ОЦЕНЯВАНЕ НА ИНДУСТРИАЛНИЯТ СЕКТОР ЧРЕЗ МНОЖИТЕЛЯ „ЦЕНА-ПЕЧАЛБА“ НА ИЗТОЧНО-ЕВРОПЕЙСКИТЕ РАЗВИВАЩИ СЕ ПАЗАРИ

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VALUATION OF THE INDUSTRIAL SECTOR USING P/E RATIO IN THE EASTERN EUROPEAN EMERGING MARKETS

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Анотация: *Целта на настоящият доклад е да тества приложението на сравнително оценяване с пазарния множител „Цена – печалба“ на Източно-Европейските развиващи се пазари. След тестването на разработената методология се потвърждава практическата използваемост на метода и се стига до известна критика към подхода на Лайбовиц за определяне на фундаменталния показател „Цена – печалба“.*

Ключови думи: *„Цена-печалба“, Фундаментална стойност, Сравнително оценяване , Възвръщаемост на капитала, Капиталови пазари.*

Abstract: *The goal of this paper is to test the application of P/E valuation on the Eastern-European Emerging Markets. The results confirm the practical usefulness of the relative valuation approach and show that there are some arguments of the Leibowitz approach to use ROE as a main driver for the fundamental P/E ratio. Furthermore the empirical testing validates the notion that relative valuation is one of the best approaches to stock picking.*

Key words: *Current P/E ratio, Intrinsic value, Relative valuation, Return on equity, Franchise value, Emerging capital markets*

I. Theoretical background of relative valuation

In equity valuation there are three theoretically established methods – intrinsic valuation approach, relative valuation approach and accounting valuation approach. Most popular way is the discounted cash flow method, where the key assumption is that the intrinsic value of an asset is equal to the present value of all cash flows coming from the asset. Although this is by far the most theoretically sound approach there are a number of problems. First of them is the use of accounting data, as we know the main purpose of accounting standards is to give information about the company for taxation purposes rather than financial performance. This issue is forcing analyst to make adjustments in the financial statements in order to calculate the cash flows. Such adjustments become difficult when trying to value companies across a sector but incorporated in different countries, because there are still differences in accounting standards especially in the frontier markets. Another problem of intrinsic valuation is the lack of data about current market conditions in other words how the market is currently valuing this particular group of assets.

The answer for these problems is the application of relative valuation. In essence we are valuing given asset on the base of how the market is pricing similar assets. Through using market multiples as a tools for relative valuation this approach is effectively combining both the fundamental specifics of the company and the current market information. Because of this it is most frequently used by financial analyst in valuing companies. It is said that more than 90% of all valuation in the major investment banks is done by applying some form of relative valuation[1]. Simplicity of the approach makes it very usable in valuing M&A deals, investment analysis etc.

In financial literature there has been little work on how this method for valuation is actually performing. Also very few authors have contributed in building the theoretical basis for relative valuation. The main reason for that is the nature of relative valuation – it is a product of financial analyst trying to resolve practical issues rather than result from economic and financial theory. *Damodaran (2002)*[2] in review of all valuation theory defines the basics of the relative valuation. He also notes that usage of multiples varies widely across sectors, with Enterprise Value/EBITDA multiples. Later in his work he constructs practical way of applying the different multiples in practice. *Fernandez (2001)*[3] give full theoretical frame for relative valuation and studies which multiples are more frequently applied in practice. Both authors do agree on the fact that relative valuation is far more popular in practice than intrinsic or accounting valuations. One of the few paper that test empirically how well the relative valuation works is *Liu, Nissim and Thomas (2002)*[4]. They test how well different multiples do in pricing while using 19,879 firm-year observations between 1982 and 1999 and suggest that multiples of forecasted earnings per share do best in explaining pricing differences.

In the series of papers[5] Leibowitz creates a new approach on using the market multiples in business valuation. His major contribution is the definition of "tangible value" and „franchise value" of companies. His methodology later will be empirically tested in this paper, because it has been accepted from the scientific community as the best way to finding the „true" value of market multpiles.

In the frontier markets such as Bulgaria the models of relative valuation are starting to become more and more popular. *Patev (2008)*[6] gives full theoretical analysis of valuation using market multiples. Although the developed methodology is applied in investment management it does bring the nuances of relative valuation in the environment of the

[1] Damodaran, A., 2002, Investment Valuation (Second Edition), John Wiley and Sons, New York

[2] Damodaran, A, 2002, Investment Valuation, Second Edition, John Wiley and Sons, New York.

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[5] Leibowitz, M.L. and S. Kogelman, 1990, Inside the PE Ratio: The Franchise Factor, Financial Analysts Journal, v46, 17-35; Leibowitz, M.L. and S. Kogelman, 1991, The Franchise Factor for Leveraged Firms,
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[6] Patev, P. and Kanaryan, N. „Portfolio Management", Abagar, Veliko Tarnovo, 2008. p.360-375.

Bulgarian capital market. Also *Nenkov (2009)*[7] makes detailed review on the theory of market multiples in the frontier markets and defines both the advantages and disadvantages of using them. Both of these works lack the empirical testing of the relative valuation on companies from markets such as Bulgaria. This is the goal of this paper – to bring the theory into practice and test how well relative valuation works also to point out what are the practical issues arising from the specific conditions of these markets.

II. P/E valuation technique

Relative valuation is about finding comparing how the market values comparable assets. In essence the valuation process goes through three major steps.

- Finding comparable assets that are priced by the market – this first step involves extracting similar companies from the investment universe. Although there will also be difference in the firm characteristics it is necessary to find companies with similar business model, size and market influence;
- Scaling the market prices to common variable – tool for this are the market multiples. In practice they are the market price of a stock divided on some fundamental metric that is also scaled per share. Depending on the goals of the valuation we can use a number of different multiples. Most multiples include performance metrics such as earnings, cash flow, dividends etc. but it is possible because of the specifics of the business to include some technical metrics – clicks per ad.
- Controlling for differences across assets – as we said it is impossible to find exactly the some type of companies so it is necessary to input some control for differences in your valuation model.

Starting with the first step (defining the comparable firms) we must set the goals of the valuation. As it was said the purpose of this paper is to test the application of P/E valuation on the industrial sector in the Eastern European Emerging markets. With this information we are making the assumption that the business model of all companies in the sector is identical and there will be no need for adjustments. Next we must control for the differences across companies. In this attempt to valuing companies from different countries we are faced with the obstacle that the conditions in these economies are very different. Respectively if we try to compare companies without accounting for these differences we are going to end up with wrong results. Also there can be made the argument that large and small companies have very significant differences in their businesses. So when valuing this particular sector in the observed markets we are going to divide the companies into two groups for each country – Large and Small cap:

[7] **Nenkov, Dimitar**. „Market value of Bulgarian public companies through the lens of fundamental multiples of P/E and P/B" / DImitar Nenkov. // *Financial Decisions: research and practice*. - Sofia: New Bulgarian University., 2009, с. 138-184.

Table 3. Dummy variables

Groups:	
Bulgarian Large cap industrial firms	Romanian Large cap industrial firms
Bulgarian Small cap industrial firms	Romanian Small cap industrial firms
Polish Large cap industrial firms	Turkish Large cap industrial firms
Polish Small cap industrial firms	Turkish Small cap industrial firms

We can control for the difference in these groups by applying dummy variables in the regression equation that will be used to calculate the fundamental value of the market multiple. Basically dummy variables will have value of 1 if the current observed company is in this specific group and value of 0 if it is not. This is very elegant way of controlling for the difference in the markets and size of the companies.

After these preliminary preparations for the analysis next step is to identify the market multiple that will be used for relative valuation. In this particular case we have chosen the current P/E ratio mainly because:

1. When valuing industrial companies it is necessary to point that most of them have slow to medium growth and for that reason current earnings are the best financial metric to be used for them;
2. In the researched markets the accounting information is not a small problem and using earnings as a valuation tool gives more credibility to the analysis rather than using sales, EBITDA or some other metric;
3. The purpose of this paper is to illustrate the basic application of relative valuation on the Eastern European Emerging markets and the P/E ratio is the most often used multiple around the world.

The actual market ratio itself when calculated on annual base is represented by the formula:

(Equation 1)

$$Actual\ Current\frac{P}{E} = \frac{P_t}{EPS_t}$$

The technology for determining which companies are over or undervalued is quite simple. It is necessary only to find the fundamental (intrinsic) value of the P/E ratio and compare both numbers. If the actual ratio is higher than the fundamental then the market is overvaluing the stock by paying more expensively for its earnings intuitively is other situation where the company should be undervalued.

Finding the true value of the P/E ratio is difficult task. By far the most theoreticaly sound approach is from the series of paper by Martin Leibowitz[8]. According to them the company's value can be differentiated on „tangible value" and „franchise value" and they also develop the formula for the P/E ratio:

[8] Leibowitz, M.L. and S. Kogelman, 1990, Inside the PE Ratio: The Franchise Factor, Financial Analysts
Journal, v46, 17-35; Leibowitz, M.L. and S. Kogelman, 1991, The Franchise Factor for Leveraged Firms,
Financial Analysts Journal, v47, 29-43.; Leibowitz, M.L. and S. Kogelman, 1992, Franchise Value and the Growth Factor, Financial Analysts Journal, v48, 16-23.

(Equation 2)

$$Current\frac{P}{E} = TV + FV = \frac{EPS_t}{k} + \frac{ROE_c - k}{k} * \frac{g}{k - g}$$

TV – Tangible value,
FV – Franchise value,
EPS – earnings per share,
g – growth,
ROE – return on equity,
k – cost of capital (hurdle rate),

The main problem is the controlling for the difference across companies. There are big arguments how to compare the franchise value of companies from different markets. One way is indexing the growth factor, other is some modification in the cost of capital but this still remains open problem for the scientific society. Because of this Damodaran suggest approach using multifactor regression to estimate the fitted value for P/E ratio. The weakness of this approach is he question – what are the drivers behind the P/E ratio? Combining this with the factors suggested by Leibowitz we can distinguish the two major determinants:

- Return on equity – it is a measure of the financial effectiveness of the equity. Also the higher ROE through the years should push the retained earnings and increase the book value;
- Growth – stable growth in earnings should have significant positive influence on the price. Calculating growth is not an easy task there are a lot of approaches including implied growth, growth in the economy or capitalized growth. In this instance we will use the geometric average of the changes in earnings for the previous 3 years.

Using these two determinants we can estimate the fundamental P/E ratio with this regression equation:

(Equation 3)

$$Current\frac{P}{E} = \alpha + \beta_1 * ROE_i + \beta_2 * g_i + \sum_1^n \beta_n * D_n$$

a and β – regression coefficients,
ROE_i – return on equity for the i^{th} company,
G_i – growth for the i^{th} company,
D_n – dummy variables.

Inclusion of dummy variables is to control the difference in size and country of incorporation. As we can see this is simple cross-section regression across companies in the Industrial Sector, but it should help to find out which companies have been overvalued and which are undervalued in this current moment of time by the market. Next step logically is to test this methodology on real world data in the selected countries.

III. P/E valuation in the industrial sector

When researches are trying to test financial models in the Eastern European Emerging markets they meet obstacle in the quality of the financial data. This problem is one of the biggest on these markets. The published data is not standardized across all countries there are a lot of errors in the numbers, mainly because of the absence of single institution that regulates the availability and the quality of the data.

In an attempt to receive credible results the P/E valuation model is going to be tested on the top 100 industrial companies traded on the exchanges in Bulgaria, Poland, Romania and Turkey. Criteria for inclusion in the sample are:

- High market capitalization in order to include the biggest companies;
- Availability and quality of the financial data in the Capital IQ database;

Although this introduces bias in the model testing since Poland and Turkey are more developed markets and will have more companies included. It can be explain by the similarities of these markets and the strong the main reason is the fact that these countries are followed together as a group by the investment world.

Given the data we can run the multifactor regression described in equation 3. The result are represented in the following table:

Table 4. Result from the regression

R Square = 32.04%		
Variables	*Coefficients*	*t Stat*
Intercept	20.881	2.300
ROE	(36.621)	(2.494)
Growth	(14.091)	(3.556)
BG Large cap	(5.787)	(0.515)
BG Small Cap	-	-
PL Large cap	5.216	0.575
PL Small Cap	2.799	0.310
ROM Large Cap	7.326	0.588
ROM Small Cap	18.302	1.467
TUR Large Cap	1.013	0.107
TUR Small Cap	6.662	0.688

As it is evident from table 2 the statistical significance of the model with R^2= 32% is very high and this is proof that it can be applied in practice. But there are some interesting results that need to be attended. First are the dummy variables that are used to control for differences across companies from different countries. As we can see from the values of the t-stat not one of them is actually have significant influence on the model. This means that the capital markets in these countries have reached certain high level of globalization and does

not affect the result from investment decisions. The more interesting result however is the negative b-coefficients for the two variables (ROE and Growth). In his research Leibowitz posits the positive linear relationship between ROE and the P/E ratio. This is empirical result that contradicts that theory. The explanation is in the way ROE is calculated – net income is divided by the total equity. In this the EPS is in the numerator, but in equation 1 as we saw in the P/E ratio calculation EPS is in the denominator – because of this mathematical standpoint we can see why there should be negative connection between the P/E ratio and ROE.

Using this statistically valid model we can give example of how relative valuation works. We are going to use three big companies from Bulgaria, Poland and Turkey – Monbat AD, Budimex SA, KOC Holding A.S. Applying the equation we can estimate the fundamental P/E and compare it with the actual:

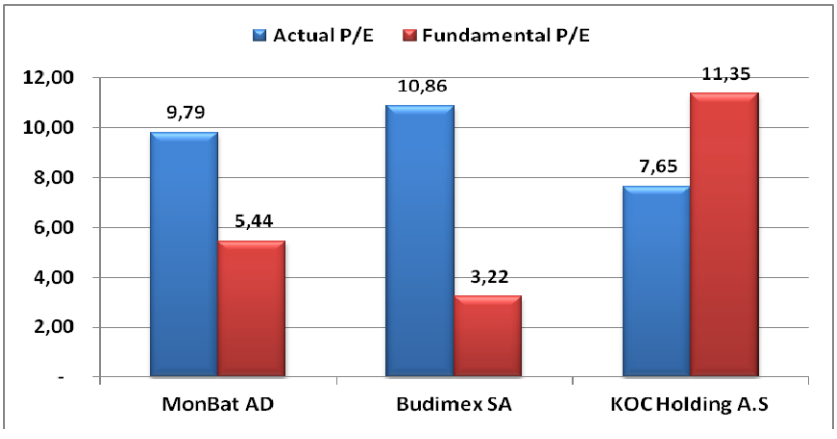

Figure 9. Actual vs. Fundamental P/E for 2013

From figure 1 we can see the way P/E valuation works – it is evident that both Monbat AD and Budimex SA are currently undervalued by the market. Monbat AD should be trading at 9,79 per unit of earnings rather than the current market value of 5,44. On the other hand the Turkish company – KOC Holding A.S. is overvalued because its fundamental P/E ratio is significantly higher than the current state of the market. In this way we can value every company on the researched markets relative to the others. This methodology does not give us an intrinsic value but it does say which companies to buy and which to short if you are an investor seeking to put your money in the Eastern European Emerging markets. Furthermore in conclusion we can say that the results do confirm the thesis that relative valuation is a quick, easy method to estimate the value of any publically traded asset.

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