Impact of Free Cash Flow on Profitability of the Firms in Automobile Sector of Germany

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Abstract

The discourse objective of the study is to investigate the effect of free cash flow on the profitability of firms listed in automotive sector of Germany. The study adopted a descriptive survey that aimed at analyzing the effect. Furthermore, the population of the study consisted of dominant and large firms, for simple random sampling method was used and all the firms within the automotive industry had equal chance of being studied, but only 5 firms were comparatively identified for the purpose of study from the population available and notably the secondary data used for the study were extracted from the audited annual reports and financial statements of the firms listed under the automotive industry of Germany for the period of ten years (2007-2016). Consequently, the regression results indicated that there was a positive relationship between the free cash flows and profitability of listed firms. However, Leverage has an inverse insignificant impact on profitability (ROA) and evidence for this comes from testing the proxies (Leverage, Current asset, Firm size, Capital liquidity, Sales growth, FCF). The findings further denoted R-squared= 0.766504 which substantiates the regression model used for the study is a good predictor, and it explained 76.65% of the variation in profitability (ROA) of the firms.

Keywords: Free cash flow, Return on Asset (ROA), Profitability, Leverage

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1. Introduction:

Companies having higher free cash flow are more likely to attract investors that look for efficient opportunities to invest their additional resources in the market. Given that free cash flows' theories were introduced in 1986 for the first time by Jensen and it gradually evolved as one of the new topics in the financial literature describing behavior of companies. In general Investors must also have an eye on companies since they can influence their free cash flow by extending the time they take to pay the bills and keeping their cash and shortening the time it takes to collect what's owed to them by outsiders, similarly delaying to buy inventory. In effect keeping an optimum level of liquidity within the firms is accordingly important for operations of firms.

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Hence, a large percentage of firms' assets in the form of cash and cash equivalents are to be held by managers in order to reinvest on other physical assets, make payments to stockholders and to keep cash inside the firm (Hann, 2013).

Furthermore, free cash flow is basically used as a measurement tool to determine how much cash a business generates after doing its accounting for the essential capital expenditures such as buildings or equipment and equally this cash can be used for expansion, dividends, reducing debt or other purposes in either cases. Coupled with, it shows the amount of cash the company allocates after spending for maintenance or development and is available for capital provider used for reinvestment purpose after fulfilling the major requirements of the business, such cash flow which is extra or free, is known as free cash flow. On the other hand investors in particular should take care of the fact that companies can highly influence their free cash flow by extending the time within which they take to pay the bills and keeping their cash and shortening the time it takes them to collect what's owed to them. (Christine, 2014).

Thereupon it is important to realize that one of the most frequently used tools of financial ratios analysis is known as profitability ratios that enumerate markedly to determine the company's final outcome, result and return to its investors. Thus profitability measures are important to managers, owners and investors of the firms since they signify the overall efficiency and performance. (Akumu, 2014) Profitability ratios can be divided into five types notably, Gross Margin Ratio, Profit Margin, Return on Assets, Return on Capital Employed, and Return on Equity.

1.1: Problem Statement:

An inexplicit relationship exists between profitability and free cash flow of the companies. Most of the time investors find profitability of the company far more important indicator for the financial strength while ignoring its cash flow situation (Thangjam R, 2015). For the reason, this study attempts to understand and clarify the relationship and effect between profitability and free cash flows of the firms listed in automotive sector of Germany.

1.2: Research Objective and Questions:

The objective of the study is to determine the relationship between profitability and free cash available to firms and interpret the data. In this case to fulfill the study objectives following research questions were investigated,

- Whether fluctuation in free cash flow has impact on profitability?

- If yes, what type of impact accurately exists?

1.3: Research Hypothesis

Since the aim of the research is to evaluate effect of free cash flow on profitability of the firms, therefore research hypotheses are stated as follows:

H1.0: There is no significant relationship previously between Gross profit and Free cash flow.

H1.1: There is a significant relationship previously between Gross profit and Free cash flow.

H2.0: There is no significant relationship previously between Net profit margin and Free cash flow.

H2.1: There is a significant relationship previously between Net profit margin and Free cash flow.

H3.0: There is no significant relationship previously between Return on asset and Free cash flow.

H3.1: There is a significant relationship previously between Return on asset and Free cash flow.

H4.0: There is no significant relationship previously between Return on capital employed and Free cash flow.

H4.1: There is a significant relationship previously between Return on capital employed and Free cash flow.

H5.0: There is no significant relationship previously between Return on equity and Free cash flow.

H5.1: There is a significant relationship previously between Return on equity and Free cash flow.

2. Review of Literature:

Free cash flow is the net cash that a firm earns after deducting developmental costs and then it is added in R&D expenditures and finally investment expenditures are to be deducted from that. More-over, over investment is one of alternate uses of free cash flow and with the information obtained we are able to allocate in six respective categories and this simply can be considered as re-characterization of the statement of cash flow, where the cash generated by the firm must be equal to the cash used. The six categories are:1- over-investment, INEW e , 2- net payments to shareholders, ΔEquity, 3- net principal payments to debt-holders, ΔDebt,4- net change in financial assets, ΔFinancial Asset,5-Other Investments and 6-miscellaneous cash flows, Other. (Richardson, 2005).

Furthermore with all things considered on the cash flow's statement operating cash flows indicate the ability of the firm to generate more future cash flows and as per the suggestion of financial analysts for the two uses of cash flows generated from operating activities is firstly that the funds generated from operating activities should be used to purchase new fixed assets so that the firms should be able to maintain the same level of operating activities and earnings in the future, secondly it can be used to be given away as dividend or repurchase stock. And the formula to calculate free cash flow is:

FCF=EBIT (1-corporate tax) + Depreciation ± Change in working capital – Capital expenditure

(Sadaf Ambreen, 2016) demonstrated further, in the theory of the free cash flow Hypothesis for the Sales Growth and Firm performance determined the relationship between free cash flows and sales growth of the companies' performance, it mentioned in particular that the companies with more free

cash flows makes the management to have better adjustment and setting the negative effects of free cash flows on companies performance off. This altogether provides higher sales growth thus it shows that there is a positive relationship between free cash flow and sales growth contributing to profitability of the firm (Thomas, 2000) . On the other hand, firms with higher cash flows of what is required are more likely to face conflict of interest between shareholders and managers.

Additionally, free cash flow is considered to be cash in excess of what is required to fund all of the firms' projects having positive net present values whereas such cash flow is supposed to be paid to the shareholders if the firm wishes to remain efficient for a longer time. On the contrary this type of payment can minimize the resources under the control of the managers. (Jensen M. , 1999). Free cash flow measures excess operating cash a company has on its hand after paying its capital expenditures and dividends. Free cash flow allows a company to avail opportunities which enhances the shareholder value, for instance increasing dividends, developing new products, paying off liabilities, buying back stock, and growing free cash flow in general may bring sustainability. However, declining free cash flow may create trouble ahead for the companies with insufficient cash flows trying to fund their business operations as well as growth. Furthermore for a company to have growth it must keep enough of cash to be able to reinvest, therefore Free cash flow is tend to be a measure of a company's growth, even it is possible that profitable companies can go under if they don't have enough cash to pay the bills and adversely a company generating cash more than required doesn't necessarily guarantee that the company will use it to the benefit of shareholders, but somehow enhancing free cash flows is a good predictor for reinvesting in the business and turning that excess cash into returns and growth (Scatizzi, 2009). Besides, in the free cash flow theory, managers don't show a behavior consistent with profit maximization and instead they use increased free cash flow to pursue personal objectives. It also holds the truth that investments reduce free cash flow available to pursue their personal opportunities. (Jensen M. C., 1996)

Dynamic Theory: The dynamic theory of profit was suggested by Prof. J. B Clark in the year 1990. As per his words "Profit is the difference between the price and the cost of the production of the commodity". But the profit comes as a result of dynamic changes. Under a dynamic situation six changes are expected, and every one of them reacts accordingly. They are; 1- Changes or increase in population, 2- Changes in tastes and preferences, 3- Multiplication of wants, 4- Capital formation, 5- Technological advancement, and 6- Changes in the form of business organization (Economics discussion, 1990) .

Risk Theory: F. B. Hawley's theory of profit considered the risk-taking important for an entrepreneur, where he exposes his business to risk and gets a reward in form of profit. And as it is clear that no entrepreneur will take risks if he gets only the normal reward, therefore it is said that the reward must be higher than the actual value of the risk (Carver, 1901).

Other Empirical Studies: A study conducted on effect of free cash flow on the profitability of the firms in Nairobi Stock Exchange, in which a stratified sampling method was used to pick a sample of 30 companies listed at Nairobi Stock Exchange as at June 2014. And the study concluded that there existed an inverse relationship between free cash flow and profitability of listed firms in the Nairobi Securities Exchange (Akumu, Effect of free cash flow on profitability of firms listed on the Nairobi se-

curities exchange, 2014). In another study carried out in India for determining the relationship between profitability and cash flow of the companies, in which four companies were selected with period of covering five years that is from April 2008 to March 2014. The results drawn from the study indicated that there is a positive correlation between free cash flow of the firms and its profitability, however the degree of relationship between these two variables (free cash flow and profitability) differs as the company changes, however 4 companies chosen for the study, which meant that a company with positive profits tends to attract shareholders and this will ensure that employees are getting their salaries on time, investors are paid dividends on time and the business is able to meet its debt obligation. The study's emphasize was on the importance of free cash flow to the profitability of the firms and the lack of free cash is not enough for the organization to survive (Thangjam R, 2015). Likewise, a study conducted on the relationship between cash flow and capital expenditure in automotive industry of Germany where six companies listed in automotive industry were selected and it concluded that cash flow and capital expenditure have a negative relationship (Saffarizadeh, 2014).

Similarly, in a study conducted regarding the impact of free cash flow on profitability of firms listed in Karachi Stock Exchange in which a stratified sampling method was used to select a study sample of 30 companies listed under Karachi Stock Exchange and four variables were included in this study, there were three independent variables: Free cash flows, capital liquidity, size of the firm and profitability was considered as dependent variable namely. To sum up it concluded, free cash flow as one of the most important financial measures since it well predicts whether a firm is financially healthy or not, is it capable of availing new opportunities and shareholders will also get a clear picture. In addition, the profitability of a firm is highly affected by the degree of competition around the firm, its product demand, state of economy, bargaining power of suppliers and buyers, political stability and substitute products. And the conducted research adopted descriptive survey that finally as a result it summarized a significant positive correlation between profitability of the firms listed under Karachi Stock Exchange and their free cash flows. The higher the level of the free cash flows the higher will be the profitability, which can lead us to think that in order for any firm to achieve profitability they need to depend on its free cash flows. That's how the importance of free cash flow for any firm becomes explicit. Looking at the real life situation it could also be said that if a firm is lacking behind in any of these two then it will be unable to survive the competition and soon possibly collapse therefore it should make sure that keeping an optimum balances for each of these accounts are vital (Sadaf Ambreen, 2016) .

In another study which explains the relationship between cash flow and growth of the firms by suggesting, that firms grow to achieve their objectives, such as increasing market share, maximizing profit, cash flow, and increasing sales. Certainly the firm growth is closely related to the firm survival and a firm with consistent growth is going to have higher profits and sustainability in the market (Akumu, Effect of free cash flow on profitability of firms listed on the Nairobi securities exchange, 2014). Likewise, A study conducted on a sample of 55 US firms using stratified sampling, from (1980-1986) and a regression analysis was used for data analysis and the results showed that there was a negative relationship between bidder returns and cash flow. (Lang P, 1991). In another study investigated on the effects of various factors on dividend payout ratio of Tehran Stock Exchange listed companies. In which a sample of 102 companies over a time span of 2005-2010 were selected. The result showed that

independent variables of free cash flow and profitability current ratio have negative impact on dividend payout ratio. (Parsian, 2013). Ultimately, As per the study which analyzed the impact of cash flow on profitability among commercial banks in Kenya over a time span of 2005-2009 which was specifically conducted to explain the impact that the components of cash flows have on profitability growth of the firm. A multiple regression models were used to analyze the data in the study and draw a conclusion. As a result of which the cash flow from the financing and the investing activities were found to have positive impact on the banks profit while operating cash flow has a negative effect (Mong'o, 2010) .

3. Research Methodology:

This study has adopted a descriptive survey that aimed at analyzing the effect of free cash flow on the profitability of firms listed under the automotive industry of Germany.

The amount of free cash flows available per year was used, and it was measured using: FCF= Profit after tax + Depreciation ± Change in working capital – Capital expenditure.

- In which profit after tax was calculated from the Income statement.

- Changes in capital expenditure were calculated from Cash flow statements and Balance sheets.

- Depreciation and Amortization was calculated from prior and current Balance sheets: current assets and current liabilities accounts.

- Changes in working capital were calculated from the Balance sheets and Cash flow statements.

And proxies for the control variables are as follow:

$$PY = b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + e$$

Y= Profitability is measured using Return on Asset (ROA) where it is calculated using Net income divided by Total Assets.

X1= Represents the size of the firm, in which Return on Assets and Net Profit margin have been used whereas Total Assets and Total Sales have been utilized as indicators of firm size.

X2= Represents Investment, and in order to find out its effect on free cash flow one can compare investment figures and free cash flows taken from the financial statements of the listed firms.

X3= Represents Leverage, which can be measured easily using different financial ratios, Total debt to Total equity or Total debt to Total assets, in which Total debt to Total equity is calculated using Total debt divided by shareholder's equity and Total debt to total assets is calculated using Total Debt divided by Total Assets.

X4= Represents Sales growth, which can be calculated by subtracting the prior period from the current one and then dividing this difference by prior periods net sales.

X5= Represents Current assets, to every increase or decrease in current assets of the listed firms where one can compare the differences between prior periods and current.

X6= Represents Capital liquidity, which can be measured using liquid assets divided by the total assets held by listed firms.

B= Measuring the amount of change in Y because of a unit change in X.

E= Error term within a confidence interval of 5%.

3.1: Theoretical Framework

The following framework tends to indicate the association of how profitability (dependent variable) is affected by free cash flow (Independent variable) and control variables the existence of which has certain impact over dependent variable and cannot be ignored.

3.2: Data collection and sampling method

The secondary data used for the study were extracted from the audited annual reports and financial statements of the firms listed under the automotive industry of Germany. The population of the study consisted of dominant and large companies. A simple random sampling method was used, which is considered to be a special case and each population element has a known and equal chance of selection (Sekaran, 2003), but only 5 firms were identified for the purpose of study from the population available. Moreover the study at the hand covered a period of ten years from 2007 to 2016.

4. Data Analysis:

Table 1: *Variance Inflating Factor Test*

Variable	VIF	1/VIF	Sig. Value
Leverage	2.364	0.154056	0.000
Current Assets	1.425	943256	0.13034
Firm Size	1.962	5	0.34485
Capital Liq	1.821	9	0.25789
Sales Growth	1.490	8	0.475677
FCF	1.442	8	0.000

Source: Data output from SPSS

Interpretation

If the VIF value is less than 10 and 1/VIF value greater than 0.10 then there is no problem of Multicollinearity present. From the findings in the table 1 above, the results revealed that the VIF value for Leverage, Current assets, Firm size, Capital liquidity, Sales growth, and FCF are 2.364, 1.425, 1.962, 1.821, 1.490, 1.442 respectively and it also indicates that the values for 1/VIF are greater than 0.10. And as per the criteria it can be concluded that there is no Multicollinearity present.

Table 2: *Heteroscedasticity Test*

Breusch-Pagan / Cook-Weisberg test for Heteroscedasticity
Ho : Constant Variance
Variables : fitted values of ROA
Chi2 (6) = 6.03036e-07
Prob > chi2 = 0.183036

Source: Data output from SPSS

Interpretation

The criteria in detection of Heteroscedasticity is, if the probability or p-value is greater than 0.05 then the null hypothesis will be accepted meaning that error variances are all equal, or if lesser then alternate hypothesis will be accepted meaning that the error variances are not equal. And as illustrated in the table 2 above the value of p is 0.183036 which is more than 0.05 therefore we accept null hypothesis and there is no Heteroscedasticity, as null hypothesis represents that the data is homoscedastic.

Model Selection Test

Table 3: Model Selection

Diagnostics	Null Hypothesis	P Value	Recommended Model
Chow Test	Pooled is better than fixed effects	0.00114272	Fixed Effect Model
Breusch-Pagan	Pooled is better than Random effects	0.528886	Pooled Model
Hausman Test	Random is better than Fixed effects	0.0352	Fixed Effect Model

Source: Data output from SPSS

Interpretation

A model selection test is used for the purpose of selecting the appropriate regression estimator, and for the purpose each of these tests: Chow test, Breusch-Pagan, and Hausman test illustrated in table 3 have been used. And in essence, it can be concluded that the fixed effect model is considered appropriate to be applied on panel data.

Table 4: Model Regression

Model: Fixed-effects, using 43 observations Included 5 cross-sectional units Time-series length: minimum 3, maximum 10 Dependent variable: ROA			
Mean dependent var	4.485116	S.D dependent var	3.835471
Sum squared resid	144.2667	S.E. of regression	2.123284
R-squared	0.766504	Adjusted R-squared	0.693536
F(10, 32)	10.50473	P-value(F)	1.40e-07
Log-likelihood	-87.03932	Akaike criterion	196.0786
Schwarz criterion	215.4518	Hannan-Quinn	203.2229
rho	0.344610	Durbin-Watson	1.165337

Return on Asset	Coefficient	T-Value	P-Value
Constant	-0.57346	0.1043	0.91755
Leverage	-1.09229	2.9955	0.02694
Current Asset	0.715506	0.46371	0.56784
Firm size	0.131292	2.329834	0.01456
Capital Liquidity	-1.2526	3.265952	0.00062
Sales Growth	0.561012	2.47964	0.00895
FCF	0.219433	2.4575	0.03041

Source: Data output from SPSS

Test Result

- Test for differing group intercepts –

- Null hypothesis: The groups have a common intercept

- Test statistic: $F(4, 32) = 5.88893$

- With p-value = $P(F(4, 32) > 5.88893) = 0.00114272$

The values above provide information regarding coefficients, standard error of parameter estimates, t-value and p-value for each of the control variables which are obtained from regression analysis.

The coefficient for leverage is -1.09229 which means there is an inverse relationship between leverage and ROA or by one-unit increase in leverage, there will be 1.09229 units decrease in ROA. And as to identify the statistical reliability of the estimates of the parameter and if the value of t is greater than 2 then there is no significant relationship as the value of t is 2.9955 and the p-value 0.02694 is less than 0.05 therefore null hypothesis is rejected and there is a significant relationship.

Secondly, the coefficient value of 0.715506 indicates that there is positive relationship between current asset and ROA, which can be interpreted as, with every unit increase in current asset there will be 0.715506 units increase in ROA. The t-value is 0.46371 which means there is no significant relationship and p-value 0.56784 that is more than 0.05 means null hypothesis is accepted and there is no significant relationship.

Thirdly, the value 0.131292 coefficient of firm size indicates that it has a positive relationship with ROA. With every unit increase in firm size, there will be 0.131292 units increase in ROA. T-value is 2.329834 and p-value 0.01456 due to which null hypothesis is rejected and propose there is a significant relationship. Furthermore, the value -1.2526 coefficient of capital liquidity also indicates that it has an inverse relationship with ROA.

With every unit increase in capital liquidity, there will be 1.2526 units decrease in ROA. T-value is 3.265952 and p-value is 0.00062 due to which we reject null hypothesis and there is a significant relationship. Moreover, the value 0.561012 coefficient of sales growth shows that it has a positive relationship with ROA.

It can be interpreted as, with every unit increase in sales growth there will be 0.561012 units increase in ROA. T-value is 2.47964 and p-value is 0.00895 for which we reject null hypothesis and propose that there is a significant relationship. Further, the value 0.219433 coefficient of FCF shows that it has a positive relationship with ROA. T-value is 2.4575 and p-value is 0.03041 for null hypothesis is rejected and there is a significant relationship.

Estimations of the parameters:

ROA= ß – 1.09229 (Leverage) + 0.715506 (Current Assets) + 0.131292 (Firm Size) - 1.2526 (Capital Liquidity) + 0.561012 (Sales Growth) + 0.219433 (FCF) + e

5. Conclusions

The results revealed that there was a positive relationship between the free cash flows and profitability of listed firms (Mercedez Benz, BMW, Porsche, Audi, Volkswagen). Furthermore the findings also indicated that while testing the proxies (Leverage, Current asset, Firm size, Capital liquidity, Sales growth, FCF) that Leverage has an inverse insignificant impact on Profitability (ROA) of the listed firms. The findings further revealed that R-squared= 0.766504 meaning that the regression model used for this study is a good predictor, and it explained 76.65% of the variation in profitability (ROA) of listed firms. Whereas only 23.35% of variation in profitability is not explained. In addition, in model selection test for selecting the appropriate regression estimator, certain tests such as: Chow test, Breusch-Pagan test, and Hausman tests were used. And in essence, fixed effect model was considered appropriate to be applied on panel data.

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