Influence and proportionality: The role of ownership distributions and separating mechanisms

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Abstract

In this paper, I show how to disentangle disproportionality from the structure of ownership (as if all firms had a one share one vote capital structure) and disproportionality from separating mechanisms specifically. A central notion to the contribution of the paper is the following: proportionality in influence requires shareholders to have voting power instead of voting rights according to their investment. Using data for 4,255 public European firms, I find that one share one vote is no guarantee of proportional influence. In fact, in firms with one share one vote, I find that the minimal winning coalition's influence is more than double of what is warranted by its investment. Separating mechanisms do add considerably to the total disproportionality though. However, separating mechanisms also reduce the cost of control, and, in countries with high investor protection, I find that they help balance the power between shareholders, as one group unified by their common investment interest, and managers. This is not the case in countries with low investor protection. Finally, I find that shareholder participation in the decision-making process reduces disproportionality in influence; the effect of a marginal shareholder joining the decision-making process is especially pronounced in firms with relatively dispersed ownership structures and an already high participation rate.

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1 Introduction

It is widely recognized that dispersed share ownership aggravates governance problems from conflicts of interests by creating a collective action problem among the shareholders (Becht et al. [2002]). Sheer numbers may rob shareholders of their power vis-a-vis the firm's management. One way to solve or at least alleviate this problem is to have a concentrated ownership structure with at least one large shareholder who has both an interest in monitoring and the power to implement changes. In many European firms, separating mechanisms or control enhancing mechanisms[1] such as dual-class shares, pyramids or cross-holdings promote this way of shareholder influence by reducing the cost of control. Nonetheless, the European Comission is currently pushing forward its principle of proportionality, which states that it is desirable to have equal distributions of cash flow rights and voting rights (Winter et al. [2002], European Commission [2006]).[2] Shares with equal voting rights should provide their owners with proportional power to influence the decisions of the firm.

This principle of proportionality is an important aspect of the equal treatment of shareholders. It is promoted to protect minority shareholders against a prisoner's dilemma problem, i.e. that an action that may benefit the individual making the decision may have adverse consequences for the group. However, protecting minority shareholders by curbing the voting power of large shareholders can easily change the balance of power in favor of management, and this is not necessarily a desirable policy approach. It should not be forgotten that there are agency costs in any corporate structure in which someone other than management owns equity. The current argument for one share one vote seems to ignore the fact that different controlling shareholder systems have quite different cha-

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[1] In this paper, the terms "separating mechanisms" and "control enhancing mechanisms" are used interchangeable as synonyms.

[2] In the literature, these initiatives are sometimes referred to as the "principle of proportional ownership". One should note that the European Commission does not attempt to influence the structure of ownership, only the relation between voting rights and cash flow rights.

racteristics, and that separating mechanisms are not harmful by definition.

In this paper, I use this outset to study the premise of the principle of proportionality. Coates [2003] questions its necessity by noting that the main part of the concentration of voting power among EU firms does not result from disproportionality between cash flow rights and voting rights due to separating mechanisms, but from the fact that controlling shareholders retain a control block in a one share one vote capital structure. First, therefore, I show how to disentangle disproportionality from the structure of ownership (as if all firms had a one share one vote capital structure) and disproportionality from separating mechanisms specifically. I find that disproportionality from the structure of ownership, on average, is the same in firms with separating mechanisms as in firms without separating mechanisms, which suggests that, at face value, one share one vote can give a false sense of proportionality. Separating mechanisms do add considerable to aggregate disproportionality though. In firms with separating mechanisms, I find that aggregate disproportionality is more than doubled and that the minimal winning coalition's influence is about six times that warranted by its investment.

This result rests on the notion that proportionality requires shareholders to have power according to their investment, which is not necessarily the case with a one share one vote capital structure with equal distributions of cash flow rights and voting rights. Depending on the specific structure of ownership, the same voting weight can carry different power, and, for that reason, disproportionality in influence can exist independently of separating mechanisms. This is different from the European Commission's notion of proportionality because it emphasizes the difference between voting rights and voting power. I consider this a richer framework, but it also calls for an explicit model of the relation between voting rights and voting power. The game theoretic concept of power indices can be regarded as such a model.

Next, I calculate the size of minimal winning coalitions to proxy the balance of power

between shareholders and management. I focus on size because a small coalition is more likely to reach an agreement, and because a small coalition is, therefore, more likely to be effective and have real real decision-making power. I focus on winning coalitions because they have the power to implement changes. If separating mechanisms reduce coalition size without adding disproportionality, they may actually provide a "free" solution to the classic agency problem between owners and managers. This would be particularly so when there is a high level of investor protection in the country of incorporation.

However, there is a trade-off here because, as we have seen, separating mechanisms do add to aggregate disproportionality. I find that in firms with separating mechanisms, minimal winning coalitions hold fewer cash flow rights but also fewer voting rights, which leads to larger coalitions, ceteris paribus. This is the worst of both worlds: there is more disproportionality between shareholders, and there is more discretionary power to management, particularly so in countries with low investor protection. In countries with high investor protection, such as Sweden, it is not the same problem. Thus, my analysis provides additional support to the argument that currently one size does not fit all with respect to harmonizing company laws and that high investor protection is a prerequisite in any case.

Finally, I consider shareholders' participation in the decision-making process and its consequences for disproportionality. Regulations and recommendations always stress the importance of shareholder participation, but, nonetheless, I find that it is not always effective in reducing disproportionality. The effect of a marginal shareholder joining the decision-making process is most pronounced in firms with relatively dispersed ownership structures and an already high participation rate. This holds for firms with no separating mechanisms as well as firms with separating mechanisms.

This paper is very much related to Bennedsen and Nielsen [2006], who analyze the value discount of disproportional ownership structures. Their analysis strengthens the

causal interpretation that the discount is driven by incentive and entrenchment effects. For this paper, one especially interesting result is that the value discount is significantly higher in firms with dual class shares than in firms with pyramidal ownership. I find that the former type of firm has less disproportionality from the separating mechanism, which may suggest that it is the type of mechanisms more than the disproportionality derived from ownership structure per se that determines the valuation effect.

I proceed as follows. Section 2 presents the analytical framework for disentangling disproportionality and determining the size of minimal winning coalitions and the effect on disproportionality of shareholder participation. A discussion of voting power theory is included in this section. Section 3 describes data sources and the construction of variables. Section 4 presents my results in more detail, and section 5 concludes.

2   Analytical framework

The analytical framework requires some notation. N is the total number of shareholders in the firm. $\{x_1, ..., x_n\}$ is the set of shareholders present at the shareholder meeting. $\{v_1, ..., v_n\}$ is the set of voting weights, and $\{c_1, ..., c_n\}$ is the set of corresponding cash flow rights. I assume that all shareholders participate in the decision-making process, and that each decision is independent of other decisions. I also assume formal voting instead of actual voting and think of this framework as an a priori analysis of the distribution of influence within the firm without reference to preferences. Let q denote the share of votes required to make a decision. The scope of these decisions, as well as the determination of q, is specified in company law and articles of association.

If the largest shareholder has a voting weight equal to or larger than the share of votes required to make a decision, I define this as absolute control. In this case, the distribution of influence is trivial since the largest shareholder has all the voting power; no other

shareholder has any effect on the outcome of the decision-making process. Otherwise, a subset $\{x_i, ..., x_j\}$ of the shareholders must cooperate to obtain control, and we face a cooperative game. In this case, I measure shareholders' relative influence on the decision-making process as the ability to change a subset from one that has no control to one that has control. The number of times this can be done is expressed as a proportion of the total number that can occur with random and equally probable voting outcomes. This is shareholder i's normalized Banzhaf [1965] voting power, ϕ_i.

2.1   Disentangling disproportionality

With mechanisms that separate cash flow rights and voting rights the cost of control is reduced. They alleviate the collective action problem among shareholders, but, at the same time, they aggravate agency problems between controlling shareholders and small outside shareholders. The former can make decisions without fully internalizing the costs related to those decisions, and, therefore, it makes sense to protect small shareholders against unfavorable treatment by promoting proportionality.[3] However, as I argue in this paper, disproportionality is not entirely due to separating or control enhancing mechanisms; part of it comes from the structure of ownership per se. A central notion is the following: *proportionality in influence requires shareholders to have voting power instead of voting rights according to their investment.*

It follows that proportionality in influence can only exist in unrealistic regimes with uniform distributions of ownership and no separating mechanisms. In any free market where the ownership structure per se is not regulated, and shareholders are restricted only by wealth or portfolio considerations, disproportionality exist irrespectively of separating mechanisms.

The simple argument goes like this. A large minority shareholder has less influence

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[3]Another important argument is that it facilitates a more effective market for corporate control.

on the decision-making process when there is another large minority shareholder than when the rest of the shareholders are small and dispersed. Because of the structure of ownership, the same voting weight can carry different influence, and, for that reason, disproportionality in influence exists independently of separating mechanisms.

Thus, to disentangle disproportionality, I define aggregate disproportionality and its two components as follows.

$$\text{Aggregate} \;\; \equiv \;\; \left.\frac{\phi^v}{c}\right|_{k=k^*} \tag{1}$$

$$\text{Structural} \;\; \equiv \;\; \left.\frac{\phi^c}{c}\right|_{k=k^*} \tag{2}$$

$$\text{Non-structural} \;\; \equiv \;\; \left.\frac{\phi^v}{c}\right|_{k=k^*} - \left.\frac{\phi^c}{c}\right|_{k=k^*}. \tag{3}$$

ϕ^v is voting power from voting rights, ϕ^c is voting power from cash flow rights, and c is the cash flow rights. k^* is the minimal winning coalition (see section 2.2 for details). I focus on the minimal winning coalition in order to control for the balance of power between shareholders and managers, which varies with the structure of ownership. Voting power from voting rights considers the actual distribution of power whereas voting power from cash flow rights is constructed to consider the distribution of power had there been no separating mechanisms. I use cash flow rights to define structural disproportionality because, in terms of voting power, this is the proper characterization of a one share one vote regime. Note that $\phi^v = \phi^c$ if there are no separating mechanisms. In line with the notion of proportionality, voting power is always divided by cash flow rights to reflect relative voting power.

The following example may help clarify the idea. Consider a firm with two classes of shares. Assume that there is a large shareholder with 15% of the voting rights in the firm, but only 5% of the cash flow rights. The remaining votes are dispersed equally among an

ocean of small shareholders with 95% of the cash flow rights, but only 85% of the voting rights (1% each). Such an ownership distribution yields the large shareholder about 60% of the voting power, i.e. 60% probability of being pivotal. In this example, as in the empirical analysis, a winning coalition has 90% or more of the voting power. The large shareholder therefore has to cooperate with a number of small shareholders. Calculating the minimal winning coalition gives a coalition of the large shareholder and 10 small shareholders. This coalition has 90% of the voting power from voting rights, 25% of the voting rights, and 16% of the cash flow rights (see section 3.1.2 for details on the minimal winning coalition's cash flow rights). Aggregate disproportionality is then equal to 0.90/0.16=5.6. If the large shareholder had voting rights according to investment (one share one vote), structural disproportionality would be 3.6. This decrease in disproportionality is due to the decrease in the voting power (from cash flow rights) of the minimal winning coalition that comes from the coalition's lower share of voting rights. The difference between 5.6 and 3.6 is the disproportionality in influence from the separating mechanism, and, as we see in this example, it is only responsible for about one third of the aggregate disproportionality.

2.2   Minimal winning coalitions

To proxy the balance of power between shareholders and management, attention is focused on minimal controlling coalitions. These coalitions have the lowest number of shareholders for a given combined holding of voting rights, and the lowest costs for any coalition with the same combined holding of voting rights.[4] Smaller coalitions are thus more likely to reach an agreement, which suggests that shareholders are more powerful. Such power mitigates agency problems between shareholders, as one group unified by their common

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[4]The costs of control is the sum of fixed and variable costs. Fixed costs are those incurred by the coalition in the direction of the firm together with a fixed component of the costs of organizing and maintaining a coalition. Variable costs reflect the general feasibility of the formation of the coalition (Leech [1987]).

investment interest, and managers.

By reducing the cost of control, separating mechanisms should reduce the size of the minimal winning coalition, ceteris paribus. The benefit to all shareholders from a controlling coalition that monitor managerial behavior is therefore larger in firms with separating mechanisms. So, curbing the voting power of large shareholders by disallowing separating mechanisms do change the balance of power in favor of the management.

The actual size of a minimal winning coalition depends on the actual structure of ownership. If the voting weight of a coalition is equal to or larger than q, it has majority control and all the voting power. It is reasonable (realistic), however, to allow a winning coalition to have minority control, and I define minority control as some voting power, ϕ^*, less than one. The size of a minimal controlling coalition must then satisfy

$$\phi^v|_{k=k^*} \geq \phi^* . \tag{4}$$

The voting power for this coalition is found in an iterative two-stage game in which a subset $\{1, ..., k^*\}$ of the shareholders forms a coalition before entering the voting game as a block.

2.3 Shareholder participation

Section 2.1 and 2.2 have showed that separating mechanisms are only partly responsible for disproportional distribution of influence, and that separating mechanisms alleviate agency problems between shareholders and managers by reducing managerial discretion. However, separating mechanisms may also create problems within the ownership structure between minimal winning coalition members and outside shareholders since the former group can make decisions without fully internalizing the costs related to these decisions. At the shareholder meeting, for the decision-making process to work efficiently, and for

10

outside shareholders to ensure a non-discriminatory use of corporate resources by the minimal winning coalition, it is therefore important that as many shareholders as possible participate in it.

So far, I have assumed that all shareholders always cast all their votes, but, because of free-rider problems, it is likely that some small shareholders decide not to vote. I close the analytical framework presented here by considering this problem. If $n < N$, I can use Dubey and Shapley [1979] to adjust the share of votes required to make a decision so that the unconditional share of votes is

$$q - \frac{1 - \sum_{i=1}^{n} v_i}{2} \ .$$

(5)

With regard to disproportionality, if some small shareholders decide not to vote and participate in the decision-making process (by presence or by proxy), then disproportionality is self-inflicted, irrespective of whether there are separating mechanisms or not. Since this is probably not the case for all small shareholders, it is still relevant to look at both aggregate and disentangled disproportionality for various levels of shareholder participation. With regard to minimal winning coalitions, nothing is changed since these are formed ex ante.

2.4   Discussion

A few caveats about this voting power based framework should be mentioned. First, it only relates to those decisions made at shareholder meetings, although, in many other situations, shareholders have to share power with other stakeholders. Second, it assumes that shareholders are neutral towards each other and that all possible coalitions are formed with equal probability. Third, it concentrates on corporate decisions that are taken by ordinary resolutions, which require a simple majority. Far-reaching decisions often require

some kind of super majority, but for these decisions, a different measure of voting power would be necessary. It is not sufficient to take into account that for example 75% of the votes are required to win; one also needs to consider that to preserve the status quo, only one shareholder or a coalition of shareholders above 25% is required. Furthermore, some legal rules protect the financial interests of small shareholders even when the distribution of votes and the rules for the voting would otherwise yield zero voting power to the small shareholders. Fourth, it does not account for individual preferences; voting outcomes are defined in terms of dispositions in a general vote without reference to preferences. A power index therefore measures the voting power of shareholders in an a priori sense within a particular voting system with a given distribution of votes and a simple majority requirement.

3   Data and variables

My ownership structure data is obtained from Faccio and Lang [2002], who recorded the ultimate ownership structure of a large cross section of public European firms in the period from 1996 to 1999. All ownership variables used here are defined as in this database. The total number of firms in my sample is 4,255. Faccio and Lang [2002] use the weakest link principle to trace the ultimate ownership stake for those shareholders with voting weights above the country specific disclosure threshold (typically 5%). The largest shareholder is said to be the ultimate owner if he or she controls 20% directly or through a vertical chain that exceeds 20% at all levels. In other words, they take into account the vertical ownership structure when they record the horizontal ownership structure, and this is an important characteristic of the data since many European firms use separating mechanisms such as pyramids and multiple control chains.

3.1 Variables

3.1.1 Voting power

The key variables are voting power and relative voting power, which is defined as voting power divided by voting weight. The choice of power index is motivated by the notion of power as the ability to influence the decision-making process (this is I-Power according to Felsenthal and Machover [1998]). The Banzhaf [1965] power index supports this notion. The alternative notion of power as the expected relative share of benefits available to the leading shareholders at the expense of non-leading shareholders is rejected because my main focus is on the balance of power between shareholders, as one group unified by their common investment interest, and managers.

Formally, shareholder i's power index value is

$$\phi_i(g) = \frac{\theta_i(g)}{\sum_{S \subseteq N, i \in S} \theta_i(g)} . \tag{6}$$

A swing for shareholder i is a pair of coalitions $(S, S \setminus \{i\})$ such that S has more votes than required to make a decision and $S \setminus \{i\}$ has not. For each $i \in N$ (or n depending on the participation), we denote by $\theta_i(g)$ the number of swings for shareholder i in the game g. The interpretation of the index value is then shareholder i's relative share among all pivotal positions. The game g is fully specified once the set of shareholders present at the shareholder meeting and the share of votes required to make a decision are given. Calculations are carried out using a generating function algorithm, as described in Leech [2002].

Calculating voting power and relative voting power requires a complete account of the distribution of votes. The ownership structure data, however, only includes those shareholders with voting weights above some disclosure threshold. Therefore, I have to make an assumption about the small shareholders unaccounted for. Two procedures can

be found in the literature. One assumes that the small shareholders are not influential (they free ride because the cost of participation is too large), and the other assumes that they are influential with some positive probability. The latter is relevant when $n = N$ and for the analysis of incremental changes in n when $n < N$. In addition, I do not want to inflict powerlessness on small shareholders by construction. I therefore use a finite representation, such as the one proposed by Guedes and Loureiro [2002], to approximate the actual distribution of votes. It simply assumes that each small shareholder holds one percent of the votes and then adds shareholders until the joint votes of all shareholders add up to one hundred percent.

3.1.2 Separating mechanisms

Empirical evidence suggests that one share one vote regimes are not generally the norm in continental Europe. Mechanisms that separate cash flow rights and voting rights so that large shareholders can more easily make decisions without internalizing all the costs are common in these countries, and Faccio and Lang [2002] record a number of the most frequent: dual-class shares, pyramids, holdings through multiple control chains, and cross-holdings. The presence of such mechanisms implies disproportional distributions of cash flow rights and voting rights. They only record the ratio of cash flow rights to voting rights for ultimate owners but then for a number of alternative definitions of control (20%, 10%, and 5% thresholds).

To impose as few restrictions as possible on the definition of ultimate owners, I should ideally use the 5% threshold and multiply the voting weight by this ratio in order to find the cash flow weight. However, since we only have data on the individual separating mechanisms under the 10 percent threshold, I use this instead. In general, I calculate the minimal winning coalition's cash flow rights as

$$c_{k^*} = c_1 + \frac{1 - c_1}{1 - v_1} \sum\nolimits_{i=2}^{k^*-1} c_i \; . \tag{7}$$

3.1.3 Minority control

Empirical literature on the relation between ownership structure and control (La Porta et al. [1999], Faccio and Lang [2002], Becht et al. [2002] amongst others) typically think of control as a dummy variable defined on some arbitrary criterion in terms of the voting weight of the largest shareholder. This is different from thinking about influence as a solution to simple multi-person cooperative games, which is what I do in this paper. Nevertheless, the static dichotomous approach and the dynamic game theoretic approach predict the same distribution of influence in cases of outright majority control; the largest shareholder has all the influence.

Once we allow for control without a single majority shareholder with absolute control, it is necessary for a subset of shareholders to form a coalition. If the combined voting weight of the coalition is larger than q, the distribution of influence remains trivial. If the combined voting weight is less than (unconditional) q, the coalition may have de facto control, but the distribution of influence is no longer trivial since the structure of the remaining votes has to be accounted for.

According to section 2, the power index value that qualifies for minority control should be less than one. I adopt the significance level from Leech and Manjón [2003] and formalize minority control as $\phi^* = 0.9$, which means that the probability of being pivotal in the decisions made at the shareholder meeting has to be equal to or larger than 0.9 to have minority control. While this criterion is just as arbitrary as the voting weight criterion, the underlying model of power to shareholdings has more structure and more general applicability.

3.1.4 Alternative measure of concentration

In addition to calculations of voting power and their shareholder-specific approach to the distribution of influence, I calculate Gini coefficients. This is a measure of inequality that ranges from 0, when all shareholders are equal in terms of influence, to a theoretical maximum of 1 in an infinite set of shareholders where only one has any votes, which is the ultimate inequality. It is calculated as the relative mean difference, i.e. the mean of the difference between every possible pair of shareholders divided by the mean value of voting weights.

$$G = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} |w_i - w_j|}{2n^2 \overline{w}} \ . \tag{8}$$

Note that a Gini coefficient has no reference to the share of votes required to make a decision.

3.1.5 Investor protection

Legal protection of shareholders is central to understanding concentration of ownership. To accommodate this, I use the revised anti-director rights index from Djankov et al. [2005] as my proxy for investor protection. The general principle behind this index is to associate better investor protection with laws that mandate, or set as a default rule, provisions that are favorable to small shareholders. It uses an ordinal scale from 0 to 6, where an index value close to 0 indicates that only few decision rights are granted to small shareholders.

As a robustness check, and to make a brief detour into the possible conflicts between large and small shareholders, I also try out the World Bank investor protection index and the anti-self-dealing index from Djankov et al. [2005]. The principle behind the first index is similar to Djankov et al. [2005]. It uses an ordinal scale from 0 to 10, where an index

value close to 0 indicates poor investor protection. The principle behind the last index is to associate the ease of self-dealing by the controlling shareholder with the strength of minority shareholder protection. The index values range from 0 to 1, where 0 indicates great ease of self-dealing.

4   Results

This section contains the results from the empirical analysis. First, since the structure of ownership is fundamental to these results, I present some related variables to characterize our sample. Table 1 shows the voting weight and voting power for the largest shareholder. Comparing the two offers some insight into the ex ante (before formation of coalitions) balance of power between shareholders and managers. On average, the voting weight of the largest shareholder is too small to control the decision-making process single-handed. Given the structure of ownership in this sample, a 38% voting weight translates to a 64% probability of being pivotal in the decisions made at the shareholder meeting. Due to costs of coalitions, such a dependency on other shareholders to form winning coalitions favors managers. Although often considered politically undesirable, separating mechanisms may however help balance the power relations by reducing the cost of control.

Table 1 also shows the ratio of cash flow rights to voting rights. If a firm uses separating mechanisms, this ratio is less than one, and the largest shareholders should be more powerful. The share of firms with a shareholder powerful enough to control the decision-making process single-handed is presented in the last two columns. For the entire sample, 32% of the firms has a shareholder with absolute control, and 16% has a shareholder with minority control. Before moving on to disentangling disproportionality, we should thus note that the capacity for coalitions among large minority shareholders appears great.

4.1 Disentangling disproportionality

I have disentangled disproportionality from the structure of ownership and disproportionality from separating mechanisms specifically using the procedure described in section 2.1. I am particularly interested in non-structural disproportionality since this supposedly is within immediate reach of policy makers, whereas structural disproportionality is unaffected by the separating mechanisms supported by law; it is merely a consequence of the ownership structure per se, which is much more troublesome to regulate in a free market. Tables 2 through 4 provide my results.

Table 2 shows the result of disentangling disproportionality. First, we see that more than two thirds of the sample firms do not use separating mechanisms at all. Second, we see that structural disproportionality is about the same in the two sub-samples. On average, shareholders in the minimal winning coalitions have to put up the same amount of money, and, regardless of separating mechanisms, this investment returns more than double influence (voting power) just as a result of ownership concentration. Third, we see that, in firms with separating mechanisms, aggregate disproportionality is considerably increased; the influence of the minimal winning coalition is 5.98 times the investment compared to 2.42 in other firms. So, although disproportionality is not entirely due to separating mechanisms, they do add to the problem. This may offend common sense of right and wrong in equal treatment, but it may help balance the power between shareholders and managers. Before this is considered in more detail, table 3 and 4 show non-structural disproportionality by mechanism.

The general result still holds. For all mechanisms, structural disproportionality is between 2 and 2.55, and non-structural is at least the same. Looking at the usual suspect, Italy always comes out very high (as high as 14.69 in the case of pyramids). In contrast, the two common law countries always come out low. We see that the use of pyramids creates more non-structural disproportionality than the use of dual-class shares. Dual-class shares

account for less than half of the aggregate disproportionality whereas pyramids account for almost two thirds. These two mechanisms are by far the most commonly used in the sample. Bennedsen and Nielsen [2006] show that the opposite holds for value destruction, which may suggest that it is the type of mechanisms more than disproportional ownership structure per se that determines the valuation effect.

4.2 Minimal winning coalitions

Tables 5 and 6 show results on the size of minimal winning coalitions. From table 5, we should note a few stylized facts. First the minimal winning coalition on average requires the 4 largest shareholders to cooperate. There is large variation though; the maximum is Ireland with 9, and the minimum is Austria and Italy with 2. Second, the countries with the smallest winning coalitions are those with the largest Gini coefficients and vice versa. Third, the countries with the smallest winning coalitions are also those with the lowest investor protection. In order to balance the power that managers have when investor protection is weak, ownership structure adjusts so that the large shareholders become more powerful. I also find that countries with small minimal winning coalitions tend to have low anti-self-dealing index values. In these countries, it seems, we should not worry about powerful managers as much as about powerful large shareholders.

To analyze the implications of disproportional ownership, I begin by comparing outright the size of minimal winning coalitions in firms with and without separating mechanisms. The mean size of the sub-sample of firms without separating mechanisms is 4 compared to 5 in the sub-sample with separating mechanisms, and the t-statistic for difference in means is -3.64 and statistically significant at all conventional levels. This is contrary to the argument in section 2.2 that by reducing the cost of control, separating mechanisms also reduce the size of the minimal winning coalition. However, in a comparative analysis, the crucial assumption underlying this theory is that the investment is

fixed, and table 6 shows that this is not the case. In firms with separating mechanisms, minimal winning coalitions hold fewer cash flow rights but also fewer voting rights, which leads to larger coalitions, ceteris paribus. The shareholders in these firms are therefore not more powerful (on the contrary); they merely obtain their control stake cheaper. This discount on control comes at a cost though: large coalitions are less efficient monitors of managerial discretion.

4.3 Shareholder participation

Figure 1 shows the effect of shareholder participation on aggregate disproportionality for firms with and without separating mechanisms, respectively. Calculations are carried out for the minimal winning coalition with an increasing number of small shareholders taking part in the decision-making process (although, in practice, 100% shareholder participation is probably the exception). The share of votes required to make a decision is continuously adjusted using equation (5). Note that a firm enters the graph repeatedly until the joint votes of all shareholders in that firm add up to one hundred percent. The numbers in the graph, therefore, cannot be compared to the numbers in the tables. 25% is the minimum share of voting rights that a minimal winning coalition can hold (they are formed ex ante assuming that $n = N$).

First, we see that, regardless of separating mechanisms, aggregate disproportionality declines in shareholder participation. Moving right, minimal winning coalitions become less powerful and hence more easily influenced by additional participation. When the minimal winning coalition holds a relatively small share of the voting rights, shareholder participation matters a great deal. In these firms with full shareholder participation, aggregate disproportionality drops to 1 for those with no separating mechanisms. This means that the minimal winning coalition has voting power according to investment and that proportionality is obtained. The corresponding number for firms with separating

20

mechanisms is 1.5. Second, the difference between the two graphs narrows, which suggests that non-structural disproportionality in firms with separating mechanisms is reduced by shareholder participation.

5 Conclusion

In this paper, I examine the premise for the principle of proportionality (one share one vote) that the European Commission has been promoting in order to facilitate a level playing field for the market for corporate control within the Internal Market. The main contribution is that I disentangle disproportionality from the structure of ownership and disproportionality from separating mechanisms. A central notion of this contribution is the following: proportionality in influence requires shareholders to have power instead of voting rights according to their investment. This distinction adds to the discussion on appropriate regulation and corporate governance related recommendations of optimal capital structures by accentuating that disproportionality is not entirely due to separating mechanisms. Empowering small shareholders with one share one vote obviously aligns cash flow rights and voting rights, but it is no guarantee of proportionality.

My results are based on a data set covering 4,255 firms in thirteen European countries. In firms with one share one vote, I find that the minimal winning coalition's influence is more than double of what is warranted by its investment. Separating mechanisms do add considerably to the total disproportionality though. In firms with separating mechanisms, I find that the minimal winning coalition's influence is about six times that warranted by its investment. Looking at the types of separating mechanisms, dual-class shares and pyramids are the most common, and pyramids cause significantly more disproportionality than dual-class shares. I conjecture that it is the type of mechanisms more than (non-structural) disproportionality per se that determines the negative valuation effect

21

documented in previous studies.

On the other hand, separating mechanisms may also help balance the power between shareholders and managers. In countries with high investor protection, such as Sweden, this is exactly what I find in the data: minimal winning coalitions are smaller and expected more efficient in firms with separating mechanisms. In countries with weak investor protection, ownership structures adjust as well, but shareholders in the minimal winning coalitions invest less and have less voting power; even in firms with separating mechanisms. Consequently, these coalitions are larger and less efficient, which is problematic. However, I also find that countries with small minimal winning coalitions tend to have low anti-self-dealing index values. In these countries, it seems, we should not worry about powerful managers as much as about powerful large shareholders.

Finally, I consider small shareholders' participation in the decision-making process and its consequences for proportionality in influence. Promoting shareholders' opportunity to participate and vote in shareholder meetings is an important part of the OECD's corporate governance recommendations for example. However, while a high participation rate might strengthen the perception of a good shareholder democracy, it is not always effective in reducing disproportionality. I find that the effect of a marginal shareholder joining the decision-making process is most pronounced in firms with relatively dispersed ownership structures and an already high participation rate. This holds for aggregate disproportionality as well as disproportionality from separating mechanisms. It should be noted though that for a significant number of firms, full participation actually results in proportionality in influence.

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Figure 1: Aggregate disproportionality and shareholder participation
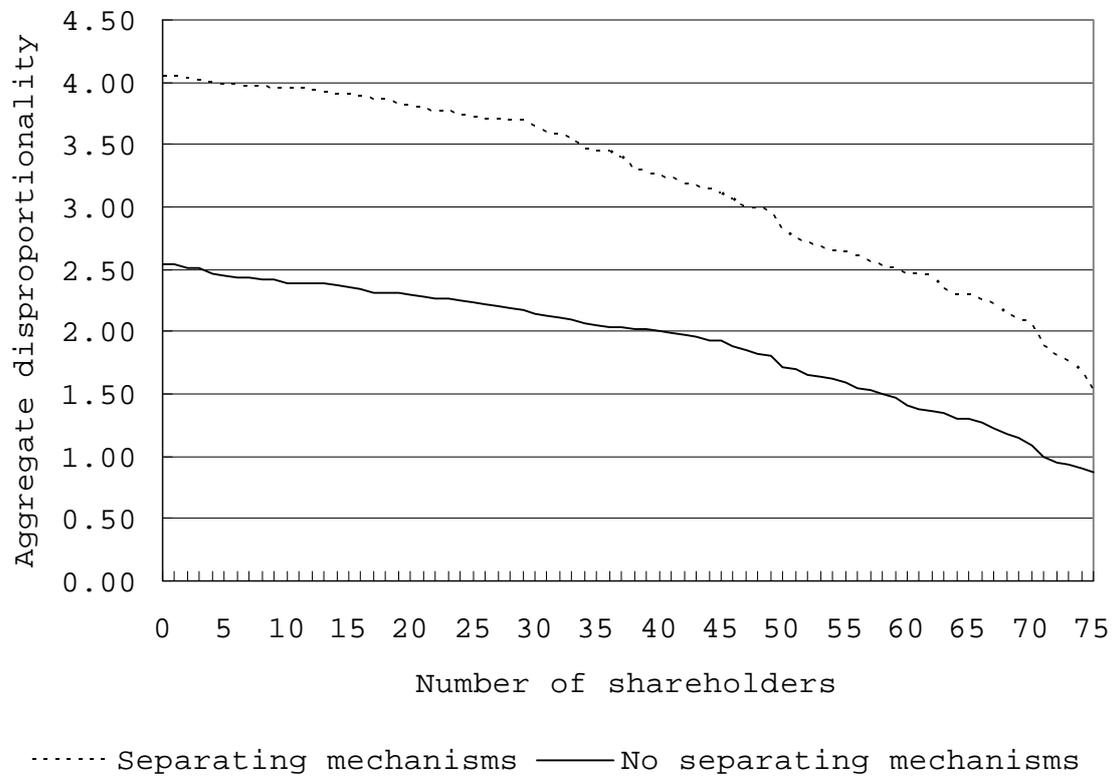
Table 1: The structure of ownership

This table presents statistics on country level for variables related to the structure of ownership. Focus is on the ultimate or the largest shareholder. Data is obtained from Faccio and Lang [2002]. Voting weight is the largest shareholder's share of the voting rights. Voting power is the largest shareholder's Banzhaf [1965] power index value. Cash flow rights to voting rights is the ratio of cash flow rights to voting rights at the 10% definition of control. Absolute control is the share of ultimate shareholders with a power index value equal to 1, and minority control is the share of ultimate shareholders with a power index value equal to or larger than 0.90.

Country	N	Voting weight ultimate owner		Voting power ultimate owner		Cash flow rights to voting rights	Absolute control	Minority control
		Mean	Median	Mean	Median			
Austria	95	0.54	0.55	0.88	1.00	0.85	0.61	0.19
Belgium	108	0.43	0.44	0.74	1.00	0.85	0.40	0.24
Finland	122	0.35	0.32	0.58	0.59	0.83	0.25	0.17
France	559	0.50	0.51	0.84	1.00	0.95	0.55	0.19
Germany	551	0.53	0.51	0.79	1.00	0.87	0.58	0.11
Ireland	62	0.22	0.17	0.42	0.23	0.83	0.06	0.15
Italy	190	0.50	0.51	0.86	1.00	0.75	0.54	0.25
Norway	128	0.29	0.26	0.54	0.35	0.83	0.16	0.19
Portugal	83	0.41	0.44	0.77	1.00	0.93	0.46	0.19
Spain	487	0.44	0.36	0.67	0.94	0.95	0.35	0.17
Sweden	228	0.28	0.23	0.53	0.36	0.79	0.13	0.22
Switzerland	170	0.47	0.51	0.79	1.00	0.74	0.54	0.16
UK	1,472	0.25	0.19	0.47	0.31	0.89	0.11	0.13
All countries	4,255	0.38	0.30	0.64	0.82	0.88	0.32	0.16

Table 2: Disentangling disproportionality

This table presents the results of disentangling disproportionality and summarizes the use of separating mechanisms on country level. The columns show the number of firms and structural and non-structural disproportionality, respectively. Structural disproportionality is the ratio of the minimal winning coalition's voting power from cash flow rights to cash flow rights. Non-structural disproportionality is the ratio of the minimal winning coalition's voting power from voting rights to cash flow rights. Voting power is the Banzhaf [1965] power index value.

Country	No separating mechanisms			Separating mechanisms		
	n	Structural	Non-structural	n	Structural	Non-structural
Austria	55	1.97	0.00	40	2.20	1.29
Belgium	81	2.20	0.00	27	2.08	4.51
Finland	67	2.39	0.00	55	2.54	3.29
France	464	2.01	0.00	95	2.48	2.44
Germany	353	1.81	0.00	198	2.36	1.86
Ireland	39	2.92	0.00	23	2.74	3.65
Italy	84	1.90	0.00	106	1.88	7.38
Norway	87	2.83	0.00	41	2.22	3.44
Portugal	73	2.34	0.00	10	1.82	5.15
Spain	410	2.10	0.00	77	2.51	2.36
Sweden	139	2.93	0.00	89	2.14	5.70
Switzerland	69	2.39	0.00	101	2.17	2.93
UK	1,016	2.92	0.00	456	2.76	3.65
All countries	2,937	2.42	0.00	1318	2.44	3.54

Table 3: Disentangling disproportionality by dual-class shares and pyramids

This table presents the results of disentangling disproportionality and summarizes the use of dual-class shares and pyramids on country level. The columns show the number of firms and structural and non-structural disproportionality, respectively. Structural disproportionality is the ratio of the minimal winning coalition's voting power from cash flow rights to cash flow rights. Non-structural disproportionality is the ratio of the minimal winning coalition's voting power from voting rights to cash flow rights. Voting power is the Banzhaf [1965] power index value.

Country	Dual-class shares			Pyramids		
	n	Structural	Non-structural	n	Structural	Non-structural
Austria	22	1.88	1.19	24	2.41	2.05
Belgium	0	-	-	20	2.10	5.64
Finland	46	2.61	2.43	7	1.79	12.82
France	12	2.74	1.27	100	2.35	1.97
Germany	98	2.33	1.81	129	2.39	2.11
Ireland	14	2.98	1.25	8	2.14	8.47
Italy	78	1.92	6.65	51	1.68	14.69
Norway	14	2.56	1.03	33	2.10	3.95
Portugal	0	-	-	10	1.82	5.15
Spain	1	3.62	0.00	71	2.50	2.38
Sweden	104	2.64	2.36	46	2.24	5.81
Switzerland	97	2.13	2.77	14	2.47	3.57
UK	339	2.87	2.03	373	2.70	3.62
All countries	825	2.55	2.53	886	2.45	4.01

Table 4: Disentangling disproportionality by cross-holdings and multiple control chains

This table presents the results of disentangling disproportionality and summarizes the use of cross-holdings and multiple control chains on country level. The columns show the number of firms and structural and non-structural disproportionality, respectively. Structural disproportionality is the ratio of the minimal winning coalition's voting power from cash flow rights to cash flow rights. Non-structural disproportionality is the ratio of the minimal winning coalition's voting power from voting rights to cash flow rights. Voting power is the Banzhaf [1965] power index value.

Country	Cross-holdings			Multiple control chains		
	n	Structural	Non-structural	n	Structural	Non-structural
Austria	1	2.22	0.56	6	2.29	0.27
Belgium	0	-	-	3	1.08	4.48
Finland	0	-	-	1	1.64	0.00
France	0	-	-	17	2.00	0.44
Germany	18	2.06	1.75	22	2.05	0.82
Ireland	0	-	-	10	2.23	7.33
Italy	2	2.67	3.67	21	1.66	9.78
Norway	2	2.37	1.08	16	1.87	4.98
Portugal	0	-	-	3	1.73	3.86
Spain	1	1.82	0.00	28	2.40	1.41
Sweden	1	3.62	0.00	8	2.56	2.86
Switzerland	0	-	-	2	2.17	0.01
UK	2	3.62	7.73	86	2.39	4.72
All countries	27	2.30	2.11	223	2.19	3.94

Table 5: Minimal winning coalitions and investor protection

This table presents the size of minimal winning coalitions as well as measures of investor protection on country level. k^* is the size of minimal winning coalitions. Size is rounded up to the nearest integer to reflect that shareholders always come in one piece. G is the Gini coefficient, which is an alternative measure of ownership concentration. The index ranges from 0 to 1, where a low value indicates high equality in terms of voting rights, and a high value indicates low equality. Anti-director rights is the revised anti-director rights index from Djankov et al. [2005]. The index ranges from 0 to 6, where an index value close to 0 indicates that only few decision rights are granted to small shareholders. The methodology behind the World Bank investor protection index is similar, but the index ranges from 0 to 10, where an index value close to 0 indicates poor investor protection. Anti-self-dealing index is also from Djankov et al. [2005]. The index values range from 0 to 1, where 0 indicates great ease of self-dealing by the controlling shareholder.

| | | | Investor protection | | |
Country	k^*	G	Anti-director rights	World Bank	Anti-self-dealing
Austria	2	0.54	2.50	3.70	0.21
Belgium	3	0.47	2.00	7.00	0.54
Finland	5	0.42	3.50	5.70	0.46
France	3	0.52	3.00	5.30	0.38
Germany	3	0.55	2.50	5.00	0.28
Ireland	9	0.25	4.00	8.30	0.79
Italy	2	0.54	2.50	5.00	0.39
Norway	6	0.37	3.50	6.70	0.44
Portugal	3	0.46	2.50	6.00	0.49
Spain	3	0.51	5.00	5.00	0.37
Sweden	5	0.35	3.50	5.70	0.34
Switzerland	3	0.50	3.00	3.00	0.27
UK	6	0.31	5.00	8.00	0.93
All countries	4	0.43	3.86	6.20	0.56

Table 6: Minimal winning coalitions

This table presents the share of voting rights and the share cash flow rights of the minimal winning coalitions on country level as well as the size of minimal winning coalitions in firms with and without separating mechanisms. Size is rounded up to the nearest integer to reflect that shareholders always come in one piece.

	Voting rights		Cash flow rights		Size of minimal winning coalition	
	No separating	Separating	No separating	Separating	No separating	Separating
Austria	0.58	0.57	0.58	0.41	2	3
Belgium	0.51	0.42	0.51	0.24	3	5
Finland	0.47	0.42	0.47	0.32	5	6
France	0.56	0.44	0.56	0.34	2	4
Germany	0.63	0.52	0.63	0.34	2	3
Ireland	0.36	0.27	0.36	0.21	7	12
Italy	0.57	0.51	0.57	0.33	2	2
Norway	0.38	0.45	0.38	0.30	7	4
Portugal	0.47	0.42	0.47	0.21	3	2
Spain	0.56	0.44	0.56	0.35	3	3
Sweden	0.36	0.40	0.36	0.23	6	5
Switzerland	0.46	0.55	0.46	0.34	3	3
UK	0.36	0.34	0.36	0.27	6	7
All countries	0.48	0.43	0.48	0.31	4	5