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Economic Growth, Corporate Earnings And Equity Returns: Evidence From Central And Eastern European Countries

Abstract

This paper discusses the links between economic growth, corporate earnings and stock returns. Cross-country correlation studies do not confirm the intuitive assumption that higher returns on equities are more likely in the faster-growing countries. The problem can be analysed more deeply by analysing stock returns with respect to the growth of earnings per share (EPS) and changes in valuation (P/E ratio). Within this framework, two types of factors explaining the lack of correlation between GDP growth and stock returns are distinguished. The empirical research on developed and emerging market countries reveals that in the long run stock price returns are driven by companies' earnings, and that the lack of correlation between GDP growth and equity returns is almost fully explained by the divergence between GDP growth and EPS growth. In this article the results of an investigation into this area, based on a sample of post-communist Central and Eastern European countries, are presented and discussed. It was found that in these countries changes in valuation (P/E ratio) appear to play an important role, cancelling the impact of EPS growth on stock returns.

***Keywords**: economic growth, stock returns, earning per share, P/E ratio, Central and Eastern European countries*

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1. Introduction

Conventional wisdom holds that the state of the economy and the situation on stock markets are related to each other. More precisely, it is believed that in countries with higher economic growth equity returns should be higher as well. A simple practical conclusion that can be drawn from this belief is that in the internationally diversified portfolios of investors seeking attractive places for stock investments, countries with higher growth prospects should predominate. There is a wealth of theoretical arguments in support of this view. The literature on financial markets describes mechanisms by which a good situation in the real sphere of the economy stimulates stock prices and, vice versa, how well-performing stock markets contribute to economic growth[1]. However, some relatively new empirical studies challenge this reasoning.

According to Sigel (2002), in developed markets economic growth and stock market returns are negatively correlated in the long run, and Ritter (2012) argues that the correlation is negative in both developed and emerging markets. In contrast, Estrada (2012) has not found any significant relationship between economic growth and stock returns and between the fundamental condition of a company and the rate of return on its stocks. Section 2 of this paper contains a short overview of these somewhat controversial findings and conclusions.

The literature offers several explanations of the above phenomena. It should be noted here that the arguments presented in Section 3 – where the discussion is set within the conceptual framework of a simple model, with stock returns decomposed into the growth of earnings per share (EPS) and changes in valuation (P/E ratio) – can be divided into two groups. The first group of arguments gives plausible reasons for the lack of a correlation between economic growth in a country and the EPS growth of companies included in the country's equity index. The second group of arguments tries to explain why the growth of EPS does not necessarily translate into higher stock returns. An investigation into the correlation coefficients between the appropriate variables across countries can help assess the relative importance of both groups of arguments in explaining why economic growth and stock returns are not positively related to each other. In Section 4, the results of a pertinent analysis performed within a group of highly developed and emerging market countries are presented. The relatively new equity markets in the Central and Eastern European (CEE) countries have not been studied yet. The main goal of this paper is therefore to present the results of an investigation into the correlation between a country's economic growth and the

[1] For an overview of these theoretical views, see Gajdka, Pietraszewski (2014) or Brzeszczyński et al. (2009).

EPS growth of companies, and into the correlation between EPS growth and stock returns in these countries (Section 5). The paper concludes with a discussion and comparison of the results.

2. Results of empirical studies on cross-country correlations between economic growth and stock returns

The relationship between stock market performance and the real sphere of the economy has attracted the interest of many researchers, for instance: Malkiel 1996; Demirguc-Kunt, Levine 1998; Binswanger 2000, 2004; Hassapis, Kelyvitis 2003; Filler et al. 2003; Sawhney et al. 2006; Wyżnikiewicz et al. 2005; Brzeszczyński et al. 2008; Cornell 2010; Ritter 2005, 2012; and Gajdka, Pietraszewski 2014. But the opinions they have presented on this matter are dissimilar. They differ in their views on whether it is the stock exchange situation that affects economic activity, or perhaps economic activity that shapes stock returns; and on whether the two spheres interact with each other, or whether no statistically significant correlation exists between the stock market and the "real" economy indicators. Moreover, there is also no consensus over the direction of the relationship between the stock market and economic situation (i.e. whether a good economic situation is accompanied by high or low rates of return). And although Ritter (2012) argues that it seems intuitively reasonable to assume that investments in equities in countries where the rates of economic growth are high should turn profitable, the results of empirical studies fail to support this view.

Ritter (2012) analysed the cross-country relationships between the growth rates of GDP per capita (in real terms, i.e. allowing for inflation) and the real rates of return on the stock market (in both local currencies and US dollars) for three groups of countries. The first group consisted of 19 highly developed countries in the years 1900–2011, the second group contained 21 highly developed countries in the years 1970–2011, and the third group was represented by 15 countries that in the early 1990s were named the emerging markets, the study encompassing the years 1988–2011.[2] Ritter converted the growth rates and the rates of return on stocks into geometric mean annual rates spanning the whole period under investigation. The returns on stocks encompassed capital gains/losses as well as dividends. Table 1 presents the correlation coefficients and p-values (in brackets) calculated by Ritter.

[2] The data on Brazil, China and India start in 1993, and on Russia in 1996.

Table 1. The correlation coefficients between GDP per capita growth and equity returns in developed countries and emerging market countries

	19 Developed countries	21 Developed countries	15 Emerging market countries
	(1900–2011)	(1970–2011)	(1988–2011)
R-L	-0.39	-0.04	-0.41
	(0.10)	(0.87)	(0.13)
R-$	-0.32	0.01	-0.47
	(0.18)	(0.95)	(0.08)

Markings: R-L – stock returns in local currency, R-$ – stock returns in USD

Source: prepared by the authors based on Ritter (2012).

Based on his findings, Ritter reported that in the group of developed countries in the years 1900–2011 and in the group of emerging market countries in the years 1988–2011, the cross-country correlations between economic growth and equity returns appeared to be negative, and in the group of 21 developed countries in the years 1970–2011 they were essentially zero. Even though the relatively high, negative correlation coefficients in two of the three examined cases are striking, Ritter's conclusion about the negative correlations in these countries is blunted by overly high p-values.

The results of other studies indicate that, rather than a negative correlation, economic growth and stock returns exhibit no correlation.

Estrada (2012) examined 24 developed countries and 21 emerging countries (and a mix of 45 countries) as classified by the MSCI. To measure their economic growth, both real GDP and real GDP per capita were used. The data on returns, accounting for both capital gains/losses and dividends, were derived from the MSCI indices. Depending on the country, the periods of analysis started in 1987 or later, but in all cases they ended in 2010. The correlation coefficients and p-values (bracketed) obtained by Estrada are presented in Table 2.

Table 2. The 1987–2010 correlation coefficients between economic growth and equity returns derived from the MSCI indices for developed and emerging countries

	Developed countries		Emerging countries		All countries	
	R-L	R-$	R-L	R-$	R-L	R-$
GDP	0.01	-0.06	-0.12	-0.13	0.25	0.20
	(0.96)	(0.77)	(0.60)	(0.59)	(0.09)	(0.18)
GDP per capita	-0.09	-0.13	-0.19	-0.14	0.20	0.17
	(0.69)	(0.54)	(0.41)	(0.54)	(0.20)	(0.25)

Note: R-L – returns in local currency, R-$ – returns in USD

Source: Estrada (2012).

The correlation coefficients in Table 2 have different signs, but all of them are statistically insignificant at the 5 percent level and almost all (except one) at the 10 percent level, which indicates a lack of correlation.

3. Reasons for non-correlation between economic growth and stock returns

The literature provides a whole range of arguments to explain why economic growth and stock returns are not correlated to each other. A useful tool for putting them in order is the conceptual framework of a simple returns decomposition model.[3]

Taking as a point of departure an obvious identity: $P = EPS \cdot P / E$ where P stands for the stock index value, EPS denotes earnings per share and P/E is the price/earnings multiplier for an index , and using a bit of algebra, the return on the index can be broken down into EPS growth and the change in the P/E ratio (in the valuation of earnings) in the following manner:

[3] The model's ability to forecast long-term stock returns in developed markets has been studied by Bogle (1991) and Estrada (2007). For a discussion of this and other supply-side models of stock returns, see Ibbotson, Chen (2002).

$$R_t = (1 + g_{EPS,t})(1 + g_{E/P,t}) - 1, \tag{1}$$

where $R_t, g_{EPS,t}, g_{E/P,t}$ denoting, respectively, the return on the index, EPS growth and the change in the *P/E* ratio are given by:

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}}, \quad g_{EPS,t} = \frac{EPS_t - EPS_{t-1}}{EPS_{t-1}}, \quad g_{E/P,t} = \frac{P_t / E_t - P_{t-1} / E_{t-1}}{P_{t-1} / E_{t-1}}.$$

Equity (1) holds for any period t, defined as a particular year. It can be easily demonstrated that a similar equity applies to geometric means:

$$\overline{R} = (1 + \overline{g_{EPS}})(1 + \overline{g_{E/P}}) - 1 \tag{2}$$

where the dashes over R, g_{EPS} and $g_{E/P}$ denote geometric means.

From the returns decomposition model (2) it follows that all arguments used to explain a lack of correlation between economic growth and stock returns can be divided into two groups. Those in the first group give reasons for the lack of a correlation between a country's economic growth and the growth of earnings per share (g_{EPS}) of companies making up the country's equity index. The second group of arguments seek to explain why EPS growth does not necessarily translate into stock returns.

The most obvious arguments in the first group have been formulated by Bernstein and Arnott (2003), according to whom the growth of listed companies has a limited role in increasing a country's GDP. If much of the economic growth of a country depends on value added generated by new or unlisted enterprises or the governmental sector, the link between economic growth and the equity index is broken. This reasoning is rather related to the methodological aspects of research and does not say much about the reasons why economic growth and companies' profits are not related to each other.

Siegel (2002) explains this phenomenon by referring to progressing globalisation and the fact that in most countries the biggest companies – and also, particularly in emerging economies, those most important for the local stock market index – tend to sell their products and services internationally. The earnings of these multinationals are linked to the worldwide economic growth rather than to the GDP growth at 'home'. A case in point is the Nokia Corporation, a major player in the Finnish economy. Nokia makes most of its sales in international markets, so its corporate results are more dependent on

how the markets do than on the economic situation in Finland. The point can also be illustrated by many Spanish companies which make substantial profits in Latin American economies.

The weak correlation between economic growth and EPS growth can also be attributed to the "dilution" of earnings (and to the "concentration" of earnings at the other end). Dilution takes place when companies issue new shares to finance their growth. This move may increase aggregate profits, but a decrease in earnings per share is inevitable. The concentration of earnings is achieved by buybacks. If it is true that companies issue new shares in times of prosperity (during an economic upturn) when stock prices are high, and buy back shares during a downturn, then the link between economic growth and corporate earnings per share may be less strong than is commonly thought to be the case. In some countries, companies' earnings may be "diluted" because of frequent use of stock options to reward and remunerate employees. The exercised options increase the volume of shares circulating in the stock market, thus reducing the growth rate of earnings per share.

The weak relationship between GDP growth and corporate performance can also be explained by the fact that the managers of public companies, in basically all countries and for various reasons, are under pressure to demonstrate that their organisations are expanding. If the paramount goal of a national or corporate policy is ongoing growth, such pressure frequently causes managers commit their resources to negative-NPV projects, including the acquisitions of other companies. In this way the companies keep expanding, but their higher revenues are not accompanied by higher aggregate earnings. To illustrate this mechanism, Ritter (2012) referred to the case of Japan. The Japanese policymakers' long-standing commitment to growth and full employment, in many cases realised at the expense of corporate profitability, is viewed as a major factor behind the country's relatively poor economic performance since 1990. After Krugman (1994, 1997) popularized the very controversial results of studies into the sources of economic growth in the South and East Asian countries conducted by Young (1992, 1995) and Kim and Lau (1994), it is believed that the case of many "Asian tigers" is very similar.

In addition to political and social pressures, the reasons why companies want to grow may also be explained through behavioural factors. In this case, overinvestment, including acquisition sprees, arises from the excessive self-confidence or inflated optimism of managers, who choose projects based on the likelihood of their high performance. Such projects may fall short of the managers' expectations, bringing rates of return below the cost of invested capital.

The second group of arguments refers to changes in valuation (P/E ratios), which can offset the positive effect of earnings' growth on stock returns. According to (2), stock returns increase with a positive growth of earnings, unless the growth is offset by a reverse change in valuation (in P/E).

The probability of the latter scenario comes from the fact that investors tend to overpay for the growth prospects of fast-growing economies and fast-growing companies. Jeremy Siegel made this observation in his widely-cited 1998 book "Stocks for the Long Run". When growth expectations are very high, investors are so set on having a share in the likely profits that they mostly ignore the price they pay for it now. In other words, because the expectations of high growth are impounded into the prices at the start of the period, the initial P/E ratios rise so dramatically that in the medium-to-long term they can go nowhere but down, affecting stock returns as a result. As Estrada (2012) has framed it, investors are "blinded by growth". He explains this phenomenon using the example of the Google corporation between early 2006 and June 30, 2010. Google's P/E ratio decreased in that period from 82.6 to 19.3, resulting in a relatively low annualized rate of return of 1.6% and extraordinary growth of annual EPS of 40.3%. The case of Amazon between July 2004 and the end of 2008 is even more striking. Amazon's P/E ratio declined over that period from 83.7 to 34.2, contributing to a negative mean annual stock return (-1.3%) and annualized EPS growth of 20.4%. The same mechanism can be observed for entire stock markets and countries. This leads to stock bubbles, such as the Internet bubble in the USA in the late 20th century. In the wake of this bubble, extremely low returns on stocks were noted, but companies' earnings did not show a proportional decline. Ritter (2012) recalls the case of China, where returns on stocks were very low (an annual average of –5.5%) despite impressive economic growth (9.4% per year) having been noted in the years 1993–2011.[4]

4. Economic growth, corporate earnings and stock returns in developed and emerging market countries

The above leads us to the question concerning which of these two groups of factors plays a greater role in practice. The simple correlation studies that have been recalled here do not provide much insight into why empirical economic growth and returns are not related to each other. More information on this subject can be obtained by using the returns decomposition model (2) and by studying the relations between economic growth and EPS growth and between

[4] As will be shown below, this example is not so obvious because such negative returns can be explained in large part by EPS falling, without a dramatic decline in the P/E multiplier.

EPS growth and returns on the indices. Such a study was conducted at the NBIM (2012),[5] using MSCI indices for 20 developed countries and 21 emerging market countries. The data that were used to analyse correlations between economic growth, corporate earnings and equity returns are presented in Table 1 and the results of the calculations are provided in Chart 1.

Table 1. Economic growth, corporate earnings and equity returns in developed and emerging market countries

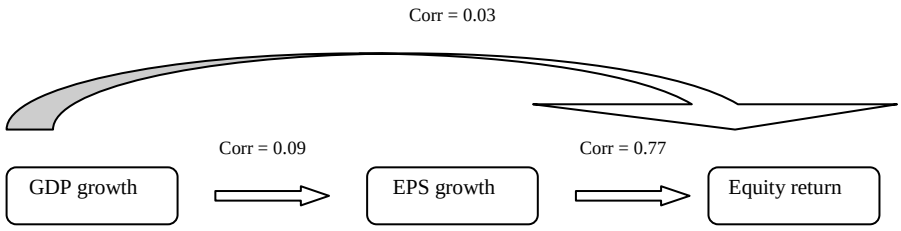
		Annual rate of real GDP growth (%)	Annual rate of real EPS growth (%)	Annual change in P/E multiplier (%)	Real annual rate of return (%)	(1)-(2)	(1)-(4)
		(1)	(2)	(3)	(4)	(5)	(6)
Developed							
Switzerland	1988–2010	1.60	5.31	0.42	5.75	-3.71	-4.15
Sweden	1988–2010	2.08	5.64	1.79	7.53	-3.56	-5.45
Denmark	1988–2010	1.57	4.66	2.18	6.94	-3.09	-5.37
Germany	1988–2010	1.71	3.52	-0.06	3.46	0-1.81	-1.75
Finland	1988–2010	2.03	3.41	1.55	5.01	-1.38	-2.98
France	1988–2010	1.70	2.84	0.22	3.07	-1.14	-1.37
Spain	1988–2010	2.65	3.37	-1.03	2.30	-0.72	0.35
Austria	1988–2010	2.21	2.84	-0.62	2.21	-0.63	0.00
USA	1988–2010	2.50	2.71	1.58	4.34	-0.21	-1.84
Netherlands	1988–2010	2.45	2.66	0.77	3.46	-0.21	-1.01
United Kingdom	1988–2010	1.93	1.50	1.11	2.63	0.43	-0.70
Norway	1988–2010	2.51	2.00	2.21	4.25	0.51	-1.74
Canada	1988–2010	2.30	1.77	3.05	4.87	0.53	-2.57
Japan	1988–2010	1.35	0.44	-5.02	-4.61	0.91	5.96
Italy	1988–2010	1.08	-0.43	-0.72	-1.14	1.51	2.22
Hong Kong	1988–2010	3.89	2.15	2.62	4.83	1.74	-0.94
Australia	1988–2010	3.25	0.45	2.05	2.51	2.80	0.74
Belgium	1988–2010	2.02	-1.14	0.74	-0.41	3.16	2.43
Singapore	1988–2010	6.72	3.26	-0.12	3.13	3.46	3.59
New Zealand	1988–2010	2.39	-5.38	2.91	-2.62	7.77	5.01

[5] Compare also with MSCI (2010).

Emerging							
Czech Republic	2000–2010	3.19	16.97	-6.53	9.33	-13.78	-6.14
Peru	1994–2010	4.84	12.20	0.83	13.13	-7.36	-8.29
Egypt	2000–2010	4.93	11.69	3.87	16.02	-6.76	-11.09
Brazil	1999–2010	3.64	8.80	-2.53	6.05	-5.16	-2.41
Russia	1998–2010	5.34	9.94	-4.15	5.38	-4.60	-0.04
Colombia	1994–2010	3.15	5.82	2.96	8.95	-2.67	-5.80
Mexico	1992–2010	2.43	4.43	2.10	6.63	-2.00	-4.20
South Africa	1993–2010	3.25	4.34	-0.43	3.90	-1.09	-0.65
Morocco	2001–2010	4.67	4.96	2.98	8.09	-0.29	-3.42
Chile	1994–2010	4.32	4.59	-0.71	3.85	-0.27	0.47
Taiwan	1988–2010	5.36	5.26	-5.15	-0.16	0.10	5.52
Hungary	1998–2010	2.32	2.10	-1.65	0.41	0.22	1.91
Turkey	1994–2010	4.14	2.71	-0.08	2.62	1.43	1.52
India	1994–2010	7.02	4.43	-0.40	4.01	2.59	3.01
Malaysia	1993–2010	5.22	2.19	-3.48	-1.36	3.03	6.58
Korea	1988–2010	5.57	2.08	-0.67	1.40	3.49	4.17
Thailand	1988–2010	5.04	0.91	0.96	1.87	4.13	3.17
Indonesia	1991–2010	4.46	-0.07	2.61	2.54	4.53	1.92
Poland	1995–2010	4.39	-2.12	4.52	2.30	6.51	2.09
Philippines	1988–2010	3.88	-4.51	5.17	0.43	8.39	3.45
China	1995–2010	9.85	-0.50	-0.16	-0.66	10.35	10.51

Source: NBIM (2012). The real rates of return on the indices were computed by the authors using nominal returns and inflation rates from the NBIM (2012).

Chart 1. The growth-earnings-return relationship in developed and emerging market countries



Source: NBIM (2012).

The NBIM (2012) made several observations based on the data contained in Table 1 and Chart 1.

Firstly, high EPS growth rates are generally associated with commensurately high price returns. The cross-sectional correlation between EPS growth and equity returns is highly positive and statistically significant. For example, developed countries (Sweden, Switzerland and Denmark, etc.) and emerging market countries (such as Peru, the Czech Republic and Egypt) posted some of the highest EPS growth rates and equity returns of all countries in the sample. On the other hand, in countries where EPS growth rates were negative, e.g. Belgium, China and New Zealand, equity returns were relatively low. This seems to imply that in the long run stock price returns are driven by fundamentals, and that changes in valuation (P/E ratio) have a limited role in explaining between-country differences in stock returns.

Secondly, high real GDP growth does not universally translate across countries into high EPS growth and, *p*, into high returns for shareholders. Both correlation coefficients – between GDP growth and EPS growth and between GDP growth and stock returns – are statistically not different from zero. In many countries in the sample, real GDP growth does not appear to have a particularly strong effect on the growth of earnings and stock returns. The most striking example is China. Although China had the highest GDP growth rate in the sample (9.85 percent on average in the period 1995–2010), its real EPS declined by 0.50 percent, while valuation levels remained basically the same. As a result, China noted in those years a "slippage" of 10.35 percent between GDP growth and EPS growth, and a comparable slippage between GDP growth and stock price returns. At the other end of the spectrum, in small, open economies such as Sweden, Switzerland and Denmark, EPS was increasing significantly faster than was the real GDP.

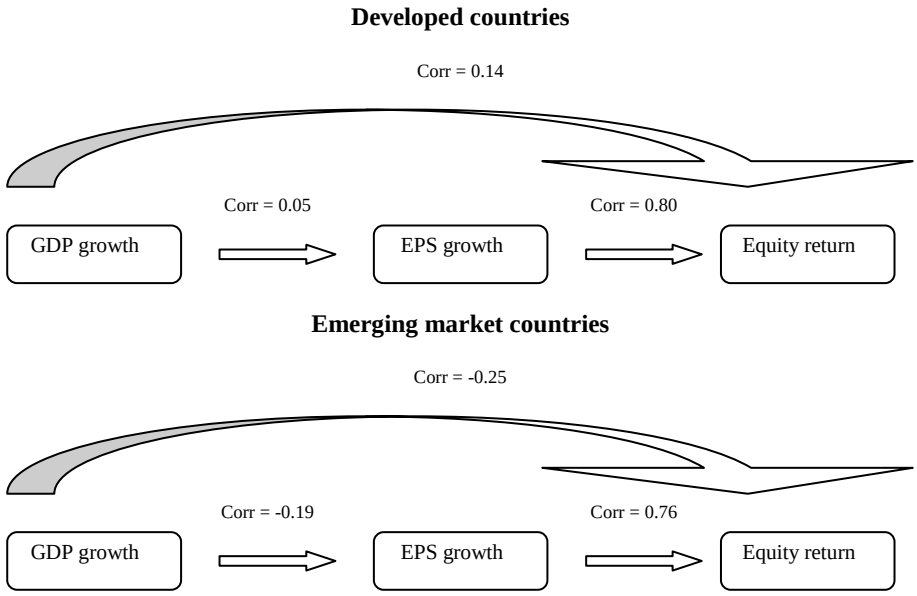
The third observation follows from the first two. The cross-country variations in the gap between GDP growth rates and equity returns (column (6) in Table 1) are largely accounted for by the difference between GDP growth rates and EPS growth rates (column (5)). For example, in countries such as Peru, Egypt, and South Africa, where EPS grew much faster than real GDP, equity returns were exceptionally high in relation to GDP growth. On the other hand, in countries such as Australia, Singapore and New Zealand, where EPS growth lagged behind real GDP growth, investors realised relatively low equity returns.

The data and correlations based on which the NBIM (2012) formulated its conclusions can also be used to draw conclusions about the relative weight of different factors explaining the lack of correlation between economic growth and stock returns. It seems that changes in valuation (P/E ratio), like investors' blinded by growth, are of limited use in accounting for the lack of cross-country correlations between economic growth and stock returns. In the long run, stock prices appear to

be driven by fundamentals (earnings per share), thus the question to be answered is why fundamentals fail to follow the GDP growth in a given country. Let us revisit the case of China. Most of the lag between China's extraordinary economic growth and disappointingly low stock returns can be explained in terms of the lag between GDP growth and changes in EPS, and the overvaluation of Chinese stocks at the beginning of the analyzed period played a limited role.

The correlations presented in Chart 1 were computed for a sample containing 41 developed and emerging market countries. It might be useful and interesting to see if the conclusions would be the same if the countries were analysed as two separate groups. To find this out, we used the data in Table 1 to make calculations for 20 developed countries and 21 emerging market countries. These results are presented in Chart 2.

Chart 2. Growth-earnings-returns relationships in developed countries and emerging market countries



Source: calculated by the authors.

According to Chart 2, the key relationships between economic growth, EPS growth and stock returns in these two groups of countries are not different from those observed in the full sample. To explore other possibilities, similar investigations were carried out for groups of countries selected using different (e.g. geographic) criteria.

5. Economic growth, corporate earnings and stock returns in Central and Eastern European countries

The new sample consisted of the post-communist countries in Central and Eastern Europe (CEE), which are located in the same geographical location and have the shared the experience of having launched large-scale systemic reforms after 1990 in order to introduce a market economy. Thus their capital markets are fairly new compared to those in the highly-developed countries and in the majority of emerging market countries. For the same reason, it is relatively rare for multinational corporations in the CEE countries to remunerate their employees with stock options, which could cause a lag between economic growth and stock returns, etc. Further, companies listed on the local stock exchanges comprise a relatively small part of the countries' economies. The fact that the local capital markets are rather "tight" and probably less efficient increases the probability of faulty valuations. All these factors together diminish the predictability of the links between economic growth, corporate earnings and stock returns.

The financial data series on the CEE countries which can be used in the analysis are not only relatively short (this particularly applies to the EPS series), but also show considerable variations between countries. Let us consider the longest period for which both equity returns and EPS data are available for each country, i.e. the years 2007–2014. A different approach would make it necessary to calculate averages for some countries with data spanning two essentially different periods (preceding and following the eruption of the most recent global financial and economic crisis), and for others using data spanning only the second of the two periods. This could distort the comparability of the results. The data used in the calculations are presented in Table 2 in an ascending order of the gap between GDP growth and EPS growth. The correlations are reported in Chart 3.

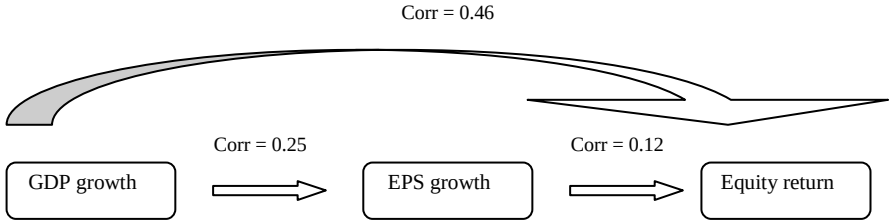
Table 2. Economic growth, corporate earnings and equity returns in 12 CEE countries in the years 2007–2014[6]

	Annual rate of real GDP growth (%)	Annual rate of real EPS growth (%)	Annual change in P/E multiplier (%)	Real annual rate of return (%)	(1)-(2)	(1)-(4)
	(1)	(2)	(3)	(4)	(5)	(6)
Romania	1.7	41.3	-34.8	-7.8	-39.6	9.5
Lithuania	1.8	6.1	-9.8	-4.3	-4.3	6.1
Croatia	-0.8	1.9	-11.0	-9.3	-2.7	8.5
Bulgaria	1.6	0.2	-13.8	-13.6	1.4	15.3
Estonia	0.6	-5.1	-0.3	-5.4	5.7	6.0
Slovenia	0.3	-5.5	-3.9	-9.2	5.9	9.5
Russia	2.4	-6.8	-5.0	-11.5	9.2	13.9
Poland	3.6	-5.9	3.9	-2.2	9.5	5.8
Ukraine	-0.5	-12.7	-3.3	-15.5	12.2	15.1
Hungary	0.1	-17.5	11.4	-8.1	17.6	8.2
Czech Republic	1.0	-24.3	22.0	-7.6	25.3	8.6
Latvia	0.5	-51.2	86.2	-9.2	51.7	9.6

Source: calculated by the authors using data on the following stock exchange indices: SOFIX Index (Bulgarian Stock Exchange - Sophia), PX Index (Prague Stock Exchange), TALSE Index (Nasdaq OMX Tallinn), VILSE Index (Nasdaq OMX Vilnius), RIGSE Index (Nasdaq OMX Riga), CROBEX Index (Zagreb Stock Exchange), SBITOP Index (Ljubljana Stock Exchange), BUX Index (Budapest Stock Exchange), PFTX index (PFTX Ukraine Stock Exchange), WIG (Warsaw Stock Exchange), BET Index (Bucharest Stock Exchange), MICEX Index (Moscow Stock Exchange). The data on the indices and EPS were sourced from Bloomberg and adjusted for inflation (GDP deflator). The inflation and GDP growth data were obtained from the World Bank database (2015, August).

[6] For Hungary, calculations were made with the 2007–2013 data, because in 2014 Hungarian EPS was negative so it was impossible to calculate the amount of the geometric mean annual percentage change.

Chart 3. Growth-earnings-return relationships in 12 Central and Eastern European Countries in the years 2007–2014



Source: calculated by the authors.

Thus in the CEE countries, the rates of EPS growth and of GDP growth are not correlated with each other (similar to the developed and emerging market countries), but cross-country variations in EPS growth rates and the gap between these rates and GDP growth rates are much bigger. The CEE countries are also different from the developed and emerging market countries in that their EPS growth rates are not correlated with stock returns. This means that between 2007 and 2014 stock returns in the CEE countries were not driven by fundamentals because of the major changes in valuation (changes in the P/E multiplier) which occurred across countries. An interesting observation is that the changes in valuation are very strongly and negatively correlated with EPS growth rates (corr = –0.9, p-value = 0.00), meaning that they usually act in the reverse direction to changes in EPS and offset their effect on stock returns. It looks like the investors were able to predict much of the future growth or decline in EPS at the beginning of the analysed period and include it in prices (making them extremely high or low, respectively). For the sake of illustration, let us consider the extreme case of Romania. The Romanian average rate of EPS growth was very high (41.3%), but its P/E moved in the reverse direction and offset all positive effects of earnings growth on returns. Because the negative impact of valuation more than outweighed the positive effect of growth, investors putting their money in Romanian companies with superb prospects of earnings growth earned a negative annual rate of return of 7.8%, which has been calculated from equation (2) in the following manner:

$$R_t = (1+41,3\%)(1-34,8\%)-1 = -7,8\% .$$

To put it briefly, the investors overpaid for growth. At the other end of the scale is Latvia, where earnings per share were falling dramatically at an average annual rate of 51.2%, but investors were losing money at a much gentler rate of

9.2% per year because of a high increase in the P/E ratio, which toned down the negative impact of falling earnings on returns (see the following calculation):

$$R_t = (1-51,2\%)(1+86,2\%)-1 = -9,2\% .$$

Overall, the presented numbers seem to provide grounds for concluding that the non-correlation between GDP growth and stock returns in CEE countries in the years 2007-2014 can be attributed to both groups of factors discussed in section 2.

6. Conclusions

While it may be intuitively assumed that stock returns are driven by the growth of the real economy, the results of empirical studies on different countries imply that this is not so. A useful tool for investigating the causes of this is the returns decomposition model, which decomposes stock returns into the growth in earnings per share and changes in valuation. According to the model, there are two groups of factors that seem to account for this lack of correlation. Firstly, the divergence between GDP growth and EPS growth can be explained in terms of the disproportionately large contribution of unlisted or new companies to the growth of country's GDP, big companies' exposure to international markets, the dilution of companies' earnings as a result of new issues of shares and the rewarding of employees with stock options, and the pressure on managers to keep companies growing whatever the cost, resulting in negative-NPV investments. Secondly, stocks may be priced to allow for expected increases (or decreases) in corporate earnings, causing the initial P/E ratios to be very high (or very low). A subsequent change in valuation may reverse the effect of EPS growth on stock returns.

It has been shown that in the long run stock prices in developed countries and emerging market countries seem to be driven by companies' earnings and that changes in valuation (P/E ratio) have a limited role in explaining why economic growth and stock returns are not correlated across countries. This non-correlation can be almost fully explained by the fact that GDP growth does not translate universally into EPS growth.

The investigation has also shown that the case of post-communist countries in Central and Eastern Europe, analysed using a 2007–2014 data sample, is more complicated. All these countries implemented massive systemic reforms after 1990 to introduce a market economy. Their capital markets are therefore fairly new compared with the well-established markets in highly-developed countries and in the majority of emerging market countries. For this

reason, instances of multinational companies remunerating their employees with stock options or acquisitions (which is thought to be a reason for a lag between economic growth and EPS growth (stock returns) of listed companies) are relatively few in the CEE countries. At the same time, companies listed on the local stock exchanges represent a relatively small part of the countries' economies – in many of them, the number of listed companies and the level of market capitalization are very low in relation to national GDP. Moreover, many listed companies that have a significant share of the total market value are partly-government owned and therefore prone to political pressures. Instead of focusing on profitable and value-building investments, they are very often forced to pay lavish dividends or undertake projects that are economically irrational but are perceived by the authorities as socially desirable and politically significant. For these reasons, the economic and market performance of companies listed on the local stock exchanges may fail to reflect the achievements of the economy as economic growth, corporate earnings and stock returns are less predictable than elsewhere.

It has thus been found that in the CEE countries, like in the highly developed and emerging market countries, economic growth and stock returns may be at odds with each other, but the reasons are more complex. The divergence between economic growth and EPS growth is accompanied in their case by changes in the P/E ratio that consume most of the positive effect of EPS growth on returns. In other words, in the CEE countries stock prices do not seem to be driven by fundamentals, which contrasts with evidence from highly developed and emerging market countries. There are several probable reasons for this non-correlation. Firstly, capital markets in the CEE countries are rather new compared with those in other countries. Because of this they are relatively "tight" and, perhaps, less efficient in the sense that prices may not be based on all the relevant information, which increases the risk of faulty valuations. Further, the political factors that many listed companies must take into account increase uncertainty and may cause investors to overreact. Investors trading on these markets may also overreact in response to international data that may be of no relevance to the locally listed companies. Foreign investors, in turn, may have a tendency to see the markets as one group, ignoring the fact that the economic performance of listed companies is determined by specific local factors. The results and conclusions of the study cannot be generalized simply into statements about long-term regularities. The period under investigation was definitely not long enough for this, and in addition quite unique because of the global crisis.

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Streszczenie

WZROST GOSPODARCZY, ZYSKI FIRM A STOPY ZWROTU Z AKCJI W KRAJACH EUROPY ŚRODKOWO-WSCHODNIEJ

W artykule omówiono związek pomiędzy wzrostem gospodarczym, zyskami firm a stopami zwrotu z akcji. Badania przekrojowe korelacji pomiędzy tymi wielkościami nie potwierdzają intuicyjnego założenia, że kraje rozwijające się szybciej powinny charakteryzować się wyższymi stopami zwrotu z akcji. Pogłębioną analizę tego zagadnienia umożliwia dekompozycja stóp zwrotu z akcji na wzrost zysków na akcję oraz zmian w wycenie zysków (stosunku ceny do zysku). W tym kontekście możliwe jest rozróżnienie dwóch typów czynników wyjaśniających brak korelacji pomiędzy stopami wzrostu produktu krajowego i stopami zwrotu z akcji. Badania empiryczne dla krajów rozwiniętych i rynków wschodzących pokazują, że w długim okresie stopy zwrotu z akcji powiązane są ściśle ze zmianami zysków firm, zaś brak korelacji pomiędzy stopami wzrostu gospodarczego i stopami zwrotu z akcji może być prawie w całości wyjaśniony dywergencją pomiędzy stopami wzrostu gospodarczego a stopami wzrostu zysków na akcję. Zaprezentowano i przedyskutowano rezultaty analogicznego badania dla grupy krajów postkomunistycznych z Europy Środkowo-Wschodniej. W tym przypadku istotną rolę okazują się odgrywać zmiany w wycenie zysków (stosunku ceny do zysku), niwelujące wpływ zmian zysków przypadających na jedną akcję na stopy zwrotu z akcji.

***Słowa kluczowe**: wzrost gospodarczy, stopy zwrotu z akcji, zysk na akcję, wskaźnik ceny do zysku, kraje Europy Środkowo-Wschodniej*