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Legal Origin and Firm Size Effects Around the World

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Abstract

We propose that the legal origin explanation of differences in financial indicators lacks the ability to satisfyingly describe investment performance and firm size effects. In this paper we investigate the impact of legal origin and firm size on investment performance for 20 111 firms in 58 countries between 2001 and 2010. Anglo Saxon (common law), German, French as well as Scandinavian (civil law) variants of legal systems are covered by the countries included in the study. In addition, we include a category of "old socialist countries". We find little support for the supposed superiority of common law systems over civil law systems. In fact, the average investor performance is lower in the Anglo Saxon countries than countries with German and Scandinavian legal origin, yet higher than in French legal origin and old socialist countries. Even though limit to firm size is frequently discussed in the theoretical literature there are few empirical studies addressing this issue. In this study we specifically investigate how investment performance is affected by increasing size. We find that irrespective of legal origin a negative impact of firm size appears after a threshold size has been passed.

JEL codes: G30, C23, L25

Keywords: Corporate governance, firm size, legal origin, marginal q

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1. Introduction

In this paper we combine the literature on legal traditions around the world with the literature on firm size limitations. The connection is interesting since it is possible to draw strong parallels in the discussions as well as offering a possibility of critically evaluating less traditional effects of legal origin on firm performance. Since the late 1990s the series of papers published by La Porta et al. (short LLSV) has had substantial impact on the legal origin effects on firm performance and ownership structure discussion. LLSV present a ranking of legal traditions and place common law as more efficient than civil law. In more detail, they rank the Anglo Saxon legal system as superior, followed by the Scandinavian and German legal system. The French, the archetype of civil law systems, is ranked as the least beneficial for firm performance (1998). Their claim is further supported when evaluating firm valuation and investor protection in one of their subsequent papers from 2002. More recently, the ranking of the legal systems has been criticized, indeed, Fagernäs et al. (2008) present a thorough investigation of legal protection within three different legal systems and suggest that not only do the changes in legislations over time affect the ranking, but also that German legal systems have been superior in their protection of property rights the last decade, and hence offer the best climate for investors. We couple this discussion on legal systems and their effects on firms and investment performance with effects of firm size. Limitations to firm size is mainly associated with Coase (1937) and Williamson (1963). While traditionally, the legal systems discussion focuses on principal agent problems and enforceability of property right protection, fewer studies measure possible secondary effects from low property right protection such as size effects and limits to governance as the firm grows. We argue that not only is the legal origin discussion lacking, it is also unable to satisfyingly explain firm size effects and firm investment performance.

We evaluate the investment performance in a total of 20 111 listed firms in 58 countries between 2001 and 2010. In addition, a fairly unique feature of this study is the use of marginal q as investment performance measure. This is a measure that mirrors market valuation of investments made by a firm in a congenial way; this has not been so

frequently used as Tobin's q. As size measure we have chosen employment over other indicators such as sales or assets, due to its connection to the theoretical literature on limits to firm size.

There is a considerable number of studies on the relationship between firm size and firm value (for a recent overview see Offenberg 2010). All these studies find a negative relationship. Additionally, a recent study by Bennedsen and Nielsen (2010) of European countries, also finds a negative relation between size and value. The commonly used size measures in these earlier studies are assets or sales. They also use Tobin´s q as performance measure. However, in the theoretical literature on limits to firm size the focus is mostly on employment and marginal effects on firm value. In this sense our choice of employment as size measure and marginal q (investment performance) as valuation measure, is well justified and, as we propose, more suitable for the cause[1].

The legal origin literature mainly focuses on the protection of minority shareholders. While this is not our prime interest, there is still a strong link between the discussion of protection of minority shareholders, legal origin, rising of capital and investment made by the firm, for example in an expanded workforce. We argue that protection of minority shareholder rights, i.e. property rights, is especially important in large firms as the capital requirements are larger. As a consequence, ownership is likely to become more dispersed as the firm becomes larger. Minority owners seldom work within the firm and are consequently only interested in the return on their investment. However, their ability and their individual incentives to exercise control of the management of the firm are utterly limited. The legal protection of their property rights is important. This is the last reason for our choice to a combined study of legal protection, firm size and investment performance.

We assume that in relatively large firms, in terms of number of employees, the possibilities for expropriation is higher as compared to smaller firms. In addition, as the

[1] Rajan and Zingales (1998) stress overinvestment as a performance effect of excessive firm size. Also in the agency cost literature overinvestment is a measure of inferior performance. By the use of marginal q the issue of overinvestment can be addressed and evaluated in terms of market valuations.

firm grows, coordination costs and complexity of decisions are likely to increase. This may lead to both more difficult investment decisions and less transparency for the minority shareholder. Both are assumed to have a negative impact on investment performance.

Our purpose is to study the impact of legal origin and firm size on firm performance. Based on previous studies we expect to find that common law countries and their higher level of shareholder protection have better investment performance than the civil law countries. In addition, we expect to find that firm size has a negative effect on firm performance as it would function as a measure of overinvestment and coordination problem when the firm grows too large.

We find, in contrast to our expectations that the German legal origin countries have on average the best investment performance, followed by the Scandinavian countries. Anglo Saxon countries are on average only outperforming the French legal origin and old socialist countries in terms of investments. The results also show large in-group differences between the different legal traditions which make us question the validity of legal origin as an explanatory variable for firm performance.

The remainder of the paper is organized as follows; the next section discusses the theoretical framework underpinning the relationship between legal origin and firm performance. We then move on to discuss the firm size issue in depth and its connection to firm performance. In section four we present the investment performance measure marginal q. Section five and six recount our data and results. We then conclude the paper in section seven.

2. Legal origin and performance

The articles written by La Porta, Lopez-de-Silanes, Shleifer and Vishny (short LLSV) 1998, 1999 and 2002, form the foundation for most contemporary discussions on legal origin and legal systems with a focus on corporate governance. LLSV study in length the impact of legal origin on valuation of firms, ownership structures, protection of minority

shareholders and corporate governance. The issue of property rights and the possibility of expropriation of minority shareholders were first drawn attention to by Berle and Means (1932). While Berle and Means focus on the US with high levels of legal protection of minority shareholder and high levels of dispersed ownership, LLSV have come to show that the US example is quite different from most other countries around the world. A majority of countries display high levels of concentrated ownership rather than the dispersed, and the protection of minority shareholders is found to be substantially lower in Continental European countries and Asia. An effect from lower levels of property right protection is that majority shareholders and/or management have increased possibilities to benefit at the expense of other investors. The consequence is then that the return on capital is lowered due to resource allocation decisions not consistent with optimization of the value of the firm. La Porta et al. (2002) show that corporate valuation in a country is related to the origin of the legal system. For a limited sample of firms from each country they find a median of Tobin´s q for common law significantly higher than the median for civil law countries. Their results indicate a relation between legal origin, ownership structure and corporate valuation with common law countries having the best performance and the most dispersed ownership structures.

The papers by LLSV have been followed by a sequence of papers by among others Gugler et al. (2003), (2004), Gugler and Yurtuglo (2003) and Mueller (2006). With a similar take on legal origin and property rights as in the LLSV papers, Gugler et al. and Mueller use a different performance measure. Instead of Tobin´s q they use a marginal q that shows how corporate investments are evaluated by the stock market (for further background on marginal q, see Mueller and Reardon 1993). There are several advantages with the marginal q measure. One advantage is that it is directly related to the net present value rule of investments. Hence, it is possible to some extent to measure if the management is catering to its own interests at the expense of the investors[2]. Another advantage is that the troublesome estimation of the replacement cost of historical

[2] Given that the managers are not just incompetent and invest in projects with obvious negative net present values.

investments in the Tobin's q is avoided. In addition, the marginal q measure has several advantages of econometric, both for estimation and interpretation of results.
Using marginal q as a measure of investment performance Gugler et al. (2003) and Mueller (2006) find a similar relationship as LLSV for legal origin, ownership structure and performance. Mueller (2006) uses seven different indicators to study the performance of firms in 53 countries. The countries are grouped by a finer definition of legal origin (English origin, European Germanic origin, Asian Germanic origin, Scandinavian origin and French origin). While the results support previous studies by LLSV of the effects from legal origin, the results also show large in-group differences, which Mueller (2006) promptly noted . This suggests that differences in legal origin may explain differences in performance to some extent, but not fully.

The status of minority shareholders and the protection of their property rights (and as a result the principal agent problems between owners and management) are both, according to LLSV, related to the legislations in a country.[3] LLSV (1998) measure the strength of minority shareholder protection by a constructed index of anti-director rights. The anti-director index is based on six types of rights adding up to an overall score for the level of minority shareholder protection. The anti-director rights consist of rights representing, for example, shareholder meetings and extra protection of minority shareholders. Each of the rights constituting the anti-director rights is given a binary indication by LLSV depending on the legislation in each country. This legislation may differ between countries. They find stronger legal protection of minority shareholders in countries with common law compared to countries with civil law.

However, legislations tend to change over time. LLSV (1998, 1999) have been criticized for using cross-section rather than time series or a panel data approach. Consequently, they do not take into consideration that minority protection in a country can change over time. Williamson (2000) suggests that legislations may change over time periods of one to ten years. Fagernäs et al. (2008) study this fact in detail. Instead of only six types of

[3] According to LLSV the existence of strong protection of minority shareholders and their property can explain why dispersed ownership is more prevalent in some countries compared to countries with lower levels of property right protection.

anti-director rights as used by LLSV, they use some 60 indicators of minority protection in each country. Their time period of interest is 36 years long (from 1970 to 2005) and they concentrate on only four countries; Great Britain, Germany, France and the US. Not surprisingly, they find that minority protection has changed substantially over time. For the time period studied in this paper (2000-20010) it is clear that Germany has the strongest protection of minority shareholder rights with France at a second place and Great Britain at the third. This is partly supported by Spamann (2010) who has updated the anti-director rights index as constructed by LLSV based on changes in legislations since 1999. The overall impression is that investor protection has increased in most countries since the LLSV measure. The division between common law and civil law countries seems to be less important as the civil law countries appear to be catching up. We include the anti-director rights index provided by Spamann (2010) for those countries available in our study, together with the results of the estimation.

In a more recent paper La Porta et al. (2008) defend their methodology and maintain their proposition that legal origin, and hence the level of minority shareholder protection, is imperative for explaining the economic development in a country in terms of the performance of its firms. Furthermore, they take a strong stand against the suggestion that legal origin would be merely a proxy for cultural differences in countries. The effects from legal origin on investment performance by firms is still a complex issue, but the general consensus points toward the propositions made by LLSV, i.e. that common law countries show higher levels of property right protection compared to civil law countries and hence the management has less possibilities to expropriate minority shareholders in common law countries. In line with LLSV our first hypothesis is:

Hypothesis 1: Due to higher minority shareholder protection, common law countries will have better investment performance than civil law countries.

3. Firm size, control loss and expropriation of minority shareholders

Listed firms vary in size from just a few employees to being counted in the hundreds of thousands of employees. A relevant question is therefore if there is an upper limit to the

size of firms in the sense that efficiency is compromised beyond a certain size level. Limit to size is to be considered an important issue in economics in general. With no size limit all economic activity could without efficiency loss be concentrated to one firm, and supply curves would not be upwards sloping. This is, however, not what we observe when studying firm size.

Kaldor (1934) is one of the first to address this issue. He questions the Marshallian concept of the representative firm in a perfect competitive industry. It is well known that price in a perfect competitive industry is determined by the point where supply and demand curves cross. The firms are numerous and they all adjust to the price and produce where marginal cost is equal to price. Kaldor studies long-term equilibriums and questions what limits the size of each firm. Without such limit to firm size there will not be a large number of firms in an industry. In a competitive industry there must be, for each firm in its production, a factor that is fixed and the same factor must not be fixed for the industry. The fixed factor is, according to Kaldor, entrepreneurship (or management). The firm is looked upon as a productive combination of factors under a single unit of control and the entrepreneur is the one who controls it. The type of control, foremost referred to, is co-ordination of actions. By co-ordination Kaldor means *"…that part of the managerial function which determines what sort of contracts should be entered into: which carries out the adjustments to the given constellation of 'data'."* (Kaldor, 1934, p. 68). Furthermore, Kaldor suggests that *"…it is the essence of co-ordination that every single decision should be on a comparison with all other decisions already made or likely to be made; it must therefore pass through a single brain."* (Kaldor, 1934, p. 68) In other words entrepreneurship in terms of co-ordination is a fixed factor and a fixed factor is needed in order to explain why the long-run cost curve of a firm would be upward sloping.

The management task of directing resources is by Coase (1937) stressed as the distinguishing mark of the firm. Similar to Kaldor he talks about the entrepreneur-co-ordinator who directs production. The alternative to the firm is according to Coase the market where the allocation of resources amongst users and uses, is determined by a price

mechanism. In a firm the price mechanism is superseded by an order mechanism (due to authority of the entrepreneur). A quote from Coase illustrates this:

"…in economic theory we find that the allocation of factors of production between different uses is determined by the price mechanism. The price of factor A becomes higher in X than Y. As a result, A moves from Y to X. Yet in the real world, we find that there are many areas where this does not apply. If a workman moves from department Y to department X, he does not go because of a change in relative prices, but because he is ordered to do so,…" (Coase, 1937, p. 387)

The firm is predicted to replace the market when it is less costly to use the order mechanism than the price mechanism. Coase describes different types of costs of using the price mechanism as search costs, information costs, negotiation costs, policing costs and enforcement costs. Yet, there are a number of different kinds of control costs of using the order mechanism and, in line with Kaldor, Coase expects these costs to increase with increasing firm size.

Related to the work of Coase, Williamson (1963) addresses the problem of firm size and possible loss of control. Williamson elaborates on the possibility that managers expand the size of the staff to increase their own non-pecuniary compensation in the sense of being similar to a promotion for the manager. Having a relatively larger staff would both be an indirect[4] way of increasing the salary for the manager as well as increasing the security, power, status, prestige and possibly also a professional achievement. In subsequent papers Williamson (1975; 1985; 1988) revisits the issue of the limits of firms from a different angle when he poses the question; *"Why can't a large firm do everything that a collection of small firms can do and more?".* Instead of imposing a costly bureaucracy with centralization of decision making and the control losses that grow with size and complexity, it should be possible to organize the firm into divisions with semi-autonomous status. Each division is assigned with a profit type goal that preserves the high powered incentives that characterize autonomous firms. Intervention from top

[4] In the sense that with larger staff comes more responsibility and claim for higher salary.

management only has to take place when divisions do not live up to expectations. In other words a management by exception type of leadership is imposed. With this type of management the better of two worlds would be accomplished. The cost efficiency associated with independent ownership could be obtained, and the alleviation of cost transaction problems caused by bilateral dependency could at the same time be avoided. However, opportunism has a tendency to flourish also inside an organization; not only between organizations in the marketplace. Problems will occur as it will be costly to enforce "promises by division managers to utilize assets with "due care"; promises by owners to reset transfer prices and exercise accounting discretion "responsibly"; promises to reward innovation "in full measure"; promises to preserve promotion prospects "without change"; and agreements by managers to "eschew politics" (Williamson, 1985 p.161.).

More recently the property rights view of the firm has been developed, partly discussed above (see i.e. Grossman & Hart (1986) and Hart & Moore (1990)). Rajan & Zingales (1998) add to this strand of firm theory by considering power emanating from specialized investments. In their analysis of additive investment an increase in the number of managers (i.e. increase in firm size) reaches a limit with negative net return on investment (overinvestment). They write: *"Above a certain threshold, coordination costs will go up while investments will overlap and become perfect substitutes…"* (Rajan & Zingales, 1998, p. 401). In other words investment performance is the critical variable in their discussion.

The upshot of the discussion above is that there are unavoidable, increasing internal transaction costs associated with increasing firm size. These costs are worth incurring only if increasing firm size means that even higher inter-organizational (external) transactions costs can be avoided. Private financing of large firms is facilitated if a large number of sources can be tapped. Hence there is a tendency that the number of shareholders increases with the size of corporate firms. With a diffuse ownership structure there is an additional efficiency problem that has to be faced, viz: *How is the separation of ownership and control problem to be dealt with?*

Jensen & Meckling (1976) state this problem as a question of asserting that the top management uses the firm´s resources to maximize firm value. To maximize firm value is equivalent to only making investments with a positive net present value. Here, the minority shareholder protection offered by the legal framework of a country has a special important role for corporate governance in large firms. All taken together, our second hypothesis is:

Hypothesis 2. An increase of firm size in terms of number of employees will eventually have a negative effect on investment performance.

4. Measure of performance

Both hypothesis 1 and 2 are tested using the marginal q measure of investment performance. The version of Tobin's marginal q that we use in this study, was first presented by Mueller and Reardon (1993). The measure has gained popularity over the last decade (see for example Wiberg (2008) and Eklund (2008)), but is still not as widely used as Tobin's q despite its clear advantages. Marginal q is used by Gugler, Mueller and Yurtuglo (2003) and Mueller (2006) in studies of legal origin and effects on investment performance of firms around the world. Marginal q estimates for a firm have the attractive property of being both fairly intuitive and easy to analyse. In contrast to Tobin's q, it considers the marginal market valuation of a firm's marginal investment rather than the ratio between market value and book value for the firm. The ratio between a change in investment and its value is reflected in the change in market value by the firm and its marginal q.

As mentioned, marginal q is directly linked to the Net Present Value (NPV) rule in corporate finance, which generally assumes that a project with a positive net present value should always be accepted. A management that only has the collective interest of the shareholders' objective to maximise the value of the firm will undertake all investments that promise a positive net present value and the last investment decided cannot have a lower net present value than zero (i.e. NPV≥0). On the other hand, a management that caters to other objectives than those of the shareholders as a group will

be prepared to choose projects with a negative NPV for the firm. The intuitive interpretation of the marginal q method is that a negative NPV will result in an estimated value of marginal q less than 1 for the firm. In other terms, the marginal investment made by the firm results in a smaller increase of the market value than the amount invested. That marginal q reflects the market valuation of the marginal investment and builds on an assumption of efficient capital markets

Marginal q includes investments in both tangible and intangible assets. Following Mueller and Reardon (1993), investment (I) made by the firm in each time period is compounded by:

$$I = \textit{After tax profits} + \textit{Depreciation} - \textit{Dividends} + \Delta\textit{Debt} + \Delta\textit{Equity} + \textit{R\&D} + \textit{ADV} \quad (1)$$

where ΔD and ΔE are funds raised using new debt and equity issues and ADV is advertising expenditures. The aggregated investment variable is then used in the model for estimating the marginal q, denoted q_m in the following equation:

$$\frac{M_{it} - M_{i,t-1}}{M_{i,t-1}} = -\delta + q_m \frac{I_{it}}{M_{i,t-1}} + \frac{\varepsilon_t}{M_{i,t-1}} \quad (2)$$

where, M_{it} is the market value of a firm i in period. Equation (2) builds on the assumption of market efficiency and that as t grows larger, term $\frac{\varepsilon_t}{M_{i,t-1}}$ will move towards zero. We use the general equation for estimating a marginal q, the q_m in (2) and name it model 1 in our presentation of the results. In model 2, we add the employees variable to control for size factors affecting the change in market value over time. In our case, it allows us to control for how differences in firm size affect performance. The number of employees reported by a firm is interacted with the investment over market value term as this makes it possible to determine the effect, if any, on investment performance.

5. Data sources and descriptive statistics

The financial data used for estimating the marginal q is obtained from Standard and Poor's COMPUSTAT Global database for the years 2000 to 2010. Due to differences in accounting standards financial firms such as banks, insurance and investment companies are removed from the dataset of firms (SIC codes 60-64) in accordance with earlier research (see for example Gugler et. al. (2002), Mueller (2006) Bjuggren and Wiberg (2008)). Furthermore, since Standard and Poor do not provide advertising expenditures explicitly in COMPUSTAT Global, we are using a wider definition than Mueller and Reardon (1993). This definition includes "general selling expenses" which is used as a proxy for the advertising expenditures. Firms with less than four consecutive years of market value and investment information are removed from the dataset to maintain consistency. Furthermore, due to the construction of the marginal q estimate, the first year (2000) observations are lost when calculating the change in market value and investments over market value. The remaining dataset contains data on 20 111 firms from 58 countries. The firms have at least four years of observations and a maximum of ten years. The countries included in the dataset represent Anglo Saxon, Scandinavian, German and French legal traditions. As mentioned, we also include a group of "old socialist countries" to further increase the possibilities of comparisons across countries. The legal origin groups and included countries are presented in Table 1.

Table 1: Legal origin groups and countries included in each group

Legal origin	Countries
Anglo Saxon origin (common law)	Australia, Bermuda, Canada, Cayman Island, Great Britain, Hong Kong, India, Ireland, Israel, Kenya, Malaysia, New Zealand, Nigeria, Pakistan, Singapore, South Africa, Sri Lanka, Thailand, United States
Scandinavian origin (civil law)	Denmark, Finland, Norway, Sweden
European German origin (civil law)	Austria, Germany, Switzerland
Asian German origin (civil law)	Japan, South Korea, Taiwan
German origin	European and Asian German origin countries
French origin	Argentina, Belgium, Brazil, Chile, Columbia, Egypt, France, Greece, Indonesia, Italy, Jordan, Luxembourg, Mexico, Netherlands, Peru, Philippines, Portugal, Spain, Turkey,

	Venezuela
Old socialist countries	Bulgaria, China, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Russia

The variable names and descriptions used in the estimation of the marginal q for each of the countries are presented in Table 2. We also include information on additional financial indicators to enhance the analysis of the results. These indicators are return on assets, sales, assets and debt level. Each of the indicators is presented in Table 2 with a short description of its components.

Table 2: Variable name and description

Variable Name	Description
I_t	Investment in period t. Defined as: I= After tax profit + Depreciation – Dividends + ΔDebt + ΔEquity + R&D + Advertising
$(M_t - M_{t-1})/ M_{t-1}$	Change in market value
I_t/ M_{t-1}	Investment ratio
Employees	Number of employees reported by the firm
Additional indicators	
ROTA	Return on total assets
Sales	Sales (turnover) net
Assets	Total/Liabilities and stockholders' equity
Debt	Total debt

The descriptive statistics for the whole dataset is presented in Table 3 below. Detailed descriptive statistics for each legal origin country group is presented in the appendix[5].

Table 3: Descriptive statistics for the full dataset, in millions of US dollar

Variable	Observations	Mean	Std. Dev.	Min	Max
It	172 172	363.58	2 506.01	-110 274	236 438.9
(Mt- Mt-1)/ Mt-1	172 172	0.14	0.48	-0.99	3.83
It/ Mt-1	172 172	0.28	0.42	-1.88	4.11
Employees	103 408	8 213.61	28 544.52	0	758 800
Additional indicators					
ROTA	170 458	1.90	13.36	-45.62	24.91
Sales	145 741	1 804.54	9 012.46	-386.00	458 361
Assets	169 776	6 134.96	59 504.17	0	3 783 742
Debt	163 944	1 615.11	20 654.34	0	3 197 052

[5] Descriptive statistics for each country included in the study is available from the authors on request.

Table 3 in combination with the fact that we study 20 111 firms indicate that on average there are about 8.5 years observations per firm. Table 3 also shows that the number of observations on employees is far below the number of observations for the variables "change in market value" and "investments over market value" which are required for the marginal q estimates. On average, there are only 5.1 years observations per firm. This forces us to estimate the firm size effects on a non-random selection of the original dataset with 20 111 firms. For some countries, the number of firms with employee data included a decrease below a required minimum of observations for the estimations. This makes legal origin averages for each group of countries a more appropriate starting point of our result presentation. The descriptive statistics also reveal that the dataset is likely to contain heterogenic firms; the largest firm included employs more than three quarters of a million people, while the average firm included employs less than 8 000 people. With traditional performance measures this may pose a problem, however, the marginal q measures a marginal effect in the investment performance of a firm and is unaffected by size differences in the traditional aspects. It is, however, still possible to capture firm size effects on the investment performance in terms of being more or less good investment decisions[6].

The additional indicators also show heterogeneity in the data, however, there are likely to be errors in the most extreme values of, for example, the return on assets indicator. Yet, on average the indicators give an adequate picture of the data characteristics, especially when comparing between groups of countries as shown in the individual tables in the appendix.

6. Regression model and results

We measure the investment performance by estimating the marginal q coefficient in accordance to equation (2). This is set as model 1 in our presentation of the results. We estimate model 1 for all countries and all groups of legal origin. The estimation results from the legal origin groups are presented in Table 4 including a ranking of the "best" to

[6] We have also tested the marginal size effects by using the change in employees rather than the absolute number of employees with similar results.

"worst" investment performance. Our model 2 is very similar to model 1, but it also includes the size measure, namely the number of employees reported by the firm. The employee variable is integrated with the investments over market value variable for us to be able to estimate the marginal effect on investment performance from firm size.

$$\frac{M_{it} - M_{i,t-1}}{M_{i,t-1}} = -\delta + \beta_1 \frac{I_{it}}{M_{i,t-1}} + \beta_2 \left(Employees \cdot \frac{I_{it}}{M_{i,t-1}} \right) + \beta_3 \left(Employees^{\,2} \cdot \frac{I_{it}}{M_{i,t-1}} \right) \tag{3}$$

Taking the derivative of (3) with respect to investments over market valuegives us an expression that can be used to test the second hypothesis of how an increase of firm size eventually affects investment performance:

$$\frac{\partial \dfrac{M_{it} - M_{i,t-1}}{M_{i,t-1}}}{\partial \dfrac{I_{it}}{M_{i,t-1}}} = \beta_1 + \beta_2 \cdot Employees + \beta_3 \cdot Employees^{\,2} \tag{4}$$

$\beta_2 > 0$ and $\beta_3 < 0$ depict a relationship with an initial positive effect that eventually turns into a negative effect on investment performance as the number of employees surpasses an efficiency threshold.

As the effect on investment valuation by the market from one additional employee is bound to be very small, we expect very small coefficients for our size effect variable. Therefore we express the results in terms of units of 10 000 employees. Hence, if the number of employees is increased by 10 000, the effect on investment performance is reflected in $\beta_3 < 0$. Still, we are primarily interested in if the effect is positive or negative rather than the size of the effect specifically. The estimates are done on a panel data with fixed effects constraints and year dummies to remove year effects.

Table 4: FE estimation; legal origin groups, Model 1, 2 and 3 including its respective rank

Legal origin	Model 1		Model 2			Model 3			
	qm [std. err]	No. of firms (obs.)	qm [std. err]	emp. [std. err.]	No. of firms (obs.)	qm [std. err]	emp. [std. err]	emp^2 [std. err]	No. of firms (obs.)
Germanic, Asian	0.768***	5668	0.728***	0.025***	4005	0.724***	0.055***	-1.52E-07***	4005
	[0.005]'''	(47108)	[0.007]'''	[0.064]	(31231)	[0.007]'''	[0.011]	[4.32E-08]	(31231)
Germanic, all	0.759***	6265	0.732***	0.013***	4546	0.728***	0.035***	-8.09E-08***	4556
	[0.005]'''	(51948)	[0.006]'''	[0.003]	(34014)	[0.006]'''	[0.007]	[2.20E-08]	(34014)
Scandinavian	0.754***	549	0.798***	0.028	497	0.790***	0.078**	-3.89E-07**	497
	[0.014]'''	(4515)	[0.018]'''	[0.022]	(3347)	[0.019]'''	[0.033]	[1.94E-07]	(3347)
Anglo Saxon	0.741***	8969	0.772***	0.015***	7700	0.766***	0.035***	-8.14E-08***	7700
	[0.004]'''	(70351)	[0.006]'''	[0.030]	(46175)	[0.006]'''	[0.005]	[1.61E-08]	(46175)
French	0.713***	2457	0.762***	0.005	1835	0.755***	0.015**	-3.93E-08**	1835
	[0.007]'''	(19856)	[0.012]'''	[0.035]	(9645)	[0.012]'''	[0.007]	[1.54E-08]	(9645)
Germanic, European	0.704***	854	0.676***	0.007	758	0.672***	0.018*	-3.54E-08	758
	[0.012]'''	(7044)	[0.018]'''	[0.006]	(4398)	[0.018]'''	[0.010]	[2.92E-08]	(4398)
Socialist	0.699***	1871	0.836***	-0.002	368	0.820***	-0.005	-4.07E-09	368
	[0.009]'''	(12863)	[0.028]'''	[0.006]	(1598)	[0.033]'''	[0.012]	[5.28E-08]	(1598)

Standard errors are reported in brackets, ***, ** and * indicates significance level of 1, 5 and 10 per cent respectively. ''', '' and ' indicate if the q estimate is significantly different from 1 on a 1, 5 and 10 per cent level respectively.

Our results show some very interesting tendencies. Compared to La Porta et al. (2002) we find diverging results as the German legal origin seems to be superior over both other civil law countries and the Anglo Saxon legal origin. La Porta et al. (2002) put the German legal origin below both the Anglo Saxon and Scandinavian legal origin. However, in our case is it mainly the Asian countries with a German legal origin that cause this superiority of investment performance. When we compare our results to those of Mueller (2006) we find similar tendencies; the Asian countries with German legal systems are second to only the Anglo Saxon countries in his study. In addition, Mueller (2006) also estimates a relatively low marginal q for the European German legal origin countries, only surpassing the French legal origin countries. In our case, we also find that the Scandinavian legal origin countries have better investment performance than the

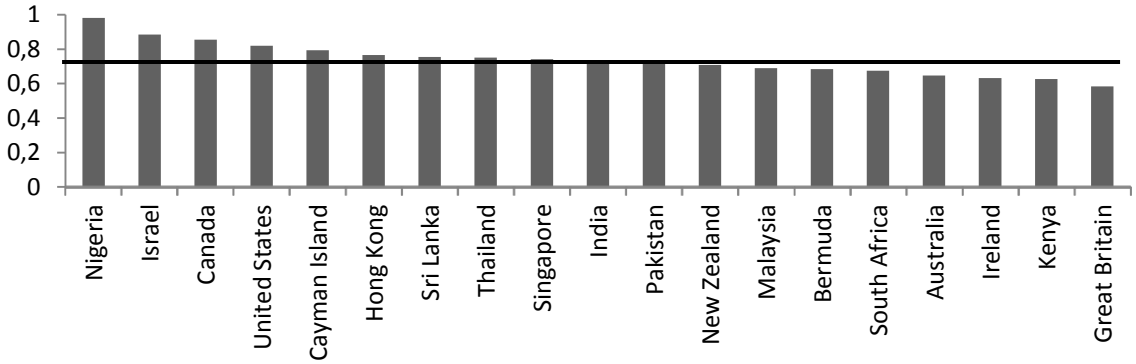
Anglo Saxon countries. The old socialist countries have the lowest estimated marginal q, indicating the highest levels of "bad investments" made by their managers. These results are similar to those of Djankov et al. (2005) who also investigate creditor rights around the world. All our estimates are significantly different from both zero and one[7] for the different legal origin groups. This makes us reject our hypothesis 1, at least on an average level since German legal origin and Scandinavian legal origin countries both have better investment performance than the Anglo Saxon legal origin countries.

Our investment performance estimates for each legal origin group show that the ranking of property right protection and effects on firm performance can be questioned. Yet, much of the results are likely to be explained by differences within each group. The Anglo Saxon group includes such diverse economies, both in terms of economic development and size as well as number of firms, as the US and Nigeria. The French legal origin countries show similar variety in countries included; both Belgium and Columbia are represented in this group. The German legal origin countries show slightly more homogeneity and the Scandinavian countries can be considered to be very similar in comparison. Mueller (2003) takes note of these in-group differences also and concludes that legal institutions are not the sole determinant of country differences of, for example, external capital markets. In light of this, we divide each group into the countries included for a more detailed pattern to be revealed. To illustrate the variance within each legal origin group we present the marginal q estimates graphically for each country. The full, numerical estimates are presented in the appendix.

The Anglo Saxon countries reveal some interesting characteristics of the heterogeneous group of common law countries. Each country's separate marginal q is presented in comparison to the average marginal q estimated for the whole group of Anglo Saxon countries. The Anglo Saxon country estimates are presented in Graph 1.

[7] If the estimate is not significantly different from one, it is not possible to determine if the investments decisions made are actually projects with NPV:s below zero.

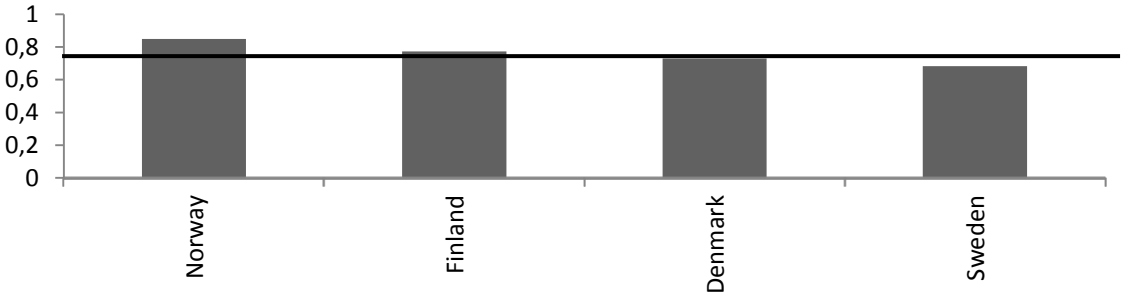
Graph 1: Anglo Saxon legal origin country estimates of investor performance, fixed effects Model 1



The Anglo Saxon average estimated marginal q without the employee variable is represented by the line at 0.741 and with the standard deviation of 0.004. The uneven distribution of firms from each country is likely to affect the results, making comparisons within the group more complicated. When checking the robustness of the average marginal q for the Anglo Saxon countries, regardless of number of firms from each country included, the standard deviation increases to 0.097. This allows for a larger group of countries to be "representative" for the average marginal q estimated for the Anglo Saxon legal origin group. However, it is still notable that Great Britain is still well below the average marginal q. This is both surprising and difficult to interpret as most previous studies tend to place Great Britain at a much higher level.

Not surprisingly, the Scandinavian legal origin countries show higher levels of homogeneity in graph 2.

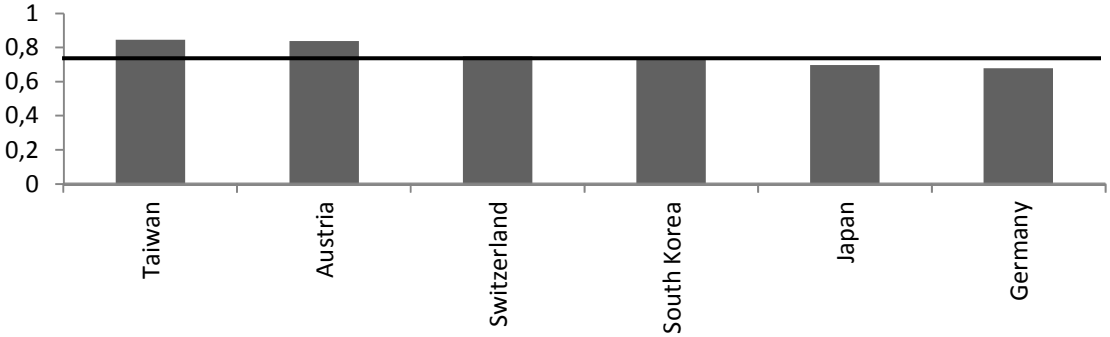
Graph 2: Scandinavian legal origin country estimates of investor performance, fixed effects Model 1



The Scandinavian average estimated marginal q without the employee variable is represented by the line at 0.754. The low number of countries included makes standard deviation from the average marginal q less interesting. Nevertheless, the standard deviation, regardless of number of firms included from each country, is around 0.07. The Swedish estimates are lower than those of for example Bjuggren and Wiberg (2008) or Mueller (2003). This may be explained by differences in firms included in the dataset as well as the time periods that are studied[8].

Even though there are obvious differences between Asian and European German legal origin, which is, as mentioned, also noted by Mueller (2006), the differences are more subtle when illustrated as in graph 3.

Graph 3: German country legal origin estimates of investor performance, fixed effects Model 1

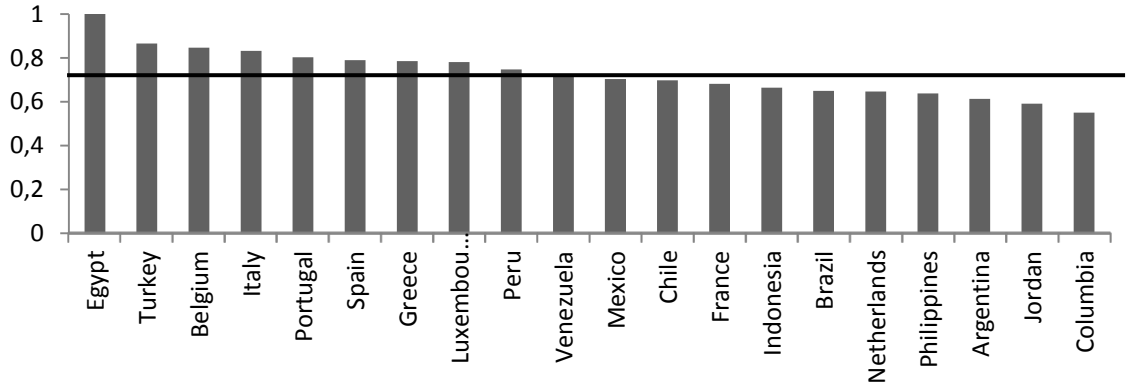


[8] If the time series in the panel includes both economic expanse and recession periods differences in estimated average marginal q:s for countries, it should be explained with some more fundamental change in economic behavior. In our case, a lower estimated marginal q is more likely to be the effect of an underestimation of the investments done by the firm as information on R&D and advertising is very sparse or non-existing for several of the firms included. This may have a negative influence on the marginal q estimates.

The German average estimated marginal q without the employee variable is represented by the line at 0.759. The group appears to be fairly homogenous, but the number of firms included for each country differs substantially. In this context, the Austrian economy is considerably smaller than that of Japan or South Korea. Still, most of the results are in line with previous studies.

The French legal origin countries again show large heterogeneous tendencies as the group includes disparate countries as Egypt and Chile. Here it is clear that other factors than legal institutions are of significant importance when explaining investor performance and firm size.

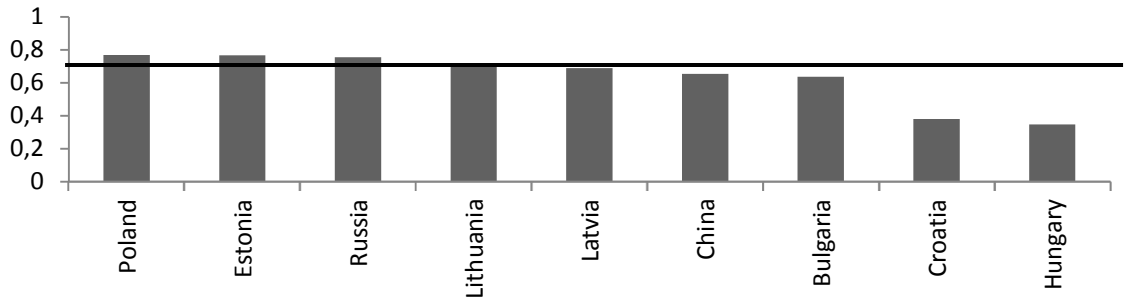
Graph 4: French country legal origin estimates of investor performance, fixed effects Model 1



The French average estimated marginal q without the employee variable is represented by the line at 0.713 and the standard deviation is around 0.11. It is not very surprising that most of the countries outside of the standard deviation interval around the average marginal q are those countries with very few firms and not very developed economies. It is, however, quite unanticipated that four out of four PIGS countries (Portugal, Italy, Greece and Spain) are all above the average marginal q for the French origin countries.

The least reliable data is that of the old socialist countries. For natural reasons the data is not always available for longer time periods and when available, the data tends to include some obvious errors. Nevertheless, graph 5 illustrates the individual country marginal q:s and the average marginal q for all old socialist countries.

Graph 5: Old socialist country legal origin estimates of investor performance, fixed effects Model 1



The old socialist average estimated marginal q without the employee variable is represented by the line at 0.699. Most noteworthy is the much lower marginal q estimates for Croatia and Hungary compared to the other countries in the group. China is by far the largest country in the group in terms of number of firms included (1461 firms out of 1871 in total) and is likely to be driving the result to a high degree.

6.1 Endogeneity and multicollinearity issues

The formulation of the marginal q measure in equation (2) raises questions about possible endogeneity. However, on a theoretical level such endogeneity is less likely to happen as Gugler et al. (2008) explain it to be managers who choose investment projects rather than investment projects that choose managers. In our case we focus on managers' investment performance around the world in general and investment in number of employees and firm size explicitly. Similar to the discussion by Gugler et al. it is more likely that managers choose the number of employees rather than the employees choose their managers (even though such choices may appear in firms owned by its employees, rare as they may be). A second issue of endogeneity may arise when using panel data as we do. However, this is most likely when exogenous variables are used in combination with

lagged values of the dependent variable. The way we have formulated our model, potential problems with endogeneity due to lagged variables should be kept to a minimum.

The way model 3 is expressed, concerns about multicollinearity are natural to arise. However, as the number of observations grows, the issues of multicollinearity decrease by default. Therefore, the results for model 3 are still trustworthy to some extent, at least for the groups of countries with many observations included. The relatively low number of observations may explain the non-significance of the squared employees parameter in model 3 for European German- and old socialist legal origin countries. These issues become more apparent when looking at the model 3 estimation results on a country level. In a greater aspect, model 3 does, however, support the assumption of optimal firm size and non-linearity as there is an initial positive effect on investment performance since the number of employees increase but the effect becomes negative for the squared employees parameter.

7. Conclusion

We studied the effects on investment performance from legal origin and firm size in 58 countries around the world. In line with earlier research we expected to find worse investment performance in countries with civil law systems (German, French and Scandinavian legal origin) than in common law countries. We also expected to find a more negative effect on investment performance from firm size in terms of number of employees.

Surprisingly we found that the firms in the common law countries in our dataset generally have a lower level of investment performance compared to the civil law countries. This could be an indication of an evolutionary process where civil law countries have improved their corporate governance system in relation to common law countries during the last decades However, on a country specific level, these results are more ambiguous. We also find that there is a negative effect from firm size in terms of number of employees on investment performance after a threshold has been passed. This result is

interesting in the light of the theory of the firm. In textbooks, a crucial assumption is that there is a limit to firm size beyond which efficiency is compromised. Increasing control and coordination costs due to complexity has been advanced as an explanation. Our results give support to such a view of the firm.

List of References

Bennedsen, M., & Nielsen, K. M. (2010). Incentive and entrenchment effects in European ownership. *Journal of Banking & Finance, 34*(9), 2212-2229.

Berle, A., & Means, G. (1932). The Modern Corporation and Private Property. *McMillian, New York, NY*.

Bjuggren, P. O., & Wiberg, D. (2008). Industry specific effects in investment performance and valuation of firms. *Empirica, 35*(3), 279-291.

Coase, R. H. (1937). The Nature of the Firm. *Economica, 4*(16).

Djankov, S., McLiesh, C., & Shleifer, A. (2005). Private credit in 129 countries: National Bureau of Economic Research.

Eklund, J. (2008). *Coporate Governance, Private Property and Investment.* Jönköping International Business School.

Fagernas, S., Sarkar, P., & Singh, A. (2008). Legal origin, shareholder protection and the stock market: new challenges from time series analysis. *The Economics of Corporate Governance and Mergers*, 20.

Grossman, S. J., & Hart, O. D. (1986). The costs and benefits of ownership: A theory of vertical and lateral integration. *The Journal of Political Economy*, 691-719.

Gugler, K., Mueller, D. C., & Burcin Yurtoglu, B. (2003). The Impact of Corporate Governance on Investment Returns in Developed and Developing Countries*. *The Economic Journal, 113*(491), 511-539.

Gugler, K., Mueller, D. C., & Yurtoglu, B. B. (2002). Separating the Wealth and Entrenchment Effects of Insider Ownership on Investment Performance. *University of Vienna, Department of Economics*.

Gugler, K., Mueller, D. C., & Yurtoglu, B. B. (2004). Corporate Governance and the Returns on Investment*. *The Journal of Law and Economics, 47*(2), 589-633.

Gugler, K., Mueller, D. C., & Yurtoglu, B. B. (2008). Insider ownership, ownership concentration and investment performance: An international comparison. *Journal of Corporate Finance, 14*(5), 688-705.

Gugler, K., & Yurtoglu, B. B. (2003). Average q, marginal q, and the relation between ownership and performance. *Economics Letters, 78*(3), 379-384.

Hart, O., & Moore, J. (1990). Property Rights and the Nature of the Firm. *Journal of political economy*, 1119-1158.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure.

Kaldor, N. (1934). The Equilibrium of the Firm. *The Economic Journal, 44*(173), 60-76.

La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (1999). Corporate Ownership around the World. *The Journal of Finance, 54*(2), 471-517.

La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2008). The economic consequences of legal origins. *Journal of economic literature, 46*(2), 285-332.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2002). Investor Protection and Corporate Valuation. *The Journal of Finance, 57*(3), 1147-1170.

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

Mueller, D. (2003). *The Corporation-Investment, Mergers, and Growth*. London: Routledge.

Mueller, D. C. (2006). The Anglo-Saxon Approach to Corporate Governance and its Applicability to Emerging Markets. *Corporate Governance: An International Review, 14*(4), 207-219.
Mueller, D. C., & Reardon, E. A. (1993). Rates of Return on Corporate Investment. *Southern Economic Journal, 60*(2).
Rajan, R. G., & Zingales, L. (1998). Power in a Theory of the Firm. *The Quarterly Journal of Economics, 113*(2), 387.
Spamann, H. (2010). The "antidirector rights index" revisited. *Review of Financial Studies, 23*(2), 467.
Wiberg, D. (2008). Institutional Ownership–The Anonymous Capital. *JIBS Dissertation Series, 48*.
Williamson, O. E. (1963). Managerial Discretion and Business Behavior. *The American Economic Review, 53*(5), 1032-1057.
Williamson, O. E. (1975). Markets and hierarchies, analysis and antitrust implications.
Williamson, O. E. (1985). The Economic Institutions of Capitalism (1985) New York: Free Press.
Williamson, O. E. (1988). Corporate Finance and Corporate Governance. *The Journal of Finance, 43*(3), 567-591.
Williamson, O. E. (2000). The new institutional economics: taking stock, looking ahead. *Journal of economic literature*, 595-613.

Appendix 1: Descriptive statistics for each type of legal origin

Table A1: Descriptive statistics Anglo Saxon legal origin, in millions of US dollar

Variable	Observations	Mean	Std. Dev.	Min	Max
It	70 351	367.84	2099.03	-14 590.14	97 307.8
(Mt- Mt-1)/ Mt-1	70 351	0.15	0.51	-0.95	3.83
It/ Mt-1	70 351	0.26	0.44	-1.88	3.71
Employees	46 175	8 912.51	2 9317.52	0	758 800
Additional indicators					
ROTA	69 430	1.89	16.32993	-54.49	78.91
Sales	62 486	1 890.6	10 202.36	-386.00	458 361
Assets	69 859	2 361.75	13 853.95	0	797 769
Debt	67 688	724.09	6 295.14	0	523 762

Table A2: Descriptive statistics Scandinavian legal origin, in millions of US dollar

Variable	Observations	Mean	Std. Dev.	Min	Max
It	4 515	287.91	1 146.21	-3 452.70	34 215.86
(Mt- Mt-1)/ Mt-1	4 515	0.15	0.47	-0.99	3.04
It/ Mt-1	4 515	0.22	0.39	-1.69	3.15
Employees	3 347	6 508.94	17 916.35	1	280 000
Additional indicators					
ROTA	4 469	2.31	12.53	-25.07	50.69
Sales	4 028	1 738.40	5 750.13	0	117 104.5
Assets	4 486	2 006.02	6 448.79	0	110 604.3
Debt	4 395	531.21	1 636.83	0	29 899.53

Table A3: Descriptive statistics European German legal origin, in millions of US dollar

Variable	Observations	Mean	Std. Dev.	Min	Max
It	7 044	570.31	2 964.69	-6 698.75	67 582.52
(Mt- Mt-1)/ Mt-1	7 044	0.11	0.45	-0.98	3.10
It/ Mt-1	7 044	0.20	.39	-1.74	3.11
Employees	4 398	14 163.14	47 788.31	0	520 112
Additional indicators					
ROTA	6 934	1.20	12.12	-24.21	92.33
Sales	6 113	3 332.63	12 902.98	0	19 0370.7
Assets	5 977	1 350.54	6 591.18	2.10	123 318
Debt	6 749	1 137.94	6 254.17	0	104 106.6

Table A4: Descriptive statistics Asian German legal origin, in millions of US dollar

Variable	Observations	Mean	Std. Dev.	Min	Max
It	44 904	241.19	1 295.44	-6 084.59	54 760.94
(Mt- Mt-1)/ Mt-1	44 904	0.10	0.42	-0.94	3.16
It/ Mt-1	44 904	0.37	0.38	-1.67	4.11
Employees	29 616	3 778.28	15 456.58	4	384 586
Additional indicators					
ROTA	44 766	1.76	7.858	-21.11	18.20
Sales	43 574	1 504.73	7 181.35	0	254 962.7
Assets	44 822	1 623.47	7 978.58	0	374 233.6
Debt	44 695	498.13	3 021.95	0	154 301.4

Table A5: Descriptive statistics all German legal origin, in millions of US dollar

Variable	Observations	Mean	Std. Dev.	Min	Max
It	51 948	285.48	1 627.13	-6 698.75	67 582.52
(Mt- Mt-1)/ Mt-1	51 948	0.10	0.42	-0.98	3.16
It/ Mt-1	51 948	0.35	0.39	-1.74	4.11
Employees	34 014	5 121.04	22 702.04	0	520 112
Additional indicators					
ROTA	51 700	1.68	8.55	-24.21	92.32
Sales	49 687	1 729.61	8 128.18	0	254 962.7
Assets	50 799	1 591.36	7 828.55	0	374 233.6
Debt	51 444	582.06	3 620.99	0	154 301.4

Table A6: Descriptive statistics French legal origin, in millions of US dollar

Variable	Observations	Mean	Std. Dev.	Min	Max
It	19 856	401.17	2 171.43	-21 897.29	101 099.2
(Mt- Mt-1)/ Mt-1	19 856	0.14	0.48	-0.99	3.17
It/ Mt-1	19 856	0.24	0.41	-1.71	3.72
Employees	9 645	12 481.42	36 352.13	0	583 830
Additional indicators					
ROTA	19 538	2.33	16.54	-1 649.62	174.35
Sales	17 295	2 248.73	8 831.24	-1.069	235 769.5
Assets	19 579	3 247.04	13 658.41	0	353 174.6
Debt	19 027	1 042.22	4 790.85	0	228 124.4

Table A7: Descriptive statistics Old socialist countries, in millions of US dollar

Variable	Observations	Mean	Std. Dev.	Min	Max
It	12 414	279.26	2 080.11	-1 022.34	86 443.6
(Mt- Mt-1)/ Mt-1	12 414	0.21	0.55	-0.972603	2.90
It/ Mt-1	12 414	0.29	0.43	-1.523782	3.53
Employees	1 363	19 893.93	59 947.27	1	552 698
Additional indicators					
ROTA	12 368	2.25	11.10	-399.09	257.27
Sales	11 781	974.02	6 569.90	0	277 176.5
Assets	12 374	1 339.90	8 304.52	0	308 109.1
Debt	12 289	343.32	1 794.22	0	61 443.52

Appendix 2: Country level results, fixed effects model 1 and 2.

	Model 1			Model 2				Model 3				
Country	**No. of firms (obs.)**	**qm = r/i**	**R2**	**No. firms (obs.)**	**qm=r/i**	**emp.**	**R2**	**No. firms (obs.)**	**qm=r/i**	**emp.**	**emp^2**	**R2**
Australia	618	0.647***	0.588	394	0.662***	0.051***	0.614	394	0.650***	0.103***	-3.72E-07*	0.615
	(4243)	[0.014]'''		(1527)	[0.029]'''	[0.019]		(1527)	[0.030]'''	[0.034]	[2.05E-07]	
Bermuda	429	0.685***	0.520	417	0.652***	0.050*	0.531	417	0.636***	0.134***	-4.04E-07	0.532
	(3333)	[0.016]'''		(2375)	[0.021]'''	[0.030]		(2375)	[0.023]'''	[0.049]	[1.88E-07]	
Canada	465	0.855***	0.555	412	0.838***	-0.021**	0.542	412	0.845***	-0.047*	1.38E-07	0.542
	(3558)	[0.019]'''		(2271)	[0.027]'''	[0.011]		(2271)	[0.028]'''	[0.027]	[1.33E-07]	
Cayman Island	252	0.793***	0.529	246	0.725***	0.225***	0.541	246	0.707***	0.359***	-5.16E-06	0.542
	(1575)	[0.028]'''		(1202)	[0.038]'''	[0.062]		(1202)	[0.040]'''	[0.111]	[3.55E-06]	
Great Britain	1072	0.583***	0.542	961	0.627***	0.010	0.546	961	0.622***	0.031**	-5.98E-08*	0.547
	(8392)	[0.010]'''		(6078)	[0.014]'''	[0.009]		(6078)	[0.014]'''	[0.015]	[3.33E-08]	
Hong Kong	246	0.765***	0.611	234	0.834***	0.017	0.654	234	0.808***	0.111***	-3.92E-07***	0.657
	(1899)	[0.020]'''		(1269)	[0.027]'''	[0.018]		(1269)	[0.028]'''	[0.037]	[1.34E-07]	
India	1147	0.724***	0.589	743	0.784***	0.047	0.663	743	0.774***	0.110	-1.60E-06	0.663
	(8078)	[0.011]'''		(2612)	[0.027]'''	[0.051]		(2612)	[0.029]'''	[0.078]	[1.52E-06]	
Ireland	46	0.632***	0.516	46	0.609***	0.168*	0.529	46	0.611***	0.150	1.73E-07	0.529
	(379)	[0.062]'''		(331)	[0.071]'''	[0.090]		(331)	[0.072]'''	[0.118]	[7.06E-07]	
Israel	138	0.885***	0.725	60	0.836***	0.396	0.616	60	0.782***	0.093**	-3.02E-05*	0.621
	(965)	[0.022]'''		(303)	[0.077]''	[0.315]		(303)	[0.084]''	[0.045]	[1.81E-05]	
Kenya	18	0.627***	0.670	10	0.373	0.349	0.087	10	0.397	0.268	5.24E-06	0.870
	(105)	[0.095]'''		(36)	[0.321]'	[0.501]		(36)	[0.750]	[0.234]	[1.48E-04]	
Malaysia	759	0.689***	0.520	654	0.666***	0.106**	0.481	654	0.656***	0.227***	-3.62E-06*	0.482
	(6168)	[0.011]'''		(2733)	[0.020]'''	[0.051]		(2733)	[0.021]'''	[0.082]	[1.90E-06]	
New Zealand	78	0.708***	0.608	48	1.056***	-0.308	0.601	48	1.097***	-0.076	2.74E-05	0.602
	(642)	[0.037]'''		(170)	[0.176]	[0.384]		(170)	[0.197]	[0.105]	[5.87E-05]	
Nigeria	26	0.981***	0.568	26	1.221***	0.108	0.675	26	1.258***	-0.049	1.20E-04	0.675
	(172)	[0.100]		(126)	[0.186]'	[0.574]		(126)	[0.224]'	[0.203]	[3.90E-04]	
Pakistan	146	0.716***	0.584	78	0.886***	-0.040	0.598	78	0.914***	-0.189	4.28E-06	0.600
	(1075)	[0.026]'''		(317)	[0.082]'	[0.122]		(317)	[0.086]'	[0.181]	[3.82E-06]	
Singapore	479	0.741***	0.585	372	0.831***	0.072*	0.574	372	0.823***	0.132	-4.86E-07	0.574
	(3535)	[0.015]'''		(1351)	[0.030]'''	[0.039]		(1351)	[0.032]'''	[0.094]	[6.88E-07]	

South Africa	185	0.675***	0.608	159	0.742***	-0.019	0.645	159	0.731***	0.006	-4.72E-07	0.646
	(1521)	[0.024]'''		(822)	[0.048]'''	[0.029]		(822)	[0.051]'''	[0.049]	[4.91E-07]	
Sri Lanka	42	0.754***	0.565	37	0.865***	-0.042	0.558	37	0.884***	-0.021	4.83E-06	0.558
	(246)	[0.086]''		(136)	[0.153]	[0.114]		(136)	[0.162]	[0.049]	[1.39E-05]	
Thailand	398	0.750***	0.572	388	0.692***	0.069	0.550	388	0.715***	-0.014	3.97E-06**	0.552
	(3132)	[0.016]'''		(1642)	[0.026]'''	[0.055]		(1642)	[0.028]'''	[0.011]	[1.90E-06]	
United States	2425	0.820***	0.455	2415	0.818***	0.013***	0.456	2415	0.812***	0.027***	-5.72E-08	0.456
	(21333)	[0.008]'''		(20874)	[0.009]'''	[0.033]		(20874)	[0.009]'''	[0.006]	[1.90E-08]	
English Origin average	*8969*	*0.741*** [0.004]'''*	*0.508*	*7700*	*0.772*** [0.006]'''*	*0.015*** [0.030]*	*0.493*	*7700*	*0.766*** [0.006]'''*	*0.035*** [0.005]*	*-8.14E-08 [1.61E-08]*	*0.494*
	(70351)			*(46175)*				*(46175)*				
Denmark	100	0.730***	0.563	97	0.791***	-0.023	0.563	97	0.788***	0.014	-8.42E-07	0.563
	(865)	[0.032]'''		(685)	[0.041]'''	[0.067]		(685)	[0.042]'''	[0.127]	[2.47E-06]	
Finland	115	0.773***	0.590	106	0.812***	0.036	0.620	106	0.821***	-0.010	8.89E-07	0.620
	(1020)	[0.032]'''		(837)	[0.042]'''	[0.047]		(837)	[0.043]'''	[0.071]	[1.01E-06]	
Norway	115	0.850***	0.662	111	0.845***	0.185	0.683	111	0.857***	0.042	5.63E-06	0.684
	(875)	[0.030]'''		(688)	[0.038]'''	[0.117]		(688)	[0.041]'''	[0.231]	[7.80E-06]	
Sweden	219	0.683***	0.613	183	0.719***	0.037	0.595	183	0.695***	0.160***	-7.21E-07***	0.599
	(1755)	[0.021]'''		(1137)	[0.032]'''	[0.027]		(1137)	[0.033]'''	[0.048]	[2.37E-07]	
Scandinavian average	*549*	*0.754*** [0.014]'''*	*0.593*	*497*	*0.798*** [0.018]'''*	*0.028 [0.022]*	*0.597*	*497*	*0.790*** [0.019]'''*	*0.078** [0.033]*	*-3.89E-07** [1.94E-07]*	*0.597*
	(4515)			*(3347)*				*(3347)*				
Austria	74	0.838***	0.568	68	0.819***	0.020	0.590	68	0.845***	-0.085	2.37E-06	0.591
	(619)	[0.043]'''		(422)	[0.061]'''	[0.056]		(422)	[0.066]''	[0.124]	[2.44E-06]	
Germany	583	0.679***	0.500	512	0.640***	0.005	0.499	512	0.637***	0.011	-1.98E-08	0.499
	(4708)	[0.014]'''		(2767)	[0.022]'''	[0.005]		(2767)	[0.022]'''	[0.012]	[3.37E-08]	
Switzerland	197	0.749***	0.499	178	0.702***	0.031**	0.518	178	0.710***	0.010	1.46E-07	0.518
	(1717)	[0.028]'''		(1209)	[0.039]'''	[0.012]		(1209)	[0.040]'''	[0.023]	[1.39E-07]	
European Germanic average	*854*	*0.704*** [0.012]'''*	*0.500*	*758*	*0.676*** [0.018]'''*	*0.007 [0.006]*	*0.504*	*758*	*0.672*** [0.018]'''*	*0.018* [0.010]*	*-3.54E-08 [2.92E-08]*	*0.505*
	(7044)			*(4398)*				*(4398)*				
Japan	3135	0.697***	0.441	3116	0.704***	0.023***	0.437	3116	0.700***	0.058***	-1.57E-07***	0.437
	(28106)	[0.006]'''		(27302)	[0.007]'''	[0.006]		(27302)	[0.007]'''	[0.012]	[4.13E-08]	
South Korea	1188	0.743***	0.594	601	0.737***	0.672*	0.592	601	0.688***	0.310***	-4.02E-04	0.594
	(9199)	[0.009]'''		(2235)	[0.024]'''	[0.370]		(2235)	[0.030]'''	[0.098]	[1.51E-04]	
Taiwan	1088	0.846***	0.555	-	-	-	-	-	-	-	-	-
	(7599)	[0.014]'''										
Asian Germanic Average	*5668*	*0.768*** [0.005]'''*	*0.449*	*4005*	*0.728*** [0.007]'''*	*0.025*** [0.064]*	*0.437*	*4005*	*0.724*** [0.007]'''*	*0.055*** [0.011]*	*-1.52E-07*** [4.32E-08]*	*0.437*
	(47108)			*(31231)*				*(31231)*				

Germanic Average	*6265*	*0.759****	*0.448*	*4546*	*0.732****	*0.013****	*0.432*	*4556*	*0.728****	*0.035****	*-8.09E-08****	*0.433*
	(51948)	*[0.005]’’’*		*(34014)*	*[0.006]’’’*	*[0.003]*		*(34014)*	*[0.006]’’’*	*[0.007]*	*[2.20E-08]*	
Argentina	55	0.613***	0.540	10	2.217**	-0.711	0.541	10	2.186**	0.101	-6.24E-04	0.617
	(477)	[0.040]’’’		(37)	[0.973]’	[0.696]		(37)	[1.563]	[0.063]	[3.60E-04]	
Belgium	107	0.847***	0.556	97	0.998***	-0.068**	0.566	97	0.999***	-0.075	-6.12E-08	0.566
	(937)	[0.033]’’’		(626)	[0.049]	[0.029]		(626)	[0.052]	[0.083]	[6.62E-08]	
Brazil	207	0.649***	0.529	76	0.778***	0.060	0.582	76	0.751***	0.134	-7.39E-07	0.584
	(1526)	[0.024]’’’		(325)	[0.072]’’’	[0.048]		(325)	[0.076]’’’	[0.082]	[6.64E-07]	
Chile	132	0.698***	0.498	28	0.211	0.600	0.667	28	2.099***	-0.370***	3.12E-04***	0.866
	(1147)	[0.036]’’’		(54)	[0.551]’	[0.664]		(54)	[0.550]’	[0.104]	[6.84E-05]	
Columbia	21	0.550***	0.430	10	1.359***	-0.904**	0.722	10	1.386***	-0.104	8.15E-06	0.722
	(161)	[0.097]’’’		(39)	[0.275]’	[0.399]		(39)	[0.446]	[0.173]	[1.03E-06]	
Egypt	16	1.005***	0.690	-	-	-	-	-	-	-	-	-
	(121)	[0.127]										
France	550	0.681***	0.536	447	0.671***	0.002	0.490	447	0.672***	-0.001	1.48E-08	0.490
	(4555)	[0.014]’’’		(2141)	[0.026]’’’	[0.008]		(2141)	[0.027]’’’	[0.014]	[4.90E-08]	
Greece	169	0.786***	0.612	128	1.008***	-0.541***	0.675	128	1.043 ***	-0.090***	1.63E-05*	0.677
	(1270)	[0.027]’’’		(697)	[0.049]	[0.207]		(697)	[0.053]	[0.030]	[9.60E-06]	
Indonesia	220	0.664***	0.514	218	0.655***	0.111**	0.519	218	0.661***	0.077	1.23E-06	0.519
	(1742)	[0.021]’’’		(1438)	[0.028]’’’	[0.049]		(1438)	[0.030]’’’	[0.075]	[2.05E-06]	
Italy	201	0.832***	0.623	169	0.909***	0.067	0.613	169	0.902***	0.037	-2.06E-07	0.613
	(1692)	[0.022]’’’		(771)	[0.041]’’	[0.018]		(771)	[0.042]’’	[0.052]	[3.30E-07]	
Jordan	83	0.591***	0.470	64	0.499***	-0.315	0.383	64	0.595***	-0.077	2.15E-03	0.393
	(505)	[0.039]’’’		(181)	[0.097]’’’	[1.553]		(181)	[0.122]’’’	[0.059]	[1.66E-03]	
Luxembourg	29	0.781***	0.600	23	0.853***	0.018	0.687	23	0.853***	0.004	-1.11E-08	0.687
	(221)	[0.061]’’’		(131)	[0.089]’	[0.010]		(131)	[0.090]’	[0.033]	[1.76E-08]	
Mexico	85	0.703***	0.484	62	0.674***	0.017	0.537	62	0.676***	0.015	1.70E-08	0.537
	(707)	[0.041]’’’		(327)	[0.064]’’’	[0.019]		(327)	[0.072]’’’	[0.046]	[3.53E-07]	
Netherlands	117	0.646***	0.566	114	0.629***	-0.002	0.566	114	0.607***	0.036*	-6.89E-08	0.569
	(1048)	[0.029]’’’		(847)	[0.034]’’’	[0.004]		(847)	[0.036]’’’	[0.019]	[3.27E-08]	
Peru	47	0.748***	0.458	17	0.719***	-0.209	0.466	17	0.600***	0.266	-4.56E-04	0.472
	(385)	[0.057]’’’		(79)	[0.178]’	[0.630]		(79)	[0.239]’	[0.389]	[6.11E-04]	
Philippines	141	0.638***	0.535	137	0.601***	0.298**	0.559	137	0.591***	0.428**	-5.15E-06	0.557
	(1142)	[0.029]’’’		(763)	[0.041]’’’	[0.138]		(763)	[0.043]’’’	[0.212]	[6.37E-06]	
Portugal	43	0.803***	0.637	37	0.720***	0.062	0.650	37	0.746***	-0.088	2.93E-06	0.651
	(386)	[0.039]’’’		(180)	[0.066]’’’	[0.076]		(180)	[0.076]’’’	[0.225]	[4.13E-06]	

Spain	112	0.790***	0.633	90	0.873***	0.017	0.654	90	0.833***	0.063**	-3.44E-07	0.657
	(987)	[0.030]'''		(482)	[0.056]''	[0.013]		(482)	[0.060]''	[0.029]	[1.93E-07]	
Turkey	97	0.866***	0.594	91	1.020***	-0.036	0.644	91	1.002***	-0.053	2.23E-07	0.644
	(643)	[0.051]''		(432)	[0.075]	[0.043]		(432)	[0.082]	[0.120]	[1.51E-07]	
Venezuela	15	0.717***	0.605	-	-	-	-	-	-	-	-	-
	(113)	[0.102]''										
French origin average	*2457*	*0.713****	*0.505*	*1835*	*0.762****	*0.005*	*0.510*	*1835*	*0.755****	*0.015***	*-3.93E-08***	*0.510*
	(19856)	*[0.007]'''*		*(9645)*	*[0.012]'''*	*[0.035]*		*(9645)*	*[0.012]'''*	*[0.007]*	*[1.54E-08]*	
Bulgaria	7	0.636**	0.598	-	-	-	-	-	-	-	-	-
	(38)	[0.247]'										
China	1461	0.676***	0.654	121	0.873***	-0.007	0.677	121	0.858***	0.010	-8.15E-08	0.678
	(10155)	[0.010]'''		(593)	[0.042]'''	[0.007]		(593)	[0.044]'''	[0.014]	[6.34E-08]	
Croatia	11	0.381***	0.646	11	1.122***	-0.801**	0.703	11	1.470**	-0.243	8.95E-05	0.709
	(79)	[0.128]'''		(55)	[0.383]	[0.316]		(55)	[0.585]	[0.210]	[1.14E-04]	
Estonia	11	0.767***	0.752	11	0.408	0.187	0.670	11	0.486	0.700	-8.26E-04	0.677
	(80)	[0.078]''		(47)	[0.373]	[0.228]		(47)	[0.574]'	[0.660]	[9.96E-04]	
Hungary	14	0.348***	0.570	14	0.317	0.210	0.603	16	0.383	-0.090	9.69E-06	0.605
	(117)	[0.129]'''		(76)	[0.200]'''	[0.318]		(89)	[0.242]''	[0.691]	[1.97E-05]	
Latvia	13	0.690***	0.552	12	1.117***	-0.825	0.603	12	1.837 ***	-0.035**	1.81E-01	0.633
	(92)	[0.104]''		(54)	[0.272]	[0.532]		(54)	[0.511]'	[0.017]	[1.10E-02]	
Lithuania	25	0.721***	0.750	25	0.781***	-0.257	0.684	25	0.675***	0.120	-3.51E-04	0.689
	(174)	[0.071]'''		(138)	[0.143]'	[0.999]		(138)	[0.167]'	[0.156]	[2.88E-04]	
Poland	153	0.769***	0.645	46	0.802***	-0.063	0.699	46	0.812***	-0.175	3.92E-06	0.700
	(981)	[0.030]'''		(135)	[0.103]'	[0.201]		(135)	[0.113]'	[0.546]	[1.78E-05]	
Russia	83	0.755***	0.561	40	1.044***	-0.010	0.661	40	1.150***	-0.056	1.81E-07	0.669
	(509)	[0.050]'''		(140)	[0.157]	[0.017]		(140)	[0.172]	[0.036]	[1.24E-07]	
Socialist average	*1871*	*0.699****	*0.597*	*368*	*0.836****	*-0.002*	*0.606*	*368*	*0.820****	*-0.005*	*-4.07E-09*	*0.588*
	(12863)	*[0.009]'''*		*(1598)*	*[0.028]'''*	*[0.006]*		*(1598)*	*[0.033]'''*	*[0.012]*	*[5.28E-08]*	

Standard errors within brackets. Numbers in parenthesis represents the number of observations included. ***, ** and * indicates significantly different from zero on a 1, 5 and 10 per cent level respectively. ''', '' and ' indicates significantly different from 1 on a 1, 5 and 10 per cent level respectively.