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THE RECOVERY FACTORS AND THE "GOLD ANCHOR" – SEE AND BSEC COUNTRIES COMPARATIVE ANALYSES AND EVALUATION (2006 – 2015)

The aim of this report is to provide a critical analysis of the economic development trends of ten selected SEE and BSEC countries in terms of identification of key factors supporting GDP growth and post-crisis recovery. The paper is structured in three parts. The first part presents a comparative monitoring analysis of the trends in the import and export flows for the period 2003-2015 in the selected SEE and the BSEC countries. The second part presents GDP growth rate models of the selected SEE and the BSEC countries in terms of the level of openness of their economies and the dynamics of their export and import flows (single and multiple regressions). The final, third part focused on the "gold anchor" as a re-stabilization factor, included in the national reserve assets and its price dynamics on the market of precious metals.

Keywords: SEE countries; BSEC countries, GDP growth, Open economy, Gold

1. Introduction. The authors believes that by studying the development of the Black Sea Economic Cooperation (BSEC) member-states, some of which are geographically located in to South-Eastern Europe (SEE), we can get an accurate and fair estimate of the rate and pitch of their economic development. Of particular interest is the potential for growth based on economic openness factors. The expected effect of the crisis on the volume of their foreign trade generates a reciprocal effect. The effects of the crisis on their foreign trade dynamics and the official reserves management has become a powerful factor for their economic recovery and stability. This is why we are especially interested in the correlation between the GDPs and the growth factors in economies with open foreign trade policies[1].

Therefore, the area of problems of this study is to investigate the effect of the export and import flows on the GDP growth rates as a recovery factors in the selected SEE and BSEC countries. Additional focus is put on the "gold anchor" as a re-stabilization factor, included in the national reserve assets and its price dynamics on the market of precious metals. Thus, the present paper aims *to present an analysis and evaluation of GDP growth trends in selected SEE and BSEC countries in terms of identification and econometric assessment of their economic growth factors and official reserves stabilization role with specific attention on their gold component and the precious metals market trends.*

The paper is organized into three sections. The first section presents data for the export and import trends in 10 BSEC & SEE countries in the period 2006-2015. The second part presents single and multiple regression models of GDP growth for the BSEC countries in terms of their openness and export/import dynamics. The models are based on comparative (benchmark) analyses, index analyses, graphical analyses, trend projections and regression modeling. The final, third part focused on the "gold anchor" as a re-stabilization factor, included in the national reserve assets and its price dynamics on the market of precious metals.

2.1. The degree of openness of the economy – from theory to the empirical evidences

Foreign trade is the basis for the global economy in the 21st century. By studying and measuring it we can turn into an important growth factor for the open economies. Some of the most important indicators for monitoring and measuring the degree of openness of an economy are [Marinov, 2006]:

[1] Note: The participation of authors is as follow: prof. Andrey Zahariev, the abstract, part 1, part 2.1, 2.2, part 3 and the bibliography; Nikolay Kolev – part 2.3.

- exports-to-GDP ratio - the ratio of the total exports to the gross domestic product (GDP) of a country in the same year;
- imports-to-GDP ratio - the ratio of the total imports to the gross domestic product (GDP) of a country in the same year;
- trade-to-GDP ratio - the ratio between the total volume of foreign trade of a country to its GDP in the same year.

The trade-to-GDP ratio is the sum of all exports and imports (i.e. exported and imported goods and services) divided by the gross domestic product of a country, i.e. it is the sum of its exports-to-GDP ratio (the volume of exported goods and services divided by its GDP) and its imports-to-GDP ratio (the volume of imported goods and services divided by its GDP). Tables 1, 2 and 3 below show the values of these three ratios for the selected BSEC & SEE countries.

Table 1. Exports-to-GDP ratios

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006
ALB	24,93%	28,08%	29,59%	29,60%	32,44%	34,01%	33,35%	35,45%	28,11%	27,10%	**30,27%**
ARM	23,36%	19,19%	15,05%	15,47%	20,83%	23,76%	27,57%	28,36%	28,48%	29,73%	**23,18%**
AZE	66,51%	68,13%	65,78%	51,64%	54,30%	56,43%	53,71%	48,72%	43,29%	37,81%	**54,63%**
BGR	47,08%	51,97%	52,30%	42,41%	53,74%	62,31%	63,41%	66,98%	65,11%	66,46%	**57,18%**
GRC	21,17%	22,52%	23,36%	18,98%	22,10%	25,54%	28,68%	30,59%	32,69%	30,11%	**25,57%**
GEO	32,87%	31,21%	28,62%	29,74%	34,95%	36,24%	38,15%	44,69%	42,94%	45,04%	**36,44%**
ROM	32,06%	29,15%	26,93%	27,37%	32,30%	36,85%	37,46%	39,75%	41,22%	41,09%	**34,42%**
MDA	45,26%	47,45%	40,82%	36,87%	39,23%	44,97%	43,48%	43,34%	41,53%	43,43%	**42,64%**
SRB	30,27%	28,36%	29,12%	26,85%	32,93%	33,98%	36,93%	41,20%	43,38%	47,69%	**35,07%**
UKR	46,62%	44,84%	46,92%	46,38%	50,75%	49,82%	47,72%	43,42%	49,15%	52,77%	**47,84%**
Average	**37,01%**	**37,09%**	**35,85%**	**32,53%**	**37,36%**	**40,39%**	**41,05%**	**42,25%**	**41,59%**	**42,13%**	**38,72%**

Source: Own analyses based on data from http://databank.worldbank.org/data/

Table 2. Imports-to-GDP ratios

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006
ALB	48,52%	54,79%	56,44%	53,76%	53,02%	56,75%	51,99%	53,48%	47,02%	44,26%	**52,00%**
ARM	39,25%	39,15%	40,66%	43,00%	45,32%	47,35%	48,40%	48,20%	46,91%	41,26%	**43,95%**
AZE	38,76%	28,51%	23,47%	23,11%	20,68%	24,08%	25,64%	26,87%	26,22%	34,82%	**27,22%**
BGR	64,21%	70,65%	71,97%	50,71%	56,46%	61,36%	66,21%	67,55%	65,98%	65,02%	**64,01%**
GRC	31,68%	35,00%	35,97%	28,76%	30,73%	32,31%	33,13%	33,39%	35,24%	30,29%	**32,65%**
GEO	57,02%	57,95%	58,40%	48,93%	52,76%	54,77%	57,80%	57,64%	60,47%	64,91%	**57,07%**
ROM	43,99%	43,45%	40,19%	33,78%	38,44%	42,41%	42,44%	40,52%	41,53%	41,62%	**40,84%**
MDA	91,90%	97,14%	93,60%	73,49%	78,55%	85,83%	83,94%	80,60%	78,53%	73,73%	**83,73%**
SRB	50,60%	52,66%	54,14%	42,74%	47,92%	49,37%	53,60%	51,91%	54,22%	57,44%	**51,46%**
UKR	49,47%	50,36%	54,91%	48,05%	53,56%	56,43%	56,37%	52,68%	53,24%	54,76%	**52,98%**
Average	**51,54%**	**52,97%**	**52,97%**	**44,63%**	**47,74%**	**51,07%**	**51,95%**	**51,28%**	**50,94%**	**50,81%**	**50,59%**

Source: Own analyses based on data from http://databank.worldbank.org/data/

Three BSEC countries have average Exports-to-GDP ratios of more than 50% - Azerbaijan (57.73%), Bulgaria (52.95%) and Ukraine (51.22%). The lowest average values were reported for Greece (21.83%), Turkey (22.79%) and Armenia (23.00%). The average value of the Exports-to-GDP ratio of all the 12 BSEC countries over the entire period is 35.73%. The highest average values (of over 36%) were reported in 2004, 2005, 2006, 2007, 2010 and 2011. The lowest value was reported at the height of the global financial and economic crisis - 32.24% in 2009, but as soon as the very next year the countries restored their export-to-GDP ratios to their pre-crisis levels of over 36%.

The highest average Imports-to-GDP ratios of over 60% were reported for two of the countries included in the survey – the Republic of Moldova (86.76%) and Bulgaria (66.28%). The lowest average values were reported for the Russian Federation (21.87%), Turkey (26.97%) and Greece (33.87%). The average value of the Imports-to-GDP ratio of all the 12

BSEC countries over the entire period is 47.33%. At the height of the crisis in 2009, the average Imports-to-GDP ratio reached its historic lows for the period of 42.22% while the highest average value reported in the pre-crisis 2008 was 49.71%. The highest average values (over 49%) for the 12 surveyed countries were reported in 2004, 2007 and 2008.

Table 3. Trade-to-GDP ratios

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006
ALB	73,46%	82,87%	86,03%	83,36%	85,46%	90,76%	85,34%	88,93%	75,13%	71,37%	**82,27%**
ARM	62,61%	58,34%	55,70%	58,48%	66,15%	71,11%	75,97%	76,56%	75,38%	71,00%	**67,13%**
AZE	105,27 %	96,64%	89,24%	74,74%	74,99%	80,51%	79,35%	75,59%	69,51%	72,64%	**81,85%**
BGR	111,29 %	122,61%	124,27%	93,12%	110,20%	123,67%	129,62%	134,53%	131,09%	131,48%	**121,19%**
GRC	52,85%	57,52%	59,33%	47,74%	52,83%	57,84%	61,82%	63,98%	67,93%	60,40%	**58,23%**
GEO	89,88%	89,16%	87,02%	78,67%	87,72%	91,02%	95,95%	102,33%	103,41%	109,95%	**93,51%**
ROM	76,05%	72,59%	67,12%	61,15%	70,74%	79,26%	79,90%	80,27%	82,75%	82,71%	**75,26%**
MDA	137,15 %	144,59%	134,42%	110,36%	117,77%	130,80%	127,42%	123,94%	120,06%	117,16%	**126,37%**
SRB	80,87%	81,03%	83,26%	69,59%	80,85%	83,35%	90,52%	93,11%	97,60%	105,13%	**86,53%**
UKR	96,10%	95,21%	101,83%	94,42%	104,31%	106,24%	104,09%	96,10%	102,40%	107,53%	**100,82%**
Average	**88,55%**	**90,06%**	**88,82%**	**77,17%**	**85,10%**	**91,46%**	**93,00%**	**93,53%**	**92,53%**	**92,94%**	**89,32%**

Source: Own analyses based on data from http://databank.worldbank.org/data/

Three countries reported average Trade-to-GDP ratio of more than 100% during the period - Moldova, Bulgaria and Ukraine. The lowest average ratios for the same period were reported for Greece (58.23%), Armenia (67.13%) and Romania (75.26%). The average ratio for all the 10 countries is 89.32%. The 10 selected SEE&BSEC countries reported highest values in the year 2013, 2012, 2015 and 2014 (over 92.5%) and lowest values at the height of the global financial and economic crisis - 77.17% in the year 2009.

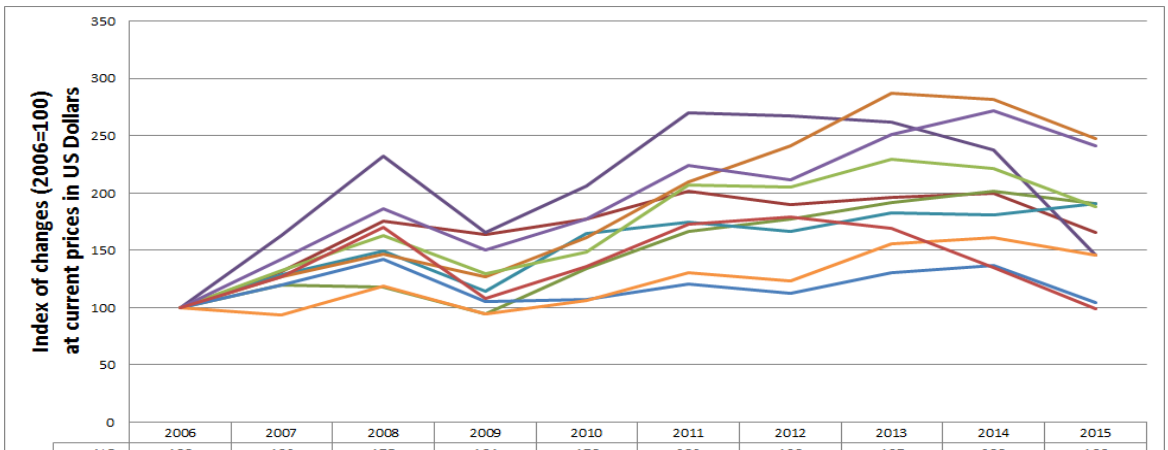
The trend analysis (Figure 1) of the volumes of export of the surveyed countries (with a year 2006 index = 100) shows that Romania ranked top with an average export growth of 12 per year from 2006 year with cumulative growth of 242%. The country with the poorest performance is Greece with an average export growth of only 1.02% compared to its 2006 volume.

The trend analysis (Figure 2) of the volumes of import of the surveyed countries (with a 2006 index = 100) shows that Azerbaijan did best with an average annual import growth of 11.25% compared to its 2006 volume. The worst-performing country here again is Greece with an average annual negative growth of minus 1.56% compared to its 2006 volume. The main conclusion from the analyzed data is in 2009 all ten countries are reporting the worst data related with their degree of openness. Otherwise, after 2011 there is significant trend of growth in both, export and import leading to a recovery in GDP growth rate.

2.2. The GDP growth and the openness of the economy

The next part of the study aimed to measure the effect of these countries' economic openness on their GDP growth. For this purpose we constructed single and multiple regression models with output indicators for correlation, determination and statistical significance of the models and their parameters. Table 4 below shows the results from the regression analyses of the annual data for the GDP, export, import and foreign trade in the period 2006-2015 for all 10 countries from the sample.

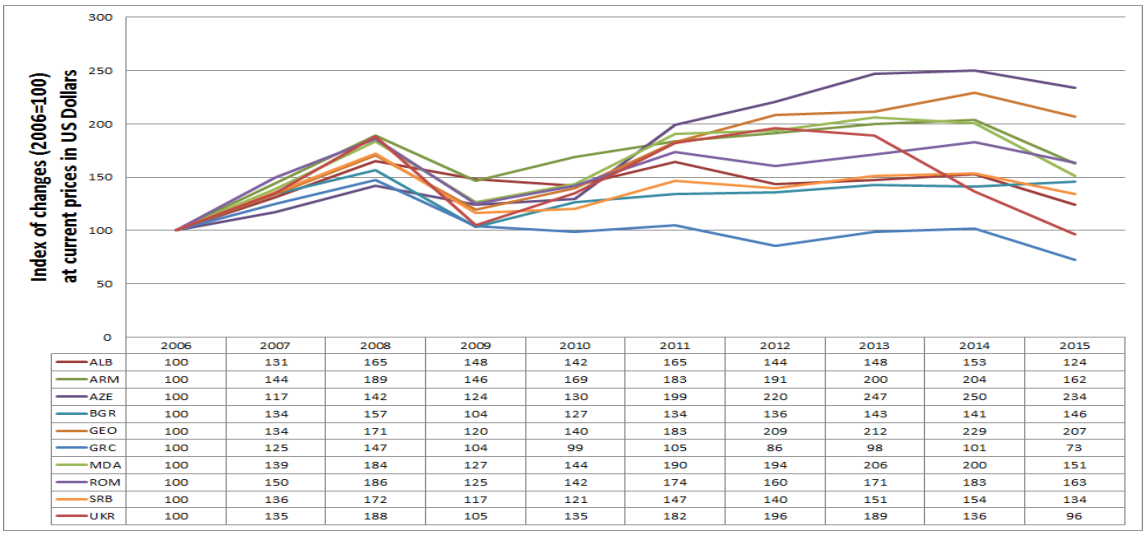
With a positive correlation (R) of 0.9705 between its exports and GDP, Moldova ranks at the top, followed by Ukraine and Albania. The country with the lowest single regression model correlation of only 0.1758 between its exports and GDP was Greece. Similar are the results for the coefficient of determination (R^2), where the export of Moldova explains and may be considered the cause for its GDP growth variance of 94.19%, while the export of Greece is the factor for its GDP growth variance of only 3.09%.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
ALB	100	132	175	164	178	202	190	197	200	166
ARM	100	120	118	95	134	167	177	192	202	191
AZE	100	163	233	166	206	270	267	262	237	146
BGR	100	129	149	114	165	175	167	183	181	191
GRC	100	127	146	127	161	210	241	287	282	248
GEO	100	120	142	105	107	121	113	130	137	104
ROM	100	132	163	130	148	207	205	230	222	188
MDA	100	143	186	150	177	224	211	252	271	242
SRB	100	94	119	94	106	130	124	156	161	146
UKR	100	127	171	108	136	173	179	169	135	99

Figure 1. Exports of goods and services trends of selected BSEC & SEE countries

Source: Own analyses based on data from http://unstats.un.org/unsd/snaama/dnllist.asp



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
ALB	100	131	165	148	142	165	144	148	153	124
ARM	100	144	189	146	169	183	191	200	204	162
AZE	100	117	142	124	130	199	220	247	250	234
BGR	100	134	157	104	127	134	136	143	141	146
GEO	100	134	171	120	140	183	209	212	229	207
GRC	100	125	147	104	99	105	86	98	101	73
MDA	100	139	184	127	144	190	194	206	200	151
ROM	100	150	186	125	142	174	160	171	183	163
SRB	100	136	172	117	121	147	140	151	154	134
UKR	100	135	188	105	135	182	196	189	136	96

Figure 2. Imports of goods and services trends of selected BSEC&SEE countries

Source: Own analyses based on data from http://unstats.un.org/unsd/snaama/dnllist.asp

With positive correlation (R) of 0.9754 between its imports and GDP, Ukraine ranks at the top, followed by Georgia and Armenia. The country with the lowest single regression model correlation of only 0.6198 between its imports and GDP was Bulgaria. Similar are the results for the coefficient of determination (R^2), where the import of Ukraine and may be considered the cause for its GDP growth variance of 95.15%, while Bulgarian import is the reason for its GDP growth variance of only 38.41%.

The foreign trade as a third factor gives leading position with positive correlation (R) of 0.9754 between its imports and GDP, for Albania, followed by Ukraine and Georgia. The country with the lowest single regression model correlation of only 0.6198 between its foreign trade and GDP was Greece. Similar are the results for the coefficient of determination (R^2), where the trade of Albania and may be considered the cause for its GDP growth variance of 96.43%, while Greek import is the reason for its GDP growth variance of only 46.60%.

Table 4. Regression statistics and variance analysis for single and multiple regression models of Y=GDP, X1=Exp, X2=Imp and X3= Trade for the period 2006-2015 in $ mlrd.

Albania	**X1**	**X2**	**X3**	**X1&X2**
R	0.955815	0.927797	0.981967	0.985915
R^2	0.913583	0.860807	0.964260	0.972028
Significance F	0.000016	0.000109	0.000000	0.000004
P-value Alfa	0.000057	0.030667	0.000310	0.000379
P-value Beta1				0.001153
P-value Beta2				0.006505
Armenia	**X1**	**X2**	**X3**	**X1&X2**
R	0.697682	0.940657	0.897036	0.940912
R^2	0.486760	0.884836	0.804673	0.885316
Significance F	0.005926	0.105624	0.058959	0.000511
P-value Alfa	0.024885	0.000050	0.000434	0.130013
P-value Beta1				0.868930
P-value Beta2				0.001690
Azerbaijan	**X1**	**X2**	**X3**	**X1&X2**
R	0.867201	0.876361	0.964438	0.974256
R^2	0.752038	0.768009	0.930140	0.949175
Significance F	0.001156	0.000878	0.000007	0.000030
P-value Alfa	0.985775	0.464848	0.185185	0.165769
P-value Beta1				0.001574
P-value Beta2				0.001238
Bulgaria	**X1**	**X2**	**X3**	**X1&X2**
R	0.721458	0.619753	0.721963	0.730083
R^2	0.520502	0.384094	0.521230	0.533021
Significance F	0.018514	0.055981	0.018392	0.069589
P-value Alfa	0.019730	0.221684	0.134822	0.158419
P-value Beta1				0.178787
P-value Beta2				0.677907
Georgia	**X1**	**X2**	**X3**	**X1&X2**
R	0.941128	0.966592	0.966115	0.968912
R^2	0.885722	0.934300	0.933378	0.938791
Significance F	0.000049	0.000005	0.000006	0.000057
P-value Alfa	0.000781	0.060968	0.005412	0.069968
P-value Beta1				0.496787
P-value Beta2				0.043239
Greece	**X1**	**X2**	**X3**	**X1&X2**
R	0.175752	0.840718	0.682618	0.937714
R^2	0.030889	0.706807	0.465968	0.879308
Significance F	0.627200	0.002313	0.029619	0.000611
P-value Alfa	0.175038	0.219381	0.568970	0.007922
P-value Beta1				0.015861
P-value Beta2				0.000209
Moldova	**X1**	**X2**	**X3**	**X1&X2**
R	0.970493	0.918594	0.951459	0.971040
R^2	0.941857	0.843814	0.905274	0.942919

Significance F	0.000003	0.000174	0.000023	0.000044
P-value Alfa	0.323134	0.985311	0.981306	0.532500
P-value Beta1				0.010181
P-value Beta2				0.728837
Romania	**X1**	**X2**	**X3**	**X1&X2**
R	0.742275	0.947930	0.868885	0.950032
R^2	0.550972	0.898571	0.754961	0.902561
Significance F	0.013950	0.000030	0.003323	0.000289
P-value Alfa	0.000520	0.011675	0.001100	0.027807
P-value Beta1				0.608964
P-value Beta2				0.001521
Serbia	**X1**	**X2**	**X3**	**X1&X2**
R	0.341926	0.849157	0.682941	0.868116
R^2	0.116913	0.721068	0.466408	0.753625
Significance F	0.006616	0.127569	0.029512	0.007423
P-value Alfa	0.333520	0.001880	0.091174	0.106855
P-value Beta1				0.368201
P-value Beta2				0.003778
Ukraine	**X1**	**X2**	**X3**	**X1&X2**
R	0.959562	0.975442	0.970141	0.979313
R^2	0.920760	0.951487	0.941174	0.959053
Significance F	0.000011	0.000002	0.000003	0.000014
P-value Alfa	0.633788	0.019261	0.141493	0.043895
P-value Beta1				0.292828
P-value Beta2				0.037630

Source: Own analyses based on data from http://databank.worldbank.org/data/

The analysis of the results of the two-factor multiple regression model shows that in terms of correlation coefficients Albania holds the leading position with a positive correlation of 98.59% between its GDP to the dynamics of its export and import. It is followed by Ukraine (97.93%) and Moldova with 97.10% positive correlation. Of all 10 selected BSEC and SEE countries Bulgaria has the lowest correlation coefficient of 73.01%. The analysis of the multiple regression model of the coefficients of determination are similar – Albania ranks top and its 97,2% variance of GDP growth dynamics can be explained by the variation in the dynamics of its export and import factors, while Bulgaria (which, according to Table 2, ranks second in terms of its openness to foreign trade with an average Trade-to-GDP ratio of 121.19%) has a value of only 53.30%.

The statistical significance (F) at 95% confidence interval shows that:

- Regarding the **export** factor – the single regression models are statistically significant for all countries except Greece;
- Regarding the **import** factor – the single regression models are statistically significant for all countries except Armenia, Bulgaria and Serbia;
- Regarding the **trade** factor – the single regression models are statistically significant for all countries except Armenia;
- Regarding the combined effect of the **export** and **import** factors – the multiple regression models are statistically significant for all countries except Bulgaria.

In the particular case of Bulgaria in terms of statistical significance of the parameters alpha and beta, the analysis of the single and multiple regression models yielded the following results:

- The single regression model of the import factor has statistically insignificant alpha and beta.

- The single regression model of the export factor has statistically significant alpha and beta.
- The single regression model of the trade factor has statistically insignificant alpha and statistically significant beta.
- The multiple regression model of both factors (export and import) has statistically insignificant alpha, beta1 and beta2.

Therefore, for a country like Bulgaria, the export is more import compared to the combination of the trade flows from its imports and exports, because this export has a substantial and statistically significant impact on its GDP growth.

2.3. Global market trend of precious metals as an investment alternative and the official reserves stability component

The following part focus attention on all three major representatives of the group of precious metals: gold, silver and platinum. The market behavior proved negative correlation against rest of the investment alternatives with the maximum effect for the period of and after the global financial crises (2008 – 2009) when the market price of gold reaches the highest ever level of 1889,70 $/oz (22.08.2011). For the selected countries from the SEE and BSEC region the gold is a significant part of the official reserves of the central bank authorities (Table 5).

Table 5

Official reserves and gold holdings of SEE and BSEC countris – the reflection of gold price dinamics for the period 2011 - 2016

BSEC and SEE countries	Gold holding as official reserves at VIII'2011 in tones	Gold as % of reserves	Total reserves'2011	Value of gold reserves at market prices - IX'2011
Albania	1,600	2,80%	$2 471 402 947,64	$96 385 360,00
Armenia	0,000	0,00%	$1 932 472 153,72	$0,00
Azerbaijan	0,000	0,00%	$10 273 926 427,18	$0,00
Bulgaria	39,900	11,70%	$17 215 734 344,32	$2 403 609 915,00
Georgia	0,000	0,00%	$2 818 191 708,52	$0,00
Greece	111,500	80,20%	$6 743 420 207,16	$6 716 854 775,00
Republic of Moldova	0,000	0,00%	$1 756 772 262,72	$0,00
Romania	103,700	10,40%	$48 044 370 163,93	$6 246 976 145,00
Serbia	13,700	4,60%	$15 583 042 926,97	$825 299 645,00
Ukraine	27,800	3,80%	$31 788 750 955,43	$1 674 695 630,00
	Gold holdings as official reserves IX'16 in tones	Gold as % of reserves	Total reserves'2015	Value of gold reserves at market prices - IX'2016
Albania	1,600	2,20%	$3 138 517 907,70	$68 334 400,00
Armenia	0,000	0,00%	$1 775 293 492,56	$0,00
Azerbaijan	30,200	16,00%	$7 319 394 023,49	$1 289 811 800,00
Bulgaria	40,300	6,70%	$22 153 050 115,73	$1 721 172 700,00
Georgia	0,000	0,00%	$2 520 721 245,19	$0,00
Greece	112,700	65,40%	$6 027 606 492,33	$4 813 304 300,00
Republic of Moldova	0,000	0,00%	$1 965 325 537,19	$0,00
Romania	103,700	9,70%	$38 700 983 235,88	$4 428 923 300,00
Serbia	18,500	7,50%	$11 344 953 312,65	$790 116 500,00
Ukraine	25,190	7,30%	$13 300 880 761,44	$1 075 839 710,00
Note. The calculations are with market prices at 02.09.2011 - $60240850/t and at 09.09.2016 of $42709000/t				

Source: Source: Own analyses based on data from IMF and World Gold Council

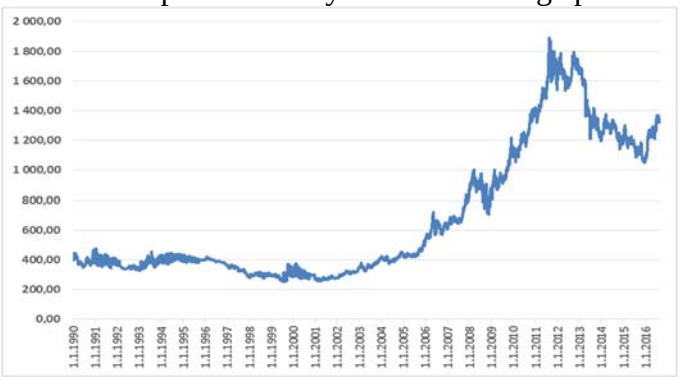
The special case is with Bulgaria where the Currency board relies on the “gold anchor” and component of the official reserves as a major factor for macro financial stability

[Radkov and Zahariev (2015; 2016); Kostov (2016); Patev (2015); Prodanov and Pavlov (2016); Brussarsky, Zahariev and Manliev (2015); Zahariev and others (2015)].

Therefor the current study continues with the long term analyses of the investment characteristics of the precious metals with the leading role of gold:

First. Gold investment analyses – the gold, as an investment, is mainly used as a reserve asset, in which to invest in times of turbulence on the equity markets. It is mainly traded on the commodity exchanges in New York (COMEX), Tokyo (TOCOM) and Shanghai (SHFE). Therefore, we can have three different quotations of gold.

The exchange code of gold on the COMEX is (^GC), for the period from 1990 to now the highest price being USD 1889.7, and the lowest - USD 253.2. This makes a range of USD 1636.5 for a period of 16 years. The average price for the period is USD 676.4.



In terms of return, the average annual return of gold is above 6% at standard deviation 3.3%, which means that the coefficient of variation is 0.58, characterizing it as a rather stable asset. The long line of positive returns definitely makes this asset one of the most demanded.

On the TOCOM gold reaches EUR 61.3 per gram, at the average of EUR 20.63. The annual standard deviation on this exchange is much lower compared to the one on the American exchange: it is 2.1%, at an average annual return of 6.65%. This gives a coefficient of variation of 0.33 on daily basis. What is interesting here is that, in fact, gold has better investment performance on the Japanese commodity exchange compared to the American exchange.

On the Shanghai futures exchange, the average annual return of gold (^ VP) is the highest 7.2% at a standard deviation of 2.3%, this gives a Sharpe ratio of 3.2, again proving that gold is a good investment alternative.

Of the three internationally known quotations of gold, the highest is the quotation on the Shanghai exchange, but we may note that the investment characteristics (risk-return) on all three exchanges characterize gold as a very good equity market investment alternative.

Second. Investment analyses of the silver market trends – as an investment asset, silver is a reserve asset that can be invested in to hedge investment risk, store value and wealth or allocate and diversify the investment portfolio. The main quotations, which it also has on the world stock exchanges, are Silver COMEX with exchange code **^SI**, Silver CBOT with exchange code **^SI2** and Silver TOCOM with exchange code **^JSY**, quoted on the New York, Chicago and Tokyo stock exchanges respectively. The trade in Silver COMEX and Silver CBOT is in USD per troy ounce (Troy oz.), while the trade in Silver TOCOM is in Japanese yen per gram. The trade in Silver CBOT started on 06.10.2004., while in Silver TOCOM – on 06.01.1992.

For the period from 01.01.1990 to 26.08.2016, the trade in the three quotations can be presented as follows:

- The value of Silver COMEX as of the beginning of the examined period (01.01.1990) is 5.21 USD/Troy oz., reaching 18.65 USD/Troy oz. at the end of the period (26.08.2016), at minimum value of 3.51 USD/Troy oz. on 22.02.1991 and the maximum value of 48.60 USD/Troy oz. on 29.04.2011;
- The value of Silver CBOT as of the beginning of trading (06.10.2004) is 7.25 USD/Troy oz., reaching 18.65 USD/Troy oz. at the end of the period (26.08.2016), at minimum value of 6.45 USD/Troy oz. on 07.01.2005 and maximum value of 48.57 USD/Troy oz.on 29.04.2011;

- The value of Silver TOCOM at the beginning of trading (06.01.1992) is 0.13 JPY/gr., reaching 0.59 JPY/gr. at the end of the period (26.08.2016), at minimum value 0.11 JPY/gr. on 23.02.1993 and maximum value of 1.58 JPY/gr. on 25.04.2011.

For the period 01.01.1990 to 26.08.2016 the three quotations give the following return:

- Silver COMEX gives 4.90% annual average daily return for the period at CAGR of 0.0017%;
- Silver CBOT gives 8.27% % annual average daily return for the period at CAGR of 0.0065%;
- Silver TOCOM gives 6.45% annual average daily return for the period at CAGR of 0.0066%.

The risk, measured using the standard deviation of the return of the three quotations for the period is:

- Silver COMEX gives annual daily standard deviation of 29.94%;
- Silver CBOT gives annual daily standard deviation of 36.22%;
- Silver TOCOM gives annual daily standard deviation of 30.36%.

The quotations for the period may be presented by the return-risk ratio (Sharpe ratio and coefficient of variation) where the same have the following values:

- Return-risk ratio Silver COMEX of 0.16 and a coefficient of variation of 6.11;
- Return-risk ratio Silver CBOT of 0.23 and a coefficient of variation of 4.38;
- Return-risk ratio Silver TOCOM of 0.21 and a coefficient of variation of 4.71.

Third. Investment analyses of the platinum market trends. Platinum is one of the less demanded precious metals. As a precious metal, it should also have the characteristic features of a reserve asset – low volatility, negative correlation with the main investment instruments, etc. Unlike gold and silver platinum is mainly traded on the New York commodity exchange COMEX, its exchange code being ^PL. The lowest value is 331.5 USD/ Troy oz, and the highest 2276.1 USD/ Troy oz, respectively.

Unlike silver and gold, the value of platinum was seriously affected by the global financial and economic crisis of 2008, but in recent years it managed to recover much of its lost value. This seemingly high correlation with the equity market means that platinum could hardly act as a reserve asset in the investment strategy. The annual average weekly return on investment in the metal is 5.5% at the standard deviation of 2.8%. Thus, the coefficient of determination CV is 0.50, which is significantly higher compared to the other metals. The different return on platinum is largely explained by the fact that unlike gold and silver,

platinum is used as input in some industries, which respectively affects its trading on the exchange.

		Average	Count	(1+Ave)^261		CAGR	Var	Annualized SD = sqrt[(1+Var)^261]	Sharpe	Coef.Var.
Gold Comex	^GC	0.02%	6954	4.31%	0.05	-0.0423%	0.00116	59.45%	0.07	13.78
GOLD TOCOM	^JAU	0.02%	6429	5.47%	2.44	0.0139%	0.00013	18.58%	0.29	3.40
GOLD SHFE	^VP	0.02%	1994	5.86%	1.39	0.0165%	0.00011	16.79%	0.35	2.87
Silver Comex	^SI	0.02%	6954	4.90%	1.13	0.0017%	0.00033	29.94%	0.16	6.11
Silver CBOT	^SI2	0.03%	3102	8.27%	1.22	0.0065%	0.00047	36.22%	0.23	4.38
Silver TOCOM	^JSY	0.02%	6429	6.45%	1.53	0.0066%	0.00034	30.36%	0.21	4.71
Platinum NYMEX	^PL	0.01%	6954	3.02%	0.84	-0.0026%	0.00025	25.94%	0.12	8.58
Palladium NYMEX	^PA	0.02%	6954	6.31%	1.32	0.0040%	0.00039	32.65%	0.19	5.17
Palladium TOCOM	^JPA	0.03%	6279	8.86%	2.14	0.0121%	0.00041	33.58%	0.26	3.79

In summary all investment instruments from the group of precious metals are proving stable trends of adding value and continuing role of factor of stability for global monetary system and national reserves.

Conclusion. Global economic crises pose increasing greater challenges for all major "players" on the global trade in goods and services. At the same time, the BSEC & SEE countries are examples of partner solutions in an environment of international competition and in a period of post-crisis recovery. The GDP growth recovery needs positive factors only under the conditions of macroeconomic stability where the role of the official reserves, including gold still remains significant.

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