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COMPARISON OF EUROPEAN CAPITAL MARKETS

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Abstract. Financial systems in European post-communist countries have been developing for two decades of market transformation, and in majority of Central and Eastern European states capital markets were created. Therefore the aim of the paper is to compare the level of development of these stock exchanges to the ones in developed economies. In the paper the analysis of capital markets, affiliated with the Federation of European Securities Exchanges (FESE) is provided. Investigation concerns the situation on stock exchanges in Europe in the time span 2000–2011, with the special emphasis on the stock exchanges operating in the post-communist states. The research is provided on the basis of FESE data, using single and multidimensional analysis. The European stock exchanges are classified to the homogenous groups applying synthetic measure of development.

Key words: capital market, FESE, taxonomic measure, capitalization, turnover, liquidity

INTRODUCTION

Transformation in Europe's former communist countries, which started over 25 years ago, results in their reintegration into the global economy, and – in most cases – major improvements in living standards. Liberalization of trade and prices was relatively easy and came quickly but institutional reforms in such areas as governance, competition policy, labor market, privatization and changes of the enterprise structure seem to be very difficult tasks since they often faced opposition from vested interests.

During the communist era, financial systems in Central and Eastern Europe (CEE) had a purely passive role. During transformation the structural changes were launched to

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set up capital markets to facilitate ownership changes; to modernize and strengthen the banks; to improve regulatory and accounting standards; and to modernize the tax system based on income tax and VAT.

There have been numerous studies, which examined the development of capital markets however investigation concerning the transition markets in the CEE region has been provided rather rarely. The research describing and comparing financial markets in European countries in transition are presented by: Koivu [2002], Gilmore and McManus [2002], Voronkova [2004], Gunduz and Hatemi [2005], Syriopoulos [2007], Foo and Witkowska [2008a, b], Gilmore et al. [2008], Krawczyk [2008], Shostya et al. [2008], Witkowska and Zdziarski [2008], Kompa and Witkowska [2011], Witkowska et al. [2012] to mention some examples.

The aim of the paper is to compare the level of development of emerging capital markets to the developed ones in Europe. The analysis of stock exchanges, operating in the post-communist states, against the securities exchanges, created the developed markets, is provided for the years 2000–2011. The research concerns only stock exchanges affiliated with The Federation of European Securities Exchanges (FESE), and is provided on the basis of FESE data. The position of selected stock exchanges is evaluated employing synthetic measure of development, which is also used to classify European stock exchanges to the homogenous groups. Section 1 discusses capital markets in Europe, Section 2 describes methods used for empirical analysis, Section 3 compares European capital markets, Section 4 contains the empirical analysis provided with application of the synthetic measure of development, and Section 5 concludes.

CAPITAL MARKETS IN EUROPE

According to the general tendencies on capital markets, after the Second World War stock exchanges were present in all market-oriented economies, and they created domestic capital markets that are represented by one (like in Austria) or more stock exchanges (for instance there are four stock exchanges in Spain). Intensification of the integration process and financial market globalization in recent years, cause creation of regional stock exchanges in Europe like Euronext, OMX Exchanges being Pan-European institutions and CEE Stock Exchange Group (CEESEG). Euronext bases on Amsterdam, Brussels, London, Lisbon and Paris Stock Exchanges. OMX Exchanges operates eight stock exchanges in Nordic (i.e. Copenhagen, Stockholm, Helsinki and Iceland Stock Exchanges) and Baltic countries (i.e. Tallinn, Riga and Vilnius Stock Exchanges), together with Armenian Stock Exchange. While CEESEG is a holding company comprising the stock exchanges in Vienna, Budapest, Ljubljana and Prague.

In the years 2004, 2007 and 2013, eleven post-communist states (together with Malta and Cyprus) became members of European Union. Financial systems in transition countries in Europe have undergone for over two decades of market transformation. Among emerging capital markets one can distinguish) four groups presented in Table 1.

Table 1. Stock exchanges inception dates

Early reformers		Laggards		Late reformers		Countries without stock exchange
Slovenia	(1989)	Kazakhstan	(1993)	Belarus	(1998)	Albania
Serbia	(1989)	Latvia	(1993)	Georgia	(1999)	Bosnia and Herzegovina
Hungary	(1990)	Lithuania	(1993)	Azerbaijan	(2000)	
Bulgaria	(1991)	Kyrgyzstan	(1994)	Armenia	(2001)	Tajikistan
Croatia	(1991)	Estonia	(1995)	Ukraine	(2002)	Turkmenistan
Poland	(1991)	FYR of Macedonia	(1995)			Uzbekistan
Slovakia	(1991)	Moldova	(1995)			
Czech Republic	(1992)	Romania	(1995)			
		Russia	(1995)			

Source: Shostya et al. [2008].

The first group contains eight countries, which – except Serbia – became European Union members in 2004 (Slovenia, Hungary, Poland, Slovakia and Czech Republic), in 2007 (Bulgaria) and in 2013 (Croatia). Six countries that belonged to the former Soviet Union (USSR) and three from South-Eastern European countries create the second group of countries. Among them Baltic states (Latvia, Lithuania and Estonia) joint EU in 2004 while Romania became the EU member in 2007.

All countries in the third group together with Kazakhstan, Kyrgyzstan, Moldova and Russia from the second class, and Tajikistan and Turkmenistan from the last group were USRR republics in the past. These states have been members of the Commonwealth of Independent States (CIS), although Ukraine has never been a formal member of CIS and in March 2014 the Ukraine's Parliament decided to withdraw from CIS. While Georgia made such decision in August 2008 and the withdrawal was effective in August 2009.

It is worth mentioning that even in states, which are classified by Shostya et al. [2008] to the fourth group, the capital markets have been created. In Bosnia and Herzegovina the Sarajevo Stock Exchange (SASE) has been operating since 2002, but with 5-day a week trading only from 2007. Tirana Stock Exchange was established in 1996 as department of Bank of Albania. Since 2002 it has been operating with full license working 2-day a week (two hours a day). In Turkmenistan only the State Commodity and Row Materials Exchange exists. The stock exchange in Uzbekistan – Toshkent Republican Stock Exchange (TRSE) was formally founded in the year 1991 with target closely to the performance of the market – selling shares of privatized enterprises (especially to the foreign investors). Real financial impact of TRSE shifts this exchange to the last group since in the year 2005 only 5,814 transactions with the shares of 643 join-stock companies were carried out.

Development of computer sciences and telecommunication together with legislation changes caused globalization of financial markets, i.e. investors from any place in the world may make transactions on every market (to some extend of course since there are limitations on some markets and states). Thus the role and range of financial market have been changed. Considering capital markets, we observe that they lost their traditional functions such as reallocation of capital from investors to companies or evaluation the market value of companies listed on the stock exchange. It is the result of introduction of

new electronic platforms, trading systems and techniques (high frequency trading, mass trading, black-box or algo-trading, farming etc.), as well as new investment instruments, which cause the increase of the role of big – institutional investors and decrease (or even practically elimination) of individual ones. In such a case financial institutions are focused on high profits regardless the risk of transactions, and do not pay attention enough to the situation of their clients and/or the shareholders earnings. In result, in recent years we have been observing several financial crises, which had not their sources in economic problems but are caused by taking too high risk by investors.

METHOD DESCRIPTION

In socio-economic research phenomena and objects, being under analysis, are usually described by many features, which may influence the development of the phenomenon (or the object) in different way. Therefore among descriptive variables we distinguish stimulants and destimulants. The increase of former is conductive to the development of the phenomenon while the increase of the latter negatively influences the level of development.

The methods that allow comparing different markets can be divided into two groups: descriptive and evaluative. The former consists in description and comparison the objects, that are described by many features, using simple statistical tools as index numbers or averages and dispersion measures. The latter consists in construction of the synthetic measure that describes objects in multi-dimensional space.

In our investigation the synthetic measure of development is applied. The taxonomic measure *SM* is evaluated for each security exchange for the years 2000–2011, and it defines the distance between the benchmark and analyzed stock exchange in the level of development. The benchmark is defined as the hypothetical object that is characterized by maximal values of stimulants and minimal values of destimulants. Maximal and minimal values are estimated for every year separately, taking into consideration all analyzed stock exchanges. A detailed description of the methodology is presented in Kompa [2012].

The synthetic measure informs about the distance of the object from the benchmark, i.e. $SM_{it} \in [0; 1]$. Since the position of the certain capital market changes in time it is convenient to create classes of homogenous objects. Therefore after evaluation of synthetic measures SM_{it}, we classify the stock exchanges into four groups according to the different levels of development, from the least developed belonging to the Class 1 to the most developed – Class 4, i.e.:

Class 1: $SM_{it} < SM_t - S_{SMt}$ Class 3: $SM_t + S_{SMt} > SM_{it} \geq SM_t$

Class 2: $SM_t > SM_{it} \geq S_{Mt} - S_{SMt}$ Class 4: $SM_{it} \geq SM_t + S_{SMt}$

where for each period *t*: SM_t and S_{SMt} are average and standard deviation of the synthetic measure SM_{it}, respectively.

COMPARISON OF CAPITAL MARKETS

Our investigation concerns 22 selected stock exchanges from: European Union member states, Armenia, Iceland, Norway, Switzerland and Turkey (Table 2), being members of Federation of European Securities Exchanges. Since the research concerns 12 years, not all necessary data are available in FESE database thus in cases of missing observations data are imputed[1] (for instance in 2007 Borsa Italiana merged London Stock Exchange and seceded from FESE thus for these Securities Exchanges there is lack of data concerning last years). The analysis is provided in two stages. The fist one concerns the selected features that describe capital markets while the second one consists in construction and evaluation of aggregated measures of development.

Table 2. List of stock exchanges

Stock Exchanges	Abbreviations	Stock Exchanges	Abbreviations
Athens Stock Exchange	ATEX	Deutsche Börse	DBAG
BME (Spain)	BME	Irish Stock Exchange	ISE
Borsa Italiana	Borsa	Istanbul Stock Exchange	BIST
Bratislava Stock Exchange	BSSE	London Stock Exchange	LSE
Bucharest Stock Exchange	BVB	Luxembourg Stock Exchange	BdL
Bulgarian Stock Exchange	Sofia	Malta Stock Exchange	MSE
CEESEG – Budapest	BSE	NASDAQ OMX Nordic	OMX
CEESEG – Ljubljana	LJSE	NYSE Euronext	NEXT
CEESEG – Prague	PSE	Oslo Børs	OSE
CEESEG – Vienna	VSE	SIX Swiss Exchange	SIX
Cyprus Stock Exchange	CSE	Warsaw Stock Exchange	WSE

Source: Own elaboration.

Tables 3 and 4 contains values of the market capitalization that are observed at the end of the year. The world financial crisis is visible by declining of capitalization of all stock exchanges after the year 2007, except Istanbul Stock Exchange, which has been intensively developing, obtaining in 2011 the increase of the market capitalization by 97% in comparison to the base from the year 2007. FESE average capitalization decreased in 2008 by 47%, in 2009 by 28%, in 2010 by 16.5% and in 2011 by 27% in comparison to the year 2007. The biggest loses are observed at Cyprus Stock Exchange: 72, 64.5, 75 and 89% from the capitalization in the years 2007–2011, respectively. Full recovery from the crisis is visible in 2010 for three securities exchanges: SIX Swiss Exchange (which capitalization increased in 2010 by 5.4% in comparison to 2007), London Stock Exchange (which capitalization increased in 2010 by 2.2% in comparison to 2007), and Warsaw Stock Exchange (which capitalization in 2010 was smaller only by 1.4% in comparison to 2007). However the situation in 2011 was not as good as in the previous year, and capitalization of the majority of European markets essentially decreased.

[1] We employ data from other sources such as the websites of stock exchanges, as well as from Eurostat and World Bank.

Table 3. Market capitalization – end of the year 2000–2005 (million EUR)

Stock Exchanges	2000	2001	2002	2003	2004	2005
Athens SE	117,956	96,950	65,760	84,547	92,140	123,033
BME (Spain)	537,044	525,840	443,097	575,766	692,053	813,812
Borsa Italiana	818,384	592,319	457,992	487,446	580,881	676,606
Bratislava SE	3,556	3,890	2,514	2,204	3,239	3,729
Bucharest SE	451	1,361	2,646	2,991	8,819	13,535
Bulgarian SE	145	572	704	1,397	2,062	4,312
CEESEG – Budapest	12,810	11,565	12,493	13,228	21,039	27,586
CEESEG – Ljubljana	3,335	3,839	5,355	5,660	7,115	6,697
CEESEG – Prague	12,313	8,999	9,796	12,288	21,720	31,059
CEESEG – Vienna	31,884	28,307	32,235	44,811	64,577	107,036
Cyprus Stock Exchange	12,402	6,572	4,505	3,807	3,588	5,580
Deutsche Börse	1,352,936	1,203,681	627,283	802,224	849,717	1,019,171
Irish Stock Exchange	87,212	84,567	57,540	67,444	83,933	96,722
Istanbul Stock Exchange	199,029	123,950	137,327	73,145	56,164	33,783
London Stock Exchange	2,744,691	2,413,272	1,708,260	1,923,168	2,071,775	2,592,623
Luxembourg SE	36,231	26,711	23,569	29,598	36,891	43,448
Malta Stock Exchange	2,169	1,528	1,319	1,467	2,090	3,474
NASDAQ OMX Nordic	786,479	580,449	385,247	468,199	542,290	704,678
NYSE Euronext	2,483,040	2,122,048	1,477,108	1,646,178	1,796,036	2,294,828
Oslo Børs	70,477	78,372	65,271	75,779	104,051	161,934
SIX Swiss Exchange	845,865	591,961	521,560	576,462	609,929	793,019
Warsaw Stock Exchange	33,761	28,846	27,055	29,350	51,888	79,353
FESE average	463,281	387,982	275,847	314,871	350,091	438,001

Source: Own elaboration on the basis of www.fese.be.

Table 4. Market capitalization – end of the year 2006–2011 (million EUR)

Stock Exchanges	2006	2007	2008	2009	2010	2011
Athens SE	152,208	181,233	64,737	78,505	50,379	26,020
BME (Spain)	1,003,299	1,231,086	680,632	999,875	873,329	794,170
Borsa Italiana	778,501	733,614	374,702	457,126	425,099	332,374
Bratislava SE	4,214	4,555	3,907	3,614	3,380	4,183
Bucharest SE	18,858	21,524	6,474	8,402	9,776	10,818
Bulgarian SE	7,830	14,821	6,371	6,031	5498	6,358
CEESEG – Budapest	31,687	31,528	13,326	20,888	20,624	14,630
CEESEG – Ljubljana	11,513	19,740	8,468	8,462	7,028	4,873
CEESEG – Prague	34,693	47,987	29,615	31,266	31,922	29,203
CEESEG – Vienna	151,013	161,731	54,752	79,511	93,944	65,683
Cyprus Stock Exchange	12,254	20,160	5,733	7,157	5,094	2,198
Deutsche Börse	1,241,963	1,439,955	797,063	900,772	1,065,712	912,420
Irish Stock Exchange	123,824	98,431	35,519	42,720	44,999	83,495
Istanbul Stock Exchange	53,440	77,463	85,279	163,576	229824	152,453
London Stock Exchange	2,876,986	2,634,577	1,352,327	1,950,048	2,693,178	2,516,122
Luxembourg SE	60,303	113,597	47,809	73,219	75,381	52,093
Malta Stock Exchange	3,416	3,854	2,567	2,844	3,222	2,641
NASDAQ OMX Nordic	851460	849,923	404,137	569,604	776,821	648,670

Table 4, cont.

Stock Exchanges	2006	2007	2008	2009	2010	2011
NYSE Euronext	2,812,261	2,888,313	1,508,423	1,999,967	2,184,076	1,884,745
Oslo Børs	212,272	241,683	101,982	157,774	219,512	170,048
SIX Swiss Exchange	919,342	869,377	616,234	738,707	916,707	835,090
Warsaw Stock Exchange	112,826	144,323	65,178	105,157	142,272	107,483
FESE average	521,553	537,704	284,783	382,056	448,990	393,444

Source: Own elaboration on the basis of www.fese.be.

Another important feature describing capital market is turnover. As one can notice (Fig. 1), the biggest turnover is observed for London Stock Exchange, NYSE Euronext and Deutsche Börse. Again the world financial crisis is visible beginning from the year 2008 when turnover declined dramatically till 2009 and 2010, with the exception of Istanbul Stock Exchange. Observing capital markets in post-communist states we notice that the biggest turnover is observed in Poland, Hungary and Czech Republic (Fig. 2).

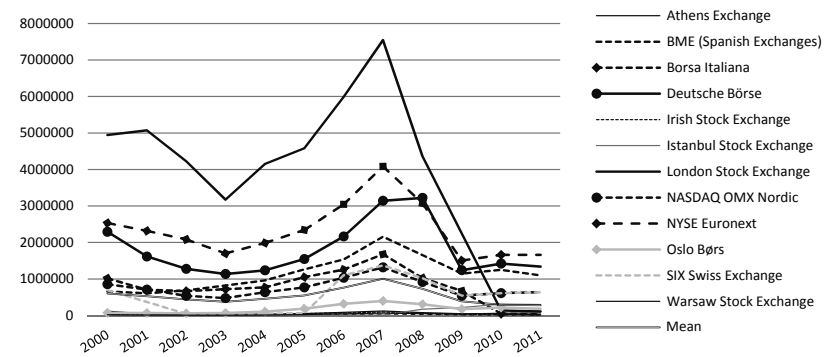

Fig. 1. Turnover of European markets (million EUR)

Source: Own elaboration on the basis of www.fese.be.

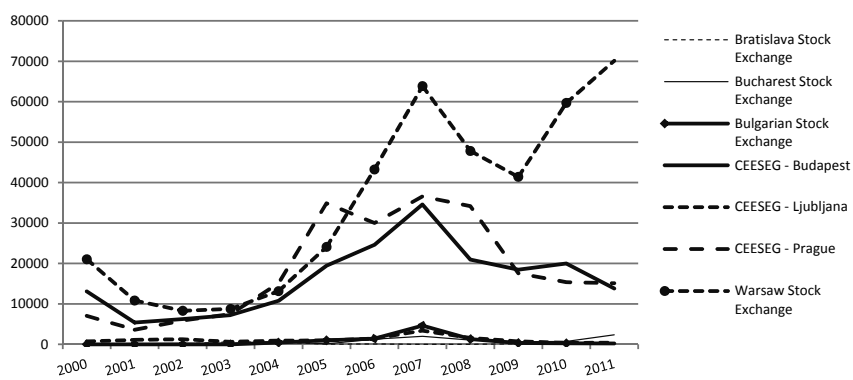

Fig. 2. Turnover in post-communist states (million EUR)

Source: Own elaboration on the basis of www.fese.be.

Another important information about the capital market is number of companies listed on the stock exchange (Fig. 3), which is the biggest for Spanish Exchanges (beginning from 2002), London Stock Exchange, Euronext and German market. Malta Stock Exchange has the smallest number of companies listed (from 10 in 2000 to 21 in 2011).

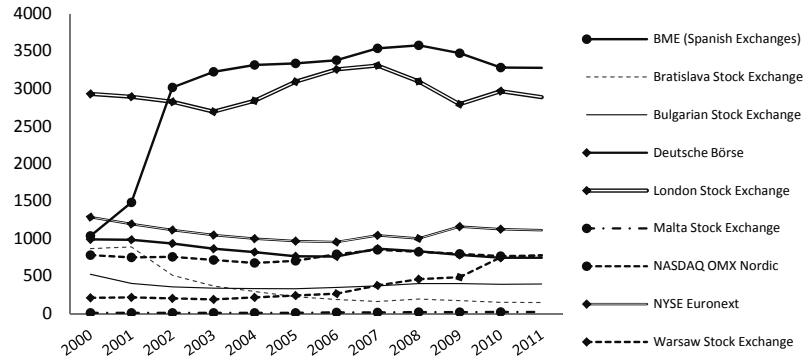

Fig. 3. Number of companies listed for selected stock exchanges

Source: Own elaboration on the basis of www.fese.be.

However, number of companies listed does not inform about the economic potential of the enterprises and institutions listed on the stock exchange. Therefore the average capitalization per company ratio (in million EUR) is often used in analysis. The smallest firms are observed in Bulgarian and Bratislava Stock Exchanges (0.28 in 2000 to 16.18 in 2011) while the biggest in Borsa Italiana in 2000–2005 (from 1,555 to 2,755.5), Euronext in 2006–2007 (from 2,769 to 2,948), and SIX Swiss Exchange in 2008–2011 (1,908 to 3,251). The smallest FESE average was observed in 2002 (411) and 2008 (489), while the biggest in 2006 and 2007 (923 and 924). New capital markets are characterized by smaller than average value of this ratio with the exception of Czech market for which the ratio has been exceeding the FESE average since 2005 (Fig. 4).

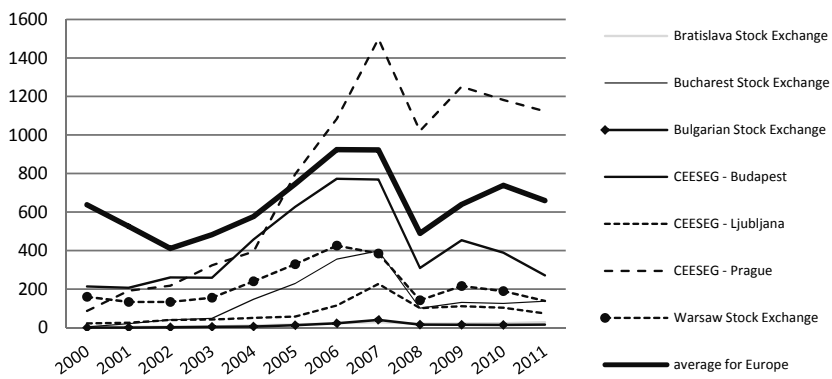

Fig. 4. Average per company capitalization ratio (million EUR) for transitional economies

Source: Own elaboration on the basis of www.fese.be.

Number of IPOs informs about "popularity" of the certain stock exchange, which assures gaining capital via public offering. This feature is often used as an essential descriptor of the capital market development. Unfortunately data regarding this variable is not available for many stock exchanges. The biggest number of IPOs has been observed in London Stock Exchange, Euronext and Warsaw Stock Exchange, which became a leader in 2011.

The most accepted definition of liquidity is ability to convert stocks into cash and vice versa without affecting the price or with minimal impact on price [Bogdan et al. 2012]. Liquidity is the ease of trading a security [Amihud et al. 2005] that just makes it one of the key elements upon which the investor will decide whether or not to invest. Since quick execution of orders and ability to convert in cash at the lowest costs are very important. Selling an illiquid stock quickly can be difficult or even impossible without accepting a lower price. The least liquid (i.e. ratio not bigger than 0.003) stock exchanges were in Bratislava in years 2000 and 2008, in Bulgaria 2001–2002 and Luxemburg in years 2003––2007 and 2009–2011. While the most liquid stock exchanges obtained the ratio value from 1.4 (in 2010) to 4.0 (in 2008). The first place was hold by London Stock Exchange in years 2000–2007, the capital market in Germany in 2008, Italy in 2009, Spain in 2010 and Istanbul Stock Exchange in 2011. Among post-communist economies (Fig. 5) the most liquid markets are in Budapest and Prague for which liquidity ratios oscillate around the FESE average, and Warsaw (below FESE average).

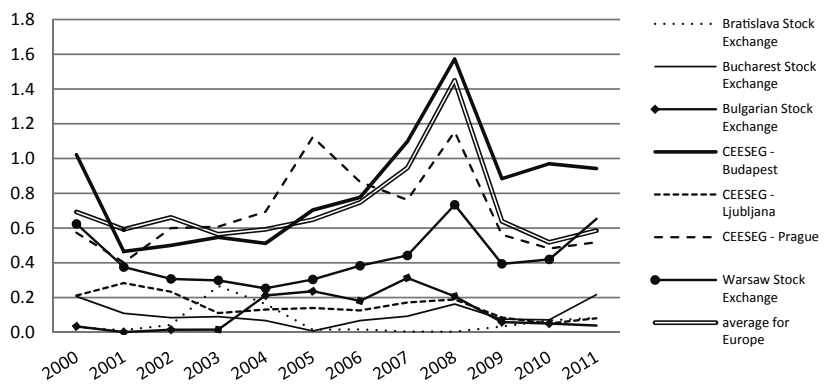

Fig. 5. Liquidity ratios evaluated for transitional economies

Source: Own elaboration on the basis of www.fese.be.

The role of capital market in the economy is measured by the ratio describing the share of market capitalization in GDP is used. This ratio is not less than 0.2 for the most developed capital markets (Fig. 6), and it obtains value from 1.65 to 3.25 for the SIX Swiss Exchange and Luxembourg Stock Exchange. While for the economies in transition this ratio is much smaller (Fig. 7) obtaining the biggest value for stock exchanges in Budapest in years 2000–2001 (0.20–0.25), Ljubljana in years 2001–2004 and 2007–2008 (0.23–0.61), and Warsaw in years 2005–2006 and 2009–2010 (from 0.31 to 0.44).

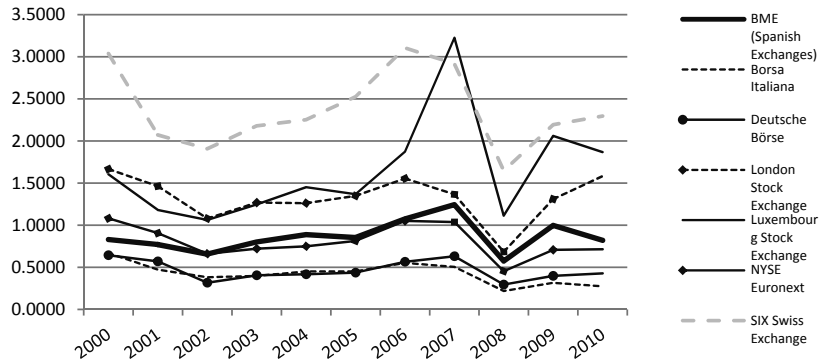

Fig. 6. Market capitalization to GDP ratio on developed markets

Source: Own elaboration on the basis of www.fese.be.

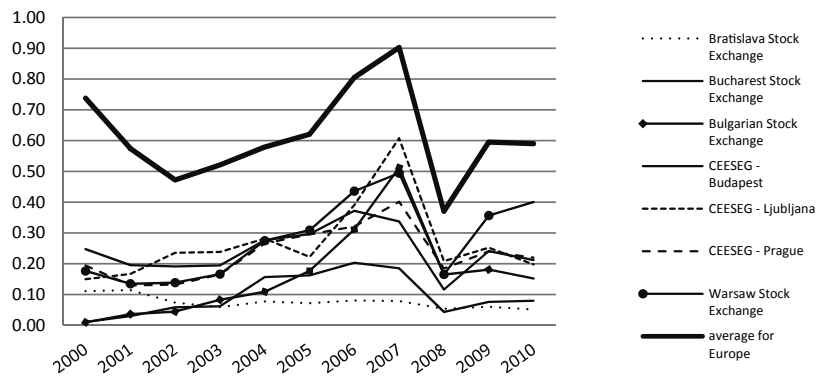

Fig. 7. Market capitalization to GDP ratio in post-communist states

Source: Own elaboration on the basis of www.fese.be.

SYNTHETIC MEASURE OF DEVELOPMENT

To construct synthetic taxonomic measure six, described above, variables are applied: capitalization, number of companies listed, turnover, liquidity ratio, i.e. turnover to capitalization, capitalization to GDP ratio, average capitalization of the company, i.e. capitalization/number of companies listed[2]. All of them are stimulants, i.e. the increase of them, positively influences the development of the analyzed capital market. Thus the benchmark is the hypothetical object, defined for every year separately, that consists of the maximal values of each variable observed in every year of investigated period. The bigger value of SM_{it} means the smaller distance to the benchmark, and higher position in the ranking of capital markets. Values of the measure *SM* are presented in Table 5.

[2] To construct the aggregated measure all available FESE data are used.

Table 5. Values of taxonomic measures SM_{it} for markets in years 2000–2011

Exchange	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
ATHEX	0.279	0.272	0.243	0.256	0.239	0.241	0.243	0.243	0.221	0.233	0.197	0.209
BME	0.377	0.423	0.429	0.474	0.466	0.458	0.453	0.474	0.476	0.539	0.477	0.496
Borsa	0.398	0.391	0.387	0.395	0.389	0.379	0.375	0.380	0.363	0.388	0.251	0.246
BSSE	0.202	0.218	0.180	0.188	0.168	0.149	0.140	0.132	0.135	0.145	0.129	0.146
BVB	0.163	0.176	0.165	0.168	0.167	0.159	0.158	0.154	0.140	0.152	0.135	0.161
BSE-Sofia	0.178	0.188	0.169	0.175	0.175	0.173	0.170	0.178	0.164	0.166	0.145	0.155
BSE	0.215	0.217	0.210	0.214	0.216	0.217	0.215	0.214	0.200	0.226	0.204	0.214
LJSE	0.174	0.201	0.191	0.187	0.179	0.165	0.166	0.174	0.162	0.164	0.139	0.145
PSE	0.196	0.208	0.205	0.217	0.221	0.236	0.224	0.229	0.240	0.253	0.225	0.241
VSE	0.191	0.210	0.199	0.213	0.218	0.232	0.243	0.242	0.222	0.236	0.223	0.218
CSE	0.255	0.246	0.205	0.191	0.174	0.174	0.203	0.205	0.172	0.182	0.152	0.149
DBAG	0.497	0.504	0.437	0.456	0.434	0.424	0.434	0.470	0.484	0.471	0.466	0.517
ISE	0.242	0.278	0.274	0.284	0.274	0.265	0.261	0.248	0.227	0.235	0.216	0.243
BIST	0.237	0.247	0.260	0.223	0.193	0.182	0.165	0.164	0.237	0.295	0.300	0.312
LSE	0.725	0.800	0.742	0.746	0.725	0.716	0.692	0.670	0.618	0.682	0.472	0.422
BdL	0.243	0.251	0.251	0.257	0.249	0.244	0.246	0.253	0.250	0.254	0.232	0.161
MSE	0.185	0.195	0.188	0.189	0.188	0.198	0.182	0.170	0.176	0.174	0.157	0.141
OMXN	0.420	0.428	0.389	0.398	0.399	0.397	0.399	0.389	0.369	0.404	0.414	0.406
EURONEXT	0.587	0.601	0.583	0.579	0.557	0.552	0.547	0.555	0.543	0.580	0.574	0.609
OSE	0.244	0.275	0.257	0.269	0.279	0.286	0.298	0.297	0.281	0.305	0.307	0.291
SIX	0.452	0.414	0.387	0.392	0.371	0.385	0.481	0.461	0.495	0.486	0.508	0.453
WSE	0.207	0.215	0.197	0.202	0.202	0.202	0.206	0.205	0.198	0.228	0.226	0.240
$\overline{SM}_t$	0.303	0.316	0.298	0.303	0.295	0.293	0.296	0.296	0.290	0.309	0.280	0.281
S_{SM_t}	0.152	0.158	0.149	0.152	0.147	0.146	0.148	0.148	0.145	0.155	0.140	0.140

Source: Own elaboration. Note – markets name abbreviations as in Table 2.

On the basis of the SM_{it} values it is possible to construct rankings of stock exchanges, which are presented in Table 6. In the years 2000–2009 the first place was hold by London Stock Exchange, and the second by Euronext, which became a leader in years 2010–2011. Other the most important European stock exchanges are BME and Deutsche Börse. In transitional countries the best positions were hold by Stock Exchanges in Budapest, Prague and Warsaw, which were kept the position from the 11th to the 18th in analyzed years. As one can notice, Euronext together with London, Spanish, German and Swiss Stock Exchanges are the most developed markets since they belong to the 4th class. The capital markets in transitional economies usually belongs to the second class, although stock exchanges in Bratislava, Bucharest, Sofia and Ljubljana, together with Cyprus and Malta Stock Exchanges belong in selected years to the first class, i.e. they are the least developed ones.

Table 6. Clustering of the stock exchanges: class IV – the best, class I – the worst

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Class
LSE	LSE	LSE	LSE	LSE	LSE	LSE	LSE	LSE	LSE	NEXT	NEXT	
NEXT	NEXT	NEXT	NEXT	NEXT	NEXT	NEXT	NEXT	NEXT	NEXT	SIX	DBAG	**IV**
DBAG	DBAG	DBAG	BME	BME	BME	SIX	BME	SIX	BME	BME	BME	
SIX	OMX	BME	DBAG	DBAG	DBAG	BME	DBAG	DBAG	SIX	LSE	SIX	
OMX	BME	OMX	OMX	OMX	OMX	DBAG	SIX	BME	DBAG	DBAG	LSE	**III**
Borsa	SIX	SIX	Borsa	Borsa	SIX	OMX	OMX	OMX	OMX	OMX	OMX	
BME	Borsa	Borsa	SIX	SIX	Borsa	Borsa	Borsa	Borsa	Borsa	OSE	BIST	
ATEX	ISE	ISE	ISE	OSE	OSE	OSE	OSE	OSE	OSE	BIST	OSE	
CSE	OSE	BIST	OSE	ISE	ISE	ISE	BdL	BdL	BIST	Borsa	Borsa	
OSE	ATEX	OSE	BdL	BdL	BdL	BdL	ISE	PSE	BdL	BdL	ISE	
BdL	BdL	BdL	ATEX	ATEX	ATEX	ATEX	ATEX	BIST	PSE	WSE	PSE	
ISE	BIST	ATEX	BIST	PSE	PSE	VSE	VSE	ISE	VSE	PSE	WSE	
BIST	CSE	BSE	PSE	VSE	VSE	PSE	PSE	VSE	ISE	VSE	VSE	**II**
BSE	BSSE	PSE	BSE	BSE	BSE	BSE	BSE	ATEX	ATEX	ISE	BSE	
WSE	BSE	CSE	VSE	WSE	WSE	WSE	WSE	BSE	WSE	BSE	ATEX	
BSSE	WSE	VSE	WSE	BIST	MSE	CSE	CSE	WSE	BSE	ATEX	BdL	
PSE	VSE	WSE	CSE	MSE	BIST	MSE	Sofia	MSE	CSE	MSE	BVB	
VSE	PSE	LJSE	MSE	LJSE	CSE	Sofia	LJSE	CSE	MSE	CSE	Sofia	
MSE	LJSE	MSE	BSSE	Sofia	Sofia	LJSE	MSE	Sofia	Sofia	Sofia	CSE	
Sofia	MSE	BSSE	LJSE	CSE	LJSE	BIST	BIST	LJSE	LJSE	LJSE	BSSE	**I**
LJSE	Sofia	Sofia	Sofia	BSSE	BVB	BVB	BVB	BVB	BVB	BVB	LJSE	
BVB	BVB	BVB	BVB	BVB	BSSE	BSSE	BSSE	BSSE	BSSE	BSSE	MSE	

Source: Own elaboration. Note – markets name abbreviations as in Table 2.

CONCLUSIONS

Development of the financial sector influences the economic development thus capital market plays an important role in the market-oriented economies. In the past, London Stock Exchange was the most important financial institution in Europe, and other domestic capital markets were far away from it. Creating pan-European stock exchanges, which applies the trading platform for some domestic markets changed situation in Europe. Although London Stock Exchange together with Euronext have been still one of the most developed.

At present majority of stock exchanges in Europe lists domestic and foreign enterprises, which are often double-listed, i.e. on domestic capital market and in selected stock exchanges. However, it could be distinguished two types stock exchanges: the ones that operate mostly on domestic market or even on the part of it and the ones that operate on several markets.

Capital markets in post-communist countries have quite short history but they adopted solutions from the developed ones and their position is visible in Europe. Stock exchanges in Baltic States belong to NASDAQ OMX Nordic, creating Baltic market while stock exchanges in Budapest, Ljubljana and Prague created a holding together with Vienna

Stock Exchange. Warsaw Stock Exchange represents the biggest capital market among European transitional economies.

Financial crisis influenced capital markets in Europe with different intensity. Comparison of the stock exchanges' positions in the year 2009 to the year 2006 shows that half of them did not change the position in the ranking, although Oslo Børs (OSE) and Deutsche Börse (DBAG) moved to the higher class, and the development of the latter is stable i.e. it is observed also in the years 2010–2011. Among analyzed security exchanges, six stocks (i.e. Greek – ATEX, Irish – ISE, Swiss – SIX, Hungarian – BSE, Cyprian – CSE and Slovenian – LJSE) obtained lower position in 2009 in comparison to 2006. The highest decreased (by four positions) is observed by Irish Stock Exchange (however in the year 2011 the situation essentially improved) and Athens Stock Exchange (by three positions) and this market seems not to recover until 2011.

There are five markets: Turkish, represented by Istanbul Stock Exchange (BIST), Bulgarian (Sofia), Maltese (MSE), Spanish (BME) and Czech (PSE), that improved their position in the year 2009 in comparison to 2006. Istanbul Stock Exchange represents the capital market, which has been developing the quickest because it shifted in by 11 positions (from the 20th place in 2006 to the 9th place in 2009), and it has been still improving its position (the 7th position in 2011) moving to the third class.

To sum up our consideration, we claim that the most developed and the biggest stock exchanges did not change their positions in the ranking while the small ones were exposed on crisis. Capital market in Turkey seems to be the only one (among all investigated) not affected by the world financial crisis.

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PORÓWNANIE EUROPEJSKICH RYNKÓW KAPITAŁOWYCH

Streszczenie. Rozwój systemów finansowych w krajach post-komunistycznych skutkował powstaniem rynków kapitałowych. Celem artykułu jest porównanie poziomu rozwoju giełd kapitałowych w krajach Europy Środkowo-Wschodniej z rozwiniętymi rynkami kapitałowymi. W badaniach przeprowadzono analizę giełd zrzeszonych w Europejskiej Federacji FESE. Badania obejmują sytuację na giełdach europejskich w latach 2000–2011 ze szczególnym uwzględnieniem giełd funkcjonujących w krajach post-komunistycznych. Dane pochodzące z FESE zostały poddane jedno- i wielowymiarowej analizie. Ta ostania pozwoliła na zbudowanie syntetycznych mierników rozwju oraz klasyfikację giełd do grup o zbliżonym poziomie rozwoju.

Słowa kluczowe: rynek kapitałowy, FESE, miara taksonomiczna, kapitalizacja, obroty, płynność

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