Research on the Impact of Corporate Cash Flow Management on Profitability

Yiwen Wang *

Hangzhou Dianzi University ,Hangzhou ,China

* Corresponding Author Email: 22140821@hdu.edu

Abstract. The level of corporate cash flow management is related to the survival and development of enterprises and value creation. This study explores the impact mechanism of corporate cash flow management on profitability and empirically analyses a sample of Chinese A-share listed companies by constructing a fixed-effects regression model. The study finds that the level of cash holding has an inverted U-shaped relationship with corporate profitability; net cash flow from operating activities is significantly and positively related to corporate profitability; cash flow volatility has a negative impact on profitability; and improved cash turnover efficiency can effectively enhance corporate profitability. These results provide theoretical basis and practical guidance for enterprises to optimise cash flow management and enhance profitability.

Keywords: Cash flow management; profitability; cash holding level; cash turnover efficiency; financial performance.

1. Introduction

Enterprise cash flow management is the core link of financial management, directly related to the survival and development of enterprises and value creation[1[. Scientific and reasonable cash flow management can not only ensure that the daily operation of the enterprise has sufficient funds, but also optimise the capital structure, improve the efficiency of the use of funds, which in turn affects the profitability of the enterprise[2]. Scholars at home and abroad have achieved certain results in the research on the relationship between cash flow management and corporate profitability, but the existing research focuses on a single dimension of cash flow indicators, and lacks a systematic examination of the comprehensive impact of multi-dimensional cash flow management[3-4]. Especially in the context of China's economic transformation, corporate cash flow management faces a more complex environment, and its impact mechanism on profitability needs to be explored more deeply. Based on the theoretical foundations of trade-off theory and preferential financing theory, this study constructs an analytical framework with four dimensions, including cash holding level, cash flow from operating activities, cash flow volatility and cash turnover efficiency, and explores the impact mechanism of corporate cash flow management on profitability through empirical research on A-share listed companies in China, with the aim of providing theoretical basis and practical guidance for enterprises to optimize their cash flow management strategies and enhance their profitability. It aims to provide theoretical basis and practical guidance for enterprises to optimise their cash flow management strategies and enhance their profitability.

2. Theoretical Basis of Enterprise Cash Flow Management

2.1. Definition of Concepts Related to Cash Flow Management

Enterprise cash flow management is the core link in the financial management system of an enterprise, which refers to the systematic management activities of an enterprise to comprehensively plan, organise and control the inflow and outflow of cash and cash equivalents. Cash flow management covers cash budget, income and expenditure balance, fund scheduling, investment of surplus funds and other aspects of its core objective is to ensure that enterprises have the right amount of cash to maintain daily operations, while avoiding excessive idle funds resulting in the loss of opportunity cost[5]. Modern enterprise cash flow management has developed from the traditional

simple funds management to a strategic resource allocation activities, enterprises need to meet the liquidity needs and the pursuit of funds between the optimal balance of profitability. Cash flow management efficiency directly affects the efficiency of the use of funds and the level of financial risk, the survival and development of enterprises and value creation has a decisive role, reasonable cash flow management can reduce the financial costs of enterprises, improve the efficiency of the use of funds, and enhance the ability of enterprises to cope with market changes.

2.2. Theoretical foundations of cash flow management

The theoretical foundations of cash flow management mainly include trade-off theory, preferential financing theory, agency theory and signalling theory. According to trade-off theory, the optimal level of cash holding should be at the place where the marginal benefit and marginal cost of cash holding are equal, the benefit of cash holding includes reducing transaction cost and preventive demand, and the cost is mainly opportunity cost[6]. The preferential financing theory states that there is an order of priority in corporate financing, and that firms tend to use internal funds before considering external financing, which makes cash reserves an important strategic resource for firms. Agency theory reveals that the conflict of interest between management and shareholders may lead to excessive cash holdings by management in order to enhance its control to the detriment of shareholders. Signalling theory explains how the cash flow position of a firm transmits information about the firm's financial health to the market, affecting investor confidence and the firm's market value. Together, these theories constitute the theoretical framework of modern enterprise cash flow management, which provides theoretical guidance for enterprises to formulate scientific and reasonable cash flow management strategies.

3. The empirical research design of the impact of corporate cash flow management on profitability

3.1. Research hypotheses

Based on the theory of cash flow management and existing research results, this study proposes four main research hypotheses to explore the relationship between corporate cash flow management and profitability. Research hypothesis H1 that there is an inverted U-shaped relationship between the level of corporate cash holdings and profitability, that is, there is an optimal level of cash holdings, too high or too low cash holdings are not conducive to the enhancement of profitability[7]. H2 hypothesis that the net cash flow from operating activities is positively correlated with the profitability of the enterprise, and the more adequate the cash flow generated by the operating activities, the greater the profitability of the enterprise. H3 speculates that there is a negative correlation between the volatility of cash flow and the profitability of the enterprise. profitability has a negative correlation, the greater the cash flow volatility, the weaker the corporate profitability.H4 hypothesises that cash turnover efficiency has a positive correlation with corporate profitability, the shorter the cash turnover cycle, the stronger the corporate profitability. These assumptions are based on the analysis of the data of A-share listed companies from 2015 to 2024, and consider the industry characteristics and macroeconomic environment factors.

3.2. Sample Selection and Data Source

This study selects Chinese A-share listed companies from 2015-2024 as the research sample, and the data are mainly from CSMAR and Wind database. The sample selection process follows strict criteria: financial and insurance companies are excluded because their cash flow characteristics are significantly different from those of other industries; ST and *ST companies are excluded to avoid financial anomalies from interfering with the results; companies with incomplete data are deleted to ensure the consistency of the analyses; and extreme outliers are excluded to improve the reliability of the results. After screening, 2183 valid sample enterprises were finally obtained, with a total of 21830

observations[8]. Table 1 demonstrates the distribution of the sample industries, with the highest proportion of enterprises in the manufacturing sector (52.4 per cent), followed by the information technology sector (12.7 per cent) and the real estate sector (8.5 per cent). In terms of annual distribution, the number of samples increases year by year from 2015 to 2024, from 1,845 in 2015 to 2,183 in 2024, a growth rate of 18.3%, reflecting the expansion trend of China's capital market. The size distribution of the sample enterprises is relatively balanced, with large-sized enterprises accounting for 37.2%, medium-sized enterprises accounting for 42.5%, and small-sized enterprises accounting for 20.3%, ensuring the universality of the study's conclusions.

Table 1. Industry distribution of the research sample.

Industry Category	Sample Size	Percentage (%)
Manufacturing	1144	52.4
Information Technology	277	12.7
Real Estate	186	8.5
Wholesale and Retail	165	7.6
Construction	127	5.8
Other Industries	284	13
Total	2183	100

3.3. Variable Design and Description

The research variable design includes three categories of dependent, independent and control variables. The dependent variable uses three indicators to measure corporate profitability: return on total assets (ROA), return on net assets (ROE) and net sales margin (ROS). The independent variables include four aspects: cash holding level (CASH) is calculated using (money funds + trading financial assets)/total assets; net cash flow from operating activities (CFO) is measured by net cash flow from operating activities/total assets; cash flow volatility (CFVOL) is expressed as the standard deviation of the net cash flow from operating activities in the last three years; and cash turnover efficiency (CCC) is measured by inventory turnover days + accounts receivable turnover days - accounts payable turnover days. Control variables include firm size (SIZE), gearing ratio (LEV), firm growth (GROWTH), firm age (AGE), industry factor (IND) and year factor (YEAR)[9].

3.4. Model Construction

This study constructs four regression models to test the impact of cash flow management on corporate profitability. Model 1 verifies the inverted U-shaped relationship between the level of cash holdings and profitability by introducing the primary and secondary terms of the level of cash holdings:

$$\begin{aligned} ROA_{i,t} = {} & \alpha^0 + \alpha^1 CASH_{i,t} + \alpha^{22CASH^2_{i,t}} + \alpha^{3SIZE_{i,t}} + \\ & \alpha_4 LEV_{i,t} + \alpha_5 GROWTH_{i,t} + \alpha_6 AGE_{i,t} + \sum IND + \sum YEAR + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Model 2 tests the relationship between cash flow from operating activities and profitability:

$$\begin{aligned} ROA_{i,t} = {} & \beta^0 + \beta^{1CFO_{i,t}} + \beta^{2SIZE_{i,t}} + \beta^{3LEV_{i,t}} + \\ & \beta_4 GROWTH_{i,t} + \beta_5 AGE_{i,t} + \sum IND + \sum YEAR + \varepsilon_{i,t} \end{aligned} \quad (2)$$

Model 3 analyses the impact of cash flow volatility on profitability:

$$\begin{aligned} ROA_{i,t} = {} & \gamma^0 + \gamma^1 CFVOL_{i,t} + \gamma^{2SIZE_{i,t}} + \gamma^{3LEV_{i,t}} \\ & + \gamma_4 GROWTH_{i,t} + \gamma_5 AGE_{i,t} + \sum IND + \sum YEAR + \varepsilon_{i,t} \end{aligned} \quad (3)$$

Model 4 explores the relationship between cash turnover efficiency and profitability:

$$\begin{aligned} ROA_{i,t} = {} & \delta^0 + \delta^1 CCC_{i,t} + \delta^{2SIZE_{i,t}} + \delta^{3LEV_{i,t}} \\ & + \delta_4 GROWTH_{i,t} + \delta_5 AGE_{i,t} + \sum IND + \sum YEAR + \varepsilon_{i,t} \end{aligned} \quad (4)$$

Regression analyses were conducted using three methods: mixed OLS, fixed effects and random effects, and the Hausman test determined that the fixed effects model best fits the characteristics of the data in this study. The preliminary model estimation results show that the model goodness of fit (R^2) are above 0.35, indicating that the model has good explanatory power. Table 2 shows the parameter design of the regression model.

Table 2. Regression model parameter design.

Model	Dependent Variable	Key Independent Variable	Expected Relationship	Control Variables	Estimation Method
Model 1	ROA	CASH, CASH2	Inverted U-shape	SIZE, LEV, GROWTH, AGE, IND, YEAR	Fixed Effects
Model 2	ROA	CFO	Positive	SIZE, LEV, GROWTH, AGE, IND, YEAR	Fixed Effects
Model 3	ROA	CFVOL	Negative	SIZE, LEV, GROWTH, AGE, IND, YEAR	Fixed Effects
Model 4	ROA	CCC	Negative	SIZE, LEV, GROWTH, AGE, IND, YEAR	Fixed Effects

4. Empirical Analysis of the Impact of Corporate Cash Flow Management on Profitability

4.1. Descriptive Statistical Analysis

The descriptive statistical results of the main financial indicators of the sample firms show the overall status of cash flow management and profitability of Chinese A-share listed companies. Table 3 shows that the average ROA of the sample enterprises is 5.38%, and the average cash holding level is 17.29%, with the maximum value as high as 65.72%, with obvious differences among enterprises. Net cash flow from operating activities averaged 5.42%, cash flow volatility averaged 3.85, and cash turnover cycle averaged 71.35 days, ranging from -85.37 days to 324.51 days[10-11]. Industry analysis reveals that the information technology industry has the highest level of cash holdings (22.38%) and the construction industry has the longest cash turnover cycle (94.27 days), reflecting the differences in operating characteristics and capital requirements of different industries.

Table 3. Details of descriptive statistics of major variables.

Variable	Mean	Median	Standard Deviation	Min	Max	P25	P75
ROA (%)	5.38	4.96	4.76	-12.84	28.35	2.75	7.63
ROE (%)	9.27	8.84	8.63	-35.62	42.18	4.52	13.76
ROS (%)	10.54	9.32	12.86	-42.37	68.94	4.25	16.43
CASH (%)	17.29	14.83	13.41	1.03	65.72	8.25	22.76
CFO (%)	5.42	5.16	6.37	-15.84	32.61	2.34	8.52
CFVOL	3.85	3.22	2.74	0.26	18.43	1.87	5.23
CCC (days)	71.35	65.24	83.64	-85.37	324.51	32.41	96.38

4.2. Correlation analysis

The results of correlation analysis between variables reveal the degree of association between cash flow management indicators and corporate profitability. Table 4 shows that the correlation coefficient between the level of cash holding and ROA is 0.216 ($p<0.01$); the correlation coefficient between net cash flow from operating activities and ROA is 0.542 ($p<0.01$), which is the most strongly correlated variable among all the indicators; the correlation coefficient between the volatility of cash flow and ROA is -0.183 ($p<0.05$), which confirms the positive effects of the stability of the cash flow; and the cash turnover cycle and ROA correlation coefficient is -0.247 ($p<0.01$), indicating that the higher the cash turnover efficiency, the stronger the profitability. The multicollinearity test shows that the VIF values of all variables are less than 5, and the maximum value is 2.83, indicating that there is no

serious multicollinearity problem. Sub-industry analysis reveals that the correlation between cash flow indicators and profitability is more significant in manufacturing and information technology industries[12].

Table 4. Correlation coefficient matrix of main variables.

Variable	ROA	ROE	ROS	CASH	CFO	CFVOL	CCC
ROA	1						
ROE	0.874***	1					
ROS	0.763***	0.685***	1				
CASH	0.216***	0.158**	0.275***	1			
CFO	0.542***	0.487***	0.463***	0.295***	1		
CFVOL	-0.183**	-0.196**	-0.218***	0.147*	-0.265***	1	
CCC	-0.247***	-0.218***	-0.184**	-0.135*	-0.326***	0.092	1

4.3. Regression Analysis Results and Interpretation

The results of the fixed effects regression analysis reveal the mechanism of the impact of the dimensions of cash flow management on corporate profitability. The primary term coefficient of CASH in Model 1 is 0.215 (t=5.43) significantly positive, and the secondary term coefficient is -0.004 (t=-4.87) significantly negative, confirming the inverted U-shape relationship between the level of cash holding and profitability, and the optimal level of cash holding is about 26.88%[13-14]. As shown in Figure 1, the firm's cash holding level is optimal at 26.88%, when ROA reaches its maximum value, and below or above this level will lead to a decline in profitability. The CFO coefficient in Model 2 is 0.378 (t=8.65) significantly positive, indicating that cash flow from operating activities has a significant positive impact on profitability. The CFVOL coefficient in Model 3 is -0.204 (t=-3.78) significantly negative, verifying that cash flow volatility is negatively related to profitability. The CCC coefficient in Model 4 is -0.009 (t=-5.24) significantly negative, indicating that the higher the cash flow efficiency, the stronger the profitability. Among the control variables, firm size and firm growth are significantly positively related to ROA, and gearing is significantly negatively related to ROA[15]. The model adjusted R^2 is between 0.386-0.452, with good explanatory power.

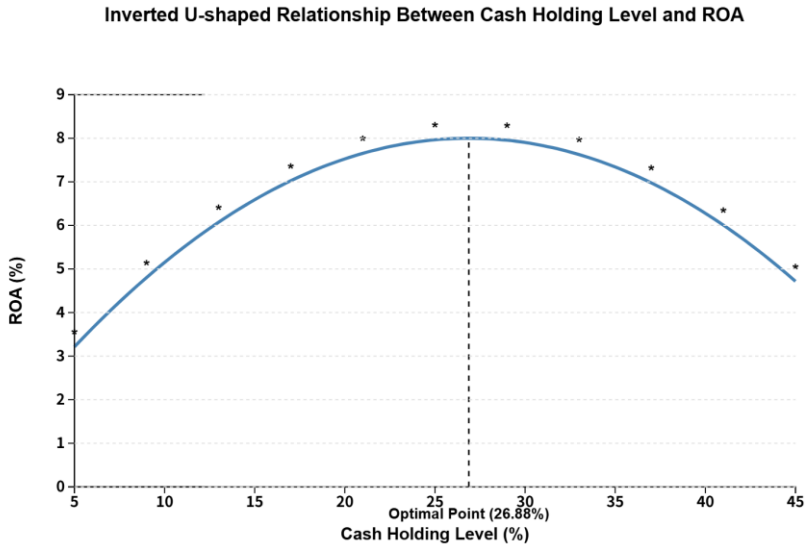

Figure 1. Inverted U-shaped relationship between cash holding level and ROA.

4.4. Robustness Tests

In order to verify the reliability of the research findings, this study conducts four robustness tests. First, using the alternative dependent variable method, ROE and ROS are re-regressed as profitability proxies, and the results are largely consistent with the main regression. Second, using the lagged

variable method, the independent variables are entered into the model with a one-period lag to alleviate the potential endogeneity problem, and the results still maintain significance and consistency. Third, using the instrumental variable method, industry average cash holding level and operating cash flow are selected as instrumental variables, and the results of the 2SLS regression still support the main research findings. Fourth, group regressions are conducted by characteristics such as firm size, industry, and nature of ownership, and the results show that the research findings remain robust across different groups of firms. Figure 2 shows that the direction and significance of the coefficients of the main variables remain consistent under different robustness test methods, with only small fluctuations in the coefficient values, confirming the reliability of the findings of this study.

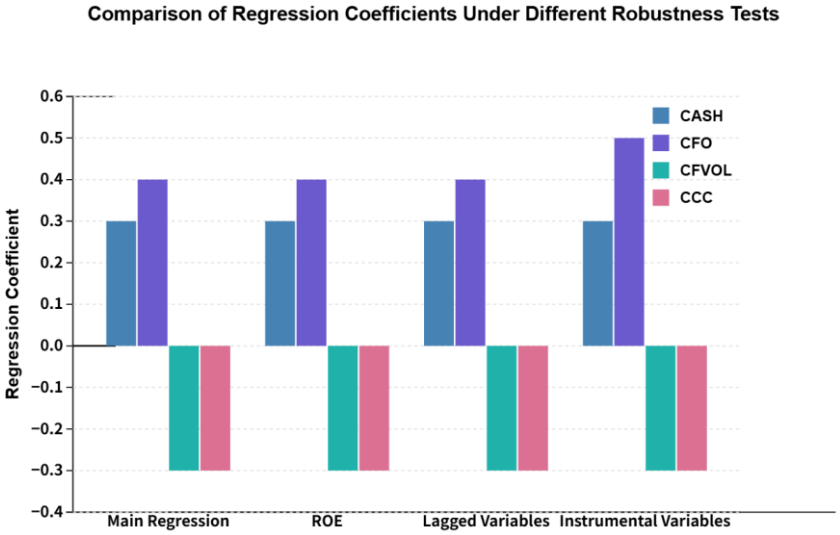

Figure 2. Comparison of regression coefficients under different robustness test methods.

4.5. Research Conclusions and Discussion

The results of empirical analyses lead to four key conclusions, which provide important insights into corporate cash flow management. First, the level of cash holdings has an inverted U-shaped relationship with corporate profitability, the optimal level of cash holdings is about 26.88%, and firms should seek a balance between liquidity security and capital efficiency. Second, net cash flow from operating activities has a significant positive impact on profitability, and improving the ability to generate cash from operating activities is the key to enhancing corporate profitability. Third, cash flow volatility is significantly negatively correlated with profitability, and enterprises should strengthen cash flow forecast planning to stabilise cash flow volatility. Fourth, cash flow efficiency has a significant positive impact on profitability, and shortening the cash flow cycle can effectively improve profitability. Sub-industry analysis shows that the manufacturing industry has the most significant impact on cash flow management efficiency, while the real estate industry has a lower level of optimal cash holding, reflecting the differences in industry characteristics. Enterprises should build a cash flow management system that meets their own characteristics.

5. Conclusion

Cash flow management, as the core link of corporate financial management, has a profound impact on corporate profitability. Through empirical analyses of Chinese A-share listed companies, this study finds that the level of cash holding has an inverted U-shaped relationship with corporate profitability, and there exists an optimal level of cash holding; net cash flow from operating activities is significantly positively correlated with corporate profitability; the volatility of cash flow has a significant negative impact on profitability; and the enhancement of the cash turnover efficiency effectively strengthens the profitability of enterprises. These findings not only enrich the theory of cash flow management, but also provide practical guidance for enterprises to build a scientific cash

flow management system. Future research can further explore the moderating effects of macroeconomic cycles and industry characteristics on the effects of cash flow management.

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