Determinants of Stock Market Development in Eurasian Countries

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Abstract

Stock market capitalization has been regarded as an important component of financial development of countries, as an instrument of economic growth. This study examines the effect of private credit, real income, inflation, foreign direct investment, financial openness, stock market liquidity, liquid liabilities, and domestic savings on stock market capitalization for 55 Eurasian countries between 1975 and 2017. I find that real income, stock market liquidity, foreign direct investment and financial openness have a positive effect, while inflation has a negative effect on stock market capitalization to GDP ratio. Other variables are found to be insignificant. I also examine pre-1990 and post-1990 periods due to political and structural changes in the region, however the results are robust to both periods.

1 Introduction

The effect of financial development on growth has been studied extensively. The sectors more dependent on external financing grow more in countries with better financial development during 1980s (Rajan and Zingales, 1996). Early theoretical work on the role of financial intermediaries, especially banks, imply that they play a significant role in reducing information costs and monitoring costs (Diamond, 1984; Boyd and Prescott, 1986). The early works on the role of financial intermediaries in stock markets imply that they play a role in information processing, risk diversification and resource mobilization (King and Levine, 1993). The effects of financial development on growth may require a degree of real development (Greenwood and Smith, 1997). Other studies found that there may be limits to benefits of financial development. Order of financial liberalization matter for welfare improvement, countries with large deficits and high reserve requirements may not benefit from financial liberalisation (Bencivenga and Smith, 1992).

Stock markets provide several functions for the economy, such as information processing, risk sharing, monitoring, and resource pooling. These functions provide means for firms and entrepreneurs to raise capital more efficiently, such that good investment projects are financed and leads to economic growth. Stock market development level also have an impact on the financing choice of companies (Demirgüç-Kunt and Maksimovic, 1996). The control mechanisms in stock markets, such as shareholder meetings and takeovers are flawed, and banks, monitor ownership and repution may serve as a better control mechanism (Stiglitz, 1985; Grossman and Hart, 1980). Concentrated ownership reduces liquidity and reduces the benefits of market monitoring (Holmstrom and Tirole, 1993). Lower costs of information, better information, lower risk aversion and noise trading makes the informativeness of the pricing system better in a stock market (Grossman and Stiglitz, 1980).

In especially developing economies, stock markets are underdeveloped and thus not the only financing source. Other financing methods involve financial intermediaries such as banks, which form long term relation with the firms and use them to serve information processing, risk sharing, resource pooling and monitoring functions. Unlike stock markets, perhaps due to heavier regulations, banks favor prudence, thus may stifle innovation and growth strategies and may even favor the companies with tight relations excerberating agency problems (Levine, 2005). They are not used to non-standard environments and may even act reluctant to allow nonperforming companies with whom they have long term relations to fail (Morck and Nakamura, 1999; Levine, 2005). Aside from stock markets, some studies argue that functions rather than institutions play a key role, since functions are more stable across time and institutions follow functions (Merton and Bodie, 1995).

The literature is reviewed in section 2 which also includes hypothesis development, section 3 discusses data and methodology, section 4 discusses the results and section 5 concludes.

2 Literature Survey and Hypothesis Development

Even though the theoretical work on the effects of financial development, bank or market-based systems, on growth is large, the determinants of stock market development remains limited (Levine, 1997).

From an empirical perspective, several studies have examined the determinants of stock market development. Two broad sets of determinants are macroeconomic and institutional factors. Macroeconomic factors include economic development, banking sector development, inflation rate, interest rate, exchange rate and private capital flows. The institutional factors include legal origin, legal protection, corporate governance, financial market liberalisation, stock market integration and trade openness (Ho and Iyke, 2017).

Private credit is expected to have a positive relation with stock market capitalization ratio. A study on 42 developing economies around the world and found stock market liquidity, income and foreign direct investment

improve the stock market capitalization ratio (Yartey, 2010). Moreover, while at low levels of private credit stock market is complementary to private credit, it becomes a substitute at high levels.

GDP per capita is expected to have a positive relation with stock market capitalization ratio. GDP per capita is highly correlated with institutional variables (La Porta and Shleifer, 2008). Using the data for 49 countries in 1996, it has been shown that countries with poorer investor protection, have smaller and narrower capital markets, with countries with English common law having the best protection against insiders, French civil law the least, and German and Scandinavian civil law in the middle (La Porta et.al, 1997). It is argued that legal protection of investors improves the availability of debt and equity financing. (La Porta et.al, 1997). Existence of a large shareholder and investor protection are essential elements of corporate governance, thus existence of them improves stock market development (Shleifer and Vishny, 1997).

Inflation is expected to have a negative relation with stock market capitalization ratio. Monetary models imply high inflation (above a certain threshold) is negatively associated with bank lending and stock market activity. (Huybens and Smith, 1999). At high levels of inflation, market frictions increase the credit rationing which leads to decreases in firms' financial performance. Using data on 65 countries between 1960 and 1995, it is found that higher inflation reduces bank lending and stock market activity (Boyd et.al, 2001). On the other hand, since stocks may provide a way to hedge inflation risk, investors in high inflation countries may use stock markets more heavily.

Foreign direct investment (FDI) may be positively or negatively correlated with stock market capitalization ratio. It has been argued that countries that are riskier, less financially developed and have weaker institutions tend to attract less capital but more of it in the form of foreign direct investments, which implies stock market development and FDI flows should be negatively correlated (Hausmann and Fernandez-Arias, 2000). On the other hand, another study on 77 countries found that stock markets and FDI flows are complements and are positively correlated (Claessens et.al, 2001).

Financial openness is expected to have a positive relation with stock market capitalization ratio. Stock market liberalization, defined by the ability of foreign investors to invest into stock market, allows investors to diversify risk and thus should impove stock market development (Henry, 2000).

Stock market liquidity is measured by the ratio of value traded to GDP. Better liquidity leads to investors requiring less premium to invest, thus is expected to be positively correlated with stock market capitalization ratio (Garcia and Liu, 1999).

Liquid liabilities is used as a measure of financial intermediary development (King and Levine, 1993). Higher financial intermediary development is expected to be positively correlated with stock market capitalization ratio.

Domestic savings in the economy is expected to be positively correlated with stock market capitalization ratio. It can be argued that more savings may increase the capital flow to the financial system, one of them being stock markets (Yartey, 2010).

3   Data and Methodology

The dataset includes 55 Eurasian countries with a total observation of more than 10 years, for a total of 1367 country-year observations. The data on variables were obtained from World Bank database, except Chinn-Ito index which measures the financial openness, in other words restrictions on cross-border financial transactions (World Bank, 2021a; World Bank 2021b; Chinn and Ito, 2006). The summary statistics, just the means and number of observations to save space, are given in Table 1.

In Table 1, SM refers to stock market capitalization ratio, CR is the private credit, GDP is long real GDP per capita, SAV is domestic savings, INF is inflation (GDP deflator), SMT is stock market traded ratio to GDP, LIQ is liquid liabilities, OP is financial openness index, YR1 is the starting period of observations, while YR2 is the end year, N is the number of years. All variables are taken logs except financial openness and inflation. Also note that gaps exist, so N may be different from the difference of YR2 and YR1. The highest average stock market capitalization ratio is for Switzerland, the lowest is for Mongolia. The highest domestic credit ratio belongs to Cyprus and Japan, and the lowest is for Georgia. Japan and Cyprus also have higher liquid liabilities. Traditionally bank-oriented systems such as Japan and Germany have a higher credit ratio than stock market capitalization ratio, which seems to be also true for UK which is a traditionally market-oriented country. This difference seems to be more pronounced for countries with lower gdp per capita. Singapore, Kuwait, and Bahrain are among the few countries with higher stock market development ratio. Average high inflation is present in countries such as Hungary, Israel, Turkey, and Ukraine. Best stock market liquidity belongs to Switzerland and Singapore, with Georgia the least. Cyprus and Singapore attract most foreign capital compared to their GDP, with Japan the lowest. Germany and Ireland have the highest average financial openness while Ukraine, Nepal, China, and Kazakhstan the lowest. The sample seem to be very diverse across all variables such as economic development, financial openness, macro-economic policies. The data also spans several years, but with an imbalanced panel, some countries covering several years, while others enter into the dataset in 2005.

	SM	CR	GDP	SAV	INF	SMT	LIQ	FDI	OP	YR1	YR2	N
Austria	2.42	4.42	10.49	3.26	2.96	0.79	4.36	-0.35	0.86	1975	2017	38
Bahrain	4.44	4.00	9.99	3.66	4.77	1.12	4.18	1.39	0.97	1996	2015	16
Bangladesh	1.85	3.27	6.37	2.92	5.92	-0.34	3.52	-1.24	0.19	1993	2012	20
Belgium	3.40	3.78	10.43	3.19	3.40	1.61	4.17	1.45	0.81	1975	2012	36
Bulgaria	0.86	3.48	8.50	2.73	67.18	-0.89	3.85	1.55	0.48	1993	2012	20
China	3.32	4.74	7.90	3.78	4.89	3.73	4.90	1.25	0.16	1992	2017	26
Croatia	3.30	3.92	9.45	2.88	3.12	0.12	3.99	1.05	0.61	1996	2017	22
Cyprus	3.26	5.13	10.21	2.98	2.72	1.13	5.17	2.75	0.59	1992	2017	26
Czech R.	2.80	3.78	9.70	3.43	4.85	2.06	4.13	1.43	0.69	1993	2012	20
Denmark	3.31	4.11	10.75	3.20	4.09	1.58	3.95	-0.18	0.79	1975	2011	33
Finland	3.75	4.18	10.49	3.33	3.27	2.69	3.95	0.11	0.89	1982	2012	28
France	3.33	4.19	10.41	3.12	4.22	2.44	4.23	-0.02	0.72	1975	2014	38
Georgia	1.40	2.76	7.76	1.75	7.00	-2.20	2.70	2.01	0.67	2000	2012	11
Germany	3.29	4.48	10.45	3.18	1.98	3.02	4.21	-0.49	1.00	1975	2017	38
Greece	3.23	4.05	10.06	2.57	5.52	2.38	4.32	-0.75	0.73	1989	2017	28
Hungary	2.60	3.54	9.33	3.15	10.42	1.86	3.87	2.24	0.67	1992	2016	21
Iceland	3.79	4.82	10.61	3.04	5.08	2.85	4.04	1.19	0.54	1996	2012	17
India	3.69	3.54	6.88	3.32	6.87	2.79	4.01	-0.32	0.16	1989	2017	29
Indonesia	3.09	3.60	7.87	3.42	9.20	1.92	3.52	0.33	0.72	1989	2017	24
Ireland	3.88	4.55	10.80	3.66	2.54	2.10	4.61	2.78	1.00	1996	2017	21
Israel	3.61	4.15	10.12	2.91	38.64	2.56	4.18	0.16	0.59	1979	2017	39
Italy	3.28	4.21	10.45	3.06	3.13	3.05	4.15	-0.67	0.92	1989	2014	25
Japan	4.00	5.10	10.51	3.37	1.10	3.67	5.20	-2.90	0.94	1975	2017	37
Jordan	4.38	4.24	8.00	1.13	5.83	2.74	4.70	0.54	0.70	1990	2016	14
Kazakhstan	2.45	3.30	8.91	3.55	12.44	-0.39	3.17	2.03	0.16	1998	2016	19
Kuwait	4.36	3.97	10.63	3.60	7.64	3.52	4.24	-1.64	0.76	1995	2012	15
Latvia	1.85	3.58	9.11	2.85	7.01	-0.57	3.45	1.43	0.97	1996	2012	16
Lithuania	2.64	3.25	9.12	2.73	4.89	0.39	3.37	1.31	0.95	1996	2012	16
Malaysia	4.76	4.66	8.77	3.64	3.29	3.21	4.67	1.18	0.62	1981	2017	37
Malta	3.45	4.61	9.90	3.06	2.44	-0.14	4.97	3.35	0.66	1995	2017	22
Mongolia	1.36	2.90	7.60	3.17	16.75	-1.18	3.14	1.81	0.68	1995	2012	18
Nepal	2.60	3.59	6.22	2.45	8.46	-0.73	3.97	-1.73	0.16	1996	2012	13
Netherlands	3.84	4.39	10.56	3.32	2.64	3.12	4.35	1.37	0.84	1975	2014	38
N. Macedonia	1.49	3.33	8.25	1.09	3.16	-0.28	3.41	1.15	0.36	1996	2012	15
Norway	3.38	4.35	11.22	3.53	4.41	2.68	3.95	0.55	0.81	1981	2017	31
Oman	3.43	3.65	9.78	3.63	5.20	1.67	3.54	0.04	0.93	1993	2017	24
Pakistan	2.84	3.12	6.79	2.54	10.00	1.80	3.59	-0.10	0.16	1989	2016	28
Philippines	3.84	3.48	7.51	2.81	6.35	2.32	3.90	0.35	0.39	1989	2017	29
Poland	2.97	3.46	9.26	2.98	5.24	2.04	3.80	1.07	0.41	1995	2017	23
Portugal	3.28	4.58	9.92	2.81	4.20	2.50	4.09	0.95	0.89	1989	2014	26
Qatar	4.53	3.87	11.09	4.20	4.36	3.04	4.04	0.46	1.00	2005	2017	12
Saudi Arabia	4.10	3.58	9.89	3.68	2.79	3.74	3.95	0.37	0.75	1993	2017	18
Singapore	4.99	4.53	10.29	3.86	2.04	4.03	4.51	2.57	0.98	1979	2017	39
Slovenia	2.68	3.59	9.95	3.26	4.93	0.63	3.93	0.31	0.67	1995	2017	22
South Korea	3.47	4.32	9.39	3.55	5.14	3.64	3.87	-0.56	0.43	1979	2017	39
Spain	3.49	4.55	10.09	3.11	6.40	2.69	4.20	0.56	0.72	1975	2017	43
Sri Lanka	2.75	3.26	7.61	2.93	9.63	0.59	3.40	0.08	0.41	1989	2016	28
Sweden	3.69	3.98	10.58	3.27	4.99	2.73	3.87	0.00	0.85	1975	2012	37
Switzerland	4.88	5.00	11.10	3.46	1.39	4.73	4.95	0.81	0.61	1983	2016	33
Thailand	4.00	4.74	8.30	3.50	3.45	3.62	4.54	0.87	0.33	1989	2017	29
Turkey	2.88	3.28	9.13	3.11	39.75	2.95	3.45	-0.12	0.32	1989	2017	29
Ukraine	2.54	3.54	7.86	3.07	16.30	-0.45	3.35	1.28	0.12	1999	2012	14
UAE	3.70	4.11	10.67	3.76	4.65	2.25	4.12	1.04	1.00	2003	2017	15
UK	4.30	4.42	10.30	2.66	5.97	3.51	4.21	0.88	0.90	1975	2012	37
Vietnam	2.54	4.53	7.20	3.30	9.43	1.58	4.57	1.73	0.34	2004	2017	14
Total	3.38	4.08	9.52	3.16	7.62	2.14	4.11	0.57	0.66	1975	2017	1406

Table 1. Summary statistics of variables. **Source:** *World Bank Database and the author's calculations*

Table 2 shows the correlations between the variables under study. Stock market capitalization is highly positively correlated with stock market liquidity, domestic credit ratio, liquid liabilities, GDP per capita, foreign direct investment, savings and financial openness while negatively correlated with inflation. Financial openness is highly correlated with GDP per capita at 61%. Also, stock market liquidity is highly correlated with liquid liabilities at 44%.

	SM	CR	GDP	SAV	INF	SMT	LIQ	FDI	OP
SM	1								
CR	0.54***	1							
GDP	0.40***	0.49***	1						
SAV	0.34***	0.25***	0.30***	1					
INF	-0.28***	-0.17***	-0.100***	-0.051	1				
SMT	0.80***	0.50***	0.37***	0.33***	-0.14***	1			
LIQ	0.52***	0.75***	0.39***	0.22***	-0.16***	0.44***	1		
FDI	0.22***	0.12***	0.072**	0.074**	-0.056*	0.097***	0.11***	1	
OP	0.40***	0.33***	0.61***	0.15***	-0.17***	0.29***	0.24***	0.18***	1
Obs.	1406								

Table 2. *Correlations between the variables.* **Source:** *World Bank Database and the author's calculations*

To analyse the effects of the variables on stock market capitalization ratio, since most variables may be subject to simultaneity bias, I employed a panel fixed effects instrumental regression analysis where estimation is done using two stage least squares.

$$y_{it} = \alpha_i + \beta y_{i,t-1} + \sum_{j=1}^{8} \gamma_j x_{jit} + \theta_t I_t + \varepsilon_{it}$$

where y_{it} is the log of stock market capitalization, x_{jit} are the dependent variables and I_t is the time dummy variables. Since the stock market development ratio exhibits high autocorrelation across the panel for several countries, its lagged value is also included in the regressions. The standard estimates for the parameters are computed by clustering the errors at the country level.

4   Results

The results of two-stage least squares regression is given in Table 3. The instruments are among the lagged levels and difference of instrumented variables. Domestic credit, GDP per capita, inflation, stock traded value, domestic savings and foreign direct investment variables are instrumented. Model fit, significance, overidentification, underidentification and weak identification tests are reported. For several instrumented values, critical values for weak identification tests are not available, but the Sanderson-Windmeijer (SW) first-stage F values for each variable separately are higher than the 5% maximal IV relative bias and 10% maximal IV size critical values.

Based on Table 3, panel (2) shows the regression results for the earlier period between 1975 and 1990, which provides a basis to compare with previous results. Moreover, since financial development is arguably more pronounced post-1990 in the Eurasia region, I examined this period separately.

Domestic credit is found to be insignificant to stock market development in all periods. This result is in disagreement with some studies which find a negative relation (Şükrüoğlu and Nalin, 2014), and others which found a positive relation (Garcia and Liu, 1999; Naceur et.al, 2007; Yartey, 2010). This may be due to the specification and estimation laid out here, as credit is instrumented.

Real GDP per capita is found to be positively affecting stock market capitalization in agreement with other studies. Investors with more income invest more into stock markets.

Inflation is found to be negatively affecting stock market capitalization for all years, like some other studies (Boyd et.al, 2001), but unlike other studies which find no relation (Yartey, 2010). Higher inflation may lead market frictions to credit rationing, decreasing firms' performance hurting stock market capitalization.

Stock market liquidity positively affects stock market capitalization, which is in agreement with other studies (Şükrüoğlu and Nalin, 2014; Naceur et.al, 2007; Yartey, 2010). This may be due to investors investing more heavily into liquid stock markets, or firms are more likely to list in liquid stock markets.

Liquid liabilities have no effect on stock market capitalization, unlike other studies for European countries between 1995 and 2011, who used Arellano-Bond dynamic panel method, unlike the panel-iv regressions used here (Şükrüoğlu and Nalin, 2014).

Foreign direct investment has a positive effect on stock market capitalization, and more significant after 1990, possibly due to larger sample size. This is in agreement with some studies (Claessens et.al, 2001), while other studies found insignificance (Yartey, 2010). In our study, a positive relation means FDI is a complement rather than an alternative for cross-border investments.

Domestic saving has no effect on stock market capitalization. This result is in disagreement with some studies on European, MENA or other countries (Şükrüoğlu and Nalin, 2014; Garcia and Liu, 1999; Naceur et.al, 2007). This may be due to the difference between estimation methods and data samples.

Financial openness has a positive effect on stock market capitalization. This is in agreement with the argument that countries with more open financial systems attract more portfolio investments from the investors who want to diversify their portfolios (Henry, 2000).

Dependent variable: Stock market cap (ln)	(1) 1975-2017	(2) 1975-1990	(3) 1990-2017
Last year stock market cap (ln)	0.425***	0.371***	0.438***
	(7.38)	(4.60)	(6.58)
Domestic credit (ln)	0.0104	0.0142	0.0274
	(0.44)	(0.43)	(0.64)
Real gdp per capita (ln)	0.301***	1.192**	0.245**
	(3.13)	(1.96)	(2.29)
Inflation (gdp deflator)	-0.00371***	-0.00331***	-0.00383***
	(-24.2)	(-5.34)	(-19.3)
S. market traded value (ln)	0.315***	0.290***	0.316***
	(5.25)	(5.06)	(4.83)
Liquid liabilities (ln)	-0.000838	-0.0275	-0.0151
	(-0.014)	(-0.093)	(-0.25)
Foreign direct investment (ln)	0.0390***	0.201*	0.0246**
	(2.76)	(1.65)	(2.26)
Domestic savings (ln)	0.0331	-0.0211	0.0813
	(0.56)	(-0.044)	(1.30)
Financial openness	0.203**	0.244	0.233***
	(2.36)	(1.49)	(2.76)
Country fixed effects	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes
Observations	1190	159	1031
No of countries	55	17	55
No of end. regressors	6	6	6
No of excl. instruments	12	12	12
R-squared	0.8441	0.4412	0.8065
Model F-stat	2710.30***	15.68***	896.30***
Overidentification test (Hansen J statistic & p-value)	4.149 [0.6565]	3.019 [0.221]	6.739 [0.3457]
Underidenification test (Kleibergen-Paap rk LM stat & p-val)	26.913*** [0.0003]	6.317* [0.0972]	26.739*** [0.0004]
Weak identification test (Kleibergen-Paap rk Wald F stat)	23.423	5.269	23.641

Table 3. *IV-2SLS regression results* **Source:** *World Bank Database and the author's calculations.*

5 Conclusion

Stock market capitalization is an important part of financial development of a country. Prior theorical and empirical work found that domestic credit, real income, inflation, stock market liquidity, liquid liabilities in the economy, foreign direct investment, domestic savings and financial openness are determinants of stock market capitalization.

Using a sample of 55 countries in the Eurasion region between 1975 and 2017, and using a fixed effect panel instrumental regression, I find that real income, stock market liquidity, foreign direct investment and financial openness have a positive effect, while inflation has a negative effect on stock market capitalization to GDP ratio. The other variables do not have statistically significant effects. These findings are robust to selecting the data before 1990, and after 1990.

Investors in countries with higher per capita real income may have more to invest into stock markets, or higher per capita income may proxy for better institutional development (La Porta and Shleifer, 2008). Countries with

more liquid stock markets have higher stock market capitalization, since investors or companies prefer liquid markets. Foreign direct investment also seems to be a complement in these countries, rather than substitutes, improving the stock market capitalization. Countries with higher financial openness have higher stock market capitalization, perhaps by attracting more international portfolio flows. Better institutional development, taking measures for financial openness and imposing rules that improve the liquidity of markets may improve stock market capitalization.

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