Institutional Determinants of Stock Market Development in European Union Transition Economies

Yilmaz Bayar [1]

Stock markets have become an important market for long run fund flows between savers and investors and also a determinant of economic growth with the emergence of endogenous growth theories. This study investigates the impact of institutional development on stock market development in 8 European Union transition economies during 2002-2013 period employing panel regression. We found that political stability, regulatory quality, rule of law and control of corruption had positive impact on stock market development.

Keywords: Institutional determinants, stock market development, panel data analysis.
JEL Classifications: C23, G10, G28, O43, O52

1. Introduction

Financial stock markets enable firms to raise funds for their investments and encourage saving by both increasing the number of financial instruments and decreasing the risk with diversification and giving the chance of a partner of successful firm to the investors. In turn increasing savings and investment and efficiently allocation of

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[1]**Yilmaz Bayar**, Usak University, Department of Economics, e-mail: yilmaz.bayar@usak.edu.tr

capital among investment opportunities foster the economic growth. Therefore, development of stock markets also has become an important determinant of economic growth directly and indirectly and academicians have begun to focus on the nexus between stock market development and economic growth (See Van Nieuwerburgh (2006), Enisan and Olufisayo (2009), Cooray (2010), Nyasha and Odhiambo (2015) and Pradhan et al. (2015)). Also the determinants of stock market development have become important after determination of a positive relationship between stock market development and economic growth. The studies on the determinants of stock market development have been proceeding in two forms of macroeconomic and institutional determinants. In this regard, empirical studies indicated that macroeconomic variables such as size of economy, income level, economic growth, domestic savings, inflation, real interest rate, trade and financial openness, foreign direct investment inflows, remittances, development of financial intermediary and stock market liquidity have been major determinants of stock market development (see Levine and Zervos (1998), Garcia and Liu (1999), Naceur et al. (2007), Yartey (2010), Aduda et al. (2012), Sukruoglu and Temel-Nalin (2014), Zhou et al. (2015), Raza et al. (2015)). On the other hand some empirical studies have focused on the institutional determinants of stock market development and found that regulatory quality, rule of law and control of corruption have been major institutional determinants behind stock market development (see Gani and Ngassam (2008), Naceur et al. (2014)).

The transitional economies of the European Union (EU) have experienced significant changes in institutional quality during the transition process from centrally planned economies to market economies between 1990s-2010s and also have taken considerable steps in the development of institutions during the process of integration with the EU in order to meet the membership criteria. Consequently, the transitional economies of the EU have come a long

way in terms of institutional quality. This study investigates the impact of structural reforms in the field of public administration on the development of stock market in transition economies of European Union including Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovak Republic and Slovenia except Estonia, Latvia, and Lithuania during the period 2002-2013 by using panel regression.

The rest of the paper is organized as follows. The next section overviews the theoretical and empirical literature on the nexus between stock market development and institutional development. Section 3 presents data and the econometric methodology; Section 4 conducts the empirical analysis and presents major findings. Finally, the study is over with the Conclusion.

2. Literature review

Institutions and regulations design and regulate the environment which stock markets operate. Therefore, countries with better institutions possibly have more developed stock markets, because institutions may contribute to the development of stock markets by creating a credible environment with better property rights, more transparency and less corruption and in turn increasing the demand of securities. More developed countries also have potential to foster stock market development through increasing the economic growth (Billmeier and Massa, 2007). There have been three major theoretical studies called as the law and finance hypothesis by La Porta et al. (1997), the endowment hypothesis by Acemoglu et al. (2001), and economic institutions hypothesis by Acemoglu et al (2004) which focus on the relationship between institutions and financial development. La Porta et al. (1997) suggested that strong legal infrastructure for investor and creditor protection had positive impact on the development of finance sector through the channels of political and adaptability. On the other hand Acemoglu (2001) asserted that countries with different resource endowments established different legal systems consisting of private property protection and this in turn

contributed to the development of finance sector. Finally Acemoglu et al. (2004) also suggested improvements in institutions had positive impact on economic growth through affecting the structure of economic incentives (provision of property rights, most efficiently allocation of the resources).

Most of the empirical studies have found that improvements in institutional quality has had positive impact on stock market development (See Billmeier and Massa (2007), Cherif and Gazdar (2010), Yartey (2010), Law and Azman-Saini (2012), Cherif and Dreger (2014),).

Billmeier and Massa (2007) investigated the impact of institutions (proxied by economic freedom index of Heritage foundation), remittances and natural resources on stock market development in 17 Middle East and Central Asian countries during the period 1995-2005 by using panel regression and found that institutions had positive impact on the development of stock markets. On the other hand Gani and Ngassam (2008) examined the relationship between institutional variables (proxied by World Governance Indicators (WGI) of World Bank) and stock market development in 8 Asian countries by using panel regression and found that rule of law and political stability had positive impact on stock market development. Law and Habibullah (2009) also investigated the impact of institutions (proxied by the indicators of International Country Risk Guide of Political Risk Services), openness and financial liberalization on the development of banking sector and stock market in 27 countries during the period 1980-2001 by using dynamic panel regression and found that institutional quality had positive impact on stock market development. Cherif and Gazdar (2010) investigated the impact of macroeconomic and institutional variables (proxied by the indicators of International Country Risk Guide of Political Risk Services) on stock market development in 14 Middle East and North African (MENA) countries during the period 1990-2007 by using panel regression and found no

significant relationship between institutional quality and stock market development. In another study, Yartey (2010) focused on the relationship among macroeconomic and institutional variables institutions (proxied by the indicators of International Country Risk Guide of Political Risk Services) and stock market development in 42 emerging markets during the period 1990-2004 by using dynamic panel regression and found that institutional quality had positive impact on stock market development.

Komijani and Ahmadi (2012) investigated the relationship between legal protection of shareholders and stock market development in 46 developing countries during the period 2006-2010 by using panel regression and found that there was a positive relationship between legal protection of shareholders and stock market development. On the other hand Yemelyanova (2013) investigated the determinants (institutional quality proxied by WGI of World Bank) of stock market development in 8 Central and Eastern European countries during the period 2002-2011 by using panel regression and found that voice and accountability, regulatory quality and control of corruption had positive impact on stock market development. Kamiru and McGowan (2013) examined the relationship between transparency and stock market development in 45 countries during three periods 2005/2006, 2007/2008, and 2009 and found that countries with higher transparency had more developed stock markets.

Cherif and Dreger (2014) examined the institutional determinants (proxied by International Country Risk Guide of Political Risk Services) of development of banking sector and stock market in 15 MENA countries during the period 1990-2007 by using panel regression and found that corruption and law had positive impact on stock market development. Finally Naceur et al. (2014) investigated the major determinants (institutions proxied by International Country Risk Guide of Political Risk Services) of banking sector and stock market development in 12 MENA countries during the period 1960-

2006 by using panel regression and found that democratic accountability had positive impact on stock market liquidity, while corruption had negative impact on stock market liquidity.

3. Data and econometric methodology

We examined the impact of six governance indicators (voice and accountability, political stability and the absence of violence/terrorism, government effectiveness, regulatory quality, rule of law and control of corruption) on stock market development in the EU transitional economies during the 2002-2013 period by panel regression. The countries and the data period in our study were determined by the availability of data.

3.1. Data

We used the market capitalization of listed domestic companies as percent of GDP as proxy for stock market development. On the other hand we used six WGIs of Kaufmann et al. (2010) as proxy for institutional development. These WGIs are consisted of voice and accountability (VAA), political stability and absence of violence/terrorism (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (ROL) and control of corruption (COC). These governance indicators based on 31 data sources reporting the perceptions of governance of a large number of survey respondents and expert assessments worldwide (see Kaufmann et al. (2010) for detailed information). The indexes of the each governance indicator changes between -2.5 (weak) and 2.5 (strong) governance performance. Our study period and sample were determined by data availability. The variables used in the econometric analysis, their symbols and data sources were presented in Table 1. We used Stata 14.0, WinRATS Pro. 8.0 and Gauss 11.0 software packages for the analysis.

Data description

Variables	Symbol	Source
Market capitalization of listed domestic companies (% of GDP)	SMC	Beck et al. (2000)
Voice and accountability	VAA	Kaufmann et al. (2010)
Political stability and absence of violence/terrorism	PS	
Government effectiveness	GE	
Regulatory quality	RQ	
Rule of law	ROL	
Control of corruption	COC	

3.2. Econometric Model and Econometric Methodology

Our empirical model is aimed at investigating the impact of institutional development on the development of stock market. Thus, our empirical models are described as follows:

$$SMC_{it} = \beta_{0i} + \beta_{1i}VAA_{it} + \beta_{2i}PS_{it} + \beta_{3i}GE_{it} + \beta_{4i}RQ_{it} + \beta_{5i}ROL_{it} + \beta_{6i}COC_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

The variables of the model are described in Table 1, the subscripts i and t index countries and time respectively. Furthermore, the model includes the unobservable country specific effect μ and error term ε.

First, we investigated the cross-section dependence among the variables, because it exhibits importance for selection of unit root test. The first generation panel unit root tests such as Levin et al. (2002), Im et al. (2003), Maddala and Wu (1999), Hadri (2000) assume that there is cross-sectional independency, while second generation panel unit root tests such as Bai and Ng (2004) and Pesaran (2007) consider allows for cross-sectional dependency. Also first generation panel unit root tests cause size distortions and low power in case there is cross-sectional dependency (Hurlin, and Mignon, 2007). In this study,

because we used Breusch and Pagan (1980) Lagrange multiplier (LM) test, because time dimension of our dataset (T=12) is higher than cross-sectional dependence of dataset (N=8). Then, we used CADF (Covariate-Augmented Dickey Fuller (CADF) and CIPS (Cross-sectionally augmented IPS (Im, Pesaran and Shin (2003))) test to investigate the stationarity of the variables.

Later, we employed Chow (F)(1960) and Breusch and Pagan (χ^2) (1980) and Hausman (1978) tests to select the estimation method of the panel regression. Finally, we test the serial correlation problem using Wooldridge (2002) autocorrelation test and test the heteroskedasticity problem using Greene (2003) heteroskedasticity test after estimating the panel regression.

4. Empirical analysis

4.1. Cross-sectional Dependence Test

We used Breusch and Pagan (1980) CD_{LM1} test (null hypothesis is that there is cross-sectional independency) to investigate the cross sectional dependency among the variables and the results of the test were presented in Table 2. We found that there was cross-sectional dependency among the variables; because the probability values were lower than 0.05.

Table 2

Results of Breusch and Pagan (1980) CD_{LM1} test

	SMC		VAA		PSS		GE	
	t ist	p	t ist	p	t ist	p	t ist	p
	9.271	0.001	10.552	0.000	9.026	0.002	8.742	0.026
CD_{LM1}	RQ		ROL		COC			
	t ist	p	t ist	p	t ist	p		
	9.423	0.003	13.982	0.009	7.451	0.001		

4.2. Results of Panel Unit Root Test

We used CIPS panel unit root test of Pesaran (2007) based on CADF test, because we found that there was cross-sectional dependency among the variables. CIPS statistics is calculated by taking arithmetic mean of CADF statistics of each country. All calculated CIPS values were found to be higher than the critical values, so the null hypothesis (the series is not stationary) is accepted and variables were not stationary at the level, but they became stationary after first-differencing.

Table 3

Results of CADF and CIPS test

test	SMC	VAA	PSS	GE	RQ	ROL	COC
CADF	5.991*	12.347*	10.732*	5.728*	6.099*	11.274*	9.642*
CIPS	6.528*	11.936*	11.002*	7.642*	7.113*	9.671*	10.033*

* Significant at 5%

4.3. Model Selection

We conduct several econometric tests to determine which estimation method to use in the panel data analysis. Chow (1960) test (null hypothesis: pooled OLS is effective) is used to determine the common significance of country- and time-specific effects among the panel data, while Breusch Pagan (BP) (1980) test (null hypothesis: OLS is effective) is used to determine whether to use pooled OLS or the random effects model (REM). Finally Hausman (1978) test (null hypothesis: REM is efficient) is used to choose between FEM and REM. We conducted Chow, BP and Hausman tests, and the results are presented in Table 4. The Chow test indicates the use of FEM model, while the BP test dictates the use of REM. Finally Hausman test showed that REM model would be more effective.

Table 4

Results of Model Selection Test

Test	p value	Decision
Chow (F) test	0.012	Accept H_1
BP (χ^2) test	0.001	Accept H_1
Hausman test	0.183	REM model is effective

4.4. Model Estimation

Different algorithms are applied for the analysis, and we conduct the estimation with the cross-section SUR algorithm, which yields the minimum sum of the squared errors; the estimation results are presented in Table 5. The results indicate that political stability and absence of violence/terrorism (PS), regulatory quality (RQ), rule of law (ROL) and control of corruption (COC) had positive impact on stock market development. On the other hand voice and accountability (VAA) and government effectiveness (GE) had no statistically significant impact on stock market development. The independent variables explained 61.3% of the changes in the dependent variable (SMC). We also used a dummy variable to represent the global financial crisis and Eurozone sovereign debt crisis, the coefficient of the dummy variable was found to be statistically significant and had positive impact on stock market development.

Table 5

Results of Panel Regression Estimation

Dependent variable: SMC	Coefficient	Std. Error	t-Statistic	Prob.
VAA	-0.074306	0.075478	-0.984473	0.3291
PS	0.507170	0.139233	-3.642603	0.0006*
GE	0.012408	0.033537	0.369984	0.7128
RQ	0.106239	0.029932	-3.549304	0.0008*

ROL	0.147709	0.037661	3.922104	0.0002*
COC	0.308095	0.062321	4.943687	0.0000*
Dummy	0.006014	0.001604	3.749099	0.0003*
C	0.029868	0.002570	11.62019	0.0000
	$R^2 = 0.613$		$\bar{R}^2 : 0.592$	
	F stat.= 59.526		F-stat (p)=0.000	
	DW test=2.19			

* Significant at 5%

4.5 Diagnostic Tests

We investigated the autocorrelation problem with Wooldridge (2002) autocorrelation test (null hypothesis: no serial correlation) and investigated the heteroscedasticity problem with by Greene (2003) test (null hypothesis: no heteroscedasticity/homoscedasticity) and the results of the test were presented in Table 6. The results indicated that there was no autocorrelation and heteroskedasticity in our model.

Table 6

Results of Woolridge autocorrelation and Greene heteroscedasticity tests

Test	p value
Wooldridge test	0.195
Greene heteroskedasticity test	0.142

Source: Own calculation

5. Conclusion

We investigated the major institutional determinants of stock market development in transition economies of European Union including Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovak Republic and Slovenia except Estonia, Latvia, and Lithuania during the period 2002-2013 by using panel regression and found that political stability, regulatory quality, rule of law and control of

corruption had positive impact on stock market development. Our findings are consistent with the predictions of major theories and findings of empirical studies in the literature and verified that the institutional quality is a component of stock market development and in turn contributes to the economic growth considering the positive relationship between stock market development and economic growth. So improvements in institutional quality and legal structure are essential for development of stock markets.

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