ATLANTIS PRESS
Advances in Social Science, Education and Humanities Research, volume 357
2nd International Conference on Education, Economics and Social Science (ICEESS 2019)

China Railway Construction Corporation Operating Cash Flow Management Evaluation and Suggestions in Financial Shared Model

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Abstract—**Operating cash flow management is a quite important component part of the capital management. It's a reflection of the enterprise's hematopoietic function, well reflecting the enterprise's increment of value through their operating activities, and also a reflection of the enterprise's profit quality. Taking China Railway Construction Corporation (hereinafter referred to as "CRCC") as an example, this paper has firstly collected and calculated seven indicator data on the corporation's operating cash flow management during 2012-2017, making a comprehensive evaluation on its operating cash flow management level in the five years after its implementation of financial shared mode by principal component analysis (hereinafter referred to as "PCA"). Secondly, putting forward that net operating cash flow (hereinafter referred to as "NOCF") is the indicator for measuring a corporation's operating cash flow management level, this paper has then compared the corporation's average NOCF in five years before and after its implementation of financial shared mode, coming to a conclusion that the corporation's operating cash flow management level has significantly improved after it's implementation of financial shared mode. Finally, this paper has proposed some constructive suggestions on how to better improve a corporation's operating cash flow management level.**

Keywords—financial shared; cash flow management; evaluation; suggestion

I. INTRODUCTION

The author Andrew Kris (Belgium) and Martin Fahy (Ireland) ever said in their book Shared Service—New Competition Series "only those who can provide business support with minimum unit cost, could be the winner of the market." Therefore, aiming at lower cost, higher efficiency and strengthened control, a growing number of Chinese enterprise groups have chosen financial shared. Financial management is the center of business management, while capital management is the core of financial management. Since Chinese enterprise groups in the past adopted the decentralized control mode, there have always been the following problems in their capital management: on one hand, the enterprise group level can't generate the scale economic effect and make rational allocation of capital resources; on the other hand, due to a lack of real-time monitoring, the subordinates' capital use efficiency is declining and their operational risk is gradually enlarged. The prominent contradiction also in return forces Chinese enterprise groups to conduct financial transformation, which starts with financial shared. Capital management has a very broad connotation and extension, and cash flow management belongs to the part of liquidity management, while operating cash flow management is one of the important factors. It's a reflection of the enterprise's hematopoietic function, well reflecting the enterprise's increment of value through their operating activities, and also a reflection of the corporation's profit quality. Taking CRCC as an example, this paper therefore attempts to make an evaluation on its cash flow management level after its implementation of financial shared mode, in order to understand whether this management model is effective to promote the operating cash flow management level, and how to better improve the management level in the model, which is of great practical significance for Chinese enterprise groups who have implemented the financial shared mode.

Construction industry is a typical capital-intensive industry characterized by "projects dispersing in so many spots and long lines". Around 2012, the Construction industry faces the common situation of business scale expanding continuously, industrial chain extending constantly, construction area expanding unceasingly, organization becoming increasingly complex, economic indicators becoming more and more heavy, and increasing difficulties in risk control and management, which reflects in finance as: increasing capital requirements, more difficulty in cost control, narrowing profit space in main business, heavy debts, and slow capital turnover. In this case, in order to further consolidate and improve its leading position in the industry, the senior leadership of CRCC has made the strategic selection of the financial shared services. Through the overall planning of the financial shared services center in strategic orientation, organizational structure, process reengineering, operations management and other aspects, by adopting phased implementation strategy, and with the help of the advanced information means—China telecom cloud platform, CRCC has successfully realized the financial transformation, making outstanding achievements in accounting quality, capital management level, internal control and many other aspects. The outstanding results in the capital management are embodied in: achieving the safety of the capital centralization and payment; making a standardized treatment of capital approval process, and interconnecting accounting business with capital management system of finance company through financial shared, which has strengthened the groups' control of capital flow, helping the finance company to reasonably arrange capital positions, provide advance warning for capital demand, reduce the provision capital limits, and improve the level of capital returns.

II. METHODOLOGY

CRCC has started the establishment of financial shared services center since June 2012, and began to pilot in some parts of the subordinate enterprises from January to August in 2013, and started to promote within the group from September 2013. Therefore, from the perspective of operating cash flow management, this paper has selected seven evaluation indicators from the four aspects of cash collection, security, stability and growth. Having got the related data through collection and calculation, this paper made a comprehensive evaluation on the enterprise' operating cash flow management level in the five fiscal years (from the end of 2012 to the end of 2017) after its implementation of financial shared mode using the PCA method, and accordingly put forward some suggestion on the promotion of its operating cash flow management level.

A. The Evaluation Indicator Selection of Operating Activities Cash Flow Management

1) Cash collection indicators

$$cash\ and\ net\ profit\ ratio = \frac{NOCF}{net\ profit} \tag{1}$$

$$cash\ collection\ and\ operating\ revenue\ ratio = \frac{the\ cash\ collected\ by\ selling\ goods\ or\ providing\ labor\ services}{operating\ revenue} \tag{2}$$

According to formula (1), cash and net profit ratio means how much operating cash flow every 1 yuan net profit can produce. The greater the value is, the better the enterprise profit quality is. On the contrary, the smaller the value is, the poorer the enterprise profit quality is, and they may even be immersed in the situation that the capital chain ruptures. Generally, when its value is close to 1, it means that the company has a great profit quality. Formula (2) explains the calculation method of the cash collection and operating revenue ratio, meaning every 1 yuan operating revenue the company gets in the current period actually needs to collect how much operating cash. When the value is less than 1, it means that the company has many receivables, and there is a high probability of bad debts; and when the value is greater than 1, it indicates that basically all the receivables have been recalled. In general, the value fluctuates up and down around 1.

2) Safety indicators

$$NOCF\ and\ debtration = \frac{NOCF}{total\ debts} \tag{3}$$

$$cash\ flow\ interest\ coverage\ ratio = \frac{NOCF}{interest\ expenses} \tag{4}$$

The NOCF and debt ratio reflects the enterprise's ability to repay all the debts with NOCF. Generally, the bigger the value is, the greater the enterprise's ability to repay the debt is, and the safer the enterprise's financial situation is. The cash flow interest coverage ratio indicates the enterprise's ability to repay its current period interests with NOCF. This indicator is more reliability than the one that established on the basis of profits. Normally, the greater the indicator value is, the safer the enterprise's ability to repay the interests, and the safer its financial condition is. On the contrary, if the indicator value is less than 1, it means that the enterprise's operating cash flow cannot bear the interest on borrowing, and it will fall into financial crisis.

3) Stability indicators

$$operating\ cash\ inflow\ structural\ ratio = \frac{operating\ cash\ inflows}{total\ cash\ inflow} \tag{5}$$

$$gross\ profit\ rate\ of\ cash = \frac{NOCF}{operating\ cash\ inflows} \tag{6}$$

The enterprise's cash inflows are mainly the total cash inflows gained from three kinds of financial activities (operating activities, investing activities and financing activities). Operating cash inflow structure ratio represents the proportion that the cash inflows generated by the operating activities accounts for the total cash inflows. Under normal circumstances, the greater the indicator value is, the more stable the enterprise's financial condition is, indicating that the enterprise's cash inflows mainly rely on operating activities. On the contrary, the smaller the indicator value is, the less stable the enterprise's financial condition is, indicating that the enterprise's cash inflow is mainly implemented by investing activities and financing activities, and there may be a operation crisis. The gross profit rate of cash reflects the ratio of the enterprise's NOCF and its operating cash inflows. Generally, the bigger the value is, the more abundant the enterprise's operating cash is, and the more stable the enterprise's operating performance is, and the greater its profit quality is. On the contrary, the smaller the value is, the worse the enterprise's operating cash shortage is, indicating that the enterprise may have potential operating risks, and the enterprise's profit quality is poorer.

4) Growth indicators

$$\text{OC}FPS\ (operating\ cash\ flows\ per\ share)\ growth\ rate = \frac{current\ period\ OCFPS\ growth}{prior\ period\ OCFPS} \tag{7}$$

Normally, when OCFPS growth rate is less than zero, it means the enterprise's operating cash flow is in negative state, the enterprise is in poor growth with poor profit quality. If the value is larger than zero, it means the enterprise's operating cash flow growth is in good state, and the enterprise has a sound profit quality.

B. Principal Components Analysis

By obtaining five years' financial data (from 2012 to 2017) of CRCC on the website of sina.com and viewing the company's annual reports, we have calculated the results in table 1, as shown below. Set the seven single operating cash flow evaluation indicators in table 1 respectively as X1, X2, X3, X4, X5, X6, X7, and put them into SPSS23.0 software to make principal component analysis[1]

TABLE I. RELATED INDICATORS OF CRCC'S OPERATING CASH FLOW IN 2012-2017

Year	cash and net profit ratio X1	cash collection and operating revenue ratio X2	NOCF and debt ratio X3	cash flow interest coverage ratio X4	operating cash inflow structural ratio X5	gross profit rate of cash X6	OCFPS growth rate X7
2012	0.65	1.14	0.01	0.95	0.85	0.01	1.44
2013	-0.89	0.95	-0.02	-1.26	0.82	-0.02	-2.68
2014	0.57	0.99	0.01	0.63	0.83	0.01	1.71
2015	3.77	0.97	0.09	4.78	0.83	0.08	5.95
2016	2.50	1.01	0.06	4.04	0.84	0.06	-0.26
2017	1.50	1.00	0.04	2.63	0.87	0.04	-0.32
Mean value	1.35	1.01	0.03	1.96	0.84	0.03	0.97
standard deviation	1.63	0.07	0.04	2.27	0.02	0.04	2.90

Specific steps are as follows:

1) View the correlation degree between the original variables

It is observed that most of the correlation coefficient in the correlation coefficient matrix between the original variables are above 0.3, proving that there is a correlation, and therefore a principal component analysis can be made.

2) Determine the number of principal components

According to the calculation of SPSS software, it is concluded that the first two characteristic root are greater than 1, $\lambda1=4.581$, with a contribution rate of 0.65447, and $\lambda2=1.459$, with a contribution rate of 0.20848, and the corresponding cumulative variance contribution rate is 86.295% (greater than 85%). Thus it can be determined that there are two principal components, respectively expressed as F1 and F2.

3) Extract factors

Extract the factors with PCA method, generating the factor loading matrix. Rotate the factor loading matrix to generate the rotating space component diagram as shown in Fig. 1. From the Figure 1 we can see that, the first principal component F1 has a heavy load on the five indicators related to the operating cash flows (cash and net profit ratio X1, NOCF and debt ratio X3, gross profit rate of cash X6, cash flow interest coverage ratio X4 and OCFPS growth rate X7), therefore F1 mainly reflects the comprehensive abilities related to the level of NOCF stock. The second principal component F2 has a heavy load on the indicators of operating cash inflow structural ratio X5 and cash collection and operating revenue ratio X2, so F2 mainly reflects the stability and collection ability related to operating activities cash flow.

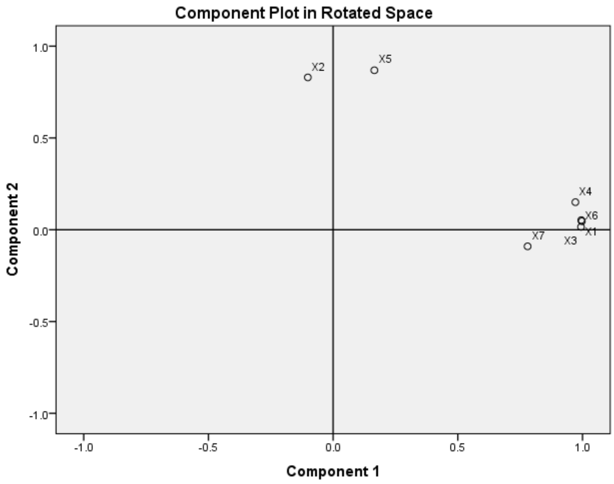

Fig. 1. Rotating space components diagram

4) Calculate principal component score

Calculate the specific scoring function of the two principal components according to the score coefficient matrix, as shown respectively in Formula (8) and Formula (9).

$$F1 = 0.219X1 - 0.053X2 + 0.218X3 + 0.209X4 + 0.004X5 + 0.219X6 + 0.176X7 \quad (8)$$

$$F2 = -0.006X1 + 0.57X2 - 0.001X3 + 0.066X4 + 0.587X5 - 0.026X6 - 0.091X7 \quad (9)$$

5) Determine the comprehensive scoring function Y

$$Y = 0.6545F1 + 0.2085F2 \quad (10)$$

According to the calculation of Formula (10), we have got the comprehensive scores of CRCC's operating cash flow management level in the five years after its implementation of financial shared mode, and drawn the trend chart of the comprehensive scores, F1 and F2, as shown in Fig. 2. Fig. 2 shows that CRCC's operating cash flow management level in the five years is as follows: the best year of 2015, the worst year of 2013, 2014 for the middle and lower level, while 2016 and 2017 for the middle upper level.

[1]In the process of applying PCA, due to the large number of charts, some charts are omitted, and only key charts and formulas are displayed).

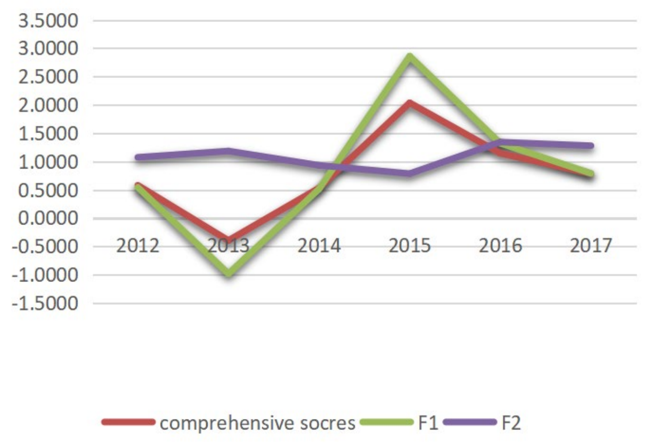

Fig. 2. The trend chart of CRRC's operating cash flow management comprehensive scores, F1 and F2

III. RESULTS AND DISCUSSION

A. The Trend of F1 and the Analysis of its Influence Factors

As we can see in Fig. 2, the trend of F1 is remarkably similar to that of the comprehensive scores. Therefore, CRCC's comprehensive management level of operating cash flow is mainly influenced by F1, while F1 is mainly under the positive influence of five individual indicators related to NOCF (another positive indicator and a negative indicator are ignored due to their relatively small weight). Since there is a negative number of NOCF in 2013, the five individual indicators of 2013 are all in their worst level during the five years. CRCC made a disclosure of relevant reasons in the annual report of 2013. The group's net cash flow generated by operating activities was - 9.014 billion yuan in 2013, a drop of 14.0337 billion yuan than that of the year before, and it's mainly due to the expansion of its production and operation scale with expenditure increasing accordingly. In 2015, since the company's accounts receivables in the early stage were withdrawn substantially in the fourth quarter, its NOCF was in rapid growth, and thus the five individual indicators in 2015 were in their optimal performance.

B. The Trend of F2 and the Analysis of its Influence Factors

According to Formula (9), the two main indicators that have positive influence on F2 are the operating cash inflow structural ratio X5 and cash collection and operating revenue ratio X2, and from table 1 we can see that the two indicators have been stable. Therefore, it can be seen from Fig. 2 that the change trend of F2 is relatively smooth and steady.

TABLE II. COMPARISON OF THE AVERAGE NOCF BEFORE AND AFTER CRCC'S FINANCIAL SHARED MODE[2]

Year	2008	2009	2010	2011	2012	Mean value in earlier five years
NOCF(ten thousand yuan)	729,985.00	1,747,445.20	625,257.00	-1,257,631.10	554,497.10	479910.64
Year	2013	2014	2015	2016	2017	Mean value in later five years
NOCF(ten thousand yuan)	-931,398.00	658,251.20	5,037,510.70	3,713,757.90	2,540,417.80	2203707.92

C. Results

Above all, during the five years after implementing financial shared mode, CRRC's cash collection and operating revenue ratio, NOCF and debt ratio, operating cash inflow structural ratio and gross profit rate of cash have been stable, and the mean values are kept in a relatively sound level, showing that the enterprise's operating cash flow management in general have a certain security and stability, and its current operating income as well as current collection is good. Although the indicators like cash and net profit ratio that reflect profit collection ability, cash flow interest coverage ratio that reflects short-term debt-paying ability and OCFPS growth rate that reflects growth have shown a greater volatility, their mean values are still in a fairly good level. It shows that from a longer operating cycle, the overall operation scale is increasing, and at the same time, it can ensure the profit quality and pay attention to the financial risk control. Through the above principal component analysis, it can be seen that the comprehensive level of the enterprise's operating cash flow management is mainly determined by F1, which is mainly affected by five positive indicators related to NOCF. Therefore, the stock level of NOCF should become a vane to measure the comprehensive level of the enterprise's operating cash flow management. According to characteristics of construction industry, this indicator is often unstable with some volatility, and in some years it may be a negative value, so we choose five years as a cycle to see the changes of the average level. From the calculation results in table 2 we can see that the average level of CRRC's NOCF has raised by 359% compared with that before the implementation of financial shared. It can be thus roughly inferred that CRCC's comprehensive management level of cash flow has greatly promoted after the implementation.

[2]Data from Sina.com

IV. SUGGESTIONS

In their book Financial Shared Services, Chen hu, Sun Yancong (2014) from ZTE Communications have made a innovation of financial management mode, which divides the financial staff into four categories: strategic financial staff, business financial staff, financial shared staff and expert team. And functions of the four different levels of financial personnel are defined as follows: the strategic financial staff mainly exercises the control and management functions in the company level; the business financial staff needs to make enforcement in the in-depth in-front line business; the financial shared staff are mainly responsible for the dealing and analysis of transactions; the expert team is composed of experts from the above three categories, focusing on solving major special problems in the enterprise's financial management. This financial management mode is particularly suitable for Chinese enterprise groups that are facing complex external environment and want to "go out". Therefore, based on this financial management mode, this paper puts forward the following suggestions on how to promote CRCC's operating cash flow management.

A. *Integrate the Indicators Related to Operating Cash Flow Management into the Overall Budget Management System*

The NOCF stock level is the first key factor to improve the comprehensive level of operating cash flow management. Once this indicator turns negative, in the short term, the enterprise may achieve cash flow through other financial activities to help itself to tide over the payment crisis. But in the long run, the enterprise is bound to have a major financial crisis, and in the most severe cases, it may cause the rupture of the capital chain. Therefore the enterprise management must always pay attention to this stock level. Table 3 lists CRRC's earnings per share after deducting non-recurring gains and losses and operating cash flows per share data in 2012-2017. By calculating the correlation coefficient R=0.59 between the two groups of data, we find that there is a relatively high positive correlation between the two. From the perspective of enterprise management, they should simultaneously improve the level of the earnings per share (after deducting non-recurring gains and losses) and operating cash flows per share. After all, operating profit is the fundamental source of operating cash flow, otherwise, operating cash flow cannot be sustained for a long time. Therefore, CRRC's strategic financial staff should, based on the enterprise's long-term strategic target and annual operation plan, set reasonable expectation level of growth capacity and profitability, make the forecast of earnings per share and operating cash flow per share in advance, and integrate other single indicators of operating cash flow management into the overall budget management system. Business financial staff should fully understand the financial requirements of the project units, participate in the annual business plan of the project units, predict the required financial resources and feed back to the strategic financial department, and finally confirm the annual budget target of the project unit after repeated communication from top to bottom for budget adjustment. The budget target shall be executed after the examination and approval of the enterprise budget management committee. Business financial staff will continue to control the project budget in the front-line, strive to achieve the budget target, and promote the company's strategic objectives. At the end of the year, they make a budget analysis by comparing the actual operating situation provided by the financial shared staff with the budget target, and timely transmit the results to strategic financial staff. The strategic financial staff process the financial information provided by business financial staff and financial shared staff, and further transform them into valuable business information for the enterprise's business decisions, so as to further support the budget assessment and budget audit of the enterprise and promote the implementation of its strategic decisions. The perfect combination of this financial management mode and comprehensive budget management will surely support the operating activities stably, promoting the continuous improvement of the enterprise's financial performance, and finally will be reflected in the various ability indicators of operating cash flow management.

B. *Moderate Debts and Reasonable Reduction of Capital Costs*

In order to further improve the safety of operating cash flow, CRCC can also adopt a strategy of moderate debt scale and reasonable reduction of capital costs. The financial leverage of a company is a double-edged sword. When used properly, it can increase the level of income, but with excessive debt, it may lead to financial crisis. Therefore, the enterprise's strategic financial staff should determine the debt scale in advance, and determine the target capital structure of the enterprise through calculation. Similarly, they should regarded it as a budget target and incorporate into the overall budget management system.

TABLE III. CRRC'S EARNINGS PER SHARE AND OPERATING CASH FLOWS PER SHARE IN 2012-2017[3]

Year	2012	2013	2014	2015	2016	2017
earnings per share（after deducting non-recurring gains and losses）	0.66	0.77	0.86	0.9	0.95	1.07
operating cash flows per share	0.4494	-0.7549	0.5335	3.7096	2.7348	1.8708

[3]Data from Sina.com

Business financial staff should also pay attention to changes in the capital structure of the project unit (such as asset-liability ratio). If this indicator exceeds the standard, it must be promptly fed back to strategic financial staff. After the strategic financial staff report to and approved by the management level of the enterprise, appropriate measures can be taken to improve it. After the implementation of financial shared mode, CRCC has strengthened the security control over the capital flow. This has provided favorable conditions for strategic financial staff and business financial staff jointly predicting the short-term and long-term financing gaps of the entire group, resolving the mismatch problem of time, currency and amount of capitals in the revenue and expenditure to ensure a reasonable minimum of the balance of capitals. Therefore, the company should strive to seize this opportunity to rationally reduce the cost of capital and reduce the expenditure on interest funds while fully improving the efficiency of capital use.

C. Convergence of Expert Team Wisdom to Break through Major Special Issues

With the globalization of the economy and the promotion of China's "the Belt and Road Initiative" policy, CRRC has implemented a "go-out" strategy. When enterprises set up subsidiaries overseas, they will inevitably encounter a series of problems, such as host country tax system, exchange rate, interest rate, capital control and other major special issues, which will bring great challenges and risks to their operating cash flow management. In the four-in-one financial management mode, the expert team adopts a project-oriented operation mode, concentrating on the researching and breaking through of major financial management issues, and providing professional guidance for practical work. Therefore, in the solution of these problems, financial shared staff as a data center should provide data support, while business financial staff needs to transform the data into useful information for strategic financial staff and expert team. Finally, the expert team summarizes the general rules and forms a complete knowledge system that guides the practice of major special issues. Therefore, the convergence of expert team wisdom to break through major special issues is an effective barrier to prevent capital management risks.

V. CONCLUSION

Although operating cash flow management is the management level promotion is mainly attributed to the operational performance improvement brought by the operation scale expansion, the implementation and operation of financial shared have provided a favorable management and organizational basis for promoting the comprehensive level of cash flow management. At the same time, the significance of financial sharing for today's enterprises is not limited to cash flow management, it will also have a profound impact on the overall financial management and transformation of enterprises.

ACKNOWLEDGMENT

This work is supported by a grant from Teachers' Research Capacity Enhancement Project: The Application Research of Financial Shared Service in Enterprise Group of Beijing Normal University Zhuhai Campus (Project No.: GL20180208), Quality Engineering Project: Cost & Management Accounting of Beijing Normal University Zhuhai Campus (Project No.: GL201827)and Guangdong Province 2017-2018 Accounting Research Project: Research on Management Accounting Talent Framework Based on Competency Theory (Project No.: 2017A21) .

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