

## Romanian government bond market

**Cornelia POP**

Babes-Bolyai University, Cluj-Napoca  
cornelia.pop@tbs.ubbcluj.ro

**Maria-Andrada GEORGESCU**

National University of Political Studies and Public Administration, Bucharest  
andradageor@yahoo.com

**Iustin Atanasiu POP**

Babes-Bolyai University, Cluj-Napoca  
iustin.pop@tbs.ubbcluj.ro

**Abstract.** *The present paper aims to present the level of development reached by Romanian government bond market segment, as part of the country financial market. The analysis will be descriptive (the data series available for Romania are short), based on the secondary data offered by the official bodies involved in the process of issuing and trading the Romanian government bonds (Romanian Ministry of Public Finance, Romanian National Bank and Bucharest Stock Exchange), and also on secondary data provided by the Federation of European Stock Exchanges.*

*To enhance the market credibility as a benchmark, a various combination of measures is necessary; among these measures are mentioned: the extension of the yield curve; the issuance calendars in order to improve transparency; increasing the disclosure of information on public debt issuance and statistics; holding regular meetings with dealers, institutional investors and rating agencies; introducing a system of primary dealers; establishing a repurchase (repo) market in the government bond market. These measures will be discussed based on the evolution presented inside the paper.*

*The paper conclude with the fact that, until now, the Romanian government bond market did not provide a benchmark for the domestic financial market and that further efforts are needed in order to increase the government bond market transparency and liquidity.*

**Keywords:** government bond; primary market; secondary market; Romania.

**JEL Codes:** H74, G18, G12, G10.

**REL Code:** 11B.

## 1. Introduction and a brief review of literature

Blanco (2001) highlight in his paper the importance of government bond markets for central banks and private agents. He also shows that the minimal credit risk, high market liquidity, and a wide range of maturities are the characteristics that distinguish government securities from other securities. Mohanty (2002) shows the benefits of a liquid government bond market within emerging economies and the fact that those benefits go beyond financing government deficits at lower costs. The author also discusses what governments can do to promote liquidity in government bond markets. Luengnaruemitchai and Ong (2005) also highlight the critical role the benchmarks provided by government debt securities in the development of any domestic bond market.

In September 2002, in its Global Financial Stability Reports, the International Monetary Fund (IMF) mentioned the growth of emerging local bond markets starting with 1997. Focusing on Central and Eastern Europe, only the developments of the government bond markets in Czech Republic, Hungary and Poland (called also CEE-3) were mentioned. Those developments were supported, in IMF view, by strong institutional development, in particular by the early establishment of public debt management agencies (IMF, 2002). The same idea is highlighted by Iorgova and Ong (2008) when they comment that government bond markets in CEE-3 countries are among the most developed in the region. These three countries have established comprehensive and relative liquid government bond market segments through a gradual increase of long term issuances (Szilagy et al., 2004). Iorgova and Ong (2008) comment further that the government issuances have been limited in Romania, Russia and Ukraine constraining growth and liquidity in respective markets.

Taking into consideration the importance a domestic government market has, the further development of debt market in Central and Eastern European Union countries should have as main objective to encourage their respective central, regional and local governments to consider bond finance as an important way for regional and local project investments. Also, a closer relationship between the local/regional/central authorities and the capital markets could enhance the quality and the efficiency of financed projects and encourage long term financial planning. Romania, as part of this group of countries, should follow this trend in order to provide to domestic and international investors alike an improved financial market environment.

The academic literature regarding debt markets is vast. An important share of this literature is dedicated to the European sovereign debt markets. Among the recent studies we mention Blanco (2001) and Pagano and Von

Thadden (2008) which discuss the European debt markets under EMU. Dunne et al. (2006) and Paesani and Piga (2007) discuss the transparency and liquidity of European bond markets. Dunne et al. (2008) discuss the microstructure of European sovereign bond markets. More in tune with the current study would have been dedicated regional studies on Central and Eastern European countries debt markets; here the literature is scarce; we were able to find only the study of Roldos (2004). Also of interest would have been dedicated country studies on neighboring debt markets; we were able to find only the study of Gyorgy (2002) on Hungarian debt market.

The literature regarding Romanian bond market, in general, is relatively scarce and appeared only starting with 2004. One of the first studies presenting the details of Romanian municipal bond market was that of Pop and Dumbrava (2004). The study of Skully and Brown (2006) had a special section dedicated to Romanian bond market and a subsection for the municipal bonds. Corduneanu and Milos (2008), Grecu (2008), Mosteanu and Lacatus (2008), Matei et al. (2009) are Romanian academic studies dealing with some aspects of Romanian bond market. Only one study (Bunescu, 2009) deals with a specific municipal bond issue in its trial for a detailed analysis. An in-depth analysis of Romanian municipal bond market was made by Pop and Georgescu (2011). Pop and Georgescu (2012) also provided a study with a section dedicated to Treasury bond market segment at Bucharest Stock Exchange.

The current paper will add to the existing literature an extensive study on Romanian government security market. The paper is structured as follow: in section two presents a brief overview on Romania's position among neighboring countries when domestic bond market is taken into consideration; section three presents the development of Romanian government security market during the 1990s until present days. Section four is dedicated to discussions and conclusions. The paper conclude with the fact that, until now, the Romanian government bond market did not provide a benchmark for the domestic financial market and that further efforts are needed in order to increase the government bond market transparency and liquidity.

## **2. Government securities within European selected new accession countries' level: a brief overview**

One of the most followed ratios at European level, as one of the Maastricht criteria, is the general government debt as percentage of GDP. The average figures for the period between 1999 and 2011 are presented in Table 1, below, while details can be found in Annex 1.

Table 1

**General government gross debt as % of GDP (selected countries)**

	EU-27	EU-12	Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovakia	Slovenia
Average for 1999 to 2011	65.8	38.6	36.7	29.3	65.0	46.0	21.3	39.7	29.8

**Source:** based on data provided by EUROSTAT.

[http://epp.eurostat.ec.europa.eu/portal/page/portal/government\\_finance\\_statistics/data/main\\_tables;code=teina225](http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data/main_tables;code=teina225)

At EU-27 level, the general government gross debt as percentage of GDP average was 65.2%, with an important increase in 2009, 2010, and 2011, under the influence of global financial crisis. The same figure for the new EU-12 (accession countries of 2004 and 2007) was lower, reaching in average 38.6%, and following the same trend of increasing level for 2009, 2010, and 2011. Romania is the only country which for the reported period had an average around 21% (the lowest from the set of selected countries). Taking this ratio into consideration, Romanian government securities should be attractive, since the country is supposedly preserved its capacity to pay the assumed debt obligations. Thus, as the paragraphs below will show, Romania domestic government security market seems was not able to capitalize on this advantage.

As Annex 3 shows, when the domestic public bond sector at Bucharest Stock Exchange is compared with the similar sectors developed within the exchanges in the neighboring countries, it can be seen that the Romanian stock exchange bond market segment has an important gap in what the trading volume is concerned and it is well behind the turnover registered by exchanges like Bratislava and Prague.

The relative modest profile of the domestic public bond sector at Bucharest Stock Exchange can be explained by the late introduction of the Treasury bonds (seven years after the bond sector was launched). Lacking the benchmark the Treasury bonds could have offered, it was only natural for investors to avoid the bond sector.

### 3. Romanian domestic government securities market

#### 3.1. Government security issuance

The first issues of Romanian government securities could be traced back to March 1994, based on the data provided by Romanian National Bank (RNB) in its annual and monthly reports.

As it can be seen from Table 2, Romanian Ministry of Public Finance (MoPF) gave preference to short term securities and issued mainly Treasury bills with discount and Treasury certificate denominated in Romanian lei. The

issuance of Treasury certificates was discontinued in 2001 and during the past 11 years only Treasury bills were issued; this shows that Romanian government tries to be in concordance with practices all over the developed and emerging economies, when the short-term issues are concerned.

The issuance of Treasury notes and bonds started only in 1999; as Table 2 shows, the value of medium and long term security issues was almost all the time under the value of short-term security issues, with the only exceptions of years 2005 and 2012. During 2006, due to the good economic conditions and an increased in central budget revenues, Romanian Government did not issue any security denominated in Romanian lei. A reason that might also have an influence on the lack of government domestic securities issuance was the fact that, starting with July 1<sup>st</sup> 2005, the national currency denomination took place; 10,000 old Romanian lei were replaced by 1 new Romanian leu (RON). During 2006, the old lei were gradually replaced by new lei. Another reason might be the fact that 2006 was the year that preceded the Romania's accession to European Union (EU) and the Romanian MoPF tried to harmonize its issuance and reporting practice with those required at EU level.

Table 2

**Romanian government security new and re-new issues, denominated in the national currency (RON) – as reported by Romanian National Bank (RNB)**

Year	Short term				Medium and long term			
	Treasury bills (discount)		Treasury certificates		Treasury notes and bonds (fix interest rate)		Treasury notes and bonds with flexible/variable interest rate	
	Nominal value (mil. RON)	Yield* (%)	Nominal value (mil. RON)	Coupon yield* (%)	Nominal value (mil. RON)	Coupon yield* (%)	Nominal value (mil. RON)	Coupon yield* (%)
1994	90.8	n/a	-	-	-	-	-	-
1995	699.9	n/a	-	-	-	-	-	-
1996	183.2	53.8	629.5	52.9	-	-	-	-
1997	462.9	55.7	2,507.7	103.0	-	-	-	-
1998	2,711.0	53.2	1,436.3	83.1	-	-	-	-
1999	5,749.8	75.8	1,339.6	81.1	1,349.4	63.7	-	-
2000	7,062.2	52.3	1,711.8	48.5	434.0	49.6	-	-
2001	7,404.1	42.2	3.8	37.0	73.5	42.0	-	-
2002	5,408.8	27.2	-	-	549.0	22.3	-	-
2003	4,062.9	16.2	-	-	967.6	14.2	51.9	5.0
2004	5,329.0	17.9	-	-	340.4	12.8	74.4	4.8
2005	150.7	6.4	-	-	2,804.8	7.5	10.0	2.0
2006	-	-	-	-	-	-	-	-
2007	5,194.0	6.9	-	-	4,323.4	7.0	-	-
2008	8,868.3	11.3	-	-	3,592.6	10.5	-	-
2009	56,259.2	10.9	-	-	8,466.8	10.9	-	-
2010	33,565.7	7.0	-	-	7,514.6	7.2	-	-
2011	38,324.2	6.7	-	-	13,096.5	7.3	-	-
2012 (June)	17,009.8	5.4	-	-	18,964.4	6.2	-	-

\*annual average

Source: RNB data (monthly bulletins).

For the domestic market, the Romanian MoPF also issued securities denominated in USD, DEM, and EUR. The issuance of USD denominated Treasury bonds started in 1998. Since 2006 no USD denominated issues were offered on the domestic market. Starting with 2006, EUR became the main currency against which Romanian leu exchange rate is reported due to the approaching expected accession to EU. From Table 3a it can be seen that the issues of Treasury bonds denominated in EUR for the domestic market started only in 2009 and for two years, there was a balance between the short term and long term issued securities.

Table 3

**Domestic government securities new and re-new issues  
denominated in USD, DEM and EUR – as reported by RNB**

Year	Denominated in USD				Denominated in DEM			
	Treasury certificates		Treasury notes and bonds		Treasury certificates		Treasury notes and bonds	
	Nominal value (mil. USD)	Interest rate* (%)	Nominal value (mil. USD)	Interest rate* (%)	Nominal value (mil. DEM)	Interest rate* (%)	Nominal value (mil. DEM)	Interest rate* (%)
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-
1998	-	-	352.90	7.75	-	-	-	-
1999	-	-	600.39	6.86	-	-	-	-
2000	-	-	76.43	5.58	-	-	21.4	5.90
2001	-	-	332.98	5.18	-	-	-	-
2002	305.88	5.00	16.37	5.00	-	-	-	-
2003	-	-	344.40	4.92	-	-	-	-
2004	-	-	11.30	5.00	-	-	-	-
2005	-	-	4.00	5.00	-	-	-	-
2006	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-
2012 (June)	-	-	-	-	-	-	-	-

\*annual average.

Source: RNB data (monthly bulletins).

Table 3a: continue

Year	Denominated in EUR			
	Treasury certificates		Treasury notes and bonds	
	Nominal value (mil. EUR)	Interest rate* (%)	Nominal value (mil. EUR)	Interest rate* (%)
1994	-	-	-	-
1995	-	-	-	-
1996	-	-	-	-
1997	-	-	-	-
1998	-	-	-	-
1999	-	-	-	-
2000	-	-	-	-
2001	-	-	-	-
2002	-	-	-	-
2003	-	-	-	-
2004	-	-	-	-
2005	-	-	-	-
2006	-	-	-	-
2007	-	-	-	-
2008	-	-	-	-
2009	1,423.30	4.25	1,240.80	5.25
2010	1,273.20	4.90	1,319.60	4.80
2011	-	-	1,401.80	4.87
2012 (June)	-	-	-	-

\*annual average.

**Source:** RNB data (monthly bulletins).

As Table 4 shows, the information provided by the Romanian MoPF is available only starting with the end of the year 2000. It also does provide data only at the level of the outstanding amount of debt at the end of every period. As it can be seen, Romanian government debt is still well below the 60% of GDP, the maximum level established by the Maastricht Treaty. It grew over 35% only in 2011 and during over the first half of 2012 due to the increased financing needs (mainly for short term, as can be seen from Table 2 above) under the pressure generated by the global financial crisis. This situation can be considered a good one for Romania's position as a borrower and there were no problems with Romanian domestic government securities to follow the scheduled interest rate payments or reimbursement.

As it can be seen, until 2008, less than 25% of domestic government debt was financed through the issuance of short and medium/long-term Treasury securities. The situation changed starting with 2009, and by June 2012 about 45% of the domestic government debt was financed through Treasury securities.

The situation presented in Table 4 shows a reluctance of Romanian MoPF (at least until 2008) to use Treasury securities as a vehicle to finance its internal debt. While no official information exists on this subject, there is reasonable to presume that the transparency required by the issuance of Treasury bills and

bonds and the need to follow the payment schedule might have been at least one motive for which the use of Treasury securities was avoided, despite the continuous requests made (since 1998) by Romanian capital market authorities for the listing of Treasury bills and Treasury bonds at Bucharest Stock Exchange.

Table 4

**Information regarding Romanian government internal debt  
as provided by the Romanian MoPF**

Year	Romanian government debt			Romanian government debt	
	Outstanding amount at the end of period		% of GDP	Financed through Treasury bills and certificate issues (denominated in RON and EUR) - % of the outstanding amount	Financed through Treasury notes and bonds (denominated in RON and EUR) - % of the outstanding amount
	(mil. RON)	(mil. EUR) <sup>(1)</sup>	%	%	%
2000	25,285.5	12,677.99	31.22	12.95	10.72
2001	33,776.4	12,974.46	28.64	14.15	8.00
2002	43,793.8	14,014.02	28.81	13.69	6.01
2003	51,136.6	13,616.09	25.90	8.46	5.43
2004	55,147.3	13,605.87	22.29	10.92	4.52
2005	56,381.8	15,560.47	19.51	2.37	7.95
2006	59,868.5	16,986.86	17.37	1.81	5.24
2007	76,149.6	22,817.73	18.30	3.30	9.04
2008	100,556.4	27,304.33	19.54	8.06	9.45
2009	136,493.8	32,212.45	27.24	17.17	16.96
2010	182,510.3	43,352.64	34.93	17.89	18.64
2011	210,388.6	49,630.49	36.36	16.03	23.82
2012 (June)	219,100.9	49,637.72	36.06	13.88	30.77
Average			26.63	10.82	12.04

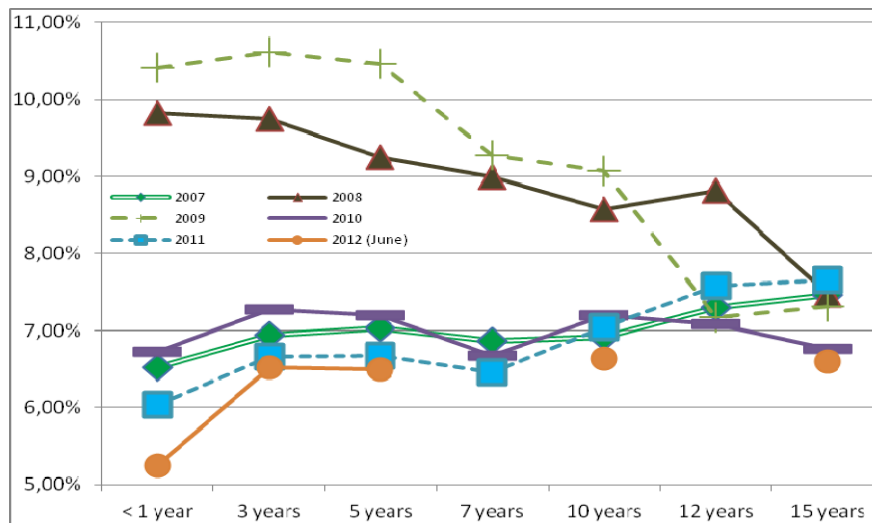
**Source:** based on data provided by the Romanian MoPF.

([http://discutii.mfinante.ro/static/10/Mfp/buletin/executii/Structura\\_dat\\_pub\\_2000-2012iunie.pdf](http://discutii.mfinante.ro/static/10/Mfp/buletin/executii/Structura_dat_pub_2000-2012iunie.pdf))

While the level of transparency increased starting with the second half of 2007 when Romanian MoPF created a special link for Treasury and Public Debt from its main website page (<http://www.mfinante.ro/trezorengl.html?pagina=domenii>), where gradually reports were uploaded up until December 2001, and a centralized table providing information until December 2000, a lot of details are still missing. No complete and ready available list for the government security issues exist; some partial information might be obtained from the RNB and, sometimes, from the MoPF, but it lacks continuity. No possibility to gather data on the Treasury securities maturities could be identified, and, as follow, there is no possibility to have an extended and detailed yield curve.



A yield curve is available only since July 2007 and is based on the issued and outstanding Treasury notes and Treasury bonds. As it can be seen from Figure 1, the available yield curve does not give any details for maturities less than one year, which is of no help for investors who are looking for the risk free rate at Romania's level.



**Source:** authors' calculations based on the data provided by the MoPF.

**Figure 1.** Romanian yield curve (end of the year/period)

However, this situation is an improvement compared with the fact that since 1994 until 2007 it was almost impossible to trace a yield curve for Romania. It is reasonable to expect for the future an increase in transparency and a more detailed yield curve, including for short-term periods.

#### *Primary and secondary market*

Since March 1994, when the first Romanian domestic Treasury securities were issued, a primary market was organized for them by RNB (Romanian National Bank), in its capacity as state agent. This primary market is based on auctions; between 1996 and 2001, some public offerings for Romanian population were launched on the market, but no details are available.

The current format of primary market is based on the presence of primary dealers authorized by RNB goes back to 2001. These primary dealers are Romanian banks or foreign banks which have authorized branches in Romania. Currently, 12 primary dealers are operating on the Treasury securities' primary

market; their list is available on the following link: <http://www.bnro.ro/Lista-dealerilor-primari-5754.aspx>. Of these 12 primary dealers, 10 are Romanian banks (of a total of 30 Romanian banks) and two are branches of foreign banks authorized to operate in Romania (of a total of eight such foreign branches). The number and structure of primary dealers cannot be traced back, since no past data are available on RNB website.

The data provided by RNB regarding the primary market are available only since 2005 and are difficult to read because no details or explanations are given.

A secondary (inter-bank) market for trading Romanian Treasury securities was also organized under the RNB supervision and with RNB participation starting with 1996, when the volume of short-term Treasury bills and certificates reached the mass that allowed the existence of a secondary market. However, no details are available for the period 1996-1999 regarding the daily transactions.

RNB offer some data regarding the trades on this secondary market starting with the year 2000; though the data are available daily, there are no details (there is no information by type of security traded and no data regarding the price for transactions per security; therefore it is not possible to establish which of the Treasury securities are most traded). Between 2001 and 2007, Romanian MoPF provided some additional data regarding the number of transactions and the liquidity, though the report format changed and these data were eliminated from the new reports.

Based on data provided by RNB regarding the secondary (inter-bank) market for domestic Treasury securities, the Tables 5 and 5a were constructed. As it can be seen, the trading volume between 2000 and 2005, while above the current level, generated a modest trading value. The lowest level was reached in 2006 when no new Treasury securities were issued. While the volume continued to remain modest, the turnover almost 'exploded' in 2009 (compared with the previous nine years). This increase in turnover might have two motives: the effect of the financial crisis which made investors to seek alternative investments, and the fact that a number of 25 series of Treasury bonds start trading on Bucharest Stock Exchange platform and the secondary (inter-bank) market provided a place for further speculation and arbitrage transactions.

Table 5

**Trading data for the secondary (inter-bank) market for T-securities  
denominated in RON**

Year	Volume	Value (mil. RON)	Value (mil. EUR) <sup>(1)</sup>
2000	19,572	27,851.2	13,694.70
2001	27,849	43,221.6	16,602.62
2002	32,362	47,454.0	15,185.28
2003	23,443	32,866.6	8,751.36
2004	25,692	48,411.4	11,943.99
2005	10,564	21,124.7	5,830.08
2006	3,115	8,050.1	2,284.11
2007	3,371	36,456.5	10,923.95
2008	5,836	33,995.1	9,230.78
2009	7,215	461,806.1	108,985.93
2010	8,875	197,810.0	46,986.86
2011	17,231	325,469.6	76,777.99
2012 (June 30 <sup>th</sup> )	10,260	798,748.9	180,958.07

**Source:** based on the information provided by RNB at <http://www.bnr.ro/Raport-statistic-606.aspx>.

Table 5a

**Trading data for the secondary (inter-bank) market for T-securities  
denominated in other currencies (USD and EUR)**

Year	Volume	Value (mil. EUR)
2003	62	24.9
2004	103	81.2
2005	0	0.0
2006	0	0.0
2007	0	0.0
2008	0	0.0
2009	191	652.5
2010	1,645	3,464.9
2011	3,094	8,384.3
2012 (June 30 <sup>th</sup> )	1,474	4,685.9

**Source:** based on the information provided by RNB at <http://www.bnr.ro/Raport-statistic-606.aspx>.

### 3.2. Treasury bond sector at BVB

Since August 4<sup>th</sup> 2008, domestic T-bonds denominated in RON start listing at Bucharest Stock Exchange (BVB<sup>(2)</sup> from now on).

The bond market segment at BVB was launched in November 2001, with the listing of municipal bonds. The diversity of listed bonds grew with the introduction of domestic corporate bonds in May 2003, and of international (corporate) bonds in September 2006. Table 6 presents the evolution of the BVB bond market segment, which, in average, represent about 10% of the BVB total turnover. Figure 2 shows the dominance of the various sub-segments

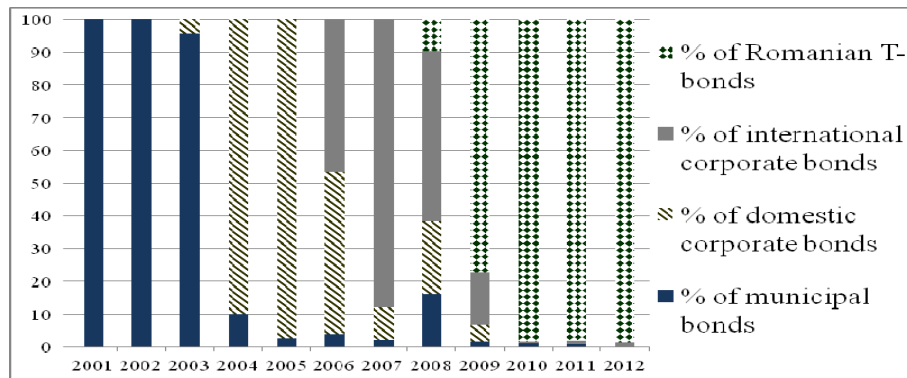
of BVB bond market. As it can be seen, Treasury bonds start dominating BVB bond sector since 2009.

Table 6

**BVB bond market (public offerings excluded)**

Year	Number of trades	Volume	Value (EUR) <sup>(1)</sup>	Number of listed issues (end of the year/period)	New entries
2001	5	45	185.13	2	2
2002	10	59,050	250,295.75	4	2
2003	37	29,870	355,584.29	10	9
2004	274	118,136	13,148,120.07	25	17
2005	334	197,107	29,666,788.77	19	6
2006	319	603,208	53,877,527.98	18	5
2007	233	3,652,467	147,985,261.23	22	11
2008	547	862,927	53,465,296.51	50	34
2009	958	1,822,908	277,746,575.81	60	16
2010	540	591,511	552,865,212.24	55	7
2011	245	857,248	105,205,882.66	59	6
2012 (June 30 <sup>th</sup> )	206	183,528	185,769,995.15	61	5

Source: authors' calculations based on BVB daily reports.



Source: authors' calculations based on BVB daily reports.

**Figure 2.** The structure of bond market segment by turnover

Table 7 presents the number of listed Treasury bond issues. As it can be seen, after the introduction of 25 Treasury bond issues for listing in August 2008 (of which one reached the maturity in September 2008), only a small number of new Treasury bond issues were allowed to be listed on BVB bond market segment, thus the number increase slowly during 2011 and the first half of 2012. The Treasury bonds listed at BVB represent in average 11.42% of Romanian government debt and 3.44% of Romanian GDP (based on the data provided by Romanian MoPF).

Table 7

Year	Number of listed outstanding bond issues (end of the year/period)		
	New entries	Reached maturity	End of period
2008	25	1	24
2009	2	0	26
2010	2	10	18
2011	4	1	21
2012 (June 30 <sup>th</sup> )	5	3	23

**Source:** authors' calculations based on BVB daily reports.

The listed Treasury bonds have the following characteristics: they are denominated only in RON; their nominal value is 10,000 RON (2,405 EUR<sup>(3)</sup>); they have fixed interest rate for their entire life; the coupon is paid annually; the principal is reimbursed only at maturity.

Table 8 presents the evolution of Treasury bond market segment at BVB. As it can be seen, while the trading volume is over the level registered by the secondary (inter-bank) market for Treasury securities, the turnover is very low compared with the same market (presented in Table 5). Of course, it must not be forgotten that at BVB no Treasury bills are listed, only Treasury bonds. The interest for the listed Treasury bonds in 2009 and 2010 might be explained by the poor performance of equity market sector and the investors' flight to safety. The decrease of 2011 might be explained by the difficult situation of Greece public debt and its reverberations all over Europe; the investors started to mistrust even the government securities. Another explanation might be provided by the data presented in Table 14, indicating a coupon yield for the listed Treasury bonds only slightly above the inflation rate for 2010 and 2011. The situation regarding Treasury bond transactions improved during the first half of 2012 due, again, to the poor performance of equity market sector and investors' choices for alternative instruments. However, the Treasury bond sector liquidity level (expressed through turnover ratio) is very low.

Table 8

BVB Treasury bond market data					
Year	Number of trades	Volume	Value (EUR) <sup>(1)</sup>	Value/ Turnover (mil. EUR)	Liquidity % (end of period) <sup>(4)</sup>
2008	17	2,069	5,182,444.41	5.18	0.16
2009	346	85,689	214,978,790.75	214.98	4.45
2010	435	203,724	544,126,776.96	544.13	11.18
2011	181	35,889	85,780,936.40	85.78	1.88
2012 (June 30 <sup>th</sup> )	199	79,027	183,273,745.31	183.27	3.78

**Source:** authors' calculations based by BVB daily reports.

Note: no Treasury bond public offerings were made through BVB system.

Table 9 shows the trading frequency by days for Treasury bond sector. Since this sector was launched only in August 4<sup>th</sup> 2008, and the climax of financial crisis was reached in September 2008, the interest of investors toward the new listed instruments was marginal. This explains the only 11 days of trading. For 2009 and 2010, the situation improved, Treasury bonds being traded in over 50% of the trading days, while during 2011 the interest toward these sector decreased, the trading occurring only in about 31% of the trading days, in concordance with the data presented in Table 8. The trading frequency during the first half of 2012 shows improvement and probably the levels of 2009 and 2010 will be reached, at least from active trading days' point of view.

Table 9

**Trading frequency for listed T-bonds**

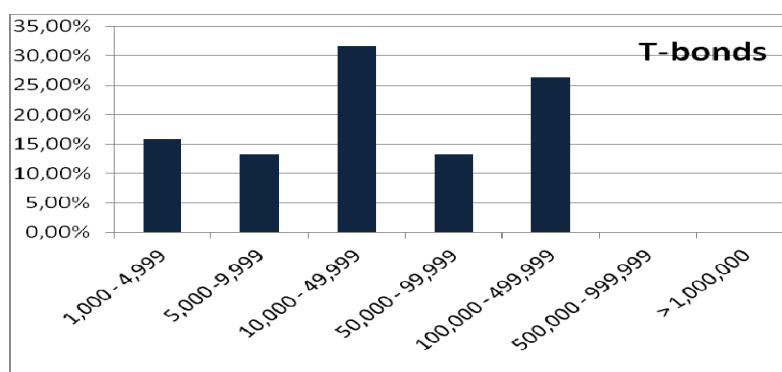
Year	Number of days when trading occurred	Number of trading days at BVB
2008	11	101*
2009	137	250
2010	134	255
2011	80	255
2012 (June 30 <sup>th</sup> )	73	125

\*Number of trading days for the period between August 4<sup>th</sup> 2008 and December 23<sup>rd</sup> 2008 (the last trading day at BVB for 2008).

**Source:** authors' calculations based on BVB daily reports.

Other factors that have an influence on the relative low profile of T-bond market segment compared with the well established BVB equity sector can be: (i) the relative low volume per Treasury bond issues; as Figure 3 and Table 10 both show, about 61% of the Treasury bond issues listed at BVB have a volume of less than 50,000 securities, which is not expected to generate enough liquidity for trading the respective issues; for 2008 and 2009 the MoPF authorities seemed to understand the need for an increased volume per issue; but for 2010, 2011, and the first half of 2012 the volume per issue decreased again, having an impact over the marketability of the respective T-bonds (confirmed by the low liquidity level as presented in Table 8; (ii) the nominal value for the listed T-bonds is 10,000 RON (or about 2,405 EUR<sup>(3)</sup>); while in tune with the international trends in having high nominal values for Treasury bonds, this nominal value is almost prohibitive for any individual investor; at this nominal value almost only the institutional investors can acquire a high enough volume per issue to generate transactions and liquidity; (iii) the number of Romanian institutional investors is relative low; a number of nine private pension funds in the second pillar and 11 pension funds within the third pillar are currently active<sup>(5)</sup>; to these numbers six domestic bond mutual funds<sup>(6)</sup> can

be added, and between 20 and 23 domestic diversified mutual funds which are likely to include Treasury bonds in their portfolios; while a number of 19 closed-end funds are registered in Romania, they have mostly international portfolios and their interest toward the domestic Treasury bonds might be considered low or very low. Romanian banks are also important investors in Treasury bonds (as the data of Romanian MoPF indicate, in average for the period 2000 – June 2012, about 69% of the domestic Treasury securities are held by “private banks and others”), but they have the secondary (inter-bank) market on which they can trade these instruments much easily. With such a small number of investors able to access the Treasury bond market segment at BVB, it is easy to understand the relative low level of trading registered and the low liquidity.



Source: authors' calculations based on BVB daily reports

Figure 3. T-bonds listed at BVB structure by volume of the issue

Table 10

**The average volume for the T-bond issues listed at BVB**

The year when the issue was launched	T-bond issues average volume
2005	8,028
2006	No issue was launched
2007	167,445
2008	274,869
2009	423,342
2010	113,381
2011	52,229
2012 (June 30 <sup>th</sup> )	84,677

Source: authors' calculations based on BVB data available at [www.bvb.ro](http://www.bvb.ro).

Note: In August 2008, the T-bonds listed at BVB were issued during 2005, 2007 and 2008.

Table 11 presents the average maturity for the listed issues, at the moment of their launching, along with the average interest rates. The decrease in the average maturity between 2008 and 2011 can be explained by the influence of global financial crisis. It can be seen that the borrowing costs increased in 2008 and 2009 also as a consequence of the global financial crisis. However, for 2010, 2011, and during the first half of 2012, Romanian MoPF reduced the borrowing costs, when the listed government securities are considered. This decrease in Treasury bond coupons generated a wave of protests among the primary dealers and the other institutional investors since the yield of decreased almost at the inflation rate, as can be seen in Table 14. However, the Treasury bond issues were subscribed because they are relatively scarce and are needed for portfolio diversification reasons mainly by the domestic pension funds.

Table 11

**Average maturity and interest rates for BVB listed T-bonds by year of issuance**

Year	Average maturity	Average interest rate (%)	Minimum (%)	Maximum (%)
2005	93.6 months (7.80 years)	7.33	6.47	8.00
2006	-	-	-	-
2007	74.7 months (6.22 years)	6.42	6.00	6.75
2008	52.0 months (4.36 years)	8.13	8.00	8.25
2009	52.5 months (4.38 years)	11.13	11.00	11.25
2010	51.0 months (4.25 years)	6.13	6.00	6.25
2011	61.5 months (5.13 years)	6.05	5.95	6.25
2012 (June 30 <sup>th</sup> )	82.0 months (6.83 years)	5.85	5.75	5.95

**Source:** authors' calculation based on the information offered by BVB for T-bonds.

**Note:** In 2006 no T-bond issues was launched by the Romanian Government.

### 3.3. Further details regarding the listed T-bond issues at BVB

Up until the end of June 2012, 38 T-bond issues were listed at BVB. Of these 15 reached their maturity (one in 2008, 10 in 2010, one in 2011, and three up until June 2012); of the expired issues, 12 were common Treasury-bond issues and three were benchmark issues (as defined by BVB); of these expired issues, seven were never traded; all seven were common issues. Currently (end of June 2012) 23 issues can be traded (eight common issues and 15 benchmark issues), however six of these 23 issues were never traded since their listing.

Table 12 presents details regarding the information registered for the traded Treasury bond issues. The information is structured taking into consideration the total turnover.



Table 12

**Details regarding the traded T-bond issues at BVB (as of June 30<sup>th</sup> 2012)**

No	Symbol <sup>(7)</sup>	Listing period (days)	No. of days when trade occurred	No. of trades	Volume	Value/ Turnover (mil. RON)	Average price (% of nominal value)	Observations
1	B1403A	871	148	351	148,524	1,713.43	106.8807	coupon yield: 11.00%
2	B1210A	807	95	148	54,637	615.34	105.3160	coupon yield: 11.25%
3	B1504A	575	36	53	36,411	364.45	97.4561	coupon yield: 6.00%
4	B1303A	986	47	83	28,581	301.74	100.5306	coupon yield: 8.25%
5	B1203A	904	80	128	28,512	287.17	94.3804	coupon yield: 6.50% matured
6	B1110A	814	59	82	26,366	273.32	98.3944	coupon yield: 8.00% matured
7	B2106A	258	36	57	26,815	263.82	93.7460	coupon yield: 5.95%
8	B1010A	559	40	61	14,688	146.46	94.6426	coupon yield: 6.00% matured
9	B1706A	986	26	41	11,143	117.01	97.2650	coupon yield: 6.75%
10	B1604A	295	29	47	10,492	106.55	97.2190	coupon yield: 6.00%
11	B1410A	304	24	40	9,815	99.93	99.1095	coupon yield: 6.25%
12	B1307A	561	32	43	5,797	58.97	99.2715	coupon yield: 6.25%
13	B2707A	72	6	11	1,497	14.69	93.2246	coupon yield: 5.80%
14	B1310A	159	5	9	981	10.00	100.1950	coupon yield: 6.00%
15	F1506A	986	2	3	300	3.28	103.2855	coupon yield: 7.50%
16	F1706A	986	2	3	300	3.26	102.9461	coupon yield: 7.25%
17	F1007A	490	2	2	300	2.98	96.3847	coupon yield: 8.00% matured
18	F1507A	986	1	2	200	2.24	104.6773	coupon yield: 7.85% only deal transactions
19	F1005A	440	2	2	219	2.17	98.1482	coupon yield: 7.80% matured
20	F1704A	986	2	4	179	1.86	100.1629	coupon yield: 7.00% only deal transactions
21	F1204A	931	1	1	156	1.62	98.1187	coupon yield: 7.00% matured
22	F1006A	464	1	1	150	1.48	94.4940	coupon yield: 7.80% matured
23	B1404A	72	1	2	135	1.36	100.8347	coupon yield: 5.95%
24	F2006A	986	1	1	100	1.01	98.5771	coupon yield: 7.30%
25	F1008A	505	2	3	100	0.98	93.2673	coupon yield: 8.00% matured

**Source:** authors' data based on information provided by BVB (<http://www.bvb.ro/Companies/DGovBonds.aspx>).

Table 12a: continued

No	Symbol <sup>(7)</sup>	Liquidity for the trading period <sup>(8)</sup> (%)
1	B1403A	42.92
2	B1210A	13.75
3	B1504A	28.72
4	B1303A	12.87
5	B1203A	13.59
6	B1110A	8.67
7	B2106A	52.76
8	B1010A	10.68
9	B1706A	7.61
10	B1604A	36.85
11	B1410A	19.99
12	B1307A	5.90
13	B2707A	12.04
14	B1310A	1.25
15	F1506A	8.19
16	F1706A	6.96
17	F1007A	1.99
18	F1507A	2.24
19	F1005A	1.26
20	F1704A	4.96
21	F1204A	3.24
22	F1006A	1.50
23	B1404A	0.09
24	F2006A	2.02
25	F1008A	0.98

**Source:** authors' data based on information provided by BVB (<http://www.bvb.ro/Companies/DGovBonds.aspx>).

As Table 12 shows, it can be observed that the top 5 traded issues are of benchmark type and are also, in two cases, the issues with the highest coupon yield. Also it can be observed that in the case of the top 3 most traded Treasury bonds, the trading frequency (days) is between 7% and 17%, which generates a relative low liquidity per trade between 350 and 700 bonds/trade.

In the case of common Treasury bonds (no benchmark) the investors' preference went toward those with relative high coupon yield, but the low volume of outstanding bonds per issue was the main factor that generated the very low level of transactions.

As it can also be observed from Table 12a above, the liquidity per traded Treasury bond issue, with two exceptions (symbol B1403A, which has a liquidity of slightly over 40%, and B2106A, which has a liquidity of slightly over 50% ), is low or very low. The investors' preference for benchmark issues is obvious, their average liquidity being 19.11%, with about 16% higher than the liquidity for the common Treasury bond issue which registered an average liquidity of only 3.01%. The low liquidity level, in general, is consistent with the low trading frequency pattern and, mainly in the case of common issues, with the very low number of trades (between 1 and 3).

Up until the trading frequency and the liquidity level will not increase, the T-bond sector at BVB will continue to have a low profile, not attracting investors.

### 3.4. Borrowing costs through T-bills and T-bonds and their yield compared with other investment alternatives at BVB

Table 13 shows an interesting situation: while Romanian Treasury bonds, in general, respected the idea that they pay the lowest interest rates (with the exception of 2001), it is however clear that there is almost no premium for longer maturities. This situation might be considered a positive one since it indicates that the economic situation might improve sometime in the future, but it represents no incentive for domestic investors. This might be another reason why BVB listed Treasury bonds fail to attract important trading volume and turnover.

Table 13

#### T-bonds and listed T-bonds coupons compared with reference Romanian Interbank Interest Rates, and bank loans interest rates (annual averages, %)

Year	ROBOR <sup>(9)</sup> 3M	ROBOR 6M	Bank loan interest rates	T-bills as reported by RNB	T-bonds as reported by RNB	Listed T-bonds coupon yield
1996	56.51	55.74	55.80	53.80	-	-
1997	90.00	85.03	63.70	55.70	-	-
1998	84.99	79.70	56.90	53.20	-	-
1999	99.47	92.81	65.90	75.80	63.70	-
2000	55.23	56.11	53.50	52.30	49.60	-
2001	38.06	44.57	45.10	42.20	42.00	-
2002	29.17	29.35	36.65	27.20	22.30	-
2003	19.87	19.25	26.19	16.20	14.20	-
2004	20.74	19.91	29.15	17.90	12.80	-
2005	9.81	9.86	21.04	6.40	7.50	7.33
2006	8.77	8.72	14.83	-	-	-
2007	7.79	7.81	13.32	6.90	7.00	6.42
2008	13.04	13.12	15.07	11.30	10.50	8.13
2009	11.72	11.79	17.30	10.90	10.90	11.13
2010	6.75	7.22	14.11	7.00	7.20	6.13
2011	5.82	6.55	12.12	6.65	7.32	6.05
2012 (June 30 <sup>th</sup> )	4.95	5.50	11.34	5.42	6.25	5.85

**Source:** authors' calculations based on RNB data and BVB data.

In Table 14 presents the performances of listed Treasury bonds in comparison with various alternatives of investment available for a domestic investor. Listed Treasury bonds total yield, as expected, is not increased by the price return. It can be observed that in 2005 they offered a total yielded below the inflation rate, while for the years 2008, 2010, and 2011 the coupon yield

was almost at inflation rate levels. For the years 2005, 2007, 2008, 2010, and 2011 no premium exist for longer maturities over Treasury bills. However, an investment in listed Treasury bonds seemed a better alternative than the equity market in 2008, 2010 and during the first half of 2012.

Table 14

**Listed T-bonds interest rates compared with inflation rate, bank deposit interest rates and BVB share segment returns through BET-C index**

Year	Inflation rate (annual average, %)	Bank deposit interest rates (annual average, %)	BET-C annual return (%)	T-bills as reported by RNB	Listed T-Bonds (annual coupon yield average, %)	Listed T-bonds (annual price return average, %)
1996	38.80	98.10	-	53.80	-	-
1997	154.80	51.60	-	55.70	-	-
1998	59.10	38.30	-	53.20	-	-
1999	45.80	45.50	-4.90	75.80	-	-
2000	45.70	32.70	7.39	52.30	-	-
2001	34.50	26.40	-6.47	42.20	-	-
2002	22.50	18.39	124.02	27.20	-	-
2003	15.30	10.78	22.62	16.20	-	-
2004	11.90	15.65	97.88	17.90	-	-
2005	9.00	8.34	31.63	6.40	7.33	-
2006	6.56	6.51	25.07	-	-	-
2007	4.84	6.70	26.27	6.90	6.42	-
2008	7.85	9.55	-69.68	11.30	8.13	0.3563
2009	5.59	11.89	34.62	10.90	11.13	1.5860
2010	6.09	7.29	10.89	7.00	6.13	0.4650
2011	5.79	6.29	-16.73	6.65	6.05	-0.0291
2012 (June)	2.22	5.74	-2.81	5.42	5.85	0.8676

**Source:** authors' calculations based on RNB data and BVB data.

**Note:** From the six indices reported for BVB (<http://www.bvb.ro/IndicesAndIndicators/indices.aspx>) only BET-C (BET-Composite) index was chosen due to the length of data series that allowed calculating the returns from 1999 to the present moment.

#### 4. Discussions and conclusions

##### *Discussions*

As Luengnaruemitchai and Ong (2005) highlighted in their study, to enhance the market credibility as a benchmark, a various combination of measures is necessary; among these measures, the authors mention: the extension of the yield curve; the issuance calendars in order to improve transparency; increasing the disclosure of information on public debt issuance and statistics; holding regular meetings with dealers, institutional investors and rating agencies; introducing a system of primary dealers; establishing a repurchase (repo) market in the government bond market.

Based on the developments presented in section 3 of this paper, we will discuss the measures mentioned above. On what the yield curve is concerned, while there is a considerable improvement from no yield curve until 2007, to an existing one, thus the available yield curves do not give any details regarding the short maturities (3, 6 and 9 months) as it can be seen in Figure 1. When information disclosure is taken into consideration, the situation is similar to the yield curve; from the almost total absence of information to a dedicated section to public debt on Romanian MoPF is an important step ahead. However, there are no detailed statistics dedicated to domestic Treasury securities (mainly Treasury bills). The only details on Treasury securities are those published by BVB. The system of primary dealers was introduced under the supervision of RNB since 2001; however the level of transparency regarding the issuances remained low until 2007. The issuance calendar became available starting with 2008 along with the other steps taken to improve transparency under the pressure of the country's accession to EU and the launching of the domestic private pension funds of second pillar. Until now there is no repo market in the government bonds established and no public announcements were made on this matter until June 2012.

### Conclusions

Despite the fact that a primary market for Romanian domestic government securities was organized since March 1994 and a secondary market started trading since 1996, both markets under the supervision of Romanian National Bank (RNB), Treasury securities in Romania did not provided for more than a decade any benchmark for domestic and foreign investors. While the transparency improved starting with 2008 and a secondary market was established at BVB for government bonds, the liquidity of this market is still very low four years since it was launched. The efforts of RNB and BVB (as agent and, respectively, intermediary) to build a liquid and credible (secondary) market for domestic government bonds were not matched by the Romanian MoPF. The MoPF lacks the flexibility and is still reluctant in being transparent, like it is not entirely aware of the importance of government bonds as benchmark for the Romanian financial markets. In order to create a credible and liquid government bond market, a higher level of transparency and flexibility is required at the MoPF level, along with a clear understanding of the crucial role of government securities as benchmarks.

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## Notes

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- (1) The exchange rates used are presented in Annex 2.
- (2) For the present paper the abbreviation BVB (from Romanian name Bursa de Valori Bucuresti) was chosen in order to avoid any confusion with the possible abbreviation for Budapest Stock Exchange, Bulgarian Stock Exchange and Bratislava Stock Exchange.
- (3) Using an average exchange rate of 4.1576 RON/ EUR – the average for the period 2008 to 2012 (June) based on data in Annex 2.
- (4) The liquidity was calculated as a ratio between the T-bond market segment turnover at the end of the year (or period) and the outstanding listed T-bonds total (nominal) value at the end of the year.
- (5) <http://www.csspp.ro/date-statistic-pilonul-2> and <http://www.csspp.ro/date-statistic-pilonul-3>
- (6) Based on data offered by the Romanian Association of Asset Managers at <http://www.aaf.ro/>
- (7) The symbol means: B – benchmark issue; F – common issue. The next two figures indicate the year when the issue will mature; the following two figures indicate the maturity month; A means that for the time when it was offered for sale, this was the only issue with the announced maturity and coupon yield. Example: B1403A means that it is a benchmark T-bond issue which will mature in March 2014 and at the time when it was launched into the market, no other T-bond issue had similar maturity.
- (8) The liquidity in this case was calculated as ratio between the turnover registered by every traded T-bond issue and the nominal value of the respective issue.
- (9) It represents the Romanian Interbank Offer Rate for three months, respectively for six months. Formerly known as BUBID-BUBOR. Data regarding ROBID-ROBOR are offered by RNB on its website: <http://www.bnro.ro/Info-financiar-5371.aspx>.

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## References

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- Blanco, R. (2001). “The Euro-area Government Securities Markets Recent Developments and Implications for Market Functioning”, Paper presented at *BIS Autumn Central Bank Economist’s Meeting*, October 2001, available at: <http://www.bis.org/publ/bppdf/bispap12d.pdf>
- Bunescu, L. (2009). “Municipal Bonds – A Viable Funding Option for Oradea Local Public Administration (Romania)”, *Economic Analysis Working Papers*, 9<sup>th</sup> volume, number 08, available at [http://www.unagaliciamoderna.com/eawp/coldata/upload/municipal\\_bonds\\_oradea\\_romania.pdf](http://www.unagaliciamoderna.com/eawp/coldata/upload/municipal_bonds_oradea_romania.pdf)
- Corduneanu, C., Milos, L. (2008). “Where is Heading the Romanian Corporate Bond Market? A National and International Approach”, as available at [www.feaa.uaic.ro/geba/.../37-Corduneanu%20Carmen\\_Milos%20Laura.doc](http://www.feaa.uaic.ro/geba/.../37-Corduneanu%20Carmen_Milos%20Laura.doc)
- Dunne, P., Moore, M., Portes, R. (2006). “European Government Bond Markets: Transparency, Liquidity, Efficiency”, *CEPR*, London
- Dunne, P., Hau, H., Moore, M. (2008). “A Tale of Two Platforms: Dealer Intermediation in the European Sovereign Bond Market”, available at: [http://www.ryerson.ca/economics/seminars/moore\\_081004.pdf](http://www.ryerson.ca/economics/seminars/moore_081004.pdf)

- Greco, E. (2008). "The Interest for the Municipal Bonds", *Annals of the Oradea University, Fascicle of Management and Technology Engineering*, Volume VII (XVII), pp. 2280-2284
- Gyorgy, S. (2002). "Developments in the Hungarian Debt Markets", *The Development of Bond Markets in Emerging Economies, BIS Paper*, No. 11, Bank for International Settlements, Basel, available at: <http://www.bis.org/publ/bppdf/bispap11i.pdf>
- Iorgova, S., Ong, L.L. (2008). "The Capital Markets of Emerging Europe: Institutions, Instruments and Investors", *Working Paper*, No.103, International Monetary Fund, available at: <http://www.imf.org/external/pubs/ft/wp/2008/wp08103.pdf>
- Luengnaruemitchai, P., Ong, L.L. (2005). "An Anatomy of Corporate Bond Markets: Growing Pains and Knowledge Gains", *Working Paper*, No.152, International Monetary Fund, as available at: <http://www.ksri.or.kr/bbs/files/research02/wp05152.pdf>
- Matei, M., Popescu, C., Eftimie, M. (2009). "Municipal Bonds – An Instrument of Financial Management Used by Romanian Authorities", *Advances in Marketing, Management and Finances*, pp.111-115, Proceedings of the 3<sup>rd</sup> International Conference on Management, Marketing and Finances, Houston, USA, April 30-May 2, WSEAS Press, as available at: <http://www.wseas.us/e-library/conferences/2009/houston/AMMF/AMMF16.pdf>
- Mohanty, M.S. (2002). "Improving Liquidity in Government Bond Markets: What Can Be Done?", *BIS Paper*, No.11, available at: <http://www.bis.org/publ/bppdf/bispap11e.pdf>
- Mosteanu, T., Lacatus, C.M. (2008). "The Municipal Bonds – The Case and the Effect of the Local Financial Decentralization Growth. Romanian Case", *Theoretical and Applied Economics*, No. 9/2008 (526), pp. 51-60, available at <http://www.ectap.ro/articole/333.pdf>
- Paesani, P., Piga, G. (2007). "Transparency in the European Bond Market", *Transition Studies Review*, 14 (1), pp. 3-21
- Pagano, M., Von Thadden, E. (2008). "The European Bond Markets under EMU", in *Handbook of European Financial Markets and Institutions*, X. Freixas, P. Hartmann, and C. Mayer (eds.), Oxford University Press, Oxford, pp. 488-518
- Pop, C., Dumbrava, P. (2004). "The Romanian Municipal Bonds – A General Overview", volume, *Public Administration – Sborník příspěvků z vědecké konference*, Universita Pardubice, Fakulta Ekonomiko-Správní, Lázně Bohdaneč, Czech Republic, 21-22 Sept.2004, UP04-57, ISBN 80-7194-684-2, pp. 285-292
- Pop, C., Georgescu, M.A. (2011). "Romanian Municipal Bond Market", *Interdisciplinary Management Research*, vol. VII, pp. 512-544
- Pop, C., Georgescu, M.A. (2012). "Municipal and Treasury Bond Market Segments Development at Bucharest Stock Exchange", *Transylvanian Review of Administrative Sciences*, No. 35 E/2012, pp. 197-218
- Roldos, J.E. (2004). "Emerging Local Bond Markets", in *Emerging Local Securities and Derivative Markets*, World Economic and Financial Survey, International Monetary Fund, Washington, pp. 24-45
- Skully, M., Brown, K. (2006). "Romanian Financial Markets", in Professor J. Jay Choi (ed.) *Emerging European Financial Markets: Independence and Integration Post-Enlargement (International Finance Review*, Volume 6), Emerald Group Publishing Limited, pp. 281-321
- Szilagy, P.G., Fetherston, T.A., Batten, J.A. (2004). "Perspective on the Emerging European Financial Markets", in *European Fixed Income Markets: Money and Interest Rate Derivatives* edited by Batten, J.A., Fetherston, T.A. and Szilagy, P.G., John Wiley and Sons Ltd., pp.53-66
- Reports: International Monetary Fund (2002). *Global Financial Stability Report: Market Developments and Issues*, Washington DC

## Websites:

<http://www.bnro.ro><http://www.bvb.ro><http://epp.eurostat.ec.europa.eu><http://www.fese.be><http://www.insse.ro><http://www.mfinante.ro>

## Annex 1

## General government gross debt as % of GDP

Year	EU-27	EU-12	Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovak Republic	Slovenia
1999	65.7	43.8	77.6	16.4	59.8	39.6	21.7	47.9	-
2000	61.9	42.6	72.5	18.5	54.9	36.8	22.5	50.3	-
2001	61.0	40.3	66.0	24.9	52.0	37.6	25.7	48.9	26.7
2002	60.4	39.2	52.4	28.2	55.6	42.2	24.9	43.4	27.9
2003	61.8	38.7	44.4	29.8	58.3	47.1	21.5	42.4	27.3
2004	62.2	37.1	37.0	30.1	59.1	45.7	18.7	41.5	27.4
2005	62.8	34.7	27.5	29.7	61.8	47.1	15.8	34.2	26.7
2006	61.5	33.4	21.6	29.4	65.7	47.7	12.4	30.5	26.4
2007	59.0	31.8	17.2	29.0	66.1	45.0	12.6	29.6	23.1
2008	62.3	32.3	13.7	30.0	72.3	47.1	13.4	27.8	21.9
2009	74.4	39.1	14.6	35.3	78.4	50.9	23.6	35.4	35.2
2010	80.0	42.8	16.2	38.5	80.2	55.0	30.8	41.0	38.0
2011	82.5	45.6	16.3	40.8	81.4	56.4	33.4	43.3	46.9
average	65.8	38.6	36.7	29.3	65.0	46.0	21.3	39.7	29.8

**Source:** based on data provided by EUROSTAT.[http://epp.eurostat.ec.europa.eu/portal/page/portal/government\\_finance\\_statistics/data/main\\_tables](http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data/main_tables); code teina225.



Annex 2

**The exchange rates used: annual average based on the daily data provided by RNB**

Year	Annual average (expressed in RON)
1994	0.1967
1995	0.2630
1996	0.3683
1997	0.8091
1998	0.9989
1999	1.6254
2000	1.9944
2001	2.6033
2002	3.1250
2003	3.7556
2004	4.0532
2005	3.6234
2006	3.5244
2007	3.3373
2008	3.6828
2009	4.2373
2010	4.2099
2011	4.2391
2012 (June)	4.4140

**Source:** RNB daily data available at <http://www.bnro.ro/Baza-de-date-interactiva-604.aspx>.

Annex 3

**Comparison of the neighboring countries domestic public bond sector**

	Listings (number of listed domestic public bonds)					
	2006	2007	2008	2009	2010	2011
Bratislava Stock Exchange	25	23	21	22	24	22
Bucharest Stock Exchange	11	14	44	57	53	58
Budapest Stock Exchange	22	23	22	25	22	23
Bulgarian Stock Exchange	6	4	3	2	1	1
Ljubljana Stock Exchange	29	27	25	28	25	23
Prague Stock Exchange	17	19	19	20	22	21
Warsaw Stock Exchange	58	51	47	41	40	38
Total	168	161	181	195	187	186
% of total EU-27	5.37	4.99	5.18	5.21	6.69	6.12

	Trades					
	2006	2007	2008	2009	2010	2011
Bratislava Stock Exchange	2,145	1,560	2,035	1,479	1,106	1,773
Bucharest Stock Exchange	61	58	193	500	523	228
Budapest Stock Exchange	391	233	1,106	920	924	1,704
Bulgarian Stock Exchange	26	7	20	13	2	0
Ljubljana Stock Exchange	11,606	7,329	5,090	5,145	3,169	1,947
Prague Stock Exchange	7,716	5,984	7,802	5,494	5,882	5,508
Warsaw Stock Exchange	40,239	28,710	29,290	23,564	17,920	16,304
Total	60,184	43,881	45,536	37,115	29,526	27,464
% of total EU-27	1.87	1.33	1.34	1.03	4.36	3.79

	Turnover (m EUR)					
	2006	2007	2008	2009	2010	2011
Bratislava Stock Exchange	26,629.2	10,235.1	24,193.5	11,365.3	6,021.3	18,453.5
Bucharest Stock Exchange	2.1	2.9	13.7	219.1	559.8	86.9
Budapest Stock Exchange	485.5	222.9	1,335.5	968.2	789.3	978.1
Bulgarian Stock Exchange	1.8	0.2	0.4	0.0	0.0	0.0
Ljubljana Stock Exchange	1,156.7	373.7	210.4	114.3	58.0	39.8
Prague Stock Exchange	19,057.4	15,622.3	24,230.6	20,881.2	20,215.9	24,567.7
Warsaw Stock Exchange	709.9	457.7	690.4	319.2	281.4	188.3
Total	48,042.6	26,914.8	50,674.5	33,867.3	27,925.7	44,314.3
% of total EU-27	0.65	0.37	0.64	0.40	0.49	0.56

**Source:** author's calculations based on data available in FESE reports and statistics.

**Note 1:** Budapest Stock Exchange, Ljubljana Stock Exchange and Prague Stock Exchange are part of CEESEG (Central and Eastern European Stock Exchange Group) which includes also Vienna Stock Exchange;

**Note 2:** EU-27 does not include Stuttgart Stock Exchange which became FESE member only since 2009;

**Note 3:** For 2010 and 2011 from the EU27 data, information regarding London Group (London Stock Exchange and Italian Stock Exchange) are missing; data for London Group were not available.