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# **Stock Market Developments and Capital Accumulation in India: Does Better Shareholder Protection Matter?**

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## **I**

### **Introduction**

Once Keynes (1936) compared stock market with casino and discounted the importance of stock market for capital accumulation and growth. Joan Robinson held the view that financial development (one aspect of which is stock market development) follows growth but not the other way round. The study of World Bank (1993) pointed out that stock markets have played little role in the post-war industrialisation of Japan, Korea and Taiwan. So Singh (1997) 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. Nevertheless in the present LPG regime (Liberalisation, Privatisation and Globalisation) the stock market has been assigned to play an important role for the capitalist development of the less developed countries (LDCs). Its theoretical and empirical support comes from a large number of mainstream economists (Levine and Zervos, 1998; Levine 1991 and 2003; Henry, 2000; Bekaert *et al* 2005).

It is in the stock market that the stocks or shares of the limited-liability corporations are usually brought or sold. It is expected that capital formation of the companies can be financed by selling shares to the general public. Moreover the privatisation drive of the public sector companies can be facilitated by a developed stock market. There is a move towards globalisation of corporate governance (Sarkar, 2007) in the light of the findings of La Porta *et al.*-LLSV- (1998). They 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, in the former group of countries stock market flourished (Djankov, 2005). It is understood as a part of conventional wisdom that this stock market is the prime mover of economic development through capital accumulation.

In this perspective the Centre for Business Research (at Judge Business School, University of Cambridge) has produced a comprehensive time series dataset (hereafter CBR dataset) for corporate governance relating to shareholder protection for 4 OECD countries (France, Germany, UK and USA) and India over a long period, 1970-2005, available online (<http://www.cbr.cam.ac.uk/pdf/Lele-Siems-Shareholder-Index.xls>). The coverage of the dataset is much more comprehensive than that of the LLSV (La Porta *et al.*, 1998) index. 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 relating to shareholder protection. Each of the variables takes a value between 0 and 1, and many take intermediate values. 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(their average would be 1).

The analysis of these data for 4 OECD countries questions the LLSV hypothesis of better corporate governance in the English-law origin countries and its long-term link with stock market developments (Lele-Siems, 2007 and Fagernas-Sarkar-Singh, 2007).

The present paper extends that study for India and examines the nature and extent of legal changes relating to the protection of the shareholders of the limited-liability corporate sector. It provides an evaluation of this aspect of corporate governance - whether it leads to stock market developments and growth through capital accumulation (Section II). Finally some concluding observations are made (Section III).

## II

### **Changes in India's Shareholder Protection, 1970-2005**

Following the trail of the NEP (New Economic Policy)-regime (or the world-wide drive towards the LPG regime) Indian corporate governance underwent substantial changes to provide more and more shareholder protection. The average<sup>1</sup> of all the 60 indicators (let us call it ALL60) falling into 28 broad categories (see Table 1 for the list) considered in the construction of the CBR dataset (details of the 60 indicators are available in Lele-Siems, 2007 – see also Appendix) rose from 0.47 during 1970-74 to 0.54 during 1990-99 and finally to 0.61 during 2000-5.

India's shareholder protection level is very much comparable to that of many OECD countries. We have a comparable dataset (constructed by CBR) for 4 OECD countries. The average of the shareholder protection indices of the four countries (UK, USA, France and Germany) - let us call it OECD4 – are plotted along with that of India in Figure 1. It clearly shows that India's shareholder protection level is very much comparable to the four OECD countries for which we have the relevant data (see also Table 2).

There are two broad aspects of shareholder protection - one concerning shareholder protection relating to board and management ('BOARD') and the other relating to protection of minority shareholders against the majority ('MINORITY'). India's shareholder protection is concerned more in the area of board and management - less concerned with minority shareholder protection (Figures 2 and 3). The index BOARD rose from 0.49 during 1970-74 to 0.52 during 1975-89, further to 0.55 during 1990-99 and finally to 0.65 during 2000-5. The index MINORITY rose from 0.43 during 1970-84 to 0.44 during 1985-89, to 0.52 during 1990-99 and finally declined to 0.47 during 2000-2005. In granting minority shareholder protection India looks somewhat behind the four OECD countries; but this is due to a rising minority shareholder protection in Germany (Indian scenario is comparable to that of the other three OECD countries).

## **Shareholder Protection, Stock Market Developments and Capital Accumulation: Estimates of Long-term Relationships**

Now the question is: apart from securing the property right of the property-owners, what other role the shareholder protection law plays? Djankov *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 era of privatisation and disinvestments in the existing public sector companies, stock market development is one top priority of the so-called Washington Consensus. It is expected to provide a market mechanism for private capital accumulation (along with public sector disinvestments) and growth. In the next part of this study we shall examine these issues through the time-series methodology.

### **Methodology: Time-Series Analysis vis-à-vis Cross-Section Study**

The conventional wisdom that developed on the basis of various cross-section studies gives an affirmative answer to these questions addressed here. But we shall follow the time-series methodology.

The utility of cross-section studies lies in the fact that the lack of enough observations per country can be overcome by increasing the number of countries in the study – even one single observation of a country can be utilised. But it is often doubtful how far it gives a causal relationship among the variables under study. Moreover a cross-section panel regression analysis often tries to include as many countries as possible – some studies cover (say) 60 countries, some covers 80 countries and all the countries

covered in the study are implicitly given the same weight (it is also difficult to devise a weighting system). It is difficult to justify how far one can treat a country such as Papua New Guinea or Ghana at par with a country such as Brazil or India. There always remains a scope for proving or disproving anything through a suitable choice of a sample.

It is also doubtful how far a general result based on a cross-section study can be used to provide a policy prescription for a particular country. In this respect time-series analysis gives better insight, particularly for individual country cases. When enough data are available for a single country it is better to carry forward a case study. The scope of the present study is limited to Indian experience.

The study of long-run relationships between two time-series variables require a test of unit root – the test for the integration of the series - how many times the series are to be differenced to attain the stationarity property needed to carry forward a meaningful (as against spurious) regression analysis. Once Nelson and Plosser (1982) argued that all the macroeconomic variables have unit root – they are long-memory series. In simple language this observation implies that a temporary shock has a permanent effect. The standard regression analysis is usually based on the assumption that the series are short-memory series – a temporary shock creates a transitory deviation from the path of the series. So instead of using the standard regression analysis one has to use cointegration approach. Subsequently the observation of Nelson and Plosser (1982) was questioned but it became a standard practice to conduct unit root tests before conducting any analysis of relationship between two variables.

But the problem is that different tests of unit root often give different results and the lower the length of the series the lower is the power of the standard tests. The Autoregressive Distributive Lag (ARDL) approach to cointegration developed by Pesaran and Shin (1999) does not require such pre-testing and ‘data-mining’. 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 not (having unit root or not). This approach is especially suitable here as our time period is not very large. So we shall follow the ARDL methodology.

The following is the ARDL (p, q) equation:

$$(1) \quad X_t = a + b.t + \sum_{i=1}^p c_i X_{t-i} + \sum_{j=0}^q d_j Y_{t-j}$$

where  $X_t$  is the dependent variable -  $Y_t$  is the independent variable,  $t$  is time trend, which captures the effect of other explanatory variables, and  $p$  and  $q$  are unknown lags to be determined by various criterion. We shall use the Schwarz Bayesian criterion (SBC) as suggested by Pesaran and Shin (1999).

There are various aspects of corporate governance but we don’t have time-series data for all these. So we concentrate only on one aspect of corporate governance-shareholder protection.

From the Financial Structure Dataset of World Bank (available on-line), we get a series on the turnover ratio (TURN) over the period, 1976-2005. It is one of the most important indicators of stock market development. It is constructed by deflating the



value of stock trade by real market capitalisation and so it contains the information of the general price level, stock market capitalisation and also the value of stock trading.

<sup>2</sup>The turnover ratio series showed a tendency to decline till the mid-1990s. Thereafter it started rising rapidly and fell abruptly in 2001 (along with the value of stock trading as percentage of GDP) in the tune of dot-com bubble burst (Figure 4). So the turnover ratio shows no significant trend growth over the period 1976-2005 (Table 3).

From the various issues of Emerging Market Economy Fact book (published by IFC, World Bank), we get a series on the number of firms listed in the major stock exchanges in India (LIST). It exhibited a rising trend up to 1990 and fell sharply in 1991 and recovered by 1995 (Figure 5). We shall use these two (TURN and LIST) as the alternative indicators of stock market development.

We shall examine the long-term relationship between the indicators of stock market development as provided by the turnover ratio or number of listed firms and the improvement in shareholder protection through the ARDL approach described above. This approach is especially suitable here as our unit root tests show that the turnover ratio is stationary (but not the series on listed firms) while some of the legal indices are non-stationary (as shown in Table 3).<sup>3</sup>

The long run coefficients estimated through the ARDL approach are reported in Table 4. In no case do we get a positive long-term relationship between the share market development indicator - turnover ratio and the alternative legal variables – All60 (average of all sixty indicators), BOARD and MINORITY.

We have modified the ARDL equation by dropping the time trend (as it is not statistically significant). We have also added a spike dummy for the outlier of the turnover series in 2001(sp2001). It is significant in one of the models but the basic conclusion remains unaltered.

The same conclusion follows if instead of turnover ratio we consider the series on the listed firms as the indicator of stock market development. Our conclusion does not change if we add dummies (intercept and slope) for the period 1991-95 (both dummies are significant).

Hence it can be concluded that the concern for better corporate governance for the protection of the interests of the shareholders is misplaced so far as stock market developments in an LDC such as India is concerned.

Next question is: why should we bother about stock market development? Is there any long-term relationship between stock market development and growth through capital accumulation? From the Economic Survey, Government of India (2006-2007), we get data on gross fixed capital formation –public and private as percentage of GDP over the period, 1950-2005. It can be observed that in the mid-1980s (before the official start of the present NEP-regime), the importance of public fixed capital formation in GDP started declining while private capital formation continued to grow (Figure 6). For our purpose we shall use the series on private capital formation. Since the stock market turnover data are available over the period 1976-2005 and the data on the number of listed firms are available over the period, 1980-2003, these will be our two alternative periods of study.

Using the same ARDL methodology, we would like to examine whether there exists any meaningful relationship between the indicator of stock market development (TURN or LIST) and the private fixed capital formation as percentage of GDP (GPFKGDP).

The estimates of the long-term coefficients show no relationship between private fixed capital formation (as percentage of GDP) and stock market variable, turnover ratio or number of listed firms (Table 5).

Next we have extended the ARDL analysis to accommodate the important indicator of financial development – bank deposit as percentage of GDP (BDGDP) or domestic credit to the private sector as percentage of GDP (PCRGDP). The relevant data are available from the Financial Structure Dataset of World Bank over the period, 1976-2005. Including this variable in the ARDL equation (current and past values), we get no change in our conclusion regarding the relationship between turnover ratio or the number of listed firms and private capital formation.

Furthermore we got no positive relationship between private credit or bank deposit and private capital formation. This raises another related issue – whether financial development (the part of which is stock market development) matters for capital accumulation and growth.

We have considered alternative set of intercept and slope dummies for the period 1985-2005, 1991-99, 2000-2005, even the spike dummy for 2001 but we find no evidence of positive relationships. Nor do we get statistically significant dummies.

The CUSUM and CUSUM Squares test were conducted on the basis of OLS trend study of the capital formation series over the periods 1970-2005, 1976-2005 and 1980-2003 but we got no sign of structural change in the series. It seems that the increasing focus on corporate governance and stock market development under the NEP regime is yet to change (if at all) the trend growth path of private fixed capital accumulation.

### **III. Concluding Observations**

Our study examines Indian experience of changes in the law governing the rights and privileges of shareholders of public limited companies (limited-liability corporations) and its impact on stock market developments. It then examines the economic relevance of stock markets –whether stock market developments have any favourable relationship with private fixed capital formation. In both cases our conclusion is in favour of a non-existent long-term relationship. Thus it questions the mainstream view –the conventional wisdom developed through the wave of works that followed the seminal paper of LLSV.

The scope of the present study is limited – particularly we did not deal with the question of law enforcement. The CBR index is based on the law on the books – not the actual implementation. There is a view that the rule of law is at a very miserable stage in many LDCs including India because of corruption and other imperfections. According to the different studies by World Bank (available online <http://info.worldbank.org/governance/>), Indian score in regard to the rule of law is very low. One may be tempted to ascribe our findings to this poor rule of law. Since

no long time series data are available it is not possible to include this factor into our analysis. Furthermore this factor does not change frequently over the years.

Another important point is that the rule of law is not uniform in every sphere of Indian legal system. It is undoubtedly very poor in the unorganised sector involving matters like child labour, child marriage in remote villages, witch hunting in tribal belts, minimum wage legislation in the poverty-stricken regions etc. But in the organised sector – particularly in the matter of corporate governance the rule of law is unlikely to be at such a poor state as is generally believed in India and abroad. Of course big multinational corporations can some times bully the government (some times through their powerful national governments) if some laws are very much against their corporate interests. Nevertheless the present finding cannot be brushed aside just by pointing to the rule of law factor.

Furthermore in the Indian context the controlled regime since the 1950s till the mid-1980s or the beginning of the 1990s was identified in many circles as the root cause of all the crises of development India faced and so there was a call for de-controls leading to the present liberalisation regime. This contradicts the view of poor rule of law. Had there been no rule of law nobody would bother whether India had controls or not. De jure controlled regime would have been a de facto market mechanism. The fact is that imperfection (in the form of corruption, bribery, dilly-dallying etc) exists in India but not at that level as to say that law does not matter.

Keeping in mind all these, we would like to conclude that in the context of India, the changes in the shareholder protection law so far have no relationship with stock

market developments and private capital accumulation. The possible explanation for the lack of relationship with the stock market developments is that in most of the cases shares are bought only to sell at a later date to appropriate capital gains. Buying and selling in the stock market are often governed by speculation and/or cornering the market to make quick money. These are the dominant activities in the share market influencing share prices, stock market capitalisation etc – almost unrelated to the state of shareholder protection and long-term capital formation. So the findings of our econometric study are not counter-intuitive. Regarding the lack of relationship with private capital formation, it should be noted that private capital formation depends on many complex factors summed up by Keynes (1936) as ‘animal spirits’. Different countries have different histories regarding the emergence of the capitalist class with different socio-economic socio-psychological and political economic complexities. Even a substantial change in law may not be enough to change all these. It may not be surprising if the similar result is found for many other individual country cases. Perhaps the LLSV related literature over emphasised the importance of proper legal environment for capital accumulation and growth.

## NOTES

\* This paper was prepared during the tenure of my visiting fellowships (January-March and May-June, 2007) at CBR, Judge Business School, University of Cambridge and was presented at the conference on 'Corporate Accountability, Limited Liability and the Future of Globalisation' organised by CISD at SOAS, University of London (July 20-21, 2007). An earlier version of this paper was presented at Queens College, University of Cambridge (Political Economy Seminar Series – 6 February 2007). I thankfully acknowledge the encouragement and support I received from Professors Ajit Singh, Simon Deakin and others at CBR. However the usual disclaimer applies.

1 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.

2 In the Financial Structure Dataset the turnover ratio is defined as the value of total shares traded to average real market capitalization. It is calculated using the following method:  $T_t/P_{a_t}/\{(0.5)*[M_t/P_{e_t}+ M_{t-1}/P_{e_{t-1}}]\}$  where T is total value traded, M is stock market capitalization, P\_e is end-of period CPI, P\_a is average annual CPI.

3 We did not try Perron test – which is the appropriate test in the presence of structural break in the series, as our ARDL methodology does not depend on the prior knowledge regarding the level of integration of the series.

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**Table 1. India's Shareholder Protection Law: Changes during 1970-2005<sup>1</sup>**

NO.	Broad Categories	Changes
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.
A.	[0.55]	It rose from 0.49 during 1970-74 to 0.52 during 1975-84, to 0.53 during 1985-89, to 0.55 during 1990-99 and finally to 0.65 during 2000-5.
	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 <b>(0.5)</b>
12			No Change <b>(1)</b>
	IV.	<i>Anticipation of shareholder decision</i>	
		[0.26]	
13			Declined from 0.5 to 0.38 in 1988 <b>(0.44)</b>
14*			Improved in 1985 from 0 to 0.5 and further to 0.88 in 2001 <b>(0.35)</b>
15			No Change <b>(0)</b>
	V.	<i>Information in the run-up of the general meeting</i>	
		[0.88]	
16			No Change <b>(0.75)</b>
17			No Change <b>(1)</b>
	V.	<i>Shares not blocked before general meeting</i>	
18*		[1]	No Change <b>(1)</b>
	VI.	<i>Individual information rights</i>	
		[0]	
19			No Change <b>(0)</b>
20			No Change <b>(0)</b>
	VII.	<i>Communication with other shareholders</i>	
		[0.94]	
21			Improved in 1975 from 0.75 to 1 and worsened to 0.5 in 2000 <b>(0.88)</b>
22			No Change <b>(1)</b>
	VIII.	<i>Board composition</i>	

23	[0.13]	Improved from 0 to 1 in 2000 <b>(0.14)</b>
24		Improved from 0 to 0.25 in 1998 and further to 0.75 in 2001 <b>(0.12)</b>
25		Improved from 0 to 0.34 in 2000, further to 0.75 in 2001 and further to 0.888 in 2002 <b>(0.13)</b>
	<i>IX. No excessive remuneration for non-executive and executive directors</i>	
26	[0.78]	No Change <b>(1)</b>
27		Improved from 0.25 to 1 in 2001 <b>(0.35)</b>
28		No Change <b>(1)</b>
	<i>X. Performance based remuneration</i>	
29	[0.5]	Improved from 0 to 1 in 1988 <b>(0.5)</b>
	<i>XII. Duration of director's appointment</i>	
30	[0.38]	No Change <b>(0)</b>
31		No Change <b>(0.75)</b>
	<i>XIII. Directors' duties</i>	
32	[0.75]	No Change <b>(0.75)</b>
33		No Change <b>(1)</b>
34		No Change <b>(0.5)</b>
	<i>XIV. Shareholder supremacy</i>	
35	[0.47]	No Change <b>(0.5)</b>

36		Improved from 0 to 1 in 1990(0.44)
	<i>XV. Pre-emptive rights</i>	
37*	[1]	No Change (1)
	<i>XVI. Director's disqualification</i>	
38	[0.08]	Improved from 0 to 0.5 in 2000(0.83)
	<i>XVII. Corporate governance code</i>	
	[0.16]	Improved from 0 to 0.25 in 1998 and
39		further to 1 in 2001(0.16)
	<i>XVIII. Public enforcement of company law</i>	
	[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)
	<b>Minority (43 to 60)</b>	It rose from 0.43 during 1970-84 to
	[0.46]	0.44 during 1985-89, to 0.52 during
		1990-99 and finally declined to 0.47
B		during 2000-5.
	<i>XIX. Quorum</i>	
43	[0]	No Change (0)
	<i>XX. Supermajority requirements</i>	
44	[1]	No Change (1)
	<i>XXI. One share – one vote</i>	
	[0.85]	
45*		No Change (1)
46		No Change (1)
		Worsened from 0.67 to 0 in 2000
47		(0.56)

48*	XXII. Cumulative voting [0.03]	Improved from 0 to 0.25 in 2001 <b>(0.03)</b>
49	XXIII. Voting by interested shareholders prohibited [0]	No Change <b>(0)</b>
50	XXIV. No squeeze out (freeze out) [0]	No Change <b>(0)</b>
51*	XXV. Right to exit [0.11]	No Change <b>(0)</b>
52		No Change <b>(0)</b>
53		Improved from 0 to 1 in 1990 and worsened to 0.5 in 1997 <b>(0.32)</b>
54	XVI. Disclosure of major share ownership [0.36]	Improved from 0 to 0.25 in 1986 and further to 0.75 in 1990 <b>(0.36)</b>
55	XXVII. Oppressed minority [0.75]	No Change <b>(0.75)</b>
56*		No Change <b>(0.75)</b>
57	XXVIII. Shareholder protection is mandatory [0.63]	No Change <b>(1)</b>
58		No Change <b>(1)</b>
59		No Change <b>(0)</b>
60		No Change <b>(0.5)</b>

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

\* Based on CBR coding these variables can be identified as the variables considered by LLSV.

Source: Calculated from the CBR data available online:

<http://www.cbr.cam.ac.uk/pdf/Lele-Siems-Shareholder-Index.xls>

Table 2. Shareholder Protection Law Indices: India and Four OECD Countries, 1970-2005

(Averages) <sup>1</sup>

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**-: Law Indices:-**

Period	ALL60		Board		Minority	
	India	OECD4	India	OECD4	India	OECD4
1970-74	.47	.47	.49	.46	.43	.49
1975-79	.49	.48	.52	.47	.43	.5
1980-84	.49	.5	.52	.49	.43	.52
1985-89	.5	.52	.53	.52	.44	.51
1990-94	.54	.54	.55	.54	.52	.52
1995-99	.54	.55	.56	.57	.51	.5
2000-05	.61	.6	.65	.63	.47	.53

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1 Indices averaged over different sub-periods and different sub-categories (maximum value is 1 and the minimum is 0).

Source: Calculated from the data available online:

<http://www.cbr.cam.ac.uk/pdf/Lele-Siems-Shareholder-Index.xls>



Table 3. India's Shareholder Protection Law Indices, Stock Market Turnover

Ratio and Capital Accumulation, 1970-2005: Trends and Tests of Stationarity

Dependent Variables/ Process <sup>1</sup>	Intercept	Time	Adj. R Sq.	D-W Stat.	ADF Stat. <sup>2</sup>
<b>ALL60</b>					
AR (1)	0.38**	0.004**	0.92	1.86	-2.318(0) <sup>\$</sup>
<b>BOARD</b>					
AR (1)	0.38**	0.005*	0.91	1.69	-1.345(0)
<b>MINORITY</b>					
AR (1)	0.38**	0.002	0.82	1.91	-1.384(0) <sup>x</sup>
<b>Turnover Ratio<sup>3</sup></b> (log-values), LTURN					
OLS	-0.95	0.01	-0.01	1.88	-4.842(0) <sup>‡</sup>
<b>Listed Firms<sup>4</sup></b> (log-values), LLIST					
AR(1)	6.96*	0.03*	0.59	1.67	-2.299(0) <sup>x</sup>
<b>Private Capital Accumulation,</b> GPKFGDP					
AR (1)	1.54**	0.02**	0.95	1.83	-2.646(0) <sup>\$</sup>

1 The fitted equation is:

$$Y = a + b.t$$

where Y is the dependent variable, t = time.

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 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<sup>th</sup> lag (say) term is statistically significant but all higher order lag terms are insignificant we run an 8<sup>th</sup> order ADF equation and check whether 8<sup>th</sup> order lag is significant. If now (say) the 6<sup>th</sup> order lag term is significant but the higher order lag terms are insignificant, we fit a 6<sup>th</sup> order ADF equation and check the maximum order significant lag terms. If the 6<sup>th</sup> order lag term is significant the appropriate ADF model is taken to be 6<sup>th</sup> order. If not, the process continues until we arrive at the zero-order ADF (i.e. DF) equation.

3 The period of analysis is 1976-2005.

4 The period of analysis is 1980-2003.

\* 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 in favour of the trend-stationary alternative (based on 1000 simulations through the boot-strapping method).

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

£ The null hypothesis of unit root is rejected at 5 per cent level in favour of the mean-stationary alternative (based on 1000 simulations through the boot-strapping method).

x The null hypothesis of unit root is not rejected at 10 per cent level against the mean-stationary alternative.



Table 4: Shareholder Protection Law and Stock Market Developments:

Estimates of the Long-run Coefficients through ARDL Method<sup>1</sup>,

1976-2005

ARDL model/ Stock Market Development Indicators/ Period	Shareholder Protection Law	c	t	Dummy-1	Dummy-2
<b>A. Turnover Ratio</b> (LTURN), 1976-2005				<b>(sp2001)</b>	
	<b>ALL60</b>				
(0,1)	-9.02	1.02	0.08		
(0,1)	4.92	-2.94			
(1,0)	9.38	-5.25		-5.14*	
	<b>BOARD</b>				
(1,2)	-15.52	2.56	0.14		
(1,2)	2.75	-1.67			
(1,2)	5.55	3.54		-11.91	
	<b>MINORITY</b>				
(0,0)	-8.33	1.35	0.05		
(0,0)	-3.67	1.31			
(3,5)	22.54	-9.91		-16.08	
<b>B. Listed Firms</b> (LLIST),				<b>(d9195)</b>	<b>(sd9195)</b>

1980-2003					
	<b>(ALL60)</b>				
(1,0)	-8.06	10.68**	0.05		
(1,0)	-1.32	-9.27**			
(1,0)	-0.9	8.73**	0.01	-14.43**	0.32**
	<b>BOARD</b>				
(1,0)	-1.48	8.66**	0.02		
(1,0)	0.17	8.46**			
(1,0)	-1.14	8.77**	0.01	-14.04**	0.31**
	<b>MINORITY</b>				
(2,2)	-1.78	9.33**	0.001		
(2,2)	-1.63	9.35**			
(4,1)	5.09	7.85**	-0.03	-29.72**	0.65**

\* Significant at 5 per cent level.

1 The ARDL equation fitted here is the following

$$X_t = a + b.t + c.sp2001 + d.d9195 + e.sd9195 + \sum_{i=1}^p c_i X_{t-i} + \sum_{j=0}^q d_j Y_{t-j}$$

where  $X_t$  is the dependent variable –the log of turnover ratio (LTURN) or the number of listed firms (LLIST)  $Y_t$  is the independent variable – alternative shareholder protection legal indexes,  $t$  is time trend which captures the effect of other explanatory variables,  $sp2001$  is a spike dummy =1 for 2001 and = 0 otherwise,  $d9195$  is an intercept dummy =1 for 1991-95 and =0 otherwise,  $sd9195$  is a slope dummy = $d9199.t$  and  $p$  and  $q$  are unknown lags to be determined by Schwarz Bayesian criterion (SBC) as suggested by Pesaran and Shin (1999).

Table 5. Private Fixed Capital Formation and Stock Market Development:

Estimates of Long-term Relationships through the ARDL Method<sup>1</sup>, 1976-2005

Period/ ARDL model	Stock Market Development Indicators	Financial Development Indicators	c	t
<b>1976-2005</b>	<b>Turnover Ratio</b> (LTURN),	Private Credit as % of GDP (LPCRGDP)		
(1,0)	-0.03		1.34**	0.03**
(0,0,4)	-0.004	-0.005	1.29**	0.03**
		Bank Deposit as % of GDP (LBDGDP)		
(0,0,1)	0.01	-0.31	0.74*	0.04**
<b>1980-2003</b>	<b>Listed Firms</b> (LLIST)			
(1,0)	0.11		0.67	0.02**
(0,0,3)	0.04	0.19	1.35**	0.03**
		Bank Deposit as % of GDP (LBDGDP)		
(0,0,3)	0.02	0.12	1.37*	0.03**

1 The following ARDL (p, q, r) model has been fitted:

$$K_t = a + b.t + \sum_{i=1}^p b_i K_{t-i} + \sum_{j=0}^q c_j S_{t-j} + \sum_{k=0}^r d_k B_{t-k}$$

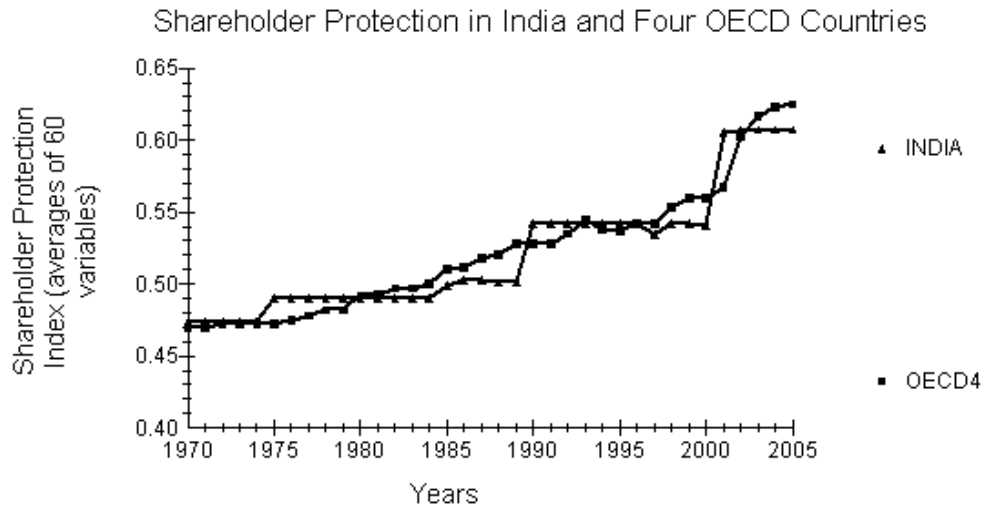
where K = GPKFGDP, S = turnover ratio –log values (LTURN) or the number of listed firms –log values (LLIST) and B = private credit as percentage of GDP-log values (LPCRGDP) or bank deposits

as percentage of GDP –log values (LBDGDP); the subscripts t, t-i, t-j, t-k indicate different time periods and p, q and r are unknown lags to be determined by the SBC.

\*\* Significant at 1 per cent level (based on asymptotic standard errors).

\* Significant at 5 per cent level (based on asymptotic standard errors).

**Figure 1:**



**Figure 2:**

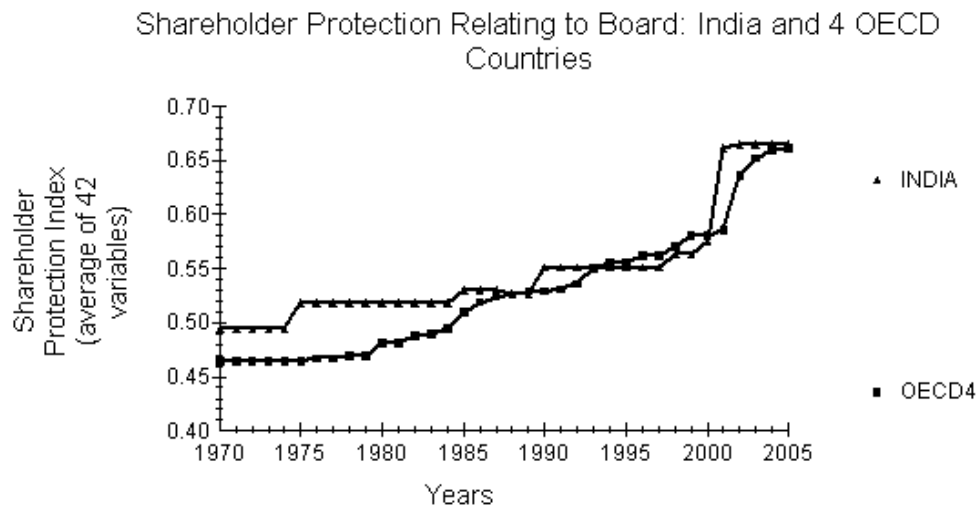




Figure 3:

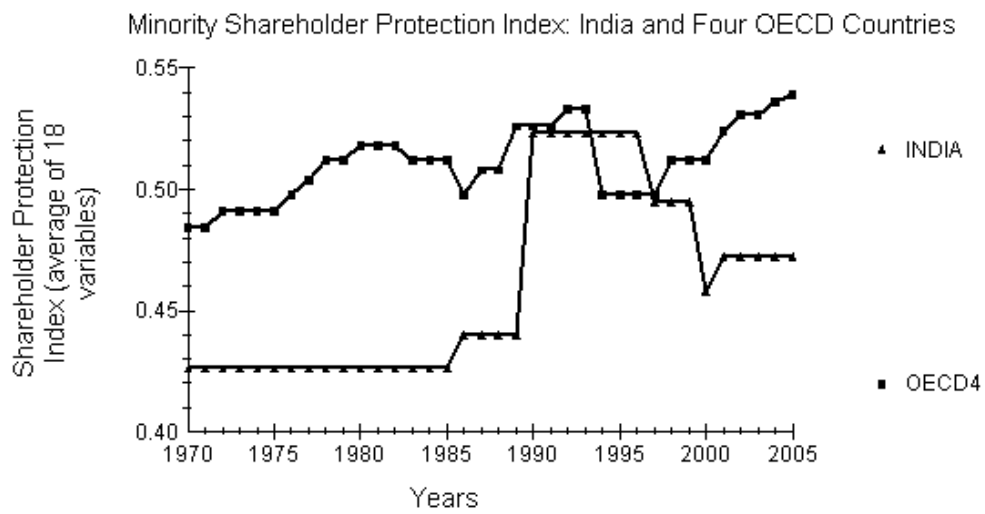


Figure 4:



Figure 5:

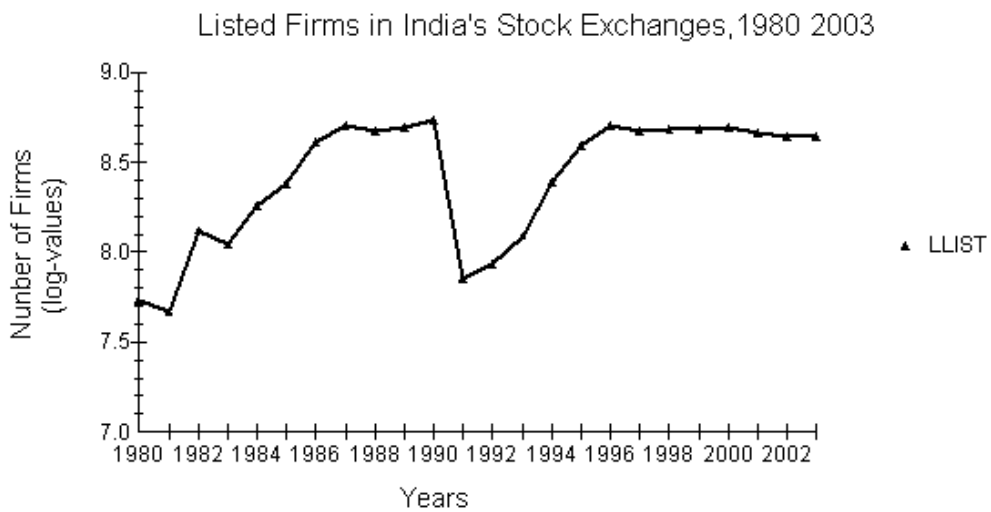


Figure 6:

