Relationship between Free Cash Flow and Financial Performance Evidence from the Listed Real Estate Companies in China

ZHOU Hong[1, a], YANG Shuting[1,b] and ZHANG Meng[1,c]

[1]Zhejiang University City College, Huzhou Street 51, Hangzhou, China

[a]zhouh08@126.com, [b]156443651@qq.com, [c]hl1114@126.com

Abstract. Free cash flow is the results of business activities. Based on the data from 2006-2010 of all listed real estate companies in China, authors studied the relationship between the free cash flow and the financial performance of these firms in order to optimize the finance decision for management and investment. Using principal component analysis and regression analysis, key financial performance indicators were calculated out of 21 financial performance indicators, and these key indicators of sample companies were correlated to their free cash flow. The results showed that the free cash flow of a company is negatively linear-correlated to its financial performance, i.e., too much free cash flow will lead the financial performance to decline. Therefore, the investors and the managers should comprehensively analyse the free cash flow, and avoid business inefficient because of too much free cash flow, which triggers the investment risk and loss.

Keywords: Free Cash Flow   Financial Performance   Correlation

1. Introduction

The authenticity of the accounting profits for listed companies are constantly questioned: the profit can be easily operated. Financial and investment analysts seek to find new variables to avoid these human factors. Therefore, free cash flow may be a better choice.

Back in the late 1980s, Western accounting theorists had set off a wave of cash flow. They believed that cash flow was a basis on measuring corporate performance and respected that 'cash is the king'. Through a development over more than 20 years, the concept of Free Cash Flow (FCF) has been put up forward by Alfred Rappaport from Northwestern University, Michael Johnson from Harvard University and other scholars. It has become the most widely used and robust index. US SEC even requires all companies to disclose this index in their annual report.

But, is FCF really the representative of the finance performance of an enterprise? To answer the question, developed countries have done numerous researches. While in China of a newly opened capital market and not enough information disclosed, the empirical researches on the correlation between an enterprise free cash flow and its financial performance are still lack of. In this respect, more experiences, rules and mechanisms need to be explored.

It is of great significance to evaluate listed companies' performance comprehensively and objectively and promote the free cash flow's spread and application in our practice. Authors take listed companies of real estate industry in China as a sample to collect and calculate the free cash flow during last five years, select indexes reflecting the financial performances and correlate them in order to enhance the enterprise's value and improve the performance evaluation index system.

2. Literature Review

In the early 1990s, the relationship between free cash flow and business financial performance had been studied in the word. Baskin's study showed that an enterprise's profitability was negatively correlated to its debt

ratio. It was said that the higher the company's profitability, the lower its debt levels. The results did not support one of the points of views in the theory of free cash flow that by controlling debt effect corporate performance could be enhanced [1].

McLaughlin etc. found that after the issuance of a common stock the company's operating cash flow performance continued to decline for three years [2]. With Tobin's Q, Hafford measured investment opportunities. He found that firms with higher free cash flow would have a lower efficiency of M & A and abnormal glide of finance performance [3]. Freund discovered that for the company's asset purchase, the market response and the level of free cash flow was negatively correlated, and the company's return on assets and asset turnover had declined after the asset purchase [4]. Richard Chung, Michael Firth and etc. found that the agency costs of free cash flow is the main motive to stimulate managers to conduct earnings manipulation, and it was more possible that those companies' management with a lot of free cash flow covered up its activities which would damage enterprises' values by earnings manipulation [5].

In recent years, Chinese scholars conduct researches in this area. Zhang and Wu used free cash flow model to analysis related indexes and found that it was not optimistic about the whole continued viability and unreasonably high investment [6]. Qing and Gan used correlation analysis to study on the relationship between free cash flow and performance. It had shown that free cash flow and discretionary revenue expenditure was positively related, but discretionary revenue expenditure negatively related to operating results [7]. Yuan and Wang analyzed whether the proportion of the largest shareholder hold could influence the profitability of company's sales growth. The results showed that the company had more free cash flow, the lower the sensitivity of sales growth, and as the largest shareholder with an increase in the proportion, its sales growth sensitivity increased [8]. Based on the hypothesis of agency costs for the free cash flow Ding researched listed companies' M & A. It showed for companies with fewer growth opportunities, changes in operating performance before and after M & A, and its free cash flow was negatively correlated, while for high-growth ones the negative correlation not established [9].

In short, despite researches from a different perspective on the relationship between free cash flow of Chinese enterprises and business activities, the basic relationship between free cash flow and financial performance is lack of clear empirical conclusion, which is important basis for moderating overall grasp of corporate free cash and worth researching.

3. Research Methodology

Variables Determining. This study established the comprehensive financial performance indicators as dependent variables, selected free cash flow and several control variables as explanatory variables, and established the model of multivariate linear regression.

Dependent Variable (F). According to the ability of profit, debt paying, operation and growth, this paper selected 21 original financial ratios, a comprehensive financial index F can be established.

$$F = \frac{w_1 F_1 + w_2 F_2 + \cdots + w_p F_p}{w_1 + w_2 + \cdots + w_a} \tag{1}$$

Where F is comprehensive financial performance index；$F_1 \ldots F_p$ are instead of the original financial ratios of p principle components；$w_1 \ldots w_p$ are variance contribution rates of the principal components.

Free Cash Flow (FCF). Consider the data availability, this paper uses the CSMAR database to definite free cash flow (FCF) and calculation methods，that is：

$$FCF = (\text{Net profit} + \text{Interest expense} + \text{Non-cash expenses})$$
$$- \text{Increase in working capital} - \text{Capital expenditure} \tag{2}$$

The scale of the company (SIZE). Refer to the most literatures' practice, in this paper, taking the natural logarithm of total assets of the company (ln assets) to measure the size of company. In general, the size of the

company would influence its business performance, it is mainly due to that large-scale enterprises will generate dimensions benefit and also can make the benefits reflect in the operating results.

__The level of debt (Lev).__ The level of debt, this paper called leverage ratio, which equals total liabilities divided by total assets to measure. Most of the previous studies show that: the enterprise's performance is better, the lower borrowing tendency. For example, Stieglitz concluded that the operating performance and leverage ratio had a negative correlation [10]. Therefore, this paper was based on the leverage ratio as control variables and inferences the negative correlation with corporate performance.

Model Construction. In order to avoid the disadvantages to evaluate of financial performance by using a single financial or profit index, this paper introduced the asset scale (SIZE) and debt levels (Lev) as two control variables, because company performance is not only influenced by the free cash flow levels, but also by its assets size and liabilities level and other factors. Through the introduction of the two control variables, the model's ability to explain and integrity can be improved.

Therefore, the multivariate linear model (3), which describes the relationship between the free cash flow and the financial performance, can be constructed.

$$F = \beta_0 + \beta_1 FCF + \beta_2 SIZE + \beta_3 Lev + \varepsilon \tag{3}$$

Sample Selection and Data Sources. The sample of this paper is listed real estate companies through the Shanghai and Shenzhen stock exchange. In recent years, the real estate industry in China developed swift and violent. This industry is characterized by large investment, high leverage ratio and so on.

This paper selects the sample data of listed real estate companies during 2006 to 2010, excluding ST, *ST companies, and other companies which has incomplete disclosure of financial data. As a result of this study does not consider the time factors, so the annual data are merged into a unified sample, and then begin analysis and calculation.

In this paper, the related financial data are derived from the database of CSMAR, and SPSS18.0 software was used to analysis and test for the model.

4. Empirical Results

Determining of Principal Components. First of all, calculate the correlation coefficient matrix of 21 original financial ratios in whole sample, found that most of the weak correlation between ratios, illustrate the better selection of indicators to obtain, the less repeated information appeared. Then KMO and Bartlett-test can be used, the result has shown in Table 1.

Table 1 KMO and Bartlett Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.661
Bartlett's Test of Sphericity	Approx. Chi-Square	3144.164
	Df	210
	Sig.	.000

It is known that the accompanied probability of Bartlett spherical test is close to 0, while KMO value 0.661is greater than 0.5. Thus, it is suitable for principal component analysis.

In a subsequent principal component analysis, with initial eigenvalues≥1, this study extracts the 8 principal components. The cumulative variance contribution is 80.82%, greater than 80%, so the selected 21 original financial indicators in this paper can be attributed to the 8 principal components. With the help of SPSS software, we can get the initial component matrix, and then the corresponding principal component expressions.

$$F=0.078ZX1-0.011ZX2+0.035ZX3+0.057ZX4+0.066ZX5+0.161ZX6+0.072ZX7-0.044ZX8$$
$$+0.074ZX9+0.043ZX10+0.025ZX11+0.006ZX12+0.13ZX13+0.165ZX14+0.187ZX15 \quad (4)$$
$$--0.032ZX16+0.037ZX17+0.077ZX18+0.072ZX19+0.03ZX20+0.085ZX21$$

Correlation Analysis. This study analysised Pearson correlation, the result showed , r = -0.29**, t=4.76. This means there's a significant negative correlation between the FCF and financial performance.

Regression Analysis. With index F as the dependent variable, FCF as an independent variable, and the scale of assets and liabilities level as control variables, the multiple regression equation is established. The results of the analysis are given in table 2.

Table 2   Multivariate Regression Results

Variable	B	Std. Error	t-Statistic	Sig.
C	-2.184	.890	-2.454	.015
FCF	-.171	.045	-3.817	.000
Ln Asset	.099	.040	2.457	.015
Lev	-.277	.041	-6.738	.000
R2(Adj. -R2)	0.231 (0.221)			
F（Sig.）	24.377 (0.000)			

According to the above regression data and statistical test data, it can get the relationship between enterprise's free cash flow and financial performance as follow regression equation:

$$F = -2.184 - 0.171\text{FCF} + 0.099\text{SIZE} - 0.277\text{Lev} + \varepsilon \quad (5)$$

5. Discussions

Empirical results show that the company's free cash flow and consolidated financial performance indexes F have a significant negative correlation, indicating that excess cash flow is not conducive to the company's financial performance. This result is consistent with Johnson's "agency cost" theory. However, many researchers reached inconsistent conclusions, which showed free cash flow positive correlation with corporate performance, or is not relevant.

The authors believe that the findings depend on the industry background, market environment, study perspective, sample determination, variable selection and other factors. Also the formula for calculating free cash flow is not uniform, which may lead to different conclusions.

This article regards the real estate industry as a research object. The real estate industry's cash flow has some particularities. In recent years, China's real estate industry has been growing rapidly. Real estate companies generally have higher profit margins. However, most of the business inflow of cash has been used to expand operations and develop new projects. The outflow of cash is much greater than the inflow of cash. Then net cash flow often expressed as negative. Thus, in our current market environment, the real estate industry listed companies under the conditions of certain level of its assets and liabilities, free cash flow and financial performance have negative linear relationship and problems of agency costs of free cash flow perform outstandingly in our real estate industry listed companies.

In addition, the regression equation of the other test results can also be discussed. First, the multiple determination coefficient of regression equation is not high. Probably because the factors that affect financial performance are numerous and free cash flow, asset size and debt level are some of the factors affecting financial performance. Second, the performance of the company are related to their size, which may be due to large enterprises easily access to internal and external financial support, while the effect of economy of scale of large enterprises will promote to improve business performance. Finally, the companies' performance correlated negatively with its debt levels. This conclusion is consistent with the explanations of the agency cost theory. At

higher levels of debt, company's manager may refuse the projects which NPV is greater than zero, and to turn to high risk investments, because if these investments are successful, the enterprise would gain the most benefits, but if they fail, the creditors would stand for most losses.

6. Conclusion

There is a significant negative correlation between the company's comprehensive financial performance and free cash flow. In addition, the performance of the company is positively correlated with its size, and negatively associated with the level of debt.

The holding of the enterprise free cash flow is not the more the better. For investors, in addition to the use of traditional financial index based on profits, more attention should be paid to the free cash flow and other not easy to manipulation index by company's manager. The enterprise managers should pay attention to the free cash flow, control capital expenditure level to ensure a reasonable proportion between capital expenditure and operating cash flow.

7. Acknowledgment

8. References

[1] J. Baskin: An Empirical Investigation of the Pecking Order Hypothesis, Financial Management，(1989), p.26

[2] R. McLaughlin, A. Safieddine and G. K. Vasudevan: The Operating Performance of Seasoned Equity Issuers: Free Cash Flow and Post-Issue Performance, Financial Management, Vol. 25(1996), p. 41

[3] J. Harford: Corporate Cash Reserves and Acquisitions, Journal of Finance, Vol. 54(1999), p.1969

[4] S. Freund, A. P. Prezas and G. K. Vasudevan: Operating Performance and Free Cash Flow of Asset Buyers, Financial Management, Vol. 32(2003), p.87

[5] R. Chung, M. Firth, and J. Kim: Earnings Management, Surplus Free Cash Flow, and External Monitoring, Journal of Business Research, Vol. 23(2005), p.766

[6] Jinhua Zhang and Fangwei Wu: the Continued Viability Analysis of Agricultural Listed Companied: Based on free cash flow theory and empirical research, Agricultural Economy, Vol. 3(2003), p.5

[7] Yanyan Qing and Shengdao Gan: the Empirical Research of Correlation between Free Cash Flow, Business Accounting, Vol. 21(2007), p. 21

[8] Lin Yuan, Lei Wang: The Hypothesis of Free Cash Flow: The Enterprise's Performance and Sales Growth, Journal of Beijing Technology and Business University (Social Sciences Edition), Vol.23(2008), p.75

[9] Lihua Ding: Free Cash Flow and M & A performance-related research, Accounting Comprehensive Communication, Vol.1 (2010), p.128

[10] J.E. Stieglitz: Credit Markets and the Control of Capital, Journal of Money, Credit and Banking, Vol.2(1985), p.133