Stock Market Development and Capital Accumulation: Does Law Matter? A Case Study of India

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A Case Study of India

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I

Introduction

Stock market development has been an important part of financial liberalisation in the less developed countries (LDCs). In the pro-liberalisation circle, stock market is assigned to play an important role in the capitalist development of the LDCs. This is also true for the liberalisation regime of India. The people in India are encouraged to invest in stocks through income tax benefits and abolition of capital gains tax. There is a move to develop a national pension fund which will be invested in different stocks to get returns out of which pension will be provided to the retired people. It is expected that boosting up of stock market will accelerate the process of capital accumulation and growth. Rules and regulations are being changed to protect the interest of the share holders as shown by a recent leximetric study by the lawyers (Lele and Siems, 2006).

There are many studies supporting the positive link between stock market development and growth. Let us mention some of the recent studies. One important study was undertaken by Levine and Zervos (1998). Their cross-country study found that the development of banks and stock markets has a positive effect on growth. In another study Levine (2003) argued that although theory provides ambiguous relationship between stock market liquidity and economic growth, the cross-country data for 49 countries over the period 1976-93 suggest a strong and positive relationship (see also Levine, 2001). Henry (2000) studied a

sample of 11 LDCs and observed that stock market liberalisation leads to private investment boom. Recently, Bekaert *et al* (2005) analysed data of a large number of countries and observed that the stock market liberalisation 'leads to an approximate 1 % increase in annual real per capita GDP growth'.

With the recognition of the importance of stock market in economic development there is a call for a better protection of the interests of the shareholders. La Porta *et al*. (1998) observed that countries with a 'common law origin' (such as UK) have a higher level of shareholder protection than countries with a civil law origin (such as France) and accordingly, the former group of countries has a lower concentration of stock ownership. In a subsequent paper (La Porta *et al*. 2005), the similar line of reasoning is used to explain a positive correlation between the level of shareholder protection and stock market developments. One of the underlying assumptions is that firm financing in the form of equity capital will be higher in countries with better shareholder protection.

There are some economists who are sceptical. Long time back Keynes (1936) compared the stock market with casino and commented: 'when the capital development of a country becomes the by-product of the activities of a casino, the job is likely to be ill-done'.

Referring to the study of World Bank (1993) Singh (1997) pointed out that stock markets have played little role in the post-war industrialisation of Japan, Korea and Taiwan. He argued that the recent move towards stock market liberalisation is 'unlikely to help in achieving quicker industrialisation and faster long-term economic growth' in most of the LDCs.

In this perspective we shall examine whether share market developments have any long-term relationship with capital accumulation and whether legal changes promoting the interest of the shareholders exerted any long-term effect on Indian share market developments (Section II). The concluding observations are made in the last section (Section III).

II

Capital Accumulation and Stock Market Changes: Long-term Relationships

From Government of India (Economic Survey, 2005-6), data on gross private and public fixed capital formation as percentage of GDP (PVTGDP and PUBGDP, respectively) are available over the period 1950-2004. PUBGDP showed a tendency to decline since the mid-1980s while PVTGDP accelerated indicating the start of the present regime with a declining importance of public sector much before the D-day of 1991(Figure 1 and Table 1).

From the on-line data source of IMF (International Financial Statistics) annual data (that smooth out short-term volatility and seasonality) on stock (share) and wholesale price indices are collected over a long period, 1950-2005. These show that the growth in wholesale price index showed a steady growth since the mid-1950s while stock or share price index showed a sharp rise (sharper than price rise) since the mid-1970s after a quarter century of very slow growth. The process slowed down in the 1990s. In real terms (i.e. the ratio of stock price to wholesale price), the share price declined till the mid-1970s and thereafter rose sharply amidst fluctuations till the early 1990s (Figure 2). The picture doesn't change much if real share prices are derived by deflating the nominal share prices by the consumer price indexes.

Regression analysis (without bothering for the tests of trend-stationarity for the time being) shows that the share price rose at a statistically significant rate of 9 percent per annum over the whole period 1950-2005; during 1950-75, the growth was not statistically significant but afterwards there was a rapid growth of 15 percent per annum. In real terms there was no significant growth over the whole period; actually it declined at the rate of 4 percent during 1950-75 followed by a rise of around 9 percent per annum in the subsequent period (Table 1).

To ascertain whether share prices are trend-stationary or random walk with drift we have conducted Augmented Dickey-Fuller (ADF) tests and Perron tests (in view of structural shifts), orders being chosen on the basis of the data-dependent General-to-Specific (GS) criterion (for details see Table 1 note 3) as advocated by Ng-Perron (1995) and Perron (1997). In no case can we reject the null hypothesis of unit root with drift.

From the Financial Structure Dataset constructed by Thorsten Beck of World Bank (available on-line), a number of indicators of Indian stock market development are available over the period 1976-2005: average real stock market capitalisation relative to GDP (RMKAPGDP), total shares traded on the stock exchanges relative to GDP (VALTRDGDP) and the turnover ratio – the ratio of the value of total shares traded to average real market capitalization (TURN).[1] Their log-values are plotted in Figure 3. It shows that stock market capitalisation (RMKAGDP) and the value of traded stocks (VALTRAD) rose over the whole period amidst much fluctuation since the early 1990s. The turnover ratio (TURN) showed a tendency to decline till the mid-1990s; thereafter it moved together with VALTRD – rising rapidly with a sharp fall in 2001. So the first two indicators show statistically significant trend growth and the turnover ratio shows no such trend growth.

In the context of increasing concern for developments of stock market in the present regime of LPG (Liberalisation, Privatisation and Globalisation), the question arises: is there any positive link between stock market developments and fixed capital formation. We seek an answer to the question on the basis of available data. We have considered the different stock market variables and examine the relationship between each of these variables and private fixed capital formation over the period for which data are available. We have left out the public fixed capital accumulation (PUBGDP) and so the total fixed capital formation (GKFGDP) for obvious reasons.

We have used the Autoregressive Distributive Lag (ARDL) approach to cointegration developed by Pesaran and Shin (1999). This technique can be used to test for the existence of a long run relationship

between two variables irrespective of whether they are stationary or stochastic (having unit root). This approach is especially suitable here as the real and nominal share price series exhibit unit root processes while capital accumulation series is stationary.

The ARDL equation fitted here is the following

$$(1) \qquad Y_t = a + b.t + \sum_{i=1}^{m} c_i Y_{t-i} + \sum_{j=0}^{n} d_j X_{t-j}$$

where Y_t is the dependent variable – log of PVTGDP, X_t is the independent variable – the log of different share market variables such as SHARE, RSHARE, RMKAPGDP, VALTRADGDP and TURN, t is the time trend which captures the effect of other explanatory variables and m, n are unknown lags[2] to be determined by the Schwarz Bayesian criterion (SBC) as suggested by Pesaran and Shin (1999).

The long run coefficients estimated through the ARDL approach are reported in Table 2. These show no long-term relationship between (log values of) gross fixed private capital formation as percentage of GDP (LPVTGDP) and (log values of) nominal or real share price (LSHARE or LRSHARE). Nor do we get any long-term relationship between other share market development indicators and private fixed capital formation (PVTGDP). We have estimated a number of alternative ARDL equations by adding intercept and slope dummies for each of the periods 1985-2004 and 1991-2004 keeping in mind the two possible dates of regime change in favour of the present LPG regime. In none of the cases we get a significant long-term relationship.

In view of the fact that all the variables excepting share prices are found to be stationary we have used also the simple regression analysis (with due care to the problem of autocorrelation) and found no significant relationship between the share market variables and private capital formation (for share prices we have used the first log-difference and all other variables are in level terms).

In the context of this observation of lack of relationship between share market variables and the very important factor behind the capitalist growth – fixed capital formation, we have studied the impact of changes in the relevant law on the development of share market.

Changes in Shareholder Protection Laws and Stock Market Behaviour

The Centre for Business Research (at Judge Business School, University of Cambridge) has produced a comprehensive time series dataset of shareholder protection for a number of countries including India. The coverage of the dataset is much more comprehensive than that of the LLSV index (La Porta *et al*, 1998). It has been constructed by a team of legal scholars based on the "law on the books". It takes into account company law, and some areas of securities law. There are 28 broad categories and altogether 60 legal variables (only 8 of these are very similar to those considered in the LLSV approach) relating to shareholder protection (details in Annexe I). Each of the variables takes a value between 0 and 1, and many take intermediate values, since it was considered inaccurate and in many cases impossible to describe the level of a certain type of protection simply with a binary variable. A value of 1 relates to the highest level of protection and a 0 to the lowest, so if a country were to have the maximum level of protection, the indicators would sum up to 60.

Out of the sixty legal variables considered, India experienced no change in 42 variables over the period of the study (1970-2005). Out of these 42 variables, 17 variables had the maximum possible value (= 1) and 13 variables had the minimum value (= zero). The remaining 12 variables assumed some intermediate values. Only 18 (two of these are considered in the LLSV study) variables showed some variations – some variables (numbering 13, 21, 41, 47, 53) declined but the most (13 variables) increased between the two dates 1970 and 2005(Table 3). By 2001, 23 variables attained the level of perfection (assuming the value 1) and another 10 variables reached close to perfection (assuming the value close to 0.8).

The over-all picture is that the shareholders protection level (unweighted[3] average of the sixty variables) increased slightly in the 1970s and the 1980s: it rose from 0.47 during 1970-74 to 0.49 during 1975-84, to 0.5 during 1985-89. Major changes took place in the early 1990s and in the early 2000s: the average index rose to 0.54 during 1990-99 and finally to 0.61 during 2000-5. The behaviour of the average of all the 60 variables (hereafter CBR60) along with the average of those 18 variables (out of 60) that actually varied during 1970-2005 ((hereafter CBR18) and the average LLSV index[4] is shown in Figure 4. Regression analysis of CBR60 and CBR18 index showed that these had statistically significant rising trends (Table 1).

Does the change in legal variable influence developments in the stock market? La Porta *et al* (2005) argued in favour of a positive influence of the shareholder protection on stock market developments (see also Beck *et al*., 2003). In the Indian context we seek an answer to this question on the basis of the ARDL approach. In no case do we get a positive long-term relationship between the share market development indicators (chosen one at a time) and the legal variable – CBR60 or CBR18 (Table 4). Rather the legal variable has a negative relationship with the value of trade and perhaps with the turnover ratio. It could be the result of the bubble of 2001. So we tried spike dummy for 2001 and got no long-term relationship instead of the negative relationship.

III

Concluding observations

The avowed objective of government concern for a proper legal environment in the stock market is promotion of growth through capital formation. This is particularly true in a less developed country such as India especially in a liberalisation regime with more and more reliance on private sector (rather than public sector) for economic development. In this context we have examined the long-term relationship between private fixed capital formation and different stock market variables. For nominal and real share price we have data for more than half a century. Over that period (1950-2004), private fixed capital formation has no relationship with the share price movements. Rising share prices are hailed in some circles including Indian

Finance Ministry as the sign of booming economy and the success of the LPG regime. But the mechanism through which it signals boom is unclear so far as the real economic growth is concerned.

The conclusion of no relationship can also be found if we use the other more recognised indicators of stock market development such as real market capitalisation and value of trade (both in relations to GDP) and the turnover ratio over a shorter period, 1976-2004.

This finding supports our earlier conclusion (Sarkar, 2006). Our earlier analysis of a sample of 31 less developed countries shows that the cross-country variations in stock market capitalization as a percentage of GDP- an important indicator of stock market development- do not explain the cross-country variations in the growth rates of gross fixed capital formation. Time series analysis of individual country cases shows that in the majority of cases (including India) there exist no meaningful relationship between stock market capitalization as a percentage of GDP and growth of gross fixed capital formation. Thus both of our studies discount the importance of stock market development in promoting industrial growth through capital accumulation in less developed countries such as India. Hence the concern for better corporate governance for protection of the interests of the shareholders is misplaced.

END NOTES

1 In the Financial Structure Dataset constructed by Thorsten Beck of World Bank, the following definitions are used:

MKAPGDP: Value of listed shares to GDP is calculated using the following deflation method: $\{(0.5)*[Ft/P\_e_t + Ft\text{-}1/P\_e_{t-1}]\}/[GDPt/P\_a_t]$ where F is stock market capitalization, P_e is end-of period CPI, and P_a is average annual CPI;

VALTRDGDP: Total shares traded on the stock market exchange to GDP;

TURNOVER: Ratio of the value of total shares traded to average real market capitalization. It is calculated using the following method: $T_t/P\_a_t/\{(0.5)*[Mt/P\_e_t + M_{t-1}/P\_e_{t-1}]$ where T is total value traded, M is stock market capitalization, P_e is end-of period CPI, P_a is average annual CPI.

2 The choice of the maximum lag-length is limited by the availability of data. For 1950-2004, we used maximum 10 lags; for 1976-2004, we could use 8 lags. Using SBC, the optimum lag structure is chosen out of the maximum lags considered.

3 It is difficult to give weights to different indices to derive the composite index. Instead of giving arbitrary weights, we have given equal weight to each index. It implies all the sixty legal variables are equally important for shareholder protection.

4 Based on Lele and Siems (2006) coding of the original LLSV variables.

Table 1: India's Capital Accumulation, Stock Market Developments and Shareholder Protection Law Indices: Trends[1] since 1950

Dependent Variables[2]/ Period & Process	Intercept	Time	Intercept Dummy	Slope Dummy	Adj. R Sq.	D-W Stat.	ADF Stat. [3]
Gross Private Fixed Capital Formation-GDP Ratio(LPVTGDP) 1950-2004							
AR (1)	1.7**	0.02**			0.96	1.58	-3.612(0)[$]
AR(2)	1.8**	0.02**	-0.38**	0.01**	0.97	2.08	
Gross Public Fixed Capital Formation-GDP Ratio(LPUBGDP) 1950-2004							
AR (1)	1.79**	0.004			0.81	1.8	-3.692(0) [£]
AR (2)	0.86**	0.04**	2.56**	-0.07**	0.89	1.71	
Nominal Share Price (LSHARE) 1950-2005							
AR (1)	-0.31	0.09**			0.99	1.74	-1.371(0)
AR (1)	0.27	0.01	-3.96**	0.15**	0.99	1.85	-2.306 (0)
Real Share Price (LRSHARE) 1950-2005							
AR (1)	2.95**	0.03			0.93	1.77	-0.952(0)
AR (1)	3.67**	-0.04**	-3.43**	0.13**	0.94	1.83	-2.805(0)
Real Stock Market Capitalisation to GDP (LRMKAPGDP) 1976-2005							
AR (1)	-7.22**	0.12**			0.95	1.89	-2.489(11) [$]
Total Shares Traded to GDP (VALTRDGDP) 1976-2005							
AR (1)	-8.29**	0.14**			0.72	1.99	-5.404(0) [$]
Turnover Ratio (LTURN) 1976-2005							
OLS	-0.95	0.01			-0.01	1.88	-4.9141(0) [$]
OLS	-0.41**				0.00	1.84	-4.842(0) [£]

Share Holder Protection Law (CBR60) 1970-2005							
AR (1)	0.38**	0.004**			0.92	1.86	-2.318(0) $
Share Holder Protection Law (CBR18) 1970-2005							
AR (1)	-0.07	0.01**			0.92	1.86	-2.318(0) $

1 The fitted equation is:

$$Y = a + b.t$$

where Y is the dependent variable, t = time.

In the appropriate cases this linear trend equation is re-estimated with intercept and slope dummies (D and SD respectively). For LSHARE and LRSHARE, D= 0 for 1950-75 and = 1 for the rest. For LPVTGDP and LPUBGDP, D= 0 for 1950-85 and =1 for the rest. SD = t.D

Initially the regression equations are fitted through the ordinary least square (OLS) technique. A twelve-order Lagrange Multiplier test is conducted to ascertain the lag structure of the autoregressive (AR) error process and the parameters and their t-values are re-estimated (as needed) through the maximum likelihood process.

2 Excepting the legal index all other dependent variables are log-values.

3 The tests are based on OLS. To correct for our small sample, the Boot-strapping method (1000 simulations) is used for testing the unit root hypothesis (through the EASYREG programme). The data-dependent General-to-specific (GS) criterion is used to choose the optimum lag structure of the error process of the Dickey-Fuller equation as advocated by Ng-Perron (1995) and Perron (1997). Under this process, the specific order is chosen out of the general order (we considered here 12 lags) on the basis of the standard t-tests of significance of the lag terms. If out of 12 lag terms considered here, the 8^{th} lag (say) term is statistically significant but all higher order lag terms are insignificant we run an 8^{th} order ADF equation and check whether 8^{th} order lag

is significant. If now (say) the 6^{th} order lag term is significant but the higher order lag terms are insignificant, we fit a 6th order ADF equation and check the maximum order significant lag terms. If the 6^{th} order lag term is significant the appropriate ADF model is taken to be 6^{th} order. If not, the process continues until we arrive at the zero-order ADF (i.e. DF) equation.

* Significant at 5 per cent level.

** Significant at 1 per cent level.

$ The null hypothesis of unit root is rejected at 5 per cent level (based on 1000 simulations through the boot-strapping method).

£ The null hypothesis of unit root is rejected at 5 per cent level (based on 1000 simulations through the boot-strapping method). In view of the insignificant time trend, it is dropped so that the alternative hypothesis accepted is mean-stationarity.

The null hypothesis of unit root is rejected at 10 per cent level (based on 1000 simulations through the boot-strapping method).

Table 2: Capital Formation and Stock Market Developments: Estimates of Long-term Relationships through ARDL Method[1]

Independent Variable (X_t)/ Period (Model)	Private Fixed Capital Formation, LPVTGDP (Y_t) (ARDL Model in parentheses) (a)	(b)	(c)
Nominal Share Price (LSHARE) 1950-2004	0.06 (1,0)	-0.04 (1,0)	0.01 (1,0)
Real Share Price (LRSHARE) 1950-2004	0.06 (1,0)	-0.06 (1,0)	0.01 (1,0)
Real Stock Market Capitalisation to GDP (LRMKAPGDP), 1976-2004	0.05 (0,0)	-0.09 (0,5)	-0.01 (0,0)
Total Shares Traded to GDP (LVALTRDGDP), 1976-2004	-0.002 (0,0)	-0.003 (0,0)	-0.005 (0,0)
Turnover Ratio (LTURN), 1976-2004	-0.01 (0,0)	-0.01 (0,0)	-0.004 (0,0)

1 The fitted equation is

$$Y_t = a + b.t + \sum_{i=1}^{m} c_i Y_{t-i} + \sum_{j=0}^{n} d_j X_{t-j}$$

where Y_t is the dependent variable – the share of gross private fixed capital formation in GDP– log values (LPVTGDP) in period t, X_t is the log values of different stock market variables (LSHARE, LRSHARE, LRMKAPGDP, LVALTRDGDP and LTURN) and m, n are unknown lags determined by the Schwarz Bayesian criterion (SBC).

In column (a), the estimates of long-run coefficients of Y_t are presented by fitting the original equation through the ARDL method (with the aid of the Microfit 4.1 programme). In column (b), the coefficients are estimated after adding intercept and slope dummies for the period 1985-04 to the original equation. In column (c), the coefficients are estimated after adding intercept and slope dummies for the period 1991-04 to the original equation.

Table 3: India's Shareholder Protection Law: Changes during 1970-2005[1]

NO.	**Broad Categories**	**Changes**
	I. Powers of the general meeting [0.61]	
1		No Change**(1)**
2		No Change**(1)**
3		No Change**(0.5)**
4		No Change**(0.25)**
5		No Change**(0.5)**
6		No Change**(1)**
7		No Change**(0)**
	II. Agenda setting power[0.29]	
8		No Change**(0)**
9		Declined from 1 to 0.75 in 1988; slightly improved to 0.8 in 2001**(0.88)**
10		No Change**(0)**
	III. Extraordinary shareholder meeting[0.75]	
11*		No Change**(0.5)**
12		No Change**(1)**
	IV. Anticipation of shareholder decision[0.26]	
13		Declined from 0.5 to 0.38 in 1988 (**0.44**)
14*		Improved in 1985 from 0 to 0.5 and further to 0.88 in 2001**(0.35)**
15		No Change**(0)**

	V. Information in the run-up of the general meeting [0.88]	
16		No Change**(0.75)**
17		No Change**(1)**
18*	*VI. Shares not blocked before general meeting [1]*	No Change**(1)**
	VII. Individual information rights [0]	
19		No Change**(0)**
20		No Change**(0)**
	VIII. Communication with other shareholders[0.94]	
21		Improved in 1975 from 0.75 to 1 and worsened to 0.5 in 2000**(0.88)**
22		No Change**(1)**
	IX. Board composition [0.13]	
23		Improved from 0 to 1 in 2000**(0.14)**
24		Improved from 0 to 0.25 in 1998 and further to 0.75 in 2001**(0.12)**
25		Improved from 0 to 0.34 in 2000, further to 0.75 in 2001 and further to 0.888 in 2002**(0.13)**
	X. No excessive remuneration for non-executive and executive directors[0.78]	
26		No Change**(1)**
27		Improved from 0.25 to 1 in 2001**(0.35)**
28		No Change**(1)**
29	*XI. Performance based remuneration [0.5]*	Improved from 0 to 1 in 1988**(0.5)**

	XII. Duration of director's appointment [0.38]	
30		No Change**(0)**
31		No Change**(0.75)**
	XIII. Directors' duties [0.75]	
32		No Change**(0.75)**
33		No Change**(1)**
34		No Change**(0.5)**
	XIV. Shareholder supremacy [0.47]	
35		No Change**(0.5)**
36		Improved from 0 to 1 in 1990(0.44)
37*	*XV. Pre-emptive rights [1]*	No Change**(1)**
38	*XVI. Director's disqualification [0.08]*	Improved from 0 to 0.5 in 2000**(0.83)**
	XVII. Corporate governance code [0.16]	Improved from 0 to 0.25 in 1998 and
39		further to 1 in 2001**(0.16)**
	XVIII. Public enforcement of company law[0.84]	
40		Improved from 0.5 to 1 in 1975**(0.93)**
		Improved from 0.75 to 1 and
41		worsened to 0.25 in 1988**(0.59)**
42		No Change**(1)**
43	*XIX. Quorum [0]*	No Change**(0)**
44	*XX. Supermajority requirements [1]*	No Change**(1)**
	XXI. One share – one vote[0.85]	
45*		No Change**(1)**
46		No Change**(1)**
		Worsened from 0.67 to 0 in 2000
47		**(0.56)**

	XXII. Cumulative voting [0.03]	Improved from 0 to 0.25 in 2001
48*		**(0.03)**
	XXIII. Voting by interested shareholders prohibited	
49	*[0]*	No Change**(0)**
50	*XXIV. No squeeze out (freeze out) [0]*	No Change**(0)**
	XXV. Right to exit [0.11]	
51*		No Change**(0)**
52		No Change**(0)**
		Improved from 0 to 1 in 1990 and
53		worsened to 0.5 in 1997 **(0.32)**
	XVI. Disclosure of major share ownership [0.36]	Improved from 0 to 0.25 in 1986 and
54		further to 0.75 in 1990 **(0.36)**
	XXVII. Oppressed minority [0.75]	
55		No Change**(0.75)**
56*		No Change**(0.75)**
	XXVIII. Shareholder protection is mandatory [0.63]	
57		No Change**(1)**
58		No Change**(1)**
59		No Change**(0)**
60		No Change**(0.5)**
	ALL (1 to 60) [0.52]	It rose from 0.47 during 1970-74 to 0.49 during 1975-84, to 0.5 during 1985-89, to 0.54 during 1990-99 and finally to 0.61 during 2000-5.

1 Indices averaged over 1970-2005 in parentheses (maximum value is 1 and the minimum is 0).

* Lele and Siems (2006) identified that these variables constituted the original LLSV index.

Source: Lele and Siems (2006).

Table 4: Shareholder Protection Law and Stock Market Developments:
Estimates of the Long-run Coefficients through ARDL Method[1], 1970-2005

Dependent Variable(Y_t)/ Period	ARDL Model	Share Holder Protection Law-CBR60 (X_t): Long-run coefficients
Nominal Share Price (LSHARE) 1970-2005[2]	(1,0)	0.28
Real Share Price (LRSHARE) 1970-2005[2]	(1,0)	-1.44
Real Stock Market Capitalisation to GDP (LRMKAPGDP), 1976-2005	(6,6)	-126.06
Total Shares Traded to GDP (LVALTRDGDP), 1976-2005	(0,1)	-17.77*
Turnover Ratio (LTURN), 1976-2005[3]	(0,1)	-13.8

* Significant at 5 per cent level.

1 The fitted ARDL (m, n) equation is

$$Y_t = a + b.t + \sum_{i=1}^{m} c_i Y_{t-i} + \sum_{j=0}^{n} d_j X_{t-j}$$

where X_t is the independent variable – legal index (CBR60 or CBR18), Y_t is the dependent variable - the log of different share market variables such as SHARE, LSHARE, RMKAPGDP, VALTRDGDP, TURN, t is the time trend which captures the effect of other explanatory variables and m, n are unknown lags determined by the Schwarz Bayesian criterion (SBC) as suggested by Pesaran and Shin (1999). We have reported only the estimates relating to CBR60 as estimates relating to CBR18 do not tell a different story.

2 In view of structural changes in the share prices since 1975 (possibly unrelated to law changes), intercept and slope dummies are added to the original equation to re-estimate the long-term coefficients but the basic conclusion remains.

3 In view of trendlessness of TURN, the ARDL model is fitted without time trend. The negative long-run coefficient is marginally significant at 5.1 per cent level.

References

Beck T., Demirguc-Kunt A., Levine R., 2003, 'Law and finance: why does legal origin matter?', *Journal of Comparative Economics*, 31(4): 653-675.

Bekaert, Geert and Christian Lundblad, 2005, 'Does financial liberalization spur growth,' *Journal of Financial Economics*, 77(1): 3-55

Henry, Peter Blair, 2000, 'Do stock market liberalizations cause investment booms?,' *Journal of Financial Economics,* 58, (1–2 ,October): 301–34.

Keynes, J.M., 1936, *The General Theory of Employment, Interest and Money*, Harcourt Brace, New York.

La Porta, R., F.Lopez-de-Silanes, A. Shleifer and R.W. Vishny, 1998,'Law and Finance', *Journal of Political Economy*, 106 (6): 1113-1155.

La Porta, R., S.Djankov, F.Lopez de Silanes and A.Shleifer, 2005.'The Law and Economics of Self-Dealing', NBER Working Paper No. W11883

Lele, P. and M. Siems, 2006,'Shareholder Protection: A Leximetric Approach.' Centre for Business Research Working Paper No. WP 324, University of Cambridge, *Journal of Corporate Law*, 2007 (forthcoming)

Levine, Ross, 2003, 'Stock markets liquidity and economic growth: theory and evidence,' in Luigi Paganetto and Edmond S. Phelps (eds), *Finance, Research, Education and Growth*, Palgrave Macmillan, New York.

_____, 2001, 'International financial liberalisation and economic growth,' *Review of International Economics*, 9 (4): 688-702.

Levine, Ross and Sara Zervos, 1998, 'Stock markets, banks, and economic growth,' *American Economic Review,* 88 (3): 537-558.

Ng, S. and Pierre Perron. 1995.' Unit Root Test in ARMA Models with Data-Dependent Methods for the Selection of the Truncation Lag', *Journal of the American Statistical Association*, 90 (429): 268-281.

Perron, P.1997. 'Further Evidence on Breaking Trend Functions in Macroeconomic Variables', *Journal of Econometrics*, 80 (2): 355-385.

Pesaran, M.H. and Y. Shin. 'An autoregressive distributed lag-modeling approach to co integration analysis.' In: Strom, S. (Ed.), *Econometrics and Economic Theory in the 20th Century*: The Ragnar Frisch Centennial Symposium. Cambridge University Press, Cambridge, 1999.

Sarkar, Prabirjit, 2006, 'Stock Market Development and Capital Accumulation in Less Developed Countries', *Mimeograph*: Jadavpur University, Kolkata-700032, India.

Singh, Ajit, 1997, 'Financial Liberalisation, Stock Markets and Economic Development,' *The Economic Journal* 107(May): 771-782.

World Bank, 1993, *The East Asian Miracle*, Oxford University Press, New York.

Figure 1:

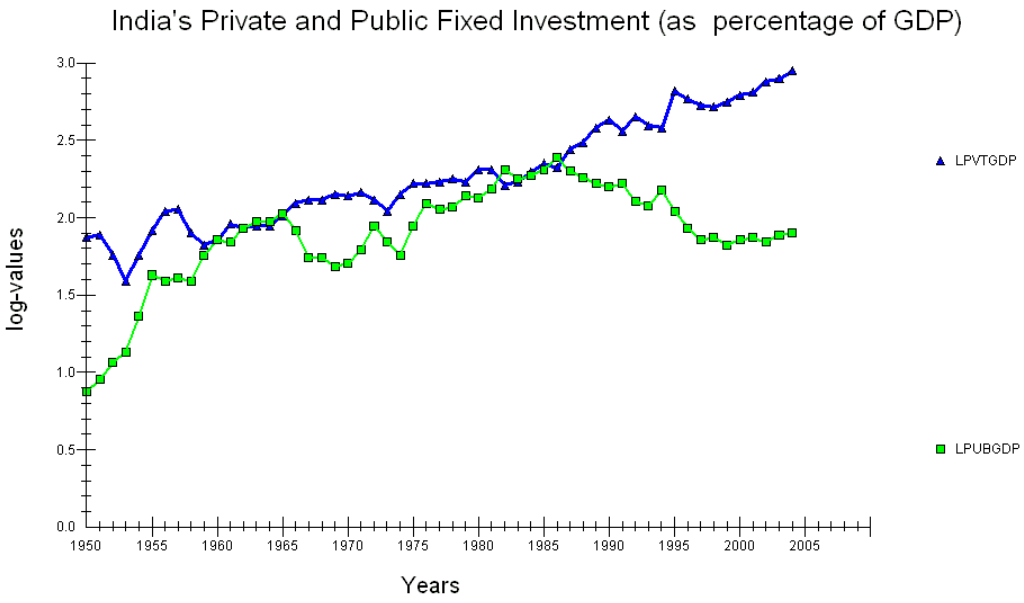

India's Private and Public Fixed Investment (as percentage of GDP)
log-values
Years
LPVTGDP
LPUBGDP
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005

Figure 2:

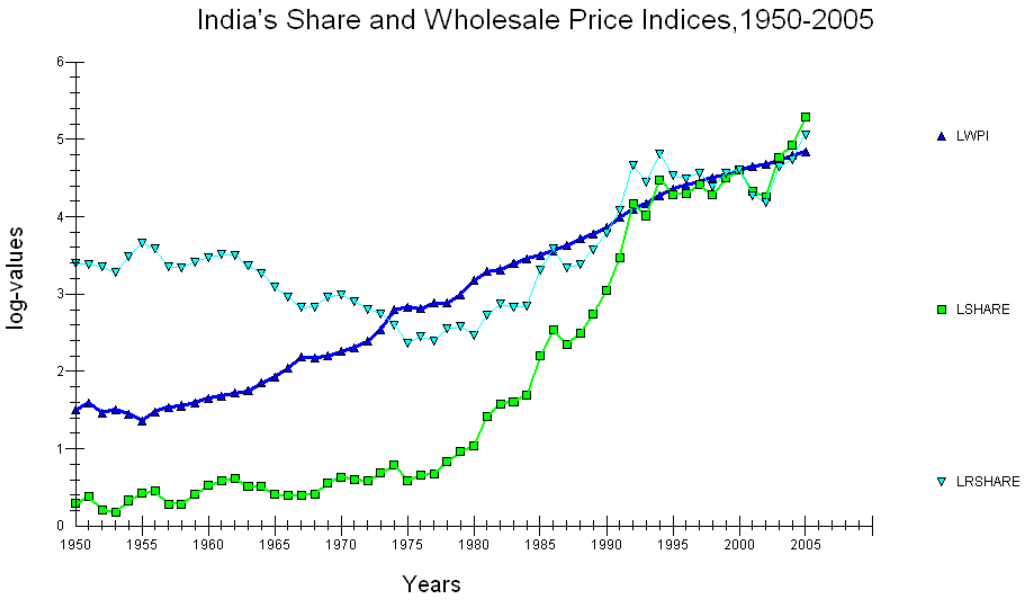

India's Share and Wholesale Price Indices,1950-2005
log-values
Years
LWPI
LSHARE
LRSHARE
0
1
2
3
4
5
6
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005

Figure 3:

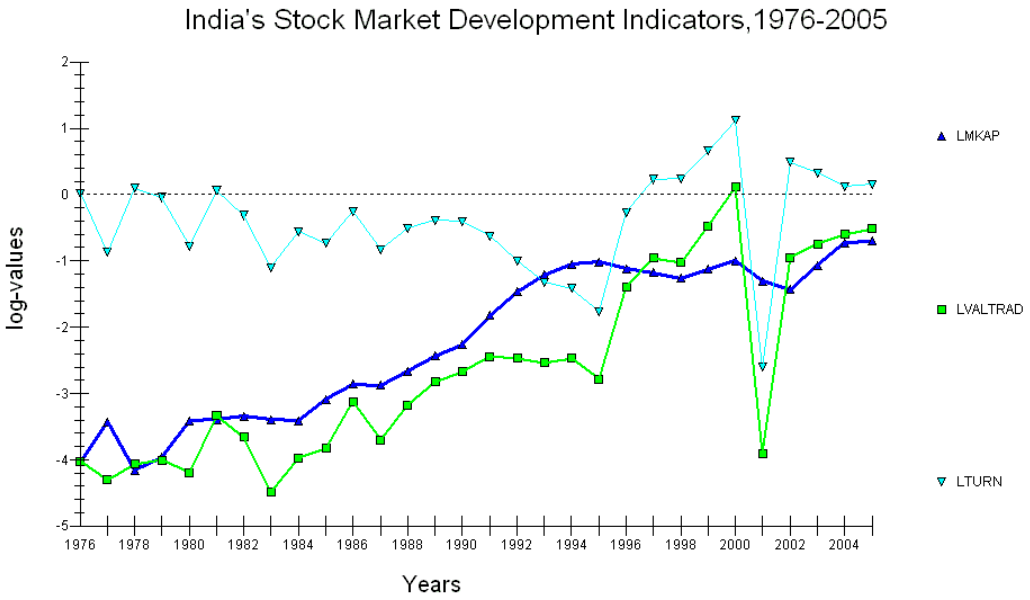
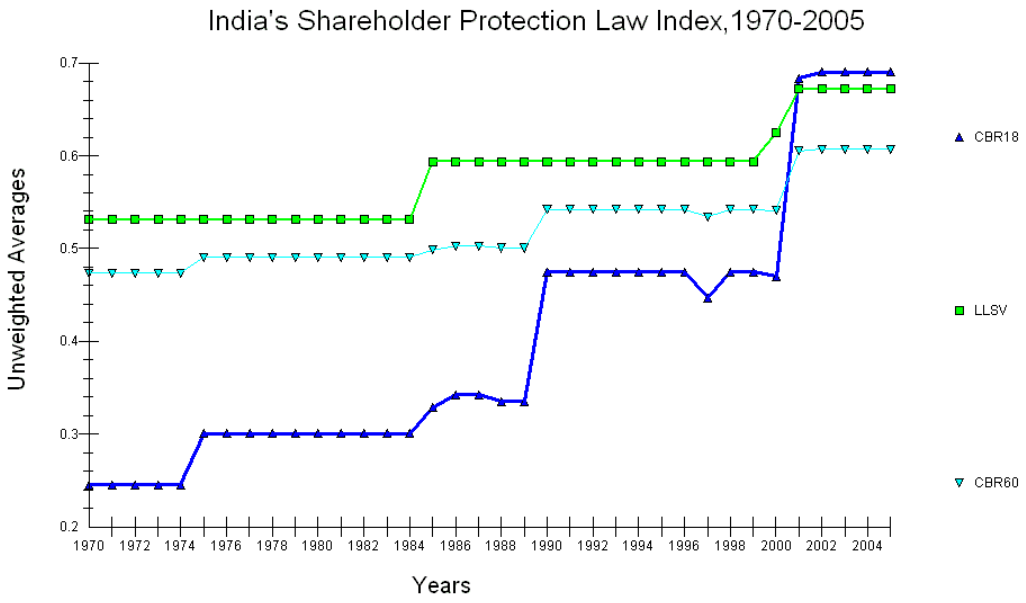

India's Stock Market Development Indicators,1976-2005
log-values
Years
LMKAP
LVALTRAD
LTURN
2
1
0
-1
-2
-3
-4
-5
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004

Figure 4:


India's Shareholder Protection Law Index,1970-2005
Unweighted Averages
0.7
0.6
0.5
0.4
0.3
0.2
1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004
Years
CBR18
LLSV
CBR60

Annex 1: Shareholder Protection Law Indices

Broad Categories	Procedures of Construction of the Sixty Indices
I. Powers of the general meeting	The following variables equal 0 if there is no power of the general meeting and 1 if there is a power of the general meeting. (1) Amendments of articles of association; (2) Mergers and divisions; (3) Capital measures; (4) De facto changes: The decisive thresholds are the sale of 50 and 80 % of the assets; i.e.. if the sale of more than 50 % requires approval of the general meeting it equals 1; if more than 80 % it equals 0.5; otherwise 0; (5) Dividend distributions: Equals 1 if the general meeting can effectively influence the amount of dividend (i.e.. if it decides about the annual accounts and the annual dividend and if the board has no significant possibility of 'manipulating' the accounts); equals 0.5 if there is some participation of the general meeting; equals 0 if it is only the board that decides about the dividend; (6) General election of board of directors; (7) Directors' self-dealing of substantial transactions.
II. Agenda setting power	8) General topics: Equals 1 if shareholders who hold 1 % or less of the capital can put an item on the agenda; equals 0.5 if there is a hurdle of more than 1 % but less than 10 %; equals 0 otherwise. 9) Election of directors: *ditto*

	10) Costs: Equals 1 if shareholders do not have to pay for their proposals; equals 0 otherwise.
III. Extraordinary shareholder meeting	11) Right: Equals 1 if the minimum percentage of share capital to demand an extraordinary meeting is less than or equal to 5 %; equals 0.5 if it is more than 5 % but less or equal than 10 %; equals 0 otherwise. 12) Enforcement: Equals 1 if shareholders can call the meeting themselves or have a right that the court will enforce it; equals 0 if the court has discretion.
IV. Anticipation of shareholder decision	13) Restrictions on proxy voting: Equals 0 if there are restrictions on who can be appointed or which rights the proxy has so that it is likely that proxy voting does usually not take place; equals 0.5 if there are some restrictions which reduce the relevance of proxy voting; equals 1 if there are no restrictions. 14) Anticipation facilitated: Equals 1 if postal voting or proxy solicitation with two-way voting proxy form has to be provided by the company; equals 0.5 if two-way proxy form has to be provided but not proxy solicitation; equals 0 otherwise. 15) Costs of proxy contest: Equals 1 if the costs of proxy solicitations are paid by the company or if proxies have the right to have their proposals included in the company's proxy form; equals 0 otherwise.
V. Information in the run-up of the general meeting	16 Amendments of the articles of association: Equals 1 if the exact wording has to be sent in advance ('push-system'); equals 0.5 if the shareholders have to request it ('pull-system'); equals 0 otherwise. 17 Mergers: Equals 1 if a special report has to be sent in advance ('push-system'); equals 0.5 if the shareholders have to request it

	('pull-system'); equals 0 otherwise.
VI. Shares not blocked before general meeting	18) Equals 0 if the shareholders have to deposit their shares prior to the general meeting and if this has the consequence that the shareholders are prevented from selling their shares for a number of days; equal 1 otherwise.
VII. Individual information rights	19) Right to demand information (a): equals 1 if an individual shareholder or shareholders with 5 % or less capital can demand information which will be answered at the general meeting; equals 0.5 if shareholders with 10% or less capital have this right; equals 0 otherwise. 20) Right to demand information (b): equals 1 if an individual shareholder or shareholders with 5 % or less capital can demand information independent of the general meeting; equals 0.5 if shareholders with 10% or less capital have this right; equals 0 otherwise.
VIII. Communication with other shareholders	21) Right to access the register of shareholders and (if necessary) beneficial owners: Equals 1 if the right of inspection can be used by a single shareholder; equals 0 if there is no such right. 22) Equals 1 if communication is not affected by proxy rules; equals 0 otherwise.
IX. Board composition	23) Division between management and control: Equals 1 if there is a two-tier system or at least half of the board members are non-executive; equals 0.5 if at least 25% of the board members are non-executive; equals 0 otherwise. 24) Independent board members: Equals 1 if at least half of the board members must be independent; equals 0.5 if at least 25 % of them must be independent or if the independence requirement is very low; equals 0

	otherwise. 25) Committees: Equals 1 if companies have to install an audit and a remuneration committee with a majority of independent members; intermediate scores are possible if the requirement is partial (for instance if it requires setting up of one of the committees or the independent members of the committees constituting less than a majority); equals 0 if committees are not necessary.
X. No excessive remuneration for non-executive and executive Directors	26) General meeting power: Equals 1 if the general meeting has to approve all compensation schemes; equals 0.5 if this is limited (e.g. applies to stock option plans only or if some directors are excluded); equals 0 otherwise. 27) Annual disclosure: Equals 1 if there is full and specific disclosure about the individual remuneration of each director; equals 0.75 if there is information about the individual remuneration of some directors; equals 0.5 if there is disclosure about the top 2 directors (executives); equals 0.25 if there is only disclosure about the overall remuneration; equals 0 otherwise. 28) Substantive requirements placing limit for remuneration in order to protect shareholders: Equals 1 if there is a direct regulation; equals 0 otherwise.
XI. Performance based remuneration	29) Equals 1 if performance based remuneration of directors and managers is fostered; equals 0 otherwise.
XII. Duration of director's	30) Normal duration: Equals 1 if this is one year or less; 0 if this is five years or more; equals 0.5 if this is more than 1 but less than 5 years.

appointment	31) Dismissal feasible: Equals 1 if there are no special requirements; equals 0 if an important reason is required; equals 0.5 if there are no special requirements but directors can claim for compensation.
XIII. Directors duties	32) Directors' liability - duty of care: Equals 0 if there are narrow criteria which virtually exclude liability; equals 0.5 if there are some restrictions (e.g. business judgement rule; gross negligence); equals 1 if there are no or little restrictions (regarding business judgement and standard of care). 33) Directors' liability - duty of loyalty: Equals 1 if there is a duty not to put personal interests ahead of the company; equals 0 otherwise. 34) Private enforcement (derivative suit shareholder action): Equals 0 if this is typically excluded (e.g. because of strict subsidiarity requirement hurdle - which is at least 10 %); equals 0.5 if there are some restrictions {e.g. certain percentage of share capital (less than 10 %); equals 1 otherwise.
XIV. Shareholder supremacy	35) General principle: Equals 1 if the board always has to give priority to shareholders interests; equals 0 if the board have to give priority to the interests of other stakeholders; equals 0.5 in other cases. 36) Takeover law: Equals 1 if there is the principle of strict neutrality in case of takeovers; equals 0.5 if the principle of neutrality is subject to exceptions; equals 0 otherwise.
XV. Pre-emptive rights	37) Equals 1 when the law grants shareholders the first opportunity to buy new issues of shares, and this right can be waived only by the general meeting; equals 0 otherwise.

XVI. Director's disqualification	38)Equals 1 if negligent conduct can lead to disqualification; 0.5 if only in specific instances of negligence the directors are disqualified (e.g.. failure of financial reporting); equals 0 otherwise.
XVII. Corporate governance code	39) Equals 1 if companies have to disclose and explain whether they comply with a corporate governance code; equals 0.5 if this is only recommended; equals 0 otherwise.
XVIII. Public enforcement of company law	The following variables equal 0 if there is no power of public authority and 1 if public authority has power. 40) Authorisation for director's self dealing of substantial transactions. 41) Authorisation for appointment of managers. 42) Power to intervene generally in cases of oppression of shareholders or mismanagement of company.

XIX. Quorum	43) Equals 1 if there is a 50 % quorum for the extraordinary shareholder meeting (at least if it is called for the first time); equals 0.5 if the quorum is 1/3; equals 1/4 if the quorum is 1/4. Equals 0 otherwise.
XX. Supermajority requirements	44) Equals 1 if there are supermajority requirements (e.g. 2/3 or 3/4) for amendments of the articles of association, mergers and voluntary liquidations; equals 0 if they do not exist at all.
XXI. One share – one vote	45) Default rule: Equals 1 if this principle exists as a default rule; equals 0 otherwise.

	46) Prohibition of multiple voting rights (super voting rights): Equals 1 if there is a prohibition; equals 2/3 if only companies which already have multiple voting rights can keep them; equals 1/3 if state approval is necessary; equals 0 otherwise. 47) Prohibition of capped voting rights (voting right ceilings): Equals 1 if there is a prohibition; equals 2/3 if only companies which already have voting caps can keep them; equals 1/3 if state approval is necessary; equals 0 otherwise.
XXII. Cumulative voting	48) Equals 1 if the law allows shareholders to cast all their votes for one candidate standing for election to the board of directors or if the law allows a mechanism of proportional representation in the board by which minority interests may name a proportional number of directors to the board; equals 0 otherwise.
XXIII. Voting by interested shareholders prohibited	49) Equals 1 if a shareholder cannot vote if this vote favours him or her personally (i.e. only 'disinterested shareholders' can vote); equals 0 otherwise.
XXIV. No squeeze out (freeze out)	50) Equals 0 if a shareholder holding 90 % or more can 'squeeze out' the minority; equals 1 otherwise.
XXV. Right to exit	51) Appraisal rights: Equals 1 if they exist for mergers amendments of the articles and sales of major company assets; equals 0 if they do not exist at all.

	52) Mandatory bid: Equals 1 if there is a mandatory bid for the entirety of shares in case of purchase of 30% or 1/3 of the shares; equals 0 otherwise. 53) Mandatory public offer: Equals 1 if there is a mandatory public offer for purchase of 10% or less of the shares; equals 0.5 if the acquirer has to make a mandatory public offer for acquiring more than 10% of the shares; equals 0 otherwise.
XVI. Disclosure of major share ownership	54) Equals 1 if shareholders who acquire at least 3 % of the companies capital have to disclose it; equals 0.75 if this concerns 5 % of the capital; equals 0.5 if this concerns 10 %; equals 0.25 if this concerns 25 %; equals 0 otherwise.
XXVII. Oppressed minority	55) Substantive law: Equals 0 if majority decisions of the general meeting have to be accepted by the outvoted minority; equals 1 if some kind of substantive control is possible (e.g. in cases of amendments to the articles of association, ratification of management misconduct, exclusion of the pre-emption right related parties transactions, freeze outs); equals 0.5 if this control covers only flagrant abuses of majority power. 56) Shareholder action: Equals 1 if every shareholder can file a claim against a resolution by the general meeting because he or she regards it as void or voidable; equals 0.5 if there are hurdles such as a threshold of at least 10 % voting rights or cost rules; equals 0 if this kind of shareholder action does not exist.
XXVIII. Shareholder protection is	57) Exclusion of directors' duty of care in articles: equals 0 if possible and equals 1 otherwise. 58) Rules on duration of director's appointment: equals 1 if mandatory and

mandatory	0 otherwise. 59) Board composition (supervisory boards. non-executive directors): equals 1 if mandatory and 0 otherwise. 60) Other topics: equals 1 if there is the general rule that company law is mandatory; equals 0 if company law is in general just a 'model off the shelf'; equals 0.5 if there is no general rule.

Source: Lele and Siems (2006).