Ownership Concentration and Firm Performance:

Evidence from Sweden

Abstract

This thesis investigates the relationship between firm performance and ownership concentration in Swedish firms. We find a negative nonlinear relationship, providing support for both a positive effect of ownership concentration, attributed to efficient monitoring, and a negative effect, attributed to expropriation of minority shareholders. Subsample analyses based on the estimated importance of these two factors support the indication that they are two key determinants for the relationship between ownership concentration and performance. Based on these findings, this paper argues that the benefits of monitoring are weak in Sweden relative to the costs associated with the risk of expropriation.

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1 Introduction

The role of ownership structure in corporate governance is the subject of extensive debate. Ownership concentration, one of the central aspects of ownership structure, and its effects on agency costs remains one of the unresolved topics in this debate. We investigate the relationship between firm performance and ownership concentration in Swedish firms, exploring financial aspects of corporate governance phenomena by working from a foundation in agency theory. Agency theory in part leads to the expectation that firm performance increases with ownership concentration, as improved monitoring helps mitigate the principal-agent problem between the firm and its managers. Conversely, conflicting interests may cause firm value to decrease as ownership concentration increases, as large shareholders are increasingly able to expropriate minority shareholders.

The discussion of these two effects has proven difficult to resolve as previous research has been ambiguous and inconsistent across different countries, yielding a mix of findings comprising negative linear relationships, positive linear relationships, and nonlinear relationships. We aim to contribute towards clarifying this relationship and why it may differ between countries and to provide the first such evidence from Sweden. With agency theory as the basis for our hypothesis, we expect to find a nonlinear relationship between ownership concentration and firm performance. If ownership concentration creates a positive effect from benefits to monitoring, but can also cause expropriation of minority shareholders, it is likely that the relative strength of these two effects will vary across the ownership concentration spectrum, resulting in a nonlinear relationship.

Using ownership data on Swedish OMXS firms, we construct a measure of ownership concentration as represented by the percentage of votes held by the largest shareholder to explain variations in firm performance, represented by an approximation of Tobin's Q. We control for key financial factors as well as temporal and industry effects and perform a panel estimation using the system generalized method of moments estimator to address endogeneity issues as well as unobservable heterogeneity. Our findings indicate an overall negative correlation for Swedish firms, but also show support for a cubic shape in the relationship, changing from negative to positive and back as ownership concentration increases. This

indicates that for Swedish firms, while the benefits of effective monitoring dominate the relationship in a certain interval of ownership concentration, they are overall offset by the adverse effects of expropriation. We discuss national differences and the relative strength of the monitoring and expropriation factors and, putting Sweden into this context, why this may be the case. To test the assumption of monitoring and expropriation as the main determinants of the concentration-performance relationship, we perform simple subsample analyses on dataset segments across which we expect the value of monitoring or the risk of expropriation to differ. We find support for the relevance of these two factors in results that are in line with our expectations.

The paper is organized as follows: Section 2 covers the theoretical background, discussing agency theory and how it relates to ownership structure and corporate governance. Section 3 presents the previous empirical literature and gives an idea of what the results have shown. In Section 4, the dataset is presented and the methodology is outlined. Section 5 presents the results from our panel estimations and subsample analyses. Section 6 collectively analyzes and discusses the results from in an international context. Lastly, Section 7 gives our conclusion, discusses the limitation of this study and gives some direction for future research.

2 Ownership and agency theory

The idea of a possible correlation between ownership concentration and firm performance across firms inherently assumes that not all firms optimize their ownership structure: if ownership is always idiosyncratically optimal in each firm, then a common relationship should not be found. However, given that firms do not control who buys their shares to any large extent and thus have little influence over the ownership structure, the assumption that all firms *do* have an optimal ownership structure is not reasonable. While it may intuitively seem as though the owners themselves would want to optimize the ownership structure, one of the main premises of this study is that an owner's profit maximization is not necessarily in line with that of the firm due to conflicting interests (Shleifer and Vishny, 1997). An owner's profit maximization may be directly conflicting with the firm's interests and reduce its performance through different mechanisms of expropriation, as we will show in Section 2.2. Thus, the conclusion is that the possible divergence of interests between a firm and its owners can cause sub-optimal ownership structures.

2.1 Corporate monitoring

The agency conflict between managers and shareholders has long been the subject of much academic literature. The separation of ownership and control was first discussed by Berle and Means (1932). Mapping the resulting conflicts of interests, and assessing the efficacy of different methods to deal with them has since been an important topic in corporate governance literature. The interests of a firm's managers and its owners need not coincide and indeed it seems they often do not; one of the most commonly cited examples of agency costs is that incurred by shareholders due to managerial profligacy, expressed as any of a number of wasteful behaviors, from empire building to executive perquisites. Viewing the relationship between a firm's owners and its managers in the context of the agency dilemma, when the incentives of the principal (the owners) and the agent (the managers) are not aligned, supervision is required in order to mitigate the issue of asymmetric information and to ensure that the agent is working in the principal's best interests.

Grossman and Hart (1986) and Shleifer and Vishny (1986) argue that larger shareholders are more efficient in monitoring management themselves due to increased incentives in alignment with firm profitability. Shleifer and Vishny discuss a number of mechanisms by which this can be achieved and according to Javid and Iqbal (2008), evidence

suggests that large shareholders compared to small shareholders not only have larger incentives but also better opportunities of influencing management. In this context, concentrated ownership allows for greater ability to monitor management and makes the cost of monitoring lower. This would imply that concentrated ownership should have a positive effect on performance, absent any other effects.

2.2 Expropriation

While the agency conflict between owners and managers outlined above has historically received the most focus, there is another conflict of interests for which ownership concentration is relevant: that between controlling owners and minority shareholders. Conflicts will naturally arise wherever an owner's profit maximization does not coincide with the firm's, as is, for example, the case when voting rights and cash flows rights are not proportional. When this is the case, controlling owners can often transfer resources out of the firm in different ways at the expense of minority owners, a process commonly referred to as expropriation of minority shareholders, or tunneling (Johnson et al., 2000). One clear and simple example of a common situation of disparity between control and cash flow rights is pyramidal ownership structures. If an investor owns 50% or more of the equity in a firm A which in turn owns 50% or more of a subsidiary B and so on, then the investor will have majority influence and thus complete control over subsidiary N while only being entitled to a fraction of its cash flows. In these situations, it is easy to see how incentives for expropriation of minority shareholders can arise where control makes it possible to divert resources from a firm.

There are many ways in which tunneling can take place, and Atanasov et al. (2007) divide the phenomenon into three main categories: asset tunneling, cash flow tunneling and equity tunneling. Asset and cash flow tunneling include the transfer or sale of assets or goods at below-market prices, or the purchase of goods at above-market prices, to intermediaries controlled by the owner, negatively impacting the firm. Equity tunneling refers to the process of a controlling owner to augment its share of the firm's value, through methods like freeze-outs and dilutive offerings.

Pecuniary benefits of control like these suggest that a concentration of ownership may negatively impact firm value, when incentives for expropriation exist. Expropriation does not need to actually take place in order for the phenomenon to constitute a cost to the firm. The mere risk of expropriation may cause minority shareholders to require a premium, thus

raising the cost of capital and causing investment inefficiency (Chen et al., 2003). Claessens et al. (1999) show that deviations of voting rights from cash flow rights are associated with lower market values in East Asian firms. Similarly, Cronqvist and Nilsson (2003) find that owners with controlling voting rights without commensurate cash flow rights negatively impact firm value.

3 Empirical results in previous literature

While the theoretical foundation gives an idea of the nature of the relationship between ownership concentration and the factors shaping it, it is not sufficient to predict when the benefits of monitoring outweigh the cost of expropriation. The relative strengths of these two forces are likely to depend largely on national factors, and indeed the empirical work on the topic has produced ambiguous results. Demsetz and Lehn (1985) first investigated the relationship empirically. Using different measures of ownership concentration (percentage of shares held by the five and the twenty largest shareholders as well as a Herfindahl measure) they found no significant link between ownership concentration and accounting profit rate in a sample of 511 US firms. Holderness and Sheehan (1988) similarly find no systematic effect on performance by large U.S. shareholders.

In continental Europe, studies have generally shown a positive effect from blockholders. Claessens and Djankov (1999) find a positive effect of ownership concentration on firm profitability and labor productivity for a cross-section of 706 firms in the Czech Republic over the period 1992 through 1997. Earle et al. (2005) find that the size of the largest blockholder in firms listed on the Budapest Stock Exchange increases profitability and efficiency. De Miguel et al. (2004) find support for both the monitoring and the expropriation effects in a quadratic relationship between firm performance and ownership concentration in a sample of 135 Spanish firms, and Iturriaga and Crisóstomo (2010) find a positive relationship between performance and ownership concentration in Brazilian firms, though they also find evidence for the negative effects in a nonlinear relationship for firms with growth opportunities. Gedajlovic and Shapiro (1998) investigate the relationship in five different countries, discussing national factors that may affect it. They find no statistically significant relationship in Canada, the U.K. or France, but find a significant quadratic relationship in the U.S. and German samples.

Studies on East Asia have also generally shown evidence of a positive relationship. Xu and Wang (1999) find a positive correlation between firm profitability and ownership concentration in China. Morck et al. (2000) find that equity ownership by corporate blockholders is positively related to firm value in Japan. Gedajlovic and Shapiro (2002) similarly find a positive relationship between ownership concentration and financial performance in Japanese firms, and further build on their 1998 discussion on national factors and emphasize the need to account for economic incentives as well as social context.

As is apparent from this short review of results, the field has produced ambiguous research. Hu and Izumida (2008) argue that the failure of existing literature in achieving consistent and convincing results is partly due to the deficiency in previous studies with regard to the national context, what they call the realities of the corporate governance environment. Though many studies discuss that varying results across nations are the result of differences in the institutional environment across nations, not much is known about which factors are the most important drivers and by what mechanisms and to what extent they influence the proposed relationship between ownership structure and firm performance. As previously mentioned, Iturriaga and Crisóstomo (2010) find support for the hypothesis that in Brazil the negative effects of concentrated ownership, manifested as expropriation, are more apparent in companies with growth opportunities. Durnev and Kim (2006), however, contend that in firms suffering from a drop in investment opportunities the controlling shareholder divert more firm resources. This phenomenon is supported by observations made of Asian firms by Johnson et al. (2000). La Porta et al. (2002) shift the focus of the determinants of expropriation by linking it to legal protection of investors, and discuss how the relationship between ownership concentration and performance varies with the legal environment, being more prominent in countries where investors are less protected.

Due to the ambiguity of previous empirical results, we lean on the theoretical framework outlined in Section 2 and expect to find a nonlinear relationship between ownership concentration and firm performance.

4 Data & Methodology

4.1 Sample

Ownership data for 271 OMXS listed firms was obtained from the database SIS Ägarservice which tracks data on ownership and insider trades for some 550 Swedish firms. Firms listed on smaller exchanges such as First North were not included due to the likely presence of confounding outliers as well as the looser exchange regulations. SIS Ägarservice lists ownership data on the 50 largest shareholders at a given point in time. The frequency of observations varies but at least annual data is available for all firms. To better reflect owner influence, percentage of votes has been used instead of percentage of shares for our ownership concentration, the disparity being sometimes rather large because of dual class shares. Since companies are unable to exercise voting rights that would stem from stock buybacks, the voting rights data has been modified by SIS to account for the effects of stock buybacks and other diluting or concentrating effects.

Annual accounting data was acquired from the Orbis database, and upon the merging the two datasets, any firms present in only one of them were dropped. The final dataset, after merging and formatting, consists of an unbalanced panel comprising 185 firms and spanning 10 years starting 2005. The sample contains annual ownership data as well as market capitalization, total assets, total liabilities, intangible assets and operating revenue.

4.2 Variables

Approximate Q

Our performance measure and dependent variable, computed as the market value of equity and debt divided by the book value of total assets, following Chung and Pruitt (1994). They show that at least 96.6% of the variability of a more theoretically correct construction of Tobin's Q is explained by this approximate Q. The intuition behind this measure is that the ratio of the firm's market value to the value of its assets represents the value added by the firm's operations - the market value of its performance.

Ownership concentration (OC)

A number of different measures of ownership concentration have been used in the literature. We use the percentage of shares held by the largest shareholder, which is one of the most

widely employed measures. We use SIS data corrected for differences between capital share and voting rights stemming from dual-class shares, to capture the control of owners.

A Herfindahl index was considered, as this would theoretically optimally capture differences in ownership distribution by including all shareholders. However, after computing both measures, we find that they have a correlation of 0.964. Thus, seeing no reason for using a more complex measure with very limited potential benefits, we elect to employ the simple and more easily interpreted measure. As we may find a nonlinear relationship, any local maxima or minima would be of interest, and in such a situation a Herfindahl measure could not be properly translated into a tangible, practical number.

For the nonlinear model, OC^2 and OC^3 refer to the square and cube of the concentration measure, respectively.

Firm size (S)

The control variable for firm size is computed as the logarithm of total assets. Firm size is controlled for mainly to avoid any bias in the results attributable to economies of scale or other size-related factors affecting performance.

Growth (G)

Revenue growth is included to capture product cycle effects and possible positive effects on performance due to growth phases. It is measured as the year-to-year percentage growth in operating revenue.

Debt-to-equity ratio (D/E)

The debt-to-equity ratio is controlled for to capture any effects of capital structure on performance. It is defined as the ratio of total liabilities to shareholders' equity.

Intangible assets (IA)

Because intangible assets by nature are hard to value, it is quite probable that they would affect our dependent variable. Any over- or undervaluation of intangible assets would contribute to the disparity between the firm's market value and its asset book value. The *IA* variable is defined as the ratio of intangible assets to total assets.

Time and industry dummies

In addition to the control variables presented, the model also contains dummy variables for time and industry effects to account for macroeconomic factors and disparities in Q-ratios between industries, respectively.

4.3 Model

The main model to be estimated is the following:

$$Q_{it} = \beta_0 + \beta_1 OC_{it} + \beta_2 S_{it} + \beta_3 G_{it} + \beta_4 D_{it} + \beta_5 IA_{it} + u_{it}$$

When estimating this model, there are a few problems that need to be addressed. First, there is the issue of endogeneity. All of explanatory variables may be determined simultaneously with performance, or there may be reverse causality. Secondly, there may be unobservable time-invariant heterogeneity, or individual fixed effects which would be captured by the error term. Thus, $u_{it} = v_i + \varepsilon_{it}$ where v_i is the firm's idiosyncratic effect and ε_{it} is the random disturbance.

Previous literature has been unable to identify any qualifying instrumental variables to disentangle the endogeneity problem, so to address these issues, we perform our panel estimation using the generalized method of moments, constructing instrumental variables from lagged values of the variables in the model, following De Miguel et al. (2004), Javid and Iqbal (2008) and Iturriaga and Crisóstomo (2010). This makes the instruments predetermined in the time period *t* and thus theoretically uncorrelated with u_{it}. The individual fixed effects are purged from the equation by first-differencing it:

$$\Delta Q_{it} = \beta_1 \Delta OC_{it} + \beta_2 \Delta S_{it} + \beta_3 \Delta G_{it} + \beta_4 \Delta D_{it} + \beta_5 \Delta IA_{it} + \Delta u_{it}$$

Since $v_{it} = v_{it-1}$, it follows that $\Delta v_{it} = 0$ and thus $\Delta u_{it} = \Delta \varepsilon_{it}$. However, because lagged levels of the variables are likely to be poor instruments for the first differences, we use the system GMM estimator, wherein we add the level equation and obtain additional instruments under the assumption of no correlation between the first-differences of instruments and the fixed effects. We employ the robust version of the estimator to avoid bias due to panel-level autocorrelation or heteroskedasticity.

4.3.1 Instruments and robustness

The main decision to make with this estimator is which lags to include as instruments. While additional instruments tend to increase efficiency, using too many will cause the model to overfit the endogenous variables while simultaneously weakening the test of the instruments' joint validity. This instrument proliferation is a common trap discussed extensively by Roodman (2009). The only existing rule of thumb is for the number of instruments to not exceed the number of groups in the panel (in our case 185), but since this is a rather arbitrary level, Roodman argues that it is important for researchers to check the robustness of their results with regard to the number of instruments used.

The validity of the estimator depends on the exogeneity of the instruments used. While the idea is that lagged values are predetermined in the time period *t* and thus uncorrelated with u_{it}, this is not necessarily a reasonable assumption. The argument could be made that without sufficient temporal distance between *t* and the lags used, there may still be endogeneity in the instruments. Let us, for example, suppose that there is a certain level of reverse causality and that performance – or a type of firm corresponding to a certain level of Q-ratio – determines ownership structure to some extent by attracting a certain type of investor. It is also reasonable to assume that an informed investor can have some notion of a firm's performance some time into the future. Thus, it is necessary for lags to be sufficiently temporally removed from the time period being estimated for the instruments to be reliably exogenous. The Hansen test is used address the importance of instrument exogeneity. The Hansen statistic is asymptotically chi-squared under the null hypothesis of no such correlation (i.e. the instruments are exogenous). For the linear model, lags from *t-2* and *t-3* are used. Due to its weakness to instrument proliferation, we use Hansen test results to choose the optimal lags for the nonlinear model as shown in section 5.3.2. We also report the Arellano-Bond test for second-order autocorrelation of the first-differences, with a null hypothesis of no autocorrelation, since the presence thereof would mean autocorrelation in the levels. These two tests constitute the main robustness checks called for by our estimator.

5 Results

The results are organized into four sections. First, we present descriptive statistics of the dataset. We present the ownership concentration-performance relationship graphically using scatterplots, finding a visual indication of a negative relationship and show Spearman correlations which support this.

Secondly, we present estimation results for the linear model. These results confirm the presence of an overall negative relationship between firm performance and ownership concentration, even after controlling for endogeneity. We present robustness tests showing the absence of autocorrelation as well as the Hansen test of the instruments' joint validity.

Next, we present the estimations of nonlinear models. We find no support for a quadratic model, but find strong and significant support for a cubic relationship. We use the Hansen test to choose the instrumental lags for our final model and show that these are convincingly exogenous with no instrument proliferation bias.

Lastly, we test our hypothesis with regard to the role of monitoring and expropriation in the interplay between ownership concentration and performance by dividing the dataset into subsamples where we would expect these two forces to differ. First, we divide the data into four segments based on the firms' total assets. The intuition is that in larger firms, there is more room for managerial profligacy, and therefore the value of effective monitoring increases. Secondly, we compare two subsamples based on the disparity between voting rights and cash flow rights. We expect firms where these rights are aligned to have a more positive concentration-performance relationship due to the lower risk of expropriation.

5.1 Summary statistics

Table 1. Descriptive statistics of model variables

	Mean	Median	Standard deviation	Observations
Q	1.818747	1.311886	1.782141	1557
OC	0.298393	0.251	0.1863407	1824
S	21.444	21.12472	2.01593	1641
G	0.2190698	0.0550304	1.462511	1430
D/E	1.363221	1.144429	2.373654	1641
IA	0.2509979	0.2310819	0.2013553	1462

Table 2. Ownership concentration three ways: stake held by the largest owner, the 50 largest owners, and a Herfindahl measure

Concentraton measure	Obs	Mean	Std. Dev.	Min	Max
Largest	1824	.298393	.1863407	.015	.9
50	1824	.746975	.1533376	.0485462	.9845526
Herfindahl	1824	.1535907	.1494329	.000369	.8106545

As can be construed from Table 1 the dataset contains a varying number of observations for the different variables, owing to inconsistencies in the data from the Orbis database. Standard deviations are generally relatively high compared to the mean and median, and especially so for growth in operating revenue (G). In light of this there should not be a problem with lack of variance in the variables. As to the data distributions, mean and median matches up quite well for all the variables with growth in operating revenue as the only anomaly.

We see an average ownership concentration at 29.8% of votes held by the largest shareholder. This is closer to what Gedajlovic and Shapiro (1998) found for U.S. and U.K. firms (18.96% and 21.00% respectively) than for France and Germany (46.89% and 68.48% respectively). Table 2 displays three measurements of ownership concentration and shows that firms with a wide range of concentrations are represented in the sample.

Diagram 1: Scatterplot of ownership concentration-performance relationship for Q < 10

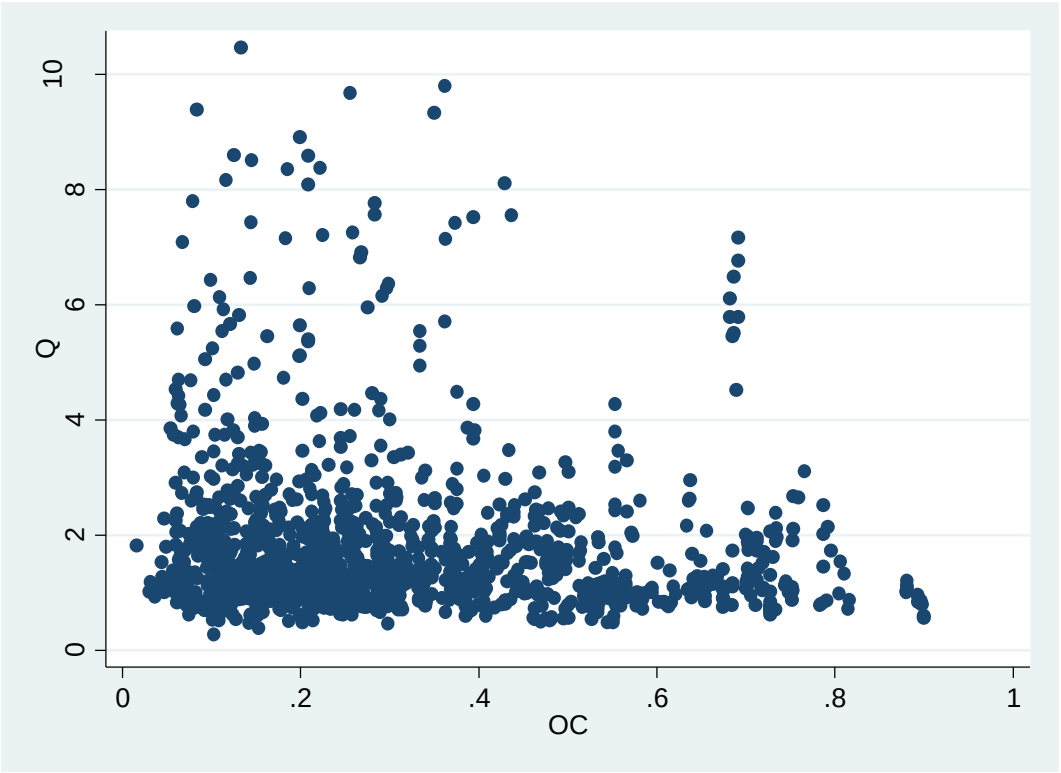
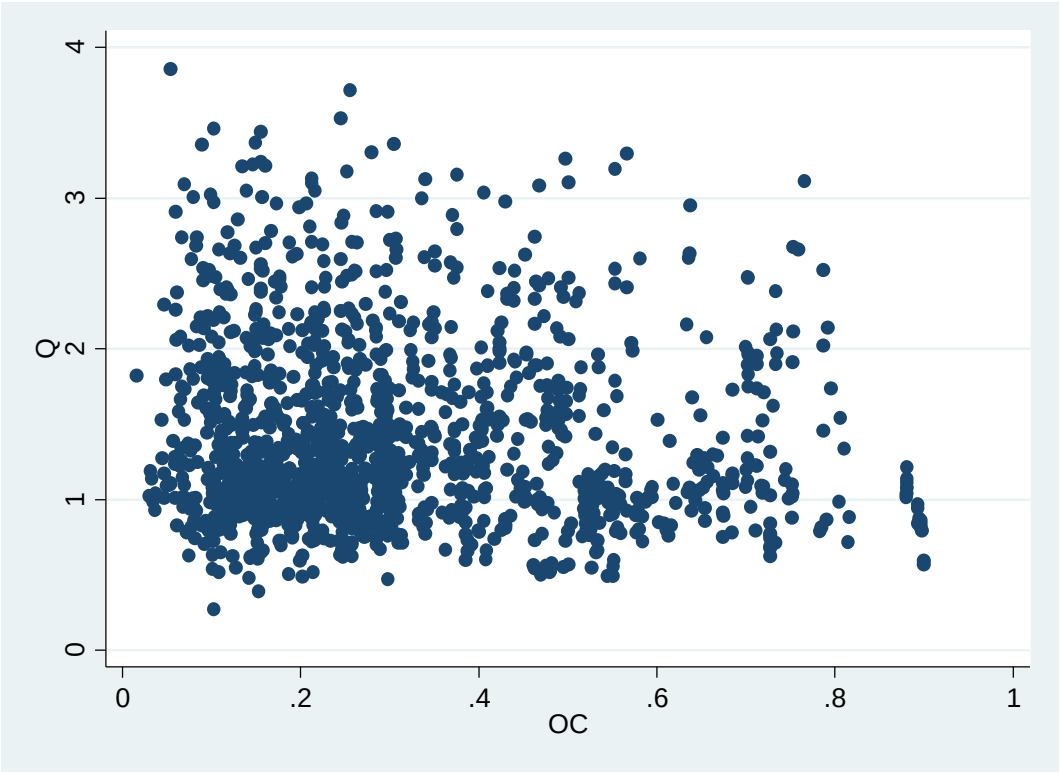


Diagram 2: Scatterplot of ownership concentration-performance relationship for Q < 4



The scatterplots show that the majority of observations appear at ownership concentrations below 40% and Q-ratios below 2. However, the spread across the sample should be enough for this not to be an issue. There appears to be an overall negative relationship between ownership concentration and performance. This is supported by the Spearman correlations presented in table 3.

Table 3. Spearman correlations for control variables

	Q	OC	S	G	D/E	IA
Q	1.0000					
OC	-0.0930	1.0000				
S	-0.1982	0.1453	1.0000			
G	0.2604	-0.0051	-0.0738	1.0000		
D/E	-0.1543	0.0654	0.3640	-0.0295	1.0000	
IA	0.0113	-0.0510	-0.0738	0.0545	-0.0287	1.0000

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5.2 Linear model estimation

We estimate the following model:

$$Q_{it} = \beta_0 + \beta_1 OC_{it} + \beta_2 S_{it} + \beta_3 G_{it} + \beta_4 D_{it} + \beta_5 IA_{it} + u_{it}$$

We use lags from *t-2* and *t-3* as instruments to control for endogeneity. We find a highly significant ($p<0.001$), negative coefficient for ownership concentration. All control variables are significant at the 2% level except for revenue growth. This is not unintuitive however, as the model estimates how performance depends on revenue growth – a relationship which is quite likely to, if anything, run in the opposite direction (a firm performing well is likely to enjoy a growth in revenue). Thus, the fact that the growth term is the only one to lose significance in the endogeneity-controlled model compared to a simple regression (in which it is significant at the 5% level, Appendix 1) is reassuring with regard to the ability of the

model to detect and expunge endogeneity bias. Table 4b shows that the null hypotheses of the Arellano-Bond test of autocorrelation as well as the Hansen test of instrument exogeneity are not rejected, affirming the validity of our results.

Table 4a: System GMM estimation of linear ownership concentration-performance model using lags from *t-2* to *t-3* as instruments.

OC	-3.039***
	(0.977)
S	-0.381***
	(0.128)
G	0.128
	(0.0859)
D/E	-0.0550**
	(0.0223)
IA	-3.077***
	(0.992)
Observations	1,251
Number of groups	185
Number of instruments	159

Standard errors in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 4b: Robustness tests for GMM estimation

	Test statistic	p-value
Hansen test of overid. restrictions	144.99	0.173
Arellano-Bond test of autocorrelation	-0.59	0.554

5.3 Nonlinear model estimation

5.3.1 Quadratic model

In order to allow the estimation to account for both the positive and the negative effects of ownership concentration, we estimate a quadratic model, specified as follows:

$$Q_{it} = \beta_0 + \beta_1 OC_{it} + \beta_2 OC_{it}^2 + \beta_3 S_{it} + \beta_4 G_{it} + \beta_5 D_{it} + \beta_6 IA_{it} + u_{it}$$

We find no support for the quadratic model: the quadratic ownership term OC^2 is insignificant at any conventional level. This contradicts our hypothesis which predicted a nonlinear relationship between firm performance and ownership concentration.

Table 5a: System GMM estimation of quadratic ownership concentration-performance model using lags from *t-2* to *t-3* as instruments.

OC	-6.653**
	(2.904)
OC^2	5.205
	(3.404)
S	-0.355***
	(0.122)
G	0.112
	(0.0768)
D/E	-0.0530**
	(0.0218)
IA	-2.615***
	(0.966)
Constant	11.54***
	(2.778)
Observations	1,251
Number of groups	185
Number of instruments	182

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5b: Robustness tests for GMM estimation

	Test statistic	p-value
Hansen test of overid. restrictions	161.19	0.290
Arellano-Bond test of autocorrelation	-0.6	0.547

To ensure that no such relationship is overlooked, we go one step further in investigating the potential nonlinearity of the relationship by estimating a cubic model.

5.3.2 Cubic model

The model is specified as follows:

$$Q_{it} = \beta_0 + \beta_1 OC_{it} + \beta_2 OC_{it}^2 + \beta_3 OC_{it}^3 + \beta_4 S_{it} + \beta_5 G_{it} + \beta_6 D_{it} + \beta_7 IA_{it} + u_{it}$$

For the cubic model, the instrument count becomes more of an issue due to the additional orders of the ownership term. To address this, we use the Hansen test to find the optimal lags to use.

Table 6. Results of Hansen test for different lags

Lags used	*t-2* to *t-3*	*t-2*	*t-3*
Number of instruments	205	150	134
Hansen statistic *(p-value)*	166.89 *(0.637)*	145.88 *(0.048)*	116.09 *(0.178)*

Using lags from both *t-2* and *t-3* of the independent variables, as in the linear model, results in an instrument count of 205, which is higher than the number of groups in the panel (185), and thus violating the rule of thumb stating that the number of instruments should not surpass the number of groups in the panel. This is cause for concern with regard to instrument proliferation, which would overfit the endogenous variables while simultaneously weakening the Hansen test. Indeed we see a Hansen p-value of 0.637, which is conspicuously high and most likely due to bias stemming from the instrument count. Roodman (2009) emphasizes that unreasonably high Hansen p-values are indeed a tell-tale sign of instrument proliferation.

To rectify this, we perform the estimation using only lags from *t-2* to reduce the instrument count and test the robustness of our results. The results of the estimation are similar (see table 7a) and all three ownership variables are still significant at the 5% level, but we see a Hansen p-value of 0.048. While this indicates that instrument proliferation is no longer an issue, the low p-value makes us reject the null hypothesis of exogeneity in the instruments. Therefore, we perform the same estimation using lags from *t-3*, as the larger temporal distance should help avoid endogeneity in the instruments. This model yields a Hansen p-value of 0.178, which is very reassuring because this model uses even fewer

instruments than the one using *t-2* lags, meaning that the Hansen statistic should not be biased by the instrument count, and the p-value is still high enough that the instruments can be considered convincingly exogenous.

Table 7a: System GMM estimations of cubic ownership concentration-performance model, using different time period lags as instruments.

	t-2 to *t-3*	*t-2*	*t-3*
OC	-18.85***	-20.45***	-25.18***
	(7.104)	*(7.614)*	*(9.368)*
OC^2	42.42**	47.18**	64.15***
	(19.16)	*(20.84)*	*(24.63)*
OC^3	-30.56**	-34.18**	-48.16**
	(15.23)	*(16.63)*	*(19.12)*
S	-0.342***	-0.400***	-0.414***
	(0.118)	*(0.132)*	*(0.145)*
G	0.0777	0.0813	0.0580
	(0.0616)	*(0.0608)*	*(0.0593)*
D/E	-0.0442**	-0.0385**	-0.0396**
	(0.0199)	*(0.0182)*	*(0.0193)*
IA	-2.683***	-3.040***	-2.056**
	(0.913)	*(0.962)*	*(0.807)*
Constant	12.38***	13.95***	14.28***
	(2.916)	*(3.156)*	*(3.683)*
Observations	1,251	1,251	1,251
Number of groups	185	185	185
Number of instruments	205	150	134

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table 7b: Robustness tests for GMM estimation using lags from *t-3*

	Test statistic	p-value
Hansen test of overid. restrictions	116.09	0.178
Arellano-Bond test of autocorrelation	-0.74	0.461

As in the linear model, we see significance in all explanatory variables except for revenue growth. Using the coefficients in the *t-3* lags model to differentiate performance with respect to ownership concentration, we find local minimum followed by local maximum at

approximately OC = 0.293 and OC = 0.595 respectively, suggesting that an increase in ownership concentration has a negative effect on firm performance except within a certain interval, between approximately 30% and 60% of votes held by the largest shareholder. These numbers should not be regarded as definitive points for firms to consider, but rather as an indication of the relationship's nonlinearity, and turning points of a trend at the aggregate level. Taken at face value however, the local minimum around 30% concentration implies that the average firm (OC=29.8%) does not properly capture the benefits of monitoring.

5.4 Subsample analyses

It is generally accepted that the ownership concentration-performance relationship is mainly driven by the relative strength of monitoring benefits and expropriation costs. To investigate this, we compare coefficients of the ownership term in regressions of subsamples where the importance of these two opposing forces should be different.

Note that endogeneity and heterogeneity are not controlled for here as the method employed in our main panel estimation would yield too high an instrument count relative to the number of firms in the subsamples. However, since this analysis is only meant to indicate differences in coefficients across subsamples, accurate model estimations per se are not the goal.

5.4.1 Value of monitoring

To test the importance of monitoring for the concentration-performance relationship, we divide the dataset into four parts, based on quartiles of firm size (total assets). Because larger firms intuitively have more room for managerial profligacy, we expect that the value of monitoring increases with firm size. As a result, we should see a performance-concentration relationship that is more positive in the subsamples of smaller firms and increasingly negative as firm size increases.

Table 8: OLS regressions on subsamples by firm size.

	DATA SEGMENT****			
	1	2	3	4
OC coefficient	-2.506***	-1.271**	-0.508**	0.618***
	(0.687)	*(0.595)*	*(0.236)*	*(0.234)*

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1
****Data is divided into segments based on quartiles of asset value.

The results are conformant to our expectations, as we see an increasingly positive effect of ownership concentration on performance as the theoretical need for monitoring increases. This indicates that the monitoring effect is indeed a significant factor driving the value of ownership concentration.

5.4.2 Risk of expropriation

By similar logic, we compare two subsamples divided on the basis of the separation of voting rights and cash flow rights. Because the disparity between these rights creates incentives for expropriation, we would expect to see a more negative concentration-performance relationship for firms with high control-ownership separation. Thus, we compute the ratio of the portion of votes held by the largest holder to the portion of equity owned. We split the dataset at a ratio of 2, i.e. the point at which the voting rights of the largest owner are twice as large as the cash flow rights.

Table 9: OLS regressions on subsamples by disparity between votes and cash flow rights

	Ratio between voting rights and cash flow rights	
	<2	>=2
OC coefficient	-0.797***	-1.243**
	(0.287)	*(0.498)*

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Again, the results are in line with our expectations. We see that while the ownership coefficient is negative for both subsamples, it is roughly three times as large for the sample with larger theoretical incentives for expropriation (ratio>2). It should be noted, however, that separating the dataset at a ratio of 1.5 instead produces some ambiguity as it yields a more negative coefficient for the <1.5 subsample (Appendix 2). However, it is reasonable to assume that this level of separation of voting and cash flow rights is too low for the effect to be observed. Thus, the arguably arbitrary ratio of 2 was used because it represents a large enough disparity to capture the hypothetical effect while still allowing for sufficient subsample sizes.

6 Analysis and discussion: Sweden in the international context

Our main panel estimation yielded interesting and somewhat unexpected results. While we were right in expecting a nonlinear relationship, the negative nature of it is different from what has generally been found in continental Europe. It indicates that for Swedish firms, while the benefits of effective monitoring dominate the relationship in a certain interval of ownership concentration, they are generally offset by the adverse effects of expropriation. The deviation in results can be attributed to a difference in the relative importance of expropriation and monitoring.

Putting Sweden into a context of international comparison helps in interpreting the results. Hu and Izumida (2008) argue that the benefits and costs of ownership concentration should vary across regions depending on national and local institutions. Particularly, Hu and Izumida summarize what they identify as the main dichotomous line of theory as the division of countries by their systems of corporate governance into either a market-oriented system (Anglo-American) or an insider-oriented system (European Japanese), the main difference being that because of a set of factors (inter alia less legal protection of investors, lower stock market liquidity and generally higher ownership concentration) monitoring by shareholders is more important for firm performance in countries belonging to the insider-oriented system than the market-oriented system. The feasibility of this grouping is questionable. Sweden, for instance, is difficult to categorize into either system as it shares characteristics with both groups. Lekvall (2009) likens ownership concentration in Sweden with continental Europe. However, in our sample, average ownership concentration of approximately 30% falls very short of the levels reported by Gedajlovic and Shapiro (1998) of 46.89% and 68.48% for French and German firms respectively, and is not that far off their findings of 18.96% and 21.00% for U.S. and U.K. firms respectively, so comparison on this point is somewhat ambiguous.

Many studies share the reasoning of Hu and Izumida, but avoid cementing the proposed dichotomy and consider the different aspects of national corporate governance system separately. In conjunction with their investigation into the relationship between ownership concentration and firm performance in five different countries Gedajlovic and Shapiro (1998) propose a number of factors likely to affect the nature of the relationship between ownership concentration and performance. Similar factors are proposed by de Miguel et al. (2004) and included in the two studies are: national level of ownership concentration, the effectiveness of boards (number of tiers, level of independence,

representation of employees), managerial independence and control mechanisms (antitrust legislation and threat of corporate takeover), activity of national market for corporate control, legal protection of investors, need for external funding (disclosure rules), and the identity of large shareholders (foreign or domestic, distant or active, private or institutional). In this section some of these factors provide the basis for an attempt to interpret our results in terms of the monitoring and expropriation effects which are believed to drive the concentration-performance relationship.

6.1 Monitoring in Sweden

First let us consider the apparently weak effect of monitoring benefits. The reasoning behind expecting a positive effect of ownership concentration stems from the benefits of increased ease of monitoring, reducing costs and inefficiencies of monitoring and reducing managerial agency costs. In Sweden several indicators make for reason to believe that costs of monitoring as well as managerial agency costs are already low when put into an international context.

Efficacy and independence of the Board of Directors (BOD) are important determinants of the importance of managerial monitoring by shareholders and the severity of agency problems. In Sweden, BOD independence is high, meaning that managers have little influence over the BOD, which limits managerial autonomy. Lekvall (2009) notes that only one member of a company's (or one of its subsidiaries') executive management team may be part of the BOD (an option only utilized in half of all Swedish companies - leaving the remaining completely non-executive) and that a majority of the board must be independent of the company and its management. He also notes that Swedish companies apply neither the one-tiered (Anglo-American system) nor the two-tiered (German system) BOD structure, as outlined by Baums (1996), but uses a hierarchical structure, where the BOD answers directly to the general shareholders' meeting, and the CEO is responsible under the board of directors. These measures make for a high level of BOD independence and consequently, low managerial autonomy, decreasing the need for monitoring by shareholders. Here it should also be noted that included in the official task of Swedish auditors is the responsibility to audit the work of the BOD and the CEO. In short, Sweden has substantial regulations in place to passively ensure corporate monitoring, thus lowering the value of additional monitoring efforts compared to countries that lack these regulations.

6.2 Expropriation risk in Sweden

The most compelling explanation for the relative strength of expropriation in Sweden lies in the separation of control and cash flow rights. As discussed in the theoretical background, any conflict of interests between a firm and its owners will naturally increase as control and cash flow rights diverge. One mechanism driving this type divergence is superior voting rights, an area in which Pajuste (2005) describes Sweden as quite unique, exemplified by the highest percentage of firms with dual-class shares (46%) and a very large difference in the voting rights belonging to the different share classes. Swedish A-class shares often have upwards of 10 times the voting rights of B-class shares, which means that a controlling owner can easily hold 50% of the votes in a firm while only being entitled to 5% of its cash flows. In these situations, it is easy to see how incentives for expropriation can arise. Given Sweden's unique situation with regard to the separation of voting rights and cash flow rights, it is quite conceivable that the risk and/or prevalence of expropriation would be higher. This explanation is supported by our findings in the subsample analysis in section 5.4.2, in which the sample was divided specifically based on this disparity. We found that when the separation of voting rights and cash flow rights is significantly higher, the negative effect of ownership concentration is larger.

Sweden is also generally considered to be characterized by a concentration of control to a few large entities, causing a prevalence of pyramidal structure which also contributes largely to the disparity between voting rights and cash flow rights. While an attempt to quantify the contribution of these structures falls outside the scope of this study, it is likely that pyramidal structures aggravate risk of expropriation through the same mechanism as dual-class shares. This is supported by the findings of Cronqvist and Nilsson (2003), which indicate that firm value in Sweden is negatively affected by controlling owners with disproportionately low cash flow rights.

7. Summary and conclusions

In summary, we find a nonlinear, negative relationship between ownership concentration and firm performance in Swedish companies. We also find support, through subsample analysis, for the generally accepted notion that this relationship is driven by the positive effects from monitoring efficiency and the negative effects from the risk of expropriation of minority shareholders. Thus, we conclude as the main implication of our results that in Sweden, the strength of monitoring benefits relative to that of the cost of expropriation risk is low. We present key factors supporting this and suggest that authors of future studies interpret their results in the light of such factors so as to work towards mapping the drivers of the concentration-performance relationship.

7.1 Limitations and suggestions for future research

There are limitations on the scope of our study and the extent to which the determinants of the concentration-performance relationship are investigated. Most importantly, the subsample analyses performed can be construed as rather weak. Data limitations make them the best available way to investigate the intricacies of the concentration-performance relationship, but we believe there to be a need for stronger work towards clarifying what factors shape the relationship. Therefore, further research on the relationship between firm performance and ownership concentration should at least in part focus on these factors. There is much room for comparative subsample analysis based on similar premises, which falls outside the scope of this study due to time and data constraints. We outline some suggestions in the following subsections.

7.1.1 Managerial ownership

The importance of monitoring depends upon the ownership structure and the nature of the firm's owners. The agency conflict between owners and managers changes dramatically depending on the managers' own stake in the company: if a significant portion of the firm is owned by managers, there will likely be a lower need for monitoring due to the resulting alignment of interests. Therefore, we propose that future studies investigate how the concentration-performance interplay changes depending on the level of managerial ownership. According to the hypothesis that monitoring and expropriation are the main

factors driving this interplay, firms with low managerial ownership should see a more positive effect of ownership concentration due to the monitoring benefits it brings.

7.1.2 Separation of voting rights and cash flow rights

We speculate that the separation of voting and cash flow rights likely influences the concentration-performance relationship, but we perform limited quantitative investigation of this link. Sweden is certainly unique in the extent of the use of dual-class shares with different voting rights, which would make it a good candidate for categorizing firms based on the separation of control and cash flow rights, perhaps based on share class differences to better capture the inherent expropriation risk of a firm's share structure. We have also been unable to account for pyramidal structures. Dual-class shares are likely not enough to explain the separation of control and cash flow rights and therefore, disentangling the prevalent pyramidal structures may allow for better quantification of this disparity. Furthermore, as discussed by Becht and Boehmer (1997) and Boehmer (1999), complicated structures of cross-shareholding and strategic alliances mean that officially reported holdings may not reflect the true distribution of voting rights within a firm. Thus, when exploring the role of expropriation, significant care in mapping the true control landscape should be taken in order to fully avoid result bias.

References

Atanasov, Vladimir A., Black, Bernard S., and Ciccotello, Conrad S., 2014, Unbundling and Measuring Tunneling, University of Illinois Law Review 2014, 1697-1738.

Becht, Marco, and Boehmer, Ekkehart, 1997, Transparency of Ownership and Control in Germany, Working paper, Humboldt-University Berlin.

Baums, Theodor, 1996, Corporate Governance Systems in Europe -- Differences and Tendencies of Convergence, Presented as the Crawfoord Lecture (1996).

Boehmer, Ekkehart, 1999, Industry groups, large shareholders, and bank control: An analysis of German takeovers, Working paper, Humboldt-University Berlin.

Berle Jr., Adolf A., Means, Gardiner C., 1932, The Modern Corporation and Private Property (Transaction Publishers, Piscataway, New Jersey).

Chen, Kevin C. W.; Wei, K. C. John, and Chen, Zhihong, 2003, Disclosure, Corporate Governance, and the Cost of Equity Capital: Evidence from Asia's Emerging Markets, Hong Kong University of Science and Technology.

Claessens, Stijn, and Djankov, Simeon, 1999, Ownership concentration and corporate performance in the Czech Republic, Journal of Comparative Economics, 27, 3, 498-513.

Claessens, Stijn; Djankov, Simeon; Fan, Joseph; and Lang, Larry, 1999, The expropriation of minority shareholders: Evidence from East Asia, World Bank (Washington, DC).

Claessens, S., Djankov, S., and Lang, L. H. P., 2000, The separation of ownership and control in East Asian corporations, Journal of Financial Economics, 58, 1-2, 81-112.

Cronqvist, Henrik, and Nilsson, Mattias, 2003, Agency Costs of Controlling Minority Shareholders, Journal of Financial and Quantitative Analysis, 38, 4, 695-719.

Demsetz, Harold, and Lehn, Kenneth, 1985, The structure of corporate ownership: Causes and consequences. Journal of Political Economy, 93, 6, 1155-1177.

De Miguel, Alberto; Pindado, Julio, and de la Torre, Chabela, 2004, Ownership structure and firm value: new evidence from Spain, Strategic Management Journal, 25, 12, 1199–1207.

Durnev, Art, and Kim, E. Han, 2006 To Steal or Not to Steal: Firm Attributes, Legal Environment, and Valuation. Journal of Finance 60, 3, 1461–1493.

Earle, John S.; Kucsera, Csaba, and Telegdy, Álmos, 2005, Ownership concentration and corporate performance on the Budapest stock exchange: Do too many cooks spoil the goulash. Corporate Governance, 13, 2, 254-264.

Lekvall, Per, 2009, The Swedish Corporate Governance Model, in The Handbook of International Corporate Governance, The Institute of Directors, 368-376.

Gedajlovic, Eric R., and Shapiro, Daniel M., 1998, Management and ownership effects: evidence from five countries, Strategic Management Journal, 19, 6, 533–553.

Gedajlovic, Eric R., and Shapiro, Daniel M., 2002, Ownership Structure and Firm Profitability in Japan, Academy of Management Journal, 19, 533–553.

Grossman, Sanford J., and Hart, Oliver D.,1986, The costs and benefits of ownership: A theory of vertical and lateral integration, Journal of Political Economy, 94, 4, 691-719.

Holderness, Clifford G., and Sheehan, Dennis P., 1988, The role of majority shareholders in publicly held corporations: An exploratory analysis, Journal of Financial Economics, 20, 317-346.

Holmstrom, Bengt, and Tirole, Jean, 1993, Market Liquidity and Performance Monitoring, Journal of Political Economy, 101, 4, 678-709.

Hu, Yabei, and Izumida, Shigemi, 2008, The Relationship between Ownership and Performance: A Review of Theory and Evidence, Corporate Governance: An International Review, 16, 4, 342-358.

Iturriaga, Félix J. Lopez, and Crisóstomo, Vicente L., 2010, Financial decisions, ownership structure and growth opportunities: An analysis of Brazilian firms, Emerging Markets Finance and Trade, 46, 3.

Javid, Attiya Y., and Iqbal, Robina, 2008, Ownership Concentration, Corporate Governance and Firm Performance: Evidence from Pakistan, The Pakistan Development Review, 47, 4, 643-659.

Johnson, Simon; Boone, Peter; Breach, Alasdair, and Friedman, Eric, 2000, Corporate Governance and the Asian Financial Crisis, Journal of Financial Economics 58, 141–186.

La Porta, Rafael; Lopez-De-Silanes, Florencio; Shleifer, Andrei; and Vishny, Robert, 2002, Investor Protection and Corporate Valuation, The Journal of Finance, 57, 3, 1147–1170.

Lehmann, Erik, and Weigand, Jürgen, 2000, Does the Governed Corporation Perform Better? Governance Structure and Corporate Performance in Germany, European Financial Review, 4, 157–162.

Morck, Randall; Nakamura, Masao; and Shivdasani, Anil, 2000, Banks, Ownership Structure, and Firm Value in Japan, Journal of Business, 73, 4, 539-567.

Pajuste, Anete, 2005, Determinants and Consequences of the Unification of Dual-Class Shares, Working Paper Series no. 465, European Central Bank.

Roodman, David, 2009, A Note on the Theme of Too Many Instruments, Oxford Bulletin of Economics and Statistics, 71, 1, 135-158.

Shleifer, Andrei, and Vishny, Robert, 1986, Large shareholders and corporate control, Journal of Political Economy, 94, 3, 461-488.

Shleifer, Andrei, and Vishny, Rober,1997, A survey of corporate governance, Journal of Finance, 52, 2, 737-783.

Kaufmann, Daniel; Kraay, Aart, and Mastruzzi, Massimo, 2010, The Worldwide Governance Indicators: Methodology and Analytical Issues, World Bank Policy Research Working Paper No. 5430, World Bank.

Appendix

Appendix 1: OLS regression of linear model for comparison

OC	-0.9711***
	(0.2553)
S	-0.1218***
	(0.0254)
G	0.0798**
	(0.0394)
D/E	-0.0544***
	(0.0176)
IA	-2.0387***
	(0.2506)

Standard errors in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Appendix 2: OLS regressions on subsamples by disparity between votes and cash flow rights dividing dataset at ratio=1.5 instead of 2.0

	Ratio between voting rights and cash flow rights	
	<1.5	>=1.5
OC coefficient	-1.4211***	-0.5834*
	(0.3991)	*(0.3464)*

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1