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One Share-One Vote: New Evidence from the Nordic Countries

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Abstract. This paper examines how ownership concentration affects investment performance, and in particular how deviations from the one share-one vote principle affect this ownership-performance relationship. Using a unique panel from the Nordic countries the so-called incentive and managerial entrenchment effects are isolated. To this end a measure of marginal q is used to evaluate performance. This is a theoretically and empirically more appropriate measure of performance as compared to Tobin's q . The main finding is that ownership concentration improves performance, whereas dual-class shares reduce the incentive effect and enhance the managerial entrenchment effect. On average, firms with dual-class shares over-invest.

JEL Codes: G 30, C 23, L25

Keywords: investment, marginal q , ownership concentration, one share-one vote

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1. Introduction

The way in which corporations are governed has received popular attention in recent years due to a series of corporate scandals, such as for example the so-called “Skandia scandal” in Sweden, Parmalat in Italy or Enron in the US. These are cases where the management has misused corporate resources and failed to serve the interests of the owners. However, the importance of sound corporate governance institutions and practices is more fundamental, and goes deeper than merely preventing flagrant fraud and managerial deceitfulness. A large body of literature show that corporate governance has a much more profound effect on the efficiency of resource allocation.¹ A special corporate governance feature that has received massive attention in Europe is the so-called proportionality principle and the use of control enhancing mechanisms (CEMs); such as dual-class shares, pyramidal structures and cross holdings (for a review of the use of CEMs in Europe see European Corporate Governance Institute (ECGI), 2007). In particular one share-one vote principle has been debated intensively. A so-called breakthrough rule has for example been suggested to facilitate a more active market for corporate control in Europe. This sparked an intense political and academic debate (e.g. Bebchuk and Hart, 2002). The theoretical and empirical research however remains inconclusive. Some studies find that dual-class shares have a negative impact on firm value (e.g. Bjuggren et al., 2007, Claessens et al., 2002, and Cronqvist and Nilsson, 2003), whilst others find the evidence unconvincing. Burkart and Lee (2008) review the theoretical literature on the one share-one vote and find the theoretical arguments are inconclusive. In a review of the empirical literature Adams and Ferreira (2008) conclude that also these

¹ In essence, the corporate governance system in a country is the institutional framework that supports the suppliers of finance to corporations and enables firms to raise substantial amounts of capital (Shleifer and Vishny, 1997). For a review of the corporate governance literature see, for example, Shleifer and Vishny (1997), Morck et al. (2005), Mueller, (2003) and Denis and McConnell (2003).

evidences are unclear and call for further research. This paper addresses some of the concerns raised by Adams and Ferreira (2008).

It can be argued that the corporate governance system in a country determines the speed of structural change and economic development by affecting (re)allocation of capital. Outright expropriation of corporate assets by managers is likely to be small in developed economies, such as the Nordic ones. Over-investment in pursuit of ends other than profit maximization and misallocation of assets is more likely to be a problem. In this respect, ownership concentration and composition appear to matter for firm performance, as shown by Morck et al. (1988) and many subsequent studies.² Moreover, not only do dual-class shares alter the ability of owners to exert control, they arguably also alter their incentives. Therefore the crucial question is whether CEMs induce managers to make good value enhancing investments decisions, or not. This paper examines how ownership concentration affects investment performance, and in particular examines how deviations from the one share-one vote principle affect the ownership-performance relationship.

To this end a measure of marginal q is used. This is a methodology developed by Mueller and Reardon (1993) which measures the return on investments, i , relative the opportunity cost of capital, r . Marginal q solves many of the empirical and theoretical problems associated with other measures, in particular endogeneity problems are reduced (Gugler and Yurtoglu, 2003), which according to Adams and Ferreira (2008) is one short coming of previous studies. In contrast to the average Tobin's q , this method measures the marginal return on capital, which makes it more appropriate when apprising performance. Moreover, measurement problems

² There is a large literature on ownership and firm performance/value emanating from the work of Morck et al. (1988). See e.g. McConnell and Servaes (1990). For critique see Demsetz and Lehn (1985). This literature goes back to at least Adam Smith (1776), and contemporary research builds on seminal contribution of Berle and Means (1932) and Jensen and Meckling (1976).

associated with market-to-book measures of Tobin's q (i.e. Badrinath and Lewellen, 1997) are also significantly reduced³.

The paper is organized in five sections. Relevant literature on investments, corporate governance and ownership is reviewed in section two. In section three the method is derived and the data are described. The fourth section examines how ownership and the extensive use of dual-class shares affect investment behavior. Section five concludes.

2. Corporate control and investment

Neoclassical investment theory suggests that investments are expanded up to the point where the expected marginal rate of return equals the opportunity cost of capital. This condition would be satisfied in a friction-free world without any informational asymmetries or transaction costs. Capital would automatically flow to the most efficient use and thereby guarantee that welfare is maximized. However, the corporation, with its separation of owners from management, there arises a set of agency problems that can cause investment decisions to deviate from what is expected from neoclassical theory.

Berle and Means (1932) were among the first modern observers to call attention to these potential agency costs.⁴ They argued that corporate ownership in large listed firms would become dispersed up to a point where professional managers would become unaccountable to the shareholders. Later, Jensen and Meckling (1976) provided a more theoretical

³ The problem of obtaining a correct measure of the replacement cost of capital (proxies with the book value) is avoided with marginal q .

⁴ Agency costs are costs that arise from the principal-agent problem, i.e. divergence of managerial objectives from the objectives of shareholders.

underpinning to the links between agency costs and ownership structure. Jensen and Meckling analyze how the interests of utility maximizing owner-managers and minority shareholders diverge as ownership structure becomes more dispersed. Their basic argument is that the owner-manager will not bear the full cost of on-the-job consumption.⁵ Potential minority investors will realize this and subsequently the share price will reflect the divergence of interests between owner-managers and minority shareholders. Arguably the conflict of interests becomes more severe as the equity stake of owner-managers decreases. Jensen and Meckling (1976) argue that investors with high stakes will also have incentives to maximize firm value. This is referred to as the *incentive* effect. From this, hypothesis one follows:

H1: Ownership concentration will improve investment performance.

In this view, agency costs increase as ownership is diluted and becomes dispersed. However, not all have seen the separation of ownership and control as a potential problem, where the counter-hypothesis is that separation of control and ownership improve capital allocation. Thorstein Veblen (1921), for example, argue that this separation would lead to the control being turned over from “monopoly” seeking owners/businessmen to growth and efficiency seeking management⁶.

⁵ Jensen and Meckling (1976) point out that the most serious problem of not having equity claims is probably that the incentive to seek new profitable investment opportunities and engage in innovative efforts will fall. These problems were observed already by Adam Smith who noted that: “*The directors of such companies, however, being the managers rather of other people’s money than of their own, cannot well be expected, that they should watch over it with the same anxious vigilance with which the partners of a private copartnery frequently watch over their own.*” (Adam Smith, 1776).

⁶ Veblen claims that if “(...) industry were completely organized as a systemic whole, and were then managed by competent technicians with an eye single to maximum production of goods and services; instead of, as now, being manhandled by ignorant business men with an eye single to maximum profits; the resulting output of goods and services would doubtless exceed the current output by several hundred per cent.” (Veblen, 1921)

Recognizing that owner-managers are also guided by utility maximization and not pure profit maximization, Demsetz (1983) argue that it is not clear that diffusion of ownership will automatically have a detrimental effect. In fact, it has been argued that as the stake of owner-managers increase, so does their ability to misallocate resources (Stulz, 1988). This effect is referred to as the *managerial entrenchment* effect (see Morck et al. 1988, and Stulz, 1988). Morck et al. (1988) find a non-monotonic relationship between ownership and Tobin's q . They find that performance initially increases with ownership concentration, then declines and finally increases again, which is consistent with incentive effect in combination with an entrenchment effect. McConnell and Servaes (1990) find similar results.⁷ Expecting a *managerial entrenchment* effect lead to the second hypothesis:

H2: Ownership concentration will have a non-linear effect on performance.

The net outcome depends on the balance between the incentive and the entrenchment effect.

Burkhart and Lee (2008) review the theoretical literature on one share-one vote arguing that there are both positive and negative effects associated with dual-class shares. Adams and Ferreira (2008) review the empirical literature and find the empirical evidence inconclusive.⁸ Bebchuk et al. (1999), on the other hand, argue that these control mechanisms distort the incentives of the controlling owners and therefore potentially cause a sharp increase in agency costs. When the incentives are distorted, this may also have a negative impact on the optimal choice of investment, scope of the firm and transferal of control. Separation of control/voting

⁷ Cho (1998) criticizes these findings and shows that market value affects ownership concentration. See also Loderer and Martin (1997).

⁸ In an external study commissioned by the European Commission (ECGI, 2007) the proportionality between ownership and control of listed firm in EU is studied. Among other things this study reports the results from a survey send to institutional investors with € 4.9 trillion of assets under management. A clear majority of the investors expect a discount of 10% to 30% of the share price of firms using CEM.

rights and cash-flow rights not only alters the control structure of the corporation, but it also changes the incentives of owner-managers. One effect that can be expected from the separation of cash-flow and control rights is that the positive incentive effect will be weakened whereas the entrenchment effect will be amplified. From this, hypothesis three follows:

H3: Control mechanisms such as dual-class equity structure will weaken the incentive and enhance the managerial entrenchment effect.

Using a market-to-book measure of Tobin's q , Claessens et al. (2002) find evidence that is consistent with this hypothesis. They examine a large number of firms in East Asia and find that cash-flow rights are positively correlated with performance. However, control rights in excess of cash-flow rights have a negative effect on firm value.

2.1 Corporate Ownership in the Nordic Countries

The generality of the Berle and Means (1932) observation is, however, empirically challenged. Looking at ownership structure around the world, most corporations have concentrated ownership and are controlled by families (Morck et al., 2005, and La Porta et al., 1999). Faccio and Lang (2002) find that families predominantly control corporations in continental Europe. This control is achieved without corresponding capital by means of primarily three different control enhancing mechanisms (CEM): vote-differentiation of shares, pyramid ownership and cross-holdings. Most European countries allow at least one of the three principal instruments for enhancing ownership control (ECGI, 2007 and Söderström et al., 2003). This means that the division between what Berle and Means (1932) call “*nominal*

ownership” and the corporate control is further enhanced by separating the capital stake and voting power, making it possible for a small group of investors, often the founding family, to maintain control of the firm.

Like most firms in continental Europe, Nordic firms very often have controlling owners that have maintained their control even as their capital stake has declined and the firm has grown. In particular, the extensive use of vote-differentiated shares has had a substantial impact on the way in which the ownership structure has evolved in the Nordic countries. In Norway about 14 percent of listed firms use dual-class shares, in Denmark and Finland more than 30 percent, and in Sweden it is as high as 55 percent (Bøhren and Ødegaard, 2006, and Söderström et al., 2003). The frequent use of dual-class shares, with strong separation of voting rights and equity claims, has produced very strong and stable ownership structures (Henrekson and Jakobsson, 2006 and Högfeldt, 2004). Supposed advantages of strong and stable owners provide the underpinning argument for the Nordic legislation that allow vote-differentiation of shares and pyramid ownership. By using vote-differentiation, the founding families may retain control of firms even with a very small equity share. In fact, most Nordic firms have a single controlling owner, and very few firms are characterized by dispersed ownership. Bennedsen and Nielsen (2005) report significant differences in the frequency of control mechanisms for a sample of 4096 European firms (see Table 1). For a review of control enhancing mechanism in Europe see also ECGI (2007).

Table 1 Corporate control mechanisms in European Countries

	Dual-class shares	Pyramid	Cross-holding
Sweden	0.62	0.27	0.01
Switzerland	0.52	0.06	0.00
Finland	0.44	0.07	0.00
Italy	0.43	0.25	0.00
Denmark	0.29	0.17	0.00
UK	0.25	0.22	0.00
Ireland	0.25	0.18	0.00
Austria	0.23	0.26	0.01
Germany	0.19	0.24	0.03
Norway	0.11	0.33	0.02
France	0.03	0.15	0.00
Belgium	0.00	0.27	0.00
Portugal	0.00	0.13	0.00
Spain	0.00	0.16	0.00
European average	0.24	0.20	0.01
Nordic average	0.37	0.21	0.01

Source: Bennedsen and Nielsen (2005). The figures represent the percentage of firms that use dual-class shares, Pyramid structures and cross-holdings, respectively.

Cronqvist and Nilsson (2003) examine a large sample of Swedish listed firms and find that controlling owners have a negative effect on Tobin's average q . These controlling owners are also more likely to use control mechanisms. Maury and Pajuste (2004) examine a sample of Finnish firms and show that a more uniform distribution of votes among large block holders is positive for firm valuation. They also find that divergence between cash-flow rights and control rights have a negative effect on firm value. An additional consequence of the strong separation of ownership claims and control is that the so-called market for corporate control (Manne, 1965, Grossman and Hart, 1980) virtually does not exist in the Nordic countries. Successful hostile bids are therefore very rare.

In this paper, ownership concentration is measured as the share of capital and votes controlled by the largest owner (cash-flow rights = CRI and voting rights = $VR1$) and the five largest owners ($CR5$ and $VR5$). About 40 percent of the firms in the sample use vote-differentiation to separate control and cash-flow rights, (see Table 2). The ownership data has been manually collected from annual reports.

Table 2 Ownership concentration in the Nordic companies (2004)

All firms						
	Mean	Std. dev.	Min	Max	No. firms	Skewness
Cash-flow rights one owner, CR 1	23.5	15.5	0.4	82.4	214	0.90
Cash-flow rights five owners, CR 5	44.8	19.6	1.5	95.1	214	0.33
Voting rights one owner, VR 1	29.4	19.7	0.4	89.3	211	0.89
Voting rights five owners, VR 5	52.0	22.6	1.5	96.5	211	0.08
Vote-differentiated firms						
	Mean	Std. dev.	Min	Max	No. firms	Skewness
Cash-flow rights one owner, CR 1	23.5	13.7	2.9	60.4	90	0.70
Cash-flow rights five owners, CR 5	47.4	19.0	9.4	93.8	90	0.43
Voting rights one owner, VR 1	35.8	20.3	4.6	89.3	88	0.73
Voting rights five owners, VR 5	64.8	19.8	18.6	96.5	87	- 0.33
Firms with one share-one vote						
	Mean	Std. dev.	Min	Max	No. firms	Skewness
Cash-flow rights one owner, CR 1	23.2	16.7	0.4	82.4	124	1.01
Cash-flow rights five owners, CR 5	42.9	19.9	1.5	95.1	124	0.32
Voting rights one owner, VR 1	23.2	16.7	0.4	82.4	124	1.01
Voting rights five owners, VR 5	42.9	19.9	1.5	95.1	124	0.32

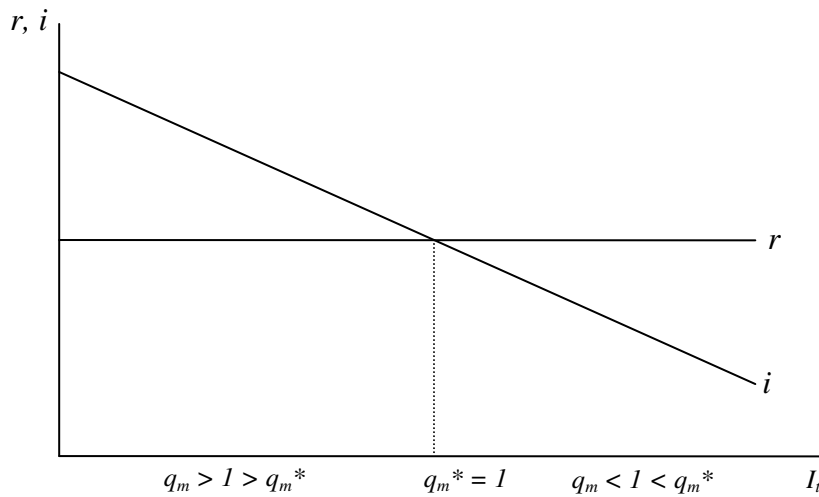
Ownership concentration is very high in listed Nordic firms, especially compared with those in the Anglo-Saxon countries. Demsetz and Lehn (1985) examine the ownership structure in 511 large US firms. They report that, on average, the five largest owners together hold 24.8 percent and the top 20 shareholders 37.7 percent. Normally 20 percent is assumed to be more than enough to control a firm (Morck et al., 2005).

La Porta et al. (1997) have hypothesized that the legal origin of a country determines the efficiency of the country's financial system. The Nordic countries can in this respect be regarded as being relatively homogeneous. The Nordic countries have a long tradition of cooperation in drafting new legislation (Carsten, 1993). Interestingly, there are still important differences with respect to deviations from the one share-one vote principle. Denmark, Finland and Sweden all allow dual-class shares. In Norway deviations from the proportionality principle need government approval (Faccio and Lang, 2002).

3 Methodology

This paper applies a method to measure marginal q developed by Mueller and Reardon (1993). Marginal q is simply a marginal version of Tobin's q . Tobin's q is defined as the market value of a firm over the replacement cost of its assets, which translates to the average return on total assets. Marginal q , on the other hand, measures the return on investments, i , (or the marginal return on capital) relative to the cost of capital, r , ($q_m = i/r$) (Mueller, 2003). This is in effect a measure of what Tobin (1984) calls the “functional form” of stock market efficiency.⁹ Marginal q is also a more appropriate measure of performance since average q contains infra-marginal returns.¹⁰ For investments to be efficient q_m must equal one (see Figure 1).

Figure 1 Marginal rate of return on capital, i , cost of capital, r , and marginal q



Marginal q can be derived from the simple insight that any investments should ex ante be evaluated against the discounted present value of future cash-flows that the investment

⁹ *Functional Stock Market Efficiency* is related but different from the standard term *Market Efficiency*. Functional efficiency refers to the way in which capital markets are allocating resources to the most efficient usage (Tobin, 1984). Morck et al. (2005) survey a literature that shows how the functional efficiency of capital markets depends on the structure and composition of corporate control.

¹⁰ When firms are price takers and perfectly competitive, marginal q and average q will be equal. For a derivation of the relationship between average q and marginal q , see Hayashi (1982).

generate¹¹. Obviously, only projects that have an expected positive net present value should be carried out. Consider an investment, I_t , made by a firm in period t . This investment generates cash flows, CF_{t+j} in j periods. The expected present value, PV_t , of this cash-flow can be expressed as follows:

$$PV_t = \sum_{j=1}^n CF_{t+j} / (1 + r_t)^j \quad (1)$$

where r_t is the discount rate. For the sake of simplicity expectations operators are not included in the derivation. This equation can be expressed in the following way, where i_t can be regarded as a quasi-permanent rate of return:

$$PV_t = I_t i_t / r_t \quad (2)$$

For investments to be efficient from a shareholder perspective the investment being considered must generate future cash flows that, discounted to the present value, equal or exceed the investment cost.

Equation (2) can be rearranged and expressed as follows:

$$\frac{PV_t}{I_t} = i_t / r_t = q_{m,t} \quad (3)$$

For investments to be meaningful, we must have that $PV_t \geq I_t$. This implies that $q_m \geq 1$. If firms are investing at $q_m = 1$, investments are efficient, which in turn implies that there are no

¹¹ This methodology can also be derived from Tobin's average q , by taking first difference.

further profitable investment opportunities. Whereas if $q_m < 1$, firms are receiving a return on their investment that is less than the cost of capital. A q_m below one can only be interpreted as over-investment and a managerial failure of some sort.

At the end of period t the market value of a firm may be decomposed into the market value in period $t-1$ (M_{t-1}), the present value of investments made in period t (PV_t), the change in market value of the old capital stock (δ_t), and an error term for the errors the market may make in its evaluation of the firm (μ_t).¹²

$$M_t \equiv M_{t-1} + PV_t - \delta_t M_{t-1} + \mu_t \quad (4)$$

Assuming that q_m and δ both are constant over time and across firms, we can use equation (4) to estimate q_m and δ directly. Taking equation (4) and subtracting M_{t-1} from both sides we get:

$$M_t - M_{t-1} = -\delta M_{t-1} + q_m I_t + \mu_t \quad (5)$$

Dividing by M_{t-1} we normalize the equation and get the following relationship that can be empirically estimated:

¹² If the market makes errors in their valuation of the firm, the error component, μ , may contain a revaluation factor in the following period. Note that we from the efficient market hypothesis have: $E(\mu_t) = 0$ and $E(\mu_t, \mu_{t-1}) = 0$, and therefore also $E\left(\sum_{j=0}^n \mu_{t+j}\right) = 0$. More recent research suggests

that in the short run the efficient market hypothesis fails (i.e. Farmer and Geanakoplos, 2008 and Lo, 2004). Casti (2008) argue that once one recognize the possibility that investors are forming expectation based on assumptions regarding the behavior of other investors this leads to a world of induction rather than deduction. In computer models of stock markets taking this behavior (i.e. trading based on technical analysis) in account prices have been found to settle down in random fluctuations around its fundamental value. Within these oscillations very complex patterns overshooting, crashes et cetera are found (see Arthur et al., 1996). It should be noted that the panel data methodology used in section 4 mitigates these concerns. For a discussion of stock market bubbles and implications for marginal q see Bjuggren and Wiberg, (2008).

$$\frac{M_t - M_{t-1}}{M_{t-1}} = -\delta + q_m \frac{I_t}{M_{t-1}} + \frac{\mu_t}{M_{t-1}} \quad (6)$$

Mueller and Reardon's (1993) methodology can be applied to test the agency hypotheses.

To study the effects of ownership structure or various institutional factors on investment decisions, measures of ownership may be added as interaction terms with I_t / M_{t-1} in equation (6). If interaction terms are added, the functional form will be: $Y = \alpha + \beta_1 X + \beta_2 XZ$, and q_m is the economic interpretation of the marginal effect, $\partial Y / \partial X = \beta_1 + \beta_2 Z$. Gugler and Yurtoglu (2003) and Bjuggren et al. (2007) use interaction terms in this manner. The equations estimated have the following functional form:

$$\frac{M_t - M_{t-1}}{M_{t-1}} = -\delta + \beta_1 \frac{I_t}{M_{t-1}} + \beta_2 Z_1 \frac{I_t}{M_{t-1}} + \dots + \beta_{i+1} Z_i \frac{I_t}{M_{t-1}} + \varepsilon_i \quad (7)$$

where the Z 's denote the explanatory variables, (cash-flow rights (CRI), voting rights (VR) or dummy for vote-differentiation). Thus, the marginal effect, q_m , of equation (7) is:

$$q_m = \beta_1 + \beta_2 Z_1 + \dots + \beta_{i+1} Z_i \quad (8)$$

The total market value of a firm is defined as the total number of outstanding shares times the share price at the end of year t , plus total debt. Investments are approximated as:

$$I = \text{After tax profit} - \text{Dividends} + \text{Depreciation} + \Delta \text{Equity} + \Delta \text{Debt} \\ + R\&D + \text{Advertising \& Marketing}$$

The market and accounting data have been collected from Compustat Global database¹³. The firms included were listed at one of the four Nordic Stock Exchanges (Copenhagen Stock exchange in Denmark, Helsinki Stock exchange in Finland, Oslo Stock Exchange in Norway and Stockholm Stock Exchange in Sweden) between 1998 or 1999 and 2005, in total 292 firms (2004 observations). Bjuggren and Wiberg (2008) find that q_m is sensitive to stock market swings and that depending on period selection the q_m may either be over- or underestimated. The choice of a 5-6 year period approximately coincides with the average length of a business cycle reduce this problem. All figures have been adjusted by harmonized consumer price indexes to 2005 constant prices. Eurostat have compiled the indexes. Naturally, the standard caveats apply to the data.

The depreciation rate can be assumed to vary across firms and industries, depending on the durability of assets employed. Equation (6) has the advantage that no assumption regarding the size of δ is necessary. This makes a fixed effects approach appropriate since it allows for variation in depreciation rates across groups and time. In an empirical estimation of equation (6) the intercept (δ) will capture the depreciation rate plus any systematic changes in market valuations of the stock of old capital (see note 10). The estimated δ has no bearing on the interpretation of q_m .

¹³ Accounting data and market prices has been collected from Standard & Poor's Compustat Global Database, 2006 version. Following variables have been collected from Compustat (mnemonics in brackets): after tax profit (IB), depreciation (DP) dividends (DVT), total debt (DT), research and development (XRD), market price (MKVAL), Advertising and marketing expenditures (XSGA), Δ equity (SSTK minus PRSTKC).

This study covers 142 large Nordic firms that are listed at one of the four stock exchanges. This accounts for about 18 percent of all listed firms and approximately 40 percent of the total stock market capitalization.¹⁴ The firms approximately follow a rank size distribution, where the second largest firm is about half the size of the largest.¹⁵

Matching accounting and financial data with the 142 firms for which ownership information was available resulted in a total of 806 observations, with no less than five observations for each firm. Since the data consists of a cross-sectional time series, a fixed effect model is used (industry and time fixed effects model). This allows for systematic changes in market value over time and varying depreciation across industries. From an empirical point of view the choice between industry and firm effects are of minor importance. The stock market may fail to make a correct valuation in a single period, but assuming efficient markets, this error will approach zero as time span increases. To take the possibility for market errors into account, time dummies were used in the estimations. Both industry and time dummies are restricted to sum to zero, so that the effects are measured as the deviation from the average depreciation rate.

There are a few extreme values that have a large impact on the estimates of q_m . These are typically smaller firms that, for some reason, either have a very high return on invested capital, or a massive loss in market value. There are several plausible explanations for these extreme values. Firms may for example introduce radical innovations that do not require any

¹⁴ These 142 firms represent all non-financial firms for which sufficient ownership information was available. In 2004, there were a total of 796 listed firms in the Nordic countries (185 in Denmark, 143 in Finland, 177 in Norway and 282 in Sweden).

¹⁵ The formula $M^i = M^1 / i$, where M^1 is the largest firm and i the firm rank, approximates the size distribution of the firms in the sample.

substantial investments, but nevertheless substantially increase firm value. In order to reduce the weight of outliers, some of the observations have been removed from the data set. The absolute deviation between the dependent variable and the explanatory variable¹⁶, has been used to identify outliers. Observations that had an absolute deviation above two (12 observations) were removed. This captures for example firms that have large swings in market value without corresponding changes in investments. The excluded firms are predominantly found among relatively small high-tech firms within the biotechnology and ICT sector. Bjuggren and Wiberg (2008) have shown that the marginal q measure is sensitive to swings in valuation of new high-tech firms.

As a first step marginal q was estimated for the Nordic countries. Details on these estimates are reported in Appendix 1. The Nordic average is significantly below one. For Denmark marginal q is 0.66, 1.07 for Norway, 0.93 for Finland and 0.77 for Sweden. These findings seem to corroborate previous estimates of marginal q for the Nordic countries. In a large cross-country study, Gugler et al. (2002) find similar estimates for the Nordic countries. Between 1985 and 2000, they estimate 0.65 for Denmark, 0.96 for Finland, 1.04 for Norway and 0.65 for Sweden. Bjuggren et al. (2007) have also estimated an average q_m to 0.65 for Sweden. The findings are, in other words, consistent with previous estimates for Finland and Norway. Gugler et al. (2002) have estimated the Nordic average at 0.78¹⁷.

By using interaction terms, equation (7) is used to test the effects of ownership concentration and separation of control from cash-flow rights on performance. As measures of ownership

¹⁶ $| (M_t - M_{t-1})/M_{t-1} - I_t/M_{t-1} |$ identify observations that have very large swings in market value without commensurate investment. In practice this excludes variables that have missing observations or contain accounting errors. Observations that were excluded were only among the small firms in the sample. Using a robust estimation technique, such as iteratively reweighted least squares or simple trimming of the data would yields consistent results.

¹⁷ Their findings support the legal origin hypothesis. Anglo-Saxon countries perform best with $q_m = 1.02$. Average q_m for Germanic and French origin is 0.74 and 0.59, respectively.

concentration, the share of cash-flow rights held by the largest owner (*CR1*) and the five largest owners together (*CR5*) are used. The voting right held by the largest owner (*VR1*) and the five largest owners (*VR5*) together is used to measure control. Dummies are used to control for dual-class shares. See Table 2. In the sample, 49 percent of the firms use a dual-class share structure. Matching accounting and market data with the ownership data leaves 142 firms. Correlations are reported in Table 3.

Table 3 **Correlation matrix**

	Sales	I_t/M_{t-1}	$M_t - M_{t-1}/M_{t-1}$	CR1	CR5	VR1	VR5
Sales	1						
I_t/M_{t-1}	0.012	1					
$M_t - M_{t-1}/M_{t-1}$	- 0.043	0.422*	1				
CR1	- 0.088*	0.069	0.033	1			
CR5	- 0.224*	0.068	0.022	0.847*	1		
VR1	- 0.031	0.118*	0.019	0.812*	0.710*	1	
VR5	- 0.119*	0.102*	0.014	0.678*	0.835*	0.817*	1
Vote-differentiation	0.082*	0.071*	- 0.049	- 0.053	0.033	0.310*	0.422*

* indicates significance at 5 percent.

Naturally all ownership variables display high and significant correlations. Sales are negatively correlated with all ownership variables, but weaker for *VR1* and *VR5* as compared to *CR1* and *CR5*. In other words, ownership concentration measured by cash-flow rights is inversely related to firm size. This means that controlling owners remain in large firms by resorting to dual-class equity structure. It is also interesting to note that investments are significantly correlated with control rights and vote-differentiation, but not with cash-flow rights.

In order to control for unobserved, time-invariant heterogeneity across firms, a fixed effect model with firm and time effects is applied. The fixed time effect is motivated by the efficient markets hypothesis; the stock market may be under- or over-estimated in any single period, but for a longer period of time the expected error in stock market evaluations is zero, $E(\mu_t) = 0$. To control for this possibility, annual dummy variables are included and estimated under

the restriction that they summarize to zero. The annual stock market evaluation effects are measured as deviations from the average. To control for the possibility that the Nordic countries have systematic differences in returns, country dummies are also included. These are also estimated under the restriction that they summarize to zero, such that any deviation is measured as the deviation from the Nordic average. Time, industry and country effects are not reported.

To identify non-linear effects on performance, the ownership variables are also estimated in quadratic and cubic form. In Tables 4 a and b, merely 3 out of 24 estimated ownership parameters are significant. However, deviation from one share-one vote creates large, and robust, negative effects. These results are corroborated by a simple regression using a market-to-book measure of Tobin's q , see Appendix 1 for description of these results.

Table 4 a Concentration of cash-flow rights and performance

Dependent variable: $(M_t - M_{t-1})/M_{t-1}$							
	Equation A	Equation B	Equation C	Equation D	Equation E	Equation F	Equation G
Constant, ($=\delta$)	- 0.088*** (-3.82)	- 0.088*** (-3.84)	- 0.087*** (-3.78)	- 0.087*** (-3.78)	- 0.087*** (-3.80)	- 0.088*** (-3.82)	- 0.087*** (-3.79)
I_t/M_{t-1}	0.929*** (14.95)	0.982*** (9.41)	0.711*** (4.61)	0.734*** (3.27)	0.853*** (6.68)	0.948*** (4.14)	0.583 (1.58)
Dual-class Shares	- 0.312*** (-3.67)	- 0.327*** (-3.71)	- 0.340*** (-3.86)	- 0.335*** (-3.55)	- 0.307*** (-3.60)	- 0.304*** (-3.56)	- 0.344*** (-3.78)
CR1		- 0.002 (-0.63)	0.026** (2.16)	0.022 (0.69)			
CR1²			- 0.001** (-2.38)	- 0.000 (-0.27)			
CR1³				- 0.000 (-0.14)			
CR5					0.002 (0.68)	- 0.003 (-0.33)	0.031 (1.07)
CR5²						0.000 (0.50)	- 0.001 (-1.17)
CR5³							0.000 (1.27)
No. obs.	794	794	794	794	794	794	794
No. firms	142	142	142	142	142	142	142
F-value	12.69	12.39	12.32	12.03	12.40	12.11	11.88
R²	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Average q_m	0.785	0.790	0.894	0.890	0.796	0.769	0.702
Dual-class q_m	0.617	0.614	0.711	0.710	0.630	0.605	0.516
Single-class q_m	0.929	0.941	1.051	1.044	0.937	0.909	0.860

*, ** and *** indicates significance at 10, 5 and 1 percent respectively. t-values in brackets.

Firms with only a single class of shares invest efficiently, that is, q_m is not different from one, whereas firms that rely on dual-class equity shares on average have a return on dual-class shares that is 30 percent below the opportunity cost of capital.

Table 4 b Concentration of control/voting rights and performance

Dependent variable: $(M_t - M_{t-1})/M_{t-1}$						
	Equation B	Equation C	Equation D	Equation E	Equation F	Equation G
Constant, ($=\delta$)	- 0.088*** (-3.80)	- 0.085*** (-3.69)	- 0.084*** (-3.63)	- 0.085*** (-3.72)	- 0.089*** (-3.86)	- 0.090*** (-3.90)
I_t/M_{t-1}	0.911*** (9.56)	0.818*** (6.02)	0.709*** (3.60)	0.702*** (5.51)	0.966*** (4.29)	0.649* (1.82)
Dual-class Shares	- 0.317*** (-3.62)	- 0.317*** (-3.61)	- 0.331*** (-3.69)	- 0.390*** (-4.19)	- 0.396*** (-4.26)	- 0.404*** (-4.33)
VR1	0.001 (0.24)	0.007 (0.99)	0.022 (1.07)			
VR1²		- 0.001 (-0.96)	- 0.001 (-0.92)			
VR1³			0.000 (0.76)			
VR5				0.005** (2.03)	- 0.007 (-0.82)	0.021 (0.80)
VR5²					0.000 (1.42)	- 0.001 (-0.92)
VR5³						0.000 (1.15)
No. obs.	794	794	794	794	794	794
No. firms	142	142	142	142	142	142
F-value	12.38	12.12	11.86	12.54	12.32	12.08
R²	0.42	0.42	0.42	0.42	0.42	0.42
Average q_m	0.812	0.836	0.836	0.774	0.728	0.730
Dual-class q_m	0.612	0.657	0.665	0.564	0.514	0.512
Single-class q_m	0.929	0.988	0.982	0.954	0.910	0.916

*, ** and *** indicates significance at 10, 5 and 1 percent respectively. t-values in brackets.

The fact that vote-differentiation has a significant negative effect on firm performance indicates that the ownership-performance relationship may differ between firms with one class of shares and those having separated cash-flow rights and control rights. This negative effect increases in equations A to G, when the ownership variables are added. One possible interpretation is that the ownership variables are picking up a positive incentive effect. This, in turn, suggests that the ownership effects differ between the two categories of firms.

In Table 5 ownership variables are interacted with the dummy variable for dual-class share structure. Different specifications of the functional form have been estimated.

Table 5 a Dual-class shares, ownership and performance

Dependent variable: $(M_t - M_{t-1})/M_{t-1}$			
	Equation H		Equation I
Constant, ($=\delta$)	- 0.087*** (-3.80)	Constant, ($=\delta$)	- 0.084*** (-3.67)
I_t/M_{t-1}	0.521*** (3.61)	I_t/M_{t-1}	0.404*** (2.60)
CR1	0.053*** (3.79)	VR1	0.063*** (4.34)
CR1 ²	- 0.001*** (-3.93)	VR1 ²	- 0.001*** (-4.43)
CR1*Vote differentiation	- 0.045*** (-4.43)	VR1*Vote differentiation	- 0.053*** (-5.07)
CR1 ² *Vote differentiation	0.001*** (3.79)	VR1 ² *Vote differentiation	0.001*** (4.67)
No. obs.	794	No. obs.	794
No. firms	142	No. firms	142
F-value	12.27	F-value	12.35
R ²	0.42	R ²	0.43
Average q_m	0.933	Average q_m	0.993
Dual-class q_m	0.652	Dual-class q_m	0.721
Single-class q_m	1.199	Single-class q_m	1.226

*, ** and *** indicates significance at 10, 5 and 1 percent, respectively.
t-values in brackets.

Table 5 b Dual-class shares, ownership and performance

Dependent variable: $(M_t - M_{t-1})/M_{t-1}$			
	Equation H		Equation I
Constant, ($=\delta$)	- 0.091*** (-3.93)	Constant, ($=\delta$)	- 0.092*** (-3.99)
I_t/M_{t-1}	0.336 (0.89)	I_t/M_{t-1}	0.050 (0.12)
CR5	0.067** (2.06)	VR5	0.089*** (2.64)
CR5 ²	- 0.002** (-2.31)	VR5 ²	- 0.002*** (-2.84)
CR5 ³	0.000*** (2.45)	VR5 ³	0.000*** (2.94)
CR5*Vote differentiation	- 0.060*** (-3.24)	VR5*Vote differentiation	- 0.094*** (-3.89)
CR5 ² *Vote differentiation	0.002*** (2.82)	VR5 ² *Vote differentiation	0.003*** (3.55)
CR5 ³ *Vote differentiation	- 0.000*** (-2.65)	VR5 ³ *Vote differentiation	- 0.000*** (-3.37)
No. obs.	794	No. obs.	794
No. firms	142	No. firms	142
F-value	11.58	F-value	11.91
R ²	0.42	R ²	0.43
Average q_m	0.808	Average q_m	0.889
Dual-class q_m	0.656	Dual-class q_m	0.784
Single-class q_m	0.952	Single-class q_m	0.978

*, ** and *** indicates significance at 10, 5 and 1 percent, respectively.
t-values in brackets.

The results are robust with respect to the choice of simple pooled OLS with year dummies, fixed effect model with year and firm effects, and random effects model. Since the number of firms with available ownership data is limited to 143, the firm effects capture possible

industry effects, and vice versa. Bjuggren et al. (2007) also find that q_m is robust with respect to model specification. Consequently, all equations have been estimated with two-digit industry SIC codes.

Hypotheses 1 and 2 cannot be rejected. For all measures of ownership concentration ($CR1$, $CR5$, $VR1$ and $VR5$) a positive non-linear relationship is found. In firms with one share-one vote, increasing ownership has a positive but marginally diminishing effect on performance. For the two concentration measures of the single largest owner, $CR1$ and $VR1$, a quadratic form gives the best fit, whereas for the concentration of the five largest owners, $CR5$ and $VR5$, a cubic form provides the best fit. Controlling for ownership characteristics and dual-class equity weakens the country effects (not reported here), but remains significantly negative for Sweden and positive for Norway. However the effects of ownership and deviations from one share-one vote cut across national boundaries.

The average q_m for single class equity firms lies between 0.95 and 1.23.¹⁸ In firms with vote-differentiated shares, the effects are similar but much weaker. By comparing the parameters in equations H and I in Tables 5 a and b, one can see that in vote-differentiated firms the positive effect of ownership concentration is significantly lower than in other firms. Average q_m 's estimate for firms with dual-share class structure lies between 0.65 and 0.78 (equations H and I respectively). As in equation A , firms with dual-class shares seem to be investing at approximately 30 percent below their cost of capital. From equation H and I in Tables 5 a and b, it is clear that the separation of cash flow and control rights reduces the positive effect of ownership and enhances the entrenchment effect. Examining Swedish listed firms, Bjuggren et al. (2007) find similar negative effects of vote-differentiation and positive effects of

¹⁸ The marginal effects have been calculated based on the average ownership concentration in the data set. ($CR1 = 22.24$, $CR5 = 44.52$, $VR1 = 28.58$ and $VR5 = 52.85$).

ownership concentration on investment performance of firms. Assuming that firms with dual-class shares in fact invest at returns on investment 30 percent below the cost of capital, this translates to a colossal destruction of shareholder value. In 2004 alone the 64 dual-class firms in the sample invested €27 billion, which generated less than €19 billion in shareholder value (2005 constant prices).

The intercept will, as discussed above, capture both the depreciation rate and any systematic changes in market evaluations. In equation *A* to *I*, the intercept is estimated to approximately 9 percent. This is a reasonable estimate and is in line with previous estimates of depreciation rates (Mueller and Reardon, 1993).

5 Conclusions

This paper examines the linkage between returns on investment and ownership concentration in the Nordic countries. A particular focus is put on how deviations from the one share-one vote affect this ownership-performance relationship. Nordic firms frequently use dual-class shares to enhance corporate control. Marginal q is used as performance measure. Marginal q measures the marginal return on capital relative to its cost. This return to cost of capital ratio ($r/i = q_m$) is a measure of what Tobin (1984) labeled the functional efficiency of capital markets. When studying firm performance, this method has some clear advantages over the conventional market-to-book measures of Tobin's q . When measuring performance marginal q is both theoretically and empirically appealing. Endogeneity problems are reduced and measurement problems associated with Tobin's q are avoided. Thus, alleviating a problem in previous empirical studies.

Berle and Means (1932) notion of dispersed ownership structure characterize few Nordic firms. Vote-differentiation is a common tool for creating and maintaining strong and concentrated ownership structures. Nordic firms make more frequent use of control mechanisms than firms in comparable countries. On average the largest owner holds more than 20 percent of the capital (*CRI*) and close to 30 percent of the voting rights (*VR1*).

The hypothesis that ownership concentration improves resource allocation is supported in this paper. Ownership concentration is found to have a non-linear effect on firm performance (cubic or quadratic). This is consistent with previous studies that find both positive *incentive* effects and negative *managerial entrenchment* effects of ownership concentration. For firms with one share-one vote ownership has a positive impact but marginally diminishing, whereas for firms controlled by dual-class shares this effect is weaker. These firms have a systematically worse performance than other firms. Dual-class shares drive a wedge between cash-flow rights and control rights. Not only does this change the control structure, but it also changes the incentive structure. Firms with one class of shares are, on average, investing efficiently, whereas firms with dual-class equity structure are over-investing. The separation of cash-flow rights and control rights reduces the positive incentive effect and enhances the negative entrenchment effect. By impairing capital reallocation, corporate control mechanisms are in the long run harmful for industry dynamics and economic renewal.

Vote-differentiation creates massive entrenchment effects and destroys large values. In the long run, they are likely to harm the functional efficiency of the Nordic capital markets. On average, “entrenched” firms have returns on investments that are approximately 30 percent below their cost of capital.

Differences in investment performance across firms can largely be explained by differences in ownership structure and, in particular, to what extent dual-class shares uphold corporate control. Separation of cash-flow rights from control appears to distort the incentives of the controlling owner by significantly reducing the incentive effect.

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Appendix 1

Nordic q_m 's (1999-2005)

Dependent variable: $(M_t - M_{t-1})/M_{t-1}$		
<i>Constant, ($= \delta$)</i>	- 0.034** (-2.25)	- 0.039** (-2.52)
I_t / M_{t-1}	0.868*** (27.79)	0.794*** (34.06)
Denmark* I_t / M_{t-1}	- 0.205*** (-5.32)	
Norway* I_t / M_{t-1}	0.244*** (4.87)	
Finland* I_t / M_{t-1}	0.057 (0.88)	
Sweden* I_t / M_{t-1}	- 0.097*** (-2.85)	
No. obs.	1963	1963
No. firms	292	292
R ²	0.48	0.47
R ² -adjusted	0.46	0.45
F-value	32.45	32.78

*** indicates significance at 1 percent, ** at 5 percent and * at 10 percent level. t-values in brackets. Since no ownership variables are included more observation could be obtained. Data for 292 firms between 1999 and 2005 were available. 41 observations have been identified as outliers and consequently deleted. The regressions in Table 3 were estimated with country specific intercepts, δ , for the; these were however insignificant and were therefore dropped out of the regression. In order to test for national differences in marginal q , country dummy variables were interacted with I_t/M_{t-1} , (see equation (7)). These too were also estimated under the restriction to sum to zero, such that the country effects measures the deviation from the average Nordic marginal q .

OLS-estimation, Dual-class shares and Tobin's q

Dependent variable: Tobin's Q	
Dual-class shares	- 0.347** (- 2.16)
Sales	- 0.000 (- 0.55)
Growth in Sales	- 0.014*** (2.90)
Constant	1.554*** (13.7)
No. obs.	142
R ²	0.10
F-value	4.96

*** and ** indicates significance at 1 and 5 percent respectively. t-values in brackets. The regression is made with data available for 2004.