THE PATTERNS OF EU STOCK MARKETS. IS THERE A SIGN OF CONVERGENCE?

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Abstract: This paper offers a preliminary analysis regarding the convergence of European stock markets. The sample consists of all 27 countries of European Union split in seven sub-groups related to income level, euro adoption and development level. The patterns analysed through this article are an important indication of expected convergence in EU stock markets. This study analyses the evolution and the trend of market capitalization and stocks traded and their correlation with some important determinants, namely inflation, capital formation, enrolment years, trade, FDI, government debt. Results show a negative correlation between initial level of market capitalisation and its growth rate and also of initial level of stocks traded and its growth rate. These results could be a sign of absolute convergence. Further research in this area is needed to see if there exists conditional convergence when heterogeneity among individuals is controlled for.

Keywords: market capitalization, stocks traded, convergence, stock markets, EU

JEL classification: G15, G30

1. Introduction

By this study, we offer a preliminary analysis of patterns of the stock markets in European countries. We base our analysis on 27 EU countries which are split in sub-groups based on their income-level and Euro adoption. We have 7 sub-groups of countries: high income, upper middle income, euro and non-euro countries, developed, developing and emerging countries. The convergence model is usually applied for economic growth but, recently has been applied to stock markets as well (Narayan et al., 2011).

The introduction of a global capital market, if technologies are the same, would speed up the convergence for domestic product but would slow down the convergence for personal income according to Barro and Sala-i-Martin (1992). Still, some authors (Allen et al., 2006; Soto, 2003) suggest that countries which receive greater private capital flows have also grown faster due to the development of financial structure in response to the real economy.

Convergence in European Union has been the centre of many analyses for many researchers, which have divided in several areas like: monetary convergence (Orlowski, 2005, Mylonidis and Kollias, 2010), convergence on macroeconomic variables (Brada et al., 2005) and recently in convergence of stock markets (Narayan et al., 2011). The studies present Germany and France with the higher degree of convergence in euro zone (Mylonidis and Kollias, 2010) and Czech Republic as the best to obtain price stability (Orlowski, 2005) from the emerging countries. Still, Mylonidis and Kollias (2010) report that the process of convergence is still on-going.
In theory, European Monetary Union is considered a good example of convergence because it led to a single currency, a single central bank, and a single monetary policy (Narayan et al., 2011). Still there are more realistic researcher (Kim et al., 2005) which consider that effectiveness of different economic convergence criteria associated with European Monetary Union differs across member states. Also, Mylonidis and Kollias (2010) support that the introduction of the euro optimizes European economic integration and follows convergence process that is taken place from over two decades (Kim et al., 2005).

In this context we consider that an in-depth analysis of market capitalization and stock traded in the process of convergence in European stock markets is of greater importance. Not many studies have analysed the patterns of these indicators on European stock market in the context of convergence or have treated the relationship between market capitalization and stocks traded and different variables. This paper tries to address this gap and investigate possible channels through which EU countries could converge completely.

The patterns which are analysed through this article are an important indication regarding the expected convergence within European stock markets. The objective of this paper is to offer a preliminary view on the relationship between variables, by calculus and graphical representation.

The paper is organized as follow: section 2 provides a brief view on literature review on convergence hypothesis and stock markets convergence, section 3 describes the data, section 4 presents the relationship between stock market indicators and growth of stock markets and section 5 concludes.

2. Theoretical literature review
Convergence hypothesis is usually applied to economic growth and has been inspired by Baumol (1986). This theory regard specially if low growth countries converge to high economic growth and the speed of convergence (see Barro, 1991; Barro and Sala-i-Martin, 1992).

Specifically, Barro and Sala-i-Martin (1992) are asking if poor countries or regions tend to grow faster than rich ones, and what are the forces that could lead to convergence over time particularly in the levels of per capita income and product. Narayan et al. (2011) also support that there is a common force that make a market converge to another market such as arbitrage activity, that bring markets together. Barro and Sala-i-Martin (1992) study the convergence across the 48 contiguous U.S. states. They exploit data on personal income since 1840 and on gross domestic product (of each state) since 1963. This involves keeping constant school enrolment rates and ratio of government consumption to GDP. The empirical results for the U.S. states indicate that the speed of convergence for output is only slightly faster than that for personal income.

Neoclassical growth models, such as Sollow (1956), Cass (1965) and Koopmans (1965) describe this as the pattern where a country’s per capita growth rates tends to be inversely related to its starting level of income per person. Providing that countries have similar preferences and technology, poor countries tend to grow faster than rich countries. So, there is a force that encourages convergence in levels of per capita income across countries (Barro, 1991). Barro’s results support the convergence hypothesis in a study of 98 countries between 1960-1985. So, for a given quantity of human capital, a poor country will grow faster than a rich country.
But King and Levine (1993 a, b)), Demirguc and Maksimovic (1996) argue that countries which have better developed financial systems, especially efficient banks and stock markets, are predisposed to grow faster because they provide access to much funds necessary to constrained economic enterprises. Financial theory considers that integrated markets tend to be relatively more efficient than divergent markets (see Narayan et al., 2011). Convergence also involves that markets are integrated. Thus level of financial development of countries seems to be a central factor underlying conditional convergence, according to past studies results (Fung, 2009).

**Figure 1. Convergence approaches**


Convergence can be absolute and conditional. Absolute convergence of financial markets is taking place when countries share the same fundamental characteristics regarding financial markets. The only difference across countries is its initial level of financial market development (Narayan et al., 2011). The conditional convergence takes place when financial markets across countries differ in terms of factors relating to the performance of their financial markets.

Recently, this theory has been applied to financial markets see, inter alia: Brada et al. (2005), Su et al. (2010), Orlowski (2005), Elyasiani et al. (2007), Narayan et al. (2011), Fung (2009) and Mylonidis and Kollias (2010). The reasons for applying the theory of convergence on financial markets are based on the literature on stock market interdependence and portfolio diversification according to Narayan et al. (2011). Narayan et al. (2011) focus their research on convergence of stock market for 120 countries covering the period 1985-2008. Convergence of stock markets is proxied by stocks traded and market capitalization. Dataset used is a balanced panel with an annual time component. Due to the large number of countries, they used 11 different panels based on the following criteria: high income, middle income, low
income, OECD, CSI and developing countries. Their analysis is carried also at a regional level. The main finding is that, based on the conditional convergence model, convergence of market capitalization and stocks traded is found for 4 panels. These are high and low income panels, the OECD panel, and the Sub-Saharan African panel. The speed of convergence is high, in most of the cases it is depicted between 20% and 30%.

Mylonidis and Kollias (2010) carry a research work on convergence on European stock markets in the first euro-decade. These are the major stock markets namely Germany, France, Spain and Italy, the largest and most developed markets in the euro area (Kim et al., 2005). The dominant position of Germany within the euro zone seems to be (re)affirmed by tests conducted herein. These criteria included convergence in long term interest rates, inflation rates, as well as, in the fiscal position of prospective eurozone members. The study examines the time-varying long-run relationship in the post-euro era using daily data from January 4, 1999 to July 23, 2009, transformed in logarithms. In general, the empirical results suggest that although some convergence has been taking place over time, it is still in the process of being achieved.

The differences between these studies is that Narayan et al., (2011) take into consideration 120 countries from the worldwide and Mylonidis and Kollias, (2010) study four European stock markets. Still, the results are somehow similar. Narayan et al. (2011) show a high degree in convergence in high income countries while Mylonidis and Kollias (2010) remark that the most developed countries are having the highest degree of convergence.

Monetary convergence, especially in European countries represent another research part of the convergence literature. In this context, Orlowski (2005) develops a monetary policy framework necessary in implementation of monetary convergence in Eurozone for EU accession countries. This is based on direct inflation targeting. This model is possible only for countries with developed financial markets (Mishkin, 2000), excluded for smaller accession states. So, countries which are subject of this study are: Poland, Hungary and Czech Republic, the larger accession countries which have adopted DIT policies. The analysis implies that the monetary convergence begins with flexible inflation targeting and concludes with a full-fledged euroization using ordinary least squares (OLS). The theoretical framework suggests adopting flexible DIT policies for monetary convergence to the eurozone. Czech Republic seems to be the best performer within the examined group to obtain price stability.

Another study that completes the research on European stock market is Brada J.C. et al. (2005) who estimate the convergence of macroeconomic variables using the rolling cointegration between financial and real macroeconomic aggregates of the European Union (EU). They examine three groups of countries: benchmarks of EU performance, recently members of EU and first round candidates. The sample period for the recent EU members generally covers the 1980-2001 period while for the rest of the countries the data begin in early 1990s and run through 2000 or 2001. For all estimations are used monthly data. The results show there is no systematic difference in the cointegration pattern of the EU members who joined in the 1990s and those who joined in the earlier expansion of the EU. The countries that recently joined the EU exhibit time-varying cointegration with the reference countries over much of the 1980-2000 sample period.
Other authors which have studied convergence across different variables or institution in stock markets are: Elyasiani et al. (2007), Fung (2009), Choong et al. (2010), Chordia et al. (2005) and Kumar (2010). Elyasiani et al. (2007) results support the existence of convergence across different financial institution. They examine risk and return linkages in US commercial banks, securities firms and life insurance companies between 1991 and 2001. The main finding is that large financial institutions exhibit much larger volatility spillovers than smaller institutions. The results also confirm the presence of a higher level of convergence between banks and brokerages and tighter link in risk among large financial institutions. Also, Fung (2009) tests for convergence in financial development and economic growth by incorporating the interaction between the real and financial sectors into an otherwise traditional test for convergence. The sample consists in 57 countries running from 1967-2001. Results support the existence of conditional convergence among countries in economic growth and financial development, but only for high and middle income subsamples. Choong et al. (2010) focus on the role of stock markets as a channel through which foreign capital flows could promote growth. The findings reveal that FDI exhibits a positive impact on growth, while both foreign debt and portfolio investment have a negative impact on growth in all sample countries. However, results indicate that stock markets might be a significant channel through which capital flows affect economic growth. The sample is formed of 51 countries with different growth experiences (32 developing and 19 developed) and contains various categories of foreign capital flows from 1988 to 2002. Chordia et al. (2005) study individual actions following how market converge to efficiency based on the data of large NYSE firms. They indicate that efficiency does not happen immediately. But Kumar N. (2010) uses the growth model in order to capture the trends and patterns of market capital, domestic saving, GDP growth in Indian context. He also investigates the relationship between market capitalization, saving and GDP growth over the last three decades or so. Time series data for the study is considered for the period 1983-2007. The results indicate further growth of market capitalization and positive association between macro indicators. It supports the hypothesis that Indian stock market is emerging and has opportunity to attract investors from overseas.

3. Data description

The sample consists of all 27 countries from European Union. We have classified these countries by their level of development, income level and euro adoption. These allowed us to disaggregate the data into seven panels: high income and middle income, developed, emerging and developed countries, euro and non-euro countries. The country classification based on their income level is defined by World Development Bank and country classification based on their level of development is made according with Dow Jones Indexes classification. This classification begins with analysts’ examination of countries based on three broad categories of metrics for each country: Market & Regulatory Structure, Trading Environment, and Operational Efficiency. Euro area delimitation is taken from Eurostat.
### Table 1. Country classification

<table>
<thead>
<tr>
<th>Income level</th>
<th>Development</th>
<th>Euro area</th>
</tr>
</thead>
<tbody>
<tr>
<td>High income</td>
<td>Developed</td>
<td>Emerging</td>
</tr>
<tr>
<td>Austria</td>
<td>Bulgaria</td>
<td>Bulgaria</td>
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<tr>
<td>Belgium</td>
<td>Latvia</td>
<td>Belgium</td>
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<tr>
<td>Czech Republic</td>
<td>Lithuania</td>
<td>Cyprus</td>
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<tr>
<td>Cyprus</td>
<td>Romania</td>
<td>Estonia</td>
</tr>
<tr>
<td>Denmark</td>
<td>Finland</td>
<td>Latvia</td>
</tr>
<tr>
<td>Estonia</td>
<td>Germany</td>
<td>Lithuania</td>
</tr>
<tr>
<td>Finland</td>
<td>Greece</td>
<td>Malta</td>
</tr>
<tr>
<td>France</td>
<td>Ireland</td>
<td>Romania</td>
</tr>
<tr>
<td>Germany</td>
<td>Italy</td>
<td>Slovak</td>
</tr>
<tr>
<td>Greece</td>
<td>Luxembourg</td>
<td>Republic</td>
</tr>
<tr>
<td>Ireland</td>
<td>Netherlands</td>
<td>Slovenia</td>
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<tr>
<td>Italy</td>
<td>Portugal</td>
<td></td>
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<tr>
<td>Luxembourg</td>
<td>Spain</td>
<td></td>
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<tr>
<td>Malta</td>
<td>Sweden</td>
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<tr>
<td>United Kingdom</td>
<td>United</td>
<td>United Kingdom</td>
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<tr>
<td>Netherlands</td>
<td>Kingdom</td>
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<tr>
<td>Poland</td>
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<tr>
<td>Portugal</td>
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<td>Slovak</td>
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<tr>
<td>Republic</td>
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<tr>
<td>Slovenia</td>
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<tr>
<td>Spain</td>
<td></td>
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<tr>
<td>Sweden</td>
<td></td>
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<tr>
<td>Hungary</td>
<td></td>
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</tbody>
</table>

### Table 2. Variables

<table>
<thead>
<tr>
<th>Description</th>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflation</td>
<td>- annually standard deviation calculated of consumer index price.</td>
<td>Eurostat</td>
</tr>
<tr>
<td>Capital formation</td>
<td>- gross domestic fixed investment</td>
<td>World Bank</td>
</tr>
<tr>
<td></td>
<td>- in literature capital formation is generally associated to economic and also have positive effect on market capitalization by facilitating faster rate of growth (see Kumar, 2010).</td>
<td></td>
</tr>
<tr>
<td>Primary and secondary enrollment years</td>
<td>- the number of years of full-time equivalent duration in primary and secondary education in the school system</td>
<td>World Bank</td>
</tr>
<tr>
<td>Interest rate spread</td>
<td>- the interest rate charged by banks on loans to private sector customers minus the interest rate paid by</td>
<td>World Bank</td>
</tr>
<tr>
<td>Description</td>
<td>Definition</td>
<td>Source</td>
</tr>
<tr>
<td>-------------</td>
<td>------------</td>
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</tr>
<tr>
<td>Domestic credit provided by the private sector</td>
<td>credits allocated to the private sector</td>
<td>World Bank</td>
</tr>
<tr>
<td>Domestic credit provided by the banking sector</td>
<td>includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net.</td>
<td>World Bank</td>
</tr>
<tr>
<td>Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.</td>
<td>is the sum of exports and imports of goods and services measured as a share of gross domestic product.</td>
<td>World Bank</td>
</tr>
<tr>
<td>Government debt</td>
<td>is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans</td>
<td>World Bank</td>
</tr>
<tr>
<td>Foreign direct investment</td>
<td>are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments.</td>
<td>World Bank</td>
</tr>
</tbody>
</table>

Source: Accomplished by author based on World Bank definitions

The credits allocated to the private sector are considered a measure of financial development in Fung (2009) study about convergence of financial development and economic growth. Credits allocated to the private sector are credits issued by both depository and non-depository institutions, which excludes those allocated to the public sector because those allocated to the private sector normally yield higher returns and are more likely to reflect fluctuations in the level of intermediated finance (Xu, 2000).

Narayan et al. (2011) use similar variables with us except government debt. At this stage we carry just a descriptive analysis and depict some correlations of these variables with the market capitalisation.

Stock markets indicators are market capitalization of listed companies and stocks traded. These measures were used by Narayan et al. (2011) and Choong et al. (2010) who have taken them as percentages in GDP. The market capitalization measures market size as the ratio of market capitalization to GDP, and stocks traded measure stock market liquidity. Total stock value traded measures market liquidity and is defined as the product of share price and the number of shares traded. As an indicator of stock market development, it not only reflects stock market liquidity, but also its interaction with market size. For this reason, Choong et al. (2010) consider that trading value may be considered a better indicator of stock market growth than market capitalization ratio alone. Also, trading value complements market capitalization because a market may be large, but have little trading. Taken together, market capitalization and trading value provide more information about a nation’s stock market than using only a single indicator (Choong et al., 2010)
Market capitalization is considered the biggest macro indicator for doing a country analysis which is defined as the value of listed shares divided by GDP and it is a measure of the size of stock markets relative to the economy (Kumar, 2010). The author, however, states that market capitalization is not an universal indicator of predicting economic performance but has a positive effect of financial development on economic growth (Kumar, 2010).

4. Common patterns of stock market convergence in EU

Table 3a contains some descriptive statistics namely mean, standard deviation, coefficient of variation, skewness and kurtosis for market capitalization. The results are reported for seven panels namely high income, middle income, developed, emerging, developing, euro and non-euro countries. We notice that the mean is highest in developed countries followed by high income countries and the lowest is for developing countries. A comparative analysis of the mean reveals that the mean of market capitalization in developed countries is 88 times the mean for developing countries and 11 times the mean for emerging countries. Also, the mean for high income countries is 48 times the mean of middle income countries. Still, euro and non-euro panels seem to have similar means. The coefficient of variation suggests that volatility is highest for high income countries. Narayan et al. (2011) report a contrary situation for their panel of 120 countries. Regarding the level of development we find the highest volatility for developed countries which also have the highest mean. Skewness reports for all panels an asymmetrical distribution with most values concentrated on left of the mean, with extreme values to the right. Kurtosis show for all panels a leptokurtic distribution sharpen than a normal distribution with values concentrated around the mean.

Table 3. Descriptive statistics of market capitalization13 (mil.$) during 2001-2011

<table>
<thead>
<tr>
<th>Panels</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Coeff. variation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Income</td>
<td>41900000</td>
<td>70800000</td>
<td>1.69</td>
<td>2.51</td>
<td>9.47</td>
</tr>
<tr>
<td>Middle income</td>
<td>859000</td>
<td>1030000</td>
<td>1.20</td>
<td>1.84</td>
<td>5.76</td>
</tr>
<tr>
<td>Developed</td>
<td>63000000</td>
<td>80100000</td>
<td>1.27</td>
<td>1.92</td>
<td>6.43</td>
</tr>
<tr>
<td>Emerging</td>
<td>5660000</td>
<td>5180000</td>
<td>0.92</td>
<td>1.59</td>
<td>4.57</td>
</tr>
<tr>
<td>Developing</td>
<td>7130000</td>
<td>8110000</td>
<td>1.14</td>
<td>2.45</td>
<td>9.15</td>
</tr>
<tr>
<td>Euro</td>
<td>36000000</td>
<td>53900000</td>
<td>1.50</td>
<td>1.94</td>
<td>6.49</td>
</tr>
<tr>
<td>Non-euro</td>
<td>35600000</td>
<td>85000000</td>
<td>2.39</td>
<td>2.84</td>
<td>9.88</td>
</tr>
</tbody>
</table>

Source: Own author’s computations based on data

Next we consider the same summary statistic for stocks traded (see table 4). The mean results here show similar results with those of market capitalization. The highest mean is for high income countries and developed countries. Euro group presents comparable results with non-euro group similar with market capitalization. In terms of volatility of stocks traded high income countries experience the highest volatility.

13 Market capitalization (also known as market value) is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country’s stock exchanges at the end of the year.
volatility. In fact, developed countries have the highest volatility and emerging countries have the lowest volatility in developments panels. Non-euro countries also supports the highest volatility. Skewness and kurtosis values suggest similar interpretations with those from market capitalization.

Table 4. Descriptive statistics of stocks traded\textsuperscript{14} (mil.$) during 2001-2011

<table>
<thead>
<tr>
<th>Panels</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Coeff. variation</th>
<th>skewness</th>
<th>kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Income</td>
<td>53300000</td>
<td>111000000</td>
<td>2.08</td>
<td>4.27</td>
<td>29.90</td>
</tr>
<tr>
<td>Middle Income</td>
<td>108000</td>
<td>167000</td>
<td>1.55</td>
<td>2.44</td>
<td>9.19</td>
</tr>
<tr>
<td>Developed</td>
<td>81100000</td>
<td>129000000</td>
<td>1.60</td>
<td>3.54</td>
<td>21.71</td>
</tr>
<tr>
<td>Emerging</td>
<td>29900000</td>
<td>24600000</td>
<td>0.82</td>
<td>1.11</td>
<td>3.43</td>
</tr>
<tr>
<td>Developing</td>
<td>928000</td>
<td>137000</td>
<td>1.48</td>
<td>2.70</td>
<td>11.36</td>
</tr>
<tr>
<td>Euro</td>
<td>44200000</td>
<td>46000000</td>
<td>1.69</td>
<td>2.07</td>
<td>7.03</td>
</tr>
<tr>
<td>Non-euro</td>
<td>47400000</td>
<td>141000000</td>
<td>2.98</td>
<td>4.47</td>
<td>26.41</td>
</tr>
</tbody>
</table>

Source: Own author’s computations based on data

The evolution of market capitalization growth rate between 2001-2011 can be followed in figure 2. It can be seen a decrease in the majority of the cases between 2008-2009 which was followed by a recovery starting with 2010. Interesting pattern records Poland which hasn’t followed the evolution of the others countries and hasn’t registered a slowdown during financial crisis. Poland even doubled the number of listed companies from 2008 to 2011 and its turnover value has started to increase recently. Overall stocks traded depicts the same trend as market capitalization. Several countries began to recover starting with the year 2011 including Germany, Italy, Finland, Austria and Poland.

In this analysis we could follow and test the convergence hypothesis which states that economies with lower initial levels of market capitalization per capita will tend to grow faster than the others (Solow, 1956). This type of convergence is named conditional convergence.

\textsuperscript{14} Stocks traded refer to the total value of shares traded during the period.
Figure 2: Market capitalization growth rate (log) during 2001-2011

Source: Author’s calculations based on World Bank Data
Figure 3: Stocks traded growth rate (log) during 2001-2011

Source: Author's calculations based on World Bank Data
In the next figure we represent a negative relationship between the growth rate of market capitalization and turnover and the initial level of market capitalization and stocks traded per capita. Based on these results we can confirm that the convergence hypothesis seems to verify in these countries. These results show that the countries with the lowest level of market capitalization or stocks traded per capita tend to grow faster than the countries with the highest values.

**Figure 4:** Correlation between the initial level of market capitalization and growth rate of market capitalization and correlation between initial level of stocks traded and growth rate of it during 2001-2011

Source: Author’s calculations based on World Bank Data
Figure 5. Relationship between market capitalization growth and capital formation during 2001-2011

Source: Author's calculations based on World Bank and ICRG Data
In the above figure we represent a linear relationship between capital formation and market capitalization growth. We observe a positive correlation between market capitalization and capital formation during the considered period. The higher is the level of capital formation, the lowest is market capitalization in these countries. The same results are available for stock traded.

In this paper we intended to do a preliminary analysis for determinants of market capitalization and stocks traded. The theoretical literature offers us enough reasons to believe that these determinants could enhance market capitalization and stocks traded. For the 27 European countries, we checked as initial steps only the convergence hypothesis. At this stage we only looked at the correlations. For further research, we intend to employ dynamic panel methodology. An OLS estimation has been carried. A positive correlation was noticed between market capitalization growth and interest rate, government debt, trade, private credit. Also, were observed negative correlations with primary and secondary years. Still, no significant results were depicted when OLS estimation was carried. Since OLS is a biased and inconsistent estimator for our case (Barro and Sala-i-Martin, 1992) because the lagged values of variables we intend to use are endogenous and the lagged dependent variable will be correlated with the composed error term (Narayan et al., 2011), we intend in a future work to improve the methodology by controlling for differences between the countries and including dynamics for market capitalisation variable.

5. Conclusions
In this paper we presented a pattern of the EU countries regarding their stock market determinants such as market capitalization and stock traded. When splitting the countries in sub-groups, we noticed that the indicators record larger values in developed and high income countries from developing and middle income countries. Still, countries from euro area present similar results with countries from non-euro area.

We depicted a negative correlation between initial level of market capitalisation and its growth rate and also of initial level of stocks traded and its growth rate. By depicting these results, we can state that in these countries there is a sign of absolute convergence. Further work is needed in the area to test for conditional convergence by using appropriate estimators that would control for heterogeneity among countries and endogeneity. As policy recommendation, the countries with low initial of market capitalisation and low initial value of stocks traded should enhance their market capitalisation by new financing opportunities offered by stocks for the firms, due to low transaction costs. As absolute convergence could be depicted in terms of deterministic calculus, gaps could be reduced between European countries (between middle income and developed for example) if for the middle and low income countries market capitalisation and value of stocks traded would increase.

The study of these patterns has revealed interesting findings. Expected relationships between market capitalization/stocks traded and market growth were confirmed by the results.
References


