

THE IMPORTANCE OF THE COUNTRY'S GDP IN THE EVALUATION OF COMPANIES USING MULTIPLES ON THE EUROPEAN STOCK MARKET

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Abstract

The article provides an overview of contemporary empirical studies of the relationship between country characteristics and valuation multiples. It describes the existing approaches to establishing the accuracy of multiples, as well as the comparison of the empirical evaluations obtained by different researchers. This article is intended to analyze the influence of the estimated multiples on the accuracy of differences in the country characteristics. The article examines the impact of the GDP growth on the accuracy of determining the “price/earnings” multiples for the comparative valuation of companies on the European markets. An econometric study presented in this paper allows making a conclusion about the need to find justification for the differences in the multiples and mitigation of the differences. It also allows assessing the dependence of the “price/earnings” multiple on the GDP growth rate by European countries. The article explains the accounting of GDP growth as one of the methods of mitigating the differences in the variables and P/E multiples in different countries.

Keywords: P/E multiple, gross domestic product, valuation

JEL Codes

1. Introduction

An analysis of multiples is needed for the comparative evaluation of the value of companies, which is widely used. For this purpose, comparable companies and the regression analysis are generally used. However, it is rather difficult to select comparable companies, as a rule, considering that one must find a sufficient number of them.

The accuracy of assessment of various multiples has been analyzed in a number of works. Alford (1992) studied the impact of conformity of comparable companies according to the estimation accuracy using the P/E multiple. The accuracy of the future multiples forecasting can be improved, as Bhojraj and Lee (2002) identified using a closely matched selection of comparable firms. They believe that their method of comparable firms' selection ensures better accuracy compared to the selection of comparable firms by industry. Their approach includes two components: (1) A regression analysis of multiples using the standard value drivers as independent

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variables and (2) the choice of closely comparable firms is based on their reviewed relations.

Liu, Nissim and Thomas (2002) conducted a study in 2002 of the operation of companies on the US stock market. They found out that the multiples based on income forecasting explain well the stock prices for a large fraction of firms. In a recent study, Liu, Nissim and Thomas (2007) extended the analysis and concluded that multiples based on measures of earnings have an edge on those based on the operating cash flow and dividends.

Schreiner and Spremann (2007) studied the accuracy of various multiples using the European data. They claim that the multiples of equity capital (P/E, P/BV) surpass in accuracy the multiples of enterprise value (EV) and multiples of the EV/EBITDA or EV/EBIT types.

Easton (2004) analyzed the PE and PEG multiples. The PEG multiple, as the author indicates, takes into account the differences in the short-term earnings growth and implicitly assumes that the short-term growth outlook also captures distant future. Easton shows that the multiples provide the means of simultaneous estimation of the expected rate of return and the rate of change in abnormal growth of revenues outside the short time horizon of forecasting, and thereby clarifies the PEG multiple.

Henschke and Homburg (2009) studied the problem of differences between firms and its impact on estimates based on the multiples. They believe that the differences between firms lead to systematic errors in the valuation of various multiples. The authors argue that the problem of differences between firms, for estimates based on multiples, arises because it is difficult to find homogeneous groups, which correspond to the target firm in all of the characteristics that are related to the value, namely the risk, profitability, growth, and industry. All the studied methods of control of differences between firms lead to better estimation accuracy. In particular, the authors believe that a hybrid approach of selecting comparable firms, using a set of financial indicators and valuation adjustments of a multiple for the remaining differences, provides the most accurate valuation.

Holthausen and Zmijewski (2012) analyze the evaluation process of selecting a company for comparison, which really are comparable to the target company. The authors note that the purpose of the evaluation of comparability is to align the relevant value drivers—especially the risk and growth—of the comparable companies with those of the company being evaluated. In the article, the authors examine the relevant value drivers for commonly used multiples, such as EBIT and EBITDA. They show that, in addition to risk and growth, analysts applying market multiples valuation should take into account different variables such as cost structure, working capital, and the required investment costs.

Harbula (2009) analyzes market multiples as a tool for evaluation of assets. He explores the accuracy and the main drivers of multiples' valuation along with their relative and absolute level. In particular, they believe that the most relevant multiples for the technology sector of the industry are the multiples of the company value EV/EBITDA and EV/EBIT with the estimation error (mean/median) equal to 21% / 18%.

Overall, these results highlight the importance of considering differences between firms, when applying the method of evaluation using multiples.

Foster, Kasznik, and Sidhu (2011) investigated the relative importance of the country and certain specific factors of a certain industry to explain the difference in multiples. According to the authors, the factors that characterize companies are predominant in explaining the differences in the assessment by spatial data (cross-sectional), and factors of the country and industry have a significant explanatory power over them. The authors claim that using indicators of a country ensures the better increasing explanatory power compared to the use of factors determined for the country.

According to the authors (Foster, 2011; Salmanov, Babina, Bashirova, & Samoshkina, 2015) extension of the research to the global stage adds difficulties, but allows us to state quantitatively (and test hypotheses) the importance of factors, for which there are more changes in the sample for many countries than in the sample for one country.

Dittman and Weiner (2005) studied what method of selection of comparable companies generates the most accurate forecasts when assessing European companies for profit multiples. The authors found that the method of selection of comparable companies with similar income assets obviously supersedes the choice according to the membership in an industry or to the total assets. In addition, Dittman and Weiner (2005) determined the best way to select comparable companies: from the same country, from the same region, or from all OECD countries. According to the authors, for most European countries, the selection of comparable companies from 15 countries of the European Union gives the best prognoses. In contrast, in the UK and the USA, the comparable companies should be selected only from the same country.

An analysis performed by Dittman and Weiner (2005) gave two main results, which are important for practical assessment of firms: first, the selection of comparable companies in the same industry (using the SIC code as the indicator) is not optimal for all countries. Instead, these firms must use the similarity of the return on assets (ROA) as a comparative measure. This selection method can be improved by selecting the firms that are most similar by ROA and total assets. Secondly, the authors' analysis shows that comparable firms in the United States, the UK, Denmark, and Greece should be selected only from the same country. For all other European countries, the forecasts are more accurate when firms are selected from 15 European countries (EU 15) or from 30 countries that are members of OECD.

Land and Lang (2002) when examining a sample from 7 countries for 1987-1999 found that systematic differences in the multiples persist indeed, despite the convergence of the Earnings-to-Price multiples. This convergence is partly attributed to the harmonization of accounting standards.

Leuz, Nanda, and Wysocki (2003) explored the specific factors that characterize countries. According to the authors, they are important in explaining systematic differences in the management of the profit in the data sample from 31 countries. Firms in countries with developed stock markets, widespread ownership structures, strong law enforcement and the rights of investors are involved in less income management.

Gaio (2009) explored the “differences” in the quality of income in the sample from 38 countries for 1990-2003 and found that a company, country, and industry factors—all of them have the explanatory power.

Characteristics of firms play a decisive role in explaining the quality of the profit level in samples from different countries and macroeconomic environments. The environment of a country is more adapted to capture a change in the quality of income of sustainable level in the less economically developed countries, and in legal environments with weaker investor protection. On the contrary, the increasing explanatory power of firms’ characteristics by the country’s environment is higher in more economically developed countries and legal environments with strong investor protection.

Country characteristics have priority over the characteristics of firms in less developed countries, and vice versa, the firms’ characteristics take priority in the more developed countries.

The authors show that with improved accounting and financial globalization in the late 1990s, the country characteristics became less able to explain the changes in income worldwide. In the earlier 1990s, the country characteristics were predominant. More recently, the characteristics of firms became the primary determinant of the level of income in the world.

M.C. Guisan (2011) analyzed the consequences of EU industrial and trade economic development policy and the impacts of trade and industrial recession. The author compares five major EU countries with Switzerland and the United States. Macroeconomic models developed by the author enabled to establish a quantitative estimate of the positive effects of the industry on the economic development, employment and real wages.

An, J., Bhojraj, S., and Ng, D. T. (2010) studied the importance of the country, industry, and sustainable special components in determining sustainable relations of evaluation. Using a sample of firms from 33 countries, the authors analyzed the Book-to-Market and Earnings-to-Price multiples in the country, industry, and firm. As compared with membership in the industry, membership in the country significantly more influences two assessment multiples. Two estimate multiples are found to predict subsequent share revenue worldwide, and most predictability comes from a particular component of these two relations. Evaluating how the Book-to-Market and Earnings-to-Price relations change over time, the authors found that special components and features of the country are the main drivers of relationship assessment. However, the importance of the country differs in various countries. The difference was explained by the authors by the level control of the country, market efficiency, openness of capital, illiquidity of firms, and information uncertainty.

It can be concluded that many authors investigate the explanatory power of a large set of factors that are associated with the performance of countries and effects caused by them, which are identified in the existing accounting, economics, finance, and legal literature. It requires further research in understanding and quantitative measurement of cross-country differences in the structure of financial markets and factors that affect the assessment in different markets.

2. Methodology

Various multiples are used for comparison between comparable companies. The multiples of profit (revenue) in one form or another are widely used. Obviously, the reason for their popularity is due to a positive correlation between profits and company value.

The “Price/Earnings” (P/E) multiple is defined as the ratio of market price-to-earnings (price) per share (EPS).

$$\frac{\text{Price}}{\text{EPS}} = \text{P/E}$$

P/E is a powerful comparative instrument. Investors can identify a range or limit to determine what shares correspond to one of many criteria.

According to analysts, the main point in using the P/E multiple is to understand how the multiple correlates among firms in the sector and on the market.

Some researchers, such as Damodaran, A. (2012) and others, established that the P/E multiple is determined by the following factors: the return on equity and reinvestment rate, the risk and expected earnings growth. The variability of multiples is high: various lengths of time, companies, industries, and markets are determined by the difference in magnitude. This occurs because of epy differences in the variables: lesser growth, higher risk, and lower payouts lead to low multiples and vice versa. Due to this fact, there is an important problem to mitigate these differences between the risk values by the growth rates and payout ratios.

An analysis using the “Price/Earnings” multiples is often carried out on the securities markets of various countries with the aim of finding the deviation from with the average values or set criteria. That is, equity markets with higher values of the P/E multiple are considered as overestimated and the markets with lower values—as undervalued. A comparison analysis of the “Price/Earnings” multiples for various countries is provided in the works by Gregory, A. (2001), Damodaran, A. (2012), Roche, J. (2005). The authors note that there are significant differences between variables in different countries, and, therefore, the conclusion in such conditions might be misleading. The present work was performed in order to find opportunities to mitigate the differences between variables in different countries.

It is assumed that companies in countries with higher growth, expressed in the GDP growth rate, and, accordingly, have a higher expected growth, should reflect this fact in the values of the multiples, including the “Price/Earnings” multiple. The countries with higher interest rates should have lower “Price/Earnings” multiples than countries with lower interest rates.

3. Results

The study was conducted on the example of the EEC countries, including the UK and Turkey. The data source is the Damodaran website (December 2014).

The analysis covered European companies (more than 6 thousand). The companies with insufficient data were excluded. The Payout Ratio, the expected growth rate in EPS for the next 5 years, and the beta coefficient as a measure of risk were considered as the regressors. The result of the regression analysis is shown in the expression (1). The values of t-statistics are given below the formula.

$$P/E = -6.455 + 24.559 \text{PayoutRatio} + 77.37 \text{growth} + 6.02 \text{beta} \tag{1}$$

(14.29)

(10.46)

(2.36)

The coefficient of determination equals to 0.215; F-statistic equals to 106.3; t-statistics of the regressors are significant.

The database of companies was grouped by countries and the average values of the same indicators were set. The result is shown in Figure1 and Table.1.

The next step of the study was the analysis of the regression relationship of the P/E multiple with the GDP growth rate across countries. The data source for the European countries' GDP growth rate is the World Bank's website (2014, December). The regressor was the dividend yield and annual GDP growth rate.

The regression result is shown in the expression (2), Figure 2 and Table 2. The values of t-statistics are shown below the regression expression in parentheses.

$$P/E = 55.16 - 1045.84 \text{DividendYield} + 3.169 \text{GDPgrowth} \tag{2}$$

(- 2.349)

(1.859)

The coefficient of determination is 0.355.

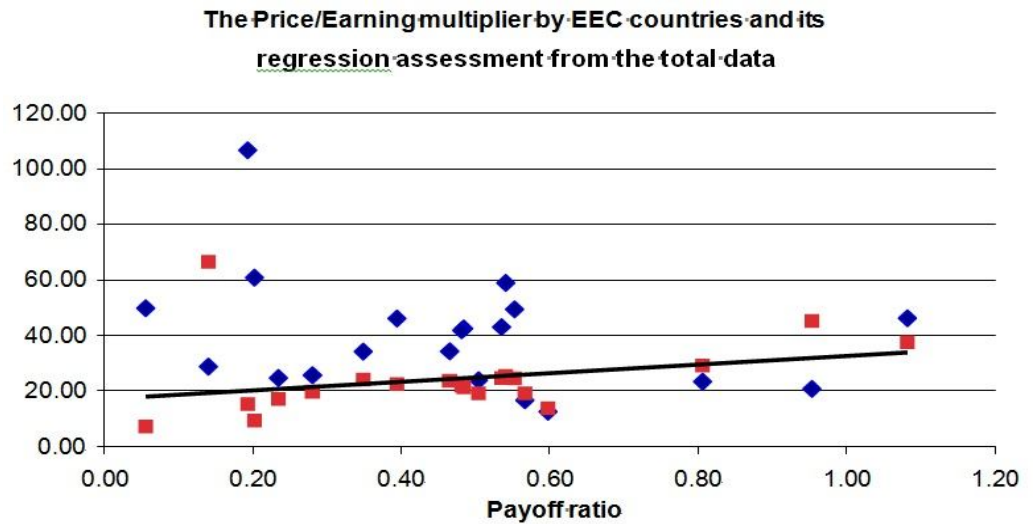


Figure 1. The P/E multiple for European countries and the regression $P/E=f(PR, g, b)$ in the axis of the payoff ratio

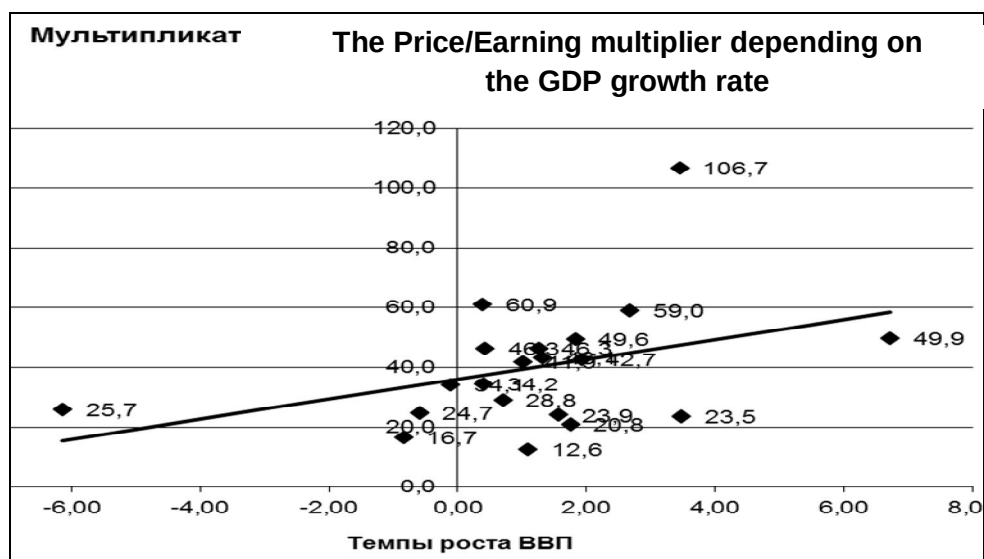
Table 1. Values of the P/E multiple by countries and a comparison with the regression estimate

Country	Current P/E	Payoff ratio	Expected growth rate in EPS in the next 5 years	Beta	P/E assessment	Over estimation/ underestimation
Austria	49.57	0.55	0.14	1.04	37.86	11.70
Belgium	43.13	0.54	0.15	1.11	38.27	4.87
Czech R	12.61	0.5977	0.0223	0.651	39.30	-26.69
Denmark	28.82	0.14	0.84	0.84	35.08	-6.26
Finland	20.83	0.95	0.27	1.26	24.21	-3.39
France	46.34	1.08	0.15	1.03	23.33	23.01
Germany	59.03	0.54	0.17	0.90	37.73	21.30
Greece	25.75	0.28	0.15	1.30	45.14	-19.40
Hungary	60.92	0.20	0.07	0.86	49.00	11.93
Ireland	46.29	0.39	0.14	1.41	42.15	4.14
Italy	34.15	0.35	0.18	1.34	42.60	-8.45
Netherlands	34.25	0.47	0.14	1.37	40.30	-6.05
Norway	23.93	0.50	0.17	0.04	39.12	-15.19
Poland	106.72	0.19	0.1497	0.90	47.68	59.05
Portugal	16.74	0.57	0.08	0.98	38.90	-22.16
Spain	24.71	0.23	0.13	1.28	46.75	-22.03
Sweden	23.46	0.81	0.12	1.09	31.39	-7.93
Switzerland	42.67	0.48	0.13	1.03	40.11	2.56
Turkey	49.91	0.06	0.07	1.22	53.03	-3.12
United Kingdom	41.94	0.48	0.14	0.96	39.94	2.00

Figure 2 shows that countries with a higher GDP growth have higher P/E values. The regression line divides all countries into the overestimated ones (above the line of regression), and the undervalued ones (below the regression line). Such overestimation/underestimation values are given in Table 2.

It is obvious that the obtained results for underestimation/overestimation may be compared, which was done in Table 3.

Table 3 shows that in all countries with the high GDP growth rate, the amount of overestimation is reduced, i.e., it finds its true validity or it is “justified”. For example, in Austria, the overestimation was 25.0, but the GDP growth rate of 1.82 makes the overestimation low—5.99. And Ireland had overestimation at 23.78, but the low growth of 0.42 nullified this overestimation—0.48. But the obtained data of overestimation/underestimation are more real, and therefore, significant.



GDP growth rate

Figure 2. The values of the P/E multiple for European countries depending on the GDP growth rate

Table 2. Values of the P/E multiple by countries and comparison with the regression estimate by the GDP growth rate

Country	Current P/E	Dividend yield	Annual GDP growth rate, %	P/E Valuation	Overestimation/ Underestimation
Austria	49.57	0.02	1.82	43.58	5.99
Belgium	43.13	0.02	1.32	41.98	1.16
Czech Republic	12.61	0.02	1.09	32.88	-20.27
Denmark	28.82	0.01	0.70	45.77	-16.95
Finland	20.83	0.03	1.75	26.33	-5.50
France	46.34	0.02	1.26	37.73	8.61
Germany	59.03	0.02	2.68	46.49	12.54
Greece	25.75	0.01	-6.14	27.07	-1.33
Hungary	60.92	0.01	0.39	44.58	16.35
Ireland	46.29	0.01	0.42	45.81	0.48
Italy	34.15	0.01	-0.11	39.77	-5.62
Netherlands	34.25	0.04	0.41	14.52	19.73
Norway	23.93	0.03	1.57	29.81	-5.88
Poland	106.72	0.01	3.45	55.52	51.20
Portugal	16.74	0.03	-0.85	23.40	-6.66
Spain	24.71	0.01	-0.60	37.89	-13.18
Sweden	23.46	0.03	3.47	39.91	-16.45
Switzerland	42.67	0.02	1.93	43.55	-0.88
Turkey	49.91	0.00	6.72	73.54	-23.62
United Kingdom	41.94	0.02	1.01	41.63	0.31

Table 3. Comparison of overestimation/underestimation of the fundamental variables and the regression of GDP growth rate

Country	Annual GDP growth rate, %	Overestimation /Underestimation of GDP	Overestimation/Underestimation by the cost variables
Austria	1.82	5.99	25.00
Belgium	1.32	1.16	18.39
Czech Republic	1.09	-20.27	-1.26
Denmark	0.70	-16.95	-37.80
Finland	1.75	-5.50	-24.55
France	1.26	8.61	8.76
Germany	2.68	12.54	33.64
Greece	-6.14	-1.33	5.96
Hungary	0.39	16.35	51.49
Ireland	0.42	0.48	23.78
Italy	-0.11	-5.62	9.98
Netherlands	0.41	19.73	10.49
Norway	1.57	-5.88	4.73
Poland	3.45	51.20	91.41
Portugal	-0.85	-6.66	-2.50
Spain	-0.60	-13.18	7.48
Sweden	3.47	-16.45	-5.76
Switzerland	1.93	-0.88	21.22
Turkey	6.72	-23.62	42.50
United Kingdom	1.01	0.31	19.90

4. Discussion

By choosing the group of comparable firms, it is easy to make sure that in the markets of many countries, there will be very few suitable companies. At the same time, it is known that comparative assessment based on a small sample is questionable, just because judgments are made for a limited data set.

Applying the estimate to a particular sector of industry (Salmanov, Babina, Bashirova, & Samoshkina, 2015) and to the combined market of several countries is a method of increasing the sample of comparable firms (Damodaran, 2012). However, coming to the united market of the countries, we are facing the differences in country characteristics, primarily with the growth of economy. This raises two questions: how significant such impact is and how these differences could be smoothed out.

The article has found that the impact of GDP on the Price/Earnings multiple is substantial, and if the impact of GDP is not taken into account, a wrong judgment made be made on the underestimation/overestimation of certain shares.

The most appropriate tool to control and mitigate the differences is regression. In Figure 3, the values of the set multiples correspond to the GDP growth rates across the countries, sorted by ascending values. Figure 3 shows that the line trend of some values of the multiple with account of the GDP growth rate respectively increases following

the GDP growth rate and ranked market values of the P/E multiple. At the same time, the trend of the traditionally set multiples' values is not changed depending on the GDP growth.

This confirms the relevance of our research for practical purposes. Such an approach, taking into account the GDP of countries, allows increasing the explanatory power of estimation using multiples. An inclusion in the analysis of the country risk can be considered as an extension of the study. This study does not doubt the importance for explaining differences in the assessment by spatial data of specific factors for companies, as well as specific factors for industry sectors.

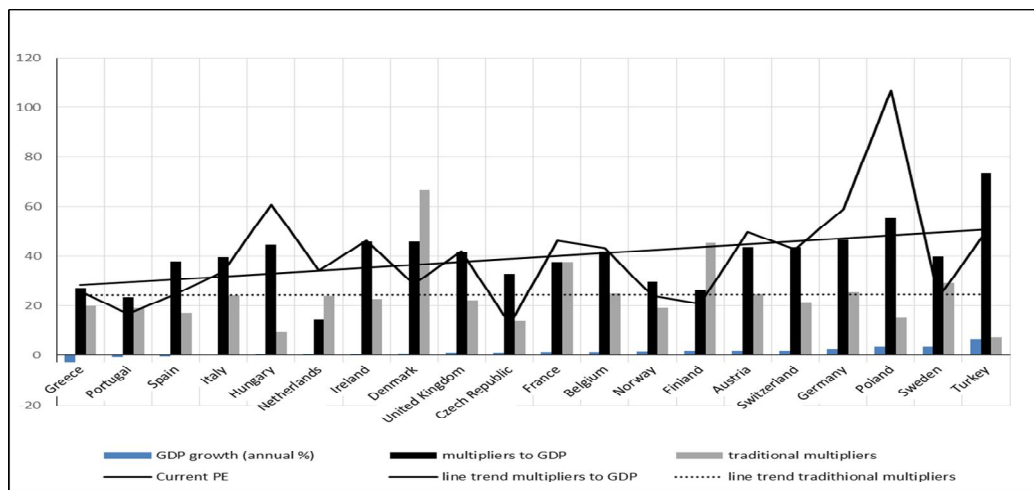


Figure 3. Comparison of the P/E multiple values rows by European countries with and without account of GDP, as well as their trends

5. Conclusions

This article has analyzed the impact of the GDP growth rate on the accuracy of setting “Price/Earnings” multiples for the comparative valuation of companies on the European markets.

The analysis showed that in the search for undervalued/overvalued country securities markets using the “Price/Earnings” multiple set by the variables determining it, will likely lead to errors. Therefore, it is necessary to apply techniques that will reduce the difference in the fundamental indicators.

One of such methods is to compare the P/E multiples of various countries with the GDP growth rates and the use of the regression analysis. A regressive dependence of the P/E multiple on the payoff ratio, expected growth in earnings per share, and the beta coefficient by the companies in the European countries was determined.

The regression of the P/E multiple based on the GDP growth rates in the European countries was also determined.

The results of the assessment of the PE multiples in both approaches were compared. This comparison allowed us to conclude that the impact of GDP on the “Price/Earnings” multiple is significant, and if the impact of GDP is not taken into

account, a misjudgment on made be made leading to underestimation/overestimation of certain shares.

One of the methods of mitigating the differences in the variables and P/E multiples in different countries is to take into account the GDP growth rate. The result, obtained in the article, confirms the relevance of research for practical purposes. This approach with account of the GDP of countries can increase the explanatory power of evaluation using multiples.

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