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**The Web of Creditor and Shareholder Protection in 25 Countries:
A Comparative Legal Network Analysis**

By Mathias M. Siems

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ABSTRACT

How different are common law and civil law legal systems? This question has occupied legal scholars for a long time. In the last twenty years the common law/civil law divide has also become a major theme in research of economics, finance and business. In many studies it is alleged that English legal origin countries provide “better law” than French and German legal origin countries, and, as a result, more developed financial markets. This paper uses a new methodology in order to examine whether there are really differences between English, French and German legal origin countries, or whether the alternative explanations are preferable.

The bases of this paper are datasets on creditor and shareholder protection in 25 countries. Part II describes how these datasets can be transformed into matrices showing differences between countries. It also explains the methodology of network analysis and what results one may expect. Subsequently, Part III presents the networks of all countries. Part IV analyses more closely the relationship between the three origin countries (France, Germany and UK) and the other 22 legal systems. Part V examines whether “cliques” or “factions” of countries can be identified. Part VI concludes.

Keywords: social network analysis, comparative law, creditor protection, shareholder protection, legal origins

JEL codes: G20, K00, K22, K35, L14, O17

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The Web of Creditor and Shareholder Protection in 25 Countries: A Comparative Legal Network Analysis

Mathias M. Siems*

I. INTRODUCTION

How different are common law and civil law legal systems? This question has occupied legal scholars for a long time.¹ In the last twenty years the common law/civil law divide has also become a major theme in research of economics, finance and business. In many “comparative law and finance studies”² it is alleged that English legal origin countries provide “better law” than French and German legal origin countries, and, as a result, more developed financial markets. Thus, these studies argue that there are two interconnected causal relationships: first, the belonging to legal origins determines the content of legal rules. This parallels a view of the comparative legal literature that emphasizes deep differences between legal families.³ The second causal claim is that differences in legal rules explain differences in financial development. Both of these findings have received strong criticism,⁴ however, there is no denying the fact that the comparative law and finance studies belong to the most influential studies of the last two decades.⁵

* Professor of Law, Norwich Law School, University of East Anglia and Research Associate, Centre for Business Research, University of Cambridge. I thank John Armour, Dominic Chai, Brian Cheffins, Simon Deakin, Hollie Stringer and the participants of the Law Research Seminar Series at the University of Manchester for helpful comments. The usual disclaimer applies.

¹ See e.g. SIR BASIL MARKESINIS, *THE GRADUAL CONVERGENCE: FOREIGN IDEAS, FOREIGN INFLUENCES, AND ENGLISH LAW ON THE EVE OF THE 21ST CENTURY* (1994); Esin Örüçü, *Family Trees for Legal Systems: Towards a Contemporary Approach* in *EPISTEMOLOGY AND METHODOLOGY OF COMPARATIVE LAW* 359-375 (MARK VAN HOECKE ed., 2004); Pierre Legrand, *European Legal Systems are not Converging*, 45 *INT’L & COMP. L.Q.* 52-81 (1996); PIERRE LEGRAND, *LE DROIT COMPARE* (2nd ed, 2006).

² Term by Mathias Siems & Simon Deakin, *Comparative Law and Finance: Past, Present and Future Research*, 166 *J. INSTITUTIONAL & THEORETICAL ECON.* 120-140 (2010).

³ The most prominent voice is Legrand, *supra* note 1.

⁴ E.g., Lucian Bebchuk & Assaf Hamdani, *The Elusive Quest for Global Governance Standards*, 157 *U. PA L. REV.* 1263-1317 (2009); CURTIS J. MILHAUPT & KATHARINA PISTOR, *LAW & CAPITALISM: WHAT CORPORATE CRISES REVEAL ABOUT LEGAL SYSTEMS AND ECONOMIC DEVELOPMENT AROUND THE WORLD* (The University of Chicago Press 2008); Mathias M. Siems, *What Does Not Work in Comparing Securities Laws: A Critique on La Porta et al.’s Methodology*, *INT’L COMPANY & COMPARATIVE L.J.* 300 (2005); Sofie Cools, *The Real Difference in Corporate Law Between the United States and Continental Europe: Distribution of Powers*, 30 *DEL. J. CORP. L.* 697-766 (2005).

⁵ For citation statistics see Boris Durisin & Fulvio Puzone, *Maturation of Corporate Governance Research, 1993–2007: An Assessment*, 17 *CORPORATE GOVERNANCE: AN INTERNATIONAL REVIEW* 266–291 (2009).

The explanatory force of legal origins can be challenged from two perspectives.⁶ On the one hand, scholars suggest that other aspects, such as politics,⁷ culture/religion,⁸ geography,⁹ and capital account liberalization¹⁰ are more important for financial development than legal rules. This line of criticism is not the topic of the present paper.

On the other hand, it can be doubted of whether similarities and differences between legal systems can really be explained by the distinction between English, French and German legal origin countries. A number of alternative explanations are conceivable. First, it can matter whether countries belong to the same international or regional organization. This is obvious as far as an organization like the EU harmonizes the legal rules of a particular topic. In addition, international organizations can have an indirect effect, for instance, if liberalization of trade induces countries to make their legal systems more competitive.¹¹ Second, geographic vicinity and a common culture make it likely that the laws of two countries influence each other. These factors may also be a partial explanation for the alleged relevance of legal origins because countries of the same legal origin are often neighboring countries with a similar culture (e.g., all Latin American countries are usually regarded as French legal origin¹²). Third, it is likely that legal systems provide similar solutions in similar circumstances, even if there is no direct link between these countries.¹³ Conversely, it may then also be expected that legal rules differ between countries that are in different stages of their economic development.¹⁴

This paper uses a new methodology in order to examine whether there are really differences between English, French and German legal origin countries, or whether the alternative explanations are preferable. The bases of this paper are datasets on creditor and shareholder protection in 25 countries. Part II describes how these datasets can be transformed into matrices showing differences between countries. It also explains the methodology of network analysis and what results one may expect. Subsequently, Part III presents the networks of all countries. Part IV analyses more closely the relationship between the three

⁶ Similar Gani Aldashev, *Legal Institutions, Political Economy, and Development*, 25 OXFORD REVIEW OF ECONOMIC POLICY 257–270 (2009).

⁷ Marco Pagano & Paolo Volpin, *The Political Economy of Finance*, 17 OXFORD REV. ECON. 502 (2001); Marco Pagano & Paolo Volpin, *The Political Economy of Corporate Governance*, 95 AM. ECON. REV. 1005 (2005).

⁸ René M. Stulz & Rohan Williamson, *Culture, Openness, and Finance*, 70 J. FIN. ECON. 313 (2003); Amir N. Licht et al., *Culture, Law, and Corporate Governance*, (2005) 25 INT. REV. LAW & ECON. 229.

⁹ Daron Acemoglu et al., *Reversal of Fortunes: Geography and Institutions in the Making of the Modern World Income Distribution*, (2001) AM. ECON. REV. 1369 (2001).

¹⁰ Menzie D. Chinn & Hiro Ito, *What Matters for Financial Development? Capital Controls, Institutions, and Interactions*, 81 JOURNAL OF DEVELOPMENT ECONOMICS 163-192 (2006).

¹¹ MATHIAS SIEMS, CONVERGENCE IN SHAREHOLDER LAW 263-6 (2008).

¹² See *infra* II B.

¹³ Siems, *supra* note 11, at 249 calls this “convergence through congruence”.

¹⁴ See e.g., WORLD BANK, DOING BUSINESS REPORT: REFORMING THROUGH DIFFICULT TIMES 1 (2010), available at <http://www.doingbusiness.org/documents/fullreport/2010/DB10-full-report.pdf>.

origin countries (France, Germany and UK) and the other 22 legal systems. Part V examines whether “cliques” or “factions” of countries can be identified. Part VI concludes.

II. DATA AND METHODOLOGY

A. Data

A project at the Centre for Business Research (CBR) of the University of Cambridge has developed two indices in order to code the legal protection of creditors and shareholders across countries. These indices use ten variables each. The creditor protection index considers the following questions: minimum capital, dividend restriction, directors’ duties to creditors, scope, registration and enforcement of security, entry to corporate bankruptcy proceedings, stay of secured creditors, outcome of bankruptcy proceedings, and subordination of secured claimants.¹⁵ The ten variables of the shareholder protection index are about the powers of the general meeting for de facto changes, the agenda setting power of shareholders, proxy and postal voting, the ‘one share one vote’ principle, independent board members, the feasibility of directors’ dismissal, shareholder actions against directors and other shareholders, the mandatory bid and disclosure of major share ownership.¹⁶

Using these indices, the CBR project has coded how well creditors and shareholders have been protected in 25 countries between 1995 and 2005. These countries are (in alphabetical order): Argentina, Brazil, Canada, Chile, China, Czech Republic, France, Germany, India, Italy, Japan, Latvia, Malaysia, Mexico, Netherlands, Pakistan, Russia, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, the UK and the US. The full text of the indices, the datasets and detailed explanations can be found online.¹⁷ Other papers have explained these indices and their coding methodology in detail. Moreover, these papers compare the strength of protection between these 25 countries.¹⁸ It has been and will also be examined whether the level of creditor and shareholder protection is reflected in a country’s financial development.¹⁹

¹⁵ See the references in the following notes.

¹⁶ See the references in the following notes.

¹⁷ See the homepage of the “Law, Finance and Development” project on the website of the Centre for Business Research: <http://www.cbr.cam.ac.uk/research/programme2/project2-20.htm>.

¹⁸ John Armour, Simon Deakin, Priya Lele & Mathias Siems, *How Do Legal Rules Evolve? Evidence From a Cross-Country Comparison of Shareholder, Creditor and Worker Protection*, 57 AM. J. COMP. L. 579-629 (2009); John Armour, Simon Deakin, Viviana Mollica & Mathias Siems, *Law and Financial Development: What We are Learning from Time-Series Evidence*, BYU L. REV. 1435-1500 (2009); Mathias Siems, *Shareholder Protection Around the World (‘Leximetric II’)*, 33 DEL. J. CORP. L. 111-147 (2008); Michael Schouten & Mathias Siems, *The Evolution of Ownership Disclosure Rules Across Countries*, J. CORP. L. STUD. (forthcoming).

¹⁹ See already John Armour, Simon Deakin, Prabirjit Sarkar, Mathias Siems & Ajith Singh, *Shareholder Protection and Stock Market Development: An Empirical Test of the Legal Origins Hypothesis*, 6 J. EMPIRICAL LEGAL STUD. 343-380 (2009).

The methodology and content of the present paper is different from these previous ones. Here, I am not interested in the aggregates of legal protection but in the differences between the 25 countries. For this purpose, I calculated the differences between each variable in the law of a particular legal system, and the same variable in the law of the other countries.²⁰ Subsequently, the absolute values of these differences were added together. This has been done for the years 1995 and 2005 (although the following will focus on 2005). The results of these mathematical operations are symmetric matrices with 25 columns and rows, indicating the differences in creditor and shareholder protection between each pair of countries. An extract of these matrices can be found in Table 1. For instance, it can be observed that the German and Japanese laws on creditor protection are relatively similar, (difference just 2.87) whereas the German and Indian laws are relatively different (difference 5.14). The main aim of this paper is to make sense of these matrices.

Table 1: Matrix on differences in creditor protection, 2005 (max 10; min 0)

	Germany	France	UK	US	India	Japan	China	Pakistan	...
Germany	0	3.46	3.27	4.13	5.14	2.87	3.31	4.38	...
France	3.46	0	3.17	4.09	4.74	3.49	4.25	2.84	...
UK	3.27	3.17	0	2.92	3.57	4.48	4.26	2.67	...
US	4.13	4.09	2.92	0	2.99	5.06	5.34	2.25	...
India	5.14	4.74	3.57	3.00	0	5.07	3.35	2.9	...
Japan	2.87	3.49	4.48	5.06	5.07	0	3.4	3.31	...
China	3.31	4.25	4.26	5.34	3.35	3.4	0	4.09	...
Pakistan	4.38	2.84	2.67	2.25	2.9	3.31	4.09	0	...
....

The transformation of the datasets on the strength of creditor and shareholder protection into three “difference matrices” has a number of benefits. First, it enables us to identify differences and similarities between countries. If one merely aggregates and compares the values on the strength of protection, similarities may be spurious. For instance, if two countries have the same score in the creditor protection index, these legal systems can still be completely different because different variables may have led to the same aggregate score. Second, this approach can help us to examine the differences between English, German and French legal origin countries. Previous research typically uses aggregates of all countries that are claimed to belong to a particular legal origin.²¹ This disregards that many legal systems are mixtures between different legal origins. Moreover, aggregates may be distorted by the selection of countries and outliers. Conversely, most parts of this paper will analyze pair-wise relationships in order to show whether there are really differences between countries of different legal origins. The third major benefit of the data trans-

²⁰ For this method see already Priya Lele & Mathias Siems, *Shareholder Protection: A Leximetric Approach*, 7 J. CORP. STUD. 17-50 at 37-43 (2007); Siems, *supra* note 18, at 125-135; Mathias Siems, *Convergence in Corporate Governance: A Leximetric Approach* J. CORP. L. (forthcoming)

²¹ See e.g. Rafael La Porta, Florencio Lopez-de-Silanes, Andrei Shleifer & Robert Vishny, *Law and Finance*, 106 J. POL. ECON. 1113-1155 (1998); Armour et al., *supra* note 19.

formation is that it opens the possibility of social network analysis.²² This approach will be explained in following section.

A necessary caveat is that any quantitative legal methodology reduces the complexity of legal systems.²³ In particular, the focus on legal rules does not deny that the way how these rules operate in practice may also differ between jurisdictions.²⁴ Thus, any analysis has to take into account that a formal legal similarity may be misleading and that a legal dissimilarity may be explained by extra-legal substitutes.

B. Network methodology and expected results

Network analysis has become increasingly popular in the last three decades.²⁵ It started in sociology but it has also been used in economics, business, psychology, anthropology and, more recently, law.²⁶ The main interest of social network analysis is to identify, visualize, compare and analyze the relationships between individuals or entities. In the terminology of network analysis the individuals are called “nodes” and the relationships are called “ties” or “edges”.

In the present case the “nodes” are the 25 countries and the “ties” are the values on the differences between countries. Thus, one can simply take the data from the relationship matrices on creditor and shareholder protection.²⁷ Moreover, it was necessary to decide when a relationship is close enough to be considered as a tie between two countries. For this pur-

²² It is also common in network analysis to turn attributes into relations. See Robert Hanneman and MARK RIDDLE, *INTRODUCTION TO SOCIAL NETWORK METHODS* (2005) (available at <http://www.faculty.ucr.edu/~hanneman/nettext/>), Ch. 6 p. 12.

²³ See Mathias M. Siems, *Numerical Comparative Law – Do We Need Statistical Evidence in Order to Reduce Complexity?*, 13 *CARDOZO J. INT. COMP. L.* 521-40 (2006).

²⁴ See e.g. Erik Berglöf & Stijn Claessens, *Enforcement and Good Corporate Governance in Developing Countries and Transition Economies*, 21 *THE WORLD BANK RESEARCH OBSERVER* 123-150 (2006); Howell E. Jackson & Mark J. Roe, *Public and Private Enforcement of Securities Laws: Resource-Based Evidence*, 93 *J. FINANCIAL ECONOMICS* 207-238 (2009).

²⁵ For general introduction see HANNEMAN & RIDDLE, *supra* note 22; DAVID KNOKE & SONG YANG, *SOCIAL NETWORK ANALYSIS*, 2008; JOHN SCOTT, *SOCIAL NETWORK ANALYSIS*, 2000. For further references see LINTON C. FREEMAN (ed.), *SOCIAL NETWORK ANALYSIS*, 2008.

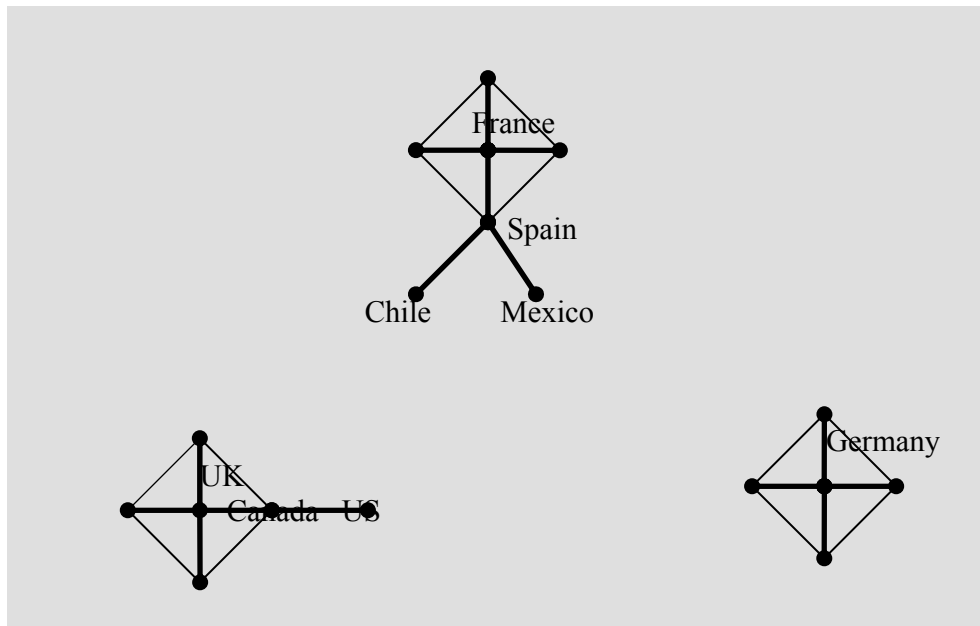
²⁶ For the latter see, e.g., Thomas A. Smith, *The Web of Law*, 44 *SAN DIEGO LAW REVIEW* 309-354 (2007); Anton Geist, *Using Citation Analysis Techniques for Computer-Assisted Legal Research in Continental Jurisdictions* (LLM Dissertation 2009), available at <http://ssrn.com/abstract=1397674> at pp. 59-65; Paul H. Edelman & Tracey E. George, *Six Degrees of Cass Sunstein: Collaboration Networks in Legal Scholarship*, 11 *GREEN BAG* 19 (2007); Reza Dibadj, *Networks of Heightened Scrutiny in Corporate Law*, 46 *SAN DIEGO LAW REVIEW* 1 (2009) and *Networks of Fairness Review in Corporate Law*, 45 *SAN DIEGO LAW REVIEW* 1 (2008). See also J. H. Fowler, T. R. Johnson, I. J. F. Spriggs, S. Jeon, & P. J. Wahlbeck, *Network Analysis and the Law: Measuring the Legal Importance of Precedents at the US Supreme Court* 15 *POLITICAL ANALYSIS* 324-346 (2007).

²⁷ See *supra* II A.

pose the following cut-off points have been chosen: the median of the difference observations, the closest 25% of the observations, and the closest 15% of the observations.²⁸

A simple visualization of a network can be based on the following procedure: legal systems which are very similar (e.g., the 25% of the closest ties) are connected with a bold line and legal systems that are somehow similar (e.g., the 50% of the closest ties) are connected with a normal line. The outcome *could* resemble Figure 1.

Figure 1: Possible network relationships



This figure would confirm a strong legal origin theory. The network is divided into three unconnected parts (called “eccentricity” in network analysis²⁹). The origin countries, France, Germany and UK, are the center of the sub-networks. For instance, in the German sub-network four German legal origin countries are very similar to German law. To be sure, even a strong legal origin theory would not assume that all German legal origin countries are perfect copies of German law. Thus, these four countries are themselves “only” connected by normal ties. In the “English” and “French” sub-networks some anomalies have been permitted. In the former the US is close to Canada but not to the UK, and in the latter Chile and Mexico are very close to Spain but not France itself.

In reality many legal systems are hybrids. For instance, South African law derives from both civil law and common law traditions; Japanese company law used to be based on the German model, but since the 1950s has been heavily influenced by US law; Swiss company law is influenced by UK company law and, due to the influence of the EU, UK law

²⁸ The values are 3.44, 2.68 and 2.25 for creditor protection and 3.38, 2.75 and 2.36 for shareholder protection.

²⁹ See HANNEMANN & RIDDLE, *supra* note 22, at Ch. 7 p. 21.

itself has become more “continental”.³⁰ Network analysis enables us to identify these mixtures because, say, a country whose legal system is equally influenced by all three origin countries would be in the centre of such a network pictures, connected by normal-strength ties with France, Germany and the UK.

However, it is also necessary to decide on categories of countries which can then be tested in the following parts. A good proxy for legal origins is “language” because most English-speaking countries are common law countries.³¹ Thus, in this paper, all countries whose main legal language is English (UK, US, Canada, India, Pakistan, Malaysia, South Africa) are regarded as English legal origin countries.³² The second group, French legal origin countries, can also be related to languages because countries with a Romance language have often been influenced by French law. Thus, the second group consists of France, Italy, Spain, Mexico, Argentina, Chile and Brazil. The final group covers the remaining countries of the sample (Germany, Switzerland, Netherlands, Sweden, Czech Republic, Slovenia, Latvia, Russia, Turkey, China and Japan). These legal systems have in common that, to some extent, they have been influenced by German law. The following calls them German legal origin countries – with the caveat that this is a relatively loose conglomerate of countries.

III. NETWORKS OF ALL COUNTRIES

The figures of this Part show the relationships between all 25 countries in creditor and shareholder protection. Different symbols stand for the three legal origins: English legal origin countries have a black spot; French legal origin countries a white box; and German legal origin countries a yellow (grey) triangle.

³⁰ For a detailed discussion, see Mathias Siems, *Legal Origins: Reconciling Law & Finance and Comparative Law*, 52 MCGILL L.J. 55, 62-70 (2007).

³¹ Following Siems, *id.* at 72-81.

³² This working hypothesis does not deny that there may have also been some civil law influence in these countries; e.g., in South Africa, Quebec, Louisiana (see <http://www.mixedjurisdiction.org/>).

A. Creditor protection

Figure 2: Creditor protection network of strongest 50% ties

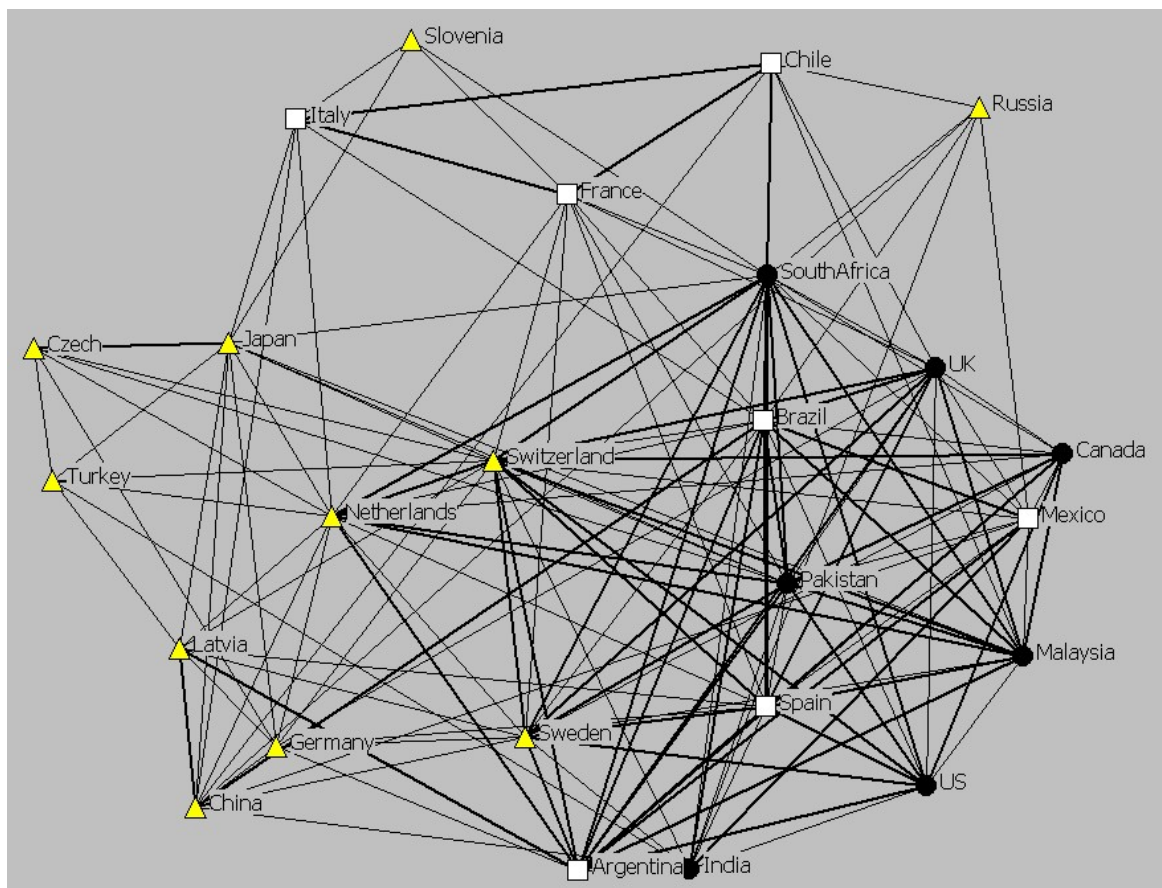


Figure 2 displays a network on creditor protection which uses a similar method than the stylized Figure 1: the weakest 50% of ties are omitted, and the bold lines indicate very strong relationships.³³ Moreover, Ucinet (the program used in this part)³⁴ can shift the position of nodes according to the strength of their relationships. Thus, countries whose creditor protection is relatively similar are moved closer together.³⁵

A clear difference from Figure 1 is that there is no “eccentricity” because the network is not divided into different, unconnected parts. It is therefore not the case that groups of countries follow completely different concepts of creditor protection. This does not mean that one cannot identify certain groups: the common law countries are all connected and relatively close together at the right corner of the figure. Interestingly, four of the five Latin American countries are close to the common law group, and there are also a number of ties between the Latin American and German legal origin countries. This does not come as

³³ See *supra* II B.

³⁴ Available at <http://www.analytictech.com/downloaduc6.htm>.

³⁵ The following function has been used: Netdraw – Layout – Ordination/Scaling – Iterative Metric MDS (adjust to the nearest Euclidian).

a complete surprise since the legal systems of Latin America have not only been influenced by France, Portugal and Spain but also Germany and the US.³⁶

Furthermore, it can be observed which countries are well connected to many other countries, presumably, because their legal systems have been influenced by different traditions. These countries can also be identified by way of descriptive statistics. Table 2 presents how close each country is to the other 24 countries. The countries with the lowest average distances (lower than 3.0) are shaded: Argentina, Brazil, Malaysia, South Africa, Sweden, and Switzerland. In Figure 2 these countries are connected to countries of all three legal origins.

Table 2: Descriptive statistics creditor protection

<i>Country</i>	<i>Mean</i>	<i>Std. deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Argentina	2.780	1.113	0.840	4.720
Brazil	2.946	1.079	1.660	5.040
Canada	3.358	1.127	0.840	5.680
Chile	3.740	1.021	1.800	6.210
China	3.679	0.881	2.000	5.640
Czech Republic	4.095	0.995	2.240	6.040
France	3.643	0.897	2.050	5.760
Germany	3.768	0.871	2.473	5.473
India	3.566	0.913	1.810	5.210
Italy	4.048	1.039	2.050	5.870
Japan	3.673	0.820	2.240	5.400
Latvia	3.698	0.889	2.100	5.140
Malaysia	2.863	0.925	0.840	4.840
Mexico	3.682	1.122	1.680	6.040
Netherlands	3.097	0.787	2.040	5.540
Pakistan	3.093	0.861	1.930	4.430
Russia	4.033	0.788	2.650	5.540
Slovenia	4.257	0.760	2.930	5.600
South Africa	2.867	0.747	1.660	4.040
Spain	3.052	1.168	0.840	5.240
Sweden	2.921	0.771	1.290	4.070
Switzerland	2.853	1.061	1.040	5.000
Turkey	4.046	0.916	2.830	6.210
UK	3.309	1.003	1.900	5.600
US	3.600	1.255	1.660	5.800

The similarity between countries of the same legal origin can also be established by way of calculating the density of these networks. For a valued network (as here) density is defined as “the total of all values divided by the number of possible ties; in this case the density

³⁶ See KONRAD ZWEIGERT & HEIN KÖTZ, INTRODUCTION TO COMPARATIVE LAW 115 (3d ed. 1998) (for the German influence); Matthew C. Mirow, *The Code Napoléon: Buried but Ruling in Latin America*, 33 DENV. J. INT’L L. & POL’Y 179, 185-187 (2005) (for the US influence).

gives the average value”.³⁷ This function is very useful in the present case because one cannot only establish the density of the overall network, but also the density of specific groups of countries (such as legal origins).

Table 3: Density matrix creditor protection

<i>Countries</i>	<i>Number of countries</i>	<i>Average value</i>	<i>Standard deviation</i>
All countries	25	3.4667	1.0622
English legal origin	7	2.5638	0.6554
French legal origin	7	3.0143	1.0866
German legal origin	11	3.4984	0.9006

Table 3 confirms that the English legal origin countries have a very close relationship since the average distance of their ties is almost one point lower than the average distance of all countries. The likely explanation is that only these countries, but not most countries of French and German legal origin, share a common legal language and culture.³⁸ More specifically, creditor protection in English legal origin countries is different from other countries because the former usually do not have a minimum capital requirement for companies but protect creditors by other means, for instance, the availability of a registered floating charge.³⁹ It is also possible to test whether the means of these average values are statistically significant. The result is that at a 95% significance level one can reject the hypothesis that there is no difference between English and German legal origin countries; however, there is no statistically significant difference between English and French legal origin, and French and German legal origin countries.⁴⁰

Figure 2 provides a comprehensive picture of the web of creditor protection in 25 countries since only the weakest 50% ties have not been displayed. However, the interconnectedness of the nodes makes it difficult to identify individual relationships. Thus, Figure 3 reduces the network to the 45 (i.e. top 15%) strongest links. Like in Figure 2, the position of the countries is determined by the closeness to each other.

³⁷ Definition at <http://www.analytictech.com/ucinet6/reference.rtf>.

³⁸ See Siems, *supra* note 18, at 142-3.

³⁹ See John Armor, Viviana Mollica, Mathias Siems, Priya Lele, Tianshu Zhou, Kenji Hirooka, Theis Klauberg, Stephan Heidenhain, Nina Cankar, John Hamilton & Pinar Akman, *Extended Creditor Protection Index* (2010, forthcoming), at <http://www.cbr.cam.ac.uk/research/programme2/project2-20output.htm>.

⁴⁰ English and German legal origin: the t-statistic is 2.37 and the actual confidence level is 0.969. For French and German legal origin these numbers are 1.027 and 0.681, and for English and French legal origin they are 0.939 and 0.634.

Figure 3: Creditor protection network of strongest 15% ties

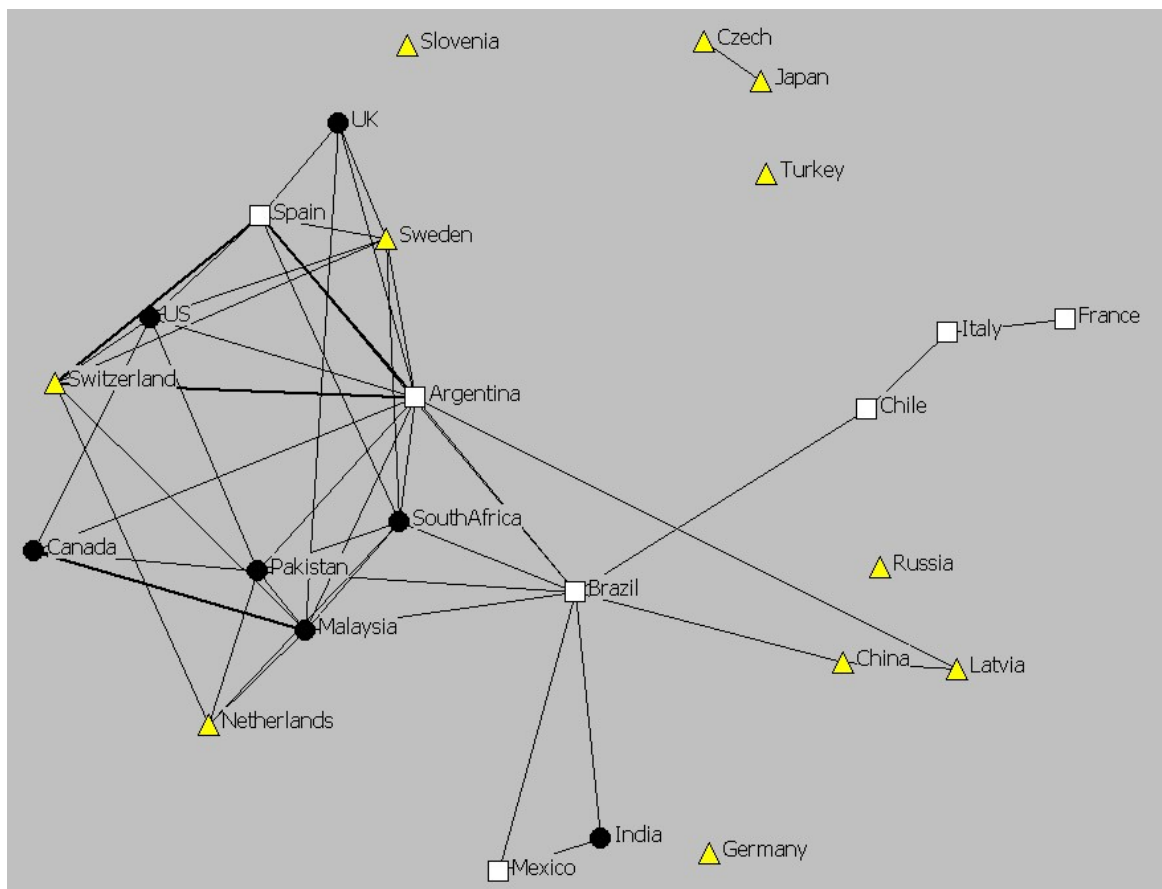


Figure 3 shows again that the common law countries but not the civil law ones are relatively well connected to each other. The only exception is India.⁴¹ Interestingly, there is also a “clique” between Brazil, India and Mexico, which means that the ties of these three countries all refer to each other.⁴² Furthermore, it can be noted that the French legal origin countries are linked by a chain: Argentina, Brazil (and Mexico), Chile, Italy and France. Surprisingly, it is Brazil, as the only Portuguese speaking country, that forms a “hinge” between Argentina, Chile and Mexico. Finally, the German legal origin countries are the most dispersed. There is even some eccentricity (Czech Republic and Japan), and some German legal origin countries are not closely connected to any of the other countries (see also the minimum scores in Table 3). Given the problem with the German legal origin category,⁴³ this “looseness” of the German network does not come as a surprise.

⁴¹ On this point see also John Armour & Priya P. Lele, *Law, Finance, and Politics: The Case of India*, 43 *LAW & SOC’Y REV.* 491-526 (2009).

⁴² For cliques see also *infra* V.

⁴³ See *supra* II B.

B. Shareholder protection

Figure 4: Shareholder protection network of strongest 50% ties

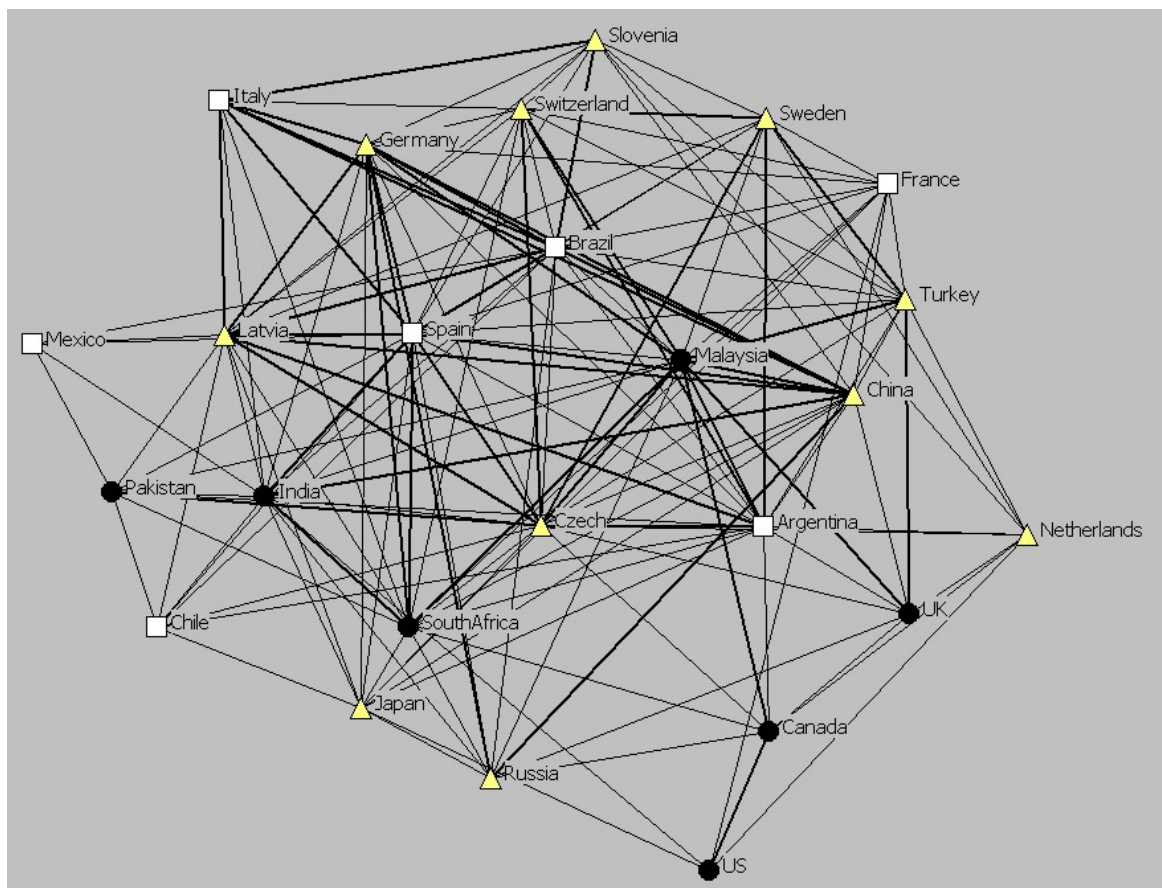


Figure 4 presents the comprehensive network of shareholder protection in 25 countries, using the same approach as Figure 2 for creditor protection. The general relationship between countries appears to be relatively untidy. At best, one can identify that the common law countries are all in the lower half of the figure. It can also be regarded as plausible that some civil law countries with an Americanized company law (e.g., Japan and Russia)⁴⁴ are close to the common law countries.

⁴⁴ For Japan see SIEMS, *supra* note 11, at 20-22 (2008). For Russia see Bernard Black & Reinier Kraakman, *A Self-Enforcing Model of Corporate Law*, 109 HARV. L. REV. 1911 (1996). See also Bernard Black, Brian Cheffins, Martin Gelter, Hwa-Jin Kim, Richard Nolan & Mathias Siems, *Legal Liability of Directors and Company Officials Part 1: Substantive Grounds for Liability*, (2007) COL. BUS. L. REV. 614-799 and *Legal Liability of Directors and Company Officials Part 2: Court Procedures, Indemnification and Insurance, and Administrative and Criminal Liability*, (2008) COL. BUS. L. REV. 1-171.

Table 4: Descriptive statistics shareholder protection

<i>Country</i>	<i>Mean</i>	<i>Std. deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Argentina	2.979	0.938	0.250	5.125
Brazil	3.200	0.840	1.850	4.750
Canada	3.698	0.972	2.000	5.600
Chile	4.125	1.041	2.500	6.000
China	2.792	0.861	0.850	4.400
Czech Republic	2.906	0.948	0.250	4.875
France	3.664	0.883	2.500	6.000
Germany	2.890	0.922	0.850	4.750
India	3.401	0.779	1.958	5.375
Italy	3.456	1.123	1.850	5.600
Japan	3.740	0.922	2.500	5.375
Latvia	3.177	1.017	1.250	5.125
Malaysia	2.981	0.986	1.550	5.000
Mexico	4.351	0.882	2.625	6.000
Netherlands	4.125	0.940	2.500	5.750
Pakistan	3.622	0.688	2.333	4.667
Russia	3.469	0.762	1.750	5.150
Slovenia	3.714	0.868	2.225	5.375
South Africa	3.115	0.810	1.833	4.667
Spain	2.692	0.762	1.250	4.500
Sweden	3.510	1.072	1.750	5.375
Switzerland	3.283	1.037	1.550	5.200
Turkey	3.400	0.976	1.925	5.950
UK	3.755	0.916	1.925	6.000
US	4.035	0.945	2.000	5.600

Figure 4 and Table 4 can be used in order to identify the most interconnected countries. The countries with the lowest average distances (lower than 3.0) are Argentina, China, Czech Republic, Germany, Malaysia, and Spain. Argentina and Malaysia have already been found to be similar to most other countries in the protection of creditors.⁴⁵ It can also be noted that five of the six countries are civil law countries with common law transplants.⁴⁶

⁴⁵ *Supra* III A.

⁴⁶ A prime example is the requirement to have independent directors. See the full data in Mathias Siems, Priya Lele, Pablo Iglesias-Rodriguez, Viviana Mollica, Theis Klauberg, Stephan Heidenhain, Nina Cankar, John Hamilton, Gerhard Schnyder & Pinar Akman, *Extended Shareholder Protection Index* (2009), available at <http://www.cbr.cam.ac.uk/research/programme2/project2-20output.htm>.

Table 5: Density matrix shareholder protection

<i>Countries</i>	<i>Number of countries</i>	<i>Average value</i>	<i>Standard deviation</i>
All countries	25	3.4432	1.0201
English legal origin	7	3.1628	0.8258
French legal origin	7	3.4429	1.0408
German legal origin	11	3.2709	1.0249

Table 5 confirms that there are similarities in the group of English legal origin countries but not in the two other groups. A test of means leads to the result that even at a 90% significance interval we cannot be sure that there are differences between English and French, English and German, and French and German legal origins.⁴⁷ Overall, we therefore observe only a weak (if any) legal origin effect in shareholder protection. Interestingly, however, the mean density and standard deviation of all 25 countries are very similar in creditor and shareholder protection (compare the first lines of Tables 3 and 5). Thus, on a general level, there are as many similarities and differences in shareholder than in creditor protection, but in shareholder protection this variation does not relate to different legal origins.

⁴⁷ English and French legal origin: the t-statistic is 0.558 and the actual confidence level is 0.413. For English and German legal origin these numbers are 0.234 and 0.182, and for French and German legal origin they are 0.345 and 0.266.

Figure 5: Shareholder protection network of strongest 15% ties

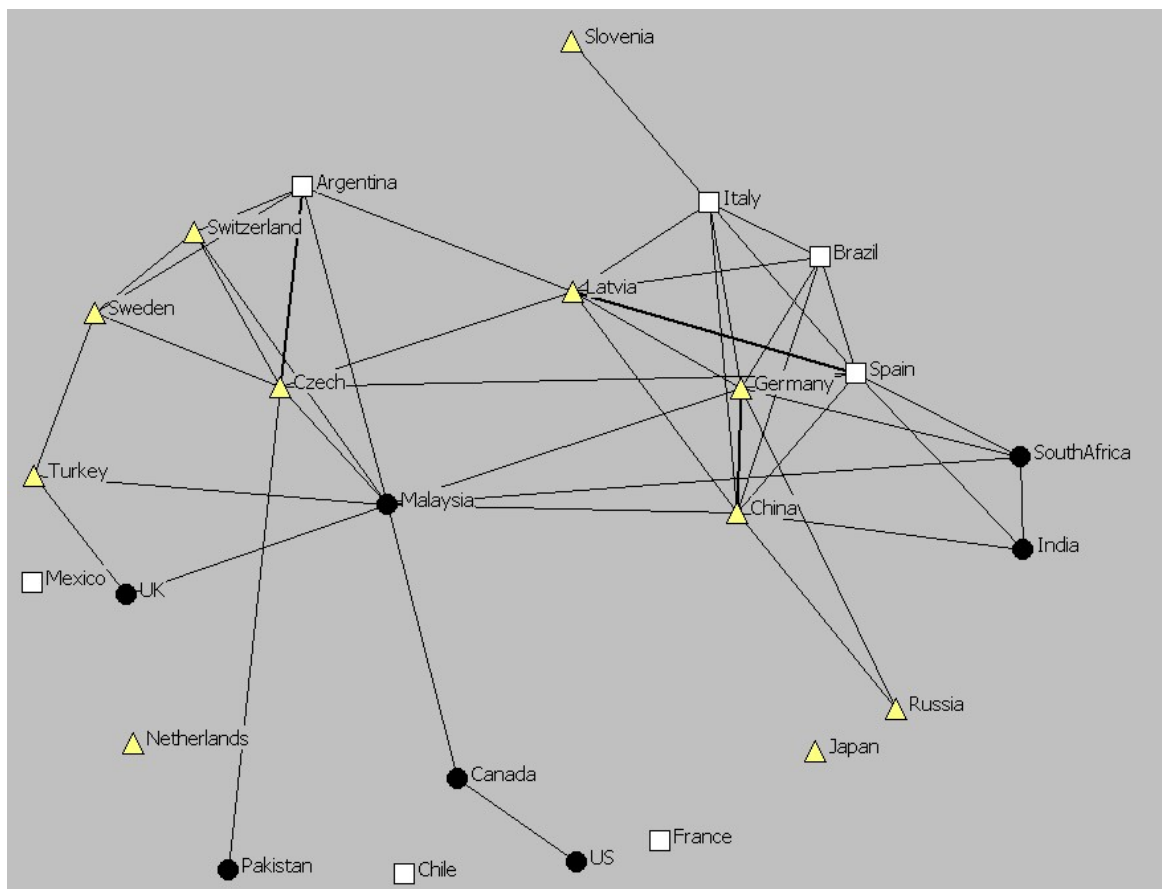


Figure 5 is the equivalent of Figure 3 for shareholder protection. Some linkages of countries of the same legal origin can be observed. In the civil law world there are cliques between Germany, Russia and China, Germany, Latvia and China, Sweden, Switzerland and the Czech Republic, and Italy, Brazil and Spain. All common countries but Pakistan are connected by a chain. Pakistan is an outsider since it is the only common law country that does not score well in the shareholder protection index.⁴⁸ Likewise, Mexico and Chile have relatively low scores,⁴⁹ which explains why they are not connected to other countries. In contrast to this, shareholder protection in France and Japan is “too high”,⁵⁰ which again makes them different from the rest of the world.

There are also a number of ties which may not make sense, for instance, the ones between Pakistan and the Czech Republic, Canada and Malaysia, and Spain and India. Most remarkably, the difference between Argentina and the Czech Republic is only 0.25 out of 10 variables (see also Table 4, above). However, such similarities are not implausible. Today

⁴⁸ Pakistan’s aggregate score is 3.583 whereas the other common law countries have scores between 5.667 and 7.375. For the data see Siems et al., *supra* note 46.

⁴⁹ The values are 3.375 for Mexico and 4.25 for Chile. The mean of all countries is 5.61. For the data see Siems et al., *supra* note 46.

⁵⁰ The values are 7.25 for France and 7.0 for Japan. See reference in previous note.

many parts of shareholder protection are based on an international model of what is regarded “good corporate governance”.⁵¹ Thus, there is no reason why today, say, as diverse legal systems as Argentina and the Czech Republic may not provide similar requirements on independent directors or disclosure of major shareholder ownership.⁵²

IV. RELATIONSHIPS BETWEEN ORIGIN AND OTHER COUNTRIES

The legal origins view not only claims that there are significant differences between legal origins but also that these differences originate from the influence that the three origin countries (UK, France and Germany) had on all other legal systems of the world.⁵³ This Part will use two methods to scrutinize this claim: ego-networks and scatterplots. Like in the previous part, creditor and shareholder protection are treated separately.

A. Creditor protection

An ego-network is defined as “a subgraph of the communications graph that consists of the ego and all nodes (the ‘alters’) that are directly connected to it”.⁵⁴ In other words, ego-networks focus on the relationships between certain nodes to the rest of the network. In the following it will be visualized which countries are similar to the three origin countries UK, Germany and France.

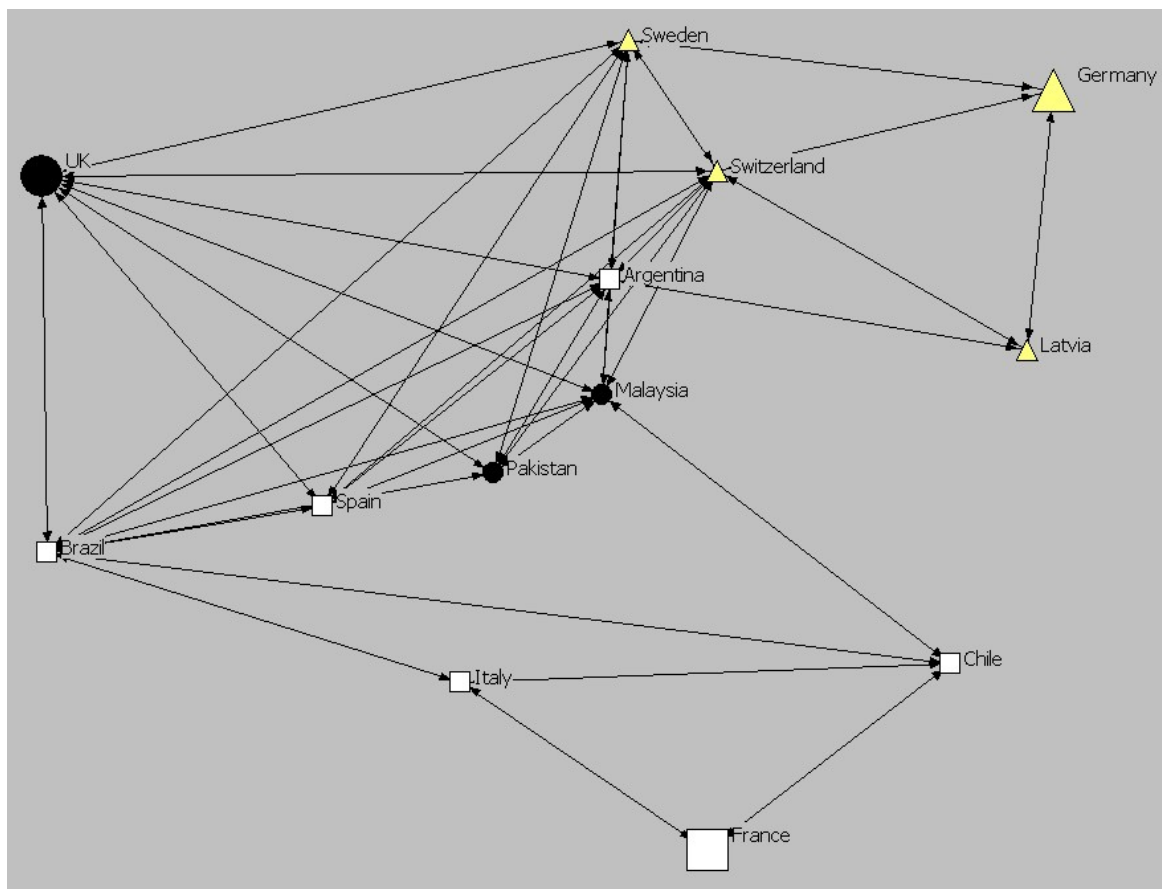
⁵¹ See, e.g., OECD Principles on Corporate Governance 2004; Gainan Avilov, Bernard Black, Dominique Carreau, Oksana Kozyr, Stilpon Nestor, & Sarah Reynolds, *General Principles of Companies for Transition Economies*, 24 JOURNAL OF CORPORATION LAW 190-293 (1999); publications of the Global Corporate Governance Forum (<http://www.gcgf.org/>).

⁵² See the references in Siems et al., *supra* note 46.

⁵³ *Supra* I. For a critical analysis see Siems, *supra* note 18, at 138-9.

⁵⁴ Jaime Montemayor, Chris Diehl, Mike Pekala & David Patrone, *SocialRank: An Ego- and Time-centric Workflow for Relationship Identification* (Milton Eisenhower Research Center, The Johns Hopkins University Applied Physics Laboratory 2008) at note 1, available at <http://www.net-science.usma.edu/NSW3/Program/Papers/Diehl/Diehl.pdf>.

Figure 6: Ego-network of creditor protection in UK, Germany and France



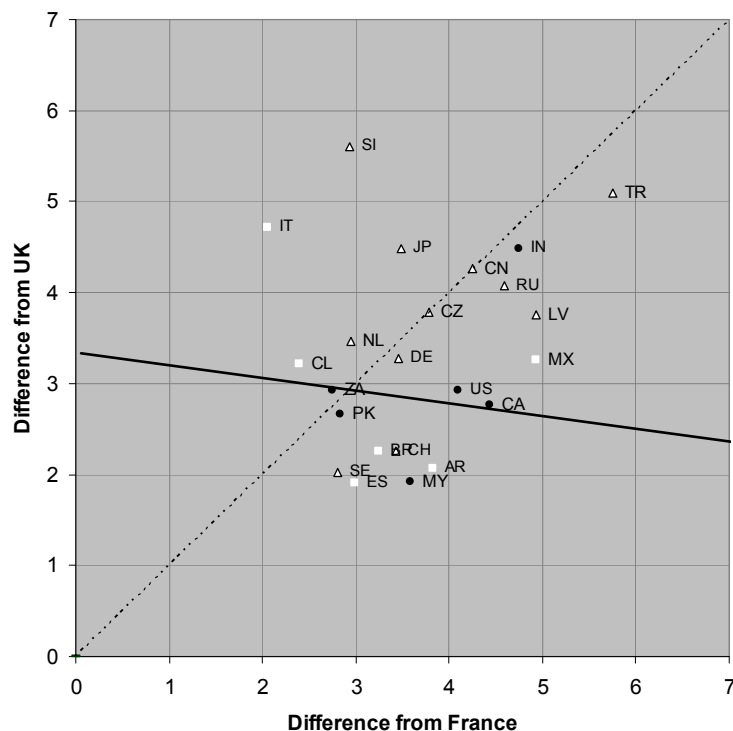
Like in the previous section, only the strongest ties are displayed. Now, however, the location of the countries does not indicate closeness but is manually adjusted in order to show how other countries relate to UK, German and French law. There are some indicators that confirm the relevance of legal origins. Only German legal origin countries are part of the German network (Sweden, Switzerland, Latvia), the two English legal origin countries (Malaysia, Pakistan) are part of the English network, and the only two countries connected to France are French legal origin countries (Italy, Chile). The other three French legal origin countries (Brazil, Spain, Argentina), are, however, closer to the UK than to France because some French legal origin countries have improved creditor protection mechanisms using Anglo-Saxon models (for instance, by way of introducing a floating charge⁵⁵). It is therefore also plausible that the UK is connected with more countries than France and Germany. Finally, ego-networks can be used to compare the distances between the “egos”: it takes just two steps to get from Germany to the UK but three steps from the UK to France and five steps from France to Germany. Thus, the German and UK laws on creditor protection seem to have more in common than the French and UK ones.⁵⁶

⁵⁵ For instance, Argentina and Mexico. *See* the references in Armour et al., *supra* note 39. In France a similar type of charge was only introduced in 2006 by Ordonnance no 2006-346 du 23 mars 2006 relative aux sûretés.

⁵⁶ For details *see* also Armour et al., *How Do Legal Rules Evolve? (...)*, *supra* note 18, at 612-5; Siems, *supra* note 20.

The ego-network of Figure 6 is useful in presenting the relationships between all three origin countries and the other countries in one picture. An alternative is to focus on just two of the origin countries at the same time, and use scatterplots in order to display and analyze the closeness to particular origin countries. The following two figures present scatterplots on the differences from UK and French law (Figure 7) and from UK and German law (Figure 8).⁵⁷ English legal origin countries have a black spot, French legal origin countries a white box, and German legal origin countries a black/white triangle.⁵⁸

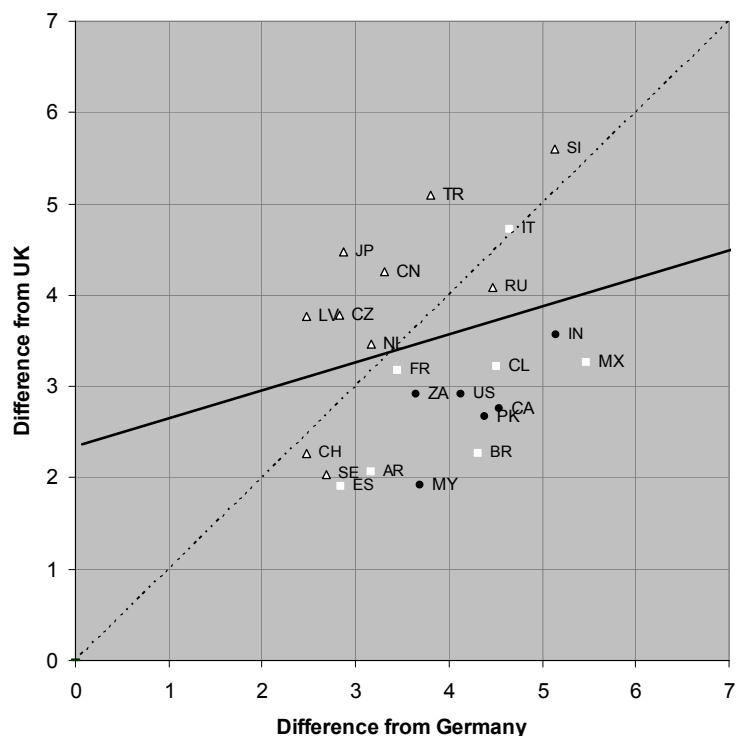
Figure 7: Difference from UK and French law on creditor protection (max 10)



⁵⁷ Since the core interest of this paper is the difference between common and civil law countries, the scatterplot on the differences from German and French law is omitted.

⁵⁸ The following abbreviations are used: AR (Argentina), BR (Brazil), CA (Canada), CH (Switzerland), CL (Chile), CN (China), CZ (Czech Republic), DE (Germany), ES (Spain), FR (France), GB (United Kingdom), IN (India), IT (Italy), JP (Japan), LV (Latvia), MX (Mexico), MY (Malaysia), NL (Netherlands), PK (Pakistan), RU (Russia), (SE) Sweden, SI (Slovenia), TR (Turkey), US (USA), and ZA (South Africa).

Figure 8: Difference from UK and German law on creditor protection (max 10)



In order to analyze these figures it is convenient to introduce a distinction between two types of legal origin effects. The “type 1 effect” means that the countries are on a downward sloping line (the bold line in the figures above). For a relationship such as the one in Figure 7, this would mean that the closer a country is to French law, the more distant it is from English law (and vice versa). Statistically, this is the case if value of the correlation coefficient between the difference from UK and French law is negative.⁵⁹ The “type 2 effect” means that the individual countries are closer to their respective own origin country than to the other origin country. Thus, here, we compare the x and y values of each country. For a relationship such as the one in Figure 7, one would expect that the French legal origin countries are all left and the English legal origin countries are all right of the 45 degree ray from the origin (the dotted line in the figures above). Statistically, this is the case if the “relative distance value” is negative.⁶⁰

The two figures show surprisingly different effects. Figure 7 has a negative slope but not Figure 8.⁶¹ So, in the relationship between the UK and French law on creditor protection we may have a type 1 legal origin effect. However, even at a 90% significance level we cannot reject the hypothesis that the slope of Figure 7 is positive and the one of Figure 8 is

⁵⁹ This involves a one-sided test of the significance between the correlation coefficient in question and a zero correlation coefficient (using the Fisher r-to-z transformation).

⁶⁰ The “relative distance value” is established as follows: (1) for each country deduct distance from the foreign origin country from distance from the own origin country; (2) calculate mean of these values. The test is a one-sided t-test.

⁶¹ The correlation coefficients are -0.16 for Figure 7 and 0.26 for Figure 8.

negative.⁶² In both figures the English legal countries (the black spots) are on the right side of the ray from origin (as one would expect). In Figure 7 many of the French legal origin countries (the white boxes) are, however, closer to UK law than to French law, whereas in Figure 8 the German legal origin countries are on the left side (as expected). In detail, in Figure 7 only 7 of 12 countries are on the correct side, whereas 13 of the 16 countries in Figure 8 are on the correct one. Thus, for the differences from UK and German law (but not UK and French one) we observe a type 2 legal origin effect, being significant at a 99% level.⁶³

How can we explain these results? The general difference between type 1 and 2 legal origin effects can be described as follows: if there is no type 1 effect, the “problem” is with the origin countries because these countries are not really very different. If there is no type 2 legal origin effect, the “problem” is with the transplant countries because these countries have not relied on the specific model of the respective origin country only. It can therefore be concluded that German and UK law on creditor protection have more in common than French and UK law. However, French legal origin countries are more diverse than German legal origin countries because they have not relied on the French model of creditor protection only. This confirms the results of the ego-network in Figure 6.⁶⁴

B. Shareholder protection

It was already found that the broad categorization into legal origins is less relevant for shareholder than for creditor protection.⁶⁵ This section will show that a similar picture emerges if we analyze the differences between the origin and the other countries in the law on shareholder protection.

⁶² Figure 7: z-statistic -0.34 (p-value 0.37); Figure 8: z-statistic: 0.68 (p-value 0.25).

⁶³ Figure 7: relative distance value -0.31 (standard deviation 1.45) and t-statistic 0.73 (p-value 0.24); Figure 8: relative distance value -0.89 (standard deviation 0.79) and t-statistic 4.52 (p-value 0.0002).

⁶⁴ See also *supra* note 55.

⁶⁵ See *supra* III B.

Figure 9: Ego-network of shareholder protection in UK, Germany and France

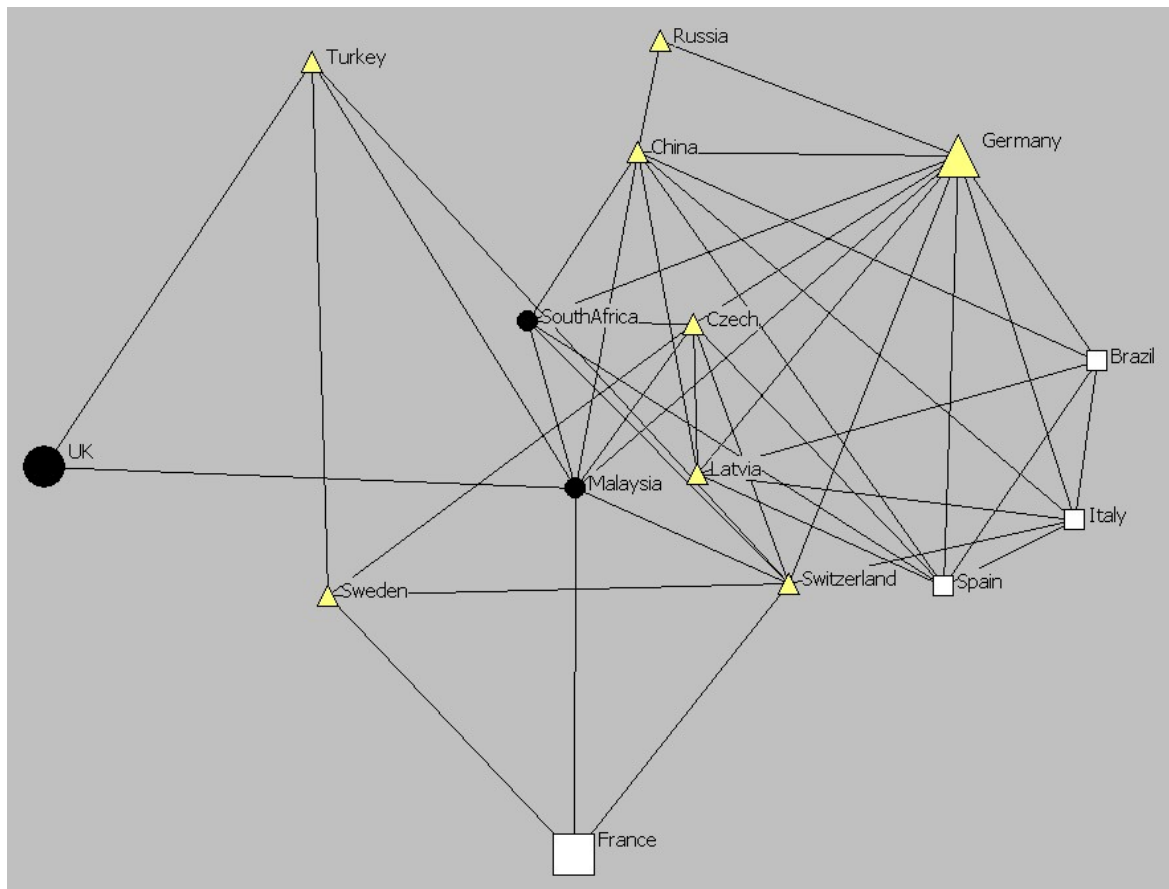


Figure 9 shows that the legal origin classification is not very relevant in the protection of shareholders across countries. For instance, France is not connected to the three French legal origin jurisdictions but it is connected to one English and two German legal origin countries. The main reason for the difference between France and the French legal origin countries is that France has a higher level of shareholder protection than Italy, Spain and the Latin American countries.⁶⁶ In contrast to creditor protection, it is not the UK but Germany which is connected to most other countries, five of them not being German legal origin countries.⁶⁷ The distances between the three origin countries are only two steps. Thus, UK, French and German laws seem to be less different in the protection of shareholders than of creditors. This can also be confirmed by way of scatterplots.

⁶⁶ France has the aggregate value of 7.25, whereas the average of French legal origin is 5.075. For the data see Siems et al., *supra* note 46.

⁶⁷ See already Siems, *supra* note 18, at 131-2.

Figure 10: Difference from UK and French law on shareholder protection (max 10)

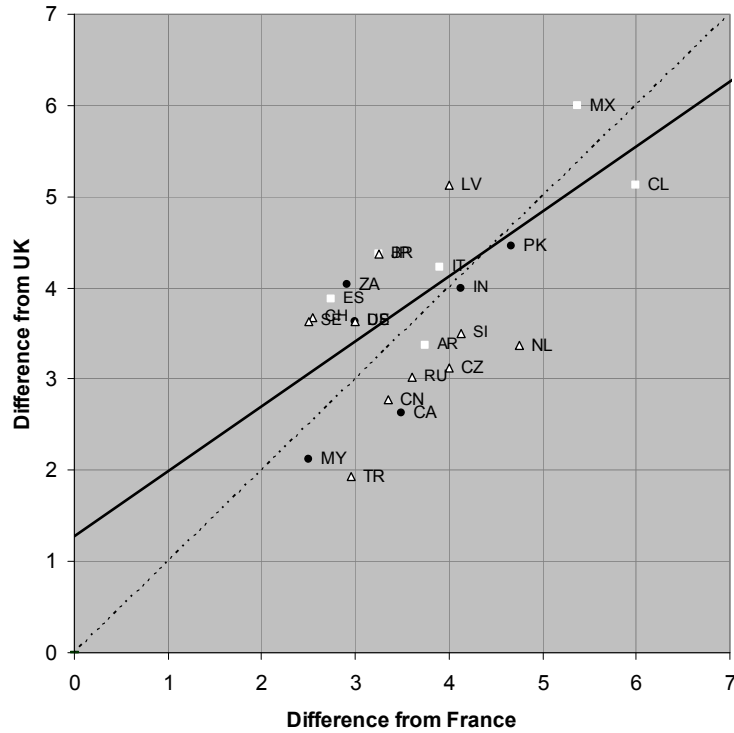
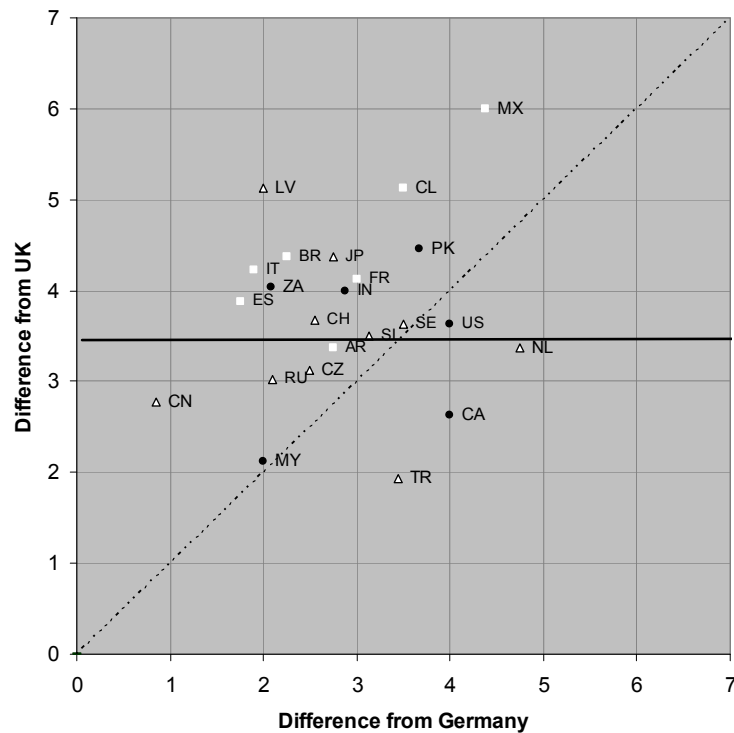


Figure 11: Difference from UK and German law on shareholder protection (max 10)



In neither of these two figures can we observe a type 1 legal origin effect. With respect to the UK and France, there is now a clear positive relationship; even at a 99% significance

level we can reject the hypothesis that the correlation coefficient is negative.⁶⁸ There is no correlation between the differences from UK and German law. There is also no statistically significant type 2 legal origin effect in either of these two relationships: in Figure 10 only eight out of 12 countries are on the correct side of the ray from origin and in Figure 11 only ten out of 16 countries are on the correct side.⁶⁹

The positive or flat slope of the correlation lines (thus, no type 1 effect) may be counterintuitive. Generally, the slope of the correlation line may be explained as follows: if the graph is close to the 45 degrees ray from the origin, we have a misclassification of legal origins. A strictly positive relationship should only have occurred if two very similar legal systems were used as benchmarks (e.g., Germany and Austria). If the graph is either almost horizontal (or almost vertical), we cannot say whether the two origin countries are really similar but, here too, the distinction between legal origins does not matter since the value of y is independent of x (or vice versa). In the present case, three specific factors can be brought forward to explain the lack of a type 1 legal origin effect: first, the origins of company and securities law are not fundamentally different across the legal origin countries.⁷⁰ Second, the Europeanization of company law has further decreased any remaining differences.⁷¹ It is therefore not implausible that we do not observe a type 1 legal origin effect. Third, French company and securities law incorporated a number of Anglo-Saxon elements in the 1980s and 90s.⁷² Thus, UK and French law on shareholder protection are relatively similar, explaining the strong positive relationship.

It is also interesting that no statistically significant type 2 legal origin effect can be observed. In Figure 10 the US and South Africa are closer to France than to the UK, and Chile and Argentina are closer to the UK than to France; in Figure 11 South Africa, India, Pakistan and Malaysia are closer to Germany than to the UK, and the Netherlands and Turkey are closer to the UK than to Germany. In some instance, these “wrong” similarities may originate from the fact that countries have transplanted rules from different countries. For instance, there could be some Anglo-Saxon influence on the company laws of Chile, Argentina and the Netherlands.⁷³ The other cases may be more puzzling because it is unlikely that there was, say, a direct copying of German law in Malaysia. Still, such similari-

⁶⁸ The correlation coefficient of Figure 10 is 0.75 (z-statistic 2.48; p-value 0.0066).

⁶⁹ Thus, even at a 90% significance level we cannot reject the hypothesis that the relative distance value is positive. Figure 10: relative distance value -0.15 (standard deviation 0.76) and t-statistic 0.68 (p-value 0.25); Figure 11: relative distance value -0.29 (standard deviation 1.40) and t-statistic 0.84 (p-value 0.21).

⁷⁰ See Henry Hansmann & Reinier Kraakman *The End of History for Corporate Law* 89 GEO. L.J. 439-468 at 439-40 (2001); Siems, *supra* note 18, at 140; Siems, *supra* note 11, at 17-22.

⁷¹ This concerns the variables on mandatory bid and disclosure of major shareholder ownership (see *supra* II A) due to the Directive 2004/25/EC on takeover bids and the Council Directive 88/627/EEC on the information to be published when a major holding in a listed company is acquired or disposed of.

⁷² See references in Lele & Siems, *supra* note 20, at 32.

⁷³ For Latin America see already *supra* note 36.

ties are not implausible because today many parts of shareholder protection are based on an international model of what is regarded “good corporate governance”.⁷⁴

V. IDENTIFYING GROUPS OF COUNTRIES

In network analysis there are various methods of grouping nodes but two main approaches can be distinguished. On the one hand, one can look for “subgroups”, such as cliques and factions.⁷⁵ This approach measures the direct relationship between countries. On the other hand, one can use “structural equivalence measures”, such as clustering tools. This approach examines if two nodes have the same relationship to all other nodes.

An article by Michael Graff has used clustering methods in order to identify groups of countries based on La Porta et al.’s anti-director rights index.⁷⁶ However, for the difference matrices of this paper⁷⁷ it is preferable “just” to identify subgroups. The matrices demonstrate differences between countries even where the aggregates of countries may be similar. For instance, assume that both Germany and the US have a score of five out of ten in the shareholder protection index, but that these aggregates are based on five completely different variables. Thus, the US and Germany should not be part of the same group. However, let us further assume that Japanese company law is close to both legal systems because it is a mixture of German and US company law.⁷⁸ Thus, cluster analysis would lead to the wrong result that German and US law are part of the same group because both legal systems are similar to Japan.

A. Creditor protection

First, it has been examined whether “cliques” lead to a meaningful distinction between different groups of countries. A clique is defined as “a set of nodes where each node is connected by an edge to each other node”.⁷⁹ Since cliques need binary data, one also has to decide on a cut-off point. The following uses the median as a cut-off point since this makes best use of the information contained in the valued data. One also has to indicate the minimum set size of a clique. Initially, it was tried to set the size as high as necessary to get a small number of cliques. However, since nodes can be part of different cliques, these cli-

⁷⁴ See already *supra* III B. The impact of recent global trends is also confirmed by the fact that the 1995 data still showed a statistically significant type 2 legal origin effect. For the difference from UK and French law (equivalent to Figure 6): relative distance value -0.36 (standard deviation 0.88) and t-statistic 1.42 (p-value 0.09). For the difference from UK and German law (equivalent to Figure 7): relative distance value -1.00 (standard deviation 1.69) and t-statistic 2.36 (p-value 0.016).

⁷⁵ For details *see infra* V A. In addition, there are other forms of subgroups, such as N-cliques, N-clans, K-plexes, K-cores, and F-groups.

⁷⁶ Michael Graff, *Law and Finance: Common Law and Civil Law Countries: Compared An Empirical Critique*, 75 *ECONOMICA* 60-83 (2008).

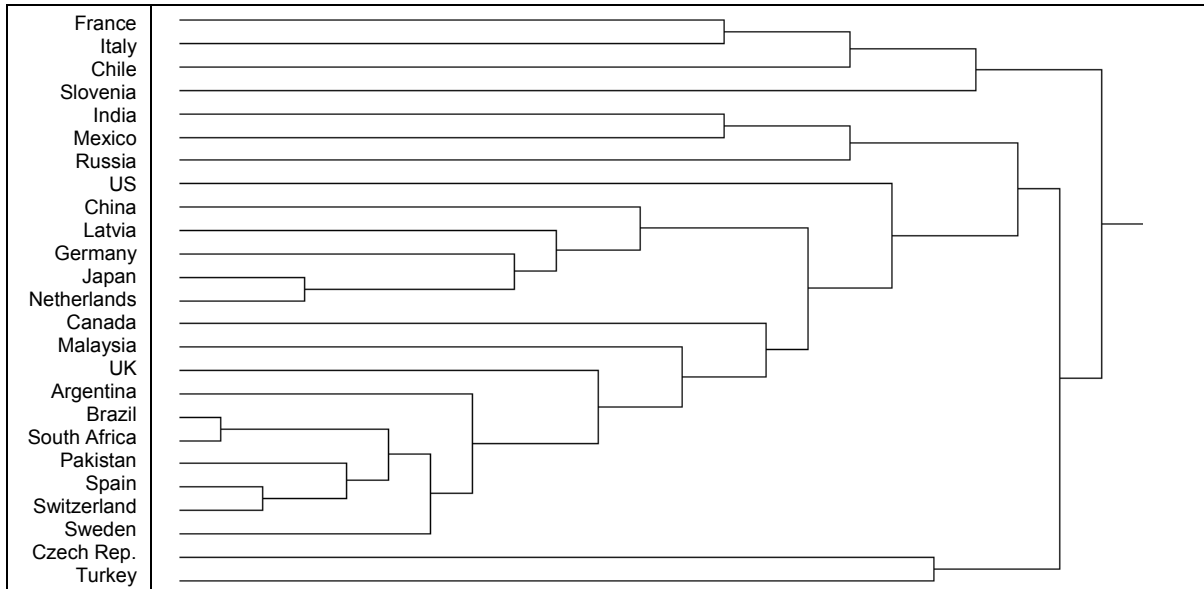
⁷⁷ *Supra* II A.

⁷⁸ That is indeed the case. *See supra* note 44.

⁷⁹ *See* <http://faculty.chass.ncsu.edu/garson/PA765/networkanalysis.htm>.

ques were almost identical. Conversely, if one sets the minimum size at just three, this leads to 35 cliques, whose relationships can be well displayed in a dendrogram (Figure 12).

Figure 12: Cliques of creditor protection



The cliques of Figure 12 can be explained as follows: France, Italy, and Chile are all French legal origin countries, and adding Slovenia, leads to a clique of three EU countries. There is also another clique of three EU and one non-EU countries: Netherlands, Japan, Germany and Latvia. Here all countries are of German legal origin (and, in addition, China joins this group in the next step). A second German legal origin clique consists of the Czech Republic and Turkey. More difficult to evaluate is the large clique of Argentina, Brazil, South Africa, Pakistan, Spain, Switzerland, Sweden and, later on, Canada, Malaysia, and the UK. At best, one can say, that five of the seven common law countries belong to this clique. Finally, there is a loose clique of India, Mexico, and Russia, which have in common that all three countries are big emerging economies.

Another method of subgrouping is to identify “factions”. Since factions do not require binary data, it is possible to make use of the entire information of the difference matrices. Ucinet uses an “algorithm to find optimal arrangements of actors into factors to maximize similarity to the ideal type”.⁸⁰ It is therefore examined whether a node is similar to members of same faction but different to other members. This approach is similar to the type 1 legal origin effect since, here too, it mattered whether there was a close relationship to a particular benchmark but not other countries.⁸¹

⁸⁰ HANNEMAN & RIDDLE, *supra* note 22, at Ch. 11.

⁸¹ See *supra* IV A.

Table 6: Factions of creditor protection

<i>Group assignments</i>					
1	Japan, Latvia, Czech Republic, Turkey				
2	China, Malaysia, Chile, Mexico, Brazil, Russia				
3	Italy				
4	UK, US, India, Pakistan, South Africa, Spain, Argentina, Canada, Switzerland, Sweden				
5	Germany, France, Slovenia, Netherlands				
<i>Density table</i>					
	1	2	3	4	5
1	3.17	4.34	4.56	3.88	3.55
2	4.34	2.80	3.47	3.30	3.99
3	4.56	3.47	n.a.	4.48	3.31
4	3.88	3.30	4.48	2.33	3.65
5	3.55	3.99	3.31	3.65	3.55

Table 6 presents the group assignments. The density table shows how close the countries of these groups are to each other and to the other groups. Faction (1) is a group of German legal origin countries. The countries of faction (2) are relatively big emerging economies of various legal origins and regions. Faction (4) covers all but one common law countries. As in Figure 12, Argentina, Spain, Switzerland, and Sweden are part of this common law group. The countries of faction (5) are all EU countries. In addition, this faction is similar to factions (1) and (3) (see the density table). With the exception of Japan and Turkey, the countries of these factions are also EU countries.

Thus, it can be followed that, on the one hand, the cliques and factions are not entirely random. On the other hand, there is no simple explanation for these groups. To some extent, the distinction between different legal origins matters in creditor protection.⁸² It has also been found that EU countries often belong to the same clique/faction. Some groups also show a distinction between developed and developing countries.

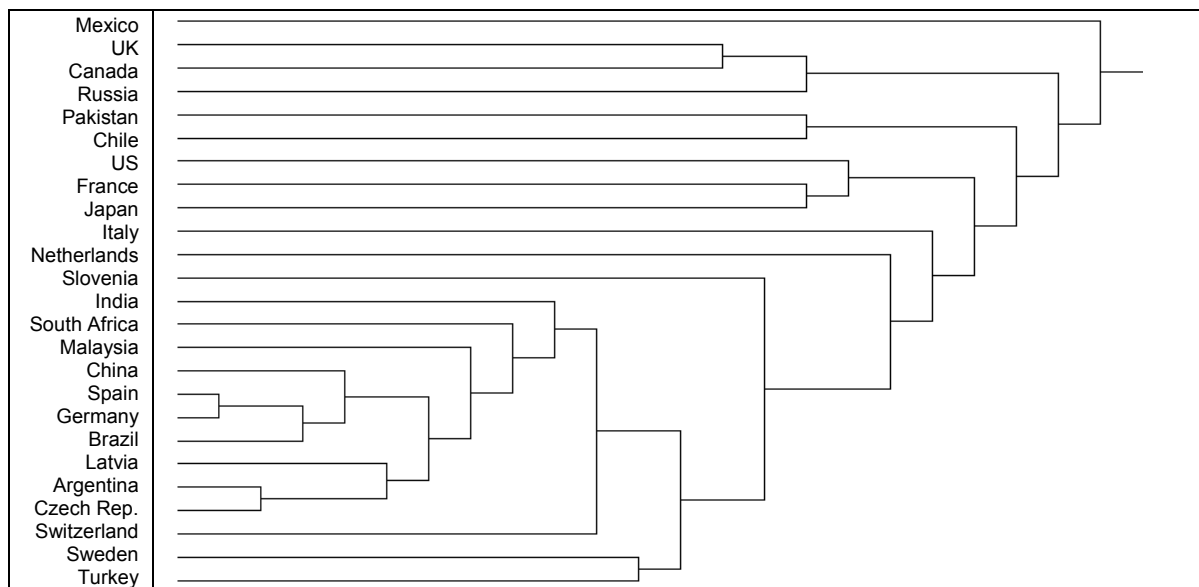
B. Shareholder protection

The same approach has been used as in the previous section. With a cut-off point at the median and a minimum clique size of three⁸³ 58 cliques can be found.

⁸² See also *supra* III A and IV A.

⁸³ See *supra* VI A.

Figure 13: Cliques of shareholder protection



The cliques (Figure 13) can be described and explained as follows: The commonality between the UK and Canada follows naturally from the common law. Russia joins this clique in the next step, which is plausible since modern Russian company law has been heavily influenced by Anglo-Saxon transplants.⁸⁴ There is also a clique of the US, France and Japan, which, similarly, can be explained by some Americanization of French and Japanese corporate law.⁸⁵ A counter-model seems to be the interconnected cliques of Argentina, Czech Republic, Latvia, Brazil, Germany, Spain, and China. These are all civil law countries – though from different origins and different continents. Interestingly, three English legal origin countries, Malaysia, South Africa and India, join this clique later. Finally, there are two small cliques (Pakistan and Chile; Sweden and Turkey). It is difficult to find commonalities, though Pakistan and Chile have in common that they have a relatively weak level of shareholder protection.⁸⁶

⁸⁴ See *supra* note 44.

⁸⁵ See *supra* notes 72 and 44.

⁸⁶ See *supra* notes 48 and 49.

Table 7: Factions of shareholder protection

<i>Group assignments</i>					
1	Pakistan, Chile, Mexico, Latvia				
2	Germany, France, South Africa				
3	UK, China, Malaysia, Italy, Spain, Brazil, Switzerland, Slovenia, Sweden, Turkey				
4	Argentina, Czech Republic, Netherlands				
5	US, India, Japan, Canada, Russia				
<i>Density table</i>					
	1	2	3	4	5
1	3.06	3.90	3.89	3.76	4.11
2	3.90	2.67	2.97	3.58	3.20
3	3.89	2.97	2.80	3.23	3.87
4	3.76	3.58	3.23	1.83	3.67
5	4.11	3.20	3.87	3.66	3.08

It is also possible to group the countries into five factions (Table 7). The first faction is a group of four transition and developing countries. The second one has two Western European countries plus South Africa. The third faction is a mix of ten countries from various legal origins and regions. Faction four is the only pure faction of civil law countries. The final faction has five countries: three of them are common law countries and the remaining two (Japan and Russia) have an Americanized corporate law.

The overall result confirms that in shareholder protection similarities and differences cannot be categorized easily. The legal origin categories do not help us in understanding most cliques and factions. Alternative categories, such as distinctions between regions and developing and developed countries, are also not very helpful. Thus, the general picture is that in shareholder protection countries do not follow clear and distinct legal models. It is often only possible to identify specific links, for instance, some Anglo-American transplants in other parts of the world.

VI. CONCLUSION

How different are countries in their laws on creditor and shareholder protection? Part III of this article used network analysis in order to explore the relationships between all countries. The network pictures on creditor protection showed clear similarities in the English legal origin countries, and some similarities in the French legal origin ones. With respect to shareholder protection it was possible to identify the civil law countries that had incorporated Anglo-American concepts into their company laws. It was not found that there was a statistically significant difference between the English, French and German legal origin sub-networks in shareholder protection.

Part IV analyzed the relationships between specific countries, using ego-networks and scatterplots. It was found that in creditor protection countries of English legal origin are close to the UK and countries of German legal origin are close to Germany. A different picture

emerged for the French legal origin countries since many of them have deviated from the French law on creditor protection. Similarly, in shareholder protection there is only a weak (if any) link between the English, French and German origin and transplant countries.

Finally, Part V identified cliques and factions of countries. In creditor protection these subgroups could be explained by a combined effect of legal origins and the distinction between EU/non-EU and developed/developing countries, whereas it was not found that countries followed distinct legal models of shareholder protection.

Why do we observe these differences in creditor and shareholder protection? It would be tempting to treat shareholder protection as the “problem” because it was possible to make some sense of the similarities and differences in creditor protection. However, one can also take the opposite stance. There is a long tradition of legal transplants in commercial law⁸⁷ and some studies suggest that by the end of the nineteenth century the most important features of company law were already relatively uniform across countries.⁸⁸ Moreover, recent non-quantitative research has found that, at least today, convergence forces have led to a clear approximation of legal systems in shareholder law.⁸⁹

Three explanations can be offered as to why different models of creditor protection are more persistent. First, creditors operate less internationally than shareholders. Notwithstanding international project finance contracts and debt securities, debtors and creditors of a normal loan are usually based in the same country. Thus, there is less pressure to develop a global model of protection in creditor than in shareholder protection.⁹⁰ Second, the existing differences in creditor protection are more fundamental than in shareholder protection: some countries use company law (minimum capital, dividend restrictions etc.), others contract and property law (floating charge, self-enforcement of secured creditors etc.), and others are mainly concerned with the protection of creditors in insolvency proceedings. Thus, there are high switching costs if a country decided to change its model of creditor protection.⁹¹ Third, the conflict between creditor and debtor interests is more contentious than the one between shareholders and directors. Cross-country data shows that shareholder interests are increasingly regarded as worth protecting,⁹² whereas countries strongly differ over the question of whether, say, insolvency law should be more debtor or creditor friendly.⁹³

An implicit purpose of this paper has been to promote social network analysis in legal research. Network analysis offers a powerful tool to analyze relationships and to identify sub-structures. Future research on legal differences could examine more closely how the

⁸⁷ Detlev Vagts, *Comparative Company Law – The New Wave* in Festschrift für Druey, pp. 595-605 at 598-9 (2000).

⁸⁸ *Supra* note 70.

⁸⁹ SIEMS, *supra* note 11.

⁹⁰ For shareholder protection *see also supra* notes 51 and 74.

⁹¹ *See also* Armour et al., *Law and Financial Development (...)*, *supra* note 18, at 1488-90.

⁹² Lele & Siems, *supra* note 20; Siems, *supra* note 18.

⁹³ Armour et al., *supra* note 39.

relationships between countries have evolved over time. Moreover, social network analysis incorporates more and more advanced statistical techniques.⁹⁴ In this paper I have only used simple methods of descriptive statistics. Inferential statistics could extend this analysis in order to examine how legal differences may relate to other types of relationships, such as trade and capital flows.⁹⁵

⁹⁴ Hanneman & Riddle, *supra* note 22, at Ch. 18.

⁹⁵ Compare Daniel Berkowitz, Johannes Moenius & Katharina Pistor, *Legal Institutions and International Trade Flows*, 26 MICH. J. INT'L L. 163-198 (2004).