ANALYSIS OF THE RELATIONSHIP BETWEEN ECONOMIC VALUE ADDED AND MARKET VALUE ADDED

Kristína Jančovičová BOGNÁROVÁ*

Abstract

Economic Value Added (EVA) is one of the most important modern performance measures. The main difference between EVA and traditional measures is that EVA incorporates both financing costs of debt and equity capital. In addition, EVA includes adjustments that minimize some accounting distortions. EVA and Market Value Added (MVA) provide a more accurate evaluation of the firm's financial performance. This paper involves a case study that analysis the use of EVA in selected Slovak companies. It examines the incremental information of a set of performance measures in the time period of 2010 - 2015, using regression models. Furthermore, we analyse the MVA performance and the relationship between EVA and MVA.

Keywords: *Economic Value Added, Market Value Added, financial performance, traditional measures, modern measures*

1. Introduction

Copeland *et al*. define Value Based Management (VBM) as the process of continuously maximising the value of a firm. According to them shareholder value creation is the main objective when applying VBM techniques. VBM is based on discounted cash flow (DCF) concepts. The value of the firm is determined by the present value of its future cash flows. Investing in projects where the return exceeds the cost of capital results in value creation, while investing in projects with returns below the cost of capital destroys value.

Developing performance measures that could be applied to evaluate financial performance and shareholder value creation is of great importance.

Traditional financial performance measures are often criticised for excluding a firm's cost of capital, and are therefore considered inappropriate to be used when evaluating value creation. Furthermore, these measures are based almost exclusively on information obtained from financial statements, and so are exposed to accounting distortions. Despite these limitations analysts and investors still widely apply the traditional measures. On the other hand, as a result of the perceived limitations of traditional measures, value based financial performance measures were developed. The major difference between the traditional and value based measures is that the value based measures include a firm's cost of capital in their calculation. They also attempt to remove some of the accounting distortions.

Proponents of the value based measures present these measures as a major improvement over the traditional financial performance measures and report high levels of correlation between the measures and share returns. In those cases where these measures yield positive values, economic profits are generated, and consequently shareholder value is expected to increase. Negative values indicate the destruction of shareholder value.

A number of different value based financial performance measures have been developed. These include, amongst others, Economic Value Added (EVA), Cash Value Added (CVA), and Cash Flow Return on Investment (CFROI) and other. While proponents of these measures report high correlations between the measures and the creation of shareholder value, a large number of studies have yielded far weaker relationships.

In the first part of the paper two value based measures are identified and discussed. The focus is placed on their theoretical foundations, calculation and interpretation. An overview of existing studies reporting on the relationship between these measures and shareholder value creation is also provided.

The second part of the paper involves the empirical analysis of the measures. It is devoted to the application of the O´Byrne model in order to identify, compare and evaluate the relationship between selected performance measures (earnings, earnings per share and economic value added) and market value added of a company. The analysis was carried out on a sample of selected Slovak companies.

2. EVA and MVA

According to Stewart EVA is an estimate of the economic profit generated by a firm. The difference between an economic and an accounting profit is a capital charge that is levied on the capital provided to the firm. In the case of an accounting profit only the cost of debt capital is included. EVA, however, considers the costs of all its forms of capital (debt, as well as equity)and compensates all its capital providers accordingly.

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* Ing. Mgr. Kristína Jančovičová Bognárová, PhD., Faculty of National Economy, University of Economics in Bratislava (email: **kristina.jancovicova.bognarova@gmail.com**).The paper is a result of the research work within the project VEGA No. V-13-007-00.

EVA is determined by calculating the difference between the cost of a firm's capital and the return earned on capital invested, and multiplying it with the amount of capital invested in the firm.

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

where:

r = the return on the capital invested

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

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

EVA quantifies the surplus return earned by the firm. In those cases where a firm 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.

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 firm 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 firm'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 (i.e. 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 economic capital. The economic capital, also called 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 return on IC minus the WACC is also called the "return spread". If the return spread is positive, it means that the company is generating surplus returns above its cost of capital, and this translates into higher 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.

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

3. Empirical Analysis and Conclusions

Before presenting our own research, the results of the most relevant previous studies are going to be presented.

The relevance of accounting information has already been tested in multiple studies; two studies for the German stock market are *Booth et al. and Harris et al.* In the USA the question of the valuation relevance of accounting based performance measures has established itself as a major field of research. In the last years EVA has been researched in depths, because EVA supposedly is an innovative approach with a broad following in the business community. Currently the general opinion on the pros and cons of EVA is not unanimous.

Easton, P. Harris, T. and Ohlson, J. observed that EVA is an increasingly popular corporate performance measure one that is often used by companies not only for evaluating performance, but also as a basis for determining incentive pay. Like other performance measures, EVA attempts to cope with the basic tension that exists between the need to come up with a performance measure that is highly corelated with shareholders wealth, but at the same time somewhat less subject to the random fluctuations in stock prices. This is a difficult tension to resolve and it explains the relatively low correlation of all accounting based performance measures with stock returns at least on a year to year basis.

Stewart (III), and Bennett, G. observed that "EVA is a powerful new management tool that has gained growing international acceptance as the standard of corporate governance. It serves as the centerpiece of a completely integrated frame-work of financial management and incentive compensation." In essence, EVA is a way both to legitimize and to institutionalize the running of a business in accordance with basic microeconomics and corporate finance principles. The experience of a long list of adopting companies throughout the world strongly supports the notion that an EVA system, by providing such an integrated decision making framework, can refocus energies and redirect resources to create sustainable value for companies customers, employees, shareholders and for management.

Thenmozhi, M. carried out a study in order to have an understanding of how the traditional performance measures are comparable to EVA, data of three financial years between 1996 and 1999 were chosen from 28 companies. Only 6 out of the 28 companies have positive EVA while the others have negative. The EVA as a percentage of Capital Employed (EVA/CE) has been found to indicate the true return on capital employed. Comparing EVA with other traditional performance measures the study indicates that all the companies depict a rosy picture in terms of EPS, RONA and ROCE for all the three years. The study shows that the traditional measures do not reflect the real value of shareholders and EVA has to be measured to have an idea about the shareholders value.

Ray, Russ observed that the missing link between EVA and improved financials is actually productivity. EVA can be a powerful tool. When properly applied, it allows a firm to ascertain where it's creating value and where it's not. More specifically it allows a firm to identify where the return on its capital is outstripping the cost of that capital. For those areas of the firm where the former is indeed greater than the latter EVA analysis then allows the firm to concentrate on the firm's productivity in order to maximize the value created of the firm. Finally, as investors buy more shares in the firm in order to have more claims on its increased value, they automatically bid up and eventually maximize the firms share price. And as any good capitalist knows, maximizing share price is the name of the game in a free market economy. Thereafter marginal increases in value added can be attained by either decreasing the firms cost of capital or by increasing its productivity.

Harris et al. investigate the relation between market values, stock returns and accounting measures for both Germany and the US. They come to the following results: Increasing the time from one year to three or more years increases the relevancy of earnings. EVA is superior in explaining both absolute market values and market value changes.

Biddle et al. investigate a sample of 773 US companies. They look at the information content of four accounting measures: Net Income, Operating Cash Flow, Residual Income and EVA for both the absolute levels of market values as well as the change of market values over time. Furthermore, they try to assess which part of the EVA calculations has a major impact on the value relevance. According to their results EVA has always a lower explanatory power than Net Income, EVA offers little additional information, as the biggest adjustment, the capital charge is comparatively stable over time.

Authors Bao, B.H., Bao, D.H., Riahi-Belkaoui, A., Fekrat, M.A., and Picur, R.D. are, based on their research findings, of the opinion that the superiority of EVA in relation to traditional financial performance measures is justified.

On the other hand, other studies bring evidence that EVA is not a better indicator of the financial performance of the company than the traditional measures based on accounting profit (eg. Biddle, G.C., Bowen, G.S., Wallace, J.S., Chen, S., Dodd, J.L.).

Concluding, the major result of all above studies is that it remains unclear which performance metric offers superior information, measured by its relevance for explaining stock returns.

The studies carried out by the above mentioned authors examined mostly the relationship of financial performance measures to share price respectively return on share. By contrast, in the next section of this paper, we focus on the MVA and apply the selected model approach to assess the linkage of selected performance measures to MVA.

In order to perform our study, data of 50 selected Slovak companies had to be selected from the following sources: published company accounts, capital market data, and data on ownership structure. The time horizon of this study includes the six years starting from 2010 and ending in 2015.

We applied the O´Byrne model in order to examine the relationship between selected performance measures on the one hand and market value resp. MVA of the sample of companies on the other hand. The selected performance measures were earnings, earnings per share and EVA.

O´Byrne differentiates between positive and negative values of EVA, includes a dummy variable for industries, and includes a correction factor for firm size (logarithm of capital employed). The reasoning is that the capital market values positive and negative results of performance measures differently by and that there are empirically significant firm size effects, which can lead to distortions.

$$MV_{i,t}/C_{i,(t-1)} = a_0 + a_1 * (X_{+i,t}/c_{i,t})/C_{i,(t-1)} +$$
$$+ a_2 * (X_{-i,t}/c_{i,t})/C_{i,(t-1)} +$$
$$+ a_3 * (ln(C_{i,(t-1)}) + a_j \sum (I_j) + e$$

with

$MV_{i,t}$ market value of company i in year t

$C_{i,(t-1)}$ capital employed by company i at the beginning of year t

$X_{i,t}$ performance measure per share in year t

$c_{i,(t-1)}$ cost of capital for company i in year t

I_j dummy variable for industry

The results are presented in table 1:

		Earnings	EPS	EVA
a_0	Intercept	1,08	0,71	1,90
		0,02	0,11	0,00
a_1	Performance measure +	18,71	20,44	17,87
		0,00	0,00	0,00
a_2	Performance measure –	-2,71	-3,88	-0,75
		0,05	0,00	0,50
a_3	ln (C)	0,00	0,00	0,00
		0,08	0,01	0,42
a_4	Automobile	-1,01	-1,00	-1,15
		0,00	0,00	0,00
a_5	Construction	-1,00	-1,04	-1,04
		0,00	0,00	0,00
a_6	Chemical and pharmaceutical	-1,18	-1,18	-1,00
		0,00	0,00	0,00
a_7	Consumer goods	-1,06	-1,14	-1,42
		0,00	0,00	0,00
a_8	Steel and electro.	-0,95	-0,97	-1,0
		0,00	0,00	0,00
R^2	Adjusted R^2	**0,357**	**0,406**	**0,359**
	F stat.	54,01	66,11	54,28
		0,00	0,00	0,00
	Significance F	0,00	0,00	0,00

In the case of Slovak companies the traditional measure EPS has the biggest explanatory power with R^2 of 40.6%, while the modern measure EVA explained only 35.9% of market value changes of the companies.

Now, we modify the above applied model in the sense that instead of market value, we will examine the relationship of MVA and the financial performance

measures, in order to evaluate the value orientation of monitored indicators of financial performance. MVA, in fact, measures the difference between the market value of the company and the value of invested capital (debt and equity). The higher the value of this ratio, the better, because high levels of MVA suggest that the company creates real value for shareholders. Negative MVA value means that the company does lower the shareholder value. It should be stressed that the aim is to maximize MVA and not the market value of the company, because it can be also done by increasing the amount of invested capital. The increase in the value of MVA will only happen, if the capital invested is more profitable than the cost of capital.

$$MVA_{i,t}/C_{i,(t-1)} = a_0 + a_1*(X^+_{i,t}/c_{i,t})/C_{i,(t-1)} +$$
$$+a_2*(X^-_{i,t}/c_{i,t})/C_{i,(t-1)} +$$
$$+a_3*(ln(C_{i,(t-1)}+a_j\sum(I_j)) + e$$

    $MVA_{i,t}$ market Value Added of company i in year t

The results are presented in table 2:

		Earnings	EPS	EVA
a_0	Intercept	2,08 0,01	1,01 0,01	0,75 0,00
a_1	Performance measure +	10,31 0,00	8,24 0,00	19,19 0,00
a_2	Performance measure –	-4,01 0,05	-3,18 0,30	0,39 0,48
a_3	ln (C)	0,00 0,08	0,20 0,01	0,00 0,49
a_4	Automobile	-1,41 0,00	-1,03 0,00	-0,63 0,00
a_5	Construction	0,09 0,00	-1,00 0,00	-0,24 0,01
a_6	Chemical and pharmaceutical	-2,07 0,00	-0,38 0,00	-0,59 0,00
a_7	Consumer goods	1,06 0,00	0,94 0,00	-0,41 0,00
a_8	Steel and electro.	0,05 0,00	-0,77 0,00	-0,44 0,00
R^2	Adjusted R^2	**0,328**	**0,249**	**0,402**
	F stat.	52,15	43,97	56,71
	Significance F	0,00	0,00	0,00

When we replaced the market value with MVA, EVA´s explanatory power has increased (from 35.6% to 40.2%) and thus in this model came first in explaining changes in MVA. Earnings´ and EPS´ results have also changed. In the case of EPS it decreased from 40.6% to 24.9%, the decrease in the earnings is less (from 35.7% to 32.8%).

According to the results of the models we came to the conclusion, that in case of selected companies in the analysed time period we can confirm the dominance of a modern performance measure EVA above the two other traditional performance measures in explaining the changes in MVA.

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