Economics Bulletin

Volume 38, Issue 1

Free cash flow and corporate profitability in emerging economies: Empirical evidence from Vietnam

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Abstract

This paper examined the relationship between free cash flow and corporate profitability of Vietnamese listed firms. Basing on the agency theory of free cash flow, several previous studies proposed a negative relationship between free cash flow and corporate profitability. In this study, we argue that the presence of information asymmetry in the financial market of developing economies may limit the access to external sources of finance. Thus, free cash flow may serve as a cheaper alternative source of finance. This benefit may reduce, nullified, or even outweigh the agency cost caused by excess free cash flow. The empirical analysis results basing on a sample of 208 Vietnamese listed non-financial firms in the period from 2012 to 2016 showed that free cash flow seems to have a positive effect on the corporate profitability of Vietnamese listed firms.

This research is funded by Vietnam National Foundation for Science and Technology Development (NAFOSTED) under grant number 502.02-2015.26. We would like to thank Ms. Ha Bao Chau and Mr. Nguyen Tuan Anh for their assistance in the data collecting process.
Citation: An Nguyen and Tuan Nguyen, (2018) "Free cash flow and corporate profitability in emerging economies: Empirical evidence from Vietnam", *Economics Bulletin*, Volume 38, Issue 1, pages 211-220
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Submitted: September 14, 2017. **Published:** February 09, 2018.

1. Introduction

Corporate free cash flow, which is defined as the amount of money left over after satisfying all current operating and financing needs (Jensen, 1986), has long been a subject of studying in financial theory. According to the agency theory of free cash flow by Jensen (1986), free cash flow may increase the costs of agency problem inheriting in public corporations. Due to the misalignment of interest of corporate managers and shareholders, managers have incentive to waste this excess cash on underproductive investment projects or use to their own benefits. Thus, it is predicted that there is a negative relationship between the amount of free cash flow and corporate profitability.

Grounded in the pecking order theory of Myers and Majluf (1984), it is proposed that in the presence of heavy information asymmetry, external financial sources prove to be a costly source of funds. Thus, corporations, in such conditions, will resource to an internal source of fund as a cheaper source of funds before searching for external sources (Myers & Majluf, 1984). Thus, the availability of an amount of excess free cash flow may provide managers with some flexibility in their investment and financing decisions, limiting the problem of underinvestment and reducing the cost of financing. Consequently, free cash flow also has a positive effect on corporate financial performance in certain circumstances.

In emerging economies like Vietnam, it is generally assumed that the problem of information asymmetry is more serious than in developed economies. Thus, we argue that the availability of an amount of free cash flow may bring benefits to corporations. These benefits may reduce or even nullify the negative effect of free cash flow on corporate profitability as predicted by the agency theory of free cash flow. The empirical analysis results basing on a sample of 208 Vietnamese listed non-financial firms in the period from 2012 to 2016 showed that free cash flow seems to have a positive effect on the corporate profitability of Vietnamese firms. These results confirm our hypothesis that the relationship between the amount of free cash flow and corporate financial performance might be positive in the presence of heavy information asymmetry.

The remainder of the research paper is structured as follows. The next section provides a brief review on the existing literature, basing on which the hypotheses be developed. The third and the fourth section describe the data and the model. The next section presents and discusses the results. The final section presents the conclusions and implications for future research.

2. Literature review and hypothesis development

2.1. Overview of the Vietnamese financial markets

The first Vietnamese stock market, the Hochiminh Security Trading Center (HoSTC), was established in 2000 with only 2 trading stocks. The HoSTC was officially converted to Hochiminh Stock Exchange (HOSE) in August 2007, following the Prime Minister Decision No-559/2007/QD-TT. Until 2014, the number of listed companies on the HOSE had increased to 303, with the size of 27 percent of GDP as in 2015 (The International Monetary Fund, 2017). Companies listed on the Hochiminh Stock Exchange must have registered capital of at least 120 billion VND (approximately 5.5 million USD). According to the Vietnam Stock Depository, 99.57 percent of the total 1.569.792 trading accounts on the market in 2015 are classified as individual investors (Vietnam Stock Depository, 2016).

Despite remarkable developments over the years, Vietnamese financial markets are still considered as less developed. More importantly, the corporate bonds and bills market, one of the sources for companies' working capital, are virtually inexistent. The majority source of

Vietnamese firms' capital was provided by the banking sector, which amounted to 124 percent of GDP as in 2016. However, the survey also pointed out that only about 57 percent of the large firms (with more than 100 employees) had active lines of credit. Consequently, their investment was limited and was largely financed by internal sources of fund (The International Monetary Fund, 2017).

2.2. Literature review

In most studies, free cash flow is defined in accordance with the definition in Jensen (1986), which defined free cash flow as the amount of cash flow in excess of that required to fund all projects that have positive present values as discounted at the relevant cost of capital.

The agency theory of free cash flow suggests that a high level of cash holdings increases managerial discretions and provides managers with the incentive to engage in expropriation activities for their private benefits (Jensen, 1986). Papaioannou, Strock, and Travlos (1992) suggest that managers tend to retain more cash as a privilege, and Myers and Rajan (1998) also argue that managers can obtain more private benefits from liquid assets. Opler, Pinkowitz, Stulz, and Williamson (1999), likewise, document managers' preference for the control that comes with holding cash rather than paying out as dividends to stockholders. When firms have limited investment opportunities, retaining a high level of cash increases the likelihood of asset expropriation by managers because the excess cash may effectively encourage them to overinvest or to pursuit private interests, thereby damaging the interests of shareholders (Dittmar, Mahrt-Smith, & Servaes, 2003; Easterbrook, 1984; Jensen, 1986). Basing on that argument, it is proposed that there is a negative relationship between the amount of free cash flow and firms' profitability. Researchers also suggest that increasing leverage (Jensen, 1986) or paying out cash as dividends would decrease both cash holdings and the agency cost of overinvestment (Jensen , Solberg, & Zorn, 1992; Kalcheva & Lins, 2007).

Empirical evidence in developed markets generally confirms this prediction. Brush, Bromiley, and Hendrickx (2000) examine the free cash flow hypothesis for sale growth and firm performance. With 1570 firm-year dataset covering the period of 1988-1995 from the COMPUSTAT database, the authors find a negative relationship between the amount of free cash flow and firms' profitability. In a different context, Freund, Prezas, and Vasudevan (2003) examine the same relationship with 522 firms that announce asset purchases and discover that the announcement period's returns are negatively related to the amount of free cash flow for buyers with fewer growth opportunities. These findings are consistent with Jensen's (1986) free cash flow theory. Similar research on this relationship in developing countries, such as Zeitun and Tian (2014) with 167 Jordanian companies during the period 1989-2003; or Vo and Doan (2014) with 74 Vietnamese firms during the period 2007-2011, also show similar results.

In general, previous studies show evidence consistent with the free cash flow theory of Jensen (1986). However, most of these studies are about developed economies, where the asymmetric information is not a serious problem. Two studies about Jordanian and Vietnamese companies, though about emerging economies, are conducted with small samples and short time periods, which cast doubt on the power of their evidence.

2.3. Hypothesis development

Although it is proved that too much free cash may cause problems, accumulating a fair amount of free cash flow can also be beneficial to corporations in the presence of information

asymmetry. According to Myers and Majluf (1984), information asymmetry can limit the access to external sources of funds. In that condition, holding a high level of cash is essential to firms with strong growth opportunities, because the greater business risks they face make them subject to higher external financing costs (Mueller, 2006). Consequently, rapidly growing firms have the incentive to retain large cash holdings. This leads to a trade-off situation for their shareholders; that is, a trade-off between losing high-return investment opportunities if the firms experience a shortage in funds due to cash payouts, on one hand, and facing the agency costs of excess cash holdings if retaining almost their cash, on the other hand. However, whether a fast growing firm should retain most of its cash from shareholders also depends on how well company assets and shareholder interests are protected (Chen, 2008). A firm with better shareholder protection mechanisms should retain a high level of cash to meet its capital demand of investment opportunities without worrying too much about the costs of agency problems.

From this point of view, we can see that previous studies have failed to address the benefits of free cash flows to companies. When these benefits are taken into account, the negative relationship between free cash flow and firms' profitability found may be explained by the fact that the agency costs of free cash flow outweigh the benefits of having a large amount of free cash flow, which is typically the case in highly developed financial markets.

Grounding in the pecking order theory of Myers and Majluf (1984), we argue that the availability of an amount of free cash flow may also bring benefits to corporations in markets with high information asymmetry. These benefits may reduce or even nullify the negative effects of free cash flow on corporate profitability as predicted by the agency theory of free cash flow.

In order to test our argument, we use data of listed firms on the Hochiminh Stock Exchange in Vietnam, which was established in 2000. With a relatively short history, small in size, dominated by small individual investors, and is located in a developing country, the Vietnamese financial market can be assumed to have a higher level of information asymmetry than those of developed markets. This claim has partly been confirmed by studies on the information efficiency of Vietnamese stock markets, such as by Vo and Phan (2017). Thus, we propose the hypothesis that there is a positive relationship between the amount of free cash flow and corporate profitability in the context of Vietnam.

3. Data and variable descriptions

The firm-level data used in this paper consist of financial reports information of 208 listed companies on the Hochiminh Stock Exchange with full required data between the years 2012 and 2016. The final sample consists of 1040 firm-year observations. To facilitate comparison of results with other studies, like those of Vo and Doan (2014), we exclude financial firms from our dataset. To measure free cash flow of one-year lag, we use the same operating definition as in Vo and Doan (2014):

$$FCF = \frac{\text{EBIT x (1 - Tax) + Depreciation – Change in working capital – Cost of capital}}{\text{Net sales}} \quad (1)$$

To measure corporate performance, we use the return on assets (ROA), measured as the ratio of net income to total assets, as a proxy for corporate profitability. This is in line with Vo and Doan (2014) and Zeitun and Tian (2014); thus, facilitating the comparison of results.

We also include several control variables known to affect firm profitability in the model to be estimated. In particular, we control for sales growth (as the ratio of current year sales and

previous year sales), debt over assets ratio, company size (natural logarithm of total assets), tangible assets (total tangible assets over total assets) and the ratio of operation expenses over net sales. Details of variables used in this research are presented in Table I. After removing 5 percent of the largest and smallest value for ROA and FCF to account for possible outliers, the summary statistics of the remaining 834 firm-year observations are presented in Table II.

Table I. Variable descriptions

Variable	Measurement		Notation
	Previous studies	Formula	
Free cash flow	Jensen (1986), Brush et al. (2000), Freund et al. (2003), Vo and Doan (2014)	(EBIT x (1 - Tax) + Depreciation – Change in working capital – Capital expenses)/(Net sales)	FCF
Sales growth	Brush et al. (2000), Vo and Doan (2014)	Current year net sales/Previous year net sales	GROWTH
Debt ratio	Brush et al. (2000), Vo and Doan (2014)	Total debts/Total assets	DA
Company size	Zeitun and Tian (2007), Vo and Doan (2014)	Ln(Total assets)	SIZE
Tangible assets	Freund et al. (2003), Zeitun and Tian (2007)	Tangible assets/Total assets	TANG
Operating expense ratio	Vo and Doan (2014)	(Sales expenses + Administrative expenses)/Net sales	OPER

Table II. Summary statistics of variables

Variable name	No. of observations	Mean	Minimum	Maximum	Standard deviation
ROA	834	6.64	-2.30	20.86	4.93
FCF	834	0.5	-10.93	6.92	2.42
GROWTH	834	1.14	-8.82	27.60	1.56
DA	834	0.44	0.00	0.97	0.24
SIZE	834	27.86	25.10	32.82	1.20
TANG	834	0.26	0.00	1.15	0.23
OPER	834	5.96	-269.30	2587.40	90.60

Note: Firms' profitability is measured by return on assets (ROA); FCF is free cash flow; GROWTH is sales growth; DA is debt over assets ratio; SIZE is natural logarithm of assets; TANG is tangible asset over total assets ratio; and OPER is operating expenses over net sales ratio.

Table III presents the correlation coefficients among the variables. In general, we can see no significant correlation between free cash flow and return on assets. However, this result must be checked with multivariable analysis. Besides, we see that there are a few pairs of variables that have significant correlations; However, these correlation coefficients are low, which indicates that multicollinearity is not a problem in multivariable analysis. This is confirmed

by the variance inflation factors (VIFs) calculated to officially detect multicollinearity among independent variables in our models. We found that the values of VIFs are all smaller than two (unreported), suggesting that multicollinearity is unlikely a problem in our empirical models.

Table III. Correlation coefficient matrix

	ROA	FCF	GROWTH	DA	SIZE	TANG	OPER
ROA	1.0000						
FCF	0.0074	1.0000					
GROWTH	0.0755*	-0.4229*	1.0000				
DA	-0.3045*	0.0129	-0.0421	1.0000			
SIZE	0.0519	-0.0339	0.0403	0.2202*	1.0000		
TANG	0.0411	0.0128	0.0214	-0.0276	0.0012	1.0000	
OPER	-0.0300	-0.0024	0.0027	0.0339	-0.0153	-0.0136	1.0000

Note: Firms' profitability is measured by return on assets (ROA); FCF is free cash flow; GROWTH is sales growth; DA is debt over assets ratio; SIZE is natural logarithm of assets; TANG is tangible asset over total assets ratio; and OPER is operating expenses over net sales ratio. * indicates 5% level of significance.

4. Model specification

To test our hypothesis, we regress the corporate profitability measures, which is the return on asset (ROA), against the amount of free cash flow of one-year lag (FCF). Additional variables are also added to the model to control for other potential influences on the performance of the firm. Specifically, these variables are GROWTH (ratio of current year sales and previous year sales), DA (debt over assets ratio), SIZE (natural logarithm of sales), TANG (total tangible assets over total assets) and OPER (the ratio of operation expenses over net sales). Therefore, we estimate the model:

$$\mathrm{ROA}_{it} = \beta_0 + \beta_1 \mathrm{FCF} + \beta_2 \mathrm{GROWTH} + \beta_3 \mathrm{DA} + \beta_4 \mathrm{SIZE} + \beta_5 \mathrm{TANG} + \beta_6 \mathrm{OPER} + u_i + \varepsilon_{it} \quad (2)$$

To estimate the coefficients of equation (2), we use panel data regression methods, including pooled model, fixed-effects model, and random-effects model estimation techniques. Hausman (1978) test is used to choose the suitable model for further analysis. Then, the Perasan's test is performed to test the cross-sectional dependency among the observations. To provide a crosscheck on the results, we also regress equation (2) over years and sales growth, using ordinary least square method, corrected for heteroskedasticity and clustered errors.

5. Results and discussions

Table IV presents the regression results for equation (2). The regression results are presented for pooled data model in column (1), fixed-effects model in column (2), and random-effects model in column (3). The Hausman's (1978) test is performed to choose the most suitable model. Perasan's test for cross-sectional independence is also carried out to test for clustering effect among the observations. The test result indicates that the observations are clustered. Thus, we use estimation techniques that correct for both heteroskedasticity and clustering effect.

The Hausman's test rejects the null hypothesis that there are systematic differences between the estimates of the random-effects model and the fixed-effects model. The result of the Hausman's test means that, in this case, the fixed-effects model produces consistent and more efficient estimates compared to the random-effects model, while the pooled data model produces inconsistent estimates and should not be used for drawing inferences.

Results of the fixed-effects model, presented in column (2) of Table IV, show that there is no relationship between free cash flow and firms' profitability. These results are contrary to the negative relationship found by previous studies mentioned in the literature review section, such as Vo and Doan (2014) or Zeitun and Tian (2014), and consistent with our predictions basing on the pecking order theory of Myers and Majluf (1984).

Table IV. Regression results

Coefficient estimate	Pooled (1)	FEM (2)	REM (3)
Constant	3.432227	35.92009**	13.60693**
FCF	0.3041111***	0.0127098	0.0678468
GROWTH	0.504299***	0.5481288***	0.5256348***
DA	-6.816568***	-2.286078***	-3.65994***
SIZE	0.1908	-1.033646*	-0.2332466
TANG	1.357979***	-0.2991434	1.057767
OPER	-0.002942	-0.0005425***	-0.0009429***
F-value	15.71	16.57	83.17
p-value	0	0	0
N	834	834	834

Notes: The table reports results from estimating the following regression model from the year 2012 to 2016, with 834 observations:

$$\mathrm{ROA}_{it} = \beta_0 + \beta_1 \mathrm{FCF} + \beta_2 \mathrm{GROWTH} + \beta_3 \mathrm{DA} + \beta_4 \mathrm{SIZE} + \beta_5 \mathrm{TANG} + \beta_6 \mathrm{OPER} + u_i + e\varepsilon_{it}$$

Where profitability is measured by return on assets (ROA); FCF is free cash flow; GROWTH is sales growth; DA is debt over assets ratio; SIZE is natural logarithm of assets; TANG is tangible asset over total assets ratio; and OPER is operating expenses over net sales ratio. *, **, *** denotes the level of significance of 10%, 5%, and 1%, respectively. The Hausman's test indicates the fixed-effects model is preferred. The Pesaran's test of cross-sectional independence indicates there is cross-sectional dependence among observations. The models are estimated using panel data analysis techniques that are robust to heteroskedasticity and cross-sectional dependency.

Furthermore, the regression results by year in Table V also contrast to those of previous studies. The results show that the relationship between free cash flow and Vietnamese firms' profitability are actually positive and statistically significant for the year 2012, 2015, and 2016, and insignificant for the year 2013 and 2014. These results can happen when the benefits of free cash flow actually outweigh the agency costs of free cash flow, as predicted by the pecking order theory of Myers and Majluf (1984).

To further test the hypothesis that the positive benefits of Vietnamese firms' free cash flow are the results of high information asymmetry, we should prove that firms with higher level of information asymmetry would reap more benefits from free cash flow than firms with a lower level of information asymmetry. To confirm this claim, we divide the data set into two subsamples with regard to corporate sales growth rate. Firstly, we split the dataset into two sub-samples, the high growth firms, and the low growth firms, at the 50^{th} percentile with regard to sales growth. Then, we re-perform the regression analysis in Table V. As documented by previous research on information asymmetry and firms' characteristics, such as Fosu, Danso, Ahmad, and Coffie (2016), firms with high growth rate normally face a higher level of information asymmetry compared to low growth counterparts. In line with previous literature, we posit that if information asymmetry is, in fact, the cause of the positive benefits of free cash flow observed in Vietnamese listed firms, it should follow that high growth firms, i.e. firms with higher level of information asymmetry, would benefit more from the flexibility provided by free cash flow.

The regression results for the low and high growth firms are presented in Table VI. The results show that the relationship between free cash flow and profitability for high growth firms are positive and statistically significant at 10 percent or above in four out of five years studied, compared to just one year for low growth firms.

The results from Table V and Table VI in some ways have confirmed our hypothesis that in the condition of high information asymmetry, the benefits of having a large amount of free cash flow by means of greater flexibility for managers and lower financing costs have compensated for the disadvantages caused by managers-shareholders interest conflict.

Table V. Regression results by year

Year	2012	2013	2014	2015	2016
Constant	-6.348246**	-1.000292	.6477858	3.852787	7.625937
FCF	.3406297***	-.0300702	.1286909	.4576197***	.3909531***
GROWTH	.8145493***	.5610044	.2485472	.7290016*	.3560093**
DA	-12.54652	-11.5872***	-10.7064***	-8.300284***	-.8231004
SIZE	.6525869	.4385179	.3929113	.2071013	-.0423072
TANG	-.1685854	1.106297	.7565467	3.245114**	1.997901
OPER	-.0019411***	.0069624	-.0513914**	-.1653462**	-.0704863**
F-value	20.71	5.64	11.6	12.84	4.76
p-value	0	0	0	0	0
N	162	161	170	168	173

Notes: The table reports results from estimating the following regression model from the year 2012 to 2016, with 834 observations:

$$\mathrm{ROA}_{it} = \beta_0 + \beta_1 \mathrm{FCF} + \beta_2 \mathrm{GROWTH} + \beta_3 \mathrm{DA} + \beta_4 \mathrm{SIZE} + \beta_5 \mathrm{TANG} + \beta_6 \mathrm{OPER} + \varepsilon e_{it}$$

Where profitability is measured by return on assets (ROA); FCF is free cash flow; GROWTH is sales growth; DA is debt over assets ratio; SIZE is natural logarithm of assets; TANG is tangible asset over total assets ratio, and OPER is operating expenses over net sales ratio. *, **, *** denotes the level of significance of 10%, 5%, and 1%, respectively. The models are estimated using linear regression techniques which are robust to heteroskedasticity and cross-sectional dependency.

Table VI. Regression results by growth

Year	2012		2013		2014		2015		2016	
	Low growth	**High growth**	**Low growth**	**High growth**	**Low growth**	**High growth**	**Low growth**	**High growth**	**Low growth**	**High growth**
Constant	-.9504	-12.4990	-5.1225	2.5167	-2.4184	7.0247	8.36161	3.2693	14.49698	7.0424
FCF	.0765	.4764**	-.3299*	.6468***	-.0818	.2414	.4480***	.4543***	.2353	.4198*
GROWTH	.7024	.3028	.7058	-.5175*	4.1560***	-.5397	2.0970***	-.5735**	2.1258**	.0878
DA	-11.413***	-11.676***	-11.461***	-10.339***	-11.324***	-6.798***	-6.558***	-10.575***	-.8112	-1.0153
SIZE	.4025	.9273	.5212	.4307	.3866	.2021	-.0532	.4060	-.3611	.0405
TANG	-.9016	.8924	3.1472	-1.1787	1.1537	-.1809	4.0089**	1.7953	2.2817	1.9841
OPER	-.0012***	-.0978	.0089	-.1841**	-.01589*	-.2540**	-.1719***	-.4126	-.0463**	-.1884***
F-value	6.39	5.25	3.95	9.66	16.51	4.42	10.71	8.64	4.56	9.11
p-value	0	0	0	0	0	0	0	0	0	0
N	81	81	80	81	85	85	84	84	86	87

Notes: The table reports results from estimating the following regression model from the year 2012 to 2016 for low and high growth companies group, which comprises of companies in the lowest and highest 50^{th} percentile with regard to growth:

$$ROA_{it} = \beta_0 + \beta_1 FCF + \beta_2 GROWTH + \beta_3 DA + \beta_4 SIZE + \beta_5 TANG + \beta_6 OPER + e\varepsilon_{it}$$

Where profitability is measured by return on assets (ROA); FCF is free cash flow; GROWTH is sales growth; DA is debt over assets ratio; SIZE is natural logarithm of assets; TANG is tangible asset over total assets ratio, and OPER is operating expenses over net sales ratio. *, **, *** denotes the level of significance of 10%, 5%, and 1%, respectively. The models are estimated using linear regression techniques which are robust to heteroskedasticity.

6. Conclusions

The regression results, based on 834 firm-year observations of 208 Vietnamese listed companies, has shown that there is a positive relationship between free cash flow and firms' financial performance. This result is contrary to the predictions by the agency theory flow by Jensen (1986) and also inconsistent with the empirical evidence by previous studies on firms in developed markets. The reasons for the positive relationship between free cash flow and corporate profitability may be that, under severe information asymmetry, free cash flow would also benefit firms, by providing the flexibility to managers and acting as a cheaper source of funds compared to other external sources of funds. Thus, in the case of high information asymmetry, like in Vietnamese financial markets, these benefits can reduce, nullify, or even out weight the agency cost of free cash flow predicted by Jensen (1986).

The main contribution of this research is that it modifies the theory about the relationship between free cash flow and firms' profitability to take into account the benefits of free cash flow to firms. Basing on the pecking order theory of Myers and Majluf (1984), this paper also points out that these benefits can reduce, nullify, or even out weight the agency costs of free cash flow in markets with a high level of information asymmetry. Thus, we predict that in general, the relationship between free cash flow and firms' profitability is also determined by the level of information asymmetry of the markets or firms considered. Empirical evidence from Vietnamese market, which suffers from high information asymmetry, confirms our hypothesis.

Although this study makes contributions toward a better understanding about the relationship between free cash flow and firms' profitability, it unavoidably has limitations. Firstly, the paper uses only return on assets as a measure of firms' profitability. Future research can retest the hypothesis with different measures of firms' profitability. Secondly, the model we use in this paper is by no mean the best one. Future research can also make use of different models, with more control variables, to retest the hypothesis. Finally, our paper only tests the hypothesis with Vietnamese firms' data. To better prove that information asymmetry can nullify the agency costs of free cash flow, future research can re-perform the test with a larger data set, containing different countries at the different level of development.

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