

Stock exchanges' development in selected Danube Region eu member states: The way ahead

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Abstract: *The research paper will analyze the current state of development of the capital markets of selected Danube Region EU member states and will evaluate quantitative and qualitative economic indicators on these stock markets, as well as factors promoting their development. Neighboring countries have similar cultures and well-developed business relations. The expected positive external effects from deepened intra-regional cooperation processes are along the lines of economies of scale, diminishing market uncertainties, boosted liquidity and improved depth of capital markets.*

Keywords: *stock markets development, European financial integration, regional cooperation*

JEL Classification: G19, G23, G29

Introduction

The effective functioning of the capital markets is dependent on the boost of liquidity, fall in transaction costs and encouraging trade and competition through alternative trading systems. Main customers of such systems could be various institutional investors, which are not admitted to direct trading on the stock exchange. The effective functioning of the stock exchange is viewed as a public good. The stock exchange generates profits through raising the volume of transactions, which is directly linked to the quality of offered services and the established reputation of the exchange. Increase in competition drives prices of securities to socially optimum equilibrium level as per the public well-being theory. Cooperation and consolidation processes among capital markets

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participants in EU are explained by factors as rising demand of investment possibilities with the European financial area. The main models for consolidation followed by capital market participants in EU are horizontal and vertical consolidation.

The research paper will aim at analyzing the current state and strategic aspects for deepening of integration of selected Danube region capital markets through increasing regional cooperation. Further on the paper will evaluate quantitative and qualitative changes in selected Danube region stock exchanges and draw conclusions regarding possible cooperation among them.

The potential model for the future development of the selected stock markets is regional cooperation and consolidation process. According to this model neighboring countries have similar cultures and well-developed business relations. The main precondition for success of the regional model of consolidation is harmonization in EU member states' legislation. This requires as a first step research of the potential for cooperation through introduction of a common trading system, unified rules for market quotes, clearing and settlement and subsequently moving to eventual horizontal (implicit mergers) integration after an extensive cost-benefit analysis.

The expected positive external effects from deepened intraregional cooperation processes among Danube regional stock exchanges are along the lines of economies of scale driven by demand, due to the link between interoperability, compatibility and coordination. The rise in the number of traders on the exchange leads to diminishing market uncertainties, boosted liquidity and improved depth of capital markets. Intraregional cooperation of capital markets in the Danube region is an important element from the entire process of establishing competitive and well-integrated capital markets in EU. A stimulating factor in this regard is technological advancement urging transition from traditional forms of trade to electronic platforms and execution of orders through alternative trade systems.

The research methodology will include comparative and economic analysis on the basis of European financial integration theory; analysis and evaluation of quantitative and qualitative links between variables relating to capital markets in selected countries in the Danube region (Romania, Bulgaria, Croatia and the Slovak Republic); analysis of current state of development of the capital markets in these countries and drawing of conclusions regarding tendencies. Important externalities from the cooperation process are expected to be increasing market liquidity, falling transaction costs, easier access to market data, higher quality of services offered as clearing and settlement.

Regional cooperation is an important element in the development of the Danube region stock exchanges for increasing the capital markets efficiency and safeguarding the future development of these markets. The regionalization process needs to be driven by

the market forces and through an adequate evaluation of expected costs and benefits. The effective functioning of the capital markets in the Danube region is contingent on the boost of liquidity, fall in transaction costs and encouraging trade and competition through alternative trading systems.

1. Theoretical base for consolidation and integration processes among EU stock exchanges

The main consolidation models followed by market participants on EU capital markets include¹:

1. Vertical consolidation

This process involves combination of diverse activities along the securities trade execution chain from integration of trade and clearing to securities settlement activities within a single entity or between two or more entities. Such consolidation model in EU is followed by Deutsche Boerse (Germany), Borsa Italiana (Italy) and Bolsas y Mercados Españoles Group (Spain). These consolidation structures may result in establishing the dominant position, creation of barriers for entry and may limit the transparency levels in pricing of services along the trade execution and post-trade cycle.

2. Horizontal consolidation

This model assumes entering into various strategic alliances agreements or implicit coordinated mergers among system operators providing the same types of services. Such consolidation model is followed by NYSE EURONEXT Group that is also the owner of the London Futures Exchange. Another such example in the sphere of settlement activities is Euroclear Group as a merger among the national central securities depositories of Belgium, France, the Netherlands and Great Britain.

Irrespective of significant consolidation processes on the capital markets there continue to exist various barriers in front of the clearing and settlement infrastructure in EU². The advantages from consolidation and integration processes point to decrease in securities trade costs and rise in liquidity volumes on EU capital markets. At the background of these advantages one has to evaluate such shortcomings as decrease in competition and the monopolization of stock exchanges. This leaves open the question what the mechanism for preservation of competition will be and how traditional market participants will compete with the alternative/multifunctional securities trade facilities

¹ ECB (2006), Horizontal and Vertical Integration in Securities Trading and Settlement, WP N 387.

² The Giovannini Group (2003), Second Report on EU Clearing and Settlement Arrangements.

(most active of which in Europe are Chi-X, Turquoise, BATS etc., some of which also known as «dark pools» due to the significant trades' volume that they could place at high frequency quotations). There are two categories of multifunctional trading facilities. The first type offer secondary trade in liquid European stocks in a public order book and compete with exchanges by the cost of trading and the speed and efficiency of the trading system. These include BATS Chi-X Europe, which in 2013 was transformed into an exchange and Turquoise (of which the London Stock Exchange is its major shareholder), as well as Acquis Exchange (of which Warsaw Stock Exchange is a shareholder). The other type includes the so-called "dark pools" trading facilities which allow institutional clients and brokers to trade in large orders and to close trades at reference prices, generated in other systems.

The expectations are for further intensification of the competitive pressure under the influence of the new regulatory framework at EU level and the incentives for free access to trade execution, clearing and settlement infrastructures. The competition in the field of derivatives contracts trade in the EU is chiefly among Eurex Group, NYSE Liffe, EDX London Ltd., as well as a multitude of functioning OTC derivatives markets. The national clearing organizations face significant competitive pressure in their activities from cross-border multifunctional clearing systems as EMCF, X-Clear and EuroCCP. This process is sped up also by the implementation of the Code of Conduct in Clearing and Settlement of the European Market Infrastructure Association in 2006, on the basis of which market participants have the freedom of choice for preferred provider of clearing and settlement services through observation of the principles for price transparency, free access and technical compatibility. The consolidation of trade and clearing infrastructures has been significant during the last decade. As a result of horizontal and vertical mergers the number of central counterparties in Europe decreased from 14 in 1999 to about 7 after 2006. However the number of central depositories decreased from 23 to about 18. It is noteworthy that the majority of central depositories are part of holding structures (as Euroclear Group, Clearstream International, etc.)¹.

The gradual implementation of the Financial Services Action Plan at EU level leads to heightened degree of harmonization in the regulatory framework of EU capital markets in the process of trade execution, clearing and settlement of transactions. The amendments in the regulatory and institutional framework of EU capital markets in 2012 aim at further centralization of supervisory functions and strengthening the resilience of the financial markets against financial instability. The principal regulatory changes encompass revision of the Markets in Financial Instruments Directive (MiFID II), European Market Infrastructures Regulation (EMIR), regulations on short sales, OTC

¹ ECB (2006), Horizontal and Vertical Integration in Securities Trading and Settlement, WP N 387.

derivatives, central counterparties and central securities depositories, etc. These institutional activities encourage open and level-playing access of market participants to trade execution and clearing (preferably through the central counterpart) and settlement (through provision of direct and/or remote access) infrastructures and could lead to a greater competition. On one side, these initiatives seek to strike a balance between market effectiveness and protection against financial abuses, safeguarding financial stability and mitigating the negative impact over the single market and the real economy. On the other side the regulative changes create a high degree of uncertainty for the stock exchange participants in planning and implementing their business strategies due to the effects from these changes along the line of future unforeseeable expenses for compliance with the revised regulatory framework.

In the execution of their activities, stock exchanges realize positive external effects due to achieved economies of scale, rising demand and the close links among interoperability – compatibility – coordination. With the rise in the number of traders on a given market accordingly market uncertainty falls as measured by the standard deviation of market prices. These external effects lead to provision of liquidity and on the other hand are instrumental for coordinated mergers (oligopols) among stock exchanges. Coordinated mergers involve entering into an agreement between stock exchanges under the terms of which all securities listed at one exchange are listed on the other and all the intermediaries of the one exchange are granted remote access to the other one.

The quoted companies realize greater benefits from dual listings on more than one stock exchange in view of the availability of higher degree of liquidity on the markets. The intermediaries acting competitively drive down trade fees and commissions and generate the so called “cross network” effects. Besides these external effects it can be recognized that there also exists a “direct external” effect. It relates to the fact that companies occasionally seek listing on a stock exchange where there is a large number of other listed companies since this proves the high quality of services offered by the respective stock exchange. Among the other external effects there are indirect effects as deeper market; higher quality of supplementary activities for stock exchanges services as clearing and settlement; easier access to exchange information due to larger financial market, etc.

An analysis of coordinated mergers undertaken by Di Noia¹ based on Nash equilibrium and game theory establishes that coordinated mergers lead to improved public well-being in all cases. They always drive up the aggregate consumer surplus, except where the stock

¹ Di Noia C., (1998) “Competition and Integration among Stock Exchanges in Europe: Network Effects, Implicit Mergers and Remote Access”, Financial Institutions Center, University of Pensilvaniya.

exchange has higher marginal costs than the external effects. Competition among different stock exchanges may only appear when they operate on one and the same or “relevant market”. The coordinated merger approach is based on the assumptions of a profitable stock exchange which reduces its marginal costs and whose quotations are within such limits that allow application of competitive models. If there is a monopolistic stock exchange which is effective in its competitive behavior, a coordinated merger does not lead to an effect boosting social wellbeing. Under conditions of a unique Nash equilibrium a stock exchange operating at a loss has marginal costs exceeding the external network effects. According to the Di Noia model competition among stock exchanges may end up setting up of a monopolistic structure in case of failure to reach an agreement. Thus under conditions of trading with highly specialized and tailored securities dominant position acquires the stock exchange offering these financial instruments.

Coordinated mergers are definitely a strategic option for stock exchanges since they lead to generation of greater profits. Accordingly, a stock exchange which remains outside a given merger agreement could not operate in a normal competitive environment listing unilaterally the securities traded on the other exchange(s). Coordinated mergers always lead to improved public well-being, thus regulatory bodies should encourage these forms of integration and consolidation among stock exchanges by eliminating the remaining barriers regarding the listing and delisting of securities on these stock exchanges and relating to trade execution processes by providing possibilities for remote access to stock exchanges. The competition and the EU regulatory requirements give an impetus to stock exchanges toward coordinated mergers. The coordinated mergers models of Domowitz¹, Katz and Shapiro² also demonstrate that stock exchanges can reach high degree of specialization in listing and securities trading activities.

The model of Di Noia assumes the case of horizontal consolidation among stock exchanges, in which the participants reach a high degree of harmonization in trading practices and have the freedom to choose clearing and settlement services providers. Similar competitive models are supported by the European Forum of Securities Associations³. The establishment of a pan-European clearing infrastructure (for example, through implicit coordinated merger among LCH.Clearnet, Eurex Clearing, EuroCCP, etc.) may be expected to generate two important external effects: diminishing the volume of transactions (due to the mutual netting of exposures through the use of

¹ Domowitz I., (1995), “Electronic Derivatives Exchanges: Implicit Mergers, Network Externalities and Standardization”, *Quarterly Review of Economics and Finance*

² Katz M. and Shapiro C., (1985), “Network Externalities, Competition and Compatibility”, *American Economic Review*.

³ European Forum of Securities Associations (2006) Post-Trading in Europe – Calls for Consolidation

central counterparty) and optimizing the collateral management process. The use of the services of a central counterpart in Europe is also encouraged by G-30¹ in view of mitigating the risks (mostly operational ones due to the attainment of a high degree of transparency and mutual interoperability in interfaces).

On the other hand through the development of a single pan-European settlement infrastructure (for example, among Euroclear and Clearstream International) are expected reductions in crossborder settlement fees, unified membership rules, optimization of costs and effective risks management. Such conclusions are also reached in a report of a Bourse Consult², according to which the stock exchanges should not have control over post-trade processes (clearing-settlement). The existing vertically integrated structures create barriers in front of the effective competition along the transactions chain. As a first step in the establishment of harmonized settlement infrastructures at the EU level, in 2009 ten leading central securities depositories (Clearstream Banking AG Frankfurt, Cyprus Stock Exchange, Hellenic Exchanges S.A., IBERCLEAR (Spain), MCDR (Egypt), Oesterreichische Kontrollbank AG (Austria), SIX SIS AG (Switzerland), STRATE (South Africa), VP SECURITIES (Denmark) и VPS (Norway)³ entered in a cooperation agreement for setting up a joint venture Link Up Markets Capital S.L. in view of improving the effectiveness and reducing costs in cross-border settlement of transactions.

Consequently, the establishment of a competitive pan-European stock exchange and harmonized post-trade infrastructure is of paramount importance for EU capital markets since investors evaluate the capital markets as integrated and undertake strategies based on economic sectors and not on geographic segmentations. Important driving factors in this process are technological advances which support the transition from traditional trade methods to platforms for electronic execution of trades and the heightened competition on the part of multifunctional trade facilities. The development of unified pan-European exchange and post trade infrastructure is considered to boost the effectiveness of supervision and to strengthen the coordination efforts in preventing market abuses, misuse of inside information and preservation of financial stability on regional and global scale.

In Central and Eastern Europe an example of horizontal form of consolidation is followed by the Central and Eastern Europe Stock Exchange Group AG (CEESEG AG). The integration model of CEESEG AG includes consolidation of the stock exchanges of Vienna, Budapest, Ljubljana and Prague through the development of a parent holding company and regional subsidiary entities with independent management and

¹ Group of Thirty (2006) Global Clearing and Settlement – Final Monitoring Report.

² Bourse Consult (2005) "The Future of Clearing and Settlement in Europe", City research series N 7.

³See www.linkupmarkets.com

establishment of a high degree of harmonization of trade execution, clearing and settlement infrastructures. A fundamental strategic objective¹ of the parent structure CEESEG AG is the consolidation of the regional markets of the stock exchanges of Vienna, Budapest, Ljubljana and Prague and urging their future development and boost in liquidity. Among the important mid-term objectives of the Group is implementation of the electronic trade platform XETRA on the subsidiaries stock exchanges and establishing cross-membership process among them. The long-term strategy of the Group envisages harmonization of market segments, the general business terms on regional scale, reaching high degree of interoperability in the clearing and settlement process and diversification of the financial instruments product range.

On an international level CEESEG AG undertakes coordinated efforts for increasing the visibility of the four regional markets and the distribution of services through entering into various agreements for distribution of exchange-traded market data, index quotation licenses, etc. By 2013 CEESEG AG concluded index cooperation agreements with over 12 countries in the CEE region which supports the rising visibility of the companies in the region and boosts total liquidity levels and trades volumes. In 2013 the stock exchanges of the four countries generated over 60 % of turnover on CEE capital markets. The common electronic trades' the platform XETRA has already been implemented on the four stock exchanges. Cross listings on the regional stock exchanges and the potential for their visibility on other markets in Europe is facilitated through a direct link of the CEESEG AG with the Frankfurt stock exchange operated by Deutsche Boerse. By 2013 the total market capitalization of the Group reached 127 billion EUR while the total turnover amounted to EUR 68.5 billion². The Group calculates two group indices – CEETEX and CEESEG Composite Index. The first index includes 25 of the most frequently traded shares of companies with the highest market capitalization on the four stock exchanges, while the other index consists of the four leading stock indices of the Group stock exchanges (ATX, BUX, PX и SBITOP) and serves as a benchmark.

2. Comparative Analysis among the Stock Exchanges of Selected Danube Region EU Member States

2.1. The Bulgarian Stock Market Development

By 2013 the Bulgarian capital market remains limited in size and insufficiently developed as compared to the Eurozone countries and Central and Eastern European (CEE) member-states. A report by the IMF (IMF Working Paper, WP 2012/131) outlines the necessity to continue development of the capital market in Bulgaria in view of

¹ CEESEG (2013), The CEE Stock Exchange Group and its Capital Markets 2012/2013.

accelerating economic growth and productivity through further structural reforms. It should also be emphasized that while most of the CEE countries (especially Hungary and the Czech Republic) are undergoing an intensified convergence process toward the EU economic structures, the expectations for Bulgaria are divergences from the average EU indicators to remain significantly pointed (Economic Research Institute at BAS, 2012).

In the wake of the global financial crisis by 2013 the market capitalization of the the Bulgarian Stock Exchange – Sofia AD as a share of GDP continued its downward evolution and reached 12.75 %, while for 2012 it stood at 12.67% (Financial Supervision Commission, 2013) yet it remains at considerably a low level as compared to the Eurozone average (for 2013 standing at 58.1% - ECB Convergence Report, 2014). The low liquidity is the chief shortcoming of the capital market in Bulgaria. It is explained by the low volume of free float as well as with the outflow of foreign investors from the Bulgarian capital market in the aftermath of the developments of the global financial and economic crisis.

In 2013 secondary public placements continued to predominate. The main reasons for this continue to be the high costs relating to fees and commissions, the requirements for disclosure of information under the Law on Markets in Financial Instruments and the Law on Public Offering of Securities, as well as the lengthy procedures for approval of prospectuses. By 2013 the turnover on the regulated market recorded a rise by over 43 % as compared to the same period of 2012 due to the rise in turnover with traded shares and shares in collective investment schemes. The two main stock exchange indices SOFIX and BGTR30 marked a further push-up by 43 % and by 27.98 %, respectively as compared to 2012. As from 2012 the stock exchange introduced a lengthened trade sessions schedule to achieve further synchronization of trades' terms to that of European capital markets.

2.2. The Romanian Stock Market Development

From regional viewpoint the Bucharest Stock Exchange (BSE) is an average stock exchange. In 2013 the trading turnover on BSE reached EUR 171 million, the highest being the turnover volume on the regulated market (86%), followed by that on RASDAQ (5%), the bonds markets (4.5%) and the turnover on the structured products market (3.8%). As from 2011 the BSE introduced short sales transactions and increased further the number of traded derivative financial instruments aimed at the adoption of hedging or speculative strategies. More specifically the issues of index-based and turbo certificates contribute to boosting the attractiveness of the structured products market.

Besides the main regulated market, operated by BSE since 1997, in Romania a derivative market SIBEX (Sibiu Stock Exchange), has been functioning organized initially as a commodity exchange. The derivatives market offers trades in futures,

options, binary options, contracts for differences, etc. The futures segment includes over 15 products as futures contracts over oil, DJIA index, currencies contracts based on EUR/RON and on gold.

As from 2011 BSE has been added to Dow Jones Global Exchanges Index which allows for juxtaposing developments in the value of shares at BSE against other regulated equities markets. It has signed memoranda of cooperation with the stock exchanges of Bulgaria, Amman, Moldova, Vienna, Thessaloniki, Athens, Tokyo, London and the BSE has been a member of the Federation of the Euro-Asian Stock Exchanges since 2009.

The central securities depository of Romania provides a settlement cycle T+3 and as from 2010 it has established an operational link with US central depositories, while starting from 2012 (under signed cooperation agreement with the Bulgarian central securities depository) it has been in process for the development of direct access link with Bulgaria. This link will allow for dual listings and cross-listings of equities on the two markets. In 2012 BSE introduced the first Romanian exchange traded fund for collective investments in transferable securities on the regulated market and the fund tracks the development of the leading stock exchange index BET (Bucharest Stock Exchange, 2013).

2.3. The Slovak Stock Market Development

The stock exchange of Bratislava (BSSE) started its activities in a similar way to the countries of Southern Europe and more precisely in 1991. Its founders are several banks and insurance companies and it functions on the principle of membership. Only its members (which are 16) and the National Bank of Slovakia are authorised directly to conclude transactions on it. As from 2008 the license of the stock exchange permits it to execute transactions through Multilateral Trading Facility (MTF). In 2004, owing to accession of Slovakia to the European Union, BSSE became full member of the Federation of the European Securities Exchanges (FESE), which significantly improved its visibility among investors. This entirely boosts the opportunities of BSSE for international cooperation.

According to data from FESE (FESE, 2013), BSSE is one of the small-sized stock exchanges in Western Europe. By 2013 its market capitalization amounted to EUR 3.5 billion. The main market index SAX in 2013 strengthened by 2.79% against the end of 2012. The traded volumes include shares of private and public companies while the trade in international bonds marks zero values during the first two quarters of 2014.

The market segmentation of BSSE includes regulated market and MTF. The regulated market is divided into Listed Market (which on its part is subdivided into Listed Main

Market with 25 securities traded in 2013 and Listed Parallel Market with 43 issues listed) and Regulated Free Market on which in 2013 were traded 186 issues of securities. Shares, bonds (including municipal bonds) and investment certificates in closed-end funds are mainly objects of trade on BSSE and up to now only one foreign company has listed its shares on the Slovak capital market. Transactions concluded by non-residents in 2013 accounted for 57.59% of the total trading volume. Natural persons achieved a 0.46% share in total turnover, the remaining part belongs to legal entities.

BSSE does not yet offer derivative trading, neither trade in exchange traded funds, investment funds, Eurobond funds, depository receipts etc. Securities lending is permitted in accordance with the Securities and Investment Services Act, but due to underdeveloped market practices securities lending is non-existent on an organized basis in Slovakia. Short-selling is not allowed on the capital market segments yet. The settlement cycle at the Securities Depository is T +3 for bond and equity markets.

2.4. The Croatian Stock Market Development

The Zagreb Stock Exchange (ZSE) is an example of a small, but exclusively rapidly progressing market. Upon the accession of the country to EU in July 2013 Croatia undertook significant steps in harmonization of its legislation with the EU requirements, yet in order to attract foreign investments, there are still some administrative burdens to be removed and the competitiveness of the country to be increased.

The ZSE started functioning in 1991 and its founders were initially 25 banks and 2 insurance companies. In 1994, for the first time the exchange introduced an electronic trading platform and this led to almost 10-fold (982.6%) increase in the market capitalization of the stock exchange over the period 1995-2000. So far the used trade platform is NASDAQ OMX's X-Stream and various modifications of the OMX platform have been in usage in over 40 stock exchanges in Europe, Asia and Australia. In 2007 the consolidated Croatian financial market, namely Varaždin Stock Exchange merged with the ZSE. In parallel with the improved investment climate in the country, this led to boosting the interest of the market participants to the already united capital market of Croatia in new financial products.

At the international level the ZSE also plays an important role. It is among the founders of the Federation of Euro-Asian Stock Exchanges (FEAS), an associated member of the FESE and works in close cooperation with organizations as OECD. In May 2014 The Bulgarian, the Macedonian and the Zagreb Stock Exchanges have announced that with the assistance of the European Bank for Reconstruction and Development have established a common fund company located in Macedonia, whose purpose will be the creation of a regional infrastructure for trade in securities, listed on these three markets. The share of non-residents on the local capital market of Croatia is still very small and

one of the key drawbacks of the Croatian market is the still very low liquidity (Raiffeisen Research, 2013).

The main segments of the ZSE are Regulated market, MTF (MTF – Fortis, MTF – Alter and MTF - X) and OTC (over-the-counter market), the main difference between the first two being the level of transparency (Zagreb Stock Exchange, 2014). The Regulated Market is subdivided into three segments: Prime Market, Official Market and Regular Market and according to the Capital Market Law all transactions, effected on the Regulated market, should be obligatorily disclosed. The set free float on Regular market is minimum 15 %, while the requirements for listing of shares on the Prime Market is free float of minimum 25 % and market capitalization of minimum EUR 1 million. The market capitalization of ZSE reached one of its highest values in 2014, i.e. EUR 26 billion. The main indices are CROBEX10 for the 10 blue-chip shares, the broader CROBEX (consists of the 25 most liquid stocks) and CROBIS for bonds. The ZSE also traded rights, commercial papers and structured products (among which index, turbo, bonus and discount certificates).

3. Factors Influencing the Development of the Selected Danube Region Stock Markets

According to a research (IESE Business School, 2010) the six most important factors which determine the relative attractiveness of the capital market (and, in particular, the venture capital market) of a given country for investors (domestic and foreign) relate to the following:

1) Economic activity – this includes level of economic growth and GDP, inflation, net flows of foreign direct investments etc.

Over the period May 2013 – April 2014, the 12-month average rate of inflation in **Romania** was 2.1 % (above the reference value of 1.7 % for the criterion of price stability). Real GDP grew by 3.5% on average in 2013 after a very moderate 0.6 % in 2012. The government budget balance showed a deficit of 2.3 % of GDP. The general government gross debt-to-GDP ratio was 38.4%.

In **Bulgaria** the Currency Regime introduced in 1997 guarantees the preservation of financial stability. The reported budget deficit for 2013 amounted to 1.5 % of GDP and remains sufficiently below the EU reference value of 3 %.The ratio of gross domestic debt to GDP by 2013 stood at 18.9 %, lower than the EU reference value of 60 %. The level of inflation kept falling down from 3.4 % in 2011 to 0.4 % in 2013. Real GDP growth rate overcame the negative tendency of -5.5. % in 2009 and gradually started rising from 0.6 % in 2012 to 0.9 % 2013.

In the **Slovak Republic** during 2013 the inflation rate continued to fall while the inertia inflation for the period 1987-2014 is on average 1.92 %. Over 10 years the country's budget is in deficit. Since 2009 onwards the values of the indicator started to decrease and in 2014 the budget deficit reached its pre-crisis level of 2.8 %. The external debt which is usually tracked by investors as a relevant measure for the capacity of the country to service its future debt payments from 35.6% in 2010 rose to 55.4 % in 2014.

As in the Slovak Republic, in **Croatia** since the beginning of 2014 deflationary processes (average rate of inflation was 1.1%) are observed. The external debt of Croatia in 2014 is at higher levels as compared to 2013 (when it stood at 100% of GDP), while the government debt in January 2014 reached its highest level for the last 10 years of 61.7 % of GDP and the general government balance recorded a deficit of 4.9 % of GDP. This led to the imposition of procedure of an excessive deficit by the European Commission and undertakings by Croatia to improve the institutional framework of its public finances, to increase the effectiveness of its tax administration and to provide opportunities for implementing growth policies, including with the involvement of EU financing - all this with the purpose to decrease its economic disbalances.

2) Entrepreneurial culture – capacity of the country for innovations, R&D costs, etc.

R&D expenditures in Bulgaria for 2011 were 0.60% of GDP and according to this indicator **Bulgaria** lags behind the average EC-28 value of 2 % for 2010 and according to the National Framework Programme Europe 2020 this indicator should be between 1.4 % and 2 %. **Romania** plans to increase R&D expenditures to 2 % of GDP by various incentives for boosting private investments in science and research and along the lines of the utilization of EU funds.

According to EU Innovation Union Scoreboard (2011) **Bulgaria and Romaina** are in the group of "modest" innovators, while **the Slovak Republic** is in the group of "moderate" innovators (together with **Hungary** and **the Czech Republic** from CEE). **Croatia** occupies 75th position out of 148 countries in the world in global competitiveness (Bulgaria on 57th place and Romania on 78th, WEF, 2013-2014).

3) Depth of the capital market – relates to the existence of well-developed capital market measured by the market capitalization or the number of listed public companies. The predominance of bank-based financing is a sign of weakly developed capital market, which restricts the entrepreneurial activities due to the conservative approach of banks to financing.

The market capitalization of the **Bulgarian stock market** shows progressive decline in recent years from a peak of 48.2 % of GDP in 2007 to just 12.7 % at the end of 2013.

Bulgaria's financial sector is heavily bank-based with credit to non-government residents increasing very rapidly between 2004 and 2009 and amounting to 70.8 % of GDP in 2013.

In **Romania** the stock market capitalization stood at 11.6 % of GDP in 2013, compared with 17%-18% that Romania generated during the period 2005 – 2007 in view of the financial expansion prior to the global financial and economic crisis. Bank financing as measured by credit to non-government residents amounting to 34.8 % of GDP in 2013 points to a more balanced structure between bank-based and stock market generated financing.

In the **Slovak Republic** the market capitalization continued its upward development trend in the course of over 13 years, and from EUR 6 billion in 2000, in 2013 it stood at EUR 3,5 billion, yet as a share of GDP it amounted to 4.7 %. A strong point is the Eurozone membership which supports the institutional framework and increases the attractiveness of Slovakia as a destination of foreign investments.

The stock market capitalization in **Croatia** stood at 38.4% of GDP in 2013 and was relatively high in comparison with the other CEE stock markets. Croatia's financial sector is heavily bank-based with credit extended to non-government residents amounting to 76.1 % of GDP in 2013-end (Euro area average being 125 % of GDP).

4) Protection of investors and corporate governance – the presence of a stable legal framework which safeguards the rights of investors and high corporate culture. The stock markets of the analyzed Danube region countries have established well-based market practices for the protection of investors through adopted and maintained corporate governance codes, which is an important factor for boosting the competitiveness of these capital markets.

5) Taxation – the low tax rates of corporate tax and more tax preferences are also significant factors for encouraging the investments on the capital market.

In **Bulgaria** the capital gains tax is 10 % accrued to non-resident entities and there is a 5 % withholding tax on distribution of dividends to residents and non-residents (excluding EU/EEA entities). Regarding **Romania** there is a uniform capital gains and dividend withholding tax of 16 %.

In **Slovakia** the corporate tax rate has increased from 19 % to 22 % as from 2014. The withholding tax rate has increased as from 2013 to 23 % for corporate entities and for private individuals to maximum 25 %. Dividends are exempt since 2004 for both residents and non-residents. According to a report by IMF (IMF, 2014) the reduction in the high taxes on investment income and the prospective lowering of transaction fees would be important factors for widening the currently limited capital market activity. The

report explicitly underlines the opportunities for cooperation with more established stock exchanges in the region.

Currently in **Croatia** the corporate tax rate is 20 % and there is a 12 % withholding tax on dividends. In all cases double taxation treaties are taken into consideration.

6) Social environment – level of corruption and size of unregulated (grey) economy, etc.

According to the Global Perception Index 2013-2014 (which measures the perceived level of public sector corruption on a scale of 0-100, where 0 means a country is perceived as highly corrupt and 100 means a country is perceived as highly clean), **Romania** occupies the 69th position out of 175 countries (score 43), followed by **Bulgaria** on 77th position (score 41). Ahead of them in CEE are **Slovakia** (score 47), the Czech Republic and **Croatia** (score 48), Hungary (score of 54), Slovenia (score of 57) and Poland (score of 60).

Last but not least, it should be pointed out that in a research of Visa Europe for 2013 among all 31 countries, **Bulgaria** reported the highest share of grey economy of 31 % of GDP, while **Romania** achieved a 28 % share (similar to that of Slovenia, Turkey, Lithuania, Estonia and **Croatia**). The lowest share of grey economy in CEE is in **Slovakia** (15 %) and the Czech Republic (16%), whereas the European average share is 18.2%.

4. Analysis of Correlations among Stock Exchange Indices of the Selected Danube Region Stock Exchanges

a) The Bulgarian and Romanian stock exchange indices SOFIX and BET

Applying correlation analysis to the **Bulgarian and the Romanian** capital markets, it has been established that the correlation coefficient between SOFIX and BET indices for the period 2000-2013 stands at 0.78, which expresses a rather strong link. The coefficient of determination R^2 is 0.608, which explains that over 61 % of the changes in SOFIX may be attributed to changes in the variation of BET¹. The empirical results confirm that between the Bulgarian and the Romanian stock exchange indices SOFIX and BET there is a **significant correlation**. In a study by Todur (2011) using Granger tests, the author also established that the correlation coefficient between SOFIX and BET after 2009 reached $R = 0.94$.

¹ In Table 1 (Appendix 1) we observe that $b_1 = 0.1177$ and we can conclude that for each increase of 1 % in the value of BET the predicted value of Y (SOFIX) is estimated to increase by about 12%. The value of p is 0.0009944 $< \alpha = 0.05$, thus we can reject the null hypothesis (no correlation between SOFIX and BET). The Durbin-Watson statistic stands at 1.094, which means that the residuals are not auto-correlated and that the least-squares method used in the regression analysis is valid.

b) The Slovak and the Bulgarian stock exchange indices SAX and SOFIX

The applied correlation analysis for the **Slovak and the Bulgarian** stock indices (SAX and SOFIX) shows that $R = 0.75$ and $R^2 = 0.56$. The analysis leads to the acceptance of the alternative hypothesis of **more than average correlation** among the two stock exchange indices¹.

c) The Romanian and the Croatian stock exchange indices BET and CROBEX

Regarding the integration links between the **Romanian and the Croatian** stock exchange indices BET and CORBEX for the period 2000 – 2013, it is the following: the correlation coefficient $R = 0.847$ denotes the existence of a significant correlation between the analyzed indices, while the determination coefficient $R^2 = 0.717^2$. The analysis leads to the acceptance of the alternative hypothesis of **significant relationship** among the two stock exchange indices.

d) The Slovak and the Croatian stock exchange indices SAX and CROBEX

As for the **Slovak and the Croatian** stock exchange indices (SAX and CROBEX) the analysis leads to the following inferences: correlation coefficient $R = 0.81$ and coefficient of determination $R^2 = 0.66^3$. The analysis leads to the acceptance of the alternative hypothesis of **significant relationship** among the two stock exchange indices as well.

e) The Bulgarian and the Croatian stock exchange indices SOFIX and CROBEX

The correlation analysis of the **Bulgarian and the Croatian** stock indices (SOFIX and CROBEX) presents the following results: correlation coefficient $R = 0.92$ and coefficient of determination $R^2 = 0.85^4$. The analysis leads to acceptance of the alternative

¹ In Table 2 (Appendix 1) and by the value of $b_1 = 0.1824$ we can draw a conclusion that for each increase of 1 % in the value of SOFIX the predicted value of Y (SAX) is expected to increase by about 18% and this result is statistically significant since $p = 0.002104 < \alpha = 0.05$. The Durbin-Watson statistic stands at 1.037, which means that the residuals are not auto-correlated and that the least-squares method used in the regression analysis is appropriate.

² In Table 3 (Appendix 1), regarding the value of $b_1 = 0.3561$, we can draw a conclusion that for each increase of 1 % in the value of CROBEX the predicted value of Y (BET) is expected to increase by about 36% and this result is statistically significant since $p = 0.000131 < \alpha = 0.05$. The Durbin-Watson statistic stands at 1.206, which means that the residuals are not auto-correlated and that the least-squares method used in the regression analysis is appropriate.

³ In Table 4 (Appendix 1), regarding the value of $b_1 = 0.0714$, we can draw a conclusion that for each increase of 1 % in the value of CROBEX the predicted value of Y (SAX) is expected to increase by about 7% and this result is statistically significant since $p = 0.000371 < \alpha = 0.05$. The Durbin-Watson statistic stands at 1.059, which means that the residuals are not auto-correlated and that the least-squares method used in the regression analysis is appropriate.

⁴ In Table 5 (Appendix 1), the value of the coefficient $b_1 = 0.3306$ indicates that for each increase of 1 % in the value of CROBEX the predicted value of Y (SOFIX) is expected to increase by about 33%.

hypothesis about the **significant relationship** between SOFIX and CROBEX ($p = 0.000000298 < \alpha = 0.05$). The results in point d) above and in point e) are in line with the results of a study by Visek *et al.* (2006), who analyzed the daily closing price indices for the Slovenian, Hungarian, Czech, Polish, German and Croatian stock markets for 1997-2006. The results suggest that the Croatian equity market has achieved certain level of multilateral integration with the analyzed CEE markets and the German market.

f) The Slovak and the Romanian stock exchange indices SAX and BET

Finally the correlation analysis of **Slovak and Romanian** stock indices SAX and BET for 2000 -2013 shows that the coefficient of correlation $R = 0.50$ and $R^2 = 0.25^1$. The main conclusion from the analysis is that we can confirm the null hypothesis that **there is no strong relationship** between the two stock markets ($p = 0.071289 > \alpha = 0.05$). This result is in line with a study of Svilokos (2012), which covered data of daily stock market indices of Britain and Germany, as well as selected new EU member states (Slovakia, Hungary, the Czech Republic and Slovenia) for the period 2001-2009. Due to unequal market recovery in 2009, for the Slovak capital market a reduced level of co-integration was found, which means that local factors prevailed. Another study by Nikkinen (2007) including data for the period 1997-2007 came to the conclusion that the stock markets of Romania and Slovakia appear to be segmented with respect to the world market portfolio. Slovakia is not Granger caused by either world or other frontier markets except for weak evidence of direction Romania \rightarrow Slovakia. Moreover, Slovakia does not Granger cause any of the analyzed frontier markets (Croatia, Estonia, Romania and Slovenia).

5. Methodology and Results from the Empirical Analysis of Quantitative Variables on the Selected Danube Region Capital Markets

The identification of the determinants (factors) having the strongest influence on the development of the analyzed Danube Region stock exchanges for the period 1990 – 2014 is achieved by application of multiple regression analysis according to the following equation:

$$Y = \beta + \beta_1.X_1 + \beta_2.X_2 + \dots + \beta_p.X_p + \varepsilon \quad (1)$$

The Durbin-Watson statistic stands at 1.603, which means that the residuals are not auto-correlated and that the least-squares method used in the regression analysis is valid.

¹ In Table 6 (Appendix 1), the coefficient $b_1 = 0.018265032$ indicates that for each increase of 1 % in the value of BET, the predicted value of Y (SAX) is expected to increase by about 2 %. The Durbin-Watson statistic stands at 0.544, which means that the residuals are partially auto-correlated.

where:

Y is the dependent variable representing the value of the market capitalization of the respective Danube stock exchange

X_1, X_2, \dots, X_p are the included independent variables

β_i are the regression coefficients

ε is the standard error of the model

The **assumptions** necessary for regression are similar to those of the analysis of variance because both are part of the general category of *linear models*. The tested **assumptions of the regression model** are as follows:

- Linearity
- Independence of errors
- Normality of error

Table 1: Variables included in the model and sources of information

Variable	Symbol	Expected value	Source of Data
Market Capitalization in million USD (Y)	Market CAP	Not applicable	World bank
FDI in million USD (X_1)	FDI	+	World bank
Real GDP in % (X_2)	GDP	+	World bank
R&D as % of GDP (X_3)	R&D	+	World bank
Interest Rate in % (X_4)	IR	+/-	World bank
Legal Rights Index ¹ (X_5)	LRI	+	World bank

Source: the author.

The regression analysis is based on a value of $\alpha = 0.05$.

5.1. The Bulgarian Capital Market Empirical Results

We determine simultaneously the influence of the included **independent variables** – FDI, GDP, Interest Rate, R&D expenditures, Legal Rights Index on the respective dependent

¹ The Legal rights index is calculated by the World Bank and measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitates lending and financing. The highest score is 12 and indicates that laws are better designed to expand access to financing.

variable – the market capitalization. In the table 1 (Appendix 2) the correlation matrix shows that only the correlation coefficient $R = 0.590$, expressing the relation between FDI and LRI is statistically significant since for it $\text{Sig.}t = 0.002 < \alpha = 0.05$.

Table 1: ANOVA^c

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	390719.929	1	390719.929	5.219	.032 ^a
	Residual	1721762.713	23	74859.248		
	Total	2112482.642	24			
2	Regression	874283.751	2	437141.876	7.767	.003 ^b
	Residual	1238198.891	22	56281768		
	Total	2112482.642	24			
a. Predictors: (Constant), LegalRightsIndex						
b. Predictors: (Constant), LegalRightsIndex, GDP						
c. Dependent Variable: MarketCAP						

Source: Own calculations.

Table 1: ANOVA it is obvious that the calculations are done in two steps. The multiple regression model is applicable since in the second step $\text{Sig. } F = 0.003 < \alpha = 0.05$. The application of the stepwise multiple regressions starts by including all factor variables and by excluding that independent variable which has a correlation coefficient greater than the statistical error (*i.e.* greater than 0.05) till reaching the factor variable which can determine the lowest possible deviation of Fisher's coefficient.

Table 2: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Beta	Beta		
1	(Constant)	258.956	73.124		3.541	.002
	LRI	-27.983	12.249	-.430	-2.285	.032
2	(Constant)	269.581	63.508		4.245	.000
	LRI	37.948	11.151	-.583	-3.403	.003
	GDP	28.605	9.759	.502	2.931	.008
a. Dependent Variable: Market CAP						

Source: Own calculations.

Table 2: Coefficients show that the analysis included only the variables LRI and GDP, while the other three variables (R&D, IR and FDI) are excluded. The coefficients $b_1 = 37.948$ and $b_2 = 28,605$ are statistically significant because for them $\text{Sig. } t = 0.003 < \alpha$

=0.05 and $Sig. t = 0.008 < \alpha = 0.05$. According to the empirical results 100 units increase in GDP leads to an increase in market capitalization on the Bulgarian stock exchange by 28.605 units. On the other side, the increase by 1 unit of the LRI leads to increase of the market capitalization by 37.948 units.

The Legal Rights Index for Bulgaria for the period 2004-2014, as calculated by the World Bank, shows a constant score of 9, indicating an above average protection of the rights of borrowers and lenders throughout the years.

Regarding the real GDP growth rate, after 2002 it has been increasing from 4.7 % to peak 6.7 % in 2004 and then it has followed a downtrend. As from 2003 the market capitalization in Bulgaria started an upward development from about 1.7 billion USD and by 2007 the indicator peaked to 21.7 billion USD.

Table 3: Model Summary^c

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.430 ^a	.185	.150	273.60418	
2	.643 ^b	.414	.361	237.23779	1.414
a. Predictors: (Constant), LegalRightsIndex					
b. Predictors: (Constant), LegalRightsIndex, GDP					
c. Dependent Variable: MarketCAP					

Source: Own calculations.

Table 3: Model Summary states that the correlation coefficient expressing the influence of LRI and GDP on the capitalization of the Bulgarian stock exchange is $R = 0.643 < 0.9$. It shows that between the Bulgarian stock exchange market capitalization, LRI and GDP there is an average correlation. The determination coefficient $R^2 = 0.414$ shows that only 41 % of the changes in the variation of the Bulgarian stock exchange market capitalization depends on the change in the variation of LRI and GDP, while the remaining 59% is affected by other factors.

5.2. The Croatian Capital Market Empirical Results

For Croatia, from the correlation matrix Table 2 (Appendix 2), it is obvious that the correlation coefficient $R = 0.603$, expressing the relation between FDI and LRI is statistically significant (since for it $Sig.t = 0.003 < \alpha = 0.05$) and the correlation coefficient $R = 0.547$, expressing the relation between R&D and FDI is also statistically significant ($Sig.t = 0.008 < \alpha = 0.05$) Thus we may proceed by applying the stepwise multiple regression model.

The following results are obtained:

Table 4: ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3327.753	1	3327.753	31.176	.000 ^a
	Residual	2134.825	20	106.741		
	Total	5462.578	21			
a. Predictors: (Constant), FDI						
b. Dependent Variable: Market_Capitalization						

Source: Own calculations.

Table 4: ANOVA; it is clear that the calculations are done in one step. The multiple regression model is applicable since $Sig.F = 0,000 < \alpha = 0,05$.

Table 5: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Beta	Beta		
1	(Constant)	-.906	3.159		-.287	.777
	FDI	.008	.001	.781	5.584	.000
a. Dependent Variable: Market_Capitalization						

Source: Own calculations.

At the first step is included only the variable FDI, while the model excludes the other four independent variables. The constant $b_1 = 0.008$ is statistically significant because for it $Sig.t = 0.000 < \alpha = 0.05$. Thus 1 % increase in FDI leads to an increase of the market capitalization on the Croatian stock exchange by 0.008 % according to the data.

The FDI in Croatia started to increase in 1999 and throughout the years fluctuated around 2 billion USD, the highest value being reached in 2008, of 5,8 billion USD. By the same period the market capitalization also followed an uptrend peaking to 66 billion USD in 2007.

Table 6: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.781 ^a	.609	.590	10.33157	1.870
a. Predictors: (Constant), FDI					
b. Dependent Variable: Market_Capitalization					

Source: Own calculations.

The correlation coefficient R expressing the total influence of the factor FDI on the Croatian stock exchange market capitalization is $R = 0,781$ and shows that between market capitalization and FDI there is a statistically significant relationship. The determination coefficient $R^2 = 0,609$ shows that 61 % of the changes in variation of the market capitalization is explained by changes in the FDI.

5.3. The Romanian Capital Market Empirical Results

For Romania from the correlation matrix Table 3 (Appendix 2) it is obvious that the correlation coefficient $R = 0,698$ expressing the relation between FDI and LRI is statistically significant since for it $Sig.t=0,000 < \alpha=0,05$.

The following results are obtained by the application of stepwise regression:

Table 7: ANOVA^c

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.394E9	1	2.394E9	28.145	.000 ^a
	Residual	1.871E9	22	8.504E7		
	Total	4.264E9	23			
2	Regression	2.757E9	2	1.378E9	19.204	.000 ^b
	Residual	1.507E9	21	7.178E7		
	Total	4.264E9	23			
a. Predictors: (Constant), FDI						
b. Predictors: (Constant), FDI, Legal_Rights_Index						
c. Dependent Variable: Market_Capitalization						

Source: Own calculations.

Table 7: ANOVA; it is clear that the calculations are done in two steps. The multiple regression model is applicable since in the second step $Sig.F = 0.000 < \alpha=0,05$.

Table 8: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Beta	Beta		
1	(Constant)	1897.504	2453.502		.773	.448
	FDI	2.620	.494	.749	5.305	.000
2	(Constant)	563.074	2330.836		.242	.811
	FDI	1.625	.634	.465	2.564	.018
	LRI	1188.437	528.134	.408	2.250	.035
a. Dependent Variable: Market_Capitalization						

Source: Own calculations.

The second step includes only the variables FDI and LRI, while the other three independent variables are excluded. The constants $b_1 = 1.625$ and $b_2 = 1188.437$ are statistically significant because for them $Sig.t = 0.018 < \alpha = 0.05$ and $Sig.t = 0,035 < \alpha = 0.05$. As the data above shows, 1 % increase in FDI leads to an increase of the market capitalization on the Romanian capital market by about 1.6 %. On the other hand, an increase by one unit in legal rights index, leads to rise in market capitalization by 1188.437 units, holding all other factors constant.

The Legal Rights Index in Romania according to data from the World Bank for the period 2004 – 2014 rose from 8 score to reach score 10 in 2014, indicating a rather strong protection of the rights of borrowers and lenders, which facilitates financing.

The FDI inflows rose as from 1999 from about 1,2 billion USD to reach a peak of 13,8 billion USD in 2008, after which with the onset of the global financial and economic crisis the indicator was on a downtrend. Regarding the market capitalization it marked a peak in 2007 of 44,9 billion USD, after which it followed a fluctuating downtrend.

The correlation coefficient R expressing the total influence of the two factors (FDI and LRI) on the Romanian stock exchange market capitalization in the second step of the regression is $R = 0.804$ and it shows that between Market CAP, FDI and LRI there is significant relationship. The determination coefficient $R^2 = 0.647$ shows that 65 % of the changes in variation of the market capitalization is explained by changes in FDI and LRI.

Table 9: Model Summary^c

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.749 ^a	.561	.541	9221.77839	
2	.804 ^b	.647	.613	8472.43873	1.736
a. Predictors: (Constant), FDI					
b. Predictors: (Constant), FDI, Legal_Rights_Index					
c. Dependent Variable: Market_Capitalization					

Source: Own calculations.

6. The Slovak Capital Market Empirical Results

For Slovakia, the correlation matrix (Table 4 in Appendix 2) shows that $R = 0.630$ expressing the relation between FDI and LRI is statistically significant because $Sig.t = 0,002 < \alpha = 0,05$.

The following results are obtained from the regression model:

Table 10: ANOVA^c

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.012E7	1	6.012E7	94.785	.000 ^a
	Residual	1.142E7	18	634226.154		
	Total	7.153E7	19			
2	Regression	6.507E7	2	3.253E7	85.597	.000 ^b
	Residual	6461603.289	17	380094.311		
	Total	7.153E7	19			

a. Predictors: (Constant), Legal_Rights_Index
b. Predictors: (Constant), Legal_Rights_Index, GDP
c. Dependent Variable: Market_Capitalization

Source: Own calculations.

In Table 10: ANOVA we find that the calculations are done in two steps. The multiple regression model is applicable since in second step $Sig.F = 0.000 < \alpha = 0.05$.

Table 11: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Beta	Beta		
1	(Constant)	1440.958	239.963		6.005	.000
	LRI	441.111	45.308	.917	9.736	.000
2	(Constant)	956.628	229.140		4.175	.001
	LRI	421.423	35.497	.876	11.872	.000
	GDP	140.309	38.863	.266	3.610	.002

a. Dependent Variable: Market_Capitalization

Source: Own calculations.

In the second step only the variables LRI and GDP are included, while the other three independent variables are excluded. The constants $b_1 = 421.423$ and $b_2 = 140.309$ are statistically significant because $Sig.t = 0.000 < \alpha = 0.05$ and $Sig.t = 0.002 < \alpha = 0.05$. For every increase by unit in Legal rights index, there is an increase of market capitalization by 421.424 units and for every increase by 100 unit of GDP, market capitalization rises by 140.309 units.

The Legal Rights Index in Slovakia for the period 2004-2012 has been evaluated by a score of 8 by the World Bank, while after 2013 it has deteriorated to a score of 7, which

signifies the worsening of the legal protection of rights of borrowers and lenders and constrained access to financing.

Regarding the developments in the real GDP and market capitalization of Slovakia, it can be concluded that as from 2000 the GDP has been on the rise peaking to 10.5 % in 2007 after which it has entered a downtrend. The same applies to the indicator market capitalization which started an upward development in 2000 (1.2 billion USD) and marked a peak in 2007 of 6.9 billion USD.

Table 12: Model Summary^c

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.917a	.840	.832	796.38317	
2	.954b	.910	.899	616.51789	1.994
a. Predictors: (Constant), Legal_Rights_Index					
b. Predictors: (Constant), Legal_Rights_Index, GDP					
c. Dependent Variable: Market_Capitalization					

Source: Own calculations.

The correlation coefficient $R = 0.954$ in the second step expressing the total influence of the factors LRI and GDP on the Slovak stock exchange market capitalization proves a strong relationship. The determination coefficient is $R^2 = 0.910$ and shows that 91 % of the changes in variation of the market capitalization are explained by changes in LRI and GDP.

Based on the above empirical analysis for the four selected Danube region stock exchanges, it can be summarized that there exists a statistically significant relationship between FDI and market capitalization in Croatia and Romania. This is consistent with the results of Kalim *et al.* (2009) who established the complementary role of FDI on the stock market development by documenting that 1 % increase in FDI is associated with 0.409 % increase in market capitalization. Besides, Adam & Anokye *et al.* (2008) have observed that there exist a triangular causal relationship between FDI and stock market development: 1) FDI stimulates economic growth; 2) economic growth exerts a positive impact on stock market development and 3) FDI promotes stock market development. Errunza (1983) also found a long-term impact of FDI on stock market development. The study of Visek *et al.* (2006) concluded that significant FDI inflows from old EU countries could have had an effect on the increasing degree of multilateral financial integration among CEE and EU equity markets.

Legal rights index also correlates statistically with stock market capitalization in Bulgaria, Romania and Slovakia. Various other empirical studies confirm this

relationship. For La Porta, Lopez, Shleifer and Vishny (1996) investor protection is crucial because in many countries the expropriation of minority shareholders and creditors by the controlling shareholders is extensive. This is associated also with the agency problem investigated by Jensen and Meckling (1976). For La Porta *et al.* civil laws (French and other country laws modeled on it) give investors weaker legal rights than common laws (England and those laws modeled on English law) do, independently of the level of per capita income. Thus countries with poor investor protections have significantly smaller debt and equity markets. This evidence describes a link between the legal system and economic development. A study by Komijani *et al.* (2012) including a panel of 46 selected upper and lower middle income countries with dependent variable market capitalization relative to GDP and seven independent variables (among which the Investor Protection Index calculated by the World Bank) shows that the protection of shareholders has a positive and significant effect on stock market development - a one-unit increase in the strength of investor protection index leads to an increase in stock market capitalization relative to GDP by 9.542 %.

The GDP shows a significant statistical relationship with stock market capitalization in Slovakia and average relationship in Bulgaria. This is in line with the theoretical work of Demirguc-Kunt and Levine (1996a), Singh (1997) and Levine & Zervos (1998), who also show the positive links between economic growth and stock market development. The relationship between stock market development and economic growth was also investigated by Shabaz *et al.* (2008), who found long-run bi-directional causality between them. For a short period their results showed one-way causality – from stock market development to economic growth. Numerous other studies have also suggested that economic growth and stock exchange development are positively related to each other (Spears, 1991; Atje & Jovanic, 1993; Luintel & Khan, 1999, etc.).

Conclusions

The applied empirical correlation analysis shows potential for cooperation among the analyzed Danube region stock exchanges due to the statistically significant relationship between the stock market indices of Bulgaria, Romania, Slovakia and Croatia. The cooperation process may lead to enhanced capacities, reduced uncertainties and established competitive advantages that enable them to increase profits or gain future business opportunities. Stock exchanges that are located in regions with more harmonized regulatory structure and are committed to spending a relatively higher proportion of resources in trading systems and human capital have more opportunities to gain from such cooperation (Malkamaeki *et al.* (2000).

The factors with the most prominent relationship with the capital market development in **Bulgaria** and **Slovakia** are the **protection of legal rights** and the **real GDP growth**. Both countries' stock exchanges show similar patterns of development (low level of market capitalization than CEE average, lack of trade in derivative instruments, no exchange traded funds, etc.). The Bulgarian stock exchange has adopted and maintains corporate governance code which guarantees high corporate culture. The legal rights index for Bulgaria shows more than average protection of legal rights (score 9 of 12), yet the country maintains high corruption index and has the highest share of grey economy in Europe, which significantly constraints the protection of legal rights of investors and does not guarantee a fair and objective legal process to safeguard their rights through the courts. As Bulgaria and Slovakia are civil-law countries (modeling their laws by French civil law), in a study La Porta *et al.* (1998) have concluded that French-law countries protect the investors the least. However, Slovakia performs better with respect to well developed social environment, keeping lower corruption index and registering the lowest share of grey economy in CEE (lower share than the EU average). As for the importance of GDP, the analysis has found out that the Bulgarian and Slovakian stock exchanges have achieved highest levels of market capitalization over the years, when the real GDP has been rising. Based on the results, steps should be taken in order to gain from the positive correlation between economic growth and stock market development. The stock markets in both countries need to further develop at higher rates of growth. This could be obtained by increasing the level of investments in stocks and the number of local and foreign investors (possibly through cross-listings on both exchanges).

As for **Croatia** and **Romania** the factor closely linked with the capital market development (in terms of capitalization) is the increase in **FDI inflows** (and for **Romania** also the **protection of legal rights**). The market capitalizations on the stock exchanges of both countries have reached their highest values one year before when FDI inflows have peaked. This is in line with the results of a study by Furstenberg G. (1998) who has concluded that country's financial integration can be promoted by the competition and technology transfer resulting from foreign participation in a given market. A country enjoying a high degree of financial integration with the rest of the world should, on average, experience large gross capital flows (Montiel P., 1994).

The analysis of the factors for attractiveness of the capital markets in the selected Danube region countries, leads to the the following conclusions:

- according to the economic activity indicators, favorable economic conditions for the development of the capital market presently exist in Romania which has managed to revert to an acceptable level of GDP growth.

- as for entrepreneurial activity indicators, Slovakia has the most prominent innovative potential, while in terms of competitive potential Bulgaria is ahead of Slovakia, Romania and Croatia.
- relatively higher value of market capitalization is reached by the Romanian and the Croatian capital markets, but Romania has most balanced financial market structure among the four Danube region countries in view of bank and market based financing.
- the most favorable taxation policy with lowest tax rates exists in Bulgaria, while at the opposite end is Slovakia.
- regarding the social environment indicators, lowest levels of corruption exist in Croatia and Slovakia, while Slovakia registers also the lowest share of grey economy.

According to the above conclusions, there are a lot of complementarities among the capital markets of the analyzed Danube region countries. Since the Romanian and Croatian capital markets are characterized by significant market capitalization and a diversified structure of traded financial instruments, the way ahead would be that these markets **play a role in the creation of a regional hub for potential integration** of the analyzed four stock exchanges. This requires as a first step a research into the potential for horizontal cooperation/integration among these stock markets and introducing harmonized trading system infrastructure, market quote rules, clearing and settlement.

The capital markets of the Danube region countries remain limited in size and insufficiently developed as compared to Central and Eastern European capital markets. The problematic factors of their competitiveness and financial development remain the high level of corruption, insufficient effectiveness of the institutional structures and the restrained access to financing. Irrespective of the high degree of harmonization of the legal framework to that of the EU and EU membership there exist numerous obstacles to the effective functioning of these capital market at micro- and institutional level.

The potential model for the future development of the Danube Region capital markets witness row an evolutionary organic overcoming of their intrinsic limitations through various forms of regional cooperation and integration. Main prerequisites for the success of such an integration model is the high degree of legal harmonization with EU requirements, the potential for implementation of unified market practices and establishment of links between the exchanges trade systems.

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Appendix 1 - Empirical Results from Correlations among Stock Exchange Indices of the Selected Danube Region Stock Exchanges

**Table 1: Regression Statistics
For SOFIX and BETfor 2000-2013**

Multiple R	0.780222662				
R Square	0.608747403				
Adjusted R Square	0.57614302				
Standard Error	335.0922205				
Observations	14				
ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	2096475.66	2096476	18.670723	0.000994422
Residual	12	1347441.555	112286.8		
Total	13	3443917.214			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	
Intercept	50.35678464	127.6430826	0.394512	0.7001244	
X Variable 1	0.117783166	0.027258544	4.320963	0.0009944	

Source: Own calculations.

Table 2: ANOVA for SAX and SOFIX for 2000-2013

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	114615.1	114615.1	15.2227	0.002104
Residual	12	90350.65	7529.22		
Total	13	204965.7			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	166.2615	31.10531	5.345117	0.000175	98.48889
X Variable 1	0.182429	0.046757	3.901628	0.002104	0.080554

Source: Own calculations.

Table 3: ANOVA for CROBEX and BET for 2000-2013

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	19172960	19172960	30.5339	0.000130747
Residual	12	7535084	627923.7		
Total	13	26708043			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	462.9465611	301.8466	1.533714	0.151033	-194.7207925
X Variable 1	0.356190956	0.06446	5.525749	0.000131	0.215744219

Source: Own calculations.

Table 4: ANOVA for SAX and CROBEX for 2000-2013

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	136499.7	136499.7	23.92424	0.000371397
Residual	12	68465.98	5705.498		
Total	13	204965.7			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	129.0823449	31.46643	4.102224	0.001467	60.52287733
X Variable 1	0.07148993	0.014616	4.891242	0.000371	0.039644605

Source: Own calculations.

Table 5: ANOVA for SOFIX and CROBEX for 2000-2013

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	2920426	2920426	66.94491	2.9843E-06
Residual	12	523491.7	43624.31		
Total	13	3443917			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	-102.72984	87.00916	-1.18068	0.260604	-292.3065254
X Variable 1	0.33067551	0.040415	8.181987	2.98E-06	0.242618656

Source: Own calculations.

Table 6: ANOVA for SAX and BET for 2000-2013

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	50415.52	50415.52	3.914497	0.071289254
Residual	12	154550.2	12879.18		
Total	13	204965.7			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	186.1989695	43.22919	4.307251	0.001019	92.01065639
X Variable 1	0.018265032	0.009232	1.978509	0.071289	-0.00184915

Source: Own calculations.

Appendix 2 - Correlations among Variables on the Selected Danube Region Stock Exchanges and Confirmation of the Validity of the Regression Model

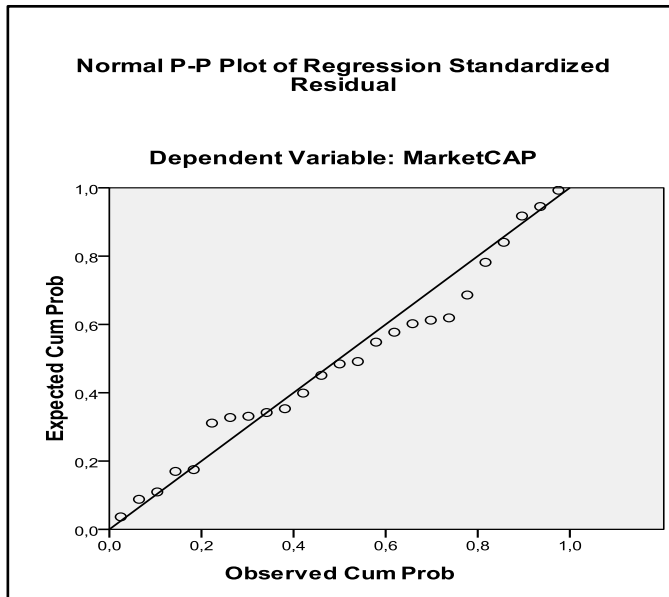
Table 1: Bulgarian Capital Market Correlations

		FDI	GDP	R&D	IR	LRI
FDI	Pearson Correlation	1	.466*	-.281	.131	.590**
	Sig. (2-tailed)		.019	.174	.534	.002
	N	25	25	25	25	25
GDP	Pearson Correlation	.466*	1	-.639**	.251	.305
	Sig. (2-tailed)	.019		.001	.226	.138
	N	25	25	25	25	25
R&D	Pearson Correlation	-.281	-.639**	1	-.125	-.455*
	Sig. (2-tailed)	.174	.001		.553	.022
	N	25	25	25	25	25
IR	Pearson Correlation	.131	.251	-.125	1	.203
	Sig. (2-tailed)	.534	.226	.553		.329
	N	25	25	25	25	25
LRI	Pearson Correlation	.590**	.305	-.455*	.203	1
	Sig. (2-tailed)	.002	.138	.022	.329	
	N	25	25	25	25	25
* . Correlation is significant at the 0.05 level (2-tailed).						
** . Correlation is significant at the 0.01 level (2-tailed).						

Source: Own calculations.

For the Bulgarian capital market we get the following confirmation of the validity of the regression model assumptions:

Figure 1



Regarding the criterion of **linearity** the residuals appear to be evenly spread above and below 0 for different values of the independent variables Legal rights index and GDP. For the other assumption, **normality**, from Figure 1, we can conclude that the linear model is appropriate for the Bulgarian capital market data. The third assumption, **independence of errors**, requires that the errors are independent of one another. The Durbin-Watson statistics, which is used to measure autocorrelations for the dataset stands at 1.414, which means that the residuals of the dataset are not autocorrelated, thus the least-squares method used in the regression model is appropriate and the independence-of-errors assumption is valid.

Table 2: The Croatian Capital Market Correlations

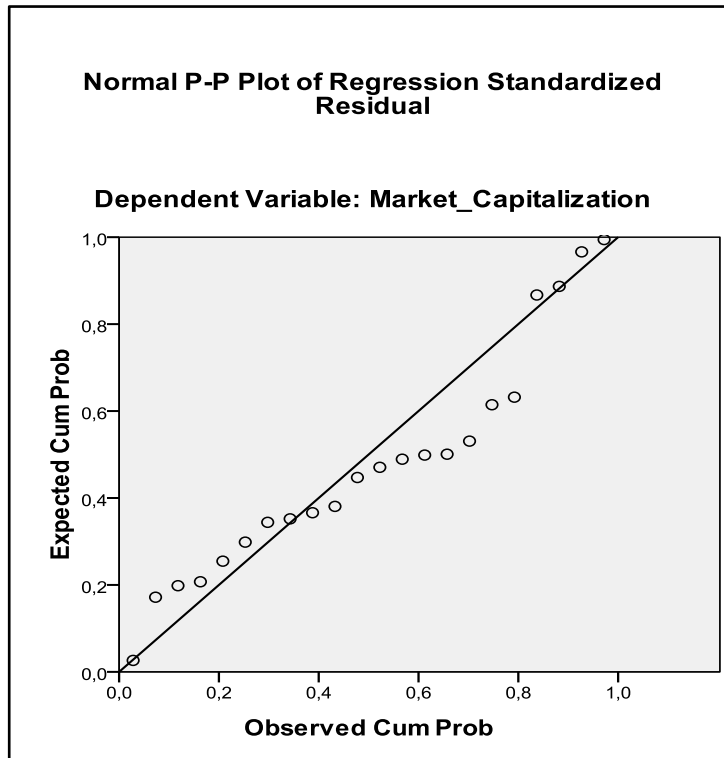
		FDI	GDP	R&D	IR	LRI
FDI	Pearson Correlation	1	.084	.547**	.122	.603**
	Sig. (2-tailed)		.712	.008	.588	.003
	N	22	22	22	22	22
GDP	Pearson Correlation	.084	1	.187	.302	-.339
	Sig. (2-tailed)	.712		.406	.172	.122
	N	22	22	22	22	22
R&D	Pearson Correlation	.547**	.187	1	.279	.294
	Sig. (2-tailed)	.008	.406		.208	.184
	N	22	22	22	22	22
IR	Pearson Correlation	.122	.302	.279	1	.018
	Sig. (2-tailed)	.588	.172	.208		.936
	N	22	22	22	22	22
LRI	Pearson Correlation	.603**	-.339	.294	.018	1
	Sig. (2-tailed)	.003	.122	.184	.936	
	N	22	22	22	22	22

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Own calculations.

For the Croatian capital market we get the following confirmations of the regression model assumptions:

Figure 2



To assess **linearity**, the residuals are plotted against the independent variables Market Capitalization and FDI in Figure 2. The residuals appear to be evenly spread above and below 0 for different values of FDI and Market Capitalization. The other assumption, **normality**, requires that the errors are normally distributed at each value of the independent variables. Since the distribution of the errors at each level of FDI and Market Capitalization is not extremely different from a normal distribution in Figure 2, we can conclude that the linear model is appropriate for the Croatian capital market data. The third assumption, **independence of errors**, requires that the errors are independent of one another. The Durbin-Watson statistics, which is used to measure autocorrelations for the data set stands at 1.870 which means that the residuals of the dataset are not auto-correlated, thus the least-squares method used in the regression model is appropriate and the independence-of-errors assumption is valid.

Table 3: Romanian Capital Market Correlations

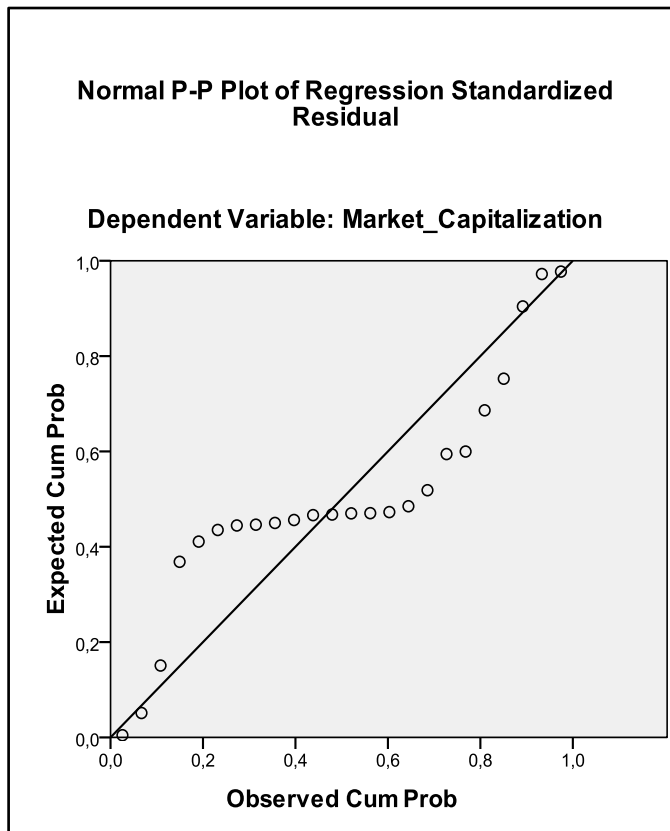
		FDI	GDP	R&D	IR	LRI
FDI	Pearson Correlation	1	.467*	-.157	.290	.698**
	Sig. (2-tailed)		.021	.465	.169	.000
	N	24	24	24	24	24
GDP	Pearson Correlation	.467*	1	-.158	.343	.290
	Sig. (2-tailed)	.021		.461	.101	.170
	N	24	24	24	24	24
R&D	Pearson Correlation	-.157	-.158	1	-.246	-.350
	Sig. (2-tailed)	.465	.461		.246	.094
	N	24	24	24	24	24
IR	Pearson Correlation	.290	.343	-.246	1	.361
	Sig. (2-tailed)	.169	.101	.246		.083
	N	24	24	24	24	24
LRI	Pearson Correlation	.698**	.290	-.350	.361	1
	Sig. (2-tailed)	.000	.170	.094	.083	
	N	24	24	24	24	24

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Source: Own calculations.

For the Romanian capital market we get the following confirmations of the regression model assumptions:

Figure 3



To assess **linearity** the residuals are plotted against the independent variables FDI and LRI in Figure 3. The residuals appear to be evenly spread above and below 0 for different values of FDI and LRI. The other assumption, **normality**, requires that the errors are normally distributed at each value of the independent variables. Since the distribution of the errors at each level of FDI and LRI is not extremely different from a normal distribution as it is obvious in Figure 3, we can conclude that the linear model is appropriate. The third assumption, **independence of errors**, requires that the errors are independent of one another. The Durbin-Watson statistics, which is used to measure autocorrelations for the data set stands at 1.736 which means that the residuals of the dataset are not auto correlated, thus the least-square method used in the regression model is appropriate and the independence-of-errors assumption is valid.

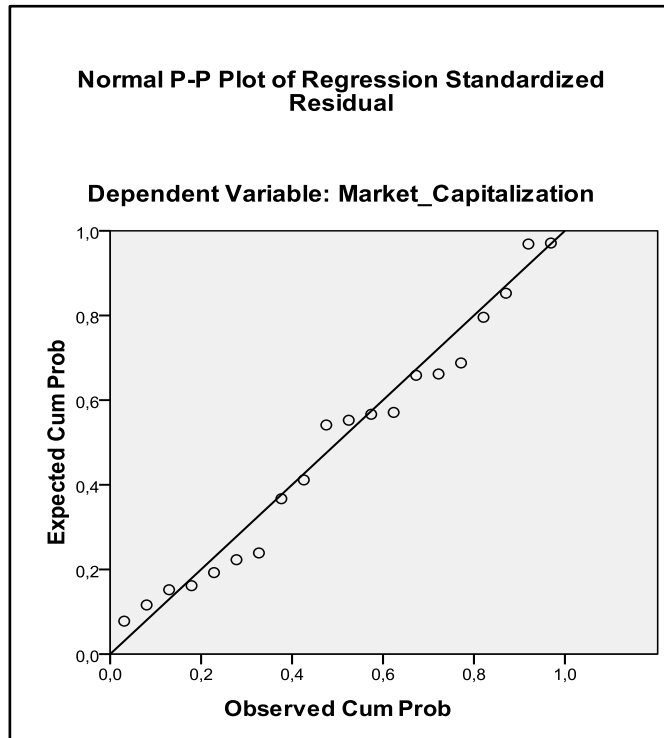
Table 4: The Slovak Capital Market Correlations

		FDI	GDP	R&D	IR	LRI
FDI	Pearson Correlation	1	.309	-.380	-.028	.630**
	Sig. (2-tailed)		.185	.081	.903	.002
	N	22	20	22	22	22
GDP	Pearson Correlation	.309	1	-.255	.303	.154
	Sig. (2-tailed)	.185		.279	.194	.518
	N	20	20	20	20	20
R&D	Pearson Correlation	-.380	-.255	1	-.076	-.568**
	Sig. (2-tailed)	.081	.279		.735	.006
	N	22	20	22	22	22
IR	Pearson Correlation	-.028	.303	-.076	1	-.183
	Sig. (2-tailed)	.903	.194	.735		.414
	N	22	20	22	22	22
LRI	Pearson Correlation	.630**	.154	-.568**	-.183	1
	Sig. (2-tailed)	.002	.518	.006	.414	
	N	22	20	22	22	22

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Own calculations.

In conclusion, for the Slovak capital market we get the following confirmations of the regression model assumptions:

Figure 4

To assess **linearity**, the residuals are plotted against the independent variables LRI and FDI, in Figure 4. The residuals appear to be evenly spread above and below 0 for different values of the two independent variables. As for the other assumption, **normality**, the distribution of the errors at each level of FDI and LRI is not extremely different from a normal distribution as is obvious from Figure 4 above, so we can conclude that the linear model is appropriate for the Slovak capital market data. The third assumption, **independence of errors**, requires that the errors are independent of one another. The Durbin-Watson statistics stands at 1.994, which means that the residuals of the dataset are not auto-correlated, thus the least-squares method used in the regression model is appropriate and the independence-of-errors assumption is valid.

Appendix 3 - Comparative table of selected Danube region stock exchanges

Quantitative and Qualitative Indicators	Bulgarian Stock exchange	Bucharest Stock Exchange	Zagreb Stock Exchange	Bratislava Stock Exchange
Year of Establishment	1997	1995	1991	1991
Shareholding Structure	Public Company	Public Company	Not a public company	Not a public company
Types of Market	Main market BSE; alternative market BaSE	Regulated market (BSE); RASDAQ; Alternative Trading System ATS - CAN ATS - CAN	Regulated Market. MTF. OTC	Regulated Market (Listed Market and Regulated Free Market); Multilateral Trading Facility
Number of Stock Indices	4	12	4	2
Market Capitalization Relative to GDP for 2013 (%)	12.54 %	11.6 %	38.4 %	4.7 %
Market Capitalization in EUR for 2013	5.0 billion	17.8 billion	26 billion	3.5 billion
Trade Volume at Regulated Market in EUR 2013	778 million	1.1 billion	690 million	1.6 billion
Trade Volume at OTC Market in EUR for 2013	324 million	639 million	1.1 billion	40 million
Number of Listed Companies on Regulated Market for 2013	33	80	378	22
Concluded Cooperation Agreements	Cooperation agreements for exchange of market	Stock Exchanges of Bulgaria, Amman, Moldova, Wiener,	-	-

Quantitative and Qualitative Indicators	Bulgarian Stock exchange	Bucharest Stock Exchange	Zagreb Stock Exchange	Bratislava Stock Exchange
	information with Macedonian, Beograd and Austrian stock exchanges	Thessaloniki, Tokyo, Athens, London		
Established Cross-Border Links between local and foreign central securities depositaries	Romania; Concluded cooperation agreement with Austrian Clearing and Settlement Bank Oesterreichische Kontrollbank AG	Bulgaria	-	-
Number of members 2013	64	49	20	16
Number of IPOs for 2013	0	2	-	-
Shares Issues for 2013	327	83	167	88
Bonds Issues for 2013	55	70	42	167
Structured Products Issues for 2013	2	96	35	-

Source: By the author according to statistical information in the annual reports of the respective stock exchanges for 2013 and the Federation of European Stock Exchanges