



Factors Impact on Capital Structure Fluctuation of Enterprises Listed on Hose, Vietnam

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Abstract: Changes in corporate capital structure were often considered on a yearly basis. However, to more deeply evaluate the fluctuations in corporate capital structure, we collected quarterly panel data of 180 enterprises listed on the Hochiminh Stock Exchange (HoSe, Vietnam) for researching. Regression techniques such as Pooled-OLS, FEM, REM and GLS were used to test the impact of a number of factors on the fluctuation of the capital structure of enterprises listed on HoSE in the period 2015 - 2020. The results of regression analysis showed that profitability, asset turnover, firm size (asset scale), short-term debt ratio and long-term debt ratio showed a positive impact on capital structure fluctuations, meanwhile ROS, firm size (revenue scale), short-term asset ratio and net cash flow shows negative impact on capital structure fluctuations. The findings based on balanced panel data collected quarterly showed differences compared to some previous researches on the same topic, on the other hand, added empirical evidence on the statistically significant relationship of some factors to fluctuations of enterprise capital structure. The results suggested future research directions, continuing empirical researches to demonstrate the impact of regional factors, corporate governance, macro factors,... on fluctuation of capital structure or use an more effective scale of capital structure fluctuations.

Keywords: Capital Structure, Listed Enterprise, Fluctuations, Impact Factor

1. Introduction

Researches on corporate capital structure in recent years have mainly focused on evaluating the effects of capital structure on financial situation and business performance, or evaluating factors affecting capital structure. A recent direction of research on capital structure has been developed to evaluate the factors affecting capital structure adjustment, based on the assumption that the company has a target capital structure.

When surveying a number of researches on company capital structure, we found that researches mainly used secondary data on annual financial reports. On the other hand, from previous researches on capital structure, we found that changes in a company's capital structure implied important information about the company's performance and financial situation. Besides containing important information about the

company, the company's capital structure and its fluctuations also showed cyclicity when analyzing changes over the quarters of the year [9, 10]. Fluctuations in a company's capital structure are also affected by business performance (asset turnover, profitability), asset structure and capital structure, and company size [16]. Fluctuations in a company's capital structure are also related to the company's cash flow situation [2, 16].

With the expectation of providing empirical evidence to clarify the characteristics of fluctuations in the capital structure of listed enterprises and analyze impact factors on the the capital structure fluctuation of enterprises listed on Hochiminh Stock Exchange (HoSE), Vietnam, in comparison with previous research results on enterprises listed on Hanoi Stock Exchange (HNX), we conducted a research on quarterly data of enterprises listed on HoSE.

2. Theoretical Background

Since the 1980s, the significance of rapid or slow changes in a company's capital structure has been pointed out, that it conveys important financial information of the company to the market [11, 12]. These findings were later further supported [14]. In later researches that further developed the topic of corporate capital structure, some researches approach capital structure in the direction of understanding the speed of change, strong or weak, fast or slow fluctuations of the debt ratio. This was a volatility approach that replaced point-in-time capital structure value approaches. Many later researches have clarified the relationship between capital structure fluctuations/stability with business performance, cash flow situation, financial structure, and asset structure.

Researching by the data of European enterprises from 2006 to 2016, Campell and Roger have made valuable comments on the relationship between company size and debt ratio fluctuations, in which enterprises with the most dramatic changes in capital structure were smaller-sized enterprises [2]. Although Campell and Roger believed that this relationship should be further verified, these results were also similar with the research results of Shah [2, 14]. Campell and Roger also evaluated the impact relationship between business performance and capital structure changes. Enterprises with lower operating efficiency (reflected by profitability) had a stronger change in debt ratio. This research also mentioned the impact relationship between a business's cash flow and changes in capital structure, stating that the increase in business capital structure was due to increased investment of enterprises (net cash flow for investment increased).

The influence of firm age on capital structure changes was demonstrated by Kieschnick and Moussawi when studying the capital structure decision, in which firm age and corporate governance characteristics (such as size/number of board members, characteristics of the board chairman, general director,...) impacted the capital structure decision, causing changes in debt ratio [7]. The relationship of tangible assets ratio and some operating characteristics with changes and adjustments to corporate capital structure was also studied in some other researches [3, 1].

In Vietnam, Le and Tran used panel data of 174 listed

enterprises in the period 2015 - 2020 to analyze the positive relationship between firm size (by total assets), asset turnover, debt ratio, ROE and firm age with the change of capital structure, while revenue showed the negative impact [8]. Developing this research direction, Tran based on data of 203 enterprises listed on HNX (Vietnam) pointed out the cyclical in capital structure fluctuations. This research also clarified the impact relationship of asset turnover, firm size, debt ratio, short-term asset ratio, fixed asset ratio, firm age, net cash flow to total assets, net finance cash flow to total assets and net investment cash flow to total assets were factors impacting the capital structure fluctuations of listed enterprises [16].

In general, the above research results aimed to evaluate capital structure changes by year and quarter, thus clarifying the characteristics of capital structure fluctuations of enterprises. The research results also provided empirical evidence on factors impacting on capital structure fluctuations of listed enterprises. However, in the case of listed enterprises in Vietnam, there was a relatively clear difference between enterprises listed on HNX and enterprises listed on HoSE. The most important difference was the firm size (reflected by both total asset and total revenue). On the other hand, from professional discussions with some of corporate financial management experts and some finance and accounting researchers, we have learned that large enterprises often have an advantage in capital planning and capital mobilization, so their high or low debt ratios do not have a strong influence on how quickly or slowly their capital structure fluctuates. To corroborate these observations and add statistically significant conclusions about factors affecting corporate capital structure fluctuations, an empirical research is needed for the group of HoSE listed enterprises.

3. Research Method

Inheriting former research, we established a research model with impact factors including (1) business performance, (2) asset structure, (3) capital structure, (4) cash flow, (5) firm size, (6) firm age, (7) gender characteristics of the chairman and general director. The dependent variable reflects capital structure fluctuations, in which capital structure is reflected by the company's debt ratio.

Table 1. Proposed variables.

Variables		Determining	Sources/Used by
CSF	Capital structure fluctuation	Debt ratio - Debt ratio of the preceding period	[8, 14, 16]
ROE	Return on Equity	Net income/ Equity	[4, 5, 2, 6, 16]
ROA	Return on Asset	Net income / Average assets	[2, 4, 5, 6, 16]
AT	Total Asset Turnover	Revenue / Average assets	[5, 8, 16]
ROS	Return on Sale	Net income / Total Sale	[5, 16]
SIZE	Firm size	Total Asset (Logarit)	[2, 16]
SIZE2	Firm size (2)	Total Revenue (Logarit)	[8, 16]
ST_A	Short-term Asset Ratio	Short-term Assets / Total Assets	[1, 3, 16]
FX_A	Fix Asset Ratio	Fix Assets / Total Assets	[8, 15, 16]
DEBT	Debt Ratio	Total debt / Total Assets	[13, 16]
ST_D	Short-term Debt Ratio	Short-term Debt / Total Asset	[16]
LT_D	Long-term Debt Ratio	Long-term Debt/ Total Asset	[7, 8, 16]
AGE	Firm Age	Time from establishing and operating to the time of making financial statements	

Variables		Determining	Sources/Used by
B_MEM	Board of Directors Scale	Number of members	[7]
CF_A	Net Cash Flow Ratio	Net Cash Flow / Total Assets	[2, 16]
OCF_A	Net Operating Cash Flow Ratio	Net Operating Cash Flow / Total Assets	[2, 16]
ICF_A	Net Investing Cash Flow Ratio	Net Investing Cash Flow / Total Assets	[2, 16]
FCF_A	Net Financing Cash Flow Ratio	Net Financing Cash Flow / Total Assets	[2, 16]
CHAIR	Gender of the Chairman	Dummy Variable	[7, 16]
DR	Gender of General Director	Dummy Variable	[7, 16]

STATA16.0 with Pooled-OLS, fixed effects model (FEM), random effects model (REM) were used for regression analysis. F-test to choose OLS or FEM, Hausman-test to choose FEM or REM. After checking the model's errors such as multicollinearity (by VIF - Variance Inflation Factor), Heteroskedasticity (by Wald - test), autocorrelation (by Wooldridge-test), if the research model has errors, it will be overcome by GLS regression. In regression analysis, independent variables whose observed values are absolute numbers will use logarithmic values. CHAIR and DR in regression analysis are dummy variables.

Data were collected from the financial statements of enterprises listed on the Hochiminh Stock Exchange (HoSE). Listed enterprises were randomly selected among non-financial enterprises listed on HoSE in the period of 2015 - 2020, with data of 24 quarters. In this research, financial enterprises, commercial banks and security enterprises were not selected because of too different industry characteristics. The number of enterprises that met the data continuity requirements included 180 enterprises, the quarterly financial statements of 180 enterprises were collected from the website <https://finance.vietstock.vn>.

The structure of the research sample according to the number of observations is summarized and presented in Table 2.

Table 2. The research sample (by number of observations).

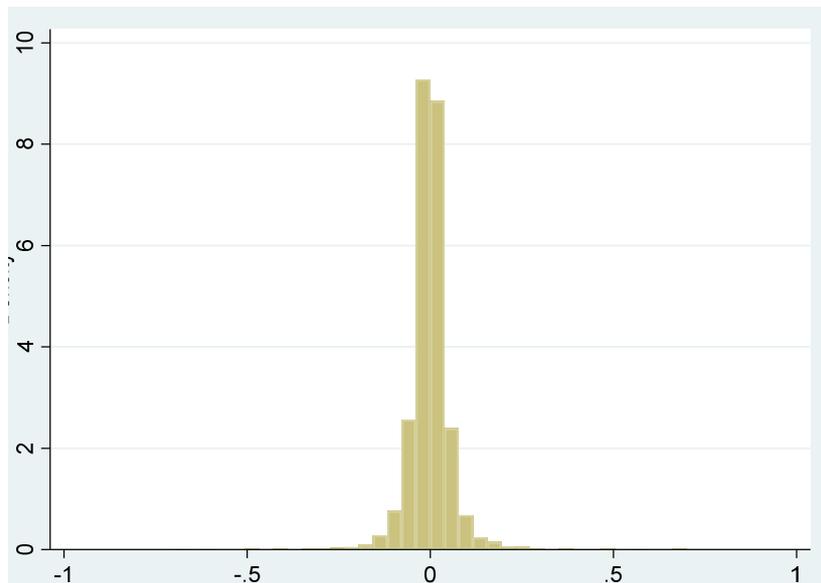
Industry	Freq.	Percent	Cum.
Wholesale Trade	312	7.22	7.22
Retail Trade	144	3.33	10.56
Information and Technology	96	2.22	12.78
Mining, Quarrying, Oil and Gas Extraction	216	5.00	17.78
Accommodation and Food Services	24	0.56	18.33
Manufacturing	1,584	36.67	55.00
Utilities	336	7.78	62.78
Transportation and Warehousing	528	12.22	75.00
Construction and Real Estate	1,080	25.00	100.00
Total	4,320	100.00	

Source: Author's synthesis by STATA 16.0

4. Results

4.1. Descriptive Statistics Results

Using the collected panel data, results from STATA16.0 show that the observed values of the dependent variable CSF have a fairly concentrated distribution, close to a normal distribution. The results are shown in Figure 1.



Source: Author's synthesis by STATA 16.0

Figure 1. CSF probability distribution.

Descriptive statistical results of the variables in the model are presented in Table 3. The value of CSF ranges from -0.7009346 to 0.7003557, the observed values are quite

concentrated with a standard deviation of 0.0609311, this result is consistent with the description of Figure 1.

Table 3. Descriptive statistical results of the research model variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
CSF	4,320	-.0006201	.0609311	-.7009346	.7003557
ROE	4,318	.1990796	7.367.009	-83	4.343.333
ROA	4,320	.0718595	2.195.881	-2.553.846	1.240.952
AT	4,320	2.108.696	5.445.906	-.0804124	3.443.333
ROS	4,270	.5847735	7.842.072	-170	278
SIZE	4,320	7.134.167	1.331.567	1.791.759	1.204.123
SIZE2	4,267	5.180.563	1.683.228	-2.302.585	101.591
ST_A	4,320	.5659783	.2291341	.0008584	1
FX_A	4,320	.1865516	.1875668	0	1
DEBT	4,320	.4497666	.2248105	0	1.277.335
ST_D	4,320	.3448639	.2148465	0	104.326
LT_D	4,320	.1049602	.1383088	0	.7179634
AGE	4,320	2.694.552	.6333879	0	4.219.508
B_MEM	4,320	174.222	.2302989	.6931472	2.484.907
CF_A	4,320	.0183221	229.699	-1.391.667	1.797.647
OCF_A	4,320	.3611244	6.693.729	-9.066.666	2.213.333
ICF_A	4,320	.2894877	4.286.425	-2.398.134	1.422.667
FCF_A	4,320	.0593004	4.965.049	-142.5	7.723.163
CHAIRdummy1	4,320	.8763889	.3291755	0	1
DRdummy1	4,320	.8981481	.3024884	0	1

Source: Author's synthesis by STATA 16.0

Basically, the descriptive statistical values such as Min and Max of the variables are realistic. In which the Min values of ROE, ROA, AT, ROS are less than 0 in case the company has a loss in business results during the period. DEBT and ST_D have Max values greater than 1. The inspection results on the financial statements show that this is a case where the listed company has suffered losses for many periods, has negative equity, and the value of short-term debt is greater than total assets.

The results of correlation analysis were summarized in Table 4. Based on the correlation coefficients in Table 4, it seemed that the independent variables of the research model have impact relationship with the CSF. Through observation, two coefficients have relatively high values, which are the correlation coefficients between ROA and ROE, ST_D and DEBT, showing that multicollinearity may exist in the research model. That was the basis for performing regression estimates and checking possible model errors.

Table 4. Correlation coefficient analysis results.

	CSF	ROE	ROA	AT	ROS	SIZE	SIZE2	ST_A	FX_A	DEBT
CSF	1.0000									
ROE	0.0161	1.0000								
ROA	0.0143	0.9937	1.0000							
AT	0.0189	0.0755	0.0811	1.0000						
ROS	-0.0212	0.0050	0.0061	-0.0027	1.0000					
SIZE	0.0209	-0.0737	-0.0812	-0.1337	0.0455	1.0000				
SIZE2	0.0091	0.0204	0.0223	0.0716	-0.1434	0.4998	1.0000			
ST_A	0.0223	0.0019	0.0024	0.0021	-0.0669	-0.0724	0.2476	1.0000		
FX_A	-0.0230	-0.0055	-0.0032	0.0141	-0.0438	-0.0943	0.1489	-0.3767	1.0000	
DEBT	0.1299	0.0226	0.0183	0.0299	-0.0638	0.2253	0.3189	0.2920	-0.1091	1.0000
ST_D	0.1090	0.0269	0.0243	0.0464	-0.0588	0.0707	0.3558	0.5531	-0.2259	0.8041
LT_D	0.0412	-0.0053	-0.0082	-0.0239	-0.0120	0.2557	-0.0371	-0.3886	0.1757	0.3709
AGE	0.0222	-0.0125	-0.0150	-0.0476	0.0179	0.0867	-0.0511	-0.0188	-0.0207	0.0278
B_MEM	0.0007	0.0011	0.0010	-0.0128	-0.0065	0.2122	0.1545	-0.1029	0.0536	0.0166
CF_A	-0.0420	0.0960	0.1044	-0.0270	0.0009	0.0410	-0.0329	-0.0390	-0.0140	-0.0219
OCF_A	-0.0259	0.1868	0.1692	0.5936	-0.0019	-0.1660	0.0472	-0.0199	0.0252	0.0201
ICF_A	0.0026	0.0525	0.0673	0.6002	-0.0012	-0.1780	0.0164	-0.0478	0.0186	0.0206
FCF_A	0.0154	-0.2204	-0.1971	-0.0617	-0.0015	0.0456	-0.0714	-0.0477	-0.0057	-0.0063
CHAIRdummy1	-0.0057	0.0079	0.0077	0.0118	-0.0290	-0.0365	-0.0967	-0.0960	0.0685	0.0520
DRdummy1	-0.0060	0.0073	0.0076	0.0110	-0.0452	-0.1212	-0.0394	0.1077	-0.0483	0.0247

	ST_D	LT_D	AGE	B_MEM	CF_A	OCF_A	ICF_A	FCF_A	CHAIR-dummy1	DR-dummy1
ST_D	1.0000									
LT_D	-0.2536	1.0000								
AGE	0.0121	0.0265	1.0000							
B_MEM	-0.0260	0.0674	-0.0142	1.0000						
CF_A	-0.0414	0.0290	0.0073	0.0057	1.0000					

	ST_D	LT_D	AGE	B_MEM	CF_A	OCF_A	ICF_A	FCF_A	CHAIR-dummy1	DR-dummy1
OCF_A	0.0356	-0.0229	-0.0641	-0.0230	-0.1219	1.0000				
ICF_A	0.0215	-0.0001	-0.0612	-0.0076	0.0768	0.4651	1.0000			
FCF_A	-0.0331	0.0414	0.0040	0.0096	0.3350	-0.4490	0.1288	1.0000		
CHAIRdummy1	-0.0471	0.1582	-0.0404	-0.0248	0.0028	0.0173	0.0264	0.0051	1.0000	
DRdummy1	0.0210	0.0075	0.0003	0.0577	0.0024	0.0155	0.0233	0.0026	0.4097	1.0000

Source: Author’s synthesis by STATA 16.0

With the prediction results from the correlation coefficient of Table 4, regression analysis were performed, tests to detect model errors were conducted and errors would be corrected if any.

4.2. Regression Analysis Results

Pooled-OLS regression was performed first, on that basis to check whether the research model has multicollinearity or not. The results showed that in the regression estimation and VIF test, the VIF coefficient of the original model was greatly high, the model had multicollinearity. Combined with the prediction from the correlation analysis results in Table 4, DEBT and ROA were respectively removed, the OLS regression and VIF test were re-performed. After eliminating DEBT and ROA, the mean VIF coefficient of the model was 1.57, in which the highest VIF coefficient of the variables was 2.38, thus accepting the model results after adjustment without multicollinearity.

FEM and REM regression were performed respectively,

choosing between OLS and FEM by F-test, choosing between FEM and REM by Hausman-test. The results show that the FEM model was more suitable. Based on the FEM regression results, tests to check the model's errors were performed, the results of checking multicollinearity, heteroskedasticity and multicollinearity presented in Table 5.

Table 5. Results of testing the research model's errors.

Errors	Results	Yes/No
Multicollinearity	VIF ≤ 2.38 (Mean VIF = 1.57)	NO
Heteroskedasticity	Prob>chi2 = 0.0000	YES
Autocorrelation	Prob > F = 0.0000	YES

Source: Analysis results by STATA16

The results of the Wald-test and Wooldridge-test demonstrate that there were heteroskedasticity and autocorrelation. Therefore, GLS regression was performed to correct. Summary of regression results using OLS, FEM, REM and GLS in Table 6.

Table 6. Regression results using OLS, FEM, REM and GLS.

	CSF			
	OLS	FEM	REM	GLS
ROE	0.000247*	0.000200	0.000247*	0.000246**
AT	0.0000596**	0.0000486**	0.0000596**	0.0000517**
ROS	-0.000169	-0.0000790	-0.000169	-0.000129*
SIZE	0.000714	-0.000982	0.000714	0.00125**
SIZE2	-0.00178**	-0.00151	-0.00178**	-0.00181***
ST_A	-0.00780	0.00813	-0.00780	-0.00810**
FX_A	-0.000510	-0.0171	-0.000510	-0.00232
ST_D	0.0429***	0.294***	0.0429***	0.0167***
LT_D	0.0288***	0.192***	0.0288***	0.00819**
AGE	0.00125	0.00963	0.00125	-0.0000905
B_MEM	0.000202	0.00205	0.000202	0.000282
CF_A	-0.00141***	-0.00129***	-0.00141***	-0.00135***
OCF_A	-0.000575***	-0.000560***	-0.000575***	-0.000521***
ICF_A	0.0000175	0.000296	0.0000175	0.000211
FCF_A	0.000134	-0.000129	0.000134	0.000170
CHAIRdummy1	-0.00279	-0.0147*	-0.00279	-0.00192
DRdummy1	-0.000252	-0.00947	-0.000252	0.000835
_cons	-0.0105	-0.117***	-0.0105	-0.00229
N	4265	4265	4265	4265
F-test	Pro>F = 0.0000			
Hausman-test	Pro>chi2 = 0.0000			
R-sq	0.025	0.135		

* p<0.1, ** p<0.05, *** p<0.01

Source: Analysis results by STATA16.0

According to the GLS regression results:

+ ROE, AT and ROS reflect business performance, in this study showing a statistically significant impact on CSF. ROE and AT showed a positive impact while ROS showed a

negative impact. This result means that when ROE and AT increase, capital structure fluctuation increases, meanwhile, when ROS increases capital structure fluctuation decreases.

+ SIZE and SIZE2 reflect firm size (SIZE - total asset,

SIZE2 - revenue) both showed meaningful impact on CSF. While SIZE showed a positive impact, SIZE2 showed a negative impact, meaning that when total asset increases, the capital structure fluctuates more, and when revenue increases, the capital structure fluctuates more slowly.

+ The ratio of short-term assets ST_A showed a negative impact on CSF, that was, when the ratio of short-term assets increases, the capital structure fluctuation of the company listed on HoSE decreases.

+ The financial structure reflected by ST_D and LT_D both showed a positive impact on CSF. This means that when the ratio of short-term debt and long-term debt ratio of a listed company increases, the fluctuations of the capital structure also got stronger.

+ CF_A and OCF_A both showed negative impact on CSF. Thus, when the net cash flow and net operating cash flow of listed enterprises improve, the fluctuations of the capital structure were slower.

5. Discussion

The results in this research added further empirical evidence, clarifying the previous findings of Campbell & Roger on the relationship between business performance and corporate cash flow with capital structure fluctuation [2]. The regression results also clarified that in addition to ROE reflecting profitability - business performance, other indicators of business performance such as asset turnover, ROS also showed the impact on how quickly or slowly the capital structure changes. Compared to the findings of Campbell & Roger that profitability had a negative impact on capital structure fluctuation [2], in this research, ROE showed a positive impact, meaning that the more profitable an enterprise was, the more volatile its capital structure was. In addition to the enterprise's profitability, the increase of asset turnover also made the capital structure more volatile, while ROS, an indicator that directly reflects the effectiveness of revenue - cost management, increases, capital structure fluctuations slow down. These results could be explained: when profitability and capital turnover improve, enterprises expect positive changes in business performance, leading to adjustments in operations and the results of these make the capital structure more volatile. On the contrary, when an enterprise's ROS gets better, the enterprise gets more stable in terms of financial potential, thereby limiting fluctuations in capital structure. The impact relationship of AT and ROS on CSF were similar to the results of previous research by Tran with companies listed on HXN, in this research, profitability had a statistically significant impact, while in research of Tran profitability did not show an impact on capital structure fluctuations [16].

In this research, firm size (with two ways of reflecting) showed statistically significant impact on capital structure fluctuations. Compared to the previous findings of Campbell and Roger, this research result was different, with annual data in Campbell and Roger's research, firm size had a negative impact on capital structure changes [2], while this

research as well as previous research by Tran proved the positive impact of asset scale to capital structure fluctuations [16]. The two research also added to the research of Campbell and Roger that firm size reflected in revenue had a negative impact on capital structure fluctuations. This reality might come from the fact that when an enterprise's revenue improves, financial resources for business and investment activities get improved, that enterprise reduces capital structure adjustments. Since then, the enterprise's capital structure has changed more slowly.

The test results on the statistically significant relationship between profitability, asset turnover, and firm size also supported the previous results of Le and Tran's research [8].

Regarding the relationship between asset structure and capital structure fluctuations, compared to some previous researches, this research added evidence supporting the impact relationship of asset structure on capital structure fluctuations [1, 3, 8]. The ratio of short-term assets increases, the capital structure fluctuations perform slower, the reason might stem from the fact that enterprises with higher ratio of short-term assets have better asset liquidity, thereby reducing the pressure on capital structure fluctuations. This conclusion was similar to Tran's, however in this research the fixed asset ratio did not show a statistically significant impact on fluctuations of capital structure as in the research of Tran's [16].

In this research, short-term debt ratio and long-term debt ratio showed positive impact on capital structure fluctuations. This result was consistent with corporate financial management practices, when short-term or long-term debt increased, capital structure volatility would increase, furthermore, a high short-term debt ratio would make the capital structure more flexible and the possibility of fluctuations higher. This result was different from previous researches by Le & Tran [8], and by Tran [16].

Regarding the impact of cash flow on capital structure fluctuations, in this research, when net cash flow and operating cash flow improved, the enterprise's capital structure fluctuated more slowly. This result was consistent with reality because when an enterprise's ability to create money improved, the level of dependence on external capital sources in general and debt dependence in particular decreased, therefore, fluctuations in the capital structure of the enterprise would decrease. This result supported Tran on the impact of OCF [16], but there was a difference in the impact of total net cash flow and financial net cash flow. Compared to the initial findings of Campbell & Roger's research [2], this research did not have enough information to verify the impact of enterprise increasing investing cash flow on capital structure fluctuations. Compared to Le & Tran's research [8], this research result contributed to additional factors affecting cash flow.

With the data and regression techniques used for this research, there is not enough information to conclude about the impact of factors on corporate governance characteristics, or cyclical characteristics of capital structure fluctuations.

6. Conclusion

This research used quarterly panel data of 180 enterprises listed on HoSe (Vietnam), empirically demonstrated the impact of factors such as profitability, asset turnover, profit margin, firm size, short-term asset ratio, financial structure, net cash flow and net operating cash flow on the capital structure fluctuations of listed enterprises. These results contributed to providing additional understanding of corporate financial structure, which is the basis for forecasting fluctuations in corporate capital structure and the basis for making financial management decisions.

However, capital structure was influenced by many other factors inside and outside the enterprise, therefore, the research scope of this research was not sufficient to test other factors. Furthermore, the difference in research results on regular data with research on annual data had not been done. Measuring capital structure fluctuations by the difference in value at the end of the period compared to the beginning of the period was just one of the ways to reflect capital structure fluctuations, therefore, the research results might be different when choosing another way to measure capital structure fluctuations. These issues should be further evaluated by further empirical researches in the future.

Abbreviations

HNX: Hanoi Stock Exchange

HoSE: Hochiminh Stock Exchange

Conflicts of Interest

The authors declare no conflicts of interest.

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