Stock Markets Development in Eastern Europe. Evidence from Poland, Hungary, Russia and Ukraine

BY YURIY BUTSA

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Supervisor: Professor Attila Ratfai

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ABSTRACT

This paper analyses performance indicators of the Polish, Hungarian, Russian and Ukrainian stock markets. All markets have different levels of development and different reasons behind this. Russia and Ukraine suffer from weak quality of law and law enforcement, which restrains the market liquidity. The Hungarian and Polish markets reached high level of development in terms of market activity and regulations; however after internal driving forces for further development became less effective, went different ways. The Budapest Stock Exchange despite being very liquid, was small and very concentrated one, therefore had no other choice but to be acquired by a large international one. In contrast, the Warsaw Stock Exchange grew from the local into international one and became an attractive place for public placements of European companies.

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INTRODUCTION

Emerging European countries have made great progress in developing their capital markets from the beginning of their transition process. As in the developed countries, banks played the most important role in the beginning of this process, as they were the most reliable source of financing for the companies. However, with the development of the economies, stock markets started to increase their importance as a source of financing and providers of investment opportunities for the economic subjects.

Many researchers find a strong positive relation between the stock market growth and overall growth of the economy (Atje and Jovanovich 1993, Demirguc-Kunt and Maksimovic 1996, Levine and Zervos1996, 1998). However, the question if stock market development contributes to economic growth or both these processes are just driven by the same factors remains open. One can argue that some developed economies do not have the large and developed stock market and it does not affect their economic performance. However, we should not forget that companies from such countries can easily access international equity markets in case of necessity which is usually hard and costly to do for the companies from emerging economies. The stock markets can be even more important during the development of the economy than after the economy reached a certain level of development.

Stock markets play a significant role in different transition processes starting from privatization to the pension reform. Banking sector, insurance companies, pension funds and other financial institutions use the shares listed in the stock market for diversification of their portfolios. Stock markets are the most convenient mechanism for attracting foreign portfolio investments. Moreover, the existence of

stock markets provides important information that improves the efficiency of financial intermediation.

However, during the transition process stock markets do not develop equally in all countries. We can observe that countries with similar pre-transition condition end up having very different by size and performance stock markets. Moreover, the stock markets of some former-USSR countries in some cases overperform the stock markets of the developing countries, which launched their transition processes much earlier.

The purpose of this paper is to explain the difference in the stock markets development in Eastern European countries by using both the market indicators, appropriate econometric techniques and resent theories of stock market development. For this reason, four countries with different characteristics of stock markets and different levels of their development were chosen: Poland, Hungary, Russia and Ukraine.

The Polish stock market is represented by the Warsaw Stock Exchange, which is the most developed in the Central and Eastern Europe and already can be considered as an international one. The Hungarian stock market, though it had very similar initial conditions with the Polish one, is much smaller and grows at a comparably lower rate. The Russian market increased dramatically in its size over the last years; however it is attractive only to speculative investors due to low liquidity and high volatility. Finally, the stock market in Ukraine demonstrated one of the highest growth rates in the world in 2007 but still is at the initial stage of development and therefore is a good illustration of the primary phase of the development.

THEORETICAL ISSUES OF STOCK MARKET DEVELOPMENT

Post-socialist emerging economies usually suffer from having a very low level of development of financial intermediaries in the beginning of their transition process. Therefore, one can observe the appearance of the stock market in the transition country only after a period of primary capital accumulation and a certain level of banking sector development. Usually banks after facing lack of instruments for operations become catalysers of creating the stock markets in the economies.

Capasso (2006) points out the following stages of stock market development. In the beginning of the transition process, financial markets are rudimentary and usually dominated by banks or other similar financial intermediaries. Stock markets do not exist at all or if they exist, their size does not allow them to have any significant effect on the economy. Accumulation of capital leads to the development of financial intermediaries and increases the number, complexity and sophistication of the financial instruments. As a result, the size of the financial market increases and stock markets begin to grow in terms of market capitalization and number of listed companies. Stock markets and financial intermediaries continue to develop together with the growth of the economy in general. However, stock markets develop in non-monotonic ways. In the economies with relatively small size of the stock market, further development goes mostly through the increase of share of the banking sector in the economy. In the economies where the size of the stock market is relatively large, further development of the financial system goes through the development of the equity markets. Therefore, during the transition process equity-todebt ratio first decreases and only after certain level of stock market development increases in the economy.

In order to measure the level and the speed or the development of the stock markets both quantitative and qualitative indicators should be used. The brief description of both types of indicators is presented below.

One of the most widely used quantitative indicators is *market capitalization ratio.* Market capitalization ratio equals the value of listed in the domestic stock exchange shares to the GDP of the country. This indicator is often used for measuring the market size as it shows the relative weight of the stock market in the whole economy. The evidence shows that market capitalization ratio is positively correlated with the capital mobility and risk diversification possibilities.

The *number of listed companies* is also used for description of the market size. This number can vary greatly in different countries due to specific features during of stock markets development (for example the mandatory listing for privatization requirement in Czech Republic).

Total value traded/GDP is a measure of liquidity of the market and is calculated by dividing the total shares traded in the market during the period by the GDP of the country. This indicator is usually used together with market capitalization ratio as in developing markets the size of the market can be relatively large but trading activity is still at very low level.

Turnover ratio is another measure if liquidity and equals to the value of total shares traded divided by the market capitalization. In contrast to the total value traded/GDP ratio which shows the value of shares traded comparing to the size of the economy, this indicator measures trading relatively to the size of the stock market. Therefore, it helps to identify small but very active stock markets with high growth potential. By using both liquidity indicators together with market size ratio one can get pretty clear picture of the level of the stock market development.

Volatility is usually calculated as a standard deviation of market returns and is often used to measure the level of risk associated with the market. Usually developing markets are characterized by higher volatility but not necessarily by higher average returns than developed ones.

Another indicator, which characterizes the liquidity of the market, is *market concentration*. Concentration is measured as a share of some number of companies with the highest capitalization (usually five or ten) in the total market capitalization. The high degree of concentration of the market signals poor liquidity. In developed markets, this indicator is usually below 20 percent.

Institutional and regulatory indicators show the level of development of regulatory framework and market institutions. According to La Porta et al. (1998), differences between the stock markets of developed countries can be explained through the differences in the law systems and regulatory mechanisms. In developing countries quality of regulations and especially law enforcement are crucial factors for successful stock market development.

All the abovementioned indicators are very useful tools for measuring the level of stock market development and comparing the stages of development in different countries. However, there are some questions concerning stock market development, which cannot be answered just by empirical evidence, and some sort of theoretical background should be provided. One such problem is late development of stock markets compared to the other financial institutions during the transition process. Another question is why the countries with similar pre-transition initial conditions end up having stock markets with very different sizes and liquidity stock markets. To explain this issues a growing number of theories appeared, which,

according to Capasso (2006) can be divided into two groups based on the approaches economists use: institutional and instrumental.

The institutional approach focuses on the stock market development from the point of view of macroeconomics. The main subject of interest for the researchers is the roles of two main institutions for capital reallocation in the economy: commercial banks and stock markets. Both of them transfer capital from lenders to borrowers but they do it in different ways. Therefore, the conditions under which the banks become less preferable for the borrowers, and as a result are partly substituted for the stock markets, should be studied to understand the emerging and development of the stock markets. Allen (1993) concludes that during the development of the economy gathering information for correct resource allocation becomes more costly and as stock market prices reflect all the information associated with the assets stock markets are more effective for capital allocation.

Capasso (1996) develops this idea and explains the evolution of financial markets through the possibility of identifying the optimal investment strategies. In a simple economic system when it is easy to realize the optimal investment opportunities, the banking system is sufficient for optimal resource allocation. A good example of such a situation can be the economy with large share of agricultural sector where the number of investment opportunities is limited and it is not difficult to realize them. However, with the growth of the economy its complexity increases and identifying best possible investment strategies becomes more difficult as it requires gathering much larger amount of information for optimal decision-making. In such conditions, when continuous monitoring is necessary for building efficient investment strategies stock markets become the optimal solution of the problem. This comes from the hypothesis that stock prices absorb most of the information available to the

market participants but due to the market incompleteness, participants still have incentives to monitor the firms and collect the information (Grossman and Stiglitz 1980).

Stock markets are more costly for the economy than the banks but they allow for better investment control and also better risk diversification. In addition, the investors' need for better risk diversification leads to the increase of the international integration of the stock markets. As a result, countries with better rates of return on investments can face the inflow of capital from abroad; however, the benefits from such speculative inflows are questionable. The evidence from the markets presented in the next chapters shows that appearance of the institutional investors and their willingness to invest in the stock market can lead to the rapid growth of the market.

It is also worth mentioning that the substitution of the banking sector by stock markets does not mean that the role banks play in the economy becomes insignificant. As it was shown in Demirgüç-Kunt and Levine (1995) stock markets development is usually accompanied by the financial intermediaries development as both this institutions are crucial for the economic growth.

In contrast to the institutional approach, the instrumental one is based on the microeconomic theory and focuses on the financial contracts between economic subjects. Its goal is to explain the choice between debt and equity financing for the firm and as a result to figure out what factors affect the choice of equity financing as the optimal one for the firm.

However, Capasso (1996) shows that traditional microeconomic framework is not helpful in answering this question. In the regular Arrow-Debreu framework with perfect markets, fully-informed agents and absence of the transaction costs, when the Modigliani-Miller theorem holds firms investment decisions does not depend on

the way of financing and choice of debt or equity financing does not affect firm's market valuation. Therefore, to provide the explanation for the choice of financing different frictions such as imperfect information, liquidity and transaction costs were introduced into this framework.

Development of microeconomic models of optimal contracts under information asymmetry and their integration into the dynamic general equilibrium models generated new ways of studying financing decisions of firms. However, these theories also faced some problems in explaining a firm's choice of financing. In contrast to debt financing in which the repayment level is set in advance, equity financing involves the repayment proportional to the firm's profits. Hence, if a firm has information about high rate of returns from the investment and as result high profits, it will always choose debt financing of the project as a cheaper one.

Another approach to explain this problem has its roots in the studies of the optimal financial structure of the firm. Every firm chooses the debt or equity financing or a mixture of two depending of the set of factors, which determine its optimal financial structure. Pagano et al. (1998) examines firms decisions to switch to equity financing through Initial Public Offerings (IPO's) and finds several reasons for this. First, firms are more likely to go public when the market valuation of the other firms in the same industry is high. Second, given a fixed cost of listing the larger is firm the more probably it will perform the IPO. Third, firms are more likely to switch to equity financing when the level of debt is high comparing to the firm's assets. In this case, the IPO helps to improve the balance sheet of the firm. In addition, it helps the firm to get access to the cheaper credits as going public requires higher level of transparency from the firm which reduces risk taken by the banks due to the asymmetric information problem. Another reason for companies to go public is to

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figure out real capitalization of the company, as market price of its shares will be determined. This is important for the firms in transition economies, which are often subjects for merges and acquisitions from foreign investors, and information about real market price of the firms can be very helpful for such deals. The market indicators presented in the next chapters show that in some markets the increase of number of IPO's can became the main driving force for the market growth.

HISTORY OF STOCK MARKETS IN POLAND, HUNGARY, RUSSIA AND UKRAINE

Polish Stock Market

Poland was one of the first post-socialist countries to open its stock market. The Warsaw Stock Exchange (WSE) was founded on 12 April, 1991 and since then the development of Polish stock market started. However, it is worth noticing that Poland has a much longer stock market tradition. First stock exchanges in the country started to operate already in the beginning of 19th century and not only in Warsaw but in six more Polish cities. The first traded assets were bills of exchange and bonds and from the second half of the 19th century equity trading developed on the large scale.

As privatization scheme used in Poland did not require mandatory listing from the companies, which went through this process, the WSE in the first year of operation had only nine listed companies. However, this number increased very fast and reached 83 companies in five years. In the end of 2007 there were already 351 companies listed in the exchange of which 25 were foreign. One of the consequences of the absence of mandatory listing requirements was stable increase of number of listed companies because the stock market did not suffer of huge amount of delisting as it was in the case of Czech Republic for example.

After three years of operations, on 16 April, 1994 the WSE introduced its performance indicator – the WIG20 price index. This index is based on the value of portfolio, which included twenty major and most liquid companies in the listed in the WSE main market. To be included in the WIG20 index basket, shares have to fulfill several requirements: number of shares in the free float should exceed 10%, value of

shares in free float should be larger than €1,000,000 and the company cannot be marked in any particular way. The initial value of the index was 1,000 and its value reached 3456.05 in the end of 2007 (Figure 1).



Figure 1. Historical Performance of WIG20 index

One of the reasons for such outstanding performance of Polish stock market was the pension reform made in the country. As in many other post-socialist countries, the goal of the reform was to switch from inefficient Pay-As-You-Go to three-pillar system. As a result, one of the most important types of institutional investors – pension funds – were introduced into the economy in 1999. As they were obliged to invest 95 of their portfolios into domestic securities, the demand for shares of Polish companies increased rapidly and share of pension funds equity holdings reached 6% of total market capitalization in 2006 (lorgova and Ong, 2008). Having invested around 30% of their portfolios into equities, pension funds created a high demand for new shares listing and supported high level of IPO's during last years. However, such a situation can create liquidity constraints in the future, as most of investments go into a small amount of shares. Hence, five such shares accounted for

Source: Homepage of the Warsaw Stock Exchange

around 35% of the total assets under management of pension funds in 2005 and this caused a decrease of amount of these shares in the free float (Zalewska, 2005).

Nowadays, the WSE is the most developed stock exchange in Eastern Europe with efficient and liquid shares, bonds and derivatives markets and market capitalization of \$192.6 billions as of April 2008.

Hungarian Stock Market

The Hungarian stock market's rebirth, similar to Polish one, occurred in the beginning of its transition process. The Budapest Stock Exchange (BSE) was opened on 21 June, 1990 and had 41 founding members and one single equity to trade. As in the case of Poland, the Hungarian stock market has long traditions and operated starting from the second half of 19th century until the World War II.

The BSE has played a significant role in the privatization processes in Hungary. Even though the main strategic enterprises were sold directly to strategic investors, some largest companies such as MOL, Hungarian Telecom, OTP Bank and Richter were listed at BSE before privatization. Nowadays, shares of this four companies account for the major part of the market turnover and capitalization.

Launching of official market performance indicator – the BUX index (Figure 2) created the necessary conditions for derivatives market. First derivatives were available in the form of BUX futures and options since 1995. In that time, the BSE was one of the first exchanges in the world to introduce new derivative instruments such as contracts based on individual equities for example.

In April 2000, the BSE Council decided to reorganize the exchange by converting it into the business association. In July 2002 the Budapest Stock Exchange Company Ltd. was established and changes in corporate structure occurred.

One of the most important events in the history of the exchange happened in 2004. The Wiener Borse together with a group of Austrian banks (Erste Bank, Österreichische Kontrollbank, Raiffeisen Zentralbank Öesterreich, and others) purchased the majority stake of the BSE (based on data from the BSE homepage). This helped to integrate the Hungarian stock market into European one; however, this fact may cause the lowering of market growth rate, which will be discussed later.



Figure 2. Historical Performance of the BUX Index

Source: Homepage of the Budapest Stock Exchange.

Russian Stock Market

The history of Russian stock market starts in late 1994 when the first trades were executed. In summer 1995, the first centralized exchange the Russian Trading System (RTS) was established in the form of dealership market. The RTS index (RTSI) was launched on 1 September, 1995 and its initial value was 100. In 2008, RTSI reached the value of 2433.07 (as of 22 May) and Russian stock market is considered to be one of the best performing among the post-socialist economies. Figure 3 presents the performance of the RTSI.

Figure 3. Historical Performance of the RTSI.



Source: Homepage of the Russian Trade System.

As we can see from Figure 3, Russian stock marked did not follow a stable growth path. Financial crisis in 1998 led to rapid decrease of market activity and dropped the RTSI below its initial value. It took five years for the market to recover and reach pre-crisis value but after that RTSI demonstrated very high growth rates.

The similar situation can be observed by looking at the number of companies listed. Before the crisis there were more than 300 companies in the RTS and by mid-1999 this number dropped below 200. However, this number reached 350 in 2001. Of course, the number of actively traded and therefore liquid stocks was much lower and fluctuated between 20 and 100 over the time and was around 90-100 in May 2008.

In 1997 another remarkable for Russian stock market event happened – the largest competitor for the RTS, MICEX stock exchange was launched. In contrast to RTS, which was a quote-driven market, MICEX was an order-driven one, which gave a big advantage due to lower transaction costs and easier access for investors. As a result, in spite of lower number of listed companies, MICEX turnover was growing much faster and is currently more than four times higher than RTS one.

Starting from 2005 the market started to demonstrate much higher growth, which was partly because of new companies, which decided to go public. During 2004-2005 there were 13 IPO's and 6 secondary offerings in the market. The value of such deals was \$880 mln in 2004 and \$5.2 bln in 2005 (Goriaev and Zabotkin, 2006). Most of those public placements were made on international stock exchanges (mostly the London Stock Exchange and the New York Stock Exchange); however, it helped to attract international investors to domestic market.

Another issue which simplified the access to Russian stock market for international investors, was converting by Russian companies parts of their shares into depository receipts (DR). Such DR could be much easier bought by foreigners than shares by themselves and in 2006 they were already available for 75 Russian stocks (Goriaev and Zabotkin, 2006).

Nowadays, we can observe increase of interest to IPO, as a way of attracting financing, from second-tier companies and this can become another reason of market growth in the future.

Ukrainian Stock Market

The Ukrainian stock market was the last to start its development among those described here. The PFTS¹ was launched in 1997; however initially it was not the stock exchange itself. From its creation this NASDAQ-like system has operated as information system for the market participants and until now did not allow for electronic deals. However, still PFTS provides all necessary information about the stock market instruments' prices, market transactions and accounts for more that 80% of local stock trading volume.

¹ PFTS abbreviation can be translated in English as First Stock Trade System.

Figure 4. Historical Performance of the PFTS Index



Source: Homepage of the PFTS Stock Exchange.

The performance of the Ukrainian stock market is measured by the PFTS index. Its value could not overcome the initial value of 100 points until the beginning of 2004. Positive investors' expectations become the main driving force for the stock market growth after the Orange Revolution in December, 2004. We can observe the dramatic increase of the PFTS index during last three years and as a result second highest growing market in the world in 2007. However, it is worth to noticing that such tremendous growth was partly because of the speculative interest to the high-growing but volatile market. As a result, after speculators left the market in the beginning of 2008 due to world financial markets downturn, we can see the decrease of the PFTS index value by 150 points.

In 2005, the PFTS announced its plans about converting into full-scale stock exchange and launching an order-driven market. It was partly done up until 2007; however, the order-driven market still does not have regular trade sessions and is working in a test mode.

EVIDENCE FROM THE MARKETS

In this section, both quantitative and qualitative indicators of Polish, Hungarian, Russian and Ukrainian stock markets are compared. Even though these markets are at different stages of their development, presented evidence can provide the material for analysing the possibilities and ways of future development of discussed emerging markets.

Quantitative indicators

Market Capitalization

As it was mentioned above, market capitalization is the indicator of the market size and therefore can vary greatly depending on the size of the economy in general. However, the dynamics of this indicator can signal about significant changes in the market. The market capitalization of discussed markets is presented in Figure 5.

The most dramatic increase of market capitalization in absolute values can be observed in Russia. There was five-fold increase of the size of the market from the value of \$268 bln in 2004 to \$1,329 bln in 2007. Such growth can be explained by very high interest to Russian stock market from international institutional investors searching for portfolio diversification. Such increase of demand for shares increased the value of usually undervaluated Russian companies. As a result, this growth of market capitalization of listed companies caused increase of interest to the stock market from the companies, which were not listed². Consequently, the number of IPO's in the market increased which led to even larger increase of the market capitalization.

² This mechanism was described in details in Pagano et al., 1998

The Polish stock market demonstrated stable growth over time but doubled its capitalization in 2007. The main reason for this was outstanding amount of IPO's in 2007. The number of new companies in listing reached the value of 81, out of them 13 were foreign. However, it is worth noticing that such a dramatic increase of market capitalization was partly because one of the largest European banks Unicredit Bank with the market capitalization of around \$88 bln placed its shares on the WSE, which accounted for around 40% of the overall market increase during 2007.





Sources: Homepages of national stock exchanges, Eurostat database.

The Ukrainian stock market demonstrated the highest among the markets discussed here rate of growth of market capitalization in 2007; however its size remained small compared to Russian and Polish ones. Its size increased by more than 260% from \$42.8 bln to \$111.8 bln caused by similar reasons as in the case of Russia.

In contrast to the others, Hungarian marked demonstrated very low rate of growth over time and reached the level of \$46.2 bln in the end of 2007.

The market capitalization to GDP ratio is a more adequate measurement of the market development as it removes the effect of the size of the economy and allows comparing the markets between each other (Figure 6).





Sources: Homepages of national stock exchanges, Eurostat database.

As we can see from the Figure 6, Poland has the largest stock market size comparing to the size of the economy. Its market capitalization/GDP ratio reached 143%, which is higher than most of Western European countries and close to the most developed markets in the world. Russia and Ukraine also demonstrated high level of market growth during the last years and their stock markets role in the economy keeps increasing over time. Only Hungary showed a decline of the stock markets share in the economy and the role of the stock market as the mechanism of attracting financing becomes less important for the Hungarian companies.

Number of Listed Companies

As none of the countries described in this paper had mandatory listing requirements, their stock markets started to operate with very small number or even

single share in the listing. Therefore, the number of companies listed in the stock market can be a good measure of the demand for equity financing from the economic subjects. However, in all presented markets much smaller number of shares are actively traded and as result the necessity of listing of another companies is guestionable from the point of view of market players.

	2007	2006	change
Poland	351	284	23.6%
Hungary	55	48	14.6%
Russia	339	n/a	n/a
Ukraine	331	276	19.9%

Table 1. Number of Listed Companies

Sources: Homepages of national stock exchanges.

Table 1 shows that the number of companies listed in WSE, RTS and PFTS is similar as well as the growth of this indicator (for Poland and Ukraine). Hungarian market appears to be the smallest one and is growing at a lower rate.

Qualitative indicators

Market Turnover

Market turnover is widely used as a measure of the market's liquidity and its value usually increases with the level of development of the stock market. The evidence from the markets is presented in Figure 7.

The WSE has the highest and most rapidly growing turnover which reached \$94 bln in 2007. Surprisingly, BSE has the second place with \$51 bln turnover in 2007 and constant growth of its value since 2003. High activity of the market players goes in contrast with the market size but signals about high level of Hungarian market development. Russian and Ukrainian markets have very low turnovers and in case of Russia its value even decreased during the last year.

Figure 7. Total Shares Traded in the Market



Sources: Homepages of national stock exchanges, Eurostat database.

The situation becomes even more interesting if we look at the turnover ratio indicator (Figure 8). The Hungarian market has not stable but much higher turnover ratio than others. One of the possible explanations for this is well-developed corporate governance mechanisms and law regulations of the market. Therefore, investments into the equity of domestic companies may be considered as a reliable way of risk diversification even given the small numbers of shares to invest in.





Sources: Homepages of national stock exchanges, Eurostat database.

The turnover ratio at WSE decreased rapidly during last two years mainly because of large amount of IPO's in the market, which immediately increased the market capitalization but did not affect the amount of capital market players were operating. This can be viewed as one of the consequences of rapid increase of market's size without proper adjusting of the level of a capital supply.

The Russian and Ukrainian markets still have very low level of liquidity mostly because of poor law regulations and even more important – weak law enforcement. Such situation can lead to very fast withdrawal of speculative capital from the market by foreign investors in case of crisis as it could be observed recently.

Volatility

Another important indicator, which characterises the stock market, is the risk of investment into the market or market volatility. Higher risk attracts speculative investors but is not suitable for pension funds and other institutional investors. To determine the level of volatility standard deviation of daily market returns over last two years was calculated. This value was also calculated for the London Stock Exchange FTSE index as one of the most developed markets in the world. Results are presented in the table below.

Std. dev. of daily returns (%)
1.99
1.54
2.18
2.97
1.17

 Table 2. Market Volatility

Source: Author's calculation

As we can see, Hungarian market is the closest to the developed one in terms of volatility. Ukrainian one is the riskiest one, followed by Russia and Poland. Demirgüç-Kunt and Levine (1995) find that volatility is significantly and negatively correlated with the level of financial institution development. Therefore, high level of volatility in Russia and Ukraine can be harmful for the operation of pension funds, insurance companies and other financial institutions.

Market Concentration

Market concentration was measured as a share of capitalization of five largest companies in the market in the total market capitalization. The results are presented in the Table 3.

Poland	40%	
Hungary	89%	
Russia	50%	
Ukraine	34%	

Table 3. Market Concentration

Sources: Homepages of national stock exchanges, Author's calculation

Researches show that higher market concentration is usually accompanied by smaller market size and lower liquidity (Demirgüç-Kunt and Levine, 1995, lorgova and Ong, 2008). However, the evidence from the Hungary does not support this conclusion. Having the extremely concentrated stock market, Hungary has also the highest market liquidity among the discussed countries. However, high level of concentration makes the market very dependent on the performance of several companies, therefore the effect of financial problem of large Hungarian company on the overall market performance can be very strong.

In the case of Russia, market is also very affected by the performance of one company – Gazprom. With the market capitalization of around \$360 bln in May 2008, it accounts for more than 25% of Russian market and makes market very sensitive to natural resources prices.

Institutional and Regulatory Indicators

Importance of development of institutional and regulatory frameworks for the sustainable stock market growth was widely discussed in the economic literature and most of researches reach the similar conclusions. Modigliani and Perotti (1996) argue that securities are the most vulnerable to poor law enforcement instrument. They find that small and low protected investors rights impair the ability of firms to attract equity financing and therefore make them to rely mostly on the debt financing.

Effective law enforcement becomes crucial for the stock markets in the emerging economies. lorgova and Ong (2008) show that in preparation for the EU accession Eastern European countries had to participate in the Financial Service Action Plan and adopt the International Financial Reporting Standards, which significantly improved the market regulatory framework in the region. However, some countries, such as Baltic countries and Romania could not establish effective enforcement of such regulations.

Valuable contribution to understanding the role of effective law regulation establishing and enforcement in the development of the financial markets was made by La Porta et al (1997, 1998, 1999, 2000). They developed a set of indicators to measure shareholder rights protection, creditor rights protection, law enforcement and ownership concentration to explain cross-country differences in capital markets development. One of their conclusions was that countries with less levels of shareholders rights protection and law enforcement have less developed markets (La Porta et al, 1998).

Pistor et al (2000) made broader the scope of La Porta et al analysis and applied their approach to study the case of most of post-socialist transition economies. In order to measure the effectiveness of legal institutions three indexes

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are used. The rule of law index measures the extend to which state power is transferred in an orderly manner, and law rather than violence is used for contract enforcement. Its value changes from 1 to 10. The effectiveness index is taken from the EBRD Transition Reports, which uses survey data to rank countries according to the effectiveness of legal reforms in the area of corporate and bankruptcy law. Its level also changes from 1 to 10. The third index reflects *law enforcement* and reports the percentage of firms in the sample that agree that the legal system will protect their property rights and enforce their contracts. The results for Poland, Hungary, Russia and Ukraine are presented in the Table 4.

	Rule of Law	Legal Effectiveness	Enforcement
Poland	8.7	4	0.75
Hungary	8.7	4	0.71
Russia	3.7	2	0.27
Ukraine	3.4	2	0.26

Table 4. Legal Development in Poland, Hungary, Russia and Ukraine

Source: Pistor et al (2000)

Even though these indicators are calculated as of 1998, they still can provide some useful information for understanding the differences in the stock market development in given countries. We can observe very big differences in legal frameworks of Poland and Hungary from one side, Russia, and Ukraine from the other. Given that Poland and Hungary improved their legal system even more prior to the entering into EU and Russia and Ukraine though adopted better law regulations still have very weak law enforcement, such differences can be the main explanation for the difference in the market liquidity³.

³ Poor law enforcement in Russia and Ukraine caused the increase of the number of so-called "raider attacks" on the companies. The point of such attacks is to remove the current management of the company for some period by often falsified courts decisions and to strip the assets of the company during that time. This caused the reorganization of joint-stock companies into the limited-liabilities ones in order to protect themselves from such attacks.

EFFECT OF REGULATORY FRAMEWORK ON STOCK MARKET DEVELOPMENT

The previous sections presented the qualitative indicators that the development of institutional and regulatory framework has a positive effect on countries' stock market development. The goal of this section is to obtain quantitative evidence of the effect of such factors on the markets' size and liquidity.

Model Specifications

For the purpose of this analysis a panel data set is used, which consists of annual observations for the 10 year period from 1998 to 2007 for Poland, Hungary, Russia and Ukraine. Due to comparably short time of existence of stock markets in countries of our interest, the panel data setup is the only way to obtain enough number of observations to apply econometric methods.

As a measure of market size, market capitalization to GDP ratio (MCAP2GDP) is being used. Using this indicator instead of simple market capitalization removes the effect of country size and allows for estimation of relationship between the regulatory environment and the role of stock market in the economy. For more adequate analysis only domestic companies capitalization is being used, which helps to avoid potential bias caused by foreign listings on Warsaw Stock Exchange in 2000's. The dynamics of MCAP2GDP indicator for all four countries is shown on Figure 6.

To measure the quality of the markets market turnover data (TRNV) is being used. In this case, accounting for the size of economy is not necessary as most of liquidity in the markets of our interest was being brought by foreign investors and

evidence from the market shows that there is no direct relation between the size of economy and market turnover (Figure 7).

The explanatory variables are taken from The Heritage Foundation and the Wall Street Journal Index of Economic Freedom Survey, which measures ten aspects of economic freedom in 183 countries around the world. As measurement of most of freedoms has subjective character and small variations, for this analysis trade freedom (TF) and fiscal (FF) measures were used. Trade freedom is a composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services. This measure includes also investment restrictions, which should have direct impact on stock market performance. Fiscal freedom index measures the tax burden imposed by government. It includes both the direct tax burden in terms of the top tax rates on individual and corporate incomes and the overall amount of tax revenue as a percentage of GDP. Lower tax pressure should have positive effect on the domestic investments and therefore positively affect the stock market.

To find the effect of trade freedom and fiscal freedom on the size of stock market in the economy, the following model is estimated:

$$MCAP2GDP_{t,i} = \beta_0 + \beta_1 \cdot TF_{t,i} + \beta_2 \cdot FF_{t,i} + \varepsilon_{t,i}$$

where the variables are as defined above, t is a time subscript and i is the country subscript.

Similar model is used for the estimation of the effect of trade and fiscal freedom indicators on market's turnover:

$$\mathsf{TRNV}_{t,i} = \beta_0 + \beta_1 \cdot \mathsf{TF}_{t,i} + \beta_2 \cdot \mathsf{FF}_{t,i} + \varepsilon_{t,i}$$

The variables are again as defined above, t is a time subscript and i is the country subscript.

Estimation Results

The estimation was done using the panel OLS with random effects method in order to control for country specific effects. Random effects were chosen over fixed effects due to small variations in explanatory variables. We believe that the application of any more sophisticated techniques for the model estimation is not justified due to very small number of observations.

The estimation results are shown in Table 5.

 Table 5. Estimation Results.

Depended Variable:	MCAP2GDP	TRNV
Constant	- 149.07 (44.50)	- 44.88 (25.90)
Trade Freedom	0.97 (0.41)	0.98 (0.24)
Fiscal Freedom	1.65 (0.38)	- 0.10* (0.23)
R-Squared	0.32	0.26
D-W Stat`	0.62	0.32
Observations	40	40

*Insignificant at 10% level. The quantities in parentheses below the estimates are the robust standard errors.

As explanatory variables were calculated as indexes, the absolute values of the estimates do not have any quantitative interpretations. What is more important for the analysis is the significance and the sign of the coefficients.

As we can see, the coefficients' estimates on both trade freedom and fiscal freedom are positive and significant in the model with MCAP2GDP as left-hand side variable. Therefore, the regression's results indicate that improvements in both trade and fiscal frameworks of the country have a positive effect on the stock market's size. Removing barriers for investment flow as part of trade liberalization can have direct

impact on the stock market, as it allows foreign capital to enter domestic stock market, which increases its size through increase of market capitalization of usually undervalued in the beginning of stock market development publicly-traded domestic companies. Trade freedom increase can also have indirect positive affect on stock market's growth, as it positively affects performance of domestic exporters and importers, which results in growth of their market capitalization and therefore the capitalization of the stock market in general.

Liberalization of fiscal framework can have similar positive indirect effect on stock markets size as it affects performance of all listed companies. Moreover, lowering of fiscal pressure encourages companies to enter new projects and markets, which implies attracting external financing, often through IPO's. As a result, growth of number of new companies on the market increases market's size. Such increase can occur also through increase of privatization activity through IPO, which often goes together with fiscal reforms as government needs to cover the increase of budget deficit, which arises due to lowering of fiscal income.

The coefficients' estimates of the turnover equation showed no evidence of the effect of fiscal freedom on market's liquidity. The coefficient estimate on fiscal freedom is negative but insignificant at 10% significance level.

The regression results show that growth of trade freedom positively affects market's liquidity, which can also be mostly explained by liberalization of capital transferability regulations. Such liberalization is always a signal for international investors and leads to increase of both direct and portfolio investments into emerging economies (see Samal, 1999 for India's case).

Of course, there are many more effects which can explain differences in market turnover between countries of our interest, such as establishing domestic

investors through pension reform and promoting stock market as a place for investments for private individuals, however due to lack of historical data for all four countries we cannot include them to our model.

DISCUSSION

Evidence from the markets presented in this paper shows that stock markets in four Eastern European emerging economies has gone in different development paths despite of similar initial conditions. Nevertheless, by analysing market indicators and identifying the reasons for noticeable differences in them between countries, certain conclusions about the process and stages of stock market development can be made.

In the primary stage of the stock market development, market growth occurs through increase of quantitative indicators. The size of the market increases in terms of both market capitalization and number of listed companies. This process is driven by demand factors and should be examined together with the privatization processes.

Successful privatization of strategic enterprises such as telecommunication, energy and oil companies creates positive investors expectation about their future growth⁴. Listing of shares of such companies on the stock exchange creates additional investments opportunities. Evidence from Russia and Ukraine shows that shares of oil and energy-distribution companies are the most interesting for investors after their privatization. As such companies are usually undervaluated after privatization, price of their shares and, as a result, their market capitalization increases after they become available for trading. Increased number of privatized enterprises, together with the increase of market capitalization of already privatized ones, become the main factors of stock markets growth in their primary stage of development.

⁴ For evidence on efficiency gains from privatization see Claessens and Djankov (1997) and Boubakri and Cosset (1998).

Privatization can also have positive effect on stock market development through the reduction of political risk. As it was shown by Perotti and van Oijen (1999) privatization decreases the level of political risk for investors as it shows political commitment to market-oriented policy and to regulatory and private property rights. They find significant negative correlation between the level of privatization and political risks. In addition, they show that further changes in political risk have strong effect on the stock markets development.

In the cases of Russia and Ukraine, the level of political risk was also decreased due to political factors. Political stability in Russia after Putin came to power increased the confidence of investors and caused a stable growth of market capitalisation after 2000. If we look at the same indicator for Ukraine, we can see the stable and rapid growth of market after the Orange Revolution, which positively affected investors' expectations and reduced political risks.

However, as we can see, increase of stock market size, which is something common for all four economies, does not necessarily leads to increase of its liquidity. Both Russian and Ukrainian markets are characterized by very low turnover ratios compared to Hungarian and Polish ones, and therefore there should be differences between these pairs of countries which explain this.

Having a look at the evidence from the markets presented in this research, we can see that in addition to much higher market liquidity Poland and Hungary have much better quality of law regulations and law enforcement. These factors were considered as the key determinants of market liquidity by many researchers. Pajuste (2002) finds that countries with better legal shareholders protection and law enforcement have higher market liquidity and shows that both quality of law and law enforcement can explain the variations of market activity however cannot explain the

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variations of market capitalization. Demirgüç-Kunt and Levine (1995) show that among all stock market indicators market turnover is the most correlated with the level of institutional development.

Both Poland and Hungary established effective legal frameworks in the beginning of the transition process and improved them prior to entering the EU. Russia and Ukraine, even after improving their law systems and adoption the acts about minority shareholders rights protection and mandatory publication of information, still have very weak law enforcement. The high level of corruption eliminates the ability of courts and government regulators to enforce that laws and protect the shareholders rights.

Such a situation limits the possibilities of using the stock market as a source of assets diversification by pension and mutual funds and insurance companies and affects their profitability. Lack of law enforcement can slow down the current growth of stock market in Russia and Ukraine as it shifts provision of funding from the stock market to banking sector, which has better possibilities to enforce its claims (Modigliani and Perotti, 1996).

In order to understand better the reasons of unequal stock markets development in case when market regulations are effective and market turnover is high, it is also important to take a look at differences between Polish and Hungarian stock markets. In Hungary market faced the lack of internal source for growth. All main companies are already listed and another ones are too small to affect the market size or do not need listing as equity financing is more expensive than debt one for them. Polish market, besides still having internal growth potential due to unfinished privatization, is also benefiting from foreign companies listings.

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In case of relative small economy and high level of market concentration, it even may become costly to run the stock exchange. Here is when the economy of scale plays its role and the necessity of merging the stock exchange appears. This situation we can observe in most of Eastern European EU countries. As a result, we can see acquisitions of local stock exchanges by regional ones such as Wiener Borse in case of Hungary, Czech Republic and Slovakia and the OMX Stock Exchange in case of Baltic countries. Consequently, stock markets still play their role in that economies as providers of portfolio diversification opportunities for domestic institutional investors; however, their possibilities to grow are limited as large companies in those countries find it more preferable to be listed in the international stock exchanges as MOL and Hungarian Telecom in case of Hungary for example.

Another way of further stock market development was chosen by Poland. The WSE started to attract foreign companies by offering them less expensive place for IPO than other markets. As a result there were already 25 foreign companies listed in the WSE in the end of 2007, among them such large as Italian Unicredit Bank, Hungarian MOL and Czech CEZ. This allowed the WSE to become international and very dynamic growing stock exchange. However, it is doubtful that any other Eastern European stock exchange could go this way.

The example of the WSE can be useful for the Russian and Ukrainian stock exchanges. Most post-Soviet countries do not have well-established stock markets however they have enough of well-performing companies, which are interested in equity financing. Improving of the legal framework and market infrastructure in Russian and Ukrainian markets can make them very attractive for IPO's of such companies.

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CONCLUSION

Since the beginning of transition, stock markets have developed significantly in most of Eastern European economies. However, the level of development varies greatly across countries in terms of market capitalization, turnover and institutional framework. There are several explanations for this.

Countries, which are at the initial stage of their stock market development, such as Russia and Ukraine, enjoy the high level of market size growth due to the privatization processes and increase of the value of domestic companies. However, they still suffer from the low liquidity of the market. In order to change this situation significant improvements in law quality and enforcement and economic freedom should be done.

Hungary and Poland benefit from high market activity; however they chose different ways of further market development. Hungarian market besides being very liquid one is small and very concentrated. Therefore, the best option for its future was integration into the regional stock market, which was done by selling the controlling stake of the BSE to Wiener Borse and Austrian banks.

In contrast, the Warsaw Stock Exchange became international by itself. By offering convenient conditions for IPO's the WSE managed to attract foreign companies and this became the main source of its growth. Nowadays even such large foreign companies as Italian Unicredit Bank, Hungarian MOL and Czech CEZ are listed at the WSE.

It is doubtful then any other market of Eastern European EU members could repeat the Polish way of growth, however they still can serve as a source of equity financing for domestic companies which cannot afford international listing. In post-Soviet world there is still necessity of well-functioning and well-regulated stock

market, which can became international by attracting companies from other countries and play the same role as Warsaw Stock Exchange started to play for companies from CEE countries.

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