

Stock Market and Shareholder Protection: Are They Important for Economic Growth?

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Abstract

With the help of recent developments in quantitative comparative law literature this paper tries to determine the long run equilibrium relationship between shareholder protection and stock market development and ultimately their relationship with economic growth in the context of India. Within a multivariate VAR framework, Granger Causality/Block Exogeneity Wald Tests are employed to investigate the long run causal relationship in a system consisting of stock market, legal development and economics growth. On the contrary to most of the existing literature our results only vaguely support the hypothesis that shareholder protection causes stock market development and eventually economic growth as the relationship is not consistent across alternative specifications of stock market and legal development.

Key words: Law and Finance, Economic Growth, Causality Tests

JEL Classification: O16, E44, C32

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Introduction

A well functioning financial sector helps channel the resources to its most productive use and distributes the risk optimally across space and time thus induces economic growth. There are ample evidences from the literature that the degree of financial sector development especially a vibrant stock market facilitates long run growth (Levine, 1991; Bensivenga et al., 1995). Cross country growth regressions show that stock market liquidity is a contributing factor to economic growth even after controlling for initial income and political stability (Atje and Jovanovic, 1993; Levine and Zervos, 1998; Khan & Senhadji, 2000). Both Rousseau and Wachtel (2000) and Arestis, Demetriades and Luintel (2000) show that stock market liquidity and banking development both predict the future growth of the economy. These empirical studies grossly confirm the theoretical predictions of Levine and Zervos (1996) and Demirguc-Kunt (1994) that stock markets can give a big boost to economic development.

Contrarily some of the recent studies show that the impact of stock market on economic growth is country specific as relationship between intermediation and growth critically depends upon the legal, regulatory and political environment of the countries (Arestis & Demetriades, 1997; Okuda, 1990). These studies, however, do not delve into the details of the determinants of stock market development in the long run and their implications for economic growth. This paper explores the significance of the legal determinants of stock market development in a time series context for India. We model the determinants of stock market development along with conventional stock market development and economic growth as a single system to analyze the interlinkages among them. We construct an index to measure the over all legal development in India over the years and compare it with a comprehensive investor protection index constructed by Lele and Siems (2006).

Recent developments in law and finance literature maintain that underdeveloped legal apparatus for financial contract enforcement would constrain the firm's ability to raise funds from outside sources either by equity or debt (LLSV, 2000). If external funds are constrained, so is investment and technology intensive long-term investment induced growth.

There is a huge informational asymmetry between the firm's insiders and the owners as the final project outcome is not verifiable by the owners. Minority shareholders lack the resources and expertise to monitor the managers and due to rational inaction there would be too little monitoring. This informational gap puts inside managers and controlling shareholders in a position to pursue projects that benefit themselves and expropriate the minority shareholders and external creditors by transfer pricing, asset stripping and other expropriation methods (LLSV, 2000). Thus a strong capital market requires adequate legal and institutional back up for the investors to gather information about the firm activities and render confidence that the firm insider will not expropriate their wealth through self dealing.

Stock market development i.e. the market for external funds critically depends on information gathering cost and monitoring costs. Legal institutions that define and protects the rights of the shareholders and creditors would crucially determine the level of expropriation and agency costs and increase the value for the principles i.e. the shareholders. These rights are typically defined in the contract, company, bankruptcy, and securities laws and the country's property rights regime. The law and finance theory holds that in countries where legal systems enforce private property rights, support private contractual arrangements, and protect the legal rights of investors are more willing to finance firms; there would be more savings as lesser premium required to part with the savings in a less risky environment thus financial markets flourish.

LLSV in a series of papers show that well defined shareholder protection laws and a strong enforcement would result in larger stock market capitalization as a percentage of GDP, high initial public offering and more number of publicly traded companies relative to population (La Porta *et.al.*, 1997; 1998; 1999). Further Levine (2000) confirms that a strong legal protection of shareholders and strong accounting standards are robustly correlated with stock market capitalization. Johnson *et. al.* (1999) show that one of the major causes of Asian Crisis, the stock market meltdown was mainly due to weakness of legal institutions and enforcement.

We explicitly introduce legal development measures and the measures of stock market development in a multivariate framework to identify the long run equilibrium relationship

among them. Johansen's maximum likelihood Vector Error Correction Model (VECM), a multivariate time series technique, is used for this purpose. The paper is organized as follows: Data sources and the methodology of constructing the indices of Legal development and shareholder protection are described in section 2. Section 3 contains description of econometric methodology and the results are discussed in section 4. Section 5 concludes the paper and a brief note on possible further studies is presented.

II. Data and Methodology

We estimate the long run equilibrium relationship between stock market indicators, legal measures and economics growth in India from 1970 to 2005. This section describes the indicators of stock market development in India, methodology of constructing the indices of legal development and the data sources.

Market Capitalization (STC), one of the most frequently used measures of stock market development, measures the size of the stock market (Rousseau et.al., 2000; Beck and Levine, 2004). It is the value of listed domestic shares on domestic exchanges divided by GDP. Industrial share price index¹ (SI) of IMF [code 6440] was used as an alternative measure of stock market development in India. We use real GDP per capita (PGDP) taken from National Accounts Statistics of India: 1950–51 to 2003-04 provided by EPW research foundation as our measure for economic development (King and Levine, 1993a, b; Demetriades and Hussein, 1996 and others).

Index of Legal Development (LD)

In a series of studies La Porta *et al.*, (1997, 1998) have constructed an index of investor and creditor protection and showed a positive relationship between these measures and financial sector growth across the countries. These indices were further extended through time and space over 100 countries for a few more years in Djankov et.al., (2006). India fares well in the index of investor protection (LLSV, 1998). It is ranked among the most protected countries in the sample as the shareholders rights are well protected as almost all of the clauses considered in LLSV (1998) are allowed in India except the one share-one vote principle. With a relatively under developed financial sector, India seems to be

¹ period averages, 2000 = 100

an outlier for its level of legal development. We alternatively propose to construct an index that captures the provisional innovation in the law in India that makes enforcement quicker and availing the legal service cheaper. We add a value of one to the index if a specialized board is constituted to resolve insolvency and debt recovery matters for the period 1960 to 2004². These innovations aimed to speed up the dispute redress would reduce the resources spent on enforcing financial contracts. This time series index that shows a dramatic increase in the 1990's coincides with the fastest period in Indian financial sector development.

Lele and Siems Index of Investor Protection

An extensive shareholder protection index was constructed by Lele and Siems, (2006) for India as a part of a larger project at the Centre for Business Research, University of Cambridge³. They have considered 60 legal variables in 28 broad categories to capture the extent of protection against the board and management and Protection against other shareholder for the period 1970-2005. This measure ranges between '0' to '1' where the higher value means effective protection. The over all index, an unweighted average of all 60 variables considered, have increased considerably from 0.45 in 1970 to 0.60 in 2005.

III. Empirical Methodology

As there is a possibility of more than one equilibrium relationship when there are more than two variables in the VAR system, we have used Johansen's vector error correction model (VECM) to estimate the long run equilibrium behavior of indicators of share market development, economic growth and legal variables (Johansen, 1995). Generalized Least Square Dickey - Fuller (GLSDF) of Elliott, Rothenberg, and Stock (1996) was used to examine the order of integration of all the variables in the system. As the structure of the system and the output critically depend on the lags chosen to estimate the VAR and VECM Akaike Information Criteria (AIC) was used to determine the optimal number of lags. The decision whether an intercept and/ or a trend is introduced in the short run and the long run model was made with the help of Pentula principle proposed by Johansen

² See Rathinam (2007) for a detailed description of the construction of index of legal development for India.

³ See Lele and Siems (2006) for the methodological description of the index and further details.

(1995). We have specified the most restricting model to the least restricting and chosen the trace statistic that does not reject the null hypothesis.

We specify Vector Error Correction Model as

$$\Delta Z_t = A_0 D_t + \Pi Z_{t-1} + \Gamma_1 \Delta Z_{t-1} + \Gamma_2 \Delta Z_{t-2} + \dots + \Gamma_{k-1} \Delta Z_{t-k+1} + \epsilon_t . \quad (1)$$

A vector error correction specification model consists of the vector of first differenced variables as a function of own and other variables' first differenced lagged values, a vector of constant terms and an error correction term. The system consists of 3 variables that are I(1) difference stationary, where $Z_t = [STC_t / SI_t, PGDP_t, LD_t / SRP_t]'$, and $\Delta Z_t = [\Delta STC_t / \Delta SI_t, \Delta PGDP_t, \Delta LD_t / \Delta SRP_t]'$. D is an $(n \times 1)$ vector of deterministic matrix that contains the constants and dummy variables introduced in the system. ϵ_t is an $(n \times 1)$ vector of white noise error terms. $\Gamma_j \Delta Z_{t-j}$ is the first differenced component in the VAR system, where Γ_j is an $(n \times n)$ matrix of short term adjustment coefficients associated with the lagged values of variables in the system Z_t . ΠZ_{t-p} is the error-correction component, where Π is an $(n \times n)$ matrix of cointegrating parameters which characterize the long run relationship among the variables and long run adjustment coefficients in the VEC system. Thus Π consists of $n \times r$ dimension matrices α and β , where $\Pi = \alpha\beta'$.

IV. Results

The unit root test results given in Table 2 confirms that all the variables considered in the model have unit roots in levels and are stationary upon differenced except stock market capitalization⁴ (STC). As all the variables contain unit root we test for cointegration relationship among financial sector development indicators, per capita GDP (PGDP) and legal development indicators (LD / SRP) using the Johansen cointegration test. With the help of lag length selection criteria we have chosen the lag length for each VECM specification. Table 3 presents both trace statistic (λ_{trace}) and eigenvalues (λ_{max}) provided by Johansen for the hypothesis that there is no cointegration relationship ($r = 0$) with the alternative hypothesis being ($r = 1$) one cointegration relation and two cointegration relations respectively. Also the Eigenvalues of the Π matrix is presented for the

⁴ However KPSS test for stock market capitalization (STC) with a trend specification indicates that STC has a unit root.

hypothesis of no, one and two cointegrating relationships. The null hypothesis of no co-integration among the models specified is rejected at 5 percent level in all the cases in favor of the alternative of at least one cointegrating relationship. All the variables introduced in the system have a tendency to move together towards long-run steady state equilibrium.

We use Pair-wise Granger Causality test to test the exogeneity of each variable introduced in the system. Chi-square (Wald) statistics indicate the significance of lagged coefficients of each variable in the equation of each endogenous variable. We here test if legal development affects economic growth via stock market growth. If there is a robust causation running from legal development (LD / SRP) to stock market development measures and from the latter to economic growth then we could conclude that legal development indirectly causes economic growth by making financial sector vibrant. Table 6 shows that the causal relationship is mixed as SRP does not cause SI and LD does not cause STC. Further STC does not cause economic growth and economic growth too does not cause STC.

Alternatively Block Exogeneity Wald Test was used to test the joint significance of each of the other lagged endogenous variables in each equation and also to test for the joint significance of all the other lagged endogenous variables in each equation. A chi-square test statistics of 1.33 in the D(STC) equation of Table 4 indicate that the null hypothesis that lagged coefficients of PGDP being equal to zero can not be rejected. Further D(PGDP) equation shows that STC does not explain economic growth. The rejection of null hypothesis of block exogeneity for all equations of stock market development indicates legal development and economic growth can be treated as purely exogenous.

V. Conclusion

In this paper we have tried to capture the long run relationship between law and stock market development and ultimately their relationship with economic growth. Even though we could identify at least one cointegrating relationship in all the VECMs specified the causal relationship between the variables considered is mixed. Legal development and economic growth have turned out to be exogenous in all the equations of stock market development but stock market development measured by STC seems to

cause economic growth. However the alternative stock market specification SI does not cause economic growth. The indices of legal development (LD / SRP) do not cause any of the stock market indicators; however they do have impact on economic growth. Granger causality test however shows a mutual relationship with the indices of legal development and economic growth.

These results are consistent with some of recent studies that question the importance of stock market development (Singh, 1999). Any further study that differentiates between the secondary and primary stock market might shed some light on the causality issue. The secondary market measured by stock market capitalization indicates the public opinion of the market value of the firms whereas the Initial Public Offerings (IPO) issued by small and high risk firms might explain the importance of legal requirements. Further IPOs will have implications for real economic growth as they mobilize surplus savings into the hand of entrepreneurs.

Bibliography

- Arestis, P. and P. O. Demetriades and K. B. Luintel, (2001) "Financial Development and Economic Growth: The Role of Stock Markets," *Journal of Money, Credit, and Banking*, 33 (1), 16—41.
- Atje, R. and Jovanovic, B. (1993). *Stock Markets and Development*. *European Economic Review*, 37 (2), 632–640.
- Beck, T. and R. Levine, (2004) "Stock Markets, Banks, and Growth: Panel Evidence," *Journal of Banking & Finance*, Volume 28, Issue 3, Pages 423-442
- Bencivenga, V. R., Smith, B. D., and Starr, R. M. (1995). Transactions Costs, Technological Choice, and Endogenous Growth. *Journal of Economic Theory*, 67 (1), 53–177.
- Demetriades, P.O., Hussain, K.A., (1996) "Does financial development cause economic growth? Time series evidence from 16 countries". *Journal of Development Economics* 51, 387–411.
- Demirguc-Kunt, A. (1994),"Developing Country Capital Structure and Emerging Stock Markets", *Policy Research Working Paper*, WPS, No 933
- Djankov, Simeon., McLiesha, Caralee., Shleifer, Andrei., 2007. "Private credit in 129 countries", *Journal of Financial Economics*, Volume 84, Issue 2, Pages 299-329
- E.P.W. Research Foundation., 1997. "National Accounts Statistics of India: 1950–51 to 2003-04". Revised Edition Mumbai
- Elliott, G., Rothenberg, T.J. and Stock, J.H. 1996. "Efficient Tests for an Autoregressive Unit Root", *Econometrica*, 64, 813–836
- Johansen, S., 1991. "Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models", *Econometrica*, 59(6), 1551-80
- Johansen, S., 1995. "*Likelihood-Based Inference in Cointegrated Vector Autoregressive Models*" Oxford University Press
- Khan, Moshin. S. and Abdelhak S. Senhadji, (2000) "Financial Development and Economic Growth: An Overview," IMF Working Paper WP/00/209, Washington: International Monetary Fund
- King, R. G., Levine, R., 1993. "Finance and Growth: Schumpeter Might Be Right", *Quarterly Journal of Economics*, 108: 717-738
- Kwiatkowski, D., Phillips, P., Schmidt, P., Shin, Y., 1992. "Testing the null hypothesis of stationarity against the alternative of a unit root", *Journal of Econometrics* 54, 159–178
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. W., 1997. "Legal determinants of external finance", *Journal of Finance* 52(3): 1131–1150
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. W., 1998. "Law and finance", *Journal of Political Economy* 106(6): 1113–1155
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny. (2000). "Agency Problems and Dividend Policies around the World" *Journal of Finance* 55, 1–33.

- Lele, Priya and Siems M Mathias, (2007) "Shareholder Protection: A Leximetric Approach" *Journal of Corporate Law Studies*, Vol. 17, pp. 17-50
- Levine, R. (1991). Stock Markets, Growth, and Tax Policy, *Journal of Finance*, 46 (4), 1445–1465.
- Levine, R., and S. Zervos, (1998) "Stock Markets, Banks and Economic Growth," *American Economic Review*, 88, 537—58
- Levine, Ross, and Sara Zervos. 1996. "Stock Market Development and Long-run Growth," *World Bank Economic Review*. 10: 323-339.
- Okuda, H. (1990) 'Financial Factors in Economic Development: a study of the financial liberalization policy in the Philippines', *Developing Economies*, 28, pp. 240-270.
- Rathinam, Francis Xavier (2007) "Law, Institutions and Finance: Time Series Evidence from India", *German Working Papers in Law and Economics*: Vol. 2007: Article 4. <http://www.bepress.com/gwp/default/vol2007/iss2/art4>
- Rousseau, Peter and Paul Wachtel. 2000. "Equity Markets and Growth: Cross Country Evidence on Timing and Outcomes, 1980-1995", *Journal of Banking and Finance* 24: 1933-1957.
- Singh, A., (1997) "Stock Markets, Financial Liberalization and Economic Development," *Economic Journal*, 107, 771—82

Appendix

Time Path of Shareholder Protection Index and Legal development index for India

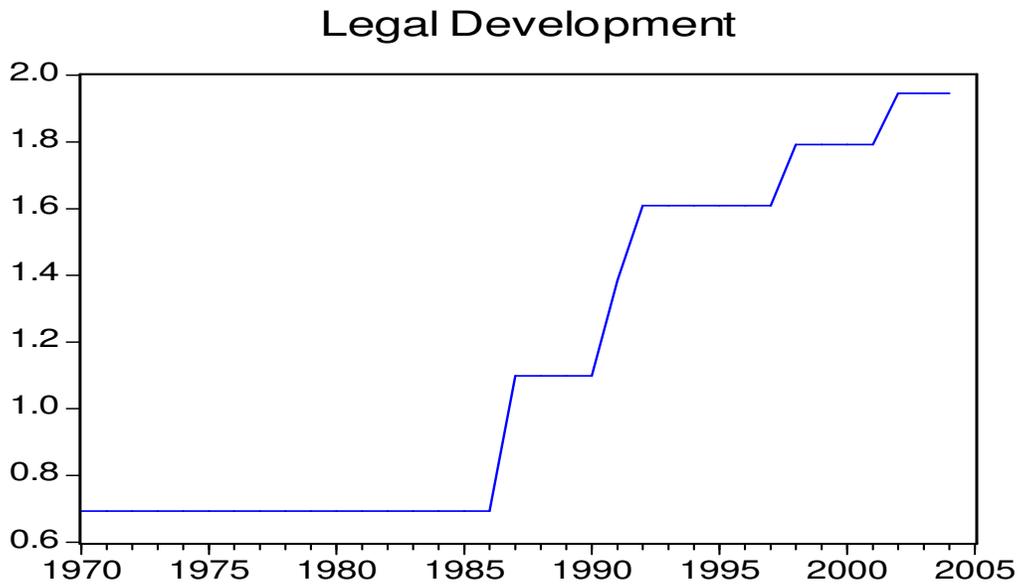
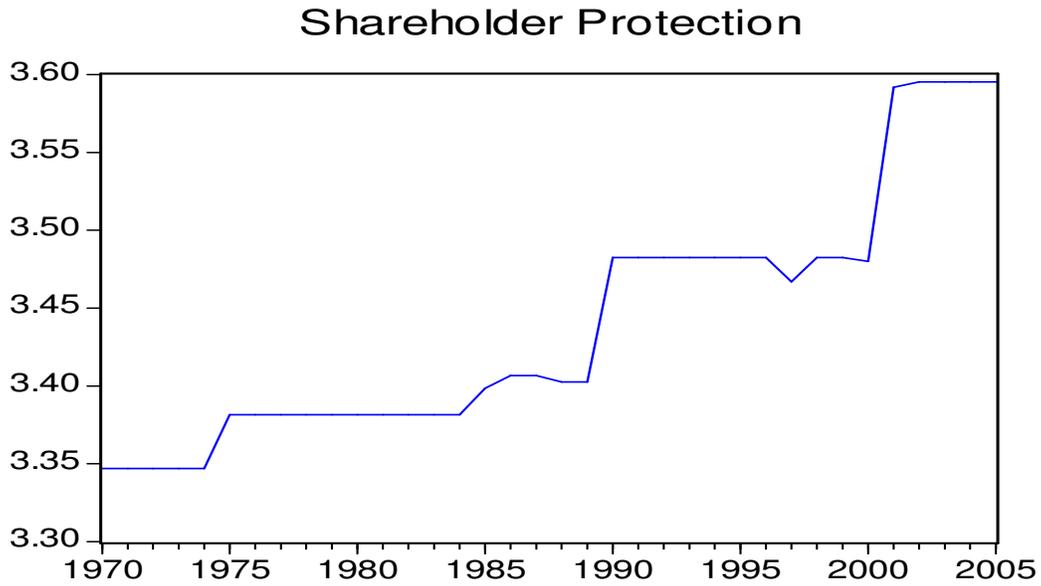


Table 1: Correlation Matrix

	STC	SI	PGDP	SRP	LD
STC	1.00				
SI	0.99	1.00			
PGDP	0.93	0.95	1.00		
SRP	0.85	0.87	0.93	1.00	
LD	0.96	0.96	0.96	0.91	1.00

Table 2: Unit Root Test Results

Variables	GLS-detrended Dickey-Fuller ¹ In levels		GLS-detrended Dickey-Fuller Differenced series	
	Constant only	Constant and trend	Constant only	Constant and trend
	STC	0.44	-3.34**	-4.27*
SI	-1.05	-1.95	-5.53*	-5.70*
PGDP	3.30*	-0.73	-6.40*	-7.50*
SRP	0.23	-2.45	-6.20*	-6.43*
LD	0.34	-1.95	-6.51*	-6.65*

¹ Elliott-Rothenberg-Stock DF-GLS test statistic where the null hypothesis is the variable is non-stationary; critical values from MacKinnon (1996).

* Significant at 1% level (-2.63 for constant only and -3.77 for constant and trend specification)

**5% level (-1.95 for constant only and -3.19 for constant and trend specification)

***10% level (-1.61 for constant only and -2.89 for constant and trend specification)

Table 3: Johansen's Cointegration Test Results: VAR = (STC/SI, PGDP, SRP)

System specifications	Trace statistics			Max Eigenvalues		
	r = 0	r = 1	r = 2	r = 0	r = 1	r = 2
STC, PGDP and SRP	50.02*	22.20	6.19	0.64	0.45	0.20
STC, PGDP and LD	39.78*	16.51	4.07	0.59	0.38	0.14
SI, PGDP and SRP	47.63*	19.12	3.85	0.57	0.36	0.11
SI, PGDP and LD	40.95*	11.03	4.56	0.59	0.17	0.13

* Ho of no cointegration (r=0) is rejected and Ho of 1 CE ($r \leq 1$ is not rejected at 5 % significant level (p- values are from MacKinnon, Haug and Michelis, 1999). VAR lag length is identified by AIC.

Table 4: Granger Causality/Block Exogeneity Wald Test for the Indicators of Stock Market Development

Dep. Variable	Excluded Variables					
	Model 1			Model 2		
	D(PGDP)	D(SRP)	All Var.	D(PGDP)	D(LD)	All Var.
D(STC)	1.33 (0.51)	1.98 (0.37)	3.84 (4.30)	2.20 (0.53)	2.07 (0.56)	4.03 (0.67)
D(SI)	0.26 (0.60)	0.21 (0.64)	0.40 (0.82)	0.13 (0.72)	1.78 (0.18)	1.83 (0.40)

* Significant at 1 percent, ** Significant at 5 percent & *** Significant at 10 percent

Table 5: Granger Causality/Block Exogeneity Wald Test for Economic Growth

Dep. Variable	Excluded Variables					
	Model 1			Model 4		
	D(STC)	D(SRP/LD)	All Var.	D(SI)	D(SRP/LD)	All Var.
D(PGDP)	4.08 (0.13)	15.00* (0.00)	28.78* (0.00)	1.39 (0.24)	4.09* (0.04)	4.39 (0.11)
D(PGDP)	8.00** (0.05)	10.20* (0.02)	11.65** (0.07)	1.02 (0.31)	2.92** (0.09)	3.86 (0.15)

* Significant at 1 percent, ** Significant at 5 percent & *** Significant at 10 percent

Table 6: Pair wise Granger Causality Tests

	STC	SI	PGDP	SRP	LD
STC	-	-	No	Yes	Yes
SI	-	-	Yes	No	No
PGDP	No	Yes	-	No	Yes
SRP	Yes	No	Yes	-	-
LD	No	Yes	Yes		

'Yes' indicates a statistically significant causation running from a row variable to a column variable at 5% level or more.