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GENERAL ECONOMIC INDICATORS AND THE STOCK EXCHANGE TOWARD THE WORLD FINANCIAL CRISIS AND POST CRISIS

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Abstract: *The influence of The World Financial Crisis (2008-2011) and Post crisis (2012-2013) upon the economics of Serbia, Bulgaria and Germany causes changes in their GDP, the level of international investments and the stability of stock exchanges. The stock exchanges rates are in interference with the economics of these states and determine the sharp decrease and increase of the shares of leading companies. The market risk of the financial markets is evaluative and useful instrument for measuring the risk of losses in positions arising from movements in market prices and the companies can control it and balance their possibility of gains. In the following research the economic indicators of Serbia, Bulgaria and Germany will be discussed and the indexes BELEX15, SOFIX, DAX will be analyzed for two different periods: The Crisis (2008-2011) and The Post Crisis (2012-2013).The market risk will be measured and general conclusions for managing it will be displayed.*

Keywords*: Crisis, GDP, Stock Exchange rate, Market risk*

1. Introduction

The World financial crisis of 2008 is a result of the mortgage and the global economic crisis of 2007. Expressed in deterioration in a strong degree of macroeconomic fundamentals of the so-called, developed countries, it is followed by a global recession.

In this research three types of country are studied: Germany as a developed country and EU member and founder; Bulgaria as a developing country and EU member since 2007; Serbia as a developing country and non – EU member.

The German economy is based upon an economic model, called the Iron Triangle. It involves export strategy, money politics and European vocation. Although the country was called "the sick man of Europe" only few years earlier due to its below-average performance (Funk, 2012), during the World financial crisis this country, opposite to other

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countries passed successfully the recession period and improved its general economic indicators in the Post Crisis period.

The Bulgarian economy in the beginning of the Crisis was strong and the global impact remained perceptible only to limited extent (Jungmann & Sagemann , Financial Crisis in Eastern Europe; Road to Recovery 2011). The drops in its GDP and other variables were delayed, but not avoided. It was due to the high level of integration into the European single market in the preceding previous years. Bulgaria was isolated from the immediate reaction of the relevant capital markets and had minor decreases in the economic indicators. But its capital market collapsed. In the last years it starts to develop again, but not at the same pace from the previous years. The protection of the CBA successfully preserved some side effects.

The Serbian economy was strong and experienced great develop before the pre-Crisis years. Its general economic values were improved and high. The macroeconomic and investment climate was fragile, but the foreign investments and GDP growth was significant. The country stayed competitive, offering financial and tax incentives to companies willing to invest as well as a spacious free-trade area with access to a far greater market than just the Serbian one (Jungmann & Sagemann , Financial Crisis in Eastern Europe; Road to Recovery 2011). In the Crisis the level of foreign direct investment reduced and the GDP turned down. Into the Post -Crisis period Serbia stated a slow development and stayed in a permanent condition, without the influence s assistance of the foreign direct investments.

The changes of leading general macroeconomic indicators reflected onto the capital market stability and insurance. The macroeconomic situation changed the developing growth of many companies and slowed down the market capitalization of them. The main sign of this process is the stock index of the analyzed countries. It shows the national companies `s situation. For foreign and national investors it`s significant to be familiar with the macroeconomic background and resulting risk of investing into the exchange – traded companies.

This research has followed the comparison between general economic indicators (GDP, Foreign direct investments, inflation and market capitalization) and their influence over the main stock indexes of these countries. The multiple regression model has been used for the analysis to show the relation between the independent macroeconomic variables and the dependent stock exchange rates. Next the VaR model and historical data has shown the rational decision for global investors - the potential market risk of a single index and portfolio of them.

2. Research

2.1. Methology and data

The comparison of the general economic indicators is going to mark the stability and the advantages of the three countries.

The multiple regression analysis of DAX, BELEX and SOFIX and its factors will be performed following the methodology described by Maddala.G.S. and Adamov. V & Zahariev. A (Financial analysis 2006, 525). Multiple regression models are prepared. EXCEL has been used to assess these relationships between the selected variables. The following forms (1), (2), (3) are :

$$Y_{DAX} = \alpha+\beta_1 X_{GDP}+\beta_2 X_{FDI}+\beta_3 X_{INFL}+\beta_4 X_{MCAP}+E_t \quad (1)$$

$$Y_{BELEX} = \alpha+\beta_1 X_{GDP}+\beta_2 X_{FDI}+\beta_3 X_{INFL}+\beta_4 X_{MCAP}+E_t \quad (2)$$

$$Y_{SOFIX} = \alpha+\beta_1 X_{GDP}+\beta_2 X_{FDI}+\beta_3 X_{INFL}+\beta_4 X_{MCAP}+E_t \quad (3).$$

Also VaR model will take part in measuring the market risk of the stock indexes (Adamov. V & Zahariev. A , Financial analysis 2006, 394) Among various methods of VaR computations, it will be used Absolute VaR. It considers the maximum loss that can occur with a given probability of confidence (95% and 99% mostly) over a holding period of *n* periods you might experience due to market movements without taking into account returns generated from the position.

$$VaR_{P,\ 1-\alpha} = -[M_{r,P} + z_\alpha \sigma_{r,P}]P_0 \quad (4).$$

2.2. Empirical analysis

The available data are for six year period and set out in Tables 1, 2 and 3.

Table 1. Germany: Data for DAX and general economic indicators (Annual)

	Dependent Result Variable		Independent Result Variable			
			I	II	III	IV
Year	DAX 30 Values	Change (%)	GDP Annual Growth %	FDI(% of GDP)	Inflation, GDP deflator (annual %)	Market capitalization of listed companies (% of GDP)
2008	4810,2	-39,50%	1,10%	0,46%	0,80%	30,60%
2009	5957,43	23,85%	-5,10%	1,15%	1,20%	39,30%
2010	6914,19	1,60%	4,00%	1,07%	1,00%	43,30%
2011	5898,35	-14,69%	3,30%	1,23%	1,20%	32,60%
2012	7778,78	31,88%	0,70%	1,01%	1,50%	43,40%
2013	9552,16	22,80%	0,40%	0,90%	2,20%	0,00%

Source: World Bank national accounts data, Deutsche Börse, Investor.bg

Table 2. Serbia: Data for BELEX and general economic indicators (Annual)

	Dependent Result Variable		Independent Result Variable			
			I	II	III	IV
Year	BELEX 15 Values	Change (%)	GDP Annual Growth %	FDI(% of GDP)	Inflation, GDP deflator (annual %)	Market capitalization of listed companies (% of GDP)
2008	565,18	-75,62%	3,80%	6,27%	12,60%	25,50%
2009	663,77	17,44%	-3,50%	4,81%	5,90%	28,60%
2010	651,78	-1,81%	1,00%	3,62%	4,90%	26,20%
2011	499,05	-23,43%	1,60%	6,17%	9,60%	19,10%
2012	523,89	4,98%	-1,50%	9,30%	6,00%	19,50%
2013	557,97	6,51%	2,50%	0,00%	5,50%	0,00%

Source: World Bank national accounts data, Belgrade Stock Exchange, Investor.bg

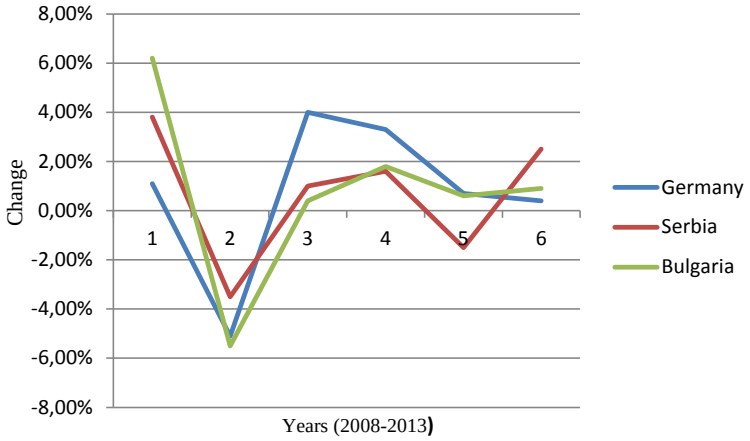
Table 3. Bulgaria: Data for SOFIX and general economic indicators (Annual)

	Dependent Result Variable		Independent Result Variable			
			I	II	III	IV
Year	SOFIX 30 Values	Change (%)	GDP Annual Growth %	FDI(% of GDP)	Inflation, GDP deflator (annual %)	Market capitalization of listed companies (% of GDP)
2008	358,66	-79,36%	6,20%	19,87%	8,40%	17,10%
2009	427,27	19,13%	-5,50%	8,02%	4,30%	15,60%
2010	362,35	-15,19%	0,40%	3,91%	2,80%	15,20%
2011	322,11	-11,11%	1,80%	3,97%	4,90%	15,40%
2012	343,72	6,71%	0,60%	3,08%	3,10%	13,00%
2013	491,52	30,07%	0,90%	3,56%	-0,90%	0,00%

Source: World Bank national accounts data, Bulgarian Stock Exchange, Investor.bg

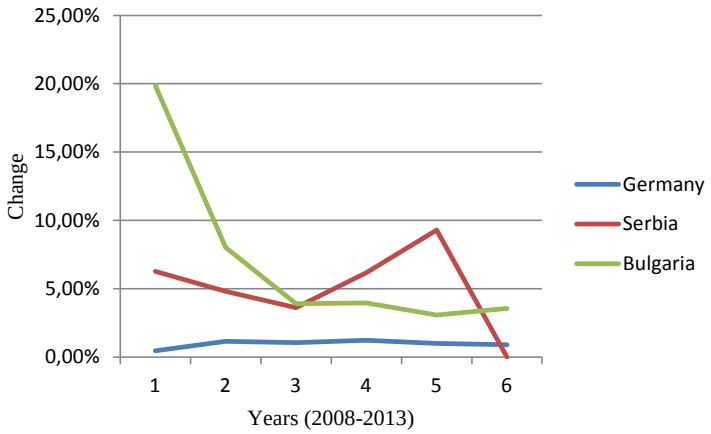
The general economic indicator GDP is analyzed in relative ratio, because of the different caliber of the German economic in comparison to the Bulgarian and the Serbian one. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (World Bank national accounts data), (Figure1). Both three countries undergo a drop in their GDP between 3% - 5%, but Germany realizes positive improvement in 2010 and slight decrease in the following years. Bulgaria follows the German trend line, and Serbia has drops and raisings till 2013, when the GDP reaches 2, 50%. Germany is most successful among them, showing strong leveling positions.

Figure 1. GDP Annual change (%)



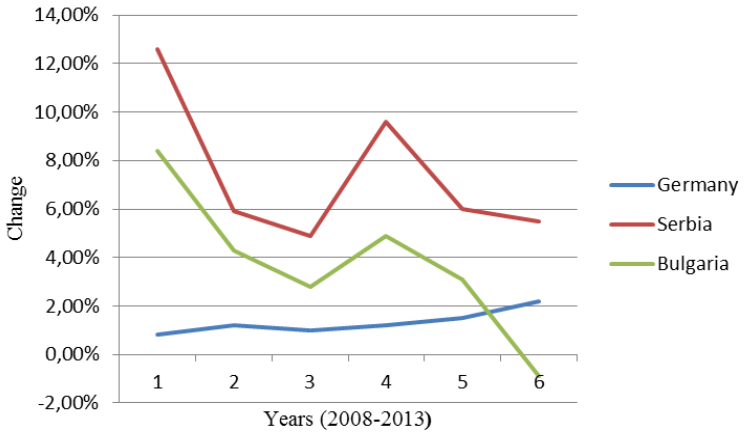
The foreign direct investments in Germany stay unchanged in almost same positions during the Crisis and the Post Crisis. Bulgarian FDI-s suffers a sharp negative decline during the beginning and fall down below 5%. Serbian advantage into the pre-Crisis years goes down and up again, showing the complicated economic situation in south Eastern Europe (Figure 2).

Figure 2. FDI Annual change (%)



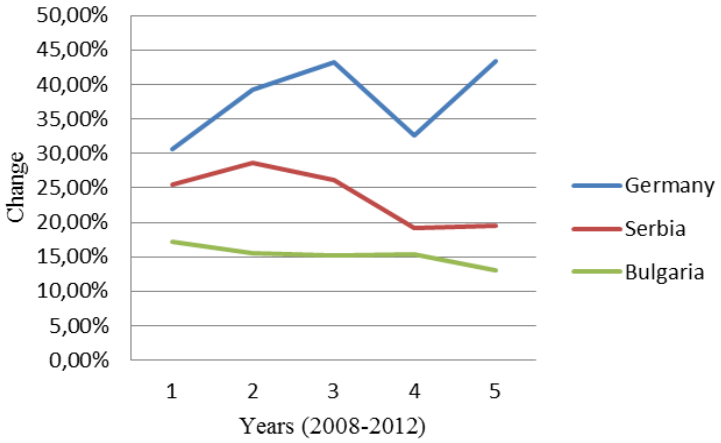
Inflation also is an important indicator. The strong monetary politics of Germany hold its inflation on very low levels. Bulgaria starts the economic crisis circle with non-so high ratio and moving to disinflation due to its partnership with CBA and EU. Serbia in the first crisis year is hit by grand level results in 12.6% and maintains ratio upon 5%. Its economy tries to stay competitive on the global market. (Figure 3)

Figure3.Inflation Rate Annual change(%)



Market capitalization (also known as market value) is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year (World Bank national accounts data). And that raises the market capitalization as an extremely important indicator for the current business climate in all of the three countries (Figure 4). The German supremacy shows that it`s the only one who successfully is dealing with the Crisis and Post Crisis effects and developing a good micro and macro investment setting.

Figure 4. Market Capitalization Annual Change (%)



These indicators are the main signs for the current economic performance and stability of the countries during the long period of stagnation and recession. They reflect on every single company, moreover the big companies in bank, industrial and agricultural states. Some of these companies are listed on the national stock exchanges and form an index. It is the representative of the economic growth. After performing a multiple regression analysis, where the three main indexes are subjected to the influence of four independent factors (table 4), it shows a very high level (more than 95%) of correlation in between the variables.

Table 4. The multiple regression analyzed factors

Stock index(DAX,BELEX,SOFIX)	Dependent Result Variable
GDP Annual Growth %	Independent Result Variable
FDI(% of GDP)	Independent Result Variable
Inflation, GDP deflator (annual %)	Independent Result Variable
Market capitalization of listed companies (% of GDP)	Independent Result Variable

The independent result variables are GDP Annual Growth %, FDI (% of GDP), Inflation, Market capitalization of listed companies (% of GDP) and the dependent variable are the values of the stock indexes. The data, set out in the study, represent six years regression. (Table 5)

The Multiple R coefficient for the three observations is over 95%. Germany shows 97,71% and both of the Balkan countries above 99%. The linear combination of predictors expresses more stable German market than the Serbian one and the Bulgarian one. As to the R Square (the percentage of variance in the dependent variable that can be explained by the predictors), it confirms the levels of significance of the bond between the associated values. Regarding the Standard Error results, we can consider that the model effectively reveals there are no remarkable deviations into the research.

Table 5. Common Regression Statistics

Regression Statistics	DAX	BELEX	SOFIX
Multiple R	97,71%	99,03%	99,73%
R Square	95,47%	98,07%	99,45%
Adjusted R Square	77,36%	90,33%	97,27%
Standard Error	13,07%	10,57%	6,42%
Observations	6	6	6
P - value	0,3143	0,2072	0,1105

The extreme impact of the factors is a recommendation for potential investors to know good the macroeconomic situation in the desire investment segment

Investing process is directly related to the market risk. Using single active VaR and Portfolio VaR for measuring the potential risk loss of the three indexes DAX, BELEX and SOFIX, it outputs general data for assets in amount of 100 000 USD. The level of confidence is 95% (Table 6). As a result the volatility and the individual asset VaR of DAX is with lowest values. BELEX And SOFIX suffer great potential of loss. Comparing the common portfolio VaR and the common amount of the individual asset VaR, it's obvious that the Portfolio VaR has a little bit lower risk levels (Table 6).

Table 6. Indexes Single VaR and Portfolio VaR

	Volatility	Asset Positions(USD)	Individual Asset VaR
DAX 30 Values	27,65%	100 000,00	45476,63
BELEX 15 Values	54,13%	100 000,00	89034,00
SOFIX 30 Values	63,61%	100 000,00	104623,66
Portfolio VaR annual (USD)	235410,21	<	$\sum$ = 239134,28

3. Conclusion

After multi-depth analysis as results may be indicated the strong bond between macroeconomic indicators and the stock exchanges due to two business cycles: The Crisis and The Post-Crisis. Outputting the market risk of wide variety of leading companies through the stock exchange index is a useful general investment instrument. In the future researches more general indicators will be discussed and other National and international stock exchange indexes will be included.

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OPŠTI EKONOMSKI POKAZATELJI I BERZA U VREME SVETSKE FINANSIJSKE KRIZE I POSLE KRIZE

Rezime: Uticaj Svetske finansijske krize (2008-2011.) i post-krize (2012-2013.) na ekonomiju Srbije, Bugarske i Nemačke izazviva promene u nivou njihovog BDP, nivou međunarodnih investicija i na stabilnost berzi. Stope berzanske razmene utiču na privrede ovih zemalja i određuju obim povećanja i smanjenja akcija vodećih kompanija. U radu će se razmatrati ekonomski indikatori Srbije, Bugarske i Nemačke, kao i berzanski indeksi BELEX15, SOFIX, DAX za period krize (2008-2011) i post-krize (2012-2013). Biće izmeren i tržišni rizik i biće prikazani opšti zaključci za upravljanje rizikom.

Ključne reči: Kriza, BDP, berza, tržišni rizik