Two Variables Affecting the Economic Value Added (EVA)

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Abstract: *Economic value added EVA is one of the most important indicators of financial analysis, however, it has not been being used widely in practice yet. A possible reason is its calculation that is more complicated than for conventional one, e.g. ratios. This complexity primarily involves calculating the average weighted cost of capital (WACC) and unequal approach to the calculation of net operating profit after tax (NOPAT), the WACC and NOPAT are initial variables for the calculation of EVA. The aim of this paper is to summarize the basic approaches to calculating WACC, particularly the cost of equity and to calculate NOPAT and finally to simplify the calculation of EVA with mathematical analogy modifications. Mathematical adjustment has proved that economic value added is essentially a net profit weighted by the debt proportion in the overall capital structure. This post is to submit a simplification of the indicator of economic value added in an effort to extend its application in practice.*

Keywords: Economic value added, EVA, Average weighted cost of capital, WACC, Net operating profit after tax, NOPAT.

JEL codes: M21.

1 Introduction

Economic value added EVA is one of the most important indicators of financial analysis, however, it has not been being used widely in practice yet. A possible reason is its calculation that is more complicated than for conventional ones, e.g. ratios. This complexity primarily involves calculating the weighted average cost of capital (WACC) and unequal approach to the calculation of net operating profit after tax (NOPAT), the WACC and NOPAT are initial variables for the calculation of EVA. The aim of this paper is to summarize the basic approaches to calculating WACC, particularly the cost of equity and to calculate NOPAT and finally to simplify the calculation of EVA with mathematical analogy modifications.

The goal of business should not be only profit maximisation.

Profit is to be regarded as an accounting entry, which should be viewed in the context of other indicators (Businessvize, 2017).

In recent decades, the pressure put on shareholder value has been strengthened, i.e. the pressure to increase shareholder value, the result of which was the creation of EVA that better affects the interests of shareholders and other stakeholders (Synek, 2002).

The goal of business should therefore be to maximise market value (Accenture, 2011).

In response to this request, economic value added EVA occurred at the beginning of 1990s.

It was first published in 1991 by the American consulting firm Stern Stewart & Co.

Its informative value became one of the most important indicators of financial analysis.

According to Synek (2002), the creation of economic value added and its maximisation is the goal of business. This governs everything - evaluation of investment, new products,

and internal departments. EVA is the basis of material involvement, on which the reward system is based. It forms a complex management system, of which main task is to analyse the factors that contribute to the value creation and ensures the decisions that will bring increasing value for shareholders (shareholder value) and increasing benefits for everybody who is closely connected with the existence of the company (stakeholder value).

Despite the undoubted importance of this indicator, it is not used by many small companies, because its calculation is complicated, to some extent.

Only 35.6% percent of companies monitor EVA, while 88.9% profit after tax (Horová and Hrdý, 2007).

Unlike common ratios indicators of financial analysis, the variables entering EVA calculation cannot easily be found in the financial statements.

The aim of this article is to show that EVA is basically affected only by two variables. This will result not only in more frequent use in practice, but a financial manager also gets the information on how to particularly act to improve this indicator using a very simple pyramidal decomposition.

2 Methodology and Data

Economic value added EVA (Eng. conomic value added) is a part of the so-called value performance criteria (Hrdý and Krechovská, 2013).

This indicator is based on economic profit, which counts with all the costs of invested capital (equity and debt), which distinguishes it from the financial profits on which common financial analysis is based.

EVA is given by the relation (Stewart, 1999):

$$EVA = NOPAT - WACC\ x\ C \tag{1}$$

Where:

- NOPAT is net operating profit after tax (Eng. net operating profit after tax)
- WACC is the weighted average cost of capital (Eng. weighted average cost of capital)
- C is invested capital.

Thus, economic profit is defined as earnings that exceed the cost of capital, i.e. EVA should be greater than zero so that the enterprise creates a new, the so-called added value, and thereby increases the original value of the company.

NOPAT

NOPAT, or net operating profit after tax, which is a rather complicated indicator, even in the Anglophone literature, enters the calculation of EVA.

The English version of Wikipedia (2010) states two different calculations. The first works with strictly terminological approach, where it only deducts the operating profit from the amount paid in taxes – i.e. it multiplies it by a tax shield (1-t).

Investopedia (2010) says that NOPAT does not include the tax savings resulting from the deduction of interest expense.

Therefore, NOPAT is already defined differently in its domestic environment and the harder it is to transfer it into the Czech environment.

NOPAT can be expresses in two ways (2), (3).

$$NOPAT = EBIT\ x\ (1-t) \tag{2}$$

Where:

- EBIT is earning before interest and tax (Eng. Earnings before interest and tax),
- t is income tax rate

Or

$$NOPAT = EAT + I\ (1-t) \quad (3)$$

Where:

- EAT is net profit after tax,
- I are cost interests,
- t is income tax rate.

WACC

The second indicator entering the EVA calculation is the weighted average cost of capital WACC (Eng. weighted average cost of capital).

WACC can be calculated as the sum of the unit costs of equity and debt, where the capital structure acts as a weight (Hrdý and Krechovská, 2013):

$$WACC = n_{vk} * \frac{K_{vk}}{K} + n_{ck} * (1-t) * \frac{K_{ck}}{K} \quad (4)$$

Where:

- n_{vk} are costs of equity (required profitability),
- n_{ck} are costs of debt,
- t is income tax rate,
- K_{vk} is equity,
- K_{ck} is debt,
- K is total capital.

While the capital structure can be found in the balance sheet and the costs can of debt be easily calculated, mostly as the average interest rate, the costs of equity are difficult to be determined.

Generally, the costs of equity can be determined either on the basis of market-based approaches, or methods and models based on accounting data.

According to Dluhošová, the basic methods, used to estimate the costs of equity (Dluhošová, 2006), are:

- Capital Asset Pricing Model CAPM (Capital Asset Pricing Model),
- Arbitrage Pricing Model – APM (Arbitrage Pricing Model),
- Modular models,
- Dividend growth model.

The economist William Sharpe's Capital Asset Pricing Model CAPM was created in the 1960s. This market-based approach to determine the cost of equity indicates that the expected risk changes in direct proportion to the beta coefficient. Beta coefficient expresses the rate of a specific market risk through the weighing the shares sensitivity to changes in market portfolio (Kislingerová, 2010).

APM model also belongs to a market valuation of assets, but unlike the CAPM, it is a multi-factor model. This model takes into account both macroeconomic factors (GDP, inflation) and microeconomic factors (profitability, indebtedness, liquidity, size).

The modular method of determining the WACC is used in an economy with imperfect capital market and short-term functioning market economy.

Alternative cost of equity is defined as the sum of the risk-free asset profitability and risk premiums. In this case, the risk premiums are not derived from the capital market, but from the business accounting data as (Dluhošová, 2006):

$$WACC = R_F + R_P + R_{FS} + R_{LA} \quad (5)$$

Where:

- WACC is the total capital cost of a debt-free company,
- R_F is a risk-free interest rate,
- R_P is a risk surcharge for the commercial business risk,
- R_{FS} is a risk surcharge for the risk resulting from the financial stability,
- R_{LA} is a risk surcharge characterising the company size.

In the modular method, the starting point is the current profitability of risk-free securities, to which, on the basis of an expert estimate, surcharges are added for different types of risks, resulting e.g. from indebtedness or a reduced level of company liquidity.

Determining costs with the use of the modular method is possible even without expert estimates. There is a method, which describes a specific method of calculation, see Kislingerová (2010).

The dividend model is used for shares valuation, when the market price of the shares is determined by the present value of future dividends from the shares in individual years.

Assuming an infinite period of holding shares and a constant value of dividends, the shares market price can be determined as perpetuity (Nývltová and Marinič, 2010).

The disadvantage of market models CAPM and APM is their limited applicability only for joint stock companies with public shares. CAPM and APM models and the modular method do not assume expert estimates.

Neither the dividend model can be generally recommended because few companies (if any) can be found in current conditions in the Czech Republic, which regularly pay dividends and the amount of dividends paid fully reflects the requirements of shareholders for increased value of invested capital, and they no longer expect, in addition to the payment of dividends, increase in the market share rate (Nývltová and Marinič, 2010).

Given that the aim of this paper is to simplify, or rather allow, the calculation of EVA, and the calculation of WACC and the components of costs of equity for all businesses, it is necessary to offer businesses a different method of calculation.

3 Results and Discussion

Similarly to the dividend model of costs of equity calculation, it can be stated that the dividends are essentially the cost of equity, as well as the interests are the cost of debt.

Given that equity is a potential liability to the owners, the entire profit after tax can also be understood a potential pay-out to the owners. Dividends may be substantially equal to the profit after tax and the profit after tax is thus the cost of equity.

The cost of equity is thus calculated as capital profitability, which is essentially the value of ROA:

$$n_{VK} = \frac{EAT}{K} \quad (6)$$

Where:

- EAT is profit after tax,
- K is the capital.

Now, we can proceed to the simplification of EVA, which is demonstrated mathematically and through the exercise experiment in this paper.

As we stated, EVA is calculated:

$$EVA = NOPAT - WACC\ x\ C, \tag{7}$$

NOPAT can be calculated:

$$NOPAT = EAT + I * (1 - t) \tag{8}$$

And WACC as in (4) can be by a modification of (6) calculated:

$$WACC = \frac{EAT}{K} * \frac{VK}{K} + \frac{I}{CK} * (1 - t) * \frac{CK}{K}. \tag{9}$$

If NOPAT and WACC are put into the calculation of EVA, we get:

$$EVA = EAT + I * (1 - t) - (\frac{EAT*VK*K}{K^2} + \frac{\mathrm{CK}*\mathrm{I}*(1-\mathrm{t})*\mathrm{K}}{\mathrm{CK}*\mathrm{K}}) \tag{10}$$

If we cancel out the variable of total capital K and the variable of debt CK, we get this equation:

$$EVA = EAT + I * (1 - t) - EAT * \frac{VK}{K} - I * (1 - t) \tag{11}$$

If we adjust it mathematically, we get:

$$EVA = EAT - EAT * \frac{VK}{K}, \tag{12}$$

After factoring out we get:

$$EVA = EAT * \left(1 - \frac{VK}{K}\right), \tag{13}$$

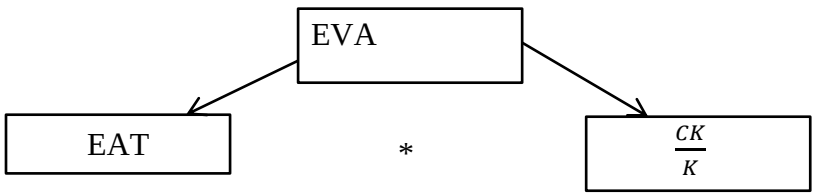
This can be finally written as:

$$EVA = EAT * \frac{\mathrm{CK}}{\mathrm{K}}. \tag{14}$$

From the derivation above, we gained an equation, when EVA is only affected by the net profit after tax and debt structure.

From a simple multiplier pyramidal decomposition, Fig. 1, it is clear that it is not necessary to calculate cost of equity and debt for the positive influence on EVA. EVA will grow with increasing net profit and debt.

Figure 1 Multiplier Decomposition of EVA



Source: own

The following example will practically prove the new equation for the calculation of EVA.

It is therefore necessary to calculate the value of EVA in the traditional way and the new suggested way to verify that the results are the same.

Exercise: Equity is 500 000 CZK, debt is 400 000 CZK, the profit after tax is 200 000 CZK, the effective tax rate of 18%, the cost of debt is 0.0721% per annum, interests are 28 500 CZK.

The exercise is first solved by the original equation of (1), (3) and (4):

$$EVA = 200\,000 + 28\,500 * (1 - 0{,}18) - (\frac{200\,000*500000x900000}{900000^2} + \frac{400000*28500*(1-0{,}18)*900000}{400000*900\,000}). \tag{15}$$

$$EVA = 88\,889. \quad (16)$$

When calculating using a new equation (1) (3) and (7), EVA is calculated very easily:

$$EVA = 200\,000 * \frac{400000}{900\,000} \quad (17)$$

$$EVA = 88\,889. \quad (18)$$

The results (16) and (18) prove that the significant simplification of equation led to the same result as in the use of a more complex equation.

4 Conclusions

The aforementioned indicates that the economic value added is essentially a net profit weighted by the debt proportion in the overall capital structure. Besides the net profit indicator, which is an absolute indicator itself, there is also a noticeable tendency of the inclusion of debt. Since there is a rule that debt is a generally cheaper type of financing in comparison with equity, cost of capital is basically integrated here as well, albeit it does not appear in a simplified concept of EVA.

This post is to submit a simplification of the indicator of economic value added in an effort to extend its application in practice.

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