THE EFFECT OF LEVERAGE AND ECONOMIC VALUE ADDED ON MARKET VALUE ADDED

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Abstract

Economic value added (EVA) is a performance measure developed by Stern Stewart & Co.) that attempts to measure the true economic profit produced by a company. Such a metric is useful for investors who wish to determine how well a company has produced value for its investors, and it can be compared against the company's peers for a quick analysis of how well the company is operating in its industry. Market value added (MVA), on the other hand, is simply the difference between the current total market value of a company and the capital contributed by investors (including both shareholders and bondholders). It is typically used for companies that are larger and publicly-traded. MVA is not a performance metric like EVA, but instead is a wealth metric, measuring the level of value a company has accumulated over time. In order to maximise the value for shareholders, companies should strive towards maximising MVA and not necessarily their total market value. It is believed, that the best way to do so is to maximize EVA, which reflects a company's ability to earn returns above the cost of capital. The leverage available to companies that incur fixed costs and use borrowed capital with a fixed interest charge has been known and quantified by financial managers for some time. In this research the effect of leverage and EVA on MVA as the measure of shareholder wealth creation was analysed. Leverage and EVA have been used as the independent variables whereas MVA has been used as the measure of shareholder wealth creation. Correlation and regression methods have been employed to find out in what way financial managers can practice the effects of leverage and EVA to maximize MVA. The results showed that EVA and leverage have no profound impact on MVA of the selected Slovak companies.

Keywords: *economic value added, total degree of leverage, market value added, degree of operating leverage, degree of financial leverage.*

1. Introduction

Shareholder value creation can be attained through maximizing the market value of investors' wealth. Determining value and value drivers is crucial to evaluate an investment regarding whether it is sound or not. In this paper the leverage effect on market value added (MVA) and the effect of conomic value added (EVA) on MVA is investigated. Total leverage can be derived by multiplying financial leverage by operating leverage. It would be possible to forecast what impact the leverage will have on MVA as soon as the total leverage is determined. The outcomes of this paper could be valuable not only to financial managers but also to the managers those who are at all levels in a business organization. Furthermore, potential and existing shareholders can get to know the worth of their investments made in the organization.

The objectives of this paper are:

- To identify the association between leverage, EVA and MVA;
- To discover the effects of leverage and EVA on MVA.

2. The theoretical concept of EVA, MVA and leverage

2.1. EVA and MVA

The concept of EVA was popularised and originally trade-marked by Stern Stewart and Company in the 1980s. According to Stewart EVA is an estimate of the economic profit generated by a company. It considers the costs of all forms of capital (debt, as well as equity) and compensates all its capital providers accordingly. EVA is determined by calculating the difference between the cost of a company's capital and the return earned on capital invested, and multiplying it with the amount of capital invested in the company.

$$EVA_t = (r - WACC) * IC_{t-1}$$

where:

r = the return on the capital invested

WACC = the company's after-tax cost of capital

IC_{t-1} = the invested capital at the beginning of period *t*

This mesure quantifies the surplus return earned by the company. In those cases where a company is able to earn a return that is higher than its cost of capital a positive value for EVA is calculated. A negative EVA value is calculated when the cost of capital exceeds the return on the invested capital.

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Alternatively, the measure can be calculated by comparing the net operating profit after tax with the total cost of capital invested.

$$EVA_t = NOPAT_t - Total\ cost\ of\ IC = = NOPAT_t - (WACC * IC_{t-1})$$

where:

$NOPAT_t$ = Net operating profit after taxes

If a company is able to earn NOPAT values in excess of its total cost of capital invested it generates a positive EVA figure. However, should NOPAT be insufficient to cover the company's total cost of capital, a negative value for EVA is calculated.

A company's total market value (MV) is equal to the sum of the market value of its equity and the market value of its debt. In theory, this amount is what can be taken out of the company when all shares are sold and debt is repaid at any given time. The MVA is the difference between the total market value of the company and the invested capital. The invested capital (IC) is the amount that is put into the company and is basically the fixed assets plus the net working capital.

$$MVA = MV\ of\ company - IC$$

From an investor's point of view, MVA is the best final measure of a company's performance. MVA is calculated at a given moment, but in order to assess performance over time, the difference or change in MVA from one date to the next can be determined to see whether value has been created or destroyed. EVA is an internal measure of performance that drives MVA.

The link between MVA and EVA is that theoretically, MVA is equal to the present value of all future EVA to be generated by the company.

$$MVA = present\ value\ of\ all\ future\ EVA$$

If the company is not operating at optimal levels of financial gearing, changing the proportion of debt relative to equity can lower the WACC, so that the capital structure is closer to optimal. This will also unlock value for the company as a whole, including the shareholders.

2.2. Operating leverage, financial leverage and total leverage

Operating leverage (OL) is a measurement of the degree to which a company incurs a combination of fixed and variable costs. The higher the degree of OL, the greater the potential danger from forecasting risk, where a relatively small error in forecasting sales can be magnified into large errors in cash flow projections.

Most of a company's costs are fixed costs that occur regardless of sales volume. As long as a business earns a substantial profit on each sale and sustains adequate sales volume, fixed costs are covered and profits are earned. Other company costs are variable costs incurred when sales occur. The business earns less profit on each sale but needs a lower sales volume for covering fixed costs. However, the business does not generate greater profits unless it increases its sales volume[1].

The percentage change in the earnings before interest and taxes (EBIT) relative to a given percentage change in sales is defined as operating leverage.

Degree of operating leverage (DOL) = % change in EBIT/% change in sales.

The equation can also be written as follows:

$$DOL = Contribution\ /\ EBIT$$

The answer is a factor equal to one (in the case of zero fixed costs) or greater than one[2].

Financial leverage (FL) is the degree to which a company uses fixed-income securities such as debt and preferred equity. The more debt financing a company uses, the higher its financial leverage. A high degree of financial leverage means high interest payments, which negatively affect the company's bottom-line earnings per share.

The percentage change in earnings per share (EPS) due to a given percentage change in EBIT is known as financial leverage. Degree of financial everage (DFL) = % change in EPS / % change in EBIT. The following equation can also be used to calculate DFL:

$$DFL = EBIT\ /\ PBT$$

where

PBT = Profit before tax

The answer is a factor equal to one (no interest) or greater than one[3].

The total leverage is the outcome of the multiplication of operating leverage and financial leverage[4].

$$Degree\ of\ total\ leverage\ (DTL) = DOL\ x\ DFL$$

or

$$DTL = \%\ change\ in\ EPS\ /\ \%\ change\ in\ sales$$

If a company has a high amount of operating leverage and financial leverage, a small change in sales will lead to a large variability in EPS.

3. Literature review regarding the link between leverage, EVA and MVA

Some studies have shown that, compared to other accounting measures, MVA has by far the best correlation with EVA (Stern 1993; Grant 1997). Further support for EVA has come from studies by Hall (1998), Gates (2000), Kramer and Peters (2001) and Hatfield (2002), while there has been some criticism,

[1] For example, a software business has greater fixed costs in developers' salaries, and lower variable costs with software sales. Therefore, the business has high operating leverage. In contrast, a computer consulting firm charges its clients hourly, resulting in variable consultant wages. Therefore, the business has low operating leverage.

[2] A DOL factor of 1.5 means that for every 10% change in sales, the operating profit will change by 15% (all other things being equal).

[3] A DFL factor of 1.5 means that for every 10% change in profit before tax, the EBIT will change by 15% (all other things being equal).

[4] A DTL factor of 1.5 x 1.5 = 2.25 indicates that the profit before tax will change by 22.5% for every 10% change in sales.

amongst others from Keef and Roush (2002) and Copeland (2002).

Irala (2005) also initiated a study on whether EVA possess a better explanatory power relative to the conventional accounting measures like earnings per share, return on net worth, capital productivity and labor productivity. The results supported that as compared to the other accounting measures, EVA has better explanatory power in predicting the market value.

Several other studies have been done by researchers by relating leverage and EVA with of MVA.

The concept of shareholder value creation was examined by Kaur and Narang (2009) by using EVA and MVA. For that study, 104 Indian companies have been used as sample and the findings reveal that EVA influences the market value of shares.

The correlation between EVA and MVA of 582 American companies was examined by Fernandez (2003) over 15 years from 1983 to 1997. The NOPAT had higher correlation with changes in MVA than the EVA for 296 companies in the sample whereas for 210 sample companies the correlation between EVA and MVA was found to be negative. In line with this, a study conducted on EVA-MVA relationship of 89 industrial companies in South Africa by De Wet (2005) found that EVA did not show the strongest association with MVA.

Pachari and Navindra (2012) conducted a study on the influence of financial leverage on shareholders' return and market capitalization of Automotive cluster companies in Pitahmpur. They found that there is no significant influence of financial leverage on shareholders' return and market capitalization.

Majumdar and Chhibber (1999) analysed Indian firms and found a significant negative relationship between the value of the firm and leverage. On the other hand, Abor (2007) collected data of Ghana listed firms and found that there is significant positive relationship between the leverage and the company´s market value. To the same conclusion came Odit and Gobardhun (2011) in a study of Mauritius firms. Adenugba et al., (2016) examine the relationship between financial leverage and firms' value, by using a sample of firms listed on Nigerian Stock Exchange (NSE) from 2007-2012. Data were sourced from annual reports of selected firms. The Ordinary Least Square (OLS) statistical technique was used for data analysis and hypothesis testing. The results indicate that there is significant relationship between financial leverage and firms' value and that financial leverage has significant effect on firms' value.

It is clear from this brief review of literature that researchers have given much emphasize to EVA in respect to shareholder value creation. By recognizing this necessity this study makes an attempt to investigate the relationship between EVA, leverage and MVA.

4. Research methods

Correlation analysis has been carried out to identify the cause-effect relationship between the predictor variables and dependent variable. Additionally, simple regression method has been used to find out the impact of leverage and EVA on MVA.

MVA has been used as the dependent variable whereas EVA, operating leverage (OL), financial leverage (FL) and total leverage (TL) have been used as independent variables.

Variables used in the analysis and their measurement are presented in table 1:

Variables	***Measurement***
Dependent variable	
MVA	market capitalization – shareholders' funds
Independent variables	
EVA	NOPAT – cost of capital employed
OL	gross income / EBIT
FL	EBIT / PBT
TL	financial leverage x operating leverage

In order to avoid multi collinearity and auto correlation issues, explanatory variables have been tested in four models rather than being tested in a single model. Based on the variables used in the study, the following regression models can be developed.

1. $MVA = \beta_0 + \beta_1 x_1 + \varepsilon$
2. $MVA = \beta_0 + \beta_1 x_2 + \varepsilon$
3. $MVA = \beta_0 + \beta_1 x_3 + \varepsilon$
4. $MVA = \beta_0 + \beta_1 x_4 + \varepsilon$

where: x_1 = EVA; x_2 = OL; x_3 = FL; x_4 = TL; β_0 = constant; ε = error term.

The key sources of data were financial statements consisting of balance sheets and income statements of 20 selected Slovak companies in a 5-year period from 2012 to 2016.

5. Results

In this section the results of the analysis are presented.

Table 2: Pearson correlation

	EVA	***OL***	***FL***	***TL***	***MVA***
EVA	1				
OL	-0,501	1			
FL	-0,398	0,879	1		
TL	-0,401	0,914	0,973	1	
MVA	-0,223	0,009	-0,219	-0,183	1

Table 2 demonstrates the existence of statistically insignificant relationship among the predictor variables (EVA, OL, FL and TL) and MVA, that means that that there is no significant relationship between EVA and MVA and leverage and MVA[5].

[5] The findings of the correlation analysis are in line with the findings of the study conducted by Fernandez (2003).

Table 3: Regression analysis – R^2

Model	***R^2***
$MVA = \beta_0 + \beta_{1*}EVA + \varepsilon$	0,102
$MVA = \beta_0 + \beta_1*OL + \varepsilon$	0,029
$MVA = \beta_0 + \beta_1*FL + \varepsilon$	0,119
$MVA = \beta_0 + \beta_1*TL + \varepsilon$	0,045

As we can see from the table 3 that 10,2%, 2,9%, 11,9% and 4,5% of the perceived variability in the models 1, 2, 3 and 4 were demonstrated by the variations in the explanatory variables (EVA, OL, FL and TL) used in the study. Remaining 89,8%, 97,1%, 88,1% and 95,5% of the variations in the models were associated with factors which were not included in the models. These R^2 values suggest that there might be factors which may have greater explanatory power in predicting MVA. EVA and leverage have no profound impact on MVA. Furthermore it is clear that operating leverage has the least impact on MVA in case of the selected sample of companies.

6. Conclusion

This paper examined the association between EVA, leverage and MVA in the selected Slovak companies in the time period from 2012 to 2016. Pearson correlation and simple regression methods have been employed in the analysis. There is no clear evidence from the analysis to support the claim that the shareholders stand to gain by looking at EVA. Furthermore R^2 values reveal that the predictor variables used in the analysis have no explanatory power in predicting the changes in MVA. It is an indication that other factors are perhaps found to be better prognosticators of MVA.

One of the major limitations of this analysis is that the it is based on 5 years data. Only 20 companies were selected as the sample for the analysis. Therefore one can extend the study by examining a wider range of companies. Moreover, findings reveal that other factors are probably found to be better predictors of MVA rather than the explanatory variables used in this analysis. Hence, there is a big opportunity for more research in this field.

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