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PRICING METHODS AND VALUE OF THE FIRM

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Declaration

Hereby I declare that I compiled this master thesis independently, using only listed literature and resources.

Prehlásenie

Prehlasujem, že som diplomovú prácu vypracovala samostatne a použila iba uvedené pramene a literatúru.

Prague, May 18th 2009

Táňa Moleková

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Special thanks belong to my parents and my partner for their patience and support throughout my studies.

Abstract

One of the main features of currently running financial and economic crisis is the substantial drop of the value of assets held in form of stocks. The key issues for investors nowadays is, whether to hold the stocks in the expectations of consequent regain of their value, or whether to look for safer and more profitable targets for allocation of capital. This is the question that is being asked also by the hundreds of professional as well as small investors and households, which are keeping their money in form of stocks of companies tradable at Prague Stock Exchange. Having in hand the information about the potential over- or undervaluation of the market price of these stock in relation to their intrinsic values based on true financial fundamentals can help them make the right decision.

Finding the answers on these questions was set as a main goal of this diploma thesis. The analysis, which of the theoretical concepts and stock valuation methods are the most successful in explaining the development of the actual stock prices for the companies listed in Prague Stock Exchange comes to the forefront. Different valuation models and econometric tools are tested on several companies in order to estimate the potential relationship between the actual and intrinsic value of these stocks as well as to exhibit eventual over- or undervaluation. Finally, based on the outcomes of this analysis, investment proposal related to buying or selling of respective stocks is made.

Abstrakt

Jedným z hlavných rysov prebiehajúcej finančnej a hospodárskej krízy je výrazný pokles hodnoty bohatstva alokovaného v podobe akcií. Investor rieši v dnešnej dobe problém, či je výhodnejšie držať akcie v očakávaní budúceho rastu ich hodnoty alebo sa zamerať na bezpečnejšie a profitabilnejšie formy aktív. Nielen stovky profesionálov, ale aj malí investori a domácnosti držia svoje úspory vo forme akcií firiem obchodovaných na Pražskej burze cenných papierov.

Riešenie popísaného problému by malo byť postavené na dôveryhodných informáciách o možnom nad- alebo podhodnotení tržných cien týchto akcií v závislosti na ich vnútornej hodnote, ktorá je založená na skutočných finančných a nefinančných ukazovateľoch.

Hlavným cieľom tejto diplomovej práce je analýza vhodnosti použitia niektorej z oceňovacích metód v snahe o vysvetlenie závislosti medzi touto vnútornou hodnotou a skutočnou tržnou hodnotou akciových titulov. Jej jadrom je nájdenie odpovede na otázku, ktorý z teoretických konceptov a oceňovacích metód najlepšie vystihuje vývoj tržných cien akcií kótovaných na Pražskej burze cenných papierov. Vybraná vzorka firiem je testovaná pomocou rôznych oceňovacích metód a ekonometrických nástrojov za účelom zistenia potenciálneho vzťahu medzi skutočnou a vnútornou hodnotou predmetných akcií, ako aj kvôli preukázaniu ich eventuálneho nad- alebo podhodnotenia. V závere je na základe výstupov z analýzy predložený investičný návrh týkajúci sa predaja alebo nákupu príslušných akcií.

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1. Introduction

In the past several months, we have been experiencing one of the worst financial and economic crises since the Great depression. The slowdown in industrial production, drop of consumption and decline in the international exchange of goods and services goes hand in hand with dramatic fall of vast majority of tradable stocks. Value of capital held in form of stocks and shares lost tens of percents within several weeks and professional investors as well as ordinary people are often facing huge losses and significant decrease of personal wealth.

One of the questions that the rational stock holder should ask would be what to do now. Does it still make sense to hold these stocks? What is their intrinsic value? Are they reflecting the actual economic strength of the company, are their undervalued due to the drop cause by the crisis, or were they overvalued before and we can still expect further decrease of their value?

Being able to perform independent valuation of the stock title and knowing the relation between this value and its actual or future market value could help us find the answers to all these questions. Great deal of literature has already dedicated to the topic of stock valuation and many methods have been developed to calculate the intrinsic stock value

and predict its future development. The goal of this diploma thesis is to test the most common and proven methods in the environment of Czech capital market in order to find out which of these methods gives the most approximate outcome when comparing it to the development of actual market value of the stocks.

This thesis is divided into two main parts. In the first theoretical part, the basic valuation terminology as well as pricing methods is described. The proper understanding of theoretical background is necessary for correct usage of specific models and right interpretation of the outcomes from the empirical analysis. In the following, empirical part, analytical and econometric tools are used to decide, which of the outlined methods "fits best" the conditions of Prague Stock Exchange. This best fitting approach is tested on five companies, whose stocks are publicly tradable here. After the selection of the model, whose outcome will approximate the real market values the most, the test is extended on another four companies. If this method proves to be effective in its ability to reflect the development of actual stock values, it will be analyzed in more depth and the investment proposal will be made on its basis. This investment recommendation could than serve as a starting point when deciding about investing into main stock titles in Prague Stock Exchange.

2. Theoretical part

2.1. Basic definitions

Coming to valuations themselves, it is important to specify the basic formulations that are going to be used by various valuation methods. The capital asset pricing model and the weighted average cost of capital are those that are described in this chapter with the detailed process how to reach their values.

2.1.1. Cost of Capital

The value of the company is obtained by discounting cash flows that are available to debt and equity holders. The appropriate discount rate is weighted average cost of capital (WACC) that is calculated by weighting the costs of equity and debt capital according to their respective market value[1]:

$$WACC = \frac{V_e}{V_d + V_e} k_e + \frac{V_d}{V_d + V_e} k_d * (1 - T),$$

where V_e represents the market value of equity, V_d the market value of debt, k_e is the cost of equity capital, k_d is the cost of debt capital and T is the marginal income tax rate of the company.

The weighted values of capital and debt represent their respective part of total capital and are measured in terms of market values. The successful implementation of the cost of capital relies on consistency between the components of the WACC and free cash flow and the cost of capital must meet some criteria to assure it[2]:

[1] PALEPU, K.G. (2004), pp. 474
[2] KOLLER, T. and GOEDHART, M. and WESSELS, D. (2005), pp. 291

- the opportunity costs from all sources of the capital have to be included; free cash flow is available to all investors who expect compensation for their risk;
- the required rate of return of every security has to be weighted by its target market-based weight and not by its historical book value;
- it must be calculated after corporate taxes;
- it has to be denominated in the same currency as free cash flow and in nominal terms in case those cash flows are stated in nominal terms.

None of the components of the WACC is directly observable and therefore several models are required to their estimation. The capital asset pricing model[3] is used to determine the cost of equity. It converts the risk of the asset into the expected return. The yield to maturity of the company on its long-term debt is used to assess the cost of debt. As long as the free cash flow is measured without interest tax shields, the cost of debt is measured on an after-tax basis[4].

2.1.2. Cost of Equity

2.1.2.1. Risk and Return

Risk and return are assumed to be the main features of investment strategy. In finance, the risk can be defined as a likelihood of receiving different return on an investment as was expected. Each investor should know that investing in the stock market brings some risks - the unique risk is typical for each stock and it can be eliminated by holding a well-diversified portfolio; the market risk is associated with market-wide variations, but cannot be eliminated. Some literature[5] compares the risk in finance to the Chinese symbols for danger and opportunity – there is a tradeoff between rewards reached with the support of opportunity and the higher risk as a consequence of a danger.

Rates of return can be used for several purposes. One of them is an evaluation of historical performance known also as ex-post rates of return, rates that have already been

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[3] The model will be described later.
[4] KOLLER, T. and GOEDHART, M. and WESSELS, D. (2005), pp. 292-293
[5] For example DAMODARAN, A. (2002), pp. 61

earned. They are used to estimate the rates of return that are expected in the future, or ex-ante rates of return. Estimation of firm's cost of equity for capital budgeting decisions can be considered as the other use of rate of returns[6].

The purchase of assets with an aim to achieve a return in a certain time is considered to be the basic investment strategy. The expected return is calculated as a weighted average of the possible returns, while the weights correspond to the probabilities[7]:

$$Expected\ return = E[R] = \Sigma_R\, p_R * R,$$

P_R represents the probability that each possible return R will occur.

The actual returns mostly differ from expected ones and this difference is assumed to be a seed of risk. Investors can reach various outcomes and the spread of them around the expected return is usually measured by variance or standard deviation of the distribution. The skewness of the distribution represents the bias toward negative or positive return. In case of normal distribution of returns, there is no need to worry about skewness as the normal distribution is symmetric. The variance is defined as an expected squared deviation from the mean and the standard deviation as a square root of the variance[8]:

$$Var(R) = E\left[(R - E[R])^2\right] = \Sigma_R\, p_R * (R - E[R])^2,$$

$$SD(R) = \sqrt{Var(R)}.$$

If case of riskless return, the variance is zero as it does not deviate from its mean. Otherwise, the variance increases when the deviations from the mean are growing. In financial terms the standard deviation is often called volatility and is easier to interpret it in comparison to the variance because it is in the same units as the returns themselves.

If the investor faces two investments that have the same standard deviation but different returns, since he is rational he chooses the one with the higher expected return. Expected returns and variances are mostly estimated by application of past rather than future returns.

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[6] LEVY, H. and POST, T (2005), pp.161
[7] BERK, J. and DeMARZO, P. (2007), pp. 286
[8] BERK, J. and DeMARZO, P. (2007), pp. 287

2.1.2.2. Capital Asset Pricing Model

Two main returns related to the systematic risk are known. Return on Treasury bills is fixed, it is not affected by transactions on the market and therefore it is rated as the least risky investment with beta[9] of 0. On the other hand, market portfolio of common stocks is considered to be the riskiest investment with beta of 1. In reality, all investors demand higher return than from the Treasury bill.

Sharpe (1964), Lintner (1965) and Mossin (1966) developed a model implying that the total risk of security consists of systematic (market) and unsystematic (individual) risk.[10] The first one, Sharpe, described the model including following assumptions[11]:

- investors are risk averse;
- the existence of identical time horizons and identical return expectations for each individual security (impossible in reality);
- the possibility to lend or borrow at the riskless rate of interest;
- no taxes or transactional costs;
- the desire of investors to hold efficient portfolios presents their rationality.

A great amount of investors limit a diversification by holding a few assets. The particular reasons for this behavior are as follows:

- a small portfolio is enough to reach the most of the benefits of diversification;[12]
- the quest to find the undervalued assets creates the displeasure to hold the assets that are supposed to be overvalued.

On the other hand, CAPM assumes the equal access to information for everybody and due to this fact investors should not be able to find under or overvalued assets in the market. Other assumptions are that all assets are traded and the investments are infinitely divisible. Portfolios of the investors will have identical weights on risky assets and will

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[9] The coefficient beta measures systematic risk of the stock. The term will be explained later.
[10] SUK, H.K. and SEUNG, H.K. (2006), pp. 547
[11] FIRTH, M. (1977), pp. 88
[12] The more diversified the portfolio is, the smaller marginal benefits of diversification are. Thus, the marginal costs of diversification (transactions and monitoring costs) could not be covered.
See: DAMODARAN(2002), pp. 93

include every traded (stocks and bonds) and untraded (private companies and human capital) asset in the market and this is the reason one call it the market portfolio[13].

The model uses the existence of risk-free asset and gives it into a connection with analyzed portfolio and the market portfolio. Two lines are distinguished within the model.

Capital Market Line

The main principles of the CML are the maximization of expected returns, minimization of the risk of return, the amount of efficient portfolios created exclusively by risk portfolios and there is only one type of risk-free asset on the market.

The expected return of the portfolio is given by following expression[14]:

$$E(r_p) = r_f + [E(r_m) - r_f] * \frac{\sigma}{\sigma_m},$$

where $E(r_p)$ is expected return on portfolio, r_f is risk-free interest rate, $E(r_m)$ represents expected return on the market portfolio, σ is standard deviation of returns on efficient portfolio and σ_m represents standard deviation of returns on the market portfolio. The next picture reflects the above mentioned formula.

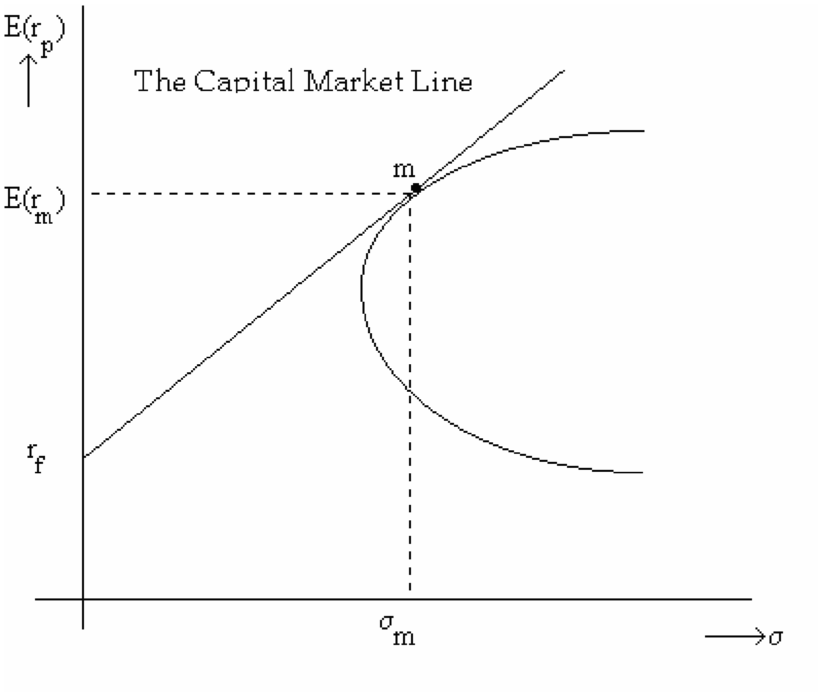
The point *m* represents the market portfolio as the optimal combination of all risky securities. In equilibrium all securities will be included in portfolio *m* in proportion to their market values. The curved line in a picture is known as an efficient frontier[15] (first mentioned by Markowitz (1952)) and represents the collection of all efficient portfolios.

[13] Thanks to unobservability of the market portfolio, a proxy is necessary. The S&P500 is considered to be the most common agent for U.S. stocks. MSCI Europe Index or the MSCI World Index is used as a proxy outside the U.S. These well-diversified indexes are highly correlated and thus, the choice of index can have small effect on beta. Literatures warn not to use a local market index. When measuring beta versus local index, not the market-wide systematic risk is measured but company's sensitivity to a particular industry.
See: KOLLER, T. and GOEDHART, M. and WESSELS, D. (2005), pp. 310

[14] FIRTH, M. (1977), pp. 90

[15] The CML uses standard deviation instead of beta to measure a risk. Portfolio theory assumes that rational investor would choose the portfolio with the greatest return. As long as the portfolios can have the same return, a rational investor would choose the portfolio with the lowest standard deviation for a specified level of return. The portfolio is efficient if there is no other portfolio that has the same standard deviation with a greater return and n portfolio that has the same return with a lesser standard deviation.
See: http://www-fp.mcs.anl.gov/otc/Guide/CaseStudies/port/efrontier.html (10.01.2009)

Figure 1: The Capital Market Line (CML)



The core from the understanding of the line is that the relationship between the expected returns on individual securities or inefficient portfolios and their standard deviations is not described.

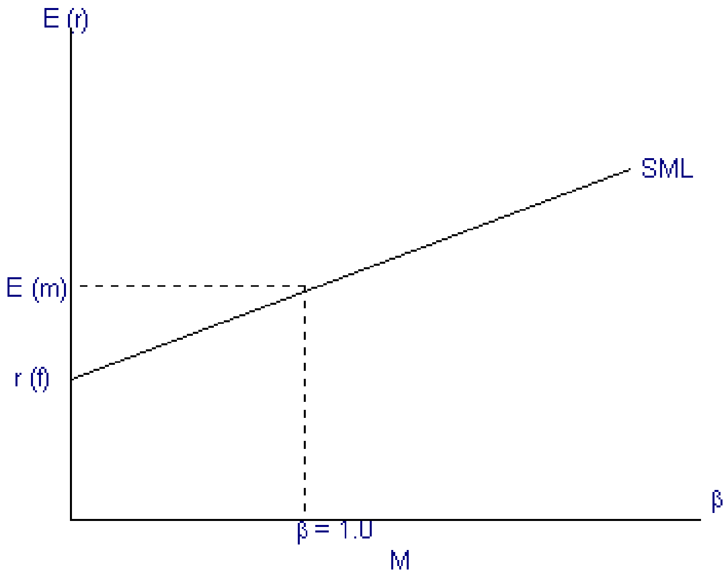
Security Market Line

Market risk premium is defined as a difference between the return on the market and the interest rate[16]. As an illustration, the following graph is used.

Treasury bills have a beta of 0; their risk premium is also 0. The market portfolio has a beta of 1; its risk premium is $E(r_m) - r_f$. These two criteria beg the question of the expected risk premium when beta is neither 0 nor 1.

[16] Since 1990 the market risk premium has been in average 7,6% a year.
See: BREALEY, R.A., and MYERS, S.C. and ALLEN, F. (2008), p. 214

Figure 2: The Security Market Line (SML)



Capital asset pricing model asserts that in a competitive market the expected risk premium varies in proportions to beta. According to this claim, all investments in a graph have to plot along the sloping line, known as a security market line (SML).

The relationship between expected risk premium on the stock and expected risk premium on the market can be written as[17]:

$$E(r_i) - r_f = \beta * \lfloor E(r_m) - r_f \rfloor,$$

where $E(r_i)$ represents expected return on security i, r_f represents risk-free interest rate and $E(r_m)$ expected return on the market portfolio. ß is used as a statistical measure of systematic[18] risk. The risk-free rate and market risk premium are common to all companies and only beta is different for the companies. In the CAPM beta catch the whole market risk that is measured relative to a market portfolio.

Three inputs should be used for the application of the CAPM. They are assessed as[19]:

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[17] KOLLER, T. and GOEDHART, M. and WESSELS, D. (2005), pp. 294

[18] The definition of systematic risk states, that it captures the uncertainty of the return distribution as far as it relates to an economy-wide benchmark variable.
See: KÜLPMANN, M. (2002), pp. 52

[19] DAMODARAN (2002)

• the investor knows the expected return of riskless asset with assurance for the entire period of analysis;

• the investor demands the risk premium to invest in the market portfolio instead of investing in a riskless asset;

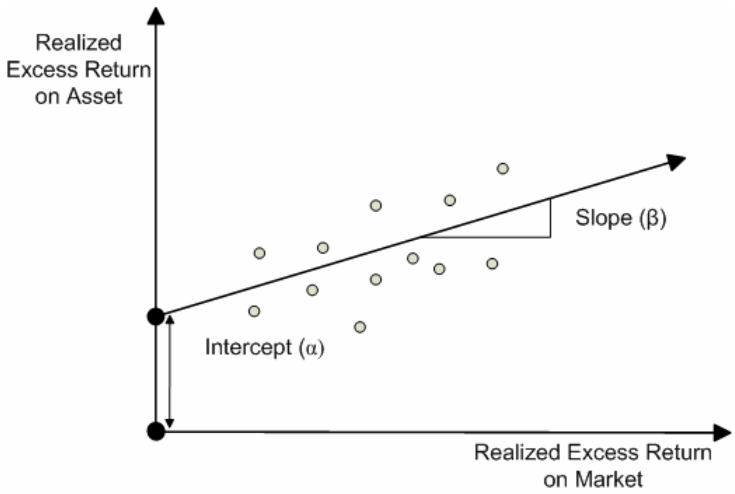
• beta measures the risk included by an investment to the market portfolio.

In praxis, the linear regression is used to estimate beta in the security market line[20]:

$$r - r_f = \alpha + \beta * (r_m - r_f) + \varepsilon$$

Beta is the ratio of the covariance to the variance of the market return, alpha is the intercept that is implied to be zero within the CAPM.

Figure 3: Regression line represented by slope beta



Picture shows beta as the regression slope; epsilon as the error in the regression presents the distance from the line (predicted) to each point on this graph (actual). The risk of the analyzed portfolio in relation to the market portfolio is bigger when the beta is above one. In comparison, the risk is lesser when the beta is smaller than one.[21] The intercept alpha specifies the overvaluation or undervaluation rate of the security. It is the rate of

[20] http://www.duke.edu/~charvey/Classes/ba350/riskman/riskman.htm (13.01.2009)
[21] Well-established and large companies like energy corporations expose to a relatively stable demand for their products.
See: OBERNDORFER, U. (2008), pp. 3

market imbalance and indicator if the assets are properly valued. On the chance that alpha is bigger than zero, the security is undervalued; lower than zero – overvalued and if alpha equals zero, the security is valued correctly[22].

2.1.2.3. Alternatives to the CAPM

The restrictive assumptions on transactional costs, private information in the CAPM and the dependence on the market portfolio were the main reasons why many of academics have been searching for other asset pricing model.

Arbitrage pricing model

Founded by Ross (1976), the arbitrage pricing model (APT) uses another basis to measure a risk. The fundamental hypothesis of the model lies in taking advantages of arbitrage opportunities[23] by investors with the successive elimination. Let's assume two portfolios having the same revelation to risk offering different expected returns. Under given circumstances, investors will buy the portfolio disposing higher expected returns, sell the portfolio that have lower expected returns and gain the difference as a riskless profit. Two portfolios have to earn the same expected return to prevent arbitrage from occurring.

The CAPM predicts that the rates of return on the asset are linearly related to the rate of return on the market portfolio. The APT assumes the rate of return on any security to be a linear function of *k* factors[24]:

$$\tilde{R}_i = E(\tilde{R}_i) + b_{i1}\tilde{F}_1 + \ldots + b_{ik}\tilde{F}_k + \tilde{\varepsilon}_i,$$

where $\tilde{R}_i$ represents the random rate of return on the *i*th asset, $E(\tilde{R}_i)$ represents the expected rate of return on the *i*th asset, b_{ik} is the sensitivity of the *i*th asset's returns to the *k*th factor, $\tilde{F}_k$ is the mean zero *k*th factor common to the returns of all assets under consideration and $\tilde{\varepsilon}_i$ is meant as a random zero mean noise term for the *i*th asset.

[22] http://www.fem.uniag.sk/Martina.Majorova/files/kvantitativny_manazment.doc (13.01.2009)
[23] In this case, the riskless investment and earning more than the riskless rate are meant under the term arbitrage opportunity.
See: DAMODARAN, A. (2002), pp. 97
[24] COPELAND, T.E. and WESTON, J.F. (1988), pp. 219

This theory does not reflect on the origin of the factors[25], the return on the market portfolio might or might not serve as one factor. Each stock has two sources of the risk:

- risk stemming from the pervasive factors that cannot be eliminated by diversification
- risk arising from feasible events that are unique to the company and can be eliminated by diversification

By stock operations, investors can ignore the unique risk and therefore the expected risk premium on stock is affected only by factor or macroeconomic risk. According to arbitrage pricing theory, the expected risk premium on a stock depends on the expected risk premium associated with each factor and the sensitivity of the stock to each of the factors[26].

To conclude, both CAPM and APM make divergences of firm-specific and market-wide risk as they measure the market risk differently. According to the CAPM, market risk is captured in the market portfolio; the APM allows for multiple sources of market-wide risk and measures of sensitivity of investments the change in every source[27]. One can think of the factors in APM as special stock portfolios that tend to be subject to a common influence. In case that the expected risk premium on each of these portfolios is proportional to the portfolio's market beta, the APM and CAPM will offer the same solution[28].

Fama-French Three -Factor Model

The Journal of Finance[29] brought an assertion made by Fama and French (1992) concerning relationship between betas and returns. This relationship was examined between 1963 and 1990 with a conclusion that average stock returns are not positively related to market betas. According to their research, equity returns are inversely proportional to the

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[25] The factor can be as oil price as interest rate, and so on. Some stocks are more sensitive to some certain factors than the others. As an example is given Exxon Mobil that would be more sensitive to an oil factor, than, e.g. Coca-Cola. If the factor 1 notices unexpected changes in oil prices, b_{i1} will be higher for Exxon Mobile.
See: BREALEY, R.A., and MYERS, S.C. and ALLEN, F. (2008), pp. 224
[26] BREALEY, R.A., and MYERS, S.C. and ALLEN, F. (2008), pp. 224
[27] DAMODARAN, A. (2002), pp. 98
[28] BREALEY, R.A., and MYERS, S.C. and ALLEN, F. (2008), pp. 225
[29] *Journal of Finance*, June 1992, pp. 427-465

size of a company and positively related to the ratio of a book value of a company to its market value of equity[30].

On the basis of given empirical results, the risk begun to be measured with a model known as the Fama-French three-factor model. The main point lies in three facts[31]: the excess returns of the stock are regressed on excess market returns, the excess returns of small stocks over big stocks and the excess returns of high book-to-market stocks over low book-to-market stocks[32]. The risk premium is determined by a regression on the second and on the third mentioned excess and this is the reason, why small companies do not receive a premium. On the other hand, companies receive risk premium if their stock returns are correlated with those of small stocks or high book-to-market companies.

There was much debate about it within next years. Amihud, Christensen and Mandelson (1992) performed other statistical tests using the same data and drew a conclusion that differences in betas explained differences in returns for this time period. One year later, Chan and Lakonishok (1993) took into consideration longer time series of returns (1926-1991) and discovered the failure of positive relationship between betas and returns and returns only in the period after 1982. The third debate was done by Kothari and Shanken (1995) who used annual data instead of short intervals to estimate betas. Their outcome was that betas explain a significant proportion of the differences in returns across investments[33].

2.1.3. Cost of Debt

Generally, the cost of debt is counted as weighted average of effective interest rates that are paid from various types of liabilities. The effective interest rate is expressed as[34]:

$$D = \sum_{t=1}^{n} \frac{U_t(1-t) + S_t}{(1+i)^t}$$

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[30] KOLLER, T. and GOEDHART, M. and WESSELS, D. (2005), pp. 315

[31] KOLLER, T. and GOEDHART, M. and WESSELS, D. (2005), pp. 316

[32] The whole description of the factor returns is a bit wordy and is not the subject of the thesis. The complete problem is described in FAMA, E. and FRENCH, K. (1993), pp. 3-56

[33] DAMODARAN, A. (2002), pp. 104

[34] *D* means net cash gained through loan, U_t are interest payments, S_t is loan repayment for a given period, *i* is demanded interest rate, for which the equation is fulfilled and which expresses the effective interest
See: MAŘÍK, M. & co. (2003), pp. 178

This calculation is usable just in case of fixed debt interests and in the situation when the amount of money obtained through loan is equal to the present market value of a debt. Therefore, this debt expression is possible to use only when a solvent company is being priced or the loan was accepted recently and reflects the present conditions.

More useful is to estimate the cost of debt with alternative method based on market data. Yield to maturity can be estimated with the rating of assessing obligation. In praxis, the concrete company's debt should be assigned to such market obligations that are burdened with the similar risk[35].

2.2. Valuation Methods

2.2.1. Discounted Cash Flow Model

The discounted cash flow principle states that the internal value of any asset is expressed as the present value of all its expected future cash flows to the investor that are discounted at the proper risk-adjusted discount rate[36]. Generally, this can be shown as:

$$P_0 = \sum_{t=1}^{\infty} \frac{CF_t}{(1+r)^t}$$

The DCF model for any asset is the same as is used to value a stock; however, analysts discount cash flows of the return that can be earned in the capital market concerning with the same risky securities.

The stock owners expect two kinds of cash flows as a consequent upon their stock means: cash dividends and capital gains and losses. In this instance, the expected return of the share over the next year is as follows:

$$r = \frac{Div_1 + P_1 - P_0}{P_0} \quad \Rightarrow \quad P_0 = \frac{Div_1 + P_1}{1+r}$$

Expected return of the stock in one year is expressed as a sum of expected dividend per share plus the expected price appreciation $P_1 - P_0$ divided by the original price. After

[35] The whole process of rating determination is described in MAŘÍK, M. & co. (2003), pp. 179-180
[36] LEVY, H. and POST, T. (2005), pp. 493

mathematical modification and in case of dividend, price and expected return forecast, the subsequent formula shows that today's price can be also predicted. Coefficient r acts as a discount rate that is called market capitalization rate or equity cost of capital. It is defined as the expected return on the other securities wit the same risk[37].

On the basis of today's stock price determination analysts are able to look into the future by using the general formula, and e.g. supposing that the final period is H:

$$P_0 = \frac{Div_1}{(1+r)} + \frac{Div_2}{(1+r)^2} + ... + \frac{Div_H + P_H}{(1+r)^H} = \sum_{t=1}^{H} \frac{Div_t}{(1+r)^t} + \frac{P_H}{(1+r)^H}$$

Assuming that H limits to the infinity, the present value of the terminal price should approach zero. The outcome is complete skip of the terminal price and the expression of today's price as the present value of a perpetual stream of cash dividends[38]:

$$P_0 = \sum_{t=1}^{\infty} \frac{Div_t}{(1+r)^t}$$

Although it seems now, that this DCF formula does not take capital gains into consideration, it was shown that the formula was derived from assumption that price is determined not only by expected dividends but also by capital gains.

It seems like very useful method of valuation, however it is not recommended to use it in several cases, particularly when[39]: it is a cyclical firm; the firm is in trouble; with unutilized assets; with patents or product options; involved in acquisitions; in the process of restructuring or it is a private firm. The model requires firms with assets that generate cash flows which can be forecasted with no troubles. The abovementioned firms have either negative cash flows or tend to follow economy.

DCF models can work with different cash flows, mostly with: DCF Entity (free cash flow to the firm FCFF) is meant as free cash flow to owners and creditors, DCF Equity (free cash flow to the equity FCFE) as a cash flow to owners, DDM (dividend discount model) – a special cash flow for stockholders is a dividend and EVA® presents the cash flow that exceeds the opportunity costs of stockholders and therefore assigns a growth of their fortune.

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[37] BREALEY, R.A., and MYERS, S.C. and ALLEN, F. (2008), pp. 88-89
[38] BREALEY, R.A., and MYERS, S.C. and ALLEN, F. (2008), pp. 90-91
[39] DAMODARAN, A. (2002): pp. 17-20

2.2.2. DCF Entity

FCFF presents the sum of cash flows to all claim holders who can use it without the threat of weakening the economic situation of the firm. The simplest way to reach this free cash flow is to compute cash flows according to the following formula[40]:

$$FCFF = EBIT(1 - tax\,rate) + Depreciation - Capital\,Expenditure - \Delta Working\,Capital$$

This cash flow is prior to debt payments and does not incorporate any of tax benefits due to interest payments.

The value of the firm that is predicted to grow at a sustain rate in perpetuity, a stable growth rate, is valued using the formula expressing the stable growth model:

$$Value\,of\ the\ firm = \frac{FCFF_1}{WACC - g_n},$$

where $FCFF_1$ expresses expected next year's FCFF and g_n the growth rate in he FCFF to infinity. Two conditions have to be fulfilled when using this model: growth rate has to be lower than or equal to the growth rate in economy and firm's characteristics have to be in accord with assumptions of stable growth.

In general case, the value of the firm can be estimated as the present value of the future FCFF[41]:

$$Value\,of\ the\ firm = \sum_{t=1}^{t=\infty} \frac{FCFF_t}{(1 + WACC)^t}$$

Let's imagine the situation when the firm achieves a steady state in few years and from this moment it starts to grow at a stable rate g_n.

$$Value\,of\ the\ firm = \sum_{t=1}^{t=n} \frac{FCFF_t}{(1 + WACC)^t} + \frac{[FCFF_{n+1} / (WACC - g_n)]}{(1 + WACC)^n}$$

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[40] http://www.it.nccu.edu.tw/faculty/lkhu/%E5%9C%8B%E9%9A%9B%E8%B2%A1%E7%AE%A1_%E7%A2%A9/Donald/Chapter_7_Primer_on_Cash_Flow_Valuation.ppt (01.02.2009)
DAMODARAN, A. (2002), pp. 383
[41] DAMODARAN, A. (2002), pp. 385-390

The FCFF approach is better used for firms that have distinction of high leverage or are in a process of changing their leverage. To use the FCFE approach in these cases will be a little bit difficult because of volatility caused by debt payments and the value of equity that is more sensitive to assumptions about growth and a risk. The advantage of using FCFF instead of FCFE is that cash flows relating to debt do not have an urge to be considered explicitly. The FCFF is a pre-debt cash flow; FCFE takes the debt into account[42].

2.2.3. DCF Equity

FCFE represents a model which discounts potential rather than actual dividends. The three versions of this model are simplified versions of DDM that vary in replacing dividends. Next formula shows how to achieve the free cash flow to equity:

$$FCFE = Net\ Income - (Capital\ Expenditures - Depreciation)(1-\delta) - \\ - (\Delta Working\ Capital)(1-\delta)$$

The difference between capital expenditures and depreciation is known as net capital expenditures; δ is a proportion of those net capital expenditures and working capital changes and is raised from debt financing[43]. Therefore, the FCFE is a cash flow that remains after adjusting for interest payments, debt issuance and debt repayment[44].

The constant growth FCFE model values firms that grow at a stable rate and the value of equity expresses as the function of expected FCFE, the stable growth rate and the required rate of return[45]:

$$P_0 = \frac{FCFE_1}{k_e - g_n},$$

where P_0 represents the value of today's stock, $FCFE_1$ is the expected FCFE for the next year, k_e is the cost of equity of the firm and g_n is the growth rate in FCFE for the firm

[42] DAMODARAN, A. (2002), pp. 407
[43] DAMODARAN, A. (2002), pp. 351-353, http://www.investopedia.com/terms/f/freecashflowtoequity.asp (01.02.2009)
[44] BERK, J. and DeMARZO, P. (2007), pp. 586
[45] DAMODARAN, A. (2002), pp. 364

forever. The growth rate has to be reasonable and since it is stable, it cannot surpass the growth rate of whole economy by more than one or two percent.

In case of stableness and when the firm pays out FCFE as dividend, the value of equity will be the same as was obtained from Gordon growth model.

The two-stage FCFE model values firms with expected growth during the initial period and stable continuation after that. The present value of a stock is expressed as follows[46]:

$$P_0 = \sum \frac{FCFE_t}{(1+k_e)^t} + \frac{P_n}{(1+k_e)^n} \quad and \quad P_n = \frac{FCFE_{n+1}}{k_e - g_n},$$

where P_n is price at the end of extraordinary growth period, $FCFE_t$ the free cash flow to equity in year t and g_n the growth rate after the terminal year forever.

The model is very similar to two-stage dividend growth model in matters of the initial and the next stable period, it differs in use of FCFE rather than dividends.

The three-stage FCFE model, called also the E-model, values firms with expected high growth rates during the initial period, the declining growth rate during the transitional period followed by steady state period[47]:

$$P_0 = \sum_{t=1}^{t=n1} \frac{FCFE_t}{(1+k_{e,hg})^t} + \sum_{t=n1+1}^{t=n2} \frac{FCFE_t}{(1+k_{e,t})^t} + \frac{P_{n2}}{(1+k_{e,st})^n} \quad and \quad P_{n2} = \frac{FCFE_{n2+1}}{r - g_n},$$

where P_{n2} represents the terminal price at the end of transitional period, $n1$ the end of initial high growth period, $n2$ the end of transition period and k_e expresses the cost of equity in high growth (hg) and stable growth (st) period.

Again, the model is very similar to the three-stage dividend discount model, however uses FCFE instead of dividends.

To conclude, the main difference between dividend discount models and free cash flow to equity models consists in diverse definition of cash flow. DDM uses expected

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[46] DAMODARAN, A. (2002), pp. 370
[47] DAMODARAN, A. (2002), pp. 379

dividends on the stock to the contrary with FCFE model that uses residual cash flow after meeting all financial obligations. The values of these models will vary in case the FCFE is different from those dividends[48].

2.2.4. Adjusted Present Value

The APV method is an alternative valuation method based on determination of a leveraged value V^L that is computed by using its unleveraged value V^U and taking the value of the interest tax shield and any costs rising from other market imperfections into account[49]:

$$V^L = APV = V^U + PV(Interest\,Tax\,Shield) -$$
$$- PV(Financial\,Distress, Agency\,and\,Issuance\,Costs)$$

The APV is especially used when the project's debt is tied to book value. Kaplan and Ruback (1995) used APV method for analysis of prices that were paid for a sample of leverage buyouts[50]. Cash flows were projected after tax, however without any interest tax shield which were valued separately and added to all-equity value[51]. The result was the APV valuation for a company.

In comparison to WACC, the APV method is more complicated because, as was just mentioned, two separate valuations, the unleveraged project and the interest tax shield, have to be computed. To compute the APV one has to know the debt level; when the debt-equity ratio is constant, the project's value has to be known to compute the debt level. If there are other size affects, it is more appropriate to use the APV method rather than the WACC method. In general, the capital investment project is worthwhile if the APV is positive.

[48] DAMODARAN, A. (2002), pp. 394
[49] BERK, J. and DeMARZO, P. (2007), pp. 581-582
[50] BREALEY, R.A., and MYERS, S.C. and ALLEN, F. (2008), pp. 549
[51] Kaplan and Ruback used the same discount rate for all cash flows, including interest tax shields; the method is known as "compressed APV" method.
See: BERK, J. and DeMARZO, P. (2007), pp. 584

2.2.5. Economic Value Added

Although it was Alfred Marshall[52] who first used the term of economic profit more than a century ago, it became popular thanks to the consulting firm *Stern Stewart & Co.*, specializing itself in increasing firm's efficiency. The firm named the concept as an economic value added (EVA®) and registered the acronym as a trademark.

EVA® represents an economic profit that is made by firm after all costs are covered, all capital costs included (equity and liabilities). It is expressed as[53]:

$$EVA^{®} = NOPAT – WACC*C$$

NOPAT implies a net operating profit after taxes and C is capital bound in assets that are used within the main activity at the beginning of the valued period.

The EVA® indicator shows the value of the firm that is made by its activities and examines if this value is higher than the value likely gained by the capital that would be invested into the firm under the terms of another investment opportunity with the same risk. In comparison to the capital profitability, EVA® has essential divergences:

- it stems from economic profit and contains alternative costs of invested capital;
- it includes only gains and costs related to the main activity;
- when counting the cost of capital, only those capital is taken into consideration that is bound in assets used in main activity of the company.

One of the qualities is its basis in many of the same concepts underlying the NPV calculations. It suits the theory, that there is a great possibility of the increase of firm's value if managers accept projects with a positive NPV. At the same time it works as a tool to measure the firm performance, employees' motivation and company and investment projects valuations[54].

EVA® uses accounting information; entry profit and investment capital data quantification demands many amendments of accounting quantities. This is considered to

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[52] According to Marshall, the economic profit comprised the rest of the owner's gains after the interest on his capital at the current rate was deducted. The value created by a company has to take into account both, expense recorded to its accounting records and the opportunity cost of capital exploited in the business.
See: KOLLER, T. and GOEDHART, M. and WESSELS, D. (2005), pp. 63, citation from: Marshall, A.: "Principles of Economics," vol.1 (New York: MacMillan &Co., 1890):142

[53] http://www.fem.uniag.sk/cvicenia/ke/bielik/Ekonomika%20podnikov/1.prednaska.ppt (22.01.2009)

[54] BERK, J. and DeMARZO, P. (2007), pp. 156-158

be the main disadvantage of EVA®. The other one is that the calculation of equity cost of capital does not give a univocal result even when using a lot of models. As long as the growth of EVA® indicator is attended by the increase of costs of capital, the value of the firm can drop in spite of the current EVA® increase. EVA® indicates the value of gains and costs today, but does not include expected assets in the future[55].

2.2.6. Dividend Discount Model

The expectation of dividends during the holding period and an expected price at the end count among main arguments why investor buys a stock. The expected price is determined by future dividends, thus the price of the stock equals to the present value of the expected future dividends it will pay[56]:

$$P_0 = \frac{Div_1}{1+k_e} + \frac{Div_2}{(1+k_e)^2} + \frac{Div_3}{(1+k_e)^3} + \ldots = \sum_{n=1}^{\infty} \frac{Div_n}{(1+k_e)^n},$$

where k_e represents cost of equity, Div is expected dividend pre share and P_0 is value per share of the stock.

Dividend presumptions cannot be made through infinity and on this ground few dividend discount models have been developed.

Gordon Growth Model

The simplest model forecasting the value of stock in a stable-growth firm in which dividends grow at a rate that can be sustained forever[57]:

$$P_0 = \frac{Div_1}{k_e - g}$$

The constant dividend growth model assumes that the stock price is equal to the next year's dividend divided by the difference between equity cost of capital (k_e) and the expected dividend growth rate in perpetuity (*g*)[58]. Some assumptions are needed to run the

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55 http://www.fem.uniag.sk/cvicenia/ke/bielik/Ekonomika%20podnikov/1.prednaska.ppt (22.01.2009) DOLLIVER, B.K. (1998), pp. 46
56 BERK, J. and DeMARZO, P. (2007), pp. 249
57 BERK, J. and DeMARZO, P. (2007), pp. 249
58 DOLLIVER, B.K. (1998), pp. 23

model[59]: the only source of financing is represented by retained earnings, the company has perpetual life with constant rate of return and the cost of capital is greater than growth rate[60]. A crucial question should be posed – which growth rate is proper to be a "stable" growth rate? It has to be less than or equal to the growth rate of the economy in which the firm operates. However, analysts often do not agree with this argument for several reasons. Firstly, each analyst has his own point of view on estimations of expected inflation and real growth in economy. For example, analyst with higher expectation of inflation in the long term can suggest a higher nominal growth rate in the economy. Secondly, firms can become smaller over time in relation to the economy if their growth of rate is lesser than that of the economy. Third, the sensitivity to the growth model indicates that the stable growth rate cannot be more than 1% or 2% above the growth rate in economy. In case of larger difference, analysts are supposed to use two-stage or three-stage growth model[61]. Multistage growth models take into consideration the fact that firms may grow at different growth rates during their lifecycles.

Two-stage Dividend Discount Model

The two-stage growth model is primary meant to value a stock with two stages of dividend growth. The growth rate in an initial phase is not stable and in most cases is higher than the stable one. The further period has a distinction of steady state and the growth rate is expected to be stable for the long term[62].

$$P_0 = \sum_{t=1}^{t=n} \frac{Div_t}{(1+k_{e,hg})^t} + \frac{P_n}{(1+k_{e,hg})^n}, \text{ where } P_n = \frac{Div_{n+1}}{k_{e,st} - g_n}$$

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[59] http://www.rocw.raifoundation.org/management/mba/CorporateRestructuring/Lecture_Notes/lecture-26.pdf (26.01.2009)

[60] If the cost of capital is lower than growth rate, the implication of Gordon Growth Model will be impossible, because stock dividends are not able to grow at this level forever.
See: BERK, J. and DeMARZO, P. (2007), pp. 249

[61] DAMODARAN, A. (2002), pp. 323-324 and DOLLIVER, B.K. (1998), pp. 23

[62] Where: Div_t = expected dividend per share in year t, P_n = price at the end of year n, k_e = equity cost of capital; "hg" represents high growth period and "st" stable growth period, g = extraordinary growth rate for the first n years, g_n = steady growth rate forever after year n
See: DAMODARAN, A. (2002), pp. 330-331; LEVY, H. and POST, T. (2005), pp. 508-509

No model is perfect and also this one has some imperfections[63]. The first problem lies in specifying the length of extraordinary growth period, typical for the initial phase. After this period, the growth rate is expected to decrease to a stable level. As this period is made longer, the value of an investment will increase. Another problem deals with a hypothesis that the growth rate is high during initial period and becomes lower stable rate overnight at the end of the period. It is much more realistic that the shift from high to lower growth rate happens gradually over time than the sudden overnight leap, although it can happen. The third problem refers to skewed estimates of the value for firms that do not pay out what they can afford in dividends.

The H Model for valuing Growth

Presented by Fuller and Hsia (1984), this two-stage model is not constant in the initial growth phase in comparison to the classical one but declines linearly over time to the stable growth in a steady phase.

The basic assumption states that the earnings growth rate starts at a high initial rate and declines linearly over the extraordinary growth period to a stable growth rate. Dividend payout and equity cost of capital are constant over time and the shifting growth rates do not have any influence on them. The value of expected dividends can be expressed as[64]:

$$P_0 = \frac{Div_0 * (1 + g_n)}{(k_e - g_n)} + \frac{Div_0 * H * (g_a - g_n)}{(k_e - g_n)}$$

The model defines a certain structure of growth rate drop. It falls in linear increment every year based upon the initial and stable growth rate and the length of extraordinary growth phase. Small deviations from this speculation do not affect the value significantly but the large can cause problem[65].

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63 DAMODARAN, A. (2002), pp. 330-331

64 Where: P_0 = value of the firm per share in the present time, Div_t = dividend in year t, g_a = grow rate initially, g_n = grow rate at the end of 2H years, applies forever afterwards

See: DAMODARAN, A. (2002), pp. 342-343

65 DAMODARAN, A. (2002), pp. 343; HITCHNER, J.R. (2002), pp. 111

Three-stage Dividend Discount Model

This model stands on the basis of the fact that a great amount of firms evolve through three stages: growth, transition and maturity. The initial period is assumed to have a stable high growth, second period declining growth and the third period is supposed to remain in stable low growth to infinity.[66].

$$P_0 = \sum_{t=1}^{t=n1} \frac{EPS_0 * (1+g_a)^t * \Pi_a}{(1+k_{e,hg})^t} + \sum_{t=n1+1}^{t=n2} \frac{Div_t}{(1+k_{e,t})^t} + \frac{EPS_{n2} * (1+g_n) * \Pi_n}{(k_{e,st} - g_n)(1+r)^n}$$

The value of the stock can be expressed as the present value of expected dividends during the first and second phases and of the terminal price at the beginning of the final stable growth phase.

The huge plus of this model is that it removes many constraints imposed by other dividend discount models. On the other hand, it requires a larger number of inputs and the errors of these inputs, where there is substantial noise in the estimation process, can overwhelm any benefits that accrue from additional flexibility[67].

2.2.7. Relative Valuation

Price-earning ratio (P/E) is one of the most common used relative valuation techniques. It measures the price which is investor prepared to pay for each monetary unit of earnings and is computed as the ratio of current stock price to the current year's annual earnings per share[68]:

$$P/E = \frac{P_0}{EPS_0}$$

The ratio serves as a demonstration of stock attractiveness. If the stock price is low relative to the EPS, investors can expect high rate of return and therefore relatively high dividends. Due to this fact, P/E ratio is often compared to DDM as its simplified version.

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[66] Where: EPS_t = earnings per share in year t, Div_t = Dividends per share in year t, g_a = growth rate in high growth phase (lasts n1 periods), g_n = growth rate in stable phase, Π_a = payout ratio in high growth phase, Π_n = payout ratio in stable growth phase, k_e = equity cost of capital; "hg" represents high growth period, "t" transition and "st" stable growth period
See: DAMODARAN, A. (2002), pp. 344-345; LEVY, H. and POST, T. (2005), pp. 509-511

[67] DAMODARAN, A. (2002), pp. 346

[68] BREALEY, R.A., and MYERS, S.C. and ALLEN, F. (2008), pp. 798

It is difficult to use P/E ratio without any uncertainties when EPS is declining or negative because of early periods of its lifecycle. More effective is to evaluate stable companies in the late growth, although it is not the most valid valuation measure. The problem grounds in P/E that is reciprocal of the expected return. Here, the expected return ignores the risk and thus he P/E should measure only differences in risk between the stocks. The higher the risk of the asset the higher the expected return and hence the P/E ratio is lower. Similarly, the less risky assets will tend to have higher P/E ratio. Since the ratio is generally computed using the current year's annual EPS, there is a need of carefulness when comparing ratios from different period[69].

3. Empirical Results

After being more familiar with the basic concepts and methods of company valuation, it is possible to proceed to the main, empirical part of this thesis. The key task at the beginning of my research was to find out, which of the previously mentioned pricing methods[70] give the most approximate picture of real market stock values[71]. In order to overcome the problem of insufficiency of reliable data sources, I focused on a sample of big companies traded on Prague Stock Exchange during years 2005-2007, which are due to legal regulations obliged to publish their main financial statements regularly, namely CEZ, Erste Bank, Zentiva N.V., Unipetrol and Philip Morris, ORCO, Komercni Banka, CETV and Telefonica. The annual balance sheet, profit and loss statement and cash-flow statement served as a base for information that was used as main inputs to used valuation models.

3.1. Assessment of the Pricing Methods

After close study of various pricing methods, I decided to use DCF entity (FCFF given and FCFF estimated), DCF equity (FCFE) and EVA models. The reason for the selection of these specific set of methods raised from the fact, that APV, DDM and P/E

[69] LEVY, H. and POST, T. (2005), pp. 518-521; DOLLIVER, B.K. (1998), pp. 23
[70] For the purposes of this thesis, I use the terms Pricing and Valuation as synonyms
[71] By talking about market, I refer here to the main companies whose stocks are publicly traded at the Prague Stock Exchange

ratio methods weren't feasible for all of my selected companies mainly because not all of them issued dividends, as one of the main incomes to the last three mentioned models.

3.1.1. FCFF methods

Before the start of FCFF pricing itself, I had to build WACC model, as its results serve as the input to other calculations as described in more detail in Chapter 2. After clarifying risk free rate[72], risk premium[73] and beta[74], for each year 2005-2007, I was able to calculate CAPM model as a prerequisite into WACC calculations. Thereby I set the ground for one of the methods, DCF entity.

The first used valuation method was DCF entity. The way how to compute the free cash flow to the firm has already been described in the chapter 3.1.1. of this work. When determining the value of the firm using DCF entity method, the first step is to calculate the future values of FCFF, which is usually being realized through following three techniques[75]:

- firstly, the historical cash flow data can be used as a base for the future. In this case it is standard to take the average of free cash flows from the past three years and use it as the expected free cash flow for the next five years. Further on, in order to take into account different possible scenarios, optimistic, realistic, and pessimistic, I used zero, two and five percent as respective growth rates for the ensuing computations of all values. The result containing two-percent growth rate served as an outcome for the pricing method (FCFF Given)[76];

- secondly, in order not to lose the information about historical growth trends on the level of individual items in financial statements, I tried to simulate the growth rates separately for all major items for the next five years, with the growth rates ranging from

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[72] http://www.mfcr.cz/cps/rde/xchg/mfcr/xsl/vrsd_emise_sdd_46698.htm/ (20.04.2009)
[73] www.ekonomicke_analyzy.cz/text_posudek.html (20.04.2009)
[74] Own calculations, see attached Appendix I.
[75] Due to the way of future FCFF calculating, I distinguish the "FCFF Given" and "FCFF Expected" method. "Given" is meant on the basis of ex-post data; "Expected" on the basis of my own predictions.
[76] The selection of 2 percent was set as a conservative estimate of the average annual growth rate in the following years. Even though we currently face the drop due to economic crisis, I expect the growth to recover at least partially in the medium term,

one to approx. four percent. When calculating FCFF outcome I used those predicted values (FCFF Expected);

- the third method is closely related to the previous one. Having the longer time series of reliable data at disposal, one of the most accurate ways would be the extrapolation of historical data into the future by the usage of statistical and econometric tools. Nevertheless, due to insufficient data availability, only the two previous options were used instead.

The calculation of FCFF is one of the inputs to the model computing the intrinsic value of the company stock (ISV). In order to obtain the value of the stock, the two-stage growth model was employed[77]. Since the result was just gross operating value of the company, it had to be reduced by interest bearing capital and non-operating assets[78]. Later on, the stock intrinsic value has been calculated and compared with the stock market value valid to the 31st December of a respective year[79].

3.1.2. EVA method

Calculation of the intrinsic stock value using EVA model[80] follows the previous two methods. The value of the firm calculated by using EVA method can be reached as follows[81]:

$$V_0 = C + MVA - \textit{ liabilities paying interest,}$$

where C is capital expressed as a sum of equity and a long-term debt[82] and MVA means Market Value Added.

[77] FCFF two-stage model was described in Chapter 3.1.1.
[78] Non-operating assets are defined as short-term and long-term investments; interest bearing capital as bonds and loans.
See: MAŘÍK (2003), pp. 103-107
[79] All calculations performed for this pricing method can be seen in Appendix II. and III., with results in Appendix VI. at the end of my work.
[80] Details about EVA calculations are described in the Chapter 2,2,5, and Appendix IV of this thesis.
[81] MAŘÍK (2003), pp. 258-261
[82] http://investorloi.com/?p=249 (15.04.2009)

3.1.3. FCFE method

The last used method was free cash flow to the equity. Firstly, the FCFF value for the next five-year period had to be computed. I determined the average of values reached for previous three years and expected two percent growth for each following year[83]. Two-stage growth model served for obtaining the value of the firm with the intrinsic stock value.

3.1.4. Results

Following tables are summarizing the results of previously mentioned calculations for each of the examined years and companies.

Table 1: Overview of the market and intrinsic stock values - 2005

	2005				
	Actual Stock Value	FCFF given	FCFF expected	EVA	FCFE
Zentiva	1 136	-869	907	507	1 098
Unipetrol	338	358	612	272	244
CEZ	736	-64	643	217	-96
Philip Morris	18 251	31 255	12 228	12 905	55 482
ERBAG	1 365	-4 564	290	903	-87

Table 2: Overview of the market and intrinsic stock values - 2006

	2006				
	Actual Stock Value	FCFF given	FCFF expected	EVA	FCFE
Zentiva	1 268	-84	627	646	-838
Unipetrol	234	318	302	79	160
CEZ	960	61	503	319	-83
Philip Morris	10 840	19 816	9 881	7 307	43 145
ERBAG	1 597	-10 265	82	1 054	-467

Table 3: Overview of the market and intrinsic stock values - 2007

	2007				
	Actual Stock Value	FCFF given	FCFF expected	EVA	FCFE
Zentiva	972	-2 630	181	192	-1 232
Unipetrol	233	222	143	92	231
CEZ	1 362	595	600	444	206
Philip Morris	7 933	19 196	12 369	8 927	37 923
ERBAG	1 291	-9 729	-186	1 506	-389

As can be clearly seen from the first insight, individual stock values obtained from different calculation methods differs significantly among each other and also in comparison to actual stock values (ASV). Nevertheless, in order to be able to better recognize common

[83] Details about calculation can be seen in Appendix V.

trends in the development of stock values as well as for further decision about the choice of the most approximate method it is very helpful to normalize the data set. Without the loss of any information about the changes in the values of stocks, it would than be possible to get clearer picture about the level of proximity of each method to actual stock values.

Further on, it makes also sense to normalize data for the purposes of the following econometric analysis. Without any data adjustments, one of the main outcomes of this analysis, standard errors of the Ordinary Least Squares (OLS)[84] estimations would be automatically biased in favor of pricing method, for which the intrinsic stock values (obtained from calculations) of stocks with high absolute value, are relatively more approximate to actual stock values comparing to other methods. This could be best illustrated on the example of Phillip Morris. Without normalization of the data, regression model:

$$ASV_i = \beta_0 + \beta_1 * FCFE_i + \mu_i \,,$$

that explains the relation between ASV and the ISV obtained by using FCFE model was giving the lowest absolute Standard Error of the model comparing to regressions using data for FCFF or EVA instead of FCFE, even though it was able to explain the development of the actual stock value only for Phillip Morris and failed in all other cases. As can be seen from the graphs on the following pages, the other methods were in general much more proximate to actual stock values for most other companies apart from Phillip Morris. This is the result of the computation formula for in OLS estimations, where regression coefficients are calculated so that the sum of squares of differences between the regression line defined by regression coefficients and actual values are minimized.[85] The data was normalized in a way, so that the 2005 value for each valuation method and each company was set to 100, and the values for the years 2006 and 2007 were adjusted accordingly to keep the information about the relative change. The following formula was used for normalization of the data:

$Value(2006)_c = 100 + 100*((Value(2006)_c – Value(2005)_c /(ABS(Value2005)_c))$

resp.

[84] For more details regarding OLS see e.g. GUJARATI (2003), pp. 58

[85] For more information about the results of other Regression model please see Appendix VI.

$$Value(2007)_c = 100 + 100*((Value(2007)_c - Value(2005)_c /(ABS(Value2005)_c))$$

for "c" standing for individual companies.

Thereafter, it was possible to compare the normalized data much easier and graphical analysis could be used to find the best fitting method. On the following articles, summary of the comparison for individual methods per each examined company is provided as well the short description of the firm to better understand the development behind financial and stock value indicators. Where applicable, the information about the development of companies' profits are provided for the comparison throughout this thesis as well, as profit is assumed to be one of the main indicators influencing the buying behavior of investors and thus also of the stock value development.

3.1.4.1. Zentiva

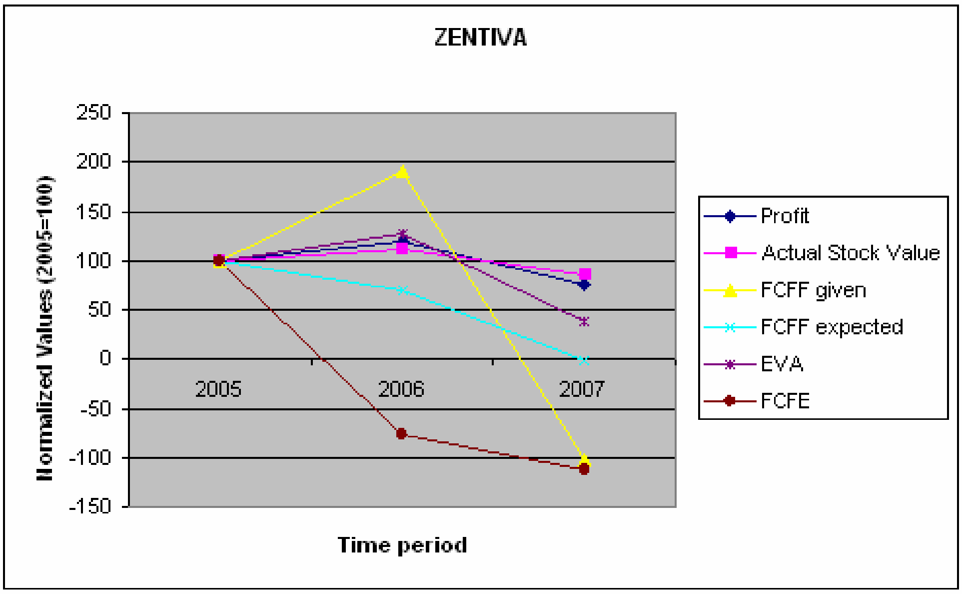
Zentiva is an international pharmaceutical company that develops, produces and sells modern generic pharmaceutical products. Its strategy oriented on profitable gain lies in developing the accessibility of modern medicaments in Central and Eastern Europe markets. In recent years Zentiva realized radical strategic acquisitions in Slovakia, Romania, Hungary and Turkey and enlarged its possibilities to concentrate on sphere of prime care across the region[86].

Table 4: Normalized Intrinsic Stock Values – Zentiva

	2005	2006	2007
Profit	100	119	76
Actual Stock Value	100	112	86
FCFF given	100	190	-103
FCFF expected	100	69	-2
EVA	100	127	38
FCFE	100	-76	-112

[86] Annual report of Zentiva, 2007, pp. 4

Figure 4: Intrinsic Value of the Stock - Zentiva



As obvious from the graph, the development of the actual stock value of Zentiva is almost identical with the development of company's profits and with the intrinsic stock value calculated using EVA method. The two other pricing methods, especially FCFF given differs from the previous significantly.

3.1.4.2. Unipetrol

Unipetrol is an important refinery and petrochemical company in Czech Republic, significant player in Central and Eastern Europe and since 2005 also a part of the biggest refinery group in Central Europe PKN Orlen. Its main strategy is created by three pillars: petroleum processing, petrochemical production and retail sale of fuels.

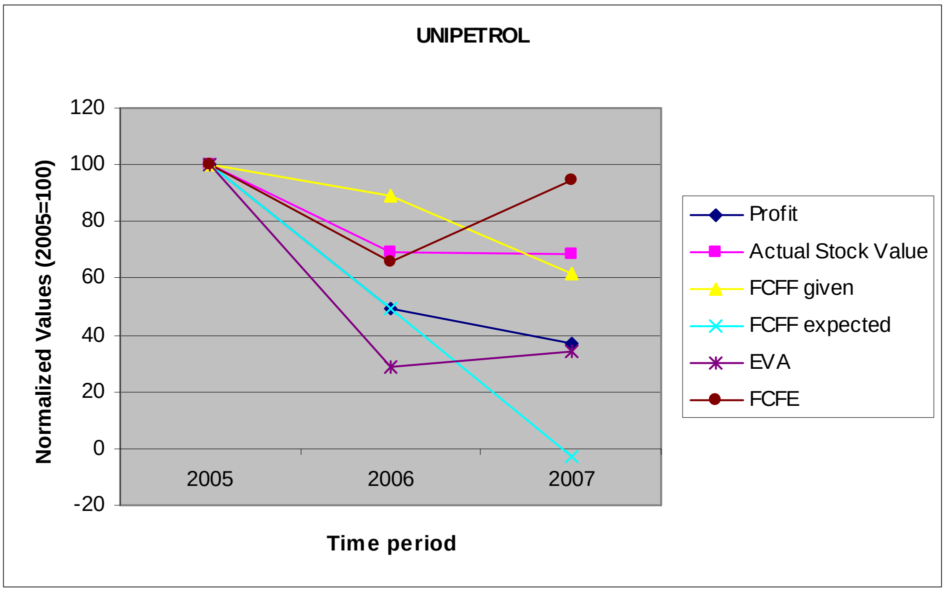
Unipetrol considers external market conditions to be a challenge in next years. Extremely volatile oil prices and the economic situation in the world should have considerable impact on economic incomes.[87].

[87] Annual report of Unipetrol, 2007, pp. 21

Table 5: Normalized Intrinsic Stock Values – Unipetrol

	2005	2006	2007
Profit	100	49	37
Actual Stock Value	100	69	69
FCFF given	100	89	62
FCFF expected	100	49	-3
EVA	100	29	34
FCFE	100	65	95

Figure 5: Intrinsic Value of the Stock - Unipetrol



For Unipetrol, none of the results from valuation methods copies the development of actual stock value as good as for the case of Zentiva. The trends of decline of the actual stock value in the first observed year and following stabilization was in line with EVA outcomes, however the drop of intrinsic value of the stock in 2006 computed by EVA was more than double. FCFF calculations do not explain much of the development of Unipetrol's actual stock value and FCFE fits almost perfectly, however only for the first period.

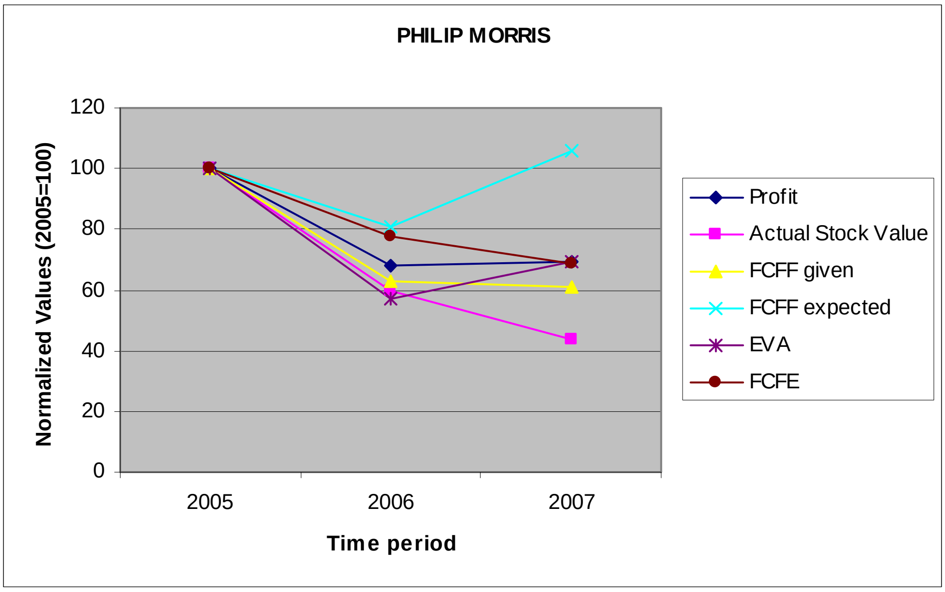
3.1.4.3 Philip Morris

Philip Morris CR is a major producer and dealer of tobacco products in Czech Republic and is a part of Philip Morris International, Inc.

Table 6: Normalized Intrinsic Stock Values – Philip Morris

	2005	2006	2007
Profit	100	68	69
Actual Stock Value	100	59	43
FCFF given	100	63	61
FCFF expected	100	81	106
EVA	100	57	69
FCFE	100	78	68

Figure 6: Intrinsic Value of the Stock - Philip Morris



As discussed earlier, for the case of Phillip Morris, FCFF given was the best fitting method. FCFE values are in line with actual trend, i.e. sharper decline in the first year and further, although slower decline in the second year. Actual stock values copies EVA just in the first year.

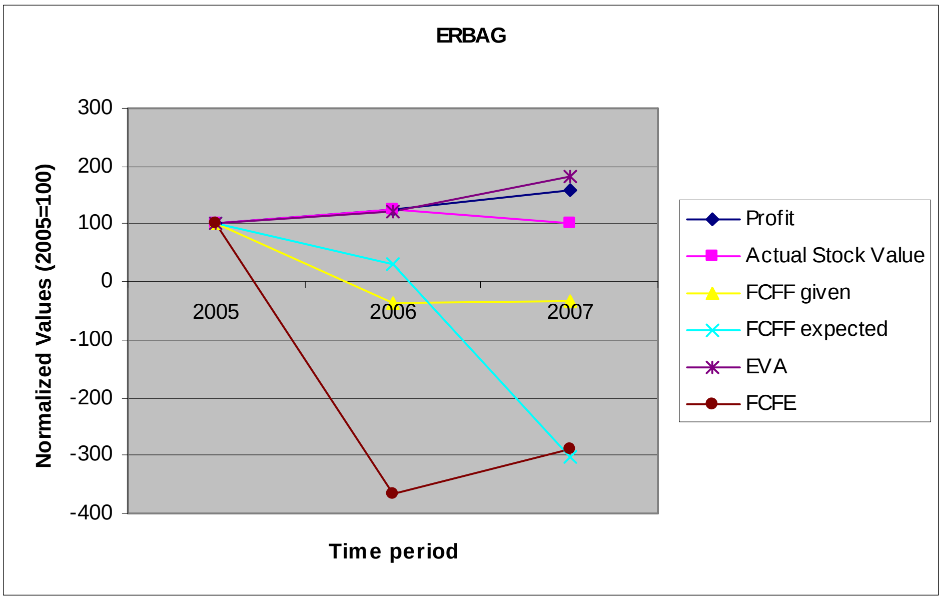
3.1.4.4. Erste Bank

Erste Bank is a retail bank in Central Europe based in Austria that operates also in Czech Republic, Slovakia, Hungary, Romania, Ukraine, Serbia, Croatia and Bosnia and Herzegovina. The strategy of Erste Bank is based on three pillars. Business pillar identifies the development of retail banking operations as a main activity. According to geographic pillar, Central and Eastern Europe presents the home market. Efficiency pillar sets out the vision of operating and expanding as efficiently as possible[88].

Table 7: Normalized Intrinsic Stock Values – Erste Bank

	2005	2006	2007
Profit	100	125	158
Actual Stock Value	100	123	103
FCFF given	100	-37	-32
FCFF expected	100	30	-303
EVA	100	123	182
FCFE	100	-367	-288

Figure 7: Intrinsic Value of the Stock - Erste Bank



For Erste Group, EVA method is the only one, whose results correspond at least approximately with the development of actual stock values.

[88] Annual report of ERBAG, 2007, pp. 25

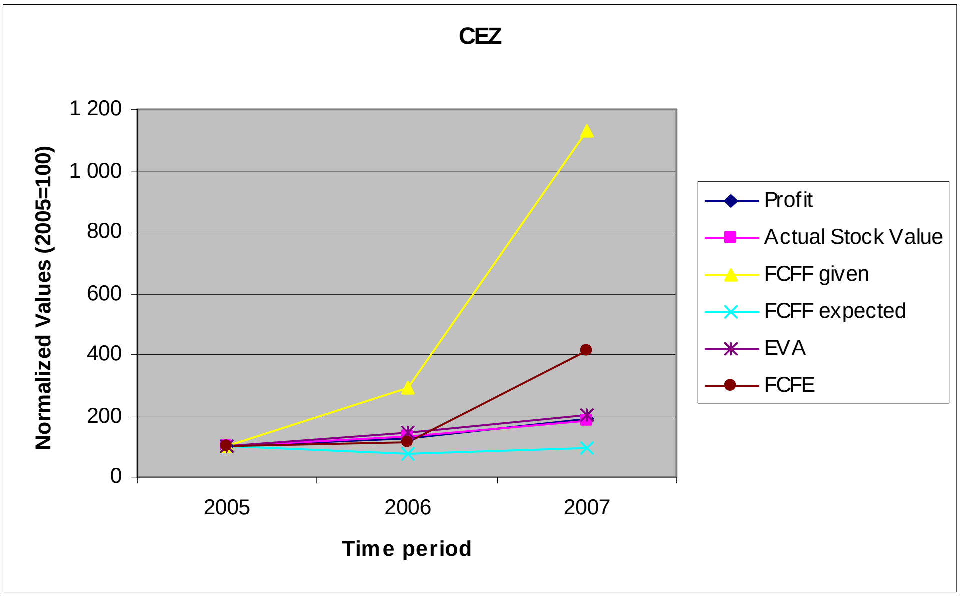
3.1.4.5. CEZ

CEZ is a dynamic, integrated energetic concern that occurs in many countries in Central and South-Eastern Europe with the headquarters in Czech Republic. Its main aim of business is production, distribution and sale of electricity and energy and mining. The short-term target is to become a number one in the market of electric energy in Central and South-Eastern Europe.

Table 8: Normalized Intrinsic Stock Values – CEZ

	2005	2006	2007
Profit	100	129	192
Actual Stock Value	100	130	185
FCFF given	100	295	1 133
FCFF expected	100	78	98
EVA	100	147	205
FCFE	100	113	415

Figure 8: Intrinsic Value of the Stock - CEZ



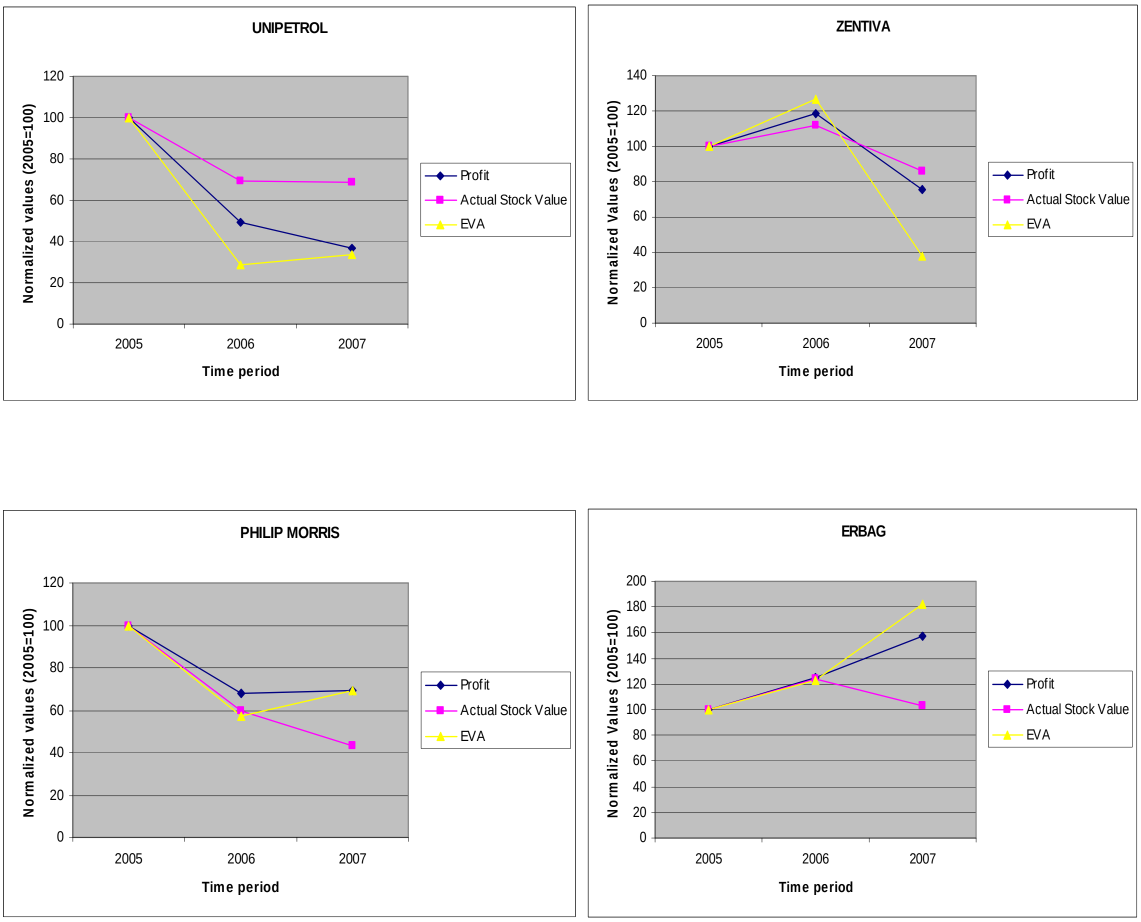
As can be seen from the graph, similar to the case of Erste Bank, development of actual stock value for CEZ is in line with its intrinsic value computed by EVA. FCFE and

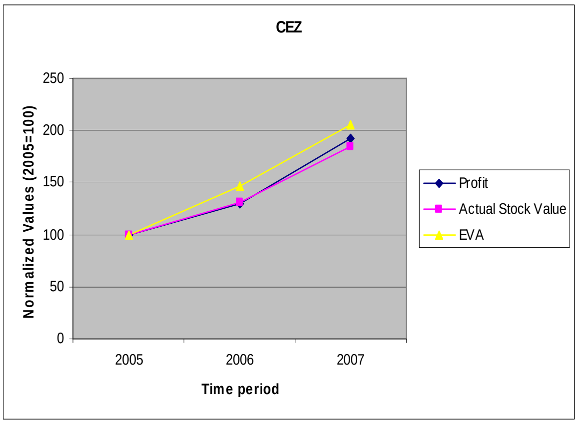
FCFF correctly estimated just the rising trend, nevertheless it is overestimated comparing to EVA and actual market values.

3.1.5. Selection of the Most Approximate Method

After the performed graphical analysis, it seems that the actual stock value is the best representative of the intrinsic stock value calculated by EVA. The following pictures outline just the development of the ASV, Profit and EVA for each of the companies in focus.

Figure 9: Intrinsic Value of the Stocks - Actual, EVA and Profit





Setting EVA as the most approximate method was the ex-ante assumption before I performed the supporting analysis based on computation of Standard Error for each of the following models[89]:

$$ASV_i = \beta_0 + \beta_1 * EVA_i + \mu_i$$
$$ASV_i = \beta_0 + \beta_1 * FCFE_i + \mu_i$$
$$ASV_i = \beta_0 + \beta_1 * FCFFg_i + \mu_i$$
$$ASV_i = \beta_0 + \beta_1 * FCFFe_i + \mu_i$$

Standard Error of the Estimate or Standard Error of the Regression computed as:

$$\hat{\sigma}_m = \sqrt{\frac{\sum \hat{\mu}_i^2}{n-1}}$$

for "m = 1,…4" representing each of the previous models, is simply the standard deviation of the actual stock values from the estimated regression line defined by linear coefficients β_0 and β_1 and it is commonly used as a summary measure of the "goodness of fit" of the estimated regression line. Alternatively, it is possible to use a Coefficient of Determination R^2 that provides us with the similar information as the Standard Error of the Regression as it measures the proportion or percentage of the total variation in actual stock values explained by the regression model[90].

[89] For computation of Standard Error of the Estimate, normalized data were used
[90] GUJARATI (2003); pp. 78

As the data set is very limited, results of this analysis are not very robust as far as the regression coefficients are concerned, nevertheless it is sufficient for the comparison of Standard Errors for particular estimations. The lower the standard error, resp. the higher the Coefficient of Determination, the better the actual stock values reflects the intrinsic stock values for individual pricing methods.

Table 9: Analysis of Standard Errors

	R-Squared	Standard Error of Regression
FCFF given	0,56223	29,4142
FCFF expected	4,36E-04	44,4466
EVA	0,68603	24,9102
FCFE	0,045872	43,4247

From the table outlining the results is clear, that the conclusions made based on graphical analysis are also supported by numerical calculations and actual stock values of the five examined companies are in general best explained by EVA model[91].

3.2. Econometric Testing of Selected Method

3.2.1. Extension of Selected Model for Supplementary Companies

After the selection of the "best fitting" method, the data set was extended for further companies, to obtain more observations and thus to make the analysis more robust. The following table outlines the results of the valuation and compares it with actual stock value and development of profits.

Table 10: Results of EVA Method for Further Four Companies

	Profit after tax			Actual Stock Value			EVA		
	2005	2006	2007	2005	2006	2007	2005	2006	2007
CETV	42 835	25 287	88 568	1 409	1 462	2 106	1 508	5 343	5 933
Komercni banka	9 120	9 211	11 225	3 441	3 099	4 371	3 619	4 264	3 618
ORCO	56 272	97 855	100 904	1 809	2 755	2 165	2 360	3 684	1 030
Telefonica	6 248	8 020	10 386	525	476	545	323	278	400

[91] Detailed regression results together with data could be provided upon request.

Nevertheless, the normalized data captured in the following tables together with respective graphs provides us with clearer picture about the relation between ASV and EVA calculated ISV.

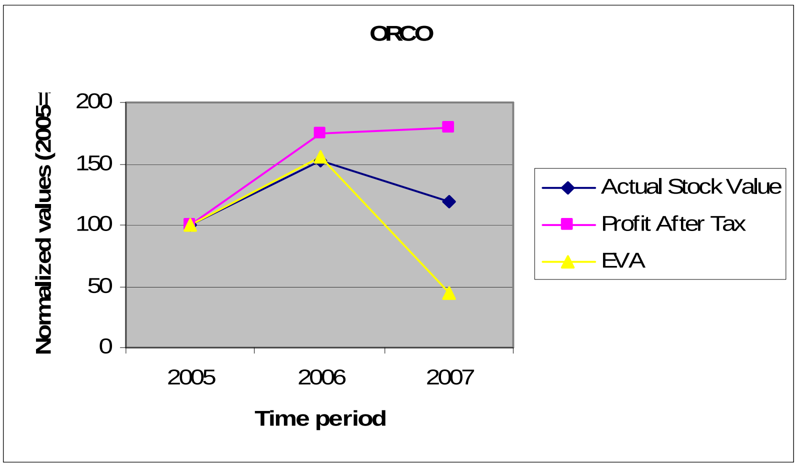
3.2.1.1. ORCO

ORCO occurs at a Central European market as a multicultural real estate developer with three main business lines – Residential Development, Property Investment and Asset Management[92].

Table 11: Normalized Intrinsic Stock Values – ORCO

	2005	2006	2007
Actual Stock Value	100	152	120
Profit After Tax	100	174	179
EVA	100	156	44

Figure 10: Intrinsic Value of the Stock – ORCO



In case of Orco, both ASV and ISV development can be characterized by similar trends, i.e. very strong growth in the year one and sharp decline in the following year. Development of the company's profit, especially in the second period does not fully copy the other two variables and both ASV and ISV decreased despite its positive growth.

[92] Annual report ORCO, 2007, pp. 4-5

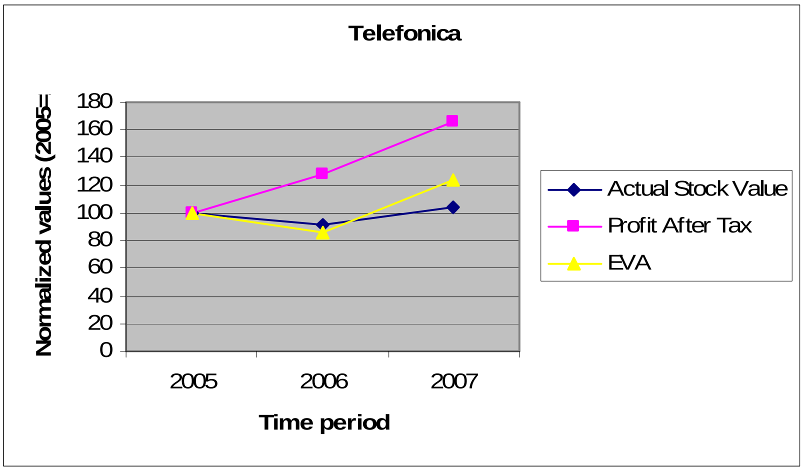
3.2.1.2. Telefonica

Telefonica is the third biggest telecommunication company in the world. Its operations are divided into three main regions: Spain, Latin America and Europe; together it is presented in 25 countries. 63 % of all revenues are generated outside the home market. The main goal is to maximize the value of its activities at global, regional and local level[93].

Table 12: Normalized Intrinsic Stock Values – Telefonica

	2005	2006	2007
Actual Stock Value	100	91	104
Profit After Tax	100	128	166
EVA	100	86	124

Figure 11: Intrinsic Value of the Stock -Telefonica



For Telefonica, we can observe relatively strong alignment between ISV computed by EVA and actual market stock values. The growth of Telefonica's profit was not fully transferred into the growth of ASV or ISV.

[93] Annual report Telefonica, 2008 pp. 14-16

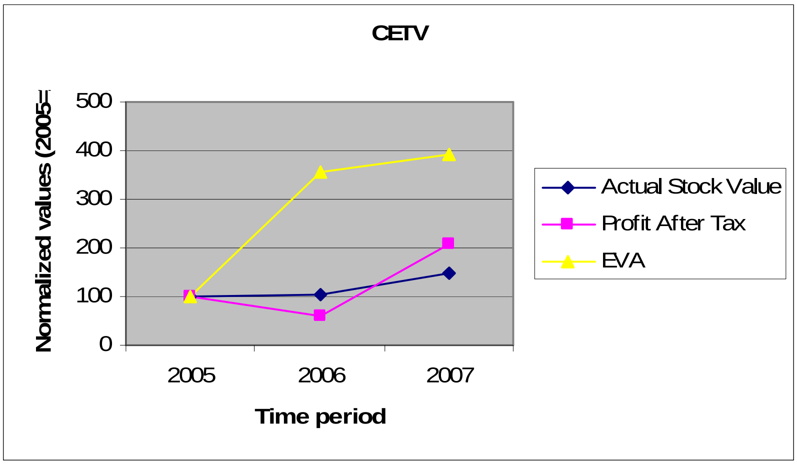
3.2.1.3. Central European Media Enterprises

CETV, company established in Bermuda, invests in, develops and operates commercial channels in Central and Eastern Europe. At present it operates in Bulgaria, Croatia, Slovakia, the Czech Republic, Slovenia, Ukraine and Romania. Their revenues are primarily generated through entering into agreements with advertisers, advertising agencies and sponsors to place advertising on air of the television channels that they operate[94].

Table 13: Normalized Intrinsic Stock Values – CETV

	2005	2006	2007
Actual Stock Value	100	104	149
Profit After Tax	100	59	207
EVA	100	354	393

Figure 12: Intrinsic Value of the Stock - CETV



In the case of CETV, results for EVA are, especially for the first period significantly different comparing to the development of ASV. The second period data are more in line with each other.

[94] Annual report CETV, 2008, pp. 5

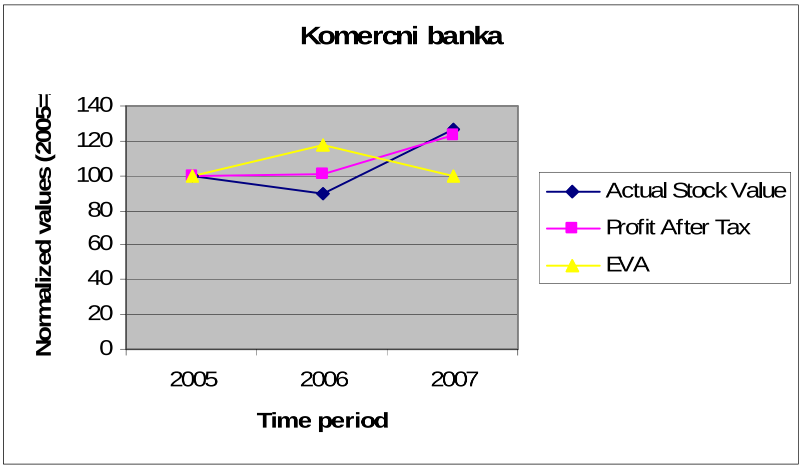
3.2.1.4. Komercni banka

KB is one of the most effective universal banks in Central and Eastern Europe with complex services in investment and retail banking. It is a member of Societe Generale that is one of the biggest bank groups in Eurozone.

Table 14: Normalized Intrinsic Stock Values – Komercni Banka

	2005	2006	2007
Actual Stock Value	100	90	127
Profit After Tax	100	101	123
EVA	100	118	100

Figure 13: Intrinsic Value of the Stock - Komercni Banka



For Komercni Banka, EVA method fails to explain the development of the ASV, as it shows different trends for each of the periods.

3.2.2. Econometric modeling

Once the decision about the selection of the most approximate model is made, it is possible to proceed to the evaluation of the relation between ASV and its ISV calculated by EVA method. Main aim of the following regression analysis is to find out, how the average value of ASV varies with the given value of its ISV. Here we implicitly assume, that at least some part of the variation of ASV could be explained by the development of ISV. As we know, the market ASV is driven by the development of Supply and Demand, which does not necessarily need to reflect just the development of stock fundamentals captured in ISV. Investors' behavior could also be driven by seemingly illogical reasons, which could either reflect their expectations or is simply the result of so called "herd behavior"[95].

Assuming the relation between ASV and ISV calculated by using EVA method, and assuming the simplified regression model having the following linear form:

$$ASV_i = \beta_0 + \beta_1 * EVA_i + \mu_i \, ,$$

for "i" representing individual observations and "μ" the standard error term i.e. the deviation of ASV from the expected values defined by regression line for each "i", the OLS method can be used to estimate β_0 and $\beta_{1.}$ Projected linear function will than describe the mutual relationship between ASV and ISV computed by EVA method. According to Gauss-Markov Theorem, the least squares estimators have minimum variance in the class of linear estimators, i.e. they are BLUE (Best Linear Unbiased Estimators) at the condition that several specific assumptions of classical linear regression model are fulfilled[96].

When dealing with small or sample size as it is in our case, the normality assumption comes forefront and should be of our focus when analyzing results. Provided that "μ" follows the normal distribution, we can further say that the OLS estimators are BUE (Best Unbiased Estimators), i.e. they have minimum variance in the entire class of unbiased estimators, whether linear or not[97].

The following overview summarizes the outcomes of the proposed regression[98]:

$$ASV_i = 81{,}2 + 0{,}2 * EVA_i$$
$$p - value(\beta_1) = 0{,}020; R^2 = 0{,}29$$

Looking at the results of individual diagnostic tests it is clear, that the model suffers from wrong functional form. One possible solution for overcoming this obstacle might be

[95] By „herd behavior" is meant the situation on the market, when majority of investors starts simultaneously buying or selling certain stock or set of stock titles without any adequate reason.
[96] For further details regarding the assumptions underlining the method of least squares see for example GUJARATI (2003), chap. 3.2.
[97] GUJARATI (2003); pp. 112
[98] The full results of this regression analysis can be found in Appendix VI.

transformation of the model to log-log form[99]. Assuming the relationship between ASV and ISV bearing the following form[100]:

$$ASV_i = \beta_0 * EVA_i^{\beta 1} * e^{\mu\, i},$$

it may be expressed alternatively as:

$$\ln(ASV)_i = \alpha + \beta * \ln(EVA)_i,$$

where ln = natural log (i.e. log to the base e=2,718) and $\alpha = \ln(\beta_0)$.

Attractive feature of this log-log model is, that the slope coefficient β_1 measures the elasticity of ASV with respect to ISV. Said differently, it measures the percentage change of ASV with a small given percentage change of ISV[101].

Results of the regression diagnostic tests summarized in Appendix IV suggest, that the assumptions of the classical linear regression model are fulfilled, and the parameters α and β are BUE.

The following overview outlines the results of the adjusted log-linear model:

$$\ln(ASV)_i = 3{,}2 + 0{,}3 * \ln(EVA)_i$$
$$p - value(\beta_1) = 0{,}006;\ R^2 = 0{,}39$$

The interpretation of β_1 is, that if, all other things being equal, the ISV changes by one percent, the ASV would respond on average by 0,3% change in the same direction.

3.3. Investment Recommendation

3.3.1. Limitations of the Model

One of the main reasons, why so many studies are being dedicated to the development of the theory of company's valuation is, that it should consequently help investors by assessment, whether to realize certain transaction or not. Having in hand the reliable tool for company pricing based on publicly accessible data would serve as a great instrument for this assessment. Nevertheless, following obstacles are making this idea very hard to realize

[99] Another reason for this specification error might be omitted variable. As mentioned before, it is clear that ASV is influenced also by other factors, e.g. investor's expectations; nevertheless this is out of the scope of this thesis.
[100] This form is known as exponential regression model.
[101] GUJARATI (2003); pp.176

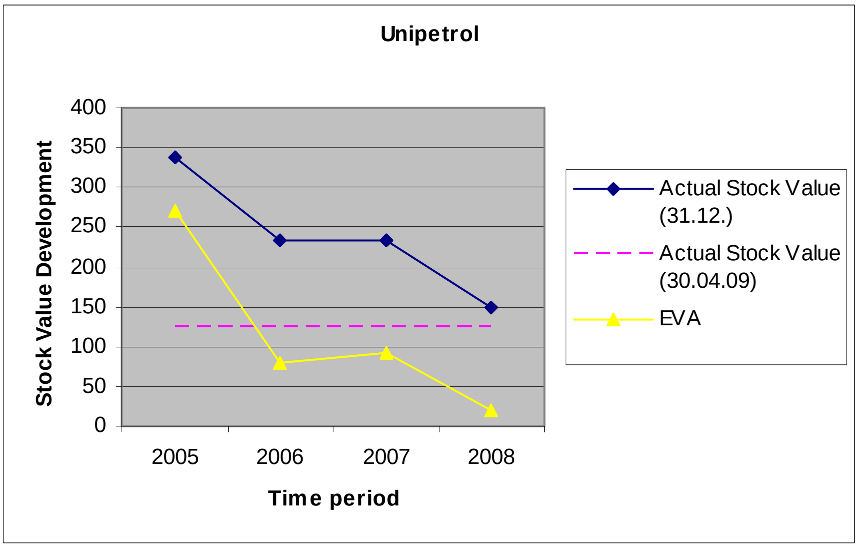
in real life. Firstly, the accessible data are publicly available only after significant time delay. Even if we would be able to perform the valuation within short time period, the lag after which the relevant data are known also for the top executives are counted in weeks or months. Secondly, as already mention several times in this thesis, the market value of the stock is by far not driven solely by the development of the financial fundamentals. These are expected to have effect on the development of the stock in the medium-to-long run, nevertheless the volatility of the market stock values have often too little to do with company's true economic and financial performance.

3.3.2. Assessment of Under- and Overvaluation of Selected Stocks

On the following pages, the overview of the EVA valuation as well as market stock values are provided for the companies, whose financial statements necessary for the companies' intrinsic stock value calculation for the year 2008 were available at the time of writing this thesis.

3.3.2.1. Unipetrol

Figure 14: Assesment of Under-and Overvaluation of Stocks - Unipetrol

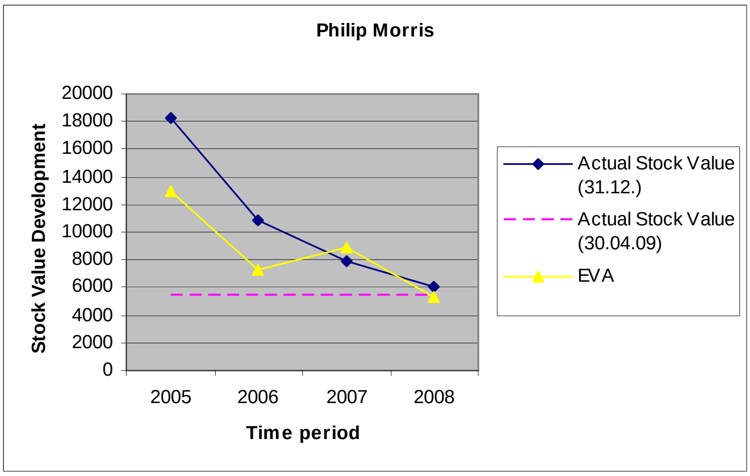


As can be seen from the previous picture, the development of the EVA ISV copies the trend of market stock value development almost perfectly. As the actual stock value of

Unipetrol is currently even bellow its end of the year 2008 level, nevertheless still higher than ISV, there is a very good chance that the actual stock value is overvaluated.

3.3.2.2. Philip Morris

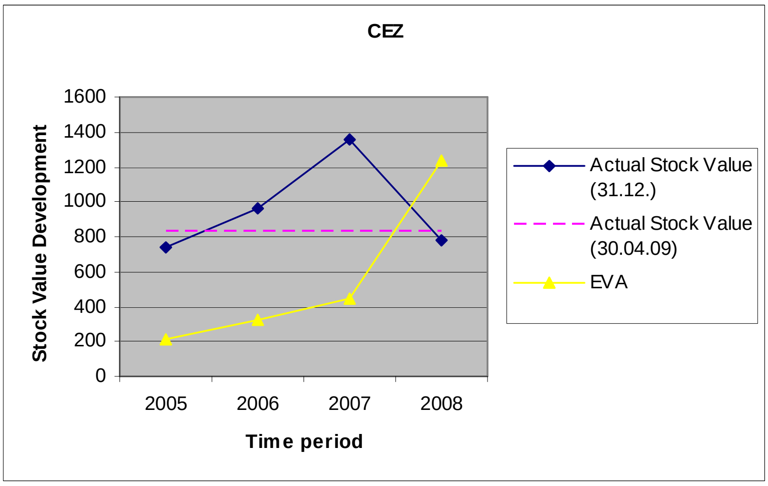
Figure 15: Assesment of Under-and Overvaluation of Stocks - Philip Morris



The case of Philip Morris seems to be the great example of how the market value converges to ISV in the medium-to-long term. From the analysis resulting in the Figure 12 it seems, that the stock prices of Philip Morris currently represents its intrinsic values.

3.3.2.3. CEZ

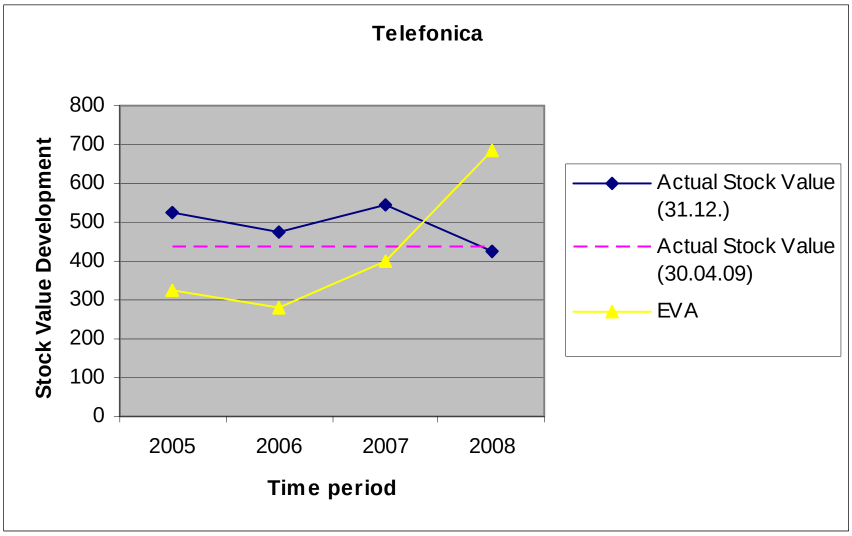
Figure 16: Assesment of Under-and Overvaluation of Stocks - CEZ



Contrary to the example of Unipetrol, the analysis of CEZ suggests that the actual market stock values switches from highly overvaluated to undervaluated in the year 2008 and thus seems to become a very interested target for investors in the near future.

3.3.2.4. Telefonica

Figure 17: Assesment of Under-and Overvaluation of Stocks - Telefonica

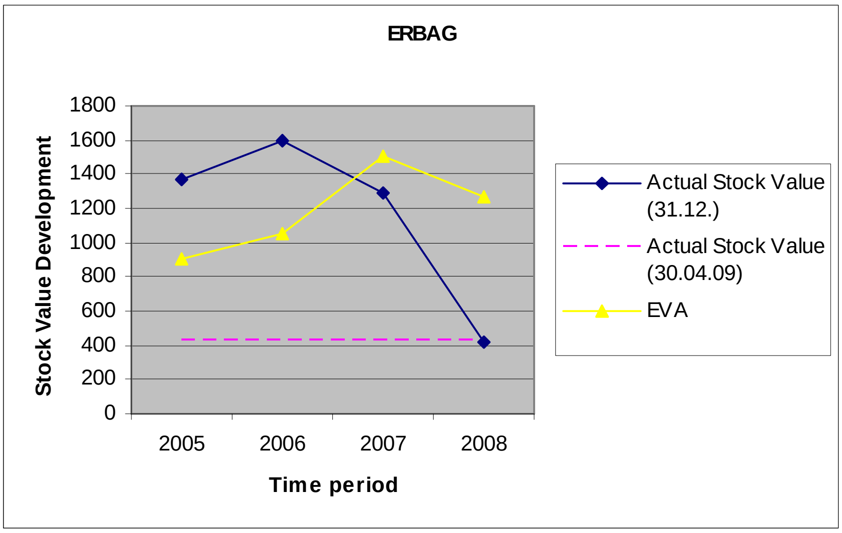


The situation of Telefonica looks very similar to the situation of CEZ. From the overvaluated price of the stock in the past years comes to undervaluated recently which should make it a very interested title for potential investors.

3.3.2.5. Erste Bank

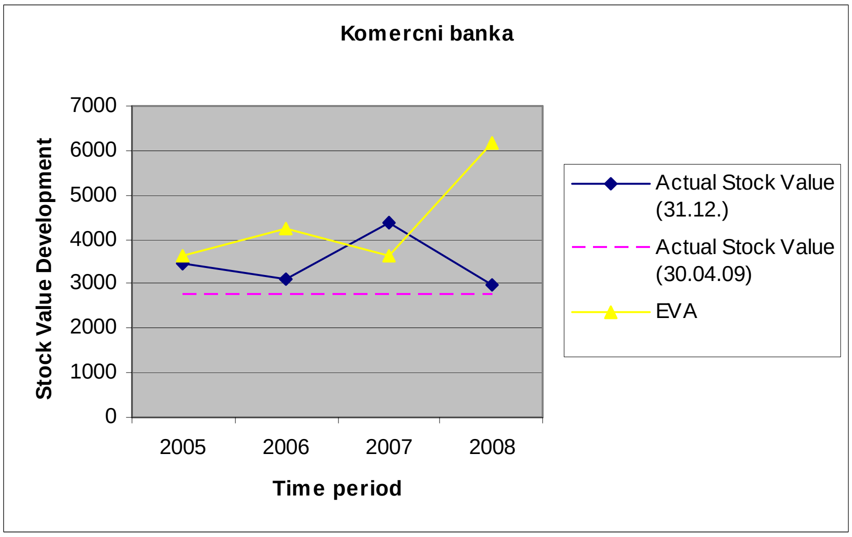
As can be clearly seen from the previous picture, current financial crisis left a significant mark on the development of the market stock value of this Bank Group. The analysis also confirms our real experience from the recent past that the financial sector was hit by the crisis as one of the first ones. If we compare the time of intersection of ISV and ASV in the cases of previous two non-financial companies, we can see that it come with a significant lag of about half a year behind financial institutions like Erste Group or Komercni Banka in the following picture. From today's perspective, the market stock values of these institutions look to be heavily undervalued. However, the recovery to its previous levels remains in questions as well as the financial health of these companies that was partly damaged by high bad-debts write-offs.

Figure 18: Assesment of Under-and Overvaluation of Stocks - Erste Bank



3.3.2.6. Komercni Banka

Figure 19: Assesment of Under-and Overvaluation of Stocks - Komercni Banka



Most of the conclusions made by the previous company remains valid also in case of Komercni Banka, even though this company does not seem to be hit by the crisis as much as Erste Bank, at least not in terms of such a high fall of market stock value and difference between ASV and ISV.

To sum it up, it seems that the market stock values of the most of the valuated companies are most likely to be undervaluated with regards to their intrinsic stock value computed by using EVA valuation method. This result could be from the big part explained by the impacts of the financial crisis. On the other hand, this state makes Prague Stock Exchange being very interesting for investors looking for allocation of their funds.

4. Summary and Conclusions

To summarize the previous chapters, great deal of literature and theory has already been dedicated to the problems of company valuation even though there is still no clear cut answer on the question, whether there is an evaluation method that would be able to explain the development of market value of titles traded on the Prague Stock Exchange perfectly. On the other hand it seems that EVA method of calculation of intrinsic values of these stocks provides us with satisfactory outcomes as it was able to explain the development of the actual stock values of majority of examined companies, especially from non-financial sector.

Results of the econometric analysis suggests, that if other things being equal, the ISV of the examined companies change by one percent, their ASV would respond to average 0,3% change in the same direction. However, more robust analysis is hampered by the lack of reliable data. This obstacle could be overcome in the future by projection of longer time-series that would enable us to use more sophisticated methods of econometric modeling like, for example cointegration analysis examining long term equilibrium in the relationship between the variables. Another problem that might occur is the model specification error. By theory, the actual stock values tends to converge to intrinsic stock values more in the medium-to-long term, keeping significant impact on the volatility of stock values in the short term caused by other influences, like psychological reasons or “herd behavior” of investors. These psychological effects are not easy to be captured by simple adding any variable in the model.

Based on the outcomes from numerous evaluations it was further possible to estimate, whether the actual stock values of selected traded companies are over- or undervaluated. Analysis revealed that the financial crisis left huge impact on the stock values of Czech companies pushing their market prices significantly down. Nevertheless this trend was not that obvious for the case of intrinsic stock values, where we in most cases did not observe such a big drop. Situation on the markets in the past months resulted in the change of status of most of the examined stock titles from over- to undervaluated, which makes them being currently a very interesting target for medium to long-term investments.

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6. Appendixes

Appendix I. – Beta calculation

ZENTIVA

2007

Cost of equity on the basis of beta coefficient

		Zentiva (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2005	1	757,6	870,8	1 032,00	1 168,40
	2	870,8	896,5	1 168,40	1 210,10
	3	896,5	1 125,00	1 210,10	1 453,70
	4	1 125,00	1 136,00	1 453,70	1 473,00
2006	1	1 136,00	1 271,00	1 473,00	1 523,90
	2	1 271,00	1 068,00	1 523,90	1 390,40
	3	1 068,00	1 301,00	1 390,40	1 447,50
	4	1 301,00	1 268,00	1 447,50	1 588,90
2007	1	1 268,00	1 443,00	1 588,90	1 712,20
	2	1 443,00	1 442,00	1 712,20	1 859,10
	3	1 442,00	1 179,00	1 859,10	1 816,30
	4	1 179,00	972	1 816,30	1 815,10

Extra calculations for beta coefficient

		Profitability (%)				
Year	Quarter	Zentiva Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2005	1	14,94%	13,22%	2,23%	1,75%	1,97%
	2	2,95%	3,57%	0,09%	0,13%	0,11%
	3	25,49%	20,13%	6,50%	4,05%	5,13%
	4	0,98%	1,33%	0,01%	0,02%	0,01%
2006	1	11,88%	3,46%	1,41%	0,12%	0,41%
	2	-15,97%	-8,76%	2,55%	0,77%	1,40%
	3	21,82%	4,11%	4,76%	0,17%	0,90%
	4	-2,54%	9,77%	0,06%	0,95%	-0,25%
2007	1	13,80%	7,76%	1,90%	0,60%	1,07%
	2	-0,07%	8,58%	0,00%	0,74%	-0,01%
	3	-18,24%	-2,30%	3,33%	0,05%	0,42%
	4	-17,56%	-0,07%	3,08%	0,00%	0,01%
Total		**37,49%**	**60,79%**	**25,93%**	**9,35%**	**11,18%**

Data	Formula	Calculation
Beta 2007	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	1,481
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	0,745
Coefficient of determination	*Correlation coefficient^2*	0,555
Coefficient of non-determination	*1 - Coefficient of determination*	0,445

2006

Cost of equity on the basis of beta coefficient

		Zentiva (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2004	1			659,10	823,80
	2		497	823,80	793,50
	3	497	573,3	793,50	875,40
	4	573,3	757,6	875,40	1 032,00
2005	1	757,6	870,8	1 032,00	1 168,40
	2	870,8	896,5	1 168,40	1 210,10
	3	896,5	1 125,00	1 210,10	1 453,70
	4	1 125,00	1 136,00	1 453,70	1 473,00
2006	1	1 136,00	1 271,00	1 473,00	1 523,90
	2	1 271,00	1 068,00	1 523,90	1 390,40
	3	1 068,00	1 301,00	1 390,40	1 447,50
	4	1 301,00	1 268,00	1 447,50	1 588,90

Extra calculations for beta coefficient

		Profitability (%)				
Year	Quarter	Zentiva Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2004	1		24,99%		6,24%	
	2		-3,68%		0,14%	
	3	15,35%	10,32%	2,36%	1,07%	1,58%
	4	32,15%	17,89%	10,33%	3,20%	5,75%
2005	1	14,94%	13,22%	2,23%	1,75%	1,97%
	2	2,95%	3,57%	0,09%	0,13%	0,11%
	3	25,49%	20,13%	6,50%	4,05%	5,13%
	4	0,98%	1,33%	0,01%	0,02%	0,01%
2006	1	11,88%	3,46%	1,41%	0,12%	0,41%
	2	-15,97%	-8,76%	2,55%	0,77%	1,40%
	3	21,82%	4,11%	4,76%	0,17%	0,90%
	4	-2,54%	9,77%	0,06%	0,95%	-0,25%
Total		**107,05%**	**96,34%**	**30,30%**	**18,60%**	**17,02%**

Data	Formula	Calculation
Beta 2006	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	0,775
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	0,561
Coefficient of determination	*Correlation coefficient^2*	0,315
Coefficient of non-determination	*1 - Coefficient of determination*	0,685

2005

Cost of equity on the basis of beta coefficient

		Zentiva (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2004	1			659,10	823,80
	2		497	823,80	793,50
	3	497	573,3	793,50	875,40
	4	573,3	757,6	875,40	1 032,00
2005	1	757,6	870,8	1 032,00	1 168,40
	2	870,8	896,5	1 168,40	1 210,10
	3	896,5	1 125,00	1 210,10	1 453,70
	4	1 125,00	1 136,00	1 453,70	1 473,00

Extra calculations for beta coefficient

		Profitability (%)				
Year	Quarter	Zentiva Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2004	1		24,99%		6,24%	
	2		-3,68%		0,14%	
	3	15,35%	10,32%	2,36%	1,07%	1,58%
	4	32,15%	17,89%	10,33%	3,20%	5,75%
2005	1	14,94%	13,22%	2,23%	1,75%	1,97%
	2	2,95%	3,57%	0,09%	0,13%	0,11%
	3	25,49%	20,13%	6,50%	4,05%	5,13%
	4	0,98%	1,33%	0,01%	0,02%	0,01%
Total		**91,86%**	**87,77%**	**21,52%**	**16,59%**	**14,56%**

Data	Formula	Calculation
Beta 2005	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	0,644
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	0,513
Coefficient of determination	*Correlation coefficient^2*	0,263
Coefficient of non-determination	*1 - Coefficient of determination*	0,737

UNIPETROL

2007

Cost of equity on the basis of beta coefficient

		Unipetrol (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2005	1	98,2	139,22	1 032,00	1 168,40
	2	139,22	143,29	1 168,40	1 210,10
	3	143,29	238,6	1 210,10	1 453,70
	4	238,6	232,5	1 453,70	1 473,00
2006	1	232,5	274,7	1 473,00	1 523,90
	2	274,7	198,8	1 523,90	1 390,40
	3	198,8	196,59	1 390,40	1 447,50
	4	196,59	234,3	1 447,50	1 588,90
2007	1	234,3	235,6	1 588,90	1 712,20
	2	235,6	285,80	1 712,20	1 859,10
	3	285,80	305,60	1 859,10	1 816,30
	4	305,60	337,60	1 816,30	1 815,10

Extra calculations for beta coefficient

		Profitability (%)				
Year	Quarter	UNIPE Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2005	1	41,77%	13,22%	17,45%	1,75%	5,52%
	2	2,92%	3,57%	0,09%	0,13%	0,10%
	3	66,52%	20,13%	44,24%	4,05%	13,39%
	4	-2,56%	1,33%	0,07%	0,02%	-0,03%
2006	1	18,15%	3,46%	3,29%	0,12%	0,63%
	2	-27,63%	-8,76%	7,63%	0,77%	2,42%
	3	-1,11%	4,11%	0,01%	0,17%	-0,05%
	4	19,18%	9,77%	3,68%	0,95%	1,87%
2007	1	0,55%	7,76%	0,00%	0,60%	0,04%
	2	21,31%	8,58%	4,54%	0,74%	1,83%
	3	6,93%	-2,30%	0,48%	0,05%	-0,16%
	4	10,47%	-0,07%	1,10%	0,00%	-0,01%
Total		156,51%	60,79%	82,58%	9,35%	25,56%

Data	Formula	Calculation
Beta 2007	$\frac{n \cdot sum(Rm.Ri) - sum(Rm) \cdot sum(Ri)}{n \cdot sum(Rm^2) - sum(Rm)^2}$	2,814
Correlation Coefficient	$\frac{n \cdot sum(Rm.Ri) - sum(Rm).sum(Ri)}{\{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]\}^{(1/2)}}$	0,893
Coefficient of determination	*Correlation coefficient^2*	0,798
Coefficient of non-determination	*1 - Coefficient of determination*	0,202

2006

Cost of equity on the basis of beta coefficient

		Unipetrol (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2004	1	66,44	65	659,10	823,80
	2	65	74,9	823,80	793,50
	3	74,9	86,25	793,50	875,40
	4	86,25	98,2	875,40	1 032,00
2005	1	98,2	139,22	1 032,00	1 168,40
	2	139,22	143,29	1 168,40	1 210,10
	3	143,29	238,6	1 210,10	1 453,70
	4	238,6	232,5	1 453,70	1 473,00
2006	1	232,5	274,7	1 473,00	1 523,90
	2	274,7	198,8	1 523,90	1 390,40
	3	198,8	196,59	1 390,40	1 447,50
	4	196,59	234,3	1 447,50	1 588,90

Extra calculations for beta coefficient

Year	Quarter	Profitability (%)				
		UNIPE Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2004	1	-2,17%	24,99%	0,05%	6,24%	-0,54%
	2	15,23%	-3,68%	2,32%	0,14%	-0,56%
	3	15,15%	10,32%	2,30%	1,07%	1,56%
	4	13,86%	17,89%	1,92%	3,20%	2,48%
2005	1	41,77%	13,22%	17,45%	1,75%	5,52%
	2	2,92%	3,57%	0,09%	0,13%	0,10%
	3	66,52%	20,13%	44,24%	4,05%	13,39%
	4	-2,56%	1,33%	0,07%	0,02%	-0,03%
2006	1	18,15%	3,46%	3,29%	0,12%	0,63%
	2	-27,63%	-8,76%	7,63%	0,77%	2,42%
	3	-1,11%	4,11%	0,01%	0,17%	-0,05%
	4	19,18%	9,77%	3,68%	0,95%	1,87%
Total		**159,32%**	**96,34%**	**83,05%**	**18,60%**	**26,80%**

Data	Formula	Calculation
Beta 2006	$\frac{n \,.\, sum(Rm.Ri) \;-\; sum(Rm) \,.\, sum(Ri)}{n \,.\, sum(Rm\text{^}2) \;-\; sum(Rm)\text{^}2}$	1,289
Correlation Coefficient	$\frac{n \,.\, sum(Rm.Ri) \;-\; sum(Rm).sum(Ri)}{\{[(n.sum(Rm\text{^}2)-sum(Rm)\text{^}2].[n.sum(Ri\text{^}2)-sum(Ri)\text{^}2]\}\text{^}(1/2)}$	0,540
Coefficient of determination	*Correlation coefficient^2*	0,292
Coefficient of non-determination	*1 - Coefficient of determination*	0,708

2005

Cost of equity on the basis of beta coefficient

		Unipetrol (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2003	1	34,59	43,49	465,00	492,80
	2	43,49	51,59	492,80	535,10
	3	51,59	63,9	535,10	602,00
	4	63,9	66,44	602,00	659,10
2004	1	66,44	65	659,10	823,80
	2	65	74,9	823,80	793,50
	3	74,9	86,25	793,50	875,40
	4	86,25	98,2	875,40	1 032,00
2005	1	98,2	139,22	1 032,00	1 168,40
	2	139,22	143,29	1 168,40	1 210,10
	3	143,29	238,6	1 210,10	1 453,70
	4	238,6	232,5	1 453,70	1 473,00

Extra calculations for beta coefficient

Year	Quarter	Profitability (%) UNIPE Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2003	1	25,73%	5,98%	6,62%	0,36%	1,54%
	2	18,62%	8,58%	3,47%	0,74%	1,60%
	3	23,86%	12,50%	5,69%	1,56%	2,98%
	4	3,97%	9,49%	0,16%	0,90%	0,38%
2004	1	-2,17%	24,99%	0,05%	6,24%	-0,54%
	2	15,23%	-3,68%	2,32%	0,14%	-0,56%
	3	15,15%	10,32%	2,30%	1,07%	1,56%
	4	13,86%	17,89%	1,92%	3,20%	2,48%
2005	1	41,77%	13,22%	17,45%	1,75%	5,52%
	2	2,92%	3,57%	0,09%	0,13%	0,10%
	3	66,52%	20,13%	44,24%	4,05%	13,39%
	4	-2,56%	1,33%	0,07%	0,02%	-0,03%
Total		**222,92%**	**124,31%**	**84,37%**	**20,15%**	**28,42%**

Data	Formula	Calculation
Beta 2005	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	0,733
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	0,301
Coefficient of determination	*Correlation coefficient^2*	0,091
Coefficient of non-determination	*1 - Coefficient of determination*	0,909

PHILIP MORRIS

2007

Cost of equity on the basis of beta coefficient

		Philip Morris (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2005	1	16 776,00	18 980,00	1 032,00	1 168,40
	2	18 980,00	17 753,00	1 168,40	1 210,10
	3	17 753,00	18 951,00	1 210,10	1 453,70
	4	18 951,00	18 251,00	1 453,70	1 473,00
2006	1	18 251,00	16 072,00	1 473,00	1 523,90
	2	16 072,00	12 285,00	1 523,90	1 390,40
	3	12 285,00	9 828,00	1 390,40	1 447,50
	4	9 828,00	10 840,00	1 447,50	1 588,90
2007	1	10 840,00	9 640,00	1 588,90	1 712,20
	2	9 640,00	11 050,00	1 712,20	1 859,10
	3	11 050,00	9 875,00	1 859,10	1 816,30
	4	9 875,00	7 933,00	1 816,30	1 815,10

Extra calculations for beta coefficient

		Profitability (%)				
Year	Quarter	PM Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2005	1	13,14%	13,22%	1,73%	1,75%	1,74%
	2	-6,46%	3,57%	0,42%	0,13%	-0,23%
	3	6,75%	20,13%	0,46%	4,05%	1,36%
	4	-3,69%	1,33%	0,14%	0,02%	-0,05%
2006	1	-11,94%	3,46%	1,43%	0,12%	-0,41%
	2	-23,56%	-8,76%	5,55%	0,77%	2,06%
	3	-20,00%	4,11%	4,00%	0,17%	-0,82%
	4	10,30%	9,77%	1,06%	0,95%	1,01%
2007	1	-11,07%	7,76%	1,23%	0,60%	-0,86%
	2	14,63%	8,58%	2,14%	0,74%	1,25%
	3	-10,63%	-2,30%	1,13%	0,05%	0,24%
	4	-19,67%	-0,07%	3,87%	0,00%	0,01%
Total		**-62,22%**	**60,79%**	**23,14%**	**9,35%**	**5,30%**

Data	Formula	Calculation
Beta 2007	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	1,350
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	0,757
Coefficient of determination	*Correlation coefficient^2*	0,573
Coefficient of non-determination	*1 - Coefficient of determination*	0,427

2006

Cost of equity on the basis of beta coefficient

		Philip Morris (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2004	1	15 728,00	19 101,00	659,10	823,80
	2	19 101,00	15 945,00	823,80	793,50
	3	15 945,00	14 898,00	793,50	875,40
	4	14 898,00	16 776,00	875,40	1 032,00
2005	1	16 776,00	18 980,00	1 032,00	1 168,40
	2	18 980,00	17 753,00	1 168,40	1 210,10
	3	17 753,00	18 951,00	1 210,10	1 453,70
	4	18 951,00	18 251,00	1 453,70	1 473,00
2006	1	18 251,00	16 072,00	1 473,00	1 523,90
	2	16 072,00	12 285,00	1 523,90	1 390,40
	3	12 285,00	9 828,00	1 390,40	1 447,50
	4	9 828,00	10 840,00	1 447,50	1 588,90

Extra calculations for beta coefficient

		Profitability (%)				
Year	Quarter	PM Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2004	1	21,45%	24,99%	4,60%	6,24%	5,36%
	2	-16,52%	-3,68%	2,73%	0,14%	0,61%
	3	-6,57%	10,32%	0,43%	1,07%	-0,68%
	4	12,61%	17,89%	1,59%	3,20%	2,26%
2005	1	13,14%	13,22%	1,73%	1,75%	1,74%
	2	-6,46%	3,57%	0,42%	0,13%	-0,23%
	3	6,75%	20,13%	0,46%	4,05%	1,36%
	4	-3,69%	1,33%	0,14%	0,02%	-0,05%
2006	1	-11,94%	3,46%	1,43%	0,12%	-0,41%
	2	-23,56%	-8,76%	5,55%	0,77%	2,06%
	3	-20,00%	4,11%	4,00%	0,17%	-0,82%
	4	10,30%	9,77%	1,06%	0,95%	1,01%
Total		**-24,51%**	**96,34%**	**24,12%**	**18,60%**	**12,20%**

Data	Formula	Calculation
Beta 2006	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	1,304
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	0,884
Coefficient of determination	*Correlation coefficient^2*	0,782
Coefficient of non-determination	*1 - Coefficient of determination*	0,218

2005

Cost of equity on the basis of beta coefficient

		Philip Morris (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2003	1	11 151,00	12 099,00	465,00	492,80
	2	12 099,00	13 483,00	492,80	535,10
	3	13 483,00	13 411,00	535,10	602,00
	4	13 411,00	15 728,00	602,00	659,10
2004	1	15 728,00	19 101,00	659,10	823,80
	2	19 101,00	15 945,00	823,80	793,50
	3	15 945,00	14 898,00	793,50	875,40
	4	14 898,00	16 776,00	875,40	1 032,00
2005	1	16 776,00	18 980,00	1 032,00	1 168,40
	2	18 980,00	17 753,00	1 168,40	1 210,10
	3	17 753,00	18 951,00	1 210,10	1 453,70
	4	18 951,00	18 251,00	1 453,70	1 473,00

Extra calculations for beta coefficient

		Profitability (%)				
Year	Quarter	PM Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2003	1	8,50%	5,98%	0,72%	0,36%	0,51%
	2	11,44%	8,58%	1,31%	0,74%	0,98%
	3	-0,53%	12,50%	0,00%	1,56%	-0,07%
	4	17,28%	9,49%	2,98%	0,90%	1,64%
2004	1	21,45%	24,99%	4,60%	6,24%	5,36%
	2	-16,52%	-3,68%	2,73%	0,14%	0,61%
	3	-6,57%	10,32%	0,43%	1,07%	-0,68%
	4	12,61%	17,89%	1,59%	3,20%	2,26%
2005	1	13,14%	13,22%	1,73%	1,75%	1,74%
	2	-6,46%	3,57%	0,42%	0,13%	-0,23%
	3	6,75%	20,13%	0,46%	4,05%	1,36%
	4	-3,69%	1,33%	0,14%	0,02%	-0,05%
Total		**57,37%**	**124,31%**	**17,10%**	**20,15%**	**13,42%**

Data	Formula	Calculation
Beta 2005	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	1,029
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	0,732
Coefficient of determination	*Correlation coefficient^2*	0,536
Coefficient of non-determination	*1 - Coefficient of determination*	0,464

ERSTE BANK

2007

Cost of equity on the basis of beta coefficient

		ERBAG (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2005	1	1 187,00	1 213,00	1 032,00	1 168,40
	2	1 213,00	1 243,00	1 168,40	1 210,10
	3	1 243,00	1 305,00	1 210,10	1 453,70
	4	1 305,00	1 372,00	1 453,70	1 473,00
2006	1	1 372,00	1 389,00	1 473,00	1 523,90
	2	1 389,00	1 268,00	1 523,90	1 390,40
	3	1 268,00	1 405,00	1 390,40	1 447,50
	4	1 405,00	1 601,00	1 447,50	1 588,90
2007	1	1 601,00	1 636,00	1 588,90	1 712,20
	2	1 636,00	1 667,00	1 712,20	1 859,10
	3	1 667,00	1 490,00	1 859,10	1 816,30
	4	1 490,00	1 301,00	1 816,30	1 815,10

Extra calculations for beta coefficient

Year	Quarter	Profitability (%) ERBAG Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2005	1	2,19%	13,22%	0,05%	1,75%	0,29%
	2	2,47%	3,57%	0,06%	0,13%	0,09%
	3	4,99%	20,13%	0,25%	4,05%	1,00%
	4	5,13%	1,33%	0,26%	0,02%	0,07%
2006	1	1,24%	3,46%	0,02%	0,12%	0,04%
	2	-8,71%	-8,76%	0,76%	0,77%	0,76%
	3	10,80%	4,11%	1,17%	0,17%	0,44%
	4	13,95%	9,77%	1,95%	0,95%	1,36%
2007	1	2,19%	7,76%	0,05%	0,60%	0,17%
	2	1,89%	8,58%	0,04%	0,74%	0,16%
	3	-10,62%	-2,30%	1,13%	0,05%	0,24%
	4	-12,68%	-0,07%	1,61%	0,00%	0,01%
Total		**12,85%**	**60,79%**	**7,33%**	**9,35%**	**4,65%**

Data	Formula	Calculation
Beta 2007	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	**0,638**
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	**0,595**
Coefficient of determination	*Correlation coefficient^2*	**0,354**
Coefficient of non-determination	*1 - Coefficient of determination*	**0,646**

2006

Cost of equity on the basis of beta coefficient

		ERBAG (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2004	1	3 192,00	3 980,00	659,10	823,80
	2	3 980,00	4 131,00	823,80	793,50
	3	4 131,00	1 063,00	793,50	875,40
	4	1 063,00	1 187,00	875,40	1 032,00
2005	1	1 187,00	1 213,00	1 032,00	1 168,40
	2	1 213,00	1 243,00	1 168,40	1 210,10
	3	1 243,00	1 305,00	1 210,10	1 453,70
	4	1 305,00	1 372,00	1 453,70	1 473,00
2006	1	1 372,00	1 389,00	1 473,00	1 523,90
	2	1 389,00	1 268,00	1 523,90	1 390,40
	3	1 268,00	1 405,00	1 390,40	1 447,50

Extra calculations for beta coefficient

Year	Quarter	Profitability (%)				
		ERBAG Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2004	1	24,69%	24,99%	6,09%	6,24%	6,17%
	2	3,79%	-3,68%	0,14%	0,14%	-0,14%
	3	-74,27%	10,32%	55,16%	1,07%	-7,67%
	4	11,67%	17,89%	1,36%	3,20%	2,09%
2005	1	2,19%	13,22%	0,05%	1,75%	0,29%
	2	2,47%	3,57%	0,06%	0,13%	0,09%
	3	4,99%	20,13%	0,25%	4,05%	1,00%
	4	5,13%	1,33%	0,26%	0,02%	0,07%
2006	1	1,24%	3,46%	0,02%	0,12%	0,04%
	2	-8,71%	-8,76%	0,76%	0,77%	0,76%
	3	10,80%	4,11%	1,17%	0,17%	0,44%
Total		**-16,00%**	**86,57%**	**65,32%**	**17,64%**	**3,15%**

Data	Formula	Calculation
Beta 2006	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	0,378
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	0,158
Coefficient of determination	*Correlation coefficient^2*	0,025
Coefficient of non-determination	*1 - Coefficient of determination*	0,975

2005

Cost of equity on the basis of beta coefficient

		ERBAG (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2003	1	2 008,00	2 067,00	465,00	492,80
	2	2 067,00	2 427,00	492,80	535,10
	3	2 427,00	2 754,00	535,10	602,00
	4	2 754,00	3 192,00	602,00	659,10
2004	1	3 192,00	3 980,00	659,10	823,80
	2	3 980,00	4 131,00	823,80	793,50
	3	4 131,00	1 063,00	793,50	875,40
	4	1 063,00	1 187,00	875,40	1 032,00
2005	1	1 187,00	1 213,00	1 032,00	1 168,40
	2	1 213,00	1 243,00	1 168,40	1 210,10
	3	1 243,00	1 305,00	1 210,10	1 453,70

Extra calculations for beta coefficient

		Profitability (%)				
Year	Quarter	ERBAG Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2003	1	2,94%	5,98%	0,09%	0,36%	0,18%
	2	17,42%	8,58%	3,03%	0,74%	1,49%
	3	13,47%	12,50%	1,82%	1,56%	1,68%
	4	15,90%	9,49%	2,53%	0,90%	1,51%
2004	1	24,69%	24,99%	6,09%	6,24%	6,17%
	2	3,79%	-3,68%	0,14%	0,14%	-0,14%
	3	-74,27%	10,32%	55,16%	1,07%	-7,67%
	4	11,67%	17,89%	1,36%	3,20%	2,09%
2005	1	2,19%	13,22%	0,05%	1,75%	0,29%
	2	2,47%	3,57%	0,06%	0,13%	0,09%
	3	4,99%	20,13%	0,25%	4,05%	1,00%
Total		**25,26%**	**122,99%**	**70,58%**	**20,13%**	**6,70%**

Data	Formula	Calculation
Beta 2005	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	**0,546**
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	**0,179**
Coefficient of determination	*Correlation coefficient^2*	**0,032**
Coefficient of non-determination	*1 - Coefficient of determination*	**0,968**

CEZ

2007

Cost of equity on the basis of beta coefficient

		CEZ (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2005	1	340,7	408,1	1 032,00	1 168,40
	2	408,1	470,8	1 168,40	1 210,10
	3	470,8	739,3	1 210,10	1 453,70
	4	739,3	736,3	1 453,70	1 473,00
2006	1	736,3	819,2	1 473,00	1 523,90
	2	819,2	751,7	1 523,90	1 390,40
	3	751,7	790,5	1 390,40	1 447,50
	4	790,5	960	1 447,50	1 588,90
2007	1	960	940,9	1 588,90	1 712,20
	2	940,9	1 096,00	1 712,20	1 859,10
	3	1 096,00	1 186,00	1 859,10	1 816,30
	4	1 186,00	1 362,00	1 816,30	1 815,10

Extra calculations for beta coefficient

Year	Quarter	Profitability (%)				
		CEZ Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2005	1	19,78%	13,22%	3,91%	1,75%	2,61%
	2	15,36%	3,57%	2,36%	0,13%	0,55%
	3	57,03%	20,13%	32,52%	4,05%	11,48%
	4	-0,41%	1,33%	0,00%	0,02%	-0,01%
2006	1	11,26%	3,46%	1,27%	0,12%	0,39%
	2	-8,24%	-8,76%	0,68%	0,77%	0,72%
	3	5,16%	4,11%	0,27%	0,17%	0,21%
	4	21,44%	9,77%	4,60%	0,95%	2,09%
2007	1	-1,99%	7,76%	0,04%	0,60%	-0,15%
	2	16,48%	8,58%	2,72%	0,74%	1,41%
	3	8,21%	-2,30%	0,67%	0,05%	-0,19%
	4	14,84%	-0,07%	2,20%	0,00%	-0,01%
Total		**158,94%**	**60,79%**	**51,24%**	**9,35%**	**19,12%**

Data	Formula	Calculation
Beta 2007	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	1,766
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	0,804
Coefficient of determination	*Correlation coefficient^2*	0,647
Coefficient of non-determination	*1 - Coefficient of determination*	0,353

2006

Cost of equity on the basis of beta coefficient

		CEZ (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2004	1	145,7	191,44	659,10	823,80
	2	191,44	184,56	823,80	793,50
	3	184,56	259,3	793,50	875,40
	4	259,3	340,7	875,40	1 032,00
2005	1	340,7	408,1	1 032,00	1 168,40
	2	408,1	470,8	1 168,40	1 210,10
	3	470,8	739,3	1 210,10	1 453,70
	4	739,3	736,3	1 453,70	1 473,00
2006	1	736,3	819,2	1 473,00	1 523,90
	2	819,2	751,7	1 523,90	1 390,40
	3	751,7	790,5	1 390,40	1 447,50
	4	790,5	960	1 447,50	1 588,90

Extra calculations for beta coefficient

Year	Quarter	Profitability (%) CEZ Ri	PX Rm	Ri^2	Rm^2	Rm x Ri
2004	1	31,39%	24,99%	9,86%	6,24%	7,84%
	2	-3,59%	-3,68%	0,13%	0,14%	0,13%
	3	40,50%	10,32%	16,40%	1,07%	4,18%
	4	31,39%	17,89%	9,85%	3,20%	5,62%
2005	1	19,78%	13,22%	3,91%	1,75%	2,61%
	2	15,36%	3,57%	2,36%	0,13%	0,55%
	3	57,03%	20,13%	32,52%	4,05%	11,48%
	4	-0,41%	1,33%	0,00%	0,02%	-0,01%
2006	1	11,26%	3,46%	1,27%	0,12%	0,39%
	2	-8,24%	-8,76%	0,68%	0,77%	0,72%
	3	5,16%	4,11%	0,27%	0,17%	0,21%
	4	21,44%	9,77%	4,60%	0,95%	2,09%
Total		**221,08%**	**96,34%**	**81,85%**	**18,60%**	**35,83%**

Data	Formula	Calculation
Beta 2006	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	1,664
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	0,855
Coefficient of determination	*Correlation coefficient^2*	0,732
Coefficient of non-determination	*1 - Coefficient of determination*	0,268

2005

Cost of equity on the basis of beta coefficient

		CEZ (CZK)		PX	
Year	Quarter	BCPP open	BCPP close	Market index at the beginning	Market index at the end
2003	1	92,47	98,7	465,00	492,80
	2	98,7	104,6	492,80	535,10
	3	104,6	136,9	535,10	602,00
	4	136,9	145,7	602,00	659,10
2004	1	145,7	191,44	659,10	823,80
	2	191,44	184,56	823,80	793,50
	3	184,56	259,3	793,50	875,40
	4	259,3	340,7	875,40	1 032,00
2005	1	340,7	408,1	1 032,00	1 168,40
	2	408,1	470,8	1 168,40	1 210,10
	3	470,8	739,3	1 210,10	1 453,70
	4	739,3	736,3	1 453,70	1 473,00

Extra calculations for beta coefficient

Year	Quarter	Profitability (%) CEZ Ri	Profitability (%) PX Rm	Ri^2	Rm^2	Rm x Ri
2003	1	6,74%	5,98%	0,45%	0,36%	0,40%
	2	5,98%	8,58%	0,36%	0,74%	0,51%
	3	30,88%	12,50%	9,54%	1,56%	3,86%
	4	6,43%	9,49%	0,41%	0,90%	0,61%
2004	1	31,39%	24,99%	9,86%	6,24%	7,84%
	2	-3,59%	-3,68%	0,13%	0,14%	0,13%
	3	40,50%	10,32%	16,40%	1,07%	4,18%
	4	31,39%	17,89%	9,85%	3,20%	5,62%
2005	1	19,78%	13,22%	3,91%	1,75%	2,61%
	2	15,36%	3,57%	2,36%	0,13%	0,55%
	3	57,03%	20,13%	32,52%	4,05%	11,48%
	4	-0,41%	1,33%	0,00%	0,02%	-0,01%
Total		**241,48%**	**124,31%**	**85,80%**	**20,15%**	**37,80%**

Data	Formula	Calculation
Beta 2005	*n . sum(Rm.Ri) - sum(Rm) . sum(Ri)* / *n . sum(Rm^2) - sum(Rm)^2*	1,758
Correlation Coefficient	*n . sum(Rm.Ri) - sum(Rm).sum(Ri)* / *{[(n.sum(Rm^2)-sum(Rm)^2].[n.sum(Ri^2)-sum(Ri)^2]}^(1/2)*	0,777
Coefficient of determination	*Correlation coefficient^2*	0,604
Coefficient of non-determination	*1 - Coefficient of determination*	0,396

Appendix II. – Free Cash Flow to the Firm (Given)

ZENTIVA

2007

FCFF	2005	2006	2007	Estim.(2008-2012)
EBIT	1 828 000	2 531 000	2 578 000	
EBIT x (1-t)	1 352 720	1 923 560	1 959 280	
+ Depreciation	664 950	869 681	1 376 138	
= CF from Operations	2 017 670	2 793 241	3 335 418	
- Change in Net Working Capital	226 391	210 393	4 039 987	
- Capital Expenditures	5 049 989	242 616	13 826 448	
= FCFF	-3 258 710	2 340 232	-14 531 017	-5 149 832

Growth of FCFF	stable (g=0%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	-5 149 832	-5 149 832	-5 149 832	-5 149 832	-5 149 832	-5 149 832
Growth of FCFF	slight growth (g=2%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	-5 046 835	-4 945 898	-4 846 980	-4 750 041	-4 655 040	-4 561 939
Growth of FCFF	growth (g=5%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	-4 892 340	-4 647 723	-4 415 337	-4 194 570	-3 984 842	-3 785 599

	g=0%	g=2%	g=5%
EV 1. Phase	-20 695 902	-19 545 447	-17 926 864
EV 2. Phase	-45 720 969	-54 579 771	-94 632 260
The Operating Company Value(BRUTTO)	-66 416 871	-74 125 218	-112 559 124
Interest Bearing Capital	23 905 327	23 905 327	23 905 327
The Operating Company Value(NETTO)	-90 322 198	-98 030 545	-136 464 451
NonOperating Assets	2 252 581	2 252 581	2 252 581
The Final Value of Equity	-92 574 779	-100 283 126	-138 717 032
Stock Intrinsic Value	-2 427,48	-2 629,60	-3 637,41
Number of Shares issued	38 136 230		

2006

FCFF	2004	2005	2006	Estim.(2007-2011)
EBIT	2 531 000	2 578 000	3 303 000	
EBIT x (1-t)	1 822 320	1 907 720	2 510 280	
+ Depreciation	560 874	664 950	869 681	
= CF from Operations	2 383 194	2 572 670	3 379 961	
- Change in Net Working Capital	2 791 125	226 391	210 393	
- Capital Expenditures	105 705	5 049 989	242 616	
= FCFF	-513 636	-2 703 710	2 926 952	-96 798

Growth of FCFF	stable (g=0%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	-96 798	-96 798	-96 798	-96 798	-96 798	-96 798

Growth of FCFF	slight growth (g=2%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	-98 734	-100 709	-102 723	-104 777	-106 873	-109 010

Growth of FCFF	growth (g=5%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	-101 638	-106 720	-112 056	-117 659	-123 542	-129 719

	g=0%	g=2%	g=5%
EV 1. Phase	-389 290	-412 065	-448 460
EV 2. Phase	-863 541	-1 312 142	-3 279 537
The Operating Company Value(BRUTTO)	-1 252 831	-1 724 207	-3 727 997
Interest Bearing Capital	279 352	279 352	279 352
The Operating Company Value(NETTO)	-1 532 183	-2 003 559	-4 007 349
NonOperating Assets	1 214 783	1 214 783	1 214 783
The Final Value of Equity	-2 746 966	-3 218 342	-5 222 132
Stock Intrinsic Value	-72,03	-84,39	-136,93
Number of Shares issued	38 136 230		

2005

FCFF	2003	2004	2005	Estim.(2006-2010)
EBIT	1 828 000	2 531 000	2 578 000	
EBIT x (1-t)	2 394 680	3 239 680	3 248 280	
+ Depreciation	365 388	560 874	664 950	
= CF from Operations	2 760 068	3 800 554	3 913 230	
- Change in Net Working Capital	1 619 997	2 791 125	226 391	
- Capital Expenditures	1 035 879	105 705	5 049 989	
= FCFF	104 192	903 724	-1 363 150	-118 411

Growth of FCFF	stable (g=0%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	-1 415 505	-1 415 505	-1 415 505	-1 415 505	-1 415 505	-1 415 505

Growth of FCFF	slight growth (g=2%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	-1 387 195	-1 359 451	-1 332 262	-1 305 616	-1 279 504	-1 253 914

Growth of FCFF	growth (g=5%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	-1 344 729	-1 277 493	-1 213 618	-1 152 937	-1 095 291	-1 040 526

	g=0%	g=2%	g=5%
EV 1. Phase	-5 925 725	-5 593 125	-5 125 469
EV 2. Phase	-16 800 230	-21 921 292	-62 609 760
The Operating Company Value(BRUTTO)	-22 725 955	-27 514 417	-67 735 230
Interest Bearing Capital	2 380 753	2 380 753	2 380 753
The Operating Company Value(NETTO)	-25 106 708	-29 895 170	-70 115 983
NonOperating Assets	3 249 223	3 249 223	3 249 223
The Final Value of Equity	-28 355 931	-33 144 393	-73 365 206
Stock Intrinsic Value	-743,54	-869,11	-1 923,77
Number of Shares issued	38 136 230		

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2007

FCFF	2005	2006	2007	Estim.(2008-2012)
EBIT	5 279 069	3 779 929	4 825 552	
EBIT x (1-t)	3 906 511	2 872 746	3 667 420	
+ Depreciation	4 226 064	4 226 064	3 495 809	
= CF from Operations	8 132 575	7 098 810	7 163 229	
- Change in Net Working Capital	4 572 649	5 663 977	-121 336	
- Capital Expenditures	1 032 174	-9 110 004	-1 769 393	
= FCFF	13 737 398	3 652 783	5 272 500	7 554 227

Growth of FCFF	stable (g=0%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	7 554 227	7 554 227	7 554 227	7 554 227	7 554 227	7 554 227
Growth of FCFF	slight growth (g=2%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	7 705 311	7 859 418	8 016 606	8 176 938	8 340 477	8 507 286
Growth of FCFF	growth (g=5%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	7 931 938	8 328 535	8 744 962	9 182 210	9 641 320	10 123 387

	g=0%	g=2%	g=5%
EV 1. Phase	24 283 717	25 623 505	27 757 492
EV 2. Phase	20 699 161	26 462 071	39 499 025
The Operating Company Value(BRUTTO)	44 982 878	52 085 577	67 256 517
Interest Bearing Capital	7 443 617	7 443 617	7 443 617
The Operating Company Value(NETTO)	37 539 261	44 641 960	59 812 900
NonOperating Assets	4 521 364	4 521 364	4 521 364
The Final Value of Equity	33 017 897	40 120 596	55 291 536
Stock Intrinsic Value	182,08	221,25	304,91
Number of Shares issued	181 334 764		

2006

FCFF	2004	2005	2006	Estim.(2007-2011)
EBIT	5 846 248	5 279 069	3 779 929	
EBIT x (1-t)	4 209 299	3 906 511	2 872 746	
+ Depreciation	5 855 804	4 226 064	4 045 813	
= CF from Operations	10 065 103	8 132 575	6 918 559	
- Change in Net Working Capital	5 542 416	4 572 649	5 663 977	
- Capital Expenditures	-221 460	1 032 174	-9 110 004	
= FCFF	4 744 147	2 527 752	10 364 586	5 878 828

Growth of FCFF	stable (g=0%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	5 878 828	5 878 828	5 878 828	5 878 828	5 878 828	5 878 828

Growth of FCFF	slight growth (g=2%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	5 996 405	6 116 333	6 238 660	6 363 433	6 490 701	6 620 515

Growth of FCFF	growth (g=5%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	6 172 770	6 481 408	6 805 479	7 145 752	7 503 040	7 878 192

	g=0%	g=2%	g=5%
EV 1. Phase	22 685 749	23 999 216	26 096 923
EV 2. Phase	40 481 645	58 067 490	117 231 039
The Operating Company Value(BRUTTO)	63 167 394	82 066 705	143 327 962
Interest Bearing Capital	12 528 526	12 528 526	12 528 526
The Operating Company Value(NETTO)	50 638 868	69 538 179	130 799 436
NonOperating Assets	11 911 904	11 911 904	11 911 904
The Final Value of Equity	38 726 964	57 626 275	118 887 532
Stock Intrinsic Value	213,57	317,79	655,62
Number of Shares issued	181 334 764		

2005

FCFF	2003	2004	2005	Estim.(2006-2010)
EBIT	734 096	5 846 248	5 279 069	
EBIT x (1-t)	506 526	4 209 299	3 906 511	
+ Depreciation	4 068 104	5 855 804	4 226 064	
= CF from Operations	4 574 630	10 065 103	20 723	
- Change in Net Working Capital	-5 063 948	5 542 416	4 572 649	
- Capital Expenditures	-2 247 742	-221 460	1 032 174	
= FCFF	11 886 320	4 744 147	-5 584 100	3 682 122

Growth of FCFF	stable (g=0%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	3 682 122	3 682 122	3 682 122	3 682 122	3 682 122	3 682 122

Growth of FCFF	slight growth (g=2%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	3 755 765	3 830 880	3 907 498	3 985 648	4 065 361	4 146 668

Growth of FCFF	growth (g=5%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	3 866 228	4 059 540	4 262 517	4 475 643	4 699 425	4 934 396

	g=0%	g=2%	g=5%
EV 1. Phase	15 395 002	16 304 398	17 758 388
EV 2. Phase	43 282 320	71 545 535	285 426 470
The Operating Company Value(BRUTTO)	58 677 323	87 849 933	303 184 858
Interest Bearing Capital	19 232 124	19 232 124	19 232 124
The Operating Company Value(NETTO)	39 445 199	68 617 809	283 952 734
NonOperating Assets	3 734 694	3 734 694	3 734 694
The Final Value of Equity	35 710 505	64 883 115	280 218 040
Stock Intrinsic Value	196,93	357,81	1 545,31
Number of Shares issued	181 334 764		

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2007

FCFF	2005	2006	2007	Estim.(2008-2012)
EBIT	3 796	2 581	2 626	
EBIT x (1-t)	2 809	1 962	1 996	
+ Depreciation	384	366	423	
= CF from Operations	3 193	2 328	2 419	
- Change in Net Working Capital	-1 846	-908	442	
- Capital Expenditures	39	-95	-314	
= FCFF	5 000	3 331	2 291	3 540

Growth of FCFF	stable (g=0%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	3 540	3 540	3 540	3 540	3 540	3 540
Growth of FCFF	slight growth (g=2%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	3 611	3 683	3 757	3 832	3 909	3 987
Growth of FCFF	growth (g=5%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	3 717	3 903	4 099	4 303	4 519	4 745

	g=0%	g=2%	g=5%
EV 1. Phase	14 083	14 904	16 217
EV 2. Phase	29 393	43 877	102 038
The Operating Company Value(BRUTTO)	43 475	58 781	118 255
Interest Bearing Capital	3 764	3 764	3 764
The Operating Company Value(NETTO)	39 711	55 017	114 491
NonOperating Assets	2 317	2 317	2 317
The Final Value of Equity	37 394	52 700	112 174
Stock Intrinsic Value	13 620,78	19 195,81	40 859,26
Number of Shares issued	2 745 386		

2006

FCFF	2004	2005	2006	Estim.(2007-2011)
EBIT	5 247	3 796	2 581	
EBIT x (1-t)	3 778	2 809	1 962	
+ Depreciation	418	384	366	
= CF from Operations	4 196	3 193	2 328	
- Change in Net Working Capital	-460	-1 846	-908	
- Capital Expenditures	-278	39	-95	
= FCFF	4 933	5 000	3 331	4 421

Growth of FCFF	stable (g=0%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	4 421	4 421	4 421	4 421	4 421	4 421
Growth of FCFF	slight growth (g=2%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	4 510	4 600	4 692	4 786	4 881	4 979
Growth of FCFF	growth (g=5%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	4 642	4 874	5 118	5 374	5 643	5 925

	g=0%	g=2%	g=5%
EV 1. Phase	16 890	17 865	19 422
EV 2. Phase	28 693	40 706	79 360
The Operating Company Value(BRUTTO)	45 582	58 571	98 782
Interest Bearing Capital	164	164	164
The Operating Company Value(NETTO)	45 418	58 407	98 618
NonOperating Assets	4 004	4 004	4 004
The Final Value of Equity	41 414	54 403	94 614
Stock Intrinsic Value	15 085,01	19 816,10	34 463,05
Number of Shares issued	2 745 386		

2005

FCFF	2003	2004	2005	Estim.(2006-2010)
EBIT	6 078	5 247	3 796	
EBIT x (1-t)	4 194	3 778	2 809	
+ Depreciation	464	418	384	
= CF from Operations	4 658	4 196	3 193	
- Change in Net Working Capital	-1 416	-460	-1 846	
- Capital Expenditures	-119	-278	39	
= FCFF	6 193	4 933	5 000	5 376

Growth of FCFF	stable (g=0%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	5 376	5 376	5 376	5 376	5 376	5 376
Growth of FCFF	slight growth (g=2%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	5 483	5 593	5 705	5 819	5 935	6 054
Growth of FCFF	growth (g=5%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	5 644	5 927	6 223	6 534	6 861	7 204

	g=0%	g=2%	g=5%
EV 1. Phase	21 511	22 768	24 776
EV 2. Phase	46 402	69 924	168 831
The Operating Company Value(BRUTTO)	67 913	92 692	193 607
Interest Bearing Capital	57	57	57
The Operating Company Value(NETTO)	67 856	92 635	193 550
NonOperating Assets	6 829	6 829	6 829
The Final Value of Equity	61 027	85 806	186 721
Stock Intrinsic Value	22 228,83	31 254,54	68 012,64
Number of Shares issued	2 745 386		

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2007

FCFF	2005	2006	2007	Estim.(2008-2012)
EBIT	1 659 400	2 003 600	2 547 700	
EBIT x (1-t)	1 227 956	1 522 736	1 936 252	
+ Depreciation	355 000	355 000	485 000	
= CF from Operations	1 582 956	1 877 736	2 421 252	
- Change in Net Working Capital	-1 403 604	-707 776	2 817 932	
- Capital Expenditures	2 730 249	7 395 706	-10 811	
= FCFF	256 311	-4 810 194	-385 869	-1 646 584

Growth of FCFF	stable (g=0%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	-1 646 584	-1 646 584	-1 646 584	-1 646 584	-1 646 584	-1 646 584

Growth of FCFF	slight growth (g=2%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	-1 613 652	-1 581 379	-1 549 752	-1 518 757	-1 488 382	-1 458 614

Growth of FCFF	growth (g=5%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	-1 564 255	-1 486 042	-1 411 740	-1 341 153	-1 274 095	-1 210 391

	g=0%	g=2%	g=5%
EV 1. Phase	-7 175 650	-6 769 116	-6 197 834
EV 2. Phase	-27 389 432	-41 820 732	405 924 465
The Operating Company Value(BRUTTO)	-34 565 083	-48 589 848	399 726 631
Interest Bearing Capital	22 756 297	22 756 297	22 756 297
The Operating Company Value(NETTO)	-57 321 380	-71 346 145	376 970 334
NonOperating Assets	44 214 000	44 214 000	44 214 000
The Final Value of Equity	-101 535 380	-115 560 145	332 756 334
Stock Intrinsic Value	-321,02	-365,36	1 052,06
Number of Shares issued	316 288 945		

2006

FCFF	2004	2005	2006	Estim.(2007-2011)
EBIT	1 454 100	1 659 400	2 003 600	
EBIT x (1-t)	1 046 952	1 227 956	1 522 736	
+ Depreciation	342 000	355 000	355 000	
= CF from Operations	1 388 952	1 582 956	1 877 736	
- Change in Net Working Capital	12 873 658	-1 403 604	-707 776	
- Capital Expenditures	-10 624 142	2 730 249	7 395 706	
= FCFF	-860 564	256 311	-4 810 194	-1 804 816

Growth of FCFF	stable (g=0%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	-1 804 816	-1 804 816	-1 804 816	-1 804 816	-1 804 816	-1 804 816

Growth of FCFF	slight growth (g=2%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	-1 768 719	-1 733 345	-1 698 678	-1 664 705	-1 631 410	-1 598 782

Growth of FCFF	growth (g=5%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	-1 714 575	-1 628 846	-1 547 404	-1 470 034	-1 396 532	-1 326 705

	g=0%	g=2%	g=5%
EV 1. Phase	-7 883 514	-7 436 637	-6 808 684
EV 2. Phase	-30 680 945	-47 460 949	329 839 329
The Operating Company Value(BRUTTO)	-38 564 459	-54 897 586	323 030 646
Interest Bearing Capital	20 448 245	20 448 245	20 448 245
The Operating Company Value(NETTO)	-59 012 704	-75 345 831	302 582 401
NonOperating Assets	42 497 000	42 497 000	42 497 000
The Final Value of Equity	-101 509 704	-117 842 831	260 085 401
Stock Intrinsic Value	-321,95	-373,75	824,89

Number of Shares issued	315 296 185

2005

FCFF	2003	2004	2005	Estim.(2006-2010)
EBIT	1 370 100	1 454 100	1 659 400	
EBIT x (1-t)	945 369	1 046 952	1 227 956	
+ Depreciation	489 000	342 000	355 000	
= CF from Operations	1 434 369	1 388 952	1 582 956	
- Change in Net Working Capital	-2 313 233	12 873 658	-1 403 604	
- Capital Expenditures	4 102 805	-6 521 337	-3 791 088	
= FCFF	-355 203	-4 963 369	6 777 648	486 359

Growth of FCFF	stable (g=0%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	486 359	486 359	486 359	486 359	486 359	486 359

Growth of FCFF	slight growth (g=2%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	496 086	506 008	516 128	526 450	536 979	547 719

Growth of FCFF	growth (g=5%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	510 677	536 210	563 021	591 172	620 731	651 767

	g=0%	g=2%	g=5%
EV 1. Phase	2 131 677	2 259 051	2 462 832
EV 2. Phase	8 539 566	17 137 053	-117 910 967
The Operating Company Value(BRUTTO)	10 671 243	19 396 104	-115 448 135
Interest Bearing Capital	18 203 368	18 203 368	18 203 368
The Operating Company Value(NETTO)	-7 532 125	1 192 736	-133 651 503
NonOperating Assets	39 455 000	39 455 000	39 455 000
The Final Value of Equity	-46 987 125	-38 262 264	-173 106 503
Stock Intrinsic Value	-193,22	-157,34	-711,83

Number of Shares issued	243 183 600

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2007

FCFF	2005	2006	2007	Estim.(2008-2012)
EBIT	29 403	40 064	53 203	
EBIT x (1-t)	21 758	30 449	40 434	
+ Depreciation	20 723	24 280	22 123	
= CF from Operations	42 481	54 729	62 557	
- Change in Net Working Capital	6 099	8 990	-24 021	
- Capital Expenditures	8 675	21 589	11 092	
= FCFF	27 707	24 150	75 486	42 448

Growth of FCFF	stable (g=0%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	42 448	42 448	42 448	42 448	42 448	42 448
Growth of FCFF	slight growth (g=2%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	43 297	44 163	45 046	45 947	46 866	47 803
Growth of FCFF	growth (g=5%)					
Year	2008	2009	2010	2011	2012	2013
FCFF	44 570	46 799	49 139	51 595	54 175	56 884

	g=0%	g=2%	g=5%
EV 1. Phase	159 389	168 553	183 183
EV 2. Phase	249 827	348 549	646 346
The Operating Company Value(BRUTTO)	409 216	517 102	829 529
Interest Bearing Capital	124 697	124 697	124 697
The Operating Company Value(NETTO)	284 519	392 405	704 832
NonOperating Assets	39 870	39 870	39 870
The Final Value of Equity	244 649	352 535	664 962
Stock Intrinsic Value	413,11	595,29	1 122,85
Number of Shares issued	592 211 000		

2006

FCFF	2004	2005	2006	Estim.(2007-2011)
EBIT	19 785	29 403	53 203	
EBIT x (1-t)	14 245	21 758	40 434	
+ Depreciation	19 842	20 723	24 280	
= CF from Operations	34 087	42 481	64 714	
- Change in Net Working Capital	22 581	6 099	8 990	
- Capital Expenditures	13 203	8 675	21 589	
= FCFF	-1 697	27 707	34 135	20 049

Growth of FCFF	stable (g=0%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	20 049	20 049	20 049	20 049	20 049	20 049

Growth of FCFF	slight growth (g=2%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	20 450	20 859	21 276	21 701	22 135	22 578

Growth of FCFF	growth (g=5%)					
Year	2007	2008	2009	2010	2011	2012
FCFF	21 051	22 104	23 209	24 369	25 588	26 867

	g=0%	g=2%	g=5%
EV 1. Phase	74 564	78 841	85 667
EV 2. Phase	111 921	154 848	280 390
The Operating Company Value(BRUTTO)	186 486	233 689	366 058
Interest Bearing Capital	140 985	140 985	140 985
The Operating Company Value(NETTO)	45 501	92 704	225 073
NonOperating Assets	56 740	56 740	56 740
The Final Value of Equity	-11 239	35 964	168 333
Stock Intrinsic Value	-18,98	60,73	284,24
Number of Shares issued	592 211 000		

2005

FCFF	2003	2004	2005	Estim.(2006-2010)
EBIT	15 048	19 785	29 403	
EBIT x (1-t)	10 383	14 245	21 758	
+ Depreciation	16 961	19 842	20 723	
= CF from Operations	27 344	34 087	42 481	
- Change in Net Working Capital	-17 414	22 581	6 099	
- Capital Expenditures	42 318	13 203	8 675	
= FCFF	2 440	-1 697	27 707	9 484

Growth of FCFF	stable (g=0%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	9 484	9 484	9 484	9 484	9 484	9 484

Growth of FCFF	slight growth (g=2%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	9 673	9 867	10 064	10 265	10 471	10 680

Growth of FCFF	growth (g=5%)					
Year	2005	2006	2007	2008	2009	2010
FCFF	9 958	10 456	10 978	11 527	12 104	12 709

	g=0%	g=2%	g=5%
EV 1. Phase	35 134	37 147	40 360
EV 2. Phase	51 828	71 476	128 262
The Operating Company Value(BRUTTO)	86 962	108 622	168 622
Interest Bearing Capital	114 365	114 365	114 365
The Operating Company Value(NETTO)	-27 403	-5 743	54 257
NonOperating Assets	32 055	32 055	32 055
The Final Value of Equity	-59 458	-37 798	22 202
Stock Intrinsic Value	-100,40	-63,82	37,49
Number of Shares issued	592 211 000		

Appendix III. – Free Cash Flow to the Firm (Expected)

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2007

Expected Cash Flow					
	2008	2009	2010	2011	2012
EBIT	2 224 250	2 279 856	2 336 853	2 395 274	2 455 156
EBIT*(1-t)	-467 093	-455 971	-444 002	-455 102	-466 480
EBIT after taxation	1 757 158	1 823 885	1 892 851	1 940 172	1 988 676
Depreciation	1 403 661	504 594	514 686	524 980	535 479
Cash Flow from Operations	3 160 818	2 328 479	2 407 537	2 465 152	2 524 155
Change in Net Working Capital	305 694	319 322	328 522	337 976	347 692
Investments	488 935	496 561	509 203	522 194	535 543
FCFF	2 366 190	1 512 596	1 569 811	1 604 981	1 640 920

FCFF - basic model						
		2008	2009	2010	2011	2012
1. Phase	FCFF	2 366 190	1 512 596	1 569 811	1 604 981	1 640 920
	WACC	7,75%				
	EV 1. Phase	7 073 517				
2. Phase	g	2,00%				
	WACC	7,75%				
	EV 2. Phase	20 024 879				

EV 1. Phase	7 073 517
EV 2. Phase	20 024 879
The Operating Company Value (BRUTTO)	27 098 396
Interest Bearing Capital	17 944 931
The Operating Company Value (NETTO)	9 153 465
NonOperating Assets	2 252 581
The Final Value of Equity	6 900 884
Stock Intrinsic Value	**181**

2006

Expected Cash Flow					
	2007	2008	2009	2010	2011
EBIT	2 170 000	2 224 250	2 279 856	2 336 853	2 395 274
EBIT*(1-t)	-520 800	-467 093	-455 971	-444 002	-455 102
EBIT after taxation	1 649 200	1 757 158	1 823 885	1 892 851	1 940 172
Depreciation	1 376 138	1 403 661	1 431 734	1 460 369	1 489 576
Cash Flow from Operations	3 025 338	3 160 818	3 255 619	3 353 219	3 429 748
Change in Net Working Capital	4 039 987	305 694	319 322	328 522	337 976
Investments	13 826 448	488 935	496 561	509 203	522 194
FCFF	-14 841 097	2 366 190	2 439 735	2 515 494	2 569 578

FCFF - basic model						
		2007	2008	200 9	2010	2011
1. Phase	FCFF	-14 841 097	2 366 190	2 439 735	2 515 494	2 569 578
	WACC	7,73%				
	EV 1. Phase	-6 147 221				
2. Phase	g	2,00%				
	WACC	7,73%				
	EV 2. Phase	31 548 247				

EV 1. Phase	-6 147 221
EV 2. Phase	31 548 247
The Operating Company Value (BRUTTO)	25 401 026
Interest Bearing Capital	279 352
The Operating Company Value (NETTO)	25 121 674
NonOperating Assets	1 214 783
The Final Value of Equity	23 906 891
Stock Intrinsic Value	**627**

2005

Expected Cash Flow					
	2006	2007	2008	2009	2010
EBIT	3 303 000	2 170 000	2 224 250	2 279 856	2 336 853
EBIT*(1-t)	-792 720	-520 800	-467 093	-455 971	-444 002
EBIT after taxation	2 510 280	1 649 200	1 757 158	1 823 885	1 892 851
Depreciation	869 681	1 376 138	1 403 661	1 431 734	1 460 369
Cash Flow from Operations	3 379 961	3 025 338	3 160 818	3 255 619	3 353 219
Change in Net Working Capital	210 393	4 039 987	305 694	319 322	328 522
Investments	242 616	13 826 448	488 935	496 561	509 203
FCFF	2 926 952	-14 841 097	2 366 190	2 439 735	2 515 494

FCFF - basic model						
		2006	2007	2008	2009	2010
1. Phase	FCFF	2 926 952	-14 841 097	2 366 190	2 439 735	2 515 494
	WACC	6,23%				
	EV 1. Phase	-4 647 000				
2. Phase	g	2,00%				
	WACC	6,23%				
	EV 2. Phase	44 856 125				

EV 1. Phase	-4 647 000
EV 2. Phase	44 856 125
The Operating Company Value (BRUTTO)	40 209 125
Interest Bearing Capital	2 380 753
The Operating Company Value (NETTO)	37 828 372
NonOperating Assets	3 249 223
The Final Value of Equity	34 579 149
Stock Intrinsic Value	**907**

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2007

Expected Cash Flow					
	2008	2009	2010	2011	2012
EBIT	4 922 063	5 020 504	5 120 914	5 223 333	5 327 799
EBIT*(1-t)	-1 033 633	-1 004 101	-972 974	-992 433	-1 012 282
EBIT after taxation	3 888 430	4 016 403	4 147 941	4 230 899	4 315 517
Depreciation	3 425 893	3 357 375	3 290 227	3 224 423	3 159 934
Cash Flow from Operations	7 314 323	7 373 778	7 438 168	7 455 322	7 475 452
Change in Net Working Capital	766 620	445 012	445 244	477 328	491 786
Investments	763 163	768 984	958 253	1 017 131	1 046 508
FCFF	5 784 540	6 159 783	6 034 671	5 960 864	5 937 157

FCFF - basic model						
		2008	2009	2010	2011	2012
1. Phase	FCFF	5 784 540	6 159 783	6 034 671	5 960 864	5 937 157
	WACC	16,83%				
	EV 1. Phase	19 177 863				
2. Phase	g	2,00%				
	WACC	16,83%				
	EV 2. Phase	18 770 903				

EV 1. Phase	19 177 863
EV 2. Phase	18 770 903
The Operating Company Value (BRUTTO)	37 948 766
Interest Bearing Capital	7 443 617
The Operating Company Value (NETTO)	30 505 149
NonOperating Assets	4 521 364
The Final Value of Equity	25 983 785
Stock Intrinsic Value	**143**

2006

Expected Cash Flow					
	2007	2008	2009	2010	2011
EBIT	4 825 552	4 922 063	5 020 504	5 120 914	5 223 333
EBIT*(1-t)	-1 158 132	-1 033 633	-1 004 101	-972 974	-992 433
EBIT after taxation	3 667 420	3 888 430	4 016 403	4 147 941	4 230 899
Depreciation	3 495 809	3 425 893	3 357 375	3 290 227	3 224 423
Cash Flow from Operations	7 163 229	7 314 323	7 373 778	7 438 168	7 455 322
Change in Net Working Capital	-121 336	766 620	445 012	445 244	477 328
Investments	-1 769 393	763 163	768 984	958 253	1 017 131
FCFF	9 053 958	5 784 540	6 159 783	6 034 671	5 960 864

FCFF - basic model						
		2007	2008	200 9	2010	2011
1. Phase	FCFF	9 053 958	5 784 540	6 159 783	6 034 671	5 960 864
	WACC	9,31%				
	EV 1. Phase	25 888 490				
2. Phase	g	2,00%				
	WACC	9,31%				
	EV 2. Phase	53 327 424				

EV 1. Phase	25 888 490
EV 2. Phase	53 327 424
The Operating Company Value (BRUTTO)	79 215 914
Interest Bearing Capital	12 528 526
The Operating Company Value (NETTO)	66 687 388
NonOperating Assets	11 911 904
The Final Value of Equity	54 775 484
Stock Intrinsic Value	**302**

2005

Expected Cash Flow					
	2006	2007	2008	2009	2010
EBIT	3 779 929	4 825 552	4 922 063	5 020 504	5 120 914
EBIT*(1-t)	-907 183	-1 158 132	-1 033 633	-1 004 101	-972 974
EBIT after taxation	2 872 746	3 667 420	3 888 430	4 016 403	4 147 941
Depreciation	4 045 813	3 495 809	3 425 893	3 357 375	3 290 227
Cash Flow from Operations	6 918 559	7 163 229	7 314 323	7 373 778	7 438 168
Change in Net Working Capital	5 663 977	-121 336	766 620	445 012	445 244
Investments	1 032 174	-9 110 004	-1 769 393	763 163	768 984
FCFF	222 408	16 394 569	8 317 096	6 165 604	6 223 940

FCFF - basic model						
		2006	2007	2008	2009	2010
1. Phase	FCFF	222 408	16 394 569	8 317 096	6 165 604	6 223 940
	WACC	6,50%				
	EV 1. Phase	30 886 400				
2. Phase	g	2,00%				
	WACC	6,50%				
	EV 2. Phase	103 047 335				

EV 1. Phase	30 886 400
EV 2. Phase	103 047 335
The Operating Company Value (BRUTTO)	133 933 735
Interest Bearing Capital	19 232 124
The Operating Company Value (NETTO)	114 701 611
NonOperating Assets	3 734 694
The Final Value of Equity	110 966 917
Stock Intrinsic Value	**612**

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2007

Expected Cash Flow					
	2008	2009	2010	2011	2012
EBIT	2 675	2 729	2 783	2 838	2 895
EBIT*(1-t)	-562	-546	-529	-539	-550
EBIT after taxation	2 113	2 183	2 254	2 299	2 345
Depreciation	415	406	398	390	382
Cash Flow from Operations	2 528	2 589	2 652	2 689	2 727
Change in Net Working Capital	145	110	127	111	127
Investments	-46	-44	-44	-42	-62
FCFF	2 429	2 524	2 569	2 621	2 663

FCFF - basic model							
1. Phase		2008	2009	2010	2011	2012
	FCFF	2 429	2 524	2 569	2 621	2 663
	WACC	8,14%				
	EV 1. Phase	10 151				
2. Phase	g	2,00%				
	WACC	8,14%				
	EV 2. Phase	29 887				
EV 1. Phase	10 151					
EV 2. Phase	29 887					
The Operating Company Value (BRUTTO)	40 039					
Interest Bearing Capital	3 764					
The Operating Company Value (NETTO)	36 275					
NonOperating Assets	2 317					
The Final Value of Equity	33 958					
Stock Intrinsic Value	**12 369**					

2006

Expected Cash Flow					
	2007	2008	2009	2010	2011
EBIT	2 626	2 675	2 729	2 783	2 838
EBIT*(1-t)	-630	-562	-546	-529	-539
EBIT after taxation	1 996	2 113	2 183	2 254	2 299
Depreciation	423	415	406	398	390
Cash Flow from Operations	2 419	2 528	2 589	2 652	2 689
Change in Net Working Capital	442	145	110	127	111
Investments	-314	-46	-44	-44	-42
FCFF	2 291	2 429	2 524	2 569	2 621

FCFF - basic model						
		2008	2009	2010	2011	2012
1. Phase	FCFF	2 291	2 429	2 524	2 569	2 621
	WACC	9,70%				
	EV 1. Phase	9 442				
2. Phase	g	2,00%				
	WACC	9,70%				
	EV 2. Phase	21 855				

EV 1. Phase	9 442
EV 2. Phase	21 855
The Operating Company Value (BRUTTO)	31 297
Interest Bearing Capital	164
The Operating Company Value (NETTO)	31 133
NonOperating Assets	4 004
The Final Value of Equity	27 129
Stock Intrinsic Value	**9 881**

2005

Expected Cash Flow	2006	2007	2008	2009	2010
EBIT	2 581	2 626	2 675	2 729	2 783
EBIT*(1-t)	-619	-630	-562	-546	-529
EBIT after taxation	1 962	1 996	2 113	2 183	2 254
Depreciation	366	423	415	406	398
Cash Flow from Operations	2 328	2 419	2 528	2 589	2 652
Change in Net Working Capital	-908	442	145	110	127
Investments	-95	-314	-46	-44	-44
FCFF	3 331	2 291	2 429	2 524	2 569

FCFF - basic model						
		2006	2007	2008	2009	2010
1. Phase	FCFF	3 331	2 291	2 429	2 524	2 569
	WACC	7,92%				
	EV 1. Phase	10 602				
2. Phase	g	2,00%				
	WACC	7,92%				
	EV 2. Phase	30 268				

EV 1. Phase	10 602
EV 2. Phase	30 268
The Operating Company Value (BRUTTO)	40 870
Interest Bearing Capital	469
The Operating Company Value (NETTO)	40 401
NonOperating Assets	6 829
The Final Value of Equity	33 572
Stock Intrinsic Value	**12 228**

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2007

Expected Cash Flow					
	2008	2009	2010	2011	2012
EBIT	2 598 654	2 650 627	2 703 640	2 757 712	2 812 867
EBIT*(1-t)	-545 717	-530 125	-513 692	-523 965	-534 445
EBIT after taxation	2 052 937	2 120 502	2 189 948	2 233 747	2 278 422
Depreciation	494 700	504 594	514 686	524 980	535 479
Cash Flow from Operations	2 547 637	2 625 096	2 704 634	2 758 727	2 813 901
Change in Net Working Capital	726 715	747 059	768 569	812 432	829 337
Investments	30 718	36 044	41 258	46 364	51 366
FCFF	1 790 204	1 841 992	1 894 807	1 899 930	1 933 198

FCFF - basic model						
		2008	2009	2010	2011	2012
1. Phase	FCFF	1 790 204	1 841 992	1 894 807	1 899 930	1 933 198
	WACC	4,76%				
	EV 1. Phase	8 144 089				
2. Phase	g	2,00%				
	WACC	4,76%				
	EV 2. Phase	56 536 352				

EV 1. Phase	8 144 089
EV 2. Phase	56 536 352
The Operating Company Value (BRUTTO)	64 680 441
Interest Bearing Capital	22 756 297
The Operating Company Value (NETTO)	41 924 144
NonOperating Assets	44 214 000
The Final Value of Equity	-2 289 856
Stock Intrinsic Value	-7

2006

Expected Cash Flow					
	2007	2008	2009	2010	2011
EBIT	2 547 700	2 598 654	2 650 627	2 703 640	2 757 712
EBIT*(1-t)	-611 448	-545 717	-530 125	-513 692	-523 965
EBIT after taxation	1 936 252	2 052 937	2 120 502	2 189 948	2 233 747
Depreciation	485 000	494 700	504 594	514 686	524 980
Cash Flow from Operations	2 421 252	2 547 637	2 625 096	2 704 634	2 758 727
Change in Net Working Capital	2 817 932	726 715	747 059	768 569	812 432
Investments	-10 811	30 718	36 044	41 258	46 364
FCFF	-385 869	1 790 204	1 841 992	1 894 807	1 899 930

FCFF - basic model						
		2007	2008	200 9	2010	2011
1. Phase	FCFF	-385 869	1 790 204	1 841 992	1 894 807	1 899 930
	WACC	4,66%				
	EV 1. Phase	5 963 814				
2. Phase	g	2,00%				
	WACC	4,66%				
	EV 2. Phase	57 924 550				
EV 1. Phase	5 963 814					
EV 2. Phase	57 924 550					
The Operating Company Value (BRUTTO)	63 888 364					
Interest Bearing Capital	20 448 245					
The Operating Company Value (NETTO)	43 440 119					
NonOperating Assets	42 497 000					
The Final Value of Equity	943 119					
Stock Intrinsic Value	**3**					

2005

Expected Cash Flow	2006	2007	2008	2009	2010
EBIT	2 003 600	2 547 700	2 598 654	2 650 627	2 703 640
EBIT*(1-t)	-480 864	-611 448	-545 717	-530 125	-513 692
EBIT after taxation	1 522 736	1 936 252	2 052 937	2 120 502	2 189 948
Depreciation	355 000	485 000	494 700	504 594	514 686
Cash Flow from Operations	1 877 736	2 421 252	2 547 637	2 625 096	2 704 634
Change in Net Working Capital	-707 776	2 817 932	726 715	747 059	768 569
Investments	7 395 706	-10 811	30 718	36 044	41 258
FCFF	-4 810 194	-385 869	1 790 204	1 841 992	1 894 807

FCFF - basic model						
		2006	2007	2008	2009	2010
1. Phase	FCFF	-4 810 194	-385 869	1 790 204	1 841 992	1 894 807
	WACC	4,56%				
	EV 1. Phase	-329 803				
2. Phase	g	2,00%				
	WACC	4,56%				
	EV 2. Phase	60 470 510				
EV 1. Phase	-329 803					
EV 2. Phase	60 470 510					
The Operating Company Value (BRUTTO)	60 140 708					
Interest Bearing Capital	18 203 368					
The Operating Company Value (NETTO)	41 937 340					
NonOperating Assets	39 455 000					
The Final Value of Equity	2 482 340					
Stock Intrinsic Value	**10**					

CEZ

2007

Expected Cash Flow					
	2008	2009	2010	2011	2012
EBIT	61 865	58 570	56 764	55 500	56 515
EBIT*(1-t)	-12 992	-11 714	-10 785	-10 545	-10 738
EBIT after taxation	48 874	46 856	45 979	44 955	45 777
Depreciation	22 565	23 242	23 940	24 658	25 398
Cash Flow from Operations	71 439	70 098	69 918	69 613	71 175
Change in Net Working Capital	7 559	6 517	5 646	6 204	6 065
Investments	14 326	14 929	16 076	17 600	19 367
FCFF	49 555	48 653	48 196	45 809	45 742

FCFF - basic model						
		2008	2009	2010	2011	2012
1. Phase	FCFF	49 555	48 653	48 196	45 809	45 742
	WACC	10,37%				
	EV 1. Phase	179 474				
2. Phase	g	2,00%				
	WACC	10,37%				
	EV 2. Phase	340 194				

EV 1. Phase	179 474
EV 2. Phase	340 194
The Operating Company Value (BRUTTO)	519 668
Interest Bearing Capital	124 697
The Operating Company Value (NETTO)	394 971
NonOperating Assets	39 870
The Final Value of Equity	355 101
Stock Intrinsic Value	**600**

2006

Expected Cash Flow					
	2007	2008	2009	2010	2011
EBIT	53 203	61 865	58 570	56 764	55 500
EBIT*(1-t)	-12 769	-12 992	-11 714	-10 785	-10 545
EBIT after taxation	40 434	48 873	46 856	45 979	44 955
Depreciation	22 123	22 565	23 242	23 940	24 658
Cash Flow from Operations	62 557	71 439	70 098	69 919	69 613
Change in Net Working Capital	-24 021	7 559	6 517	5 646	6 204
Investments	11 092	14 326	14 929	16 076	17 600
FCFF	75 486	49 555	48 653	48 196	45 809

FCFF - basic model						
		2008	2009	2010	2011	2012
1. Phase	FCFF	75 486	49 555	48 653	48 196	45 809
	WACC	10,75%				
	EV 1. Phase	203 903				
2. Phase	g	2,00%				
	WACC	10,75%				
	EV 2. Phase	320 460				
EV 1. Phase	203 903					
EV 2. Phase	320 460					
The Operating Company Value (BRUTTO)	524 363					
Interest Bearing Capital	169 563					
The Operating Company Value (NETTO)	354 800					
NonOperating Assets	56 740					
The Final Value of Equity	298 060					
Stock Intrinsic Value	**503**					

2005

Expected Cash Flow					
	2006	2007	2008	2009	2010
EBIT	40 064	53 203	61 865	58 570	56 764
EBIT*(1-t)	-9 615	-12 769	-12 992	-11 714	-10 785
EBIT after taxation	30 449	40 434	48 873	46 856	45 979
Depreciation	24 280	22 123	22 565	23 242	23 940
Cash Flow from Operations	54 729	62 557	71 439	70 098	69 919
Change in Net Working Capital	8 990	-24 021	7 559	6 517	5 646
Investments	21 589	11 092	14 326	14 929	16 076
FCFF	24 150	75 486	49 555	48 653	48 196

FCFF - basic model						
		2006	2007	2008	2009	2010
1. Phase	FCFF	24 150	75 486	49 555	48 653	48 196
	WACC	10,60%				
	EV 1. Phase	181 803				
2. Phase	g	2,00%				
	WACC	10,60%				
	EV 2. Phase	345 306				
EV 1. Phase	181 803					
EV 2. Phase	345 306					
The Operating Company Value (BRUTTO)	527 109					
Interest Bearing Capital	114 365					
The Operating Company Value (NETTO)	412 744					
NonOperating Assets	32 055					
The Final Value of Equity	380 689					
Stock Intrinsic Value	**643**					

Appendix IV. – Economic Value Added

ZENTIVA

	2005	2006	2007
EBIT (1-T)	1 352 720	1 923 560	1 959 280
Equity	9 781 548	12 096 902	11 959 402
Long-Term Debt	2 380 753	279 352	17 944 931
WACC	6,23%	7,73%	7,75%
EVA	595181,17	967328,44	-359442,31
MVA	9555645,418	12519878,02	-4635692,079
Value Brutto	21 717 946	24 896 132	25 268 641
Value of Equity	19 337 193	24 616 780	7 323 710
Stock Instrict Value	507,0557163	645,4958976	192,0407424

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	2005	2006	2007
EBIT (1-T)	3 906 511	2 872 746	3 667 420
Equity	39 695 630	41 160 194	42 138 069
Long-Term Debt	12 970 524	8 059 933	5 191 329
WACC	6,28%	12,85%	16,79%
EVA	601601,95	-3453309,25	-4280871,69
MVA	9586968,865	-26868611,19	-25491149,56
Value Brutto	62 253 123	22 351 516	21 838 248
Value of Equity	49 282 599	14 291 583	16 646 919
Stock Instrict Value	271,7768936	78,81325397	91,80214029

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	2005	2006	2007
EBIT (1-T)	2 809	1 962	1 996
Equity	9 463	8 341	8 661
Long-Term Debt	57	164	0
WACC	7,92%	9,70%	8,14%
EVA	2055,50	1136,61	1290,44
MVA	25968,56206	11718,19806	15846,10228
Value Brutto	35 489	20 223	24 507
Value of Equity	35 432	20 059	24 507
Stock Instrict Value	12905,85807	7306,512838	8926,650852

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	2005	2006	2007
EBIT (1-T)	1 227 956	1 522 736	1 936 252
Equity	6 461 154	10 904 207	11 403 276
Long-Term Debt	18 203 368	20 448 245	22 756 297
WACC	4,76%	4,68%	4,76%
EVA	53007,07	55442,07	308985,36
MVA	1112724,075	1184660,208	6486219,086
Value Brutto	25 777 246	32 537 112	40 645 792
Value of Equity	7 573 878	12 088 867	17 889 495
Stock Instrict Value	31,14469099	38,34130504	56,56060817

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	2005	2006	2007
EBIT (1-T)	21 758	30 449	40 434
Equity	191 289	207 653	184 226
Long-Term Debt	81 429	94 182	107 544
WACC	10,37%	10,75%	10,91%
EVA	-6530,65	-2000,84	8615,79
MVA	-62958,55202	-18611,1746	79005,30153
Value Brutto	209 759	283 224	370 775
Value of Equity	128 330	189 042	263 231
Stock Instrict Value	216,6971704	319,213634	444,4890445

Appendix V. – Free Cash Flow to the Equity

ZENTIVA

2007

	2005	2006	2007	2008E	2009E	2010E	2011E	2012E
EPS	310,45	367,1869506	437,1254841					
Debt proportion	46,29%	29,81%	65,49%					
Capital Expenditure	5 049 989	242 616	13 826 448					
Depreciation	664950,00	869681,00	1376138,00					
Change in Net Working Capital	226 391	210 393	4 039 987					
FCFE	-2476519,29	292814,2211	-5690352,298	-2624685,79				
				-2572192,07	-2520748,23	-2470333	-2420927	-2372508

1.Phase	-8486191,416
2. Phase	-38509905,47
Value of Equity	-46996096,89
Stock Intrinsic Value	-1232,32

2006

	2004	2005	2006					
EPS	279,89	310,45	367,1869506					
Debt proportion	19,80%	46,29%	29,81%					
Capital Expenditure	105 705	5 049 989	242 616					
Depreciation	560874,00	664950,00	869681,00					
Change in Net Working Capital	2 791 125	226 391	210 393					
FCFE	-1873246,461	-2476519,29	292814,2211	-1352317,18				
				-1325270,83	-1298765,42	-1272790	-1247334	-1222388

1.Phase	-4950680,746
2. Phase	-27011292,33
Value of Equity	-31961973,07
Stock Intrinsic Value	-838,10

2005

	2003	2004	2005					
EPS	49353,40	279,89	310,45					
Debt proportion	62,52%	19,80%	46,29%					
Capital Expenditure	-2 247 742	-221 460	5 049 989					
Depreciation	4068104,00	5855804,00	4226064,00					
Change in Net Working Capital	1 619 997	2 791 125	226 391					
FCFE	1809400,046	2635889,46	-563821,2637	1293822,75				
				1319699,2	1346093,19	1373015	1400475	1428485

1.Phase	5491099,911
2. Phase	36391615
Value of Equity	41882714,91
Stock Intrinsic Value	1098,24

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2007

	2005	2006	2007	2008E	2009E	2010E	2011E	2012E
EPS	446,39	516,714324	489,5835362					
Debt proportion	48,07%	42,76%	36,29%					
Capital Expenditure	1 032 174	-9 110 004	-1 769 393					
Depreciation	4 226 064	4045813,00	3495809,00					
Change in Net Working Capital	4 572 649	5 663 977	-121 336					
FCFE	-715533,8924	4288911,993	3432287,585	2335221,9				
				2381926,33	2429564,86	2478156	2527719	2578274

1.Phase	6783461,458
2. Phase	35088723,35
Value of Equity	41872184,81
Stock Intrinsic Value	230,91

2006

	2004	2005	2006					
EPS	446,39	446,39	516,714324					
Debt proportion	53,67%	48,07%	42,76%					
Capital Expenditure	-221 460	1 032 174	-9 110 004					
Depreciation	5855804,00	4226064,00	4045813,00					
Change in Net Working Capital	5 542 416	4 572 649	5 663 977					
FCFE	248222,2201	-715533,8924	4288911,993	1273866,77				
				1299344,11	1325330,99	1351838	1378874	1406452

1.Phase	4751055,81
2. Phase	24196332,5
Value of Equity	28947388,31
Stock Intrinsic Value	159,64

2005

	2003	2004	2005					
EPS	88,34	446,39	446,39					
Debt proportion	57,68%	53,67%	48,07%					
Capital Expenditure	-2 247 742	-221 460	1 032 174					
Depreciation	4068104,00	5855804,00	4226064,00					
Change in Net Working Capital	-5 063 948	5 542 416	4 572 649					
FCFE	4815776,433	248222,2201	-715533,8924	1449488,25				
				1478478,02	1508047,58	1538209	1568973	1600352

1.Phase	6060207,86
2. Phase	38169109,61
Value of Equity	44229317,47
Stock Intrinsic Value	243,91

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2007

	2005	2006	2007	2008E	2009E	2010E	2011E	2012E
EPS	4294,48	3653,76672	3776,882376					
Debt proportion	40,41%	38,78%	58,84%					
Capital Expenditure	39	-95	-314					
Depreciation	384,00	366,00	423,00					
Change in Net Working Capital	-1 846	-908	442					
FCFE	5600,027668	4491,845913	3898,300188	4663,39126				
				4756,65908	4851,79226	4948,82811	5047,80467	5148,760764

1.Phase	17215,53603
2. Phase	86899,10514
Value of Equity	104114,6412
Stock Intrinsic Value	37923,50

2006

	2004	2005	2006					
EPS	4806,97	4294,48	3653,76672					
Debt proportion	29,98%	40,41%	38,78%					
Capital Expenditure	-278	39	-95					
Depreciation	418,00	384,00	366,00					
Change in Net Working Capital	-460	-1 846	-908					
FCFE	5616,011757	5600,027668	4491,845913	5235,96178				
				5340,68101	5447,49464	5556,44453	5667,57342	5780,924887

1.Phase	19478,50097
2. Phase	98969,93656
Value of Equity	118448,4375
Stock Intrinsic Value	43144,55

2005

	2003	2004	2005					
EPS	5037,19	4806,97	4294,48					
Debt proportion	39,87%	29,98%	40,41%					
Capital Expenditure	-119	-278	39					
Depreciation	463,95	418,00	384,00					
Change in Net Working Capital	-1 416	-460	-1 846					
FCFE	6239,468125	5616,011757	5600,027668	5818,50252				
				5934,87257	6053,57002	6174,64142	6298,13425	6424,096932

1.Phase	23164,28575
2. Phase	129156,2295
Value of Equity	152320,5153
Stock Intrinsic Value	55482,37

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2007

	2005	2006	2007	2008E	2009E	2010E	2011E	2012E
EPS	23,89	22,48455686	18,28782539					
Debt proportion	95,77%	94,00%	94,31%					
Capital Expenditure	2 730 249	7 395 706	-10 811					
Depreciation	355000,00	355000,00	485000,00					
Change in Net Working Capital	-1 403 604	-707 776	2 817 932					
FCFE	-41099,76432	-380023,5341	-132038,0643	-184387,121				
				-180699,378	-177085,391	-173543,683	-170072,809	-166671,353

1.Phase	-692779,8954
2. Phase	-3933096,183
Value of Equity	-4625876,078
Stock Intrinsic Value	-14,63

2006

	2004	2005	2006					
EPS	21,67	23,89	22,48455686					
Debt proportion	95,74%	95,77%	94,00%					
Capital Expenditure	-10 624 142	2 730 249	7 395 706					
Depreciation	342000,00	355000,00	355000,00					
Change in Net Working Capital	12 873 658	-1 403 604	-707 776					
FCFE	-81202,34596	-41099,76432	-380023,5341	-167441,881				
				-164093,044	-160811,183	-157594,959	-154443,06	-151354,199

1.Phase	-660553,2783
2. Phase	-4691550,341
Value of Equity	-5352103,619
Stock Intrinsic Value	-16,97

2005

	2003	2004	2005					
EPS	21,73	21,67	23,89					
Debt proportion	95,59%	95,74%	95,77%					
Capital Expenditure	4 102 805	-6 521 337	-3 791 088					
Depreciation	489000,00	342000,00	355000,00					
Change in Net Working Capital	-2 313 233	12 873 658	-1 403 604					
FCFE	-57328,98072	-255904,0523	234907,6182	-26108,4716				
				-25586,3022	-25074,5761	-24573,0846	-24081,6229	-23599,9904

1.Phase	-100486,5846
2. Phase	-627842,4718
Value of Equity	-728329,0564
Stock Intrinsic Value	-2,99

CEZ

2007

	2005	2006	2007	2008E	2009E	2010E	2011E	2012E
EPS	211,21	251,8257851	294,7648727					
Debt proportion	41,00%	43,67%	50,34%					
Capital Expenditure	8 675	21 589	11 092					
Depreciation	20723,00	24280,00	22123,00					
Change in Net Working Capital	6 099	8 990	-24 021					
FCFE	3721,227978	-3296,223874	17703,11915	6042,70775				
				6163,56191	6286,83314	6412,57	6540,821	6671,638

1.Phase	20752,71015
2. Phase	101347,3373
Value of Equity	122100,0475
Stock Intrinsic Value	206,18

2006

	2004	2005	2006					
EPS	173,37	211,21	251,8257851					
Debt proportion	40,37%	41,00%	43,67%					
Capital Expenditure	13 203	8 675	21 589					
Depreciation	19842,00	20723,00	24280,00					
Change in Net Working Capital	22 581	6 099	8 990					
FCFE	-9333,072417	3721,227978	-3296,223874	-2969,3561				
				-2909,96898	-2851,7696	-2794,73	-2738,84	-2684,06

1.Phase	-9304,889911
2. Phase	-39987,1402
Value of Equity	-49292,03012
Stock Intrinsic Value	-83,23

2005

	2003	2004	2005					
EPS	143,22	173,37	211,21					
Debt proportion	42,31%	40,37%	41,00%					
Capital Expenditure	42 318	13 203	8 675					
Depreciation	16961,00	19842,00	20723,00					
Change in Net Working Capital	-17 414	22 581	6 099					
FCFE	-4439,387286	-9333,072417	3721,227978	-3350,41057				
				-3283,40236	-3217,73432	-3153,38	-3090,31	-3028,51

1.Phase	-10663,13567
2. Phase	-46100,61142
Value of Equity	-56763,74709
Stock Intrinsic Value	-95,85

Appendix VI. – Regression Analysis

Ordinary Least Squares Estimation **FCFF GIVEN**

Dependent variable is ACTUAL STOCK VALUE
10 observations used for estimation from 1 to 10

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	82.7234	10.4373	7.9257[.000]
FCFF GIVEN	.088185	.027512	3.2054[.013]

R-Squared	.56223	R-Bar-Squared	.50751
S.E. of Regression	29.4142	F-stat. F(1, 8)	10.2743[.013]
Mean of Dependent Variable	97.9000	S.D. of Dependent Variable	41.9138
Residual Sum of Squares	6921.6	Equation Log-likelihood	-46.8885
Akaike Info. Criterion	-48.8885	Schwarz Bayesian Criterion	-49.1910
DW-statistic	.91384		

Diagnostic Tests

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= 1.9764[.160]	F(1, 7)= 1.7243[.231]
B:Functional Form	CHSQ(1)= .34443[.557]	F(1, 7)= .24970[.633]
C:Normality	CHSQ(2)= .48985[.783]	Not applicable
D:Heteroscedasticity	CHSQ(1)= 1.4386[.230]	F(1, 8)= 1.3443[.280]

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

Ordinary Least Squares Estimation **FCFF EXPECTED**

```
*******************************************************************************
 Dependent variable is ACTUAL STOCK VALUE
 10 observations used for estimation from    1 to   10
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 C                         97.7517            14.2776              6.8465[.000]
 FCFF EXPECTED           .0073061              .12363            .059096[.954]
*******************************************************************************
 R-Squared                    .4364E-3    R-Bar-Squared                 -.12451
 S.E. of Regression            44.4466    F-stat.    F(  1,   8)   .0034924[.954]
 Mean of Dependent Variable    97.9000    S.D. of Dependent Variable    41.9138
 Residual Sum of Squares       15804.0    Equation Log-likelihood      -51.0166
 Akaike Info. Criterion       -53.0166    Schwarz Bayesian Criterion   -53.3191
 DW-statistic                   1.4521
*******************************************************************************


                           Diagnostic Tests
*******************************************************************************
*    Test Statistics          *        LM Version           *     F Version        *
*******************************************************************************
* A:Serial Correlation      *  CHSQ(   1)=   .27541[.600]   *  F(   1,   7)=   .19825[.670]  *
* B:Functional Form         *  CHSQ(   1)=   .32866[.566]   *  F(   1,   7)=   .23788[.641]  *
* C:Normality               *  CHSQ(   2)=   .74310[.690]   *      Not applicable            *
* D:Heteroscedasticity      *  CHSQ(   1)=   1.6943[.193]   *  F(   1,   8)=   1.6319[.237]  *
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

Ordinary Least Squares Estimation **EVA**

****

Dependent variable is ACTUAL STOCK VALUE
10 observations used for estimation from 1 to 10

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	43.3482	15.2413	2.8441[.022]
EVA	.53958	.12906	4.1809[.003]

****

R-Squared	.68603	R-Bar-Squared	.64678
S.E. of Regression	24.9102	F-stat. F(1, 8)	17.4801[.003]
Mean of Dependent Variable	97.9000	S.D. of Dependent Variable	41.9138
Residual Sum of Squares	4964.2	Equation Log-likelihood	-45.2265
Akaike Info. Criterion	-47.2265	Schwarz Bayesian Criterion	-47.5290
DW-statistic	1.0815		

****

Diagnostic Tests

****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= 1.4494[.229]	F(1, 7)= 1.1865[.312]
B:Functional Form	CHSQ(1)= 1.1144[.291]	F(1, 7)= .87788[.380]
C:Normality	CHSQ(2)= .90067[.637]	Not applicable
D:Heteroscedasticity	CHSQ(1)= 1.7184[.190]	F(1, 8)= 1.6599[.234]

****

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

Ordinary Least Squares Estimation **FCFE**

****

Dependent variable is ACTUAL STOCK VALUE
10 observations used for estimation from 1 to 10

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	97.9363	13.7322	7.1319[.000]
FCFE	.040376	.065104	.62018[.552]

****

R-Squared	.045872	R-Bar-Squared	-.073394
S.E. of Regression	43.4247	F-stat. F(1, 8)	.38462[.552]
Mean of Dependent Variable	97.9000	S.D. of Dependent Variable	41.9138
Residual Sum of Squares	15085.6	Equation Log-likelihood	-50.7839
Akaike Info. Criterion	-52.7839	Schwarz Bayesian Criterion	-53.0865
DW-statistic	1.4435		

****

Diagnostic Tests

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= .27013[.603]	F(1, 7)= .19434[.673]
B:Functional Form	CHSQ(1)= 6.2505[.012]	F(1, 7)= 11.6694[.011]
C:Normality	CHSQ(2)= .52836[.768]	Not applicable
D:Heteroscedasticity	CHSQ(1)= 4.5763[.032]	F(1, 8)= 6.7501[.032]

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

Ordinary Least Squares Estimation **EVA – 9 companies**

****

Dependent variable is ACTUAL STOCK VALUE
18 observations used for estimation from 1 to 18

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	81.1954	12.1403	6.6881[.000]
EVA	.19048	.073417	2.5945[.020]

****

R-Squared	.29613	R-Bar-Squared	.25214
S.E. of Regression	30.7932	F-stat. F(1, 16)	6.7314[.020]
Mean of Dependent Variable	106.4444	S.D. of Dependent Variable	35.6077
Residual Sum of Squares	15171.6	Equation Log-likelihood	-86.1722
Akaike Info. Criterion	-88.1722	Schwarz Bayesian Criterion	-89.0625
DW-statistic	1.8665		

****

Diagnostic Tests

****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= .053003[.818]	F(1, 15)= .044300[.836]
B:Functional Form	**CHSQ(1)= 4.2756[.039]**	F(1, 15)= 4.6729[.047]
C:Normality	CHSQ(2)= .31411[.855]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .55576[.456]	F(1, 16)= .50975[.486]

****

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

Ordinary Least Squares Estimation **log EVA – 9 companies**

****

Dependent variable is ACTUAL STOCK VALUE
18 observations used for estimation from 1 to 18

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	3.2326	.43900	7.3636[.000]
ln EVA	.29779	.093702	3.1781[.006]

****

R-Squared	.38698	R-Bar-Squared	.34867
S.E. of Regression	.29160	F-stat. F(1, 16)	10.1003[.006]
Mean of Dependent Variable	4.6106	S.D. of Dependent Variable	.36131
Residual Sum of Squares	1.3605	Equation Log-likelihood	-2.2980
Akaike Info. Criterion	-4.2980	Schwarz Bayesian Criterion	-5.1883
DW-statistic	1.7183		

****

Diagnostic Tests

****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= .35071[.554]	F(1, 15)= .29806[.593]
B:Functional Form	CHSQ(1)= .048128[.826]	F(1, 15)= .040214[.844]
C:Normality	CHSQ(2)= 1.9128[.384]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .13661[.712]	F(1, 16)= .12236[.731]

****

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

Dissertation thesis

Author: **Bc. Táňa Moleková**
Supervisor: **PhDr. Ing. Petr Jakubík Phd.**
Academic Year: **2008/2009**

Expected title: **"Pricing Methods and the Value of the Firm"**

Expected thesis:
The stock market values should converge to their intrinsic value in medium- up to the long-term period.
My main aim is to use this idea within diploma thesis and evaluate the relationship between the value of the firm expressed through its stocks market value and value that will be obtained by the application of various pricing methods. The actual stock market values will be compared with the results obtained by valuation of selected companies traded on Prague Stock Exchange. Method that will give the most faithful estimation will be applied on the other sample of companies traded on Prague Stock Exchange.
The final part of my thesis will be a complete evaluation of investments into companies traded on Prague Stock Exchange from an investor's eye view.

The main task of this diploma thesis is to find the answers to the following questions:

- Which pricing methods fit the most for the valuation of Czech companies?
- Which limits have those methods under Czech conditions?
- Is there a successful investment strategy applicable for the market in Czech Republic that is based on those pricing methods?

Tentative outline:

- Introduction to the theory of pricing methods
- Empirical analysis – the valuation of selected companies
- The interpretation of the results and an investment recommendation

The method of work:

- Being more familiarized with the problems of the stock market value determination in Prague Stock Exchange and with the most common pricing methods.
- The collection of data and relevant information and a determination of a detailed working plan.
- Practical application of valuation methods within the selected companies.
- The interpretation of results.

References (illustratively list):

- **Mařík M. & co.:“***Metody oceňování podniku“*, Praha, Ekopress 2003
- **Mařík M. & co.**: *“Finanční analýza a plánování v obchodních podnicích“,* Praha, 1996
- **Maříková P.**: *“Moderní metody hodnocení výkonnosti a oceňování podniků“*, Praha, Ekopress 2001
- The annual reports of the companies traded on the Prague Stock Exchange
- www.bcpp.cz
- Repec.org

In Prague, October 9th 2008

Bc. Táňa Moleková (Author)

PhDr. Ing. Petr Jakubík Phd. (Supervisor)