. According to the principles of comprehensiveness, importance, scientificity and maneuverability of index selection, the weights of the indexes involved are assigned with 100 full marks respectively.

2. Selection of Evaluation Criteria for Financial Risk of Petroleum Industry

In this paper, the efficiency coefficient method is used to evaluate the financial indicators of PetroChina. By looking up the financial data of PetroChina, CNOOC, Sinopec and other enterprises in recent three years, the standard values of three types of indicators in the petroleum industry are obtained.

Table 1. Maximum Variable Type Criteria

Maximum variable (%)	Satisfactory value (s)				Not allowed value
	2015	2016	2017	Average	
Net interest rate on sales	2.46	3.06	1.82	2.4467	-3
Return on net assets	5.04	6.68	7.14	6.28677	-1.6
Return on total assets	4.23	5.82	5.67	5.24	0
Operating profit margin	3.27	4.08	3.68	3.6767	-3
Interest coverage	11.57	14.76	78.71	35.0133	0
Receivable turnover rate	32.75	32.48	40.13	35.12	0
Inventory turnover	9.55	9.88	11.02	10.15	0
Fixed assets turnover rate	2.81	2.71	3.52	3.0133	0
Total asset turnover rate	1.4	1.31	1.53	1.4133	0
Annual growth rate of net profit	13.61	5.12	2.11	6.9467	-18.52
Increase rate of business income	-24.42	6.29	24.68	2.1833	-40.1
Gross Asset Growth Rate	0.47	0.12	0.33	0.3067	-2.31

The value of satisfaction (s) in Table 1 is: Find out the specific financial data of the oil industry from 2015 to 2017, select the good value, and then calculate the average.

Table 2. Stability Variable Criteria

Stability variable	Not allowed value lower limit (FD)	Satisfaction value (s)				Not allowed value Upper limit (FU)
		2015	2016	2017	Average	
Quick ratio (%)	0.4	0.49	0.53	0.59	0.5367	0.59

The satisfactory value of the stable variable in Table 2 is also screened out by looking up the specific data of the whole oil industry from 2015 to 2017 and then calculating the average.

3. Standardized Scoring and Comprehensive Evaluation Results of Financial Indicators of Petroleum Companies

According to formula $W = \frac{1}{14}\sum_{i=1}^{14} Wi * Ri$, (Wi indicating the weight of each index to financial risk assessment., Ri Indicates the over standardized value of various financial indicators, W for comprehensive evaluation value) The comprehensive financial risk evaluation score of CNPC is 86.6148.

Table 3. Partitioning of Assessment Set of Financial Risk Status

Comment set	Classification standard
Low risk	W≥90
Lower risk	85≤W<90
Medium risk	70≤W<85
Higher risk	60≤W<70
High-risk	W≤60

From Table 3, we can see the score of each index, the return on net assets and other seven indicators are all full marks, which shows that the external financing development of enterprises is very good. However, the score of asset-liability ratio is 68.8243, which indicates that the value of solvency is not high, and the net profit growth rate is 89.6859, which indicates that the expansion speed of enterprises is slow and the cash flow-liability ratio is 87.2727, which indicates that there are some deficiencies in cash flow management of enterprises.

4. PetroChina Financial Risk Prevention Risks and Suggestions

Since PetroChina is the leading enterprise in the petroleum industry, its financial risk is low, which does not mean that there is no problem in the financial management of the company. This section will focus on the analysis of the three indicators with lower scores, and clarify the causes of the financial risk of PetroChina and suggestions for improvement.

4.1 Asset-Liability Ratio

4.1.1 Genesis

The ratio of assets to liabilities reflects how much of the total assets are invested by borrowing. In 2017, the ratio of assets to liabilities of PetroChina is 42.55%, of which the total assets is 2.40 trillion and the total liabilities is 1.02 trillion. It can be seen that the amount of debt borrowed by PetroChina is too high, about half of the total assets.

4.1.2 Proposal

(1) Increase the registered capital. Actively responding to the various preferential policies of the country, making rectifications for various subsidies of the country, striving for the capital injection of the country to reduce the asset-liability ratio.

(2) Reduce the cost. Strengthen all aspects of cost operation management, for example, establish a good cost budget system, refine the budgetary expenditure of each step [9].

(3) Strengthen the management of various liabilities. On the basis of a good budget, we should control the liabilities within a reasonable range and actively use various other ways such as financial leasing to optimize our capital structure.

4.2 Cash Flow Liability Ratio

4.2.1 Reason

The ratio of cash flow to liabilities is the ratio of net operating cash flow to current liabilities for a given period of time. In 2017, Petroleum's cash flow current liabilities ratio was 61%, so the company's ability to pay short-term liabilities in the current period was poor.

4.2.2 Proposal

(1) To strengthen the management of working capital is to strengthen the management of long-term and short-term cash circulation, which will greatly reduce the production cycle and accelerate the settlement of accounts receivable.

(2) Reasonable use of social funds to improve their cash flow and maintain the appropriate level of debt. On the one hand, enterprises should improve their financing methods, make use of the role of financial leverage to obtain high-benefit equity capital; on the other hand, they should pay attention to adjusting the proportion of liabilities and reduce the pressure of liabilities through the rationalization of the proportion.

4.3 Year-on-Year Growth Rate of Net Profit

4.3.1 Reason

The annual growth rate of net profit refers to the ratio of the difference of net profit between the current period and the same period of last year to the same period of last year. The net profit amount of the enterprise in 2017 is 3.678 million, and in 2016 is 2.9414 million. The reasons are mainly three aspects: first, the development cost is rising; second, the price of refined oil is gradually falling; third, the period cost is increasing.

4.3.2 Proposal

(1) Strengthen the cost and expense management of enterprises, strictly control various cost and expense budgets, and create more cash flows.

(2) Strengthen the external supervision mechanism, improve the supervision rules and regulations of various departments, and control the expenses of each period under the joint supervision of internal and external audits.

(3) Actively utilizing the national tax policy, making use of tax planning tools or changes in pre-tax deduction items to avoid tax reasonably, and maximizing the economic leverage of tax collection.

5. Conclusion

(1) Based on 24 financial indicators, 15 key financial indicators were selected according to the weight value, and a multi-level financial risk evaluation system for petroleum enterprises was established by consulting a large number of documents and questionnaires from relevant experts.

(2) The result of comprehensive evaluation of PetroChina's financial risk is 86.6148, which shows that PetroChina belongs to a lower risk enterprise.

(3) According to the standardized scoring table of the specific indicators of PetroChina, it is found that the assets-liabilities ratio, net profit growth rate and cash flow-liabilities ratio of the enterprises have lower scoring value. The reasons are analyzed and reasonable suggestions are put forward.

(4) In this paper, the expert scoring method is used in the weight assignment of PetroChina, and the selected financial indicators are only financial indicators, not combined with non-financial indicators. If the article uses the Fuzzy Analytic Hierarchy Process, it will weaken the subjectivity of expert scoring.

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