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CORPORATE PERFORMANCE AND THE MEASURES OF VALUE ADDED

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Abstract. In recent years, managers have turned their attention to the ways increasing the value of their companies. A number of competing measures have been developed and marketed by investment and consulting firms. This paper considers the ways in which value can be created or destroyed in a firm and looks at how to calculate the cost of capital used to measure the opportunity cost of investing funds in one particular business instead of others with equivalent risk. Next, we have a look at the four most widely used value enhancement measures including Economic Value Added, Cash Flow Return on Investment, Market Value Added, Cash Value Added and use an example to think of where these approaches yield similar results and where differences might occur. In conclusion, we summarize the new or unique points in these competing measures, establish the information they can give and explain how to use it when managing and creating shareholder value.

Keywords: Value-Based Management, Economic value added (EVA), Marked value added (MVA), Cash Flow return on Investment (CFROI), Cash Value added (CVA), Shareholder Value, Cost of Capital, WACC.

1. Introduction

The concept of shareholder value has been one of the driving forces in the change of current management practice. The theories on shareholder value have a history stretching back to 1950s and 1960s and their intellectual roots are in the path breaking work of some economists and a number of them have been honored with the Nobel prize for economics. Shareholder value started to take on a life of its own as a result of work done on what become known as the Capital Asset Pricing Model (CAPM) which argues that the returns both received and expected by investors are related to the risk incurred by owning particular financial assets. Shareholder value was accredited considerable appraisal following a publication of Creating Shareholder Value by Rappaport (1986). 'Make strategic decisions that maximize expected value, even at the expense of lowering near-term earnings' according to Rappaport (2006) one of the most important principles to start considering the commitment to shareholder value. The value approach implied a change in the management process and the managers began to direct their focus on creating shareholder value.

Thus, traditional accounting numbers such as return on investment, earnings per share and operating profit have been augmented by 'new' measures and ratios such as Market Value Added, Economic Value Added (EVA®), Cash Value Added, Cash flow Return on Investment or Economic profit, see Gary *et al.* (1997). This article compares these four measures by the way they incorporate the idea of shareholder value, their flexibility in application to the valuation of companies and the measurement of financial performance.

Management decisions – specifically investment, financing, and operating decisions – affect shareholder value through their influence on such value drivers as value growth duration, (Chakravarthy 1986), operating profit margin for the cash flow from operations or the cost of capital. These value drivers (Fig. 1) connect to the valuation components through the shareholder value network, for more information see Credit Suisse (2000) or Schaltegger, Figge (2000).

Ideally, in that case financial measures are useful for assessing past managerial performance as well as for the current corporate value. For this reason, the usefulness of each measure is considered both a 'backward-looking' measure of managerial performance and a 'forward looking' measure of corporate value based on present value of anticipated cash flows.

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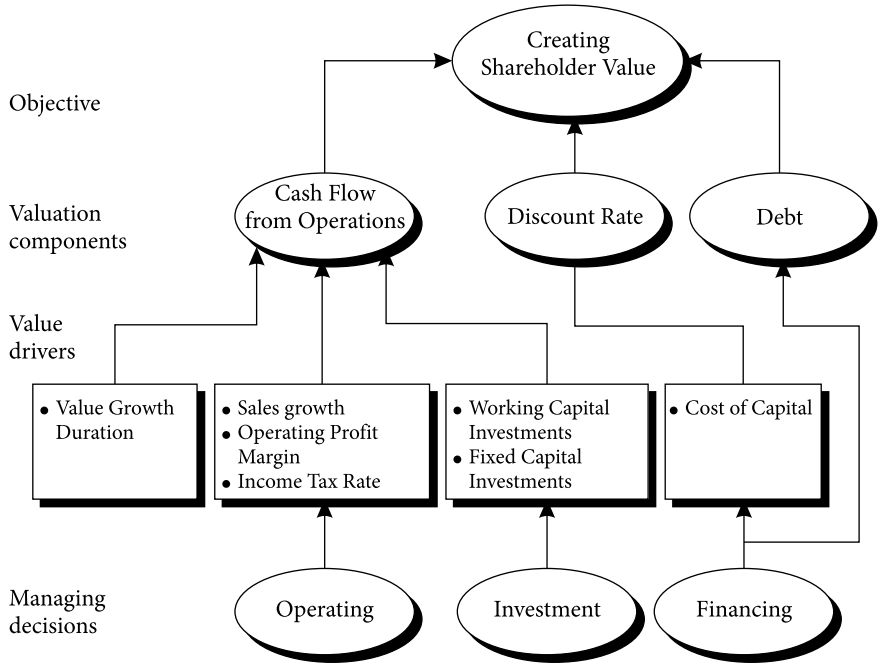

Fig. 1. Value drivers of shareholder value, Rappaport (1986)

2. Shareholder value approaches

Before proceeding to a detailed description of each of the four measures, we need to present a comparative overview. The basic idea underlying all these approaches is as simple as it is convincing: Value to the shareholders is achieved only when the residual measure of (adjusted) profit minus the cost of capital is positive – that is, when 'profit' exceeds the cost of capital. Madden (2007) argues that 'maximizing long-term value provides a criterion for management decision-making that leads to the most efficient use of society's resources' and recommends 'that corporate boards undertake a dialogue with management about the content of a periodic Shareholder Value Review'. Boards can select various approaches which differ, however, in the ways they form the basic elements needed to calculate the key measure(s), specifically measures for adjusted profit, capital (operating assets), rate of return and the cost of capital. The additional features of the measurements are the calculation formula, possible inclusion or exclusion of stock prices in the financial analysis and, certainly, the application of the various financial ratios. Also, there is a difference between past and future oriented measurements (Chakravarthy 1986).

The approaches by Stern Stewart & Co., McKinsey & Co. and the Boston Consulting Group as well as other approaches discussed here can be applied either way. EVA approach has a distinguishing feature as it permits the inclusion of capital market prices through the use of the closely related Market Value Added (MVA) ratio to provide a comparison based on market valuation, see Ampuero *et al.* (1997), Goldberg (1999). EVA also differs from the other measures, and therefore can be used for past and future (Ampuero *et al.* 1997), Cash Value Added, Cash flow return on investment and Economic Profit because it allows a more detailed and thorough adjustment and conversion from the Accounting data. Next, we illustrate how the four competing shareholder value measurements are calculated.

Third, we have to describe the cost of the company's capital. Both creditors and shareholders expect to be compensated for the opportunity cost of investing their funds in one particular business instead of others with equivalent risk. 'The weighted average cost of capital (WACC) is the discount rate, or time value of money, used to convert expected future free cash flow into present value for all investors', Copeland *et al.* (2000).

It consists of three parts – cost of debt (r_d), cost of preferred stock – r_{ps}, cost of common stock r_s; w_d, w_s, w_{ps} – weights of each part.

$$WACC = w_d r_d(1 - t) + w_{ps} r_{ps} + w_s r_s. \quad (1)$$

Cost of debt. The rate of interest on debt – r_d, company tax rate – t, the calculation is in the formula above.

Cost of preferred stock. The weighted average cost of preferred stock capital r_{ps} is the preferred dividend D_{ps}, divided by the net issuing price or the market price of the preferred stock if available (Copeland *et al.* 2000) – P_n, which is the price the firm receives after deducting flotation costs:

$$r_{ps} = \frac{D_{ps}}{P_n}. \quad (2)$$

Cost of common stock can be calculated in three ways:

(1) Capital asset pricing model. Using CAPM approach when R_F – risk-free rate, R_M – expected market risk, β_i – signifies the company's beta, Goldberg (1999):

$$r_s = R_F + \beta_i(R_M - R_F). \quad (3)$$

(2) Discounted cash flow (DCF) or Gordon growth method (Abrams 2005; Myers 2003). If dividends are ex-

pected to grow at a constant rate, then the price of a stock is, see Brealey *et al.* (2001):

$$P_0 = \frac{D_1}{(r_s - g)}, \quad (4)$$

where P_0 is the current price of the stock; D_1 is the dividend expected to be paid at the end of Year 1 and r_s is the required rate of return. We can solve for r_s to obtain the required rate of return on common equity, which for marginal investor is also equal to the expected rate of return, see Goldberg (1999) or Copeland *et al.* (2000):

$$r_s = \hat{r}_s = \frac{D_1}{P_0} + g. \quad (5)$$

Thus, investors expect to receive a dividend yield, $\frac{D_1}{P_0}$, plus a capital gain g, for a total expected return of $\hat{r}_s$. In equilibrium this expected return is also equal to the required return, r_s. We will assume that equilibrium exists, hence $r_s = \hat{r}_s$, so we can use the terms r_s and $\hat{r}_s$.

The expected growth in dividends – g is difficult to estimate. The following used approaches for estimating the growth rate are:

a) Historical growth rates. If earnings and dividend growth rates have been relatively stable in the past and if investors expect these trends to continue, then the past realized growth rate may be used as an estimate of the expected future growth rate.

b) The retention growth model. Most firms pay out some of their net income as dividends and reinvest or retain the rest. The *payout ratio* is the percent of net income that the firm pays out as a dividend, defined as total dividends divided by net income, for example Brealey *et al.* (2001), Myers (2003). The retention ratio is the complement of the payout:

$$\textit{Retention ratio} = (1 - \textit{payout ratio}). \quad (6)$$

ROE is the return on equity, defined as net income available for common stockholders divided by equity.

The growth rate of a firm will depend on the amount of net income it retains and the rate it earns on the retentions. Logically, we can write the retention growth model, see Brealey *et al.* (2001):

$$r_s = ROE \cdot \textit{Retention ratio}, \quad (7)$$

when we use it we are, by implication, making four important assumptions:

- expected payout rate, and thus the retention rate remains constant;
- the expected return on equity on new investment remain constant;
- the firm is not expected to issue new common stock; otherwise, expected this new stock to be sold at a price equal to its book value;
- future projects are expected to have the same degree of risk as the existing assets of a firm.

c) Analysts' forecasts. Analysts publish growth rate estimates for most of the larger public companies.

(3) Bond – yield – plus risk – premium approach (Goldberg, 1999). The bond-yield-plus-risk-premium is used by the companies that are not publicly traded. Some analysts use a subjective 'ad hoc' procedure to estimate firm's cost of common equity: they simply add a judgmental risk premium of 3 to 5 percentage points to the interest rate on the firm's own long-term debt. It is logical to think that firms with risky, low-rated and consequently high-interest-rate debt will also have risky, high cost equity and the procedure of basing the cost of equity on a readily observable debt cost utilizes this logic.

$$r_s = \textit{Bond yield} + \textit{Risk premium}. \quad (8)$$

Because the percent risk premium is a judgmental estimate in this approach, the estimated value of r_s is also judgmental.

A number of difficult issues of the cost of capital are related with estimate:

1. Privately owned firms. Our discussion of the cost of equity was related primarily to the publicly owned corporations and we concentrated on the rate of return required by public stockholders. However, there is a serious question about how one should measure the cost of equity for a firm the stock of which is not traded. Tax issues are also particularly important in these cases. As a general rule, the same principles of the cost of capital estimation apply to both privately held and publicly owned firms. However, the problems of obtaining input data are somewhat different for each.
2. Small businesses. It is generally privately owned companies making difficult to estimate their cost of equity.
3. Measurement problems. One cannot overstate the practical difficulties encountered when estimating the cost of equity. It is very difficult to obtain good input data for the CAPM, for g in Gordon growth method and for the *Risk premium* in the Bond yield and Risk premium method.

As a result, we can never be sure just how accurate our estimated cost of capital is.

Market value added (*MVA*)

The primary goal of most firms is to maximize shareholders' wealth. This goal benefits shareholders, but it also helps to ensure that scarce resources are allocated efficiently, which benefits the economy. Shareholder wealth is maximized by maximizing the difference between the market value of firm's stock and the amount of equity capital that was supplied by shareholders. This difference is called the Market Value Added (*MVA*):

$$\textit{MVA} = \textit{Market value of stock} - \textit{Equity shareholder capital} = (\textit{Shares outstanding}) \times (\textit{Stock price}) - \textit{Total common equity}. \quad (9)$$

The higher its *MVA* the better the job management is doing for the firm's shareholders. Sometimes *MVA* is de-

fined as the total market value of the company minus the total amount of investor-supplied capital, Wet (2005):

$$MVA = Total\ market\ value - Total\ capital = (Market\ value\ of\ stock + Book\ value\ of\ debt) - Total\ Capital. \quad (10)$$

For most companies, the total amount of investor-supplied capital is the sum of equity, debt and preferred stock. We can calculate the total amount of investor-supplied capital directly from their reported values in the financial statements. The total market value of a company is the sum of the market values of common equity, debt and preferred stock. It is easy to find the market value of equity since stock prices are readily available. Still, it is not always easy to find the market value of debt. Hence, many analysts use the value of debt that is reported in the financial statements or the debt's book value as an estimate of its market value.

Economic value added (*EVA*)

Whereas *MVA* measures the effects of managerial actions since the very inception of a company, Economic Value Added focuses on managerial effectiveness in a given year. *EVA* basic formula is as follows (see Beaver 2001; Dimitris, Anastassis 2007; Fernandez 2005):

$$EVA = NOPAT_t - Kw \times IC_{t-1}, \quad (11)$$

where: *NOPAT* – Net operating profit after taxes, *Kw* – cost of capital (*WACC*), *IC* – invested capital, *NI* – net income, *tax* – corporate tax rate, *i* – interest expense. *NOPAT* is the after-tax profit a company would have if it had no debt and no investments in non operating assets. Because it excludes the effects of financial decisions, it is a better measure of operating performance than is net income (Волков 2005).

$$NOPAT_t = NI_t + i(1 - tax). \quad (12)$$

Net operating profit after taxes can be adjusted to better express financial results. The most common adjustment used includes:

1. Increase in Deferred tax (Goldberg 1999; Волков 2005) – cumulative difference between the accounting provision for income taxes and taxes actually paid.
2. Increase in LIFO reserve (Goldberg 1999; Grant 2003) – usually presented in notes to financial statements by companies employing a LIFO valuation of ending inventory. This is the difference between the FIFO and LIFO valuation of ending inventory (see Волков 2005).
3. Increase in cumulative goodwill amortization (Goldberg 1999). Cumulative goodwill is the difference between goodwill initially and currently reported.
4. Increase in bad debt and other reserves – accrual accounting provision made to estimate the amount of uncollectible receivables; other reserves such as inventory obsolescence, warranty reserves, (Cagle *et al.* 2003; Dimitris, Anastassis 2007).
5. Increase in capitalized intangibles (Grant 2003) – research, development expenditures amortized over the estimated payoff period (see Goldberg 1999).

$$IC_{t-1} = shareholder\ equity_{t-1} + interest\ bearing\ debt_{t-1}. \quad (13)$$

Operating capital is the sum of the interest-bearing debt, preferred stock and common equity used to acquire the company's net operating assets, that is, its net operating working capital plus net plant and equipment. Operating assets by definition equals the capital used to buy operating assets. We can also calculate *EVA* in terms of *ROIC*:

$$EVA = (ROIC_t - WACC) \times IC_{t-1}. \quad (14)$$

As this equation shows, a firm adds value – that is, has a positive *EVA* – if its *ROIC* is greater than *WACC*. If *WACC* exceeds *ROIC*, then new investments in operating capital will reduce the firm's value (see Harley, Trahan 2007).

$$ROIC_t = \frac{NOPAT_t}{IC_{t-1}}. \quad (15)$$

EVA is an estimate of a true economic profit of a business for the year and differs sharply from accounting profit because no charge for the use of equity capital is reflected in accounting profit. *EVA* represents the residual income that remains after the cost of all capital (Wallace 1997) including equity capital, whereas accounting profit is determined without imposing a charge for equity capital.

Cash flow return on investment (*CFROI*)

The cash flow return on investment 'expresses an estimate of a company's single-period cash flow as a percentage of total investment' (Harley, Trahan 2007). In other words, it is a modified version of internal rate of return, designed for investments that have already been made. In the form in which it is used by its proponents, the *CFROI* for a firm is compared to the cost of capital to pass judgments on whether company's investments are good, neutral or poor ones. A firm should increase the spread between its *CFROI* and its cost of capital (see Myers 1996).

$$CFROI = \frac{CF_{ad}}{CI_{ad}}, \quad (16)$$

where first is the gross investment (CI_{ad}) that the firm has in its assets in place, second input is the gross cash flow (CF_{ad}) earned in the current year on that asset:

$$CI_{ad} = Net\ Asset\ Value + Cumulated\ Depreciation\ on\ Asset + Current\ Adjustment\ to\ inflation. \quad (17)$$

$$CF_{ad} = Adjusted\ EBIT \times (1 - t) + Current\ year's\ Depreciation\ \&\ Amortization. \quad (18)$$

The third input is the expected life of the assets (n) in place at the time of the original investment, which varies from sector to sector but reflects the earning life of the investments in question. The expected value of the assets (SV) at the end of this life is usually assumed to

be the portion of the initial investment such as land and buildings that is not depreciable.

An alternative simplified formulation of the *CFROI* allows for setting aside an annuity to cover the expected replacement cost of the asset at the end of the project life. It is called the economic depreciation (Волков 2005):

$$EN = \frac{RC \cdot k_c}{\left(1+k_c\right)^n - 1}, \quad (19)$$

where *EN* – economic depreciation, *RC* – difference between the gross investment and the salvage value, *n* – is the expected life of the asset, k_c – cost of capital. The *CFROI* for a firm or division can then be written as:

$$CFROI = \frac{CF_{ad} - EN}{CI_{ad}}. \quad (20)$$

The differences in reinvestment rate assumptions account for the difference in *CFROI* estimated using two methods. In the first approach, intermediate cash flows get reinvested at the internal rate of return while in the second one at least the portion of the cash flows that are set aside for replacement get reinvested at the k_c.

Cash value added (*CVA*)

Cash value added shows the residual cash flow wich generates investment to an enterprise. There are two ways to calculate this method: by the Boston Consulting Group (BCG) group or Frederik Weissenrieder Consulting (see Волков 2005). In this article, we will look at *CVA* calculation of BCG group.

$$CVA_j = RCF = AOCF_j - k_c \times CI_{ad}, \quad (21)$$

where: *AOCF* – Adjusted operating cash flow, k_c – cost of capital (*WACC*), gross investment – CI_{ad}.

$$AOCF_j = NOPAT_j + Dep_j - EN_j. \quad (22)$$

The economic depreciation is calculated as follows:

$$EN_j = \frac{RC_j \cdot k_c}{\left(1+k_c\right)^n - 1}, \quad (23)$$

where: *NOPAT* – net operating profit; *Dep* – depreciation and amortization; *EN* – economic depreciation; k_c – Cost of capital; *RC* – gross fixed assets. Gross cash flow is the component replacing adjusted profit; gross investment base is the capital measure. If the capital charge equation is not used, the value spread equation:

$$CVA_j = (CFROI_j - k_c) \times CI_{ad}. \quad (24)$$

Value is added when *CFROI* exceeds capital costs. The *CFROI* represents the internal rate of return – that is, the time-adjusted rate that will produce a net present value of zero (considering the investment, related gross cash flows and the net value of non depreciable assets).

3. Comparing approaches

As it was mentioned above, the measures such as those considered here can be used either as a forward-looking company valuation or backward to measure financial performance. For an additional evaluation, *MVA* can be calculated which is the difference between the total value of a company and the total capital invested by the company at a specific time.

***MVA* calculation**

The last session of share purchase was from 01/10/2005 to 31/12/2005, the total session amount of purchase – 274 056 Litas, the quantity – 153 255 units, see Annual Prospectus – Report (2004, 2005). So, the average market share price at the end of 2005 is:

274 056 / 153 255 units = 1.78 Litas.

In 2004, the last session was from 01/10/2004 to 31/12/2004, the total session amount of purchase – 287 799 Litas, the quantity – 212 872 units, see Annual Prospectus – Report (2004, 2005). So, the average market share price at the end of 2004 is:

287 799 / 212 872 units = 1.35 Litas.

Table 1. *MVA* calculation for JSC "Kauno tiekimas"

MVA calculation	2005	2004
Price per share	1.78	1.35
Number of shares	10 180 884	10 180 884
Market value of company (Litas)	18 121 973.00	13 744 193.00
Book value of company (Litas)	15 973 852.00	11 038 047.00
MVA = Market value – Book value	2 148 121.00	2 706 146.00

MVA is positive in both cases but the total amount decreased in 2005.

The positive *MVA* is an indicator of value generated in the past. *EVA* is the value generated during a specific period. Thus, a comparable future-oriented valuation measure, *MVA* may also be defined as the discounted value of future *EVA's*, see Wet (2005).

The assumed financial information underlying the following examples is reported in Figure 2.

***EVA* calculation**

Now, we will compare the backward-looking use of the *EVA* approach a measure of financial performance using the same example.

The cost of capital is calculated to illustrate the procedure and to permit a basic assessment of the competing models. We cannot show the complexity of the conversions associated with the *EVA* method in this small example but we included a part of it to a comparison of different approaches (see Table 2).

Suppose the cost of equity is 12% for the year 2004 and 2005. So the $r_s = 0.12$.

$Invested\ capital_{2004} = shareholders\ equity_{2003} +$
$interest\ bearing\ debt_{2003}$ = 10 408 964 +
25 678 935 = 36 088 899 Litas.

Profit and loss account	2005 12 31	2004 12 31	2003 12 31
Turnover	639 630 864	313 144 867	31 796 101
Cost of sales	569 407 028	299 149 395	28 035 018
Gross profit	70 223 836	13 995 472	3 761 083
Operating costs	55 425 579	12 428 016	2 685 562
Operating profit before financial accounts, taxes	14 798 257	1 567 456	1 075 521
Other operating income and expense, net	9 268 578	15 897	15 484
Financing cost, net	–18 937 223	–785 275	–859 653
Financial income	7 322 636	1 268 019	16 635
Financial expense	26 259 859	2 053 294	876 288
Profit before taxes	5 129 612	798 078	231 352
Corporate income tax	193 807	168 995	43 060
Net profit for the year	4 935 805	629 083	188 292

Balance sheet

ASSETS	2005 12 31	2004 12 31	2003 12 31
Non-current assets	19 225 971	2 218 349	2 198 314
Intangible assets	4 375	2 148	3 320
Property, plant and equipment	1 663 942	2 216 201	2 194 994
Investments	17 557 654	-	-
Current assets	462 847 348	202 152 208	73 839 357
Inventories	232 740 396	127 910 980	56 160080
Trade receivables	229 339 445	63 790 588	9 629 597
Other current assets	122 050	10 074 007	5 030 204
Cash and cash equivalents	645 457	376 633	3 019 476
Total assets	482 073 319	204 370 557	76 037 671

EQUITY AND LIABILITIES	2005 12 31	2004 12 31	2003 12 31
Equity	15 973 852	11 038 047	10 408 964
Share capital	10180 884	10 180 884	10 180 884
Reserves	480 879	201 864	158 916
Retained earnings	5 312 089	655 299	69 164
Total liabilities	466 099 467	193 322 510	65 628 707
Non current liabilities	-	-	1 365
Current liabilities	466 099 467	193 322 510	65 627 342
Interest bearing loans and int.	20 822 844	13 199 167	25 679 935
Trade creditors	431 966 468	167 195 850	38 668 482
Corporate income tax payable	119 263	142 684	43 060
Salaries and social insurance	217 528	93 009	-
Other creditors	12 973 364	12 701 800	1 235 865
Total equity and liabilities	482 073 319	204370 557	76 037 671

Fig. 2. Profit (loss) account and Balance sheet of JSC "Kauno tiekimas"

Table 2. *EVA* calculation for JSC "Kauno tiekimas"

EVA calculation	2005	2004
Net income (*NI*)	4 935 805.00	629 083.00
Tax rate, (*t*)	15.00%	15.00%
Interest expense, (*i*)	3 348 567.00	1 927 090.00
$NOPAT = NI + i \cdot (1 - t)$	7 782 086.95	2 267 109.50
Changes in income taxe payable	–23 421.00	99 624.00
Adjusted *NOPAT*	7 805 507.95	2 167 485.50
Invested capital	24 237 214.00	36 088 899.00
WACC	0.1720	0.0799
ROIC = ad. *NOPAT* / Invest.capital	0.3220	0.0600
$EVA = IC \cdot (ROIC - WACC)$	3 635 582.10	–718 169.09

$$r_{d\ 2004} = \frac{1\,927\,090}{25\,679\,935} \times (1 - 0.15) = 0.06378;$$

$$WACC_{2004} = r_{d\ 2004} w_d + r_s w_s = 0.06378 \times \frac{25\,679\,935}{36\,088\,899} + 0.12 \times \frac{10\,408\,964}{36\,088\,899} = 0.0453 + 0.0346 = 0.0799 \text{ or } 7.99\%.$$

$$\textit{Invested capital}_{2005} = \textit{shareholders equity}_{2004} + \textit{interest bearing debt}_{2004} = 11\,038\,048 + 13\,199\,167 = 24\,237\,124 \text{ Litas.}$$

$$WACC_{2005} = r_{d\ 2005} w_d + r_s w_s = 0.21564 \times \frac{13\,199\,167}{24\,237\,214} + 0.12 \times \frac{11\,038\,047}{24\,237\,214} = 0.1174 + 0.0546 = 0.1720 \text{ or } 17.20\%.$$

EVA is positive in 2005 and negative in 2004. The positive *EVA* is an indicator of value generated in the period and the negative *EVA* shows that value was destroyed in 2004.

CVA and *CFROI* calculation

The cumulated depreciation and amortization (*Dep*) during 2004 was 3 167 369 Litas for property, plant and equipment, 1 372 Litas for intangible assets. In 2005, they made – 2 951 693 and 2 545 Litas respectively. Gross fixed assets (depreciable) – *RC* is the sum of net fixed asset and cumulated depreciation:

$$RC_{2004} = 2\,216\,201 + 3\,167\,369 + 2\,148 + 1\,372 = 5\,387\,090 \text{ Litas.}$$

$$RC_{2005} = 1\,663\,942 + 2\,951\,693 + 4\,375 + 2\,545 = 4\,622\,555 \text{ Litas.}$$

The asset life represents the estimated average economic asset life for property, plant, equipment, leased assets, and capitalized research and development costs, where applicable. The average expected life of asset is:

$$n_{2004} = \frac{5\,387\,090}{173\,371} = 31 \text{ year},$$

$$n_{2005} = \frac{4\,622\,555}{200\,787} = 23 \text{ year}.$$

Economic depreciation for 2004 and 2005 is:

Table 3. *CVA* calculation for JSC "Kauno tiekimas"

CVA calculation	2005	2004
NOPAT (from table 2)	7 782 086.95	2 267 109.50
Depreciation (*Dep*)	200 787.00	173 371.00
Economic depreciation (*EN*)	21 208.00	43 758.29
AOCF = NOPAT + Dep – EN	7 961 665.95	2 396 722.21
CI_{ad}	18 928 090.00	14 206 708.00
WACC	0.172	0.0799
$CVA = AOCF - WACC \cdot CI_{ad}$	4 706 034.47	1 261 606.24

$$EN_{2004} = \frac{RC_{2004} \cdot WACC_{2004}}{(1 + WACC_{2004})^{n2004} - 1} = 43\,758.29 \text{ Litas.}$$

$$EN_{2005} = \frac{RC_{2005} \cdot WACC_{2005}}{(1 + WACC_{2005})^{n2005} - 1} = 21\,208.00 \text{ Litas.}$$

Gross investment (*CI*) is typically defined as total net assets from the balance sheet plus accumulated depreciation. Gross investment can be adjusted for inflation so as to ensure that they are measured in the units of the same purchasing power as the related gross cash flows which they are employed in generating. Gross investment (CI_{ad}) for JSC "Kauno tiekimas" is the sum of gross fixed asset (depreciable), investments and net current asset. No inflation adjustment will be made. The results of calculation are displayed in Table 3.

$$CI_{2004} = RC_{2004} + \text{investments}_{2004} + \text{current asset}_{2004} - \text{current liabilities}_{2004} = 5\,387\,090 + 0.00 + 202\,152\,208 - 193\,332\,510 = 14\,206\,708 \text{ Litas.}$$

$$CI_{2005} = RC_{2005} + \text{investments}_{2005} + \text{current asset}_{2005} - \text{current liabilities}_{2005} = 4\,622\,555 + 17\,557\,654 + 462\,847\,348 - 466\,099\,467 = 18\,928\,090 \text{ Litas.}$$

The inputs to the *CFROI* model are stated in the current monetary equivalents. That is, past investments are "grossed up" to the current period by a historical inflation factor while gross cash flows are inflation-adjusted back to the present time period, see Grant (2003). *CFROI* essentially represents an internal rate of return calculation for the business as a whole. With formula (24) and an assumption about no inflation adjustment we calculate it:

$$CFROI_{2004} = \frac{CVA_{2004}}{CI_{2004}} + WACC_{2004} = 0.1687 \text{ or } 16.87\%.$$

$$CFROI_{2005} = \frac{CVA_{2005}}{CI_{2005}} + WACC_{2005} = 0.4206 \text{ or } 42.06\%.$$

4. Conclusions

1. Value-based methods promote the maximization of the economic worth of an organization by allocating its assets to their best use. Capital is not for free and a certain cost must be calculated in to use it.
2. *EVA* is a measure of the excess value created by managers showing a created or destroyed value of the enterprise in the analyzed period. It can be used for either forward or backward-looking.
3. *MVA* reflects performance over the company's entire life and have to be applied to the whole corporation. It represents the difference between the total market value of a firm and the total amount of investor-supplied capital.

4. *MVA* shows the excess value created by firms as the difference between the market and book value of a firm's stock which is the amount of equity the shareholders have supplied.
5. *CFROI* is useful for valuation by both managers and security analysts of corporations but is more complex in financial calculation. It shows cash flow return on investment in the internal rate of return of an entire company expression.
6. If *CFROI* is compared with company's real cost of capital and then multiplied with capital employed, we get a residual income that Boston Consulting Group has branded as cash value added (*CVA*).
7. Cost of capital is central to the shareholder value approach. Only when value creation exceeds the risk – the adjusted costs of capital is added value created.

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