LEGAL ORIGIN, SHAREHOLDER PROTECTION AND THE STOCK MARKET: NEW CHALLENGES FROM TIME SERIES ANALYSIS

by

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Abstract

This paper uses a new time series dataset of shareholder protection consisting of 60 annual legal indicators for the period 1970-2005 for France, Germany, the UK and the US. On the basis of these data it examines developments in shareholder protection and reassesses the claims that common-law countries have better shareholder protection than civil law countries. Furthermore it examines the relationship between legal changes and stock market development. It casts serious doubt on the claim that common-law countries have better shareholder protection which in turn leads to more stock market development.

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1 Introduction

Since La Porta *et al.* (1998) published a study on the effects of legal origin on shareholder protection (hereafter SP) and financial development, these topics have received considerable attention from economists. The authors found that countries with a common law origin have a higher level of SP than countries with a civil law origin, which in turn in a cross-section explains the different patterns of ownership concentration of companies in these countries. Ownership concentration is found to be lower in countries with a common law origin, explained by the better level of protection offered to minority shareholders.

In a subsequent paper (Djankov *et al.* 2005), the similar line of reasoning is used to explain a positive correlation between the level of SP and stock market developments, such as those in market capitalisation, numbers of initial public offerings and companies listed on the stock exchange. One of the underlying assumptions is that firm financing in the form of equity capital will be higher in countries with better protection. Several authors have since also worked on the links between financial development and legal origin (see for e.g. Beck *et al.*, 2003) or added a limited time dimension to the existing dataset and examined the determinants of SP (see, for example, Pagano and Volpin, 2006). Embedded in the literature on legal origin is the general perception, that legal change is likely to be more frequent and the legal system as a whole more adaptable to changing environments in a common law system than in a civil law system. This relies to some extent on the assumption that case law plays a more dominant role in common than civil law systems, which could however be questioned.

Indeed, although pathbreaking, LLSV's work has not been without controversy. They have been criticised for their legal origin theory, which assumes, without adequate justification, an enormous path dependence lasting hundreds of years. Critics have also taken exception to LLSV's use exclusively of cross-section data throughout their studies. It leads, among other things, to ambiguity about causation. The inter-disciplinary research project, of which this paper is a part, was designed to address some of these difficulties. The project adopted the strategy of collecting time series data for the four advanced countries – UK, France, Germany and US, which are essentially countries where different legal systems originated (or reached a high level of development), and subsequently spread to developing countries often through colonisation and conquest. In a lighter vein, these may be called 'the countries of the original sin' in terms of the LLSV theory.

In more traditional terms, the four countries chosen can also be considered prototypes of a common law country with an equity-finance orientation (US and UK) and debt-finance oriented civil law countries (France, Germany), which also makes for interesting analysis. Additionally, although ownership structures can be expected to change over time, it is generally thought that equity ownership is more concentrated in France and Germany than in the UK and the US.

Not only LLSV's work, but also that of their collaborators as well as their critics, has mostly been cross-sectional, with the outstanding exception of Rajan and Zingales (2003). The last two authors brought an important time series dimension to their cross country study of capital market developments and showed that contrary to the legal origin theory, there were many "great reversals" in outcomes which contradicted the theory. For example, before World War One, France had a more developed capital market than the US, while in more recent decades it has been the other way round. This is contrary to the legal origin theory because these origins do not change over time.

The new data which has been examined in this paper is a product of the above mentioned research project and consists of 36 years of legal data for 4 countries for 60 variables. This data, which will be described and analysed below in detail, is unique and comprehensive. However, in a longer term historical perspective, which underlies the legal origin theory, the time series are relatively short, 36 years rather than a century or two.

The aim of this paper is to use this dataset to examine annual developments in SP in France, Germany, United Kingdom and United States since the year 1970 and assess the relationship between legal and stock market development. The coverage of the legal dataset is much more comprehensive than that of LLSV and tries to accommodate elements of the law of each country. In the light of this new data, the paper reassesses the claims made that common-law countries have better SP than civil law countries, that such law matters for stock-market development and describes the developments in different areas of SP in detail. It emerges that existing work creates an inadequate picture of the level and role of SP and that despite differences in legal origin, countries' protection of shareholders changes over time and some convergence in the levels of protection can be seen in recent years.

In short, the main contribution of this paper lies in its use of the newly available time series data to test the various empirical and analytic propositions advanced in the literature in this area, including notably by LLSV. As we shall see the

time series analysis leads to rather different conclusions from those well established in the literature by cross section studies. In the light of the nature of the data, the paper experiments with Principal Component Analysis (PCA) as an aggregation tool and Autoregressive Distributive Lag (ARDL) cointegration analysis to explore long-term equilibrium relationships between the relevant variables.

Section 2 describes the legal data and legal developments in the area of SP as well as the hypotheses tested. Section 3 describes the economic data and model used, section 4 reports the regression result and section 5 concludes.

2 Legal Data and Descriptive Analysis

A detailed description of the construction of the legal data as well as a critique of the original LLSV index can be found in the work of our legal colleagues Lele and Siems (2007). It is based on "law on the books". It takes into account company law, and some areas of securities law, although most parts of the latter are excluded. In some areas, only mandatory and not default rules are considered. Corporate governance codes are included as are case law and changes brought about by court decisions. In the case of the US, the coding is based on Delaware law. Self-regulatory listings rules of the stock exchange are also taken into account and in the case of the UK, the City Code on takeovers and mergers is included, although it is not statutory, but compliance is considered a rule.

An explanation of the variables included can be found in Annex 1. There are 60 legal variables for each country, all relating to SP. Each of the variables takes a value between 0 and 1. 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. There are two major categories of variables: protection of the shareholder against management and board and protection of the shareholder against other shareholders.

This section examines and compares the movements in the legal series over time and between countries. For the purposes of comparison and econometric analysis, some form of aggregation of the variables for each country is required. The aggregation issue will be taken up in the context of the use of PCA for analysing the data.

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2.1 Differences in Shareholder Protection: Analysis of Individual Variables

Table 1 shows the areas in which legal change occurs in each country. There is a change in roughly a third of the 60 variables in each country over time. One feature that stands out clearly from this analysis is that changes in regulation do not necessarily occur in same areas of law in each country. This can be seen by looking at the variables for which a standard deviation is calculated, implying that this variable changed over the time period covered.

A look at the means of the variables reveals that countries do protect differently. For instance, concerning agenda setting power (variable 10), France and Germany have a value of 1 in this case meaning that shareholders do not need to pay for their proposals, whereas this is not the case in US and the UK that are assigned a value of 0. Germany has a limit on executive remuneration (variable 28), whereas the other countries do not. In all the others, except the US, the law grants shareholders the first opportunity to buy new issues of shares, and this right can be waived only by the general meeting. All of these refer to cases, where there has been no change in regulation over the time. Where, there have been changes, the mean takes a value in between 0 and 1. The differences in the ways of protecting signal that laws adapts to the economic, industrial and governance structures of the country and the same laws may be less relevant in one country than in another.

However, areas where the law has changed in all of the four countries relate to board composition, director's compensation, director's disqualification after misconduct, directors' duties and compliance with corporate governance codes. Regulations on these tend to be found in corporate governance codes that came into fashion in the 1990s and may well be the clearest unifying feature of SP between the countries. Thus, despite differences, this global phenomenon is clearly reflected in the data. Areas, where rules have not changed in the US and UK, but have in both France and Germany concern those on anticipation of shareholder decision, information in the run-up to the general election, no squeeze out and right to exit.

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Table 1. Means and standard deviation* of each variable 1970-2005

		FRANCE		GERMANY		UK		US	
	I. Protection of shareholder against board and management	**Mean**	**St.dev**	**Mean**	**St.dev**	**Mean**	**St.dev**	**Mean**	**St.dev**
1	Powers of the general meeting	1.00		1.00		1.00		0.50	
2	Powers of the general meeting	1.00		1.00		1.00		0.50	
3	Powers of the general meeting	1.00		1.00		0.86	0.23	0.50	
4	Powers of the general meeting	0.00		0.33	0.24	0.58	0.50	0.75	
5	Powers of the general meeting	0.50		0.50		0.50		0.00	
6	Powers of the general meeting	1.00		0.50		1.00		1.00	
7	Powers of the general meeting	1.00		0.00		0.86	0.23	0.50	
8	Agenda setting power	1.00		0.50		0.50		1.00	
9	Agenda setting power	1.00		1.00		1.00		1.00	
10	Agenda setting power	1.00		1.00		0.00		0.00	
11	Extraordinary shareholder meeting	0.62	0.18	1.00		0.50		0.00	
12	Extraordinary shareholder meeting	0.00		1.00		1.00		0.00	
13	Anticipation of shareholder decision	0.32	0.24	0.60	0.20	0.75		1.00	
14	Anticipation of shareholder decision	0.56	0.50	0.06	0.16	0.50		1.00	
15	Anticipation of shareholder decision	0.00		0.04	0.14	0.00		0.34	0.13
16	Information in the run-up to the general meeting	0.50		1.00		0.75		1.00	
17	Information in the run-up to the general meeting	0.25	0.25	0.33	0.24	1.00		1.00	
18	Shares not blocked before general meeting	0.56	0.16	1.00		1.00		1.00	
19	Individual information rights	0.31	0.25	1.00		0.00		0.00	
20	Individual information rights	0.42	0.38	0.00		0.00		0.00	
21	Communication with other shareholders	1.00		0.86	0.35	0.50		0.79	0.25
22	Communication with other shareholders	1.00		1.00		1.00		0.19	0.25
23	Board composition	0.53	0.09	1.00		0.17	0.27	0.33	0.24
24	Board composition	0.04	0.14	0.06	0.16	0.13	0.24	0.33	0.24
25	Board composition	0.06	0.21	0.06	0.16	0.30	0.42	0.54	0.32
26	No excessive remuneration for non-executive or executive directors	0.5		0.5		0.53	0.08	0.50	0.09
27	No excessive remuneration for non-executive or executive directors	0.37	0.26	0.29	0.14	0.56	0.16	0.63	0.17
28	No excessive remuneration for non-executive or executive directors	0.00		1.00		0.00		0.00	
29	Performance based remuneration	0.53	0.51	0.22	0.42	0.28	0.45	1.00	
30	Duration of director's appointment	0.10	0.20	0.06	0.16	0.50		1.00	
31	Duration of director's appointment	0.92	0.12	0.00		0.67	0.15	0.50	
32	Director's duties	1.00		0.50		0.49	0.31	0.74	0.22
33	Director's duties	1.00		1.00		1.00		1.00	
34	Director's duties	0.52	0.07	0.11	0.21	0.30	0.21	0.54	0.09
35	Shareholder supremacy	0.50		0.50		0.50		0.50	
36	Shareholder supremacy	0.62	0.13	0.07	0.18	1.00		0.38	0.12
37	Pre-emptive rights	1.00		1.00		1.00		0.00	
38	Director's disqualification	0.29	0.25	0.36	0.23	0.69	0.38	0.56	0.16
39	Corporate governance code	0.04	0.14	0.11	0.32	0.36	0.49	0.11	0.32
40	Public enforcement of law	0.00		0.00		0.00		0.00	
41	Public enforcement of law	0.00		0.00		0.00		0.00	
42	Public enforcement of law	0.50		0.00		0.50		0.50	

	II. Protection against other shareholders								
43	Quorum	0.83	0.25	0.00		0.00		1.00	
44	Supermajority rights	1.00		1.00		1.00		0.53	0.08
45	One share one vote	1.00		1.00		1.00		1.00	
46	One share one vote	0.50		0.43	0.19	0.00		0.83	0.24
47	One share one vote	0.00		0.19	0.38	0.00		0.83	0.24
48	Cumulative voting	0.00		0.00		0.00		0.00	
49	Voting by interested shareholders prohibited	0.07	0.18	0.50		0.50		0.42	0.19
50	No squeeze out (freeze out)	0.67	0.48	0.86	0.35	0.00		0.00	
51	Right to exit	0.24	0.25	0.00		0.00		0.25	
52	Right to exit	0.43	0.48	0.14	0.35	1.00		0.00	
53	Right to exit	0.00		0.00		0.00		0.00	
54	Disclosure of major share ownership	0.40	0.38	0.42	0.24	0.87	0.13	0.75	
55	Oppressed minority	0.50		0.72	0.25	0.86	0.23	0.58	0.19
56	Oppressed minority	1.00		1.00		1.00		1.00	
57	Shareholder Protection is mandatory	1.00		1.00		1.00		0.44	0.50
58	Shareholder Protection is mandatory	1.00		1.00		0.50		0.00	
59	Shareholder Protection is mandatory	0.00		1.00		0.00		1.00	
60	Shareholder Protection is mandatory	1.00		1.00		0.47	0.12	0.06	0.16
	ALL	32.2	3.7	31.8	2.7	31.5	3.8	29.9	1.6
	Board and management (1-42)	22.5	3.1	21.6	2.0	23.3	3.4	21.2	1.9
	Minority shareholders (43-60)	9.6	0.7	10.3	0.6	8.2	0.4	8.7	0.9

* Standard deviation is shown only when it is not equal to zero (a change occurs over time). See Annex 1 for exact definitions of the variables in the table.

If there would be interest in diversifying ownership, one might expect to see more of an increase in the area of protection against other shareholders in France and Germany, where ownership is traditionally considered less dispersed. This is to some extent supported by the data, since fewer variables in this category change in the UK than in Germany and France, but the same cannot be said about the US. Perhaps unexpectedly, the number of variables with a change has been higher in the two countries, where the legal system is traditionally considered more rigid (France, Germany).

In the interest of space, correlations between the legal variables over time in each country are not shown. However, such an analysis reveals some interesting features. In the UK, the correlation between all variables is positive. With the exception of one change in 2005 (director's liability – duty of care), changes in any area of SP have always been positive; and the level of protection has not fallen. This is in contrast with the US, where there are a number of negative correlations, which suggests that SP has risen is some areas and fallen in others. Areas where protection has fallen at any point in time in the US relate to excessive remuneration of CEOs, director's duties, shareholder supremacy, one share - one vote, oppressed minority, and mandatory SP. The last three belong to the category of protection against other shareholders, which could be particularly important from a minority shareholder viewpoint. In other areas of law, change has been positive.

France and Germany are intermediate cases, where some negative correlation between variables is observed. Additionally, particularly in Germany there have been a number of simultaneous changes in SP. In Germany, protection has fallen at any point in time in law that relates to squeeze out, oppressed minority and communication with other shareholders. In France, protection has fallen in the case of no squeeze out, duration of director's appointment and quorum.

2.2 Principal Component Analysis

Confronted with the dataset of 60 variables and only 36 years of observations, an economist's first impulse is to find ways of reducing the dimensionality of the data without sacrificing any essential information. In principle, PCA is ideally suited for this task. It can a) help reduce dimensionality; b) provide a deeper analysis of the structure of co-relations that the dataset contains and c) help with the construction of suitable index numbers for SP.

Principal components are weighted linear combinations of the data, but uncorrelated among themselves. The first component captures the largest share of overall variation in the data, the weights being assigned accordingly. The analysis utilises either the covariance or correlation matrix of the original data matrix. In our case we have used the covariance matrix. Ideally, the derived components would have a clear interpretation, i.e. they would reflect a certain type of protection.

In our case, the principal component analysis could be illustrated as follows. We have data x_{ijt} for country $i = 1,...,N$, $N = 4$, variable $j = 1,2,...,J$, J = 60, for

year $t = 1, 2, ..., T$, T = 36 (1970-2005). We want to construct one or more, say R, index numbers as follows

(1) $z_{irt} = \sum_j a_{rj} x_{ijt}$

where $z_i = X_i a$

where z_i is a T × R matrix of indices, a is a J × R matrix and X_i is the T × J matrix for country i for the 60 variables.[1] If we wish to compare the levels of protection for different countries, we need the weights a_{rj} in equation (1) to be the same across countries. Alternatively, they could be country-specific, a_{irj} if the principal components analysis is carried out for each country separately. By inspecting the weights (loadings), it may be possible to give an interpretation to each principal component.

A complication of our dataset is that for many variables there is no variation over time within a country, so the rank of the $T \times J$ matrix X_i is $K_i < J$, where $J - K_i$ of the variables in that country do not vary. Since Principal Components (PCs) create indices that explain as much of the variance as possible, they will ignore the J-K variables that do not vary since they do not contribute to the variance.

To remedy this we carry out PCA for all four countries together, so that weights a_{rj} are the same for each country. For this purpose, we stack the observations vertically to analyse a $(TN) \times J$ matrix $X = \begin{bmatrix} X_1 \\ .. \\ X_4 \end{bmatrix}$. In this case, one variable has 144 observations (TN).

There is still the problem that any variable that does not vary either within or between countries, will have a zero weight, but there are far fewer of these than variables that do not vary within countries.

Thus PCA was carried out separately for each country as well as for all countries together. Through the PCA done for each country separately we find that the first three principal components (PCs) capture most of the time variation in the data, since they together account for at least or over 90% of the variation (see Table 2). However, it turned out to be impossible to identify a

few variables out of the 60 that would drive variation and give the PCs a meaningful interpretation. It proved similarly difficult to provide a sensible, economic interpretation for the principal components of all countries together, even though the first five principle components accounted for 90% of the total variation.

Table 2. PCA Country by Country:

Eigenvalues and Cumulative Proportion of Variation Explained

PC	Eigenvalue	% of Var. explained	Cum. % explained	Eigenvalue	% of Var. explained	Cum. % explained
		France			**Germany**	
First PC	1.48	76	76	0.99	72	72
Second PC	0.24	12	88	0.16	12	84
Third PC	0.10	5	93	0.12	8	92
		UK			**US**	
First PC	1.10	72	72	0.68	63	63
Second PC	0.25	16	88	0.22	20	83
Third PC	0.05	3	91	0.07	7	90

However the PC analysis was not totally unproductive. It turns out that the weighted sum of the first three principle components (weighing each component with the share of variation explained) for individual countries, correlated very highly with the un-weighted sum for all 60 variables the main aggregation device used in this paper (see the next section). The correlation co-efficients were as follows: 0.96 for both France and Germany, 0.99 for the UK and 0.70 for the US. The same holds true of the correlation between the first PC and un-weighted aggregate of all 60 variables (0.96 for France, 0.94 for Germany, 0.99 for the UK and 0.59 for the US). Thus, the unweighted sum of SP indicators appears to capture much of the same information as the PCs and have the advantage that they can be given an interpretation.

2.3 Composing an Aggregate Index of Shareholder Protection

The task of comparing the level and movements in SP in the four countries is simplified if some aggregation procedure is used to arrive at a SP measure. In line with much of the literature, we used the un-weighted sum of all variables as an aggregate index of SP. This index, as seen above, is effectively endorsed by the PCA analysis as well. [2]

Figure 1 highlights what a simple un-weighted sum of all the 60 variables tells us about the level of SP in each country. The aggregate procedure used here assumes that all variables are equally important in explaining protection. This is unlikely to be the case, but assigning a priori weights was considered too arbitrary. France and the UK appear to have seen the largest rises in aggregate protection, starting from a lower level than the two others, but in the latter half of the 1980s climbing higher. Changes in Germany have been less pronounced until the late 1990s, when there are two notable hikes. In the US, the developments in SP have oscillated between rise and fall. The jump in year 2002 is driven mainly by changes in the rules on board composition and director's disqualification after negligent conduct due to the introduction of the controversial Sarbanes-Oxley Act.

Figure 1

Shareholder Protection Index, 1970-2005
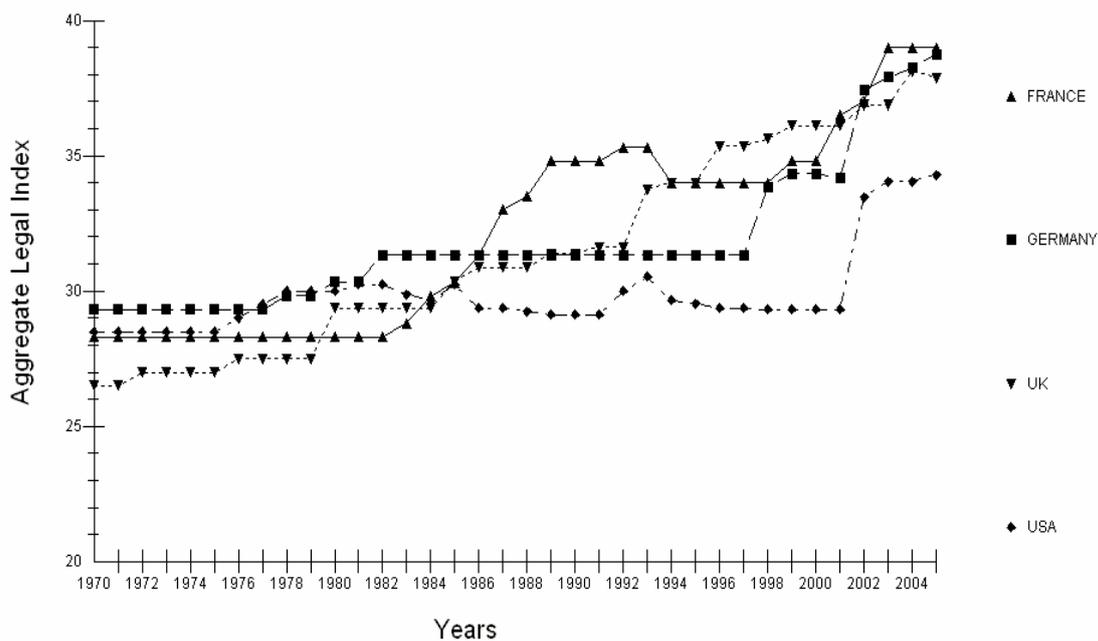
We considered two sub-categories of protection by using un-weighted sums of different variable combinations: "protection against board and management" (aggregate of first 42 variables) and "protection against other shareholders" –or 'minority shareholder protection' (aggregate of other 18 variables). Figures 2 and 3 show the movements in these two sub-categories. Table 3 shows the

correlation between the different indicators of protection. The correlations between the different variable combinations are generally fairly high and positive in each country, which means that different combinations may in fact give a rather similar picture of the development in SP over time. The clear exception is the US, where protection against other shareholders correlates negatively with other variables. Figure 3 shows that it has been falling on several occasions.

Table 3
Correlation between Different Variants of Protection

FRANCE	(a)	(b)	(c)
(a) All (Variables 1-60)	1.00		
(b) Board & Management (Variables 1-42)	0.99	1.00	
(c) Minority Share Holders (Variables 43-60)	0.82	0.74	1.00
GERMANY			
(a) All (Variables 1-60)	1.00		
(b) Board & Management (Variables 1-42)	0.99	1.00	
(c) Minority Share Holders (Variables 43-60)	0.96	0.94	1.00
UK			
(a) All (Variables 1-60)	1.00		
(b) Board & Management (Variables 1-42)	0.99	1.00	
(c) Minority Share Holders (Variables 43-60)	0.83	0.80	1.00
USA			
(a) All (Variables 1-60)	1.00		
(b) Board & Management (Variables 1-42)	0.89	1.00	
(c) Minority Share Holders (Variables 43-60)	-0.10	-0.54	1.00

Figure 2
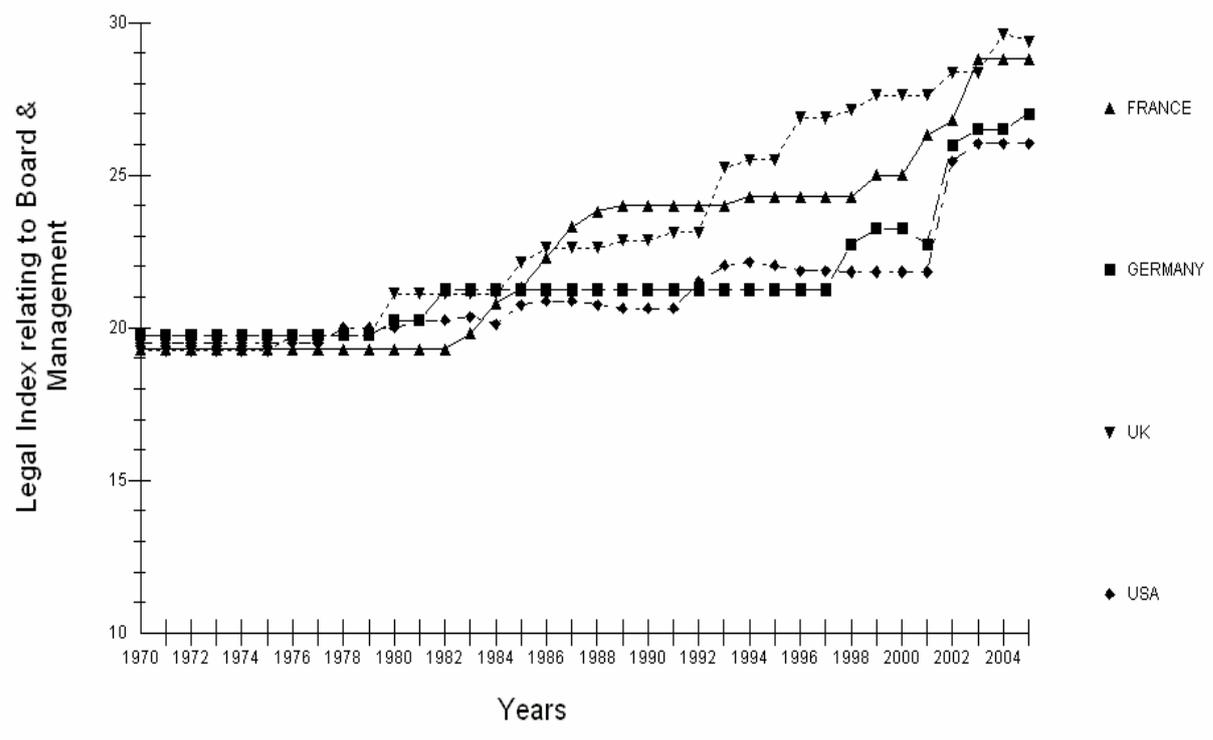**Shareholder Protection Index relating to Board and Management**
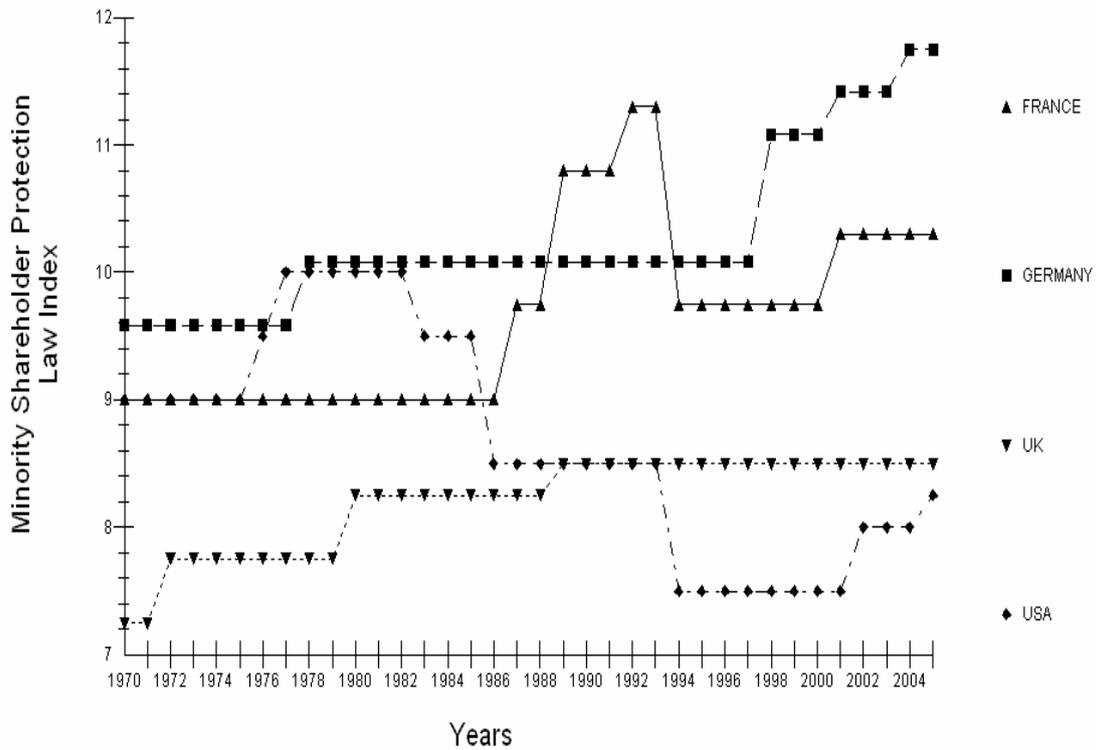**1970-2005**

Figure 3
**Minority Shareholder Protection Index**
1970-2005

The four-country average of aggregate SP has increased during 1970-2005. This is also true for the average of the 42 legal variables relating to board and management, but average minority SP (aggregate of the rest 18 variables) is stagnant (Figure 4).

Figure 4
Average State of Shareholder Protection in France,
Germany, UK and USA, 1970-2005
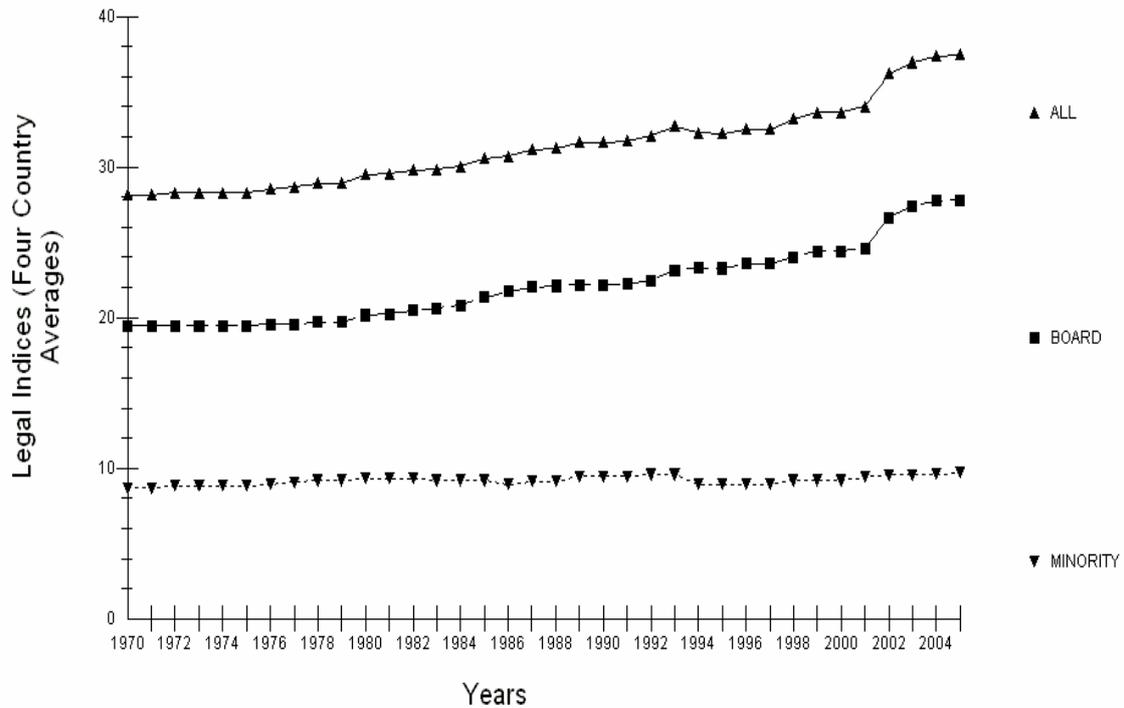
We have seen that countries protect shareholders differently, but that changes in certain areas have occurred in all of the four countries. Have the levels of SP diverged or converged over time? One way to examine the variation between the four countries is by calculating the coefficient of variation for the values of each legal variable for each year. Due to major changes in the law in France and in the UK and later on in Germany (as shown in Figures 1 to 3), the coefficient of variation started to rise since the mid-1980s (Figure 5). There is some sign of convergence in protection against the board and management since 2002 but it may be too early to call it a trend of convergence. In the field of minority SP, there is a sign of growing divergence.

Figure 5
Variations in Shareholder Protection Law among France,
**Germany, UK and USA, 1970-2005**
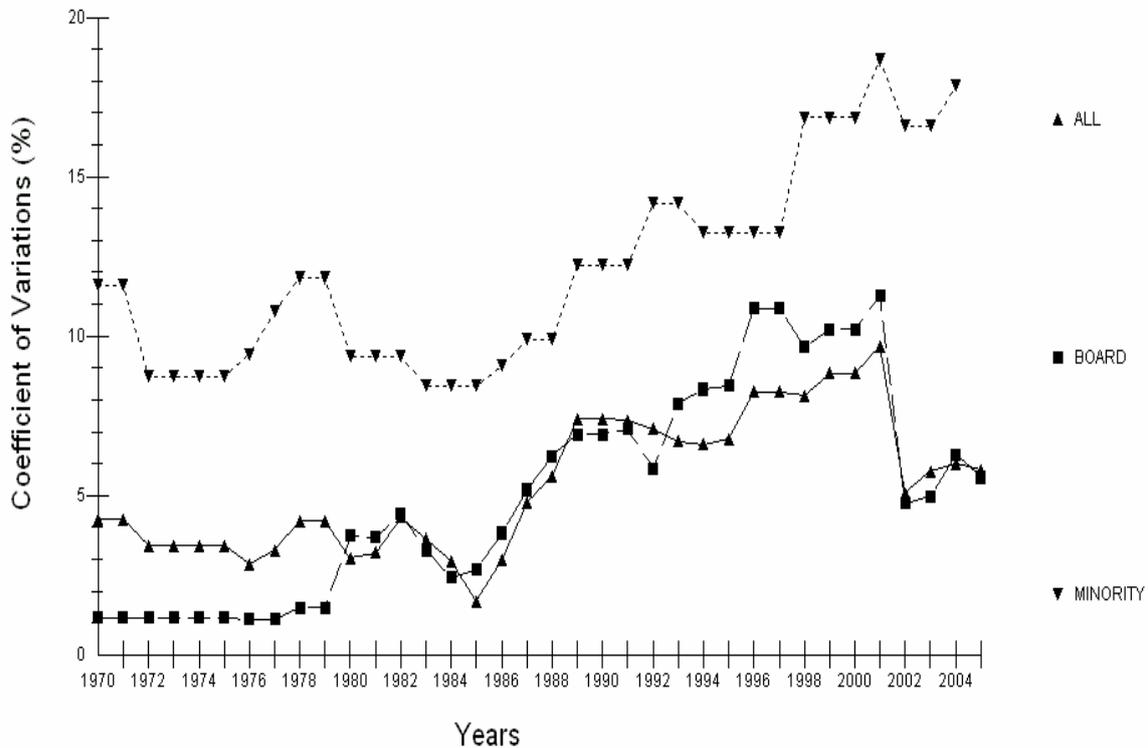
The original LLSV indicator of SP was based on only 6 variables, and is unlikely to provide an adequate picture of protection in a country. It is available for 49 countries, for a single year, and is calculated as an un-weighted mean of several variables. The authors have improved the original indicators recently by constructing a directors' self-dealing index that considers more dimensions of SP and makes use of answers by legal experts to questionnaires (see Djankov *et al.* 2005). It is still only available for one year. Some of these aspects are also incorporated into the 60 variables used in this study.

Figure 1 illustrates that the 60 variable aggregate leads to a rather different conclusion than the one made by LLSV; the relative positions of countries in terms of protection change over time and the US and the UK, the common law countries, do not have a higher level of SP than France and Germany, the civil law countries. On the contrary, the US appears to have the lowest level of aggregate protection since the mid 1980s. Although the definitions of the variables included in our study differ and care was taken to incorporate not only

statutory law, but also other aspects, Figure 6 shows what the LLSV index might look like if it were calculated with our data.[3] The resulting aggregate looks rather flat, and would provide an inadequate picture of the degree of SP.

Figure 6
LLSV Index of Shareholder Protection
1970-2005
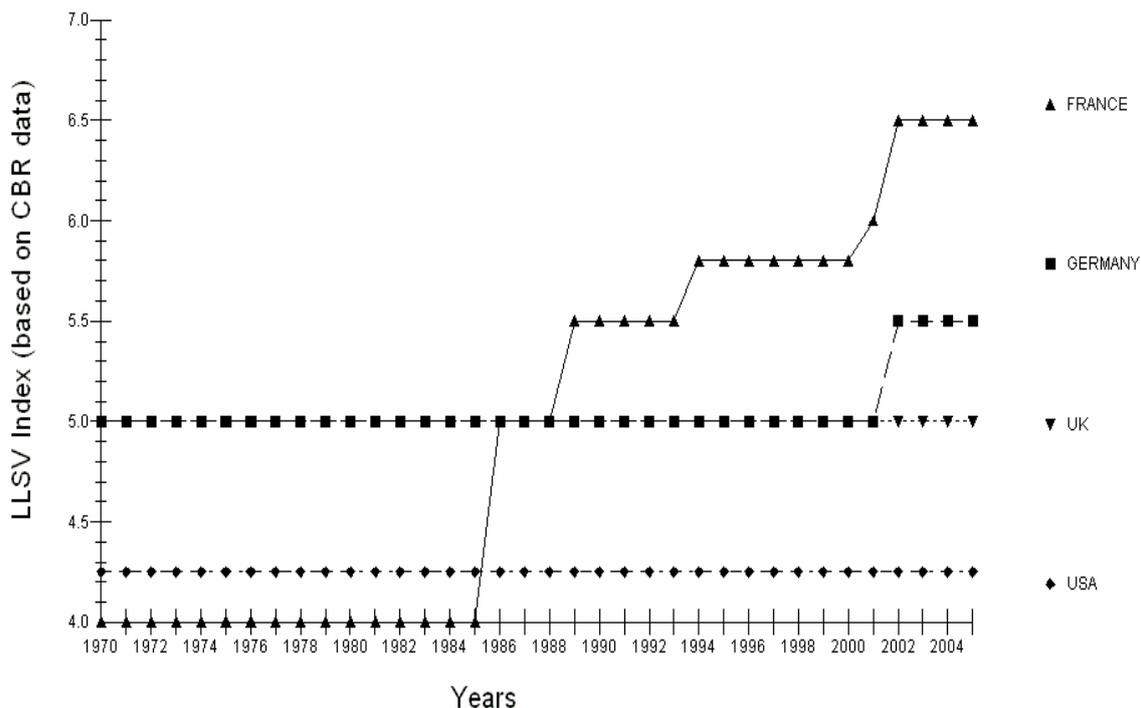
The observations made above raise such questions as why do countries such as France and Germany, have a higher level of SP than the UK and US where stock-market development has reached a higher level? Is there an optimal level of protection that has been surpassed? Although, the econometric analysis to come cannot fully answer such questions, it will provide some suggestions on the effects on protection on stock market development in the different countries.

The gulf between the cross-section and the time series results is best indicated by a table (Table 4) on the quinquennial estimates of the record of SP observed at each five year period over the thirty six year time span of our dataset. There are seven observations for each country over this period. As these are five years apart the observations arguably are likely to be independent of each other.

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Comparing the rank order of the predicted with the actual outcome every five years, in all seven cases the predictions of the legal origin theory were rejected by the data. Further, if the Anglo Saxon countries are considered together and compared with the combined civil law countries (France and Germany), at each of the seven five-year intervals the civil law countries had higher SP than the common law countries. The simple Chi-square test shows that the chances of seven out of seven predictions being contradicted by the data in each of the two cases through sampling fluctuation are extremely small. The null hypothesis that civil law countries have lower SP than common law countries is simply incompatible with the data.

Table 4
Aggregate Legal Indices of Shareholder Protection, 1970-2005:
'Original Sin' Countries

Period	USA	UK	Germany	France	Average of 4 countries	Coefficient of Variation (%)
1970-74	28.5	26.8	29.33	28.25	28.22	3.74
1974-79	29.4	27.4	29.53	28.25	28.65	3.53
1980-84	30	29.4	30.93	28.65	29.74	3.26
1985-89	29.5	30.88	31.33	32.55	31.06	4.09
1990-94	29.69	32.48	31.33	34.8	32.08	6.69
1995-99	29.39	35.3	32.43	34.15	32.82	7.83
2000-05	32.54	37	36.81	37.5	35.96	6.39

Source: Lele and Siems (2007)

3 Shareholder Protection and Stock Market Development

This section explains the econometric model used and discusses the results. Our concern is development of stock market which is essentially a long-run phenomenon. So we have decided to look for a long-run relationship between shareholder protection and stock market development. Given the small number of countries, instead of pooling the data for all countries together, we have decided to examine the effects of shareholder protection in each of the countries separately, since these are potentially different in the four countries. We have data on stock market development[4] – stock market turnover ratio[5] over the period 1976-2005, but have data on the legal variables over the period 1970-2005. However, there is only one change in all of the legal variables prior to 1976. So our period of analysis (1976-2005) does not miss much.

With the exception of the US, movements in SP have by and large been positive. Stock market turnover ratio has also risen. This is clearly the case for France and the US (see Figure 7), and lately for the UK as well. The German series has an oscillating pattern, with no clear rise in the turnover ratio since the mid 1980s.

As explained earlier, we have decided to use simple un-weighted sums of the variables to construct an aggregate measure of shareholder protection. However, we feel that it is important to test whether the two main categories, protection against board and management and protection against other shareholders have different effects. Germany and France are traditionally considered to have more concentrated equity holding and thus changes in the protection for minority shareholders might produce larger effects than in the UK and the US, where ownership on aggregate is already more dispersed. However, one could also argue that due to such ownership structures, changes in minority protection might be more relevant in the UK and US than in France and Germany.

Figure 7
Stock Market Turnover Ratio in France, Germany, UK and USA
1976-2005
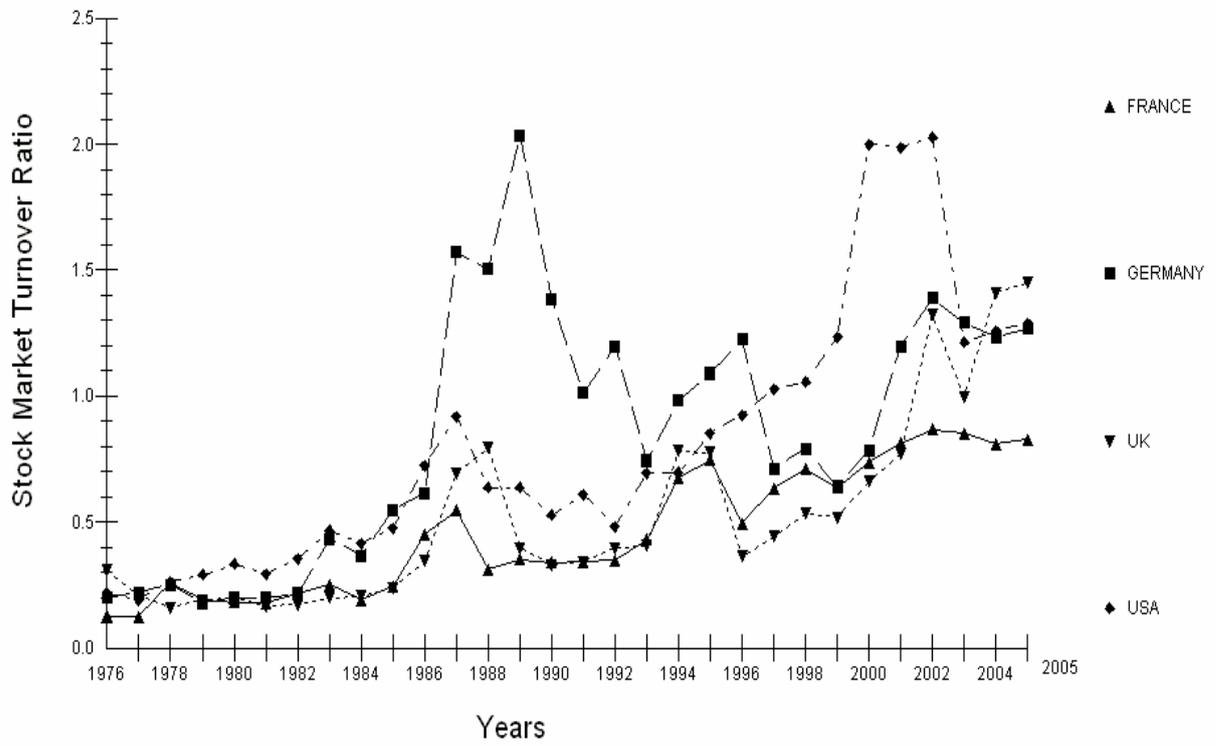
3.1 Modelling Approach

To examine the long-term relationship between two variables it has now become a standard practice to tests the stationarity of the variables. Out of all the tests of stationarity, Augmented Dickey-Fuller (ADF) tests are the most popular with many well-known advantages and disadvantages. However, choosing the appropriate order of the ADF test is another problem and different methods of choosing the lag structure of an ADF equation often give different results. Moreover, the distribution of the ADF test statistic is asymptotically true and so the conclusion drawn on the basis of this test for a small sample may not be correct.

Following the methodology followed by Sarkar (2005) we have used the data-dependent General-to-specific (GS) criterion (details in footnote to Table 5) to choose the optimum lag structure of the error process of the Dickey-Fuller equation. The GS criterion is considered to be superior to any predetermined (fixed) lag structure and is also said to be better than various parsimonious information criteria (see Ng and Perron, 1995 and Perron, 1997).

Furthermore to tackle the problem of small sample the wild boot strapping method (1000 simulations) is used (with the aid of the EASYREG program) to derive the true probability value of the ADF statistic estimated in each case.

This procedure shows (Table 5) that the indicator of share market developments such as (log-values of) stock market turnover ratio is trend-stationary for all the countries excepting Germany.

Table 5
Tests of Stationarity of the Legal Indexes, Turnover Ratio and Nominal GDP, 1976-2005: Selected Countries

Country/Variables	DF/ADF Statistics[1,2,3]
France	
All (Variables 1-60)	-2.981**(2)
Board & Management (Variables 1-42)	-3.8107**(2)
Minority Share Holders (Variables 43-60)[x]	-1.5814(0)
Turnover Ratio – log values	-4.8996**(1)
Nominal GDP – log values	-4.3709**(0)
Germany	
All (Variables 1-60)[x]	0.9491(4)
Board & Management (Variables 1-42)[x]	1.0616(4)
Minority Share Holders (Variables 43-60)[x]	-0.0422(0)
Turnover Ratio – log values[x]	-1.5773(0)
Nominal GDP – log values[x]	-1.5725(1)
UK	
All (Variables 1-60)	-3.5671**(0)
Board & Management (Variables 1-42)	-3.1126**(0)
Minority Share Holders (Variables 43-60)[x]	-2.3249(0)
Turnover Ratio – log values	-3.1977**(0)
Nominal GDP – log values	-4.7444**(0)
USA	
All (Variables 1-60)[x]	-0.3908(0)
Board & Management (Variables 1-42)[x]	0.0788(0)
Minority Share Holders (Variables 43-60)[x]	-1.0842(0)
Turnover Ratio – log values	-2.4443*(0)
Nominal GDP – log values	-3.8948**(0)

1   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 maximum 5 lags) on the basis of the standard t-tests of significance of the lag terms. For instance, if out of 5 lag terms, the 4th lag term is statistically significant but all higher order lag terms are insignificant, we run a 4th order ADF equation and check whether the 4th order lag is significant. If now (say) the 3rd order lag term is significant but the 4th order lag term is insignificant, we fit a 3rd order ADF equation and check the significance of the 3rd order lag term. If the 3rd order lag term is significant the appropriate ADF model is taken to be of 3rd order. If not, the process continues until we arrive at the zero-order ADF (i.e. DF) equation.

2   The null hypothesis of unit root is tested against the trend-stationary alternative. In some cases we have considered mean-stationary alternative marked by x. To tackle the problem of a small sample we accept or reject the null hypothesis on the basis of 1000 simulations through a boot-strapping method (the errors have been drawn from normal distribution with zero mean and variances squared OLS residuals).

3   The order of the test statistic is in parentheses.

x   The null hypothesis is unit root tested against mean-stationarity.

**   The unit root hypothesis is rejected at 5 per cent level.

*   The unit root hypothesis is rejected at 10 per cent level.

As for the different aggregates of legal indices considered here, all the categories and the sub-categories for Germany and the USA exhibited non-stationarity because of a number of structural shifts (as can be observed from Figures 1 to 3). For France and the UK, all the legal variable series excepting the index for minority SP are trend-stationary (the non-stationarity of the latter is also due to structural shifts as can be observed from Figure 3). [6]

In view of these mixed results, we shall use the Autoregressive Distributive Lag (ARDL) approach to cointegration developed by Pesaran *et al*. (1999, 2001) to ascertain the existence of a long run relationship between stock market capitalisation and different categories of legal indexes governing the share market. This approach accommodates both stationary variables and ones with a unit root. To take into account the level of economic activities of a country as a possible factor influencing the stock market behaviour we have also considered (log-values of) nominal GDP[7] in the ARDL model. These are trend-stationary for all the countries excepting Germany.

The following ARDL (p, q, r) equation has been fitted with the aid of the MICROFIT programme:

$$(2) \qquad X_t = \alpha + \beta t + \sum_{i=1}^{p} \gamma_i X_{t-i} + \sum_{j=0}^{q} \chi_j Y_{t-j} + \sum_{k=0}^{r} \delta_k Z_{t-k}$$

where α is the intercept, β is the coefficient of time, t, X refers to the log values of stock market turnover ratio, Y represents the log value of GDP in local currency and Z represents different legal indices - sum of all the 60 indicators, the sum of first 42 indicators (concerning the protection against board and management) and the sum of the remaining 18 indicators (concerning the protection against other share holders). Only one legal index is used per model. Subscripts t, t-i, t-j, t-k (i =1,2,3..p, j = 1,2,3..q and k = 1,2,3,.. r) indicate different time periods and p, q and r are the lags to be determined.

Following the suggestion of Pesaran *et al* (1999) we have used the Schwarz Bayesian criterion (SBC) to determine the lag-structure of the ARDL (p, q, r) model. The estimates of the long-term coefficients of the legal variables and GDP are reported in Table 6.

Table 6
Long-run Relationships between Shareholder Protection Law Indices and Stock Market Turnover Ratio, 1976-2005

Country & Variables	Estimates[1] of long-term coefficients (ARDL model in parentheses)					
	SP-all		**SP-board**		**SP-minority**	
France	(2,3,3)		(2,4,3)		(2,3,3)	
ln (GDP)	0.15		-0.02		0.25	
SP	-0.13**		-0.25**		-0.26**	
c	0.16		1.29		-1.23	
t	0.06**		0.1*		0.2*	
Germany	(1,0,0)	(0,0,0)	(1,0,0)	(0,0,0)	(1,0,0)	(0,3,0)
ln (GDP)	-0.48	-1.52	-0.38	-1.47	-0.77	-0.98
SP	0.09	0.05	0.11	0.06	0.54	0.4
c	0.71	-3.85	0.63	-3.97	0.5	-9.74
t		0.37**		0.37**		0.35**
d90		13.39**		13.31**		13.19**
sd90		-0.34**		-0.34**		-0.34**
UK	(0,3,3)		(0,3,3)		(0,5,4)	
ln (GDP)	-2.67*		-3.12*		11.54*	
SP	-0.68**		-0.67**		-14.68**	
c	14.95*		10.71*		75.29**	
t	0.52**		0.54**		-0.53**	
USA	(1,0,0)		(1,0,0)		(1,0,0)	
ln (GDP)	1.24**		1.46**		0.52	
SP	0.1		0.12		-0.33	
c	-8.09**		-10.46**		-2.02	
t						

*   Significant at 5 per cent level (based on asymptotic standard errors).
**   Significant at 1 per cent level (based on asymptotic standard errors.
1   The following ARDL (p, q, r) equation has been fitted with the aid of the MICROFIT programme to get the long-run relationship between stock market turnover ratio and the legal variables:

$$X_t = \alpha + \beta t + \sum_{i=1}^{p} \gamma_i X_{t-i} + \sum_{j=0}^{q} \chi_j Y_{t-j} + \sum_{k=0}^{r} \delta_k Z_{t-k}$$

where α is the intercept, β is the coefficient of time, t, X refers to the log values of stock market turnover ratio, Y represents the log values of GDP in local currency and Z represents different legal indices - sum of all the 60 indicators, the sum of first 42 indicators (concerning the protection against board and management) and the sum of the remaining 18 indicators (concerning the protection against other share holders). Only one legal index is used per model. Subscripts t, t-i, t-j, t-k (i =1,2,3..p, j = 1,2,3..q and k = 1,2,3,.. r) indicate different time periods and p, q and r are the lags. The lag-structure is determined on the basis of Schwartz Bayesian Criterion (SBC) and is reported in parentheses. In view of data limitation, the maximum value of the lag considered here is 5.

If the coefficient of time is found insignificant, it is dropped (details of those models are skipped) and the ARDL equation is re-estimated. For Germany, intercept and slope dummies (d90 and sd90, respectively) are added to the ARDL equation to take into account the phenomenon of German unification: d90=0 for 1976-1989 and =1 for 1990-2005; sd90=d90*t varies accordingly. We have also tried dummies for 1991-2005 and the basic conclusion remains unaltered (details are not reported here).

The basic conclusion that emerges is that on the whole increases in SP do not appear to have a positive link with stock market development as reflected in stock market turnover ratio, irrespective of whether the countries are common-law or otherwise. On the contrary, we do find a significantly negative relationship between different components of the SP and turnover ratio for both France and the UK. For Germany and the USA we find no relationship.

For Germany our result may be influenced by the phenomenon of the fall of Berlin Wall (in 1990) and the subsequent German unification (for instance we cannot be sure of what adjustments have been made in the data for stock market capitalisation, stock trade and GDP). In order to control for this, we added intercept and time-slope dummies (for the period 1990/91-2005) to the ARDL equation and observed that our finding of no relationship holds (both dummies are statistically significant).

A further interesting aspect of our analysis is that in many of the estimated models, we fail to find a significant direct link between the level of economic activities (as indicated by GDP) and stock market development (as indicated by the turnover ratio). For the USA, however, a positive relationship is found in two out of the three models reported here and for UK we get even a negative relationship (!) in two models. This requires further investigation beyond the scope of the present paper.

Thus our ARDL approach casts serious doubt on the proposition that better SP and higher stock market activities are positively linked even in four major developed countries – the so-called legal-origin 'mother' countries. In another study Sarkar (2007) observed no relationship between SP and stock market development in a less developed country such as India over the same period. Perhaps this observation can be generalised for many other developed and less developed countries.

Another issue that is not addressed here but dealt with elsewhere – the lack of long-term relationship between stock market development and growth through capital accumulation (see Sarkar, 2006 & 2007).

4 Summary and Conclusion

Since La Porta *et al.* (1998) published a study on the effects of legal origin on SP and financial development, these topics have received considerable attention from economists. What the above-mentioned authors captured was a snapshot of the state of regulation in one period in time, and comprehensive time series datasets on legal developments in SP in different countries have been lacking. The research project that this paper relates to has produced a novel, comprehensive time series dataset of SP consisting of 60 annual legal indicators for the period 1970-2005 for France, Germany, the UK and the US. We have used this dataset to examine annual developments in SP in these countries and reassessed the relationship between legal and stock market development as well as the claims that common-law countries have better SP than civil law countries.

If overall SP is measured by an un-weighted sum of all of the variables, we see that the relative positions of countries change over time and the common perception that civil law countries (France, Germany) have lower levels of protection than common law countries (US, UK) does not hold. Germany starts out with the highest level of protection, and the UK with the lowest, but towards the end of the period France climbs to the highest position, and the US has the lowest level of protection. Protection for minority shareholders has been stronger in France and Germany than in both UK and US since the mid 1980s. With the exception of the US, movements in SP have been mainly positive. Principal component analysis is discussed as an alternative aggregation procedure to un-weighted sums in the construction of an indicator of overall protection.

The econometric analysis in this paper attempts to find long-run relationships between stock market development and SP, separately for each country using annual data for the period 1976-2005. Given the concerns with short time series, we have opted for a simple testing procedure, starting out by examining whether a long-run relationship exists between stock market development indicator such as stock market turnover ratio and SP. The ARDL method for testing for cointegration is the main tool used. Our study casts serious doubts on a positive long-term relationship between laws protecting shareholders and stock market activity.

Notes

1 Since principal components are not invariant to units of measurement, it is common to standardise the data before calculating them, i.e. to use the correlation matrix rather than the covariance matrix. In this case, the measures have common units, between zero and one, with one indicating full regulation, so it seems more sensible not to standardise them and use the covariance matrix.

2 See however Pesaran and Smith 2006.

3 The variables included are the legal indices numbering 11, 14, 18, 37, 45, 48, 51 and 56**.**

4 The data source for stock market turnover ratio is Financial Structure Dataset of World Bank (see Beck *et al.*, 2000).

5 Stock market turnover ratio is the ratio of the value of total shares traded to average real market capitalization. In our data collected directly from Financial Structure Dataset, 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

6 We could have tried Perron tests in view of structural shifts in some variables and might have observed some more variables to be stationary. The methodology followed here and described later does not require ascertaining whether the variables are I (0), I (1) or I (2). So the knowledge of the stationarity property is just a matter of academic interest.

7 Data source for nominal GDP (in local currency) is International Financial Statistics, IMF (available on-line).

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Annex I: Shareholder Protection index (variables)

Variables	Description[1]
I. Protection against board and management	
1. Powers of the general meeting[2]	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[3] (4) De facto changes: The decisive thresholds are the sale of substantial assets of the company (e.g., if the sale of more than 50 % requires approval of the general meeting it equals 1; if more than 80 %, it equals 0.5; and otherwise 0). (5) Dividend distributions: Equals 1 if the general meeting can effectively influence the amount of dividend (e.g., 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) Election of board of directors (7) Directors' self-dealing of substantial transactions
2. Agenda setting power[4]	(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.
3. Extraordinary shareholder meeting[5]	(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.
4. 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

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[1] Even where the description of the variables does not mention so specifically, we have given intermediate scores wherever necessary. See *supra*, C 2 (f) on non-binary coding.

[2] For the power of the general meeting for remuneration see variable 26.

[3] The possibility of authorised capital does not lead to a reduction from 1 to 0.5 because the default rule does not change.

[4] Variable categories I2 and I3 could also be used as mechanisms for protecting minority from majority shareholders. However, in this study we have considered them as part of protection against directors because the directors are responsible for and decide the agenda and the calling of the shareholders meetings and therefore the legal rules of these variables primarily protect shareholders against directors.

[5] See *supra* n 4.

	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.
5. 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.
6. Shares not blocked before general meeting	(18) Equals 0 if shareholders have to deposit their shares prior to the general meeting and if this has the consequence that shareholders are prevented from selling their shares for a number of days; equals 1 otherwise.
7. Individual information rights	19) Right to demand information (1): 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 (2): 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.
8. 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.
9. 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:[6] 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 requires setting up of one of the committees or the independent members of the committees constitute less than a majority); equals 0 if committees are not necessary or if they are not required to have independent members.
10. No excessive remuneration for non-executive and executive directors	(26) General meeting power:[7] 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

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[6] To be sure, independent board members may also be a method to protect minority shareholders against majority shareholders. This depends, however, on the definition of "independence", which is not coded in this variable.

	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
11. Performance based remuneration	(29) Equals 1 if performance based remuneration of directors and managers is fostered (e.g. facilitation of stock options to reward performance); equals 0 otherwise.
12. Duration of director's appointment	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 . 31) Dismissal feasible: Equals 1 if there are no special requirements; equals 0 if an important or good reason is required; intermediate scores are possible if there are no special requirements but there may be financial burden for the company (e.g. in the form of compensation under a statute or contract or damages for breach of contract or salary under a fixed term contract).
13. Directors duties[8]	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: Equals 0 if this is typically excluded (e.g., because of strict subsidiarity requirement, hurdle which is at least 10 %; cost rules); equals 0.5 if there are some restrictions [e.g., certain percentage of share capital (unless the hurdle is at least 10 %); cost rules; demand requirement]; equals 1 otherwise.
14. 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.[9]
15. Pre-emptive right[10]	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;[11] equals 0 otherwise.
16. Director's disqualification	38) Equals 1 if negligent conduct can lead to disqualification; 0.5 if directors are disqualified only in specific instances of negligence (e.g., failure of financial reporting); equals 0 if negligent conduct itself is not sufficient for disqualification
17. 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.
18. Public	The following variables equal 0 if there is no power of public authority and 1 if public

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[7] For the involvement of boards and committees see generally variable category I9.

[8] For approval of directors' conduct by the general meeting, the supervisory board, or independent board members see variable categories I1 and I9; for exclusion of liability in the articles see variable 57.

[9] For preventive measures see, e.g. variable category II3.

[10] Usually, the directors decide about the issuance of new shares. Pre-emptive right is perceived as an important protection against directors as it prevents them from disregarding the interests of shareholders in general. Of course, in some cases this may also be a method to protect minority against majority shareholders.

[11] For the requirements for a waiver (e.g. supermajority, good reason) see variable categories II2, II9.

enforcement of company law	authority has power. 40) Authorisation for director's self dealing of substantial transactions 41) Authorisation for appointment of managers 42) Power to intervene in cases of prejudice to public interest or interest of the company for instance due to "mismanagement of company" or in cases of oppression of shareholders

II. Protection against other shareholder	
1. Quorum[12]	43) Equals 1 if there is a 50 % quorum for the extraordinary shareholder meeting (when 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.
2. 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.
3. One share – one vote[13]	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.
4. Cumulative voting	48) Equals 1 if shareholders can cast all their votes for one candidate standing for election to the board of directors or if there exists a mechanism of proportional representation in the board by which minority interests may name a proportional number of directors to the board (default or mandatory law); equals 0 otherwise.
5. 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.
6. No squeeze out (freeze out)	50) Equals 0 if a shareholder holding 90 % or more can "squeeze out" the minority; equals 1 otherwise.
7. 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 if there is no mandatory bid at all.

[12] The purpose of requiring a substantial percentage of shareholders to constitute a valid quorum could be to prevent decisions of the general meeting, which are not supported by a significant majority much like the supermajority requirements. But see also *supra*, Section D 1 (c).

[13] Preference shares without voting rights are not addressed because they are feasible in all countries.

	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% but less than 30 % of the shares; equals 0 otherwise.
8. 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
9. 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.
10. Shareholder Protection is mandatory[14]	57) Exclusion of directors duty of care (see variable 32) in articles: equals 0 if possible and equals 1 otherwise. 58) Rules on duration of director's appointment (see variable 30 and 31): equals 1 if mandatory and 0 otherwise. 59) Board composition (supervisory boards, non-executive directors) (see variable 23 and 24): 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 (2007)

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[14] Note: Variables 57-59 do not code the content of the law (this is already done in variables 23, 24, 30, 31, 32) but only its nature, i.e. whether "mandatory" or "default".