Why Do Boards Exist? Governance Design in the Absence of Corporate Law

Finance Working Paper N° 504/2017
December 2020

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Abstract

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Keywords: Board roles, ownership structure, voting, conflicts of interest, authority

JEL Classifications: G3, D23, K2, N80

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Abstract

We study when firms choose to install boards and their roles in a historical setting where neither boards nor their duties are mandated by law. Boards arise in firms with large, heterogenous shareholder bases. We propose that an important role of boards is to mediate between heterogenous shareholders with divergent interests. Voting restrictions are common and ensure that boards are representative and not captured by large blockholders. Boards are given significant powers to both mediate and monitor management, but few boards mainly advise. Firms with boards are more prevalent in regions with a greater supply of small-investor finance.

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Boards of directors are central to the governance of public corporations. The roles commonly attributed to boards are monitoring and advising top management. As pointed out by Adams, Hermalin, and Weisbach (2010), what boards do cannot be directly tested because all public corporations are mandated to have boards. Instead, researchers infer the roles and value of boards indirectly from their composition, regulatory changes, or surveys.

In this paper, we analyse when firms choose to install boards and what roles they confer on them in a setting where neither a board nor its duties are mandated by law. We study 85 Norwegian firms at the turn of the twentieth century, when Norway had no statutory corporate law but limited liability firms had legal personhood. The law granted contractual freedom, allowing owners to freely draw up the articles of association (statutes). Our sample firms are publicly traded industrial corporations with separation between ownership and control, run by small teams of managers.

This historical setting allows us to examine the raison d'être of boards in a direct manner that is not available to studies of contemporary boards. Since boards are optional, we can identify the circumstances in which owners consider a board to be beneficial. We map firms' statutes into a codable set of governance variables. In particular, we record shareholder voting rights and whether the board (if installed), management, or the general shareholder meeting (GM) are given the authority over important strategic decisions such as asset sales, borrowing, and dividends. In the empirical analysis, we examine the choice to install a board and relate it to ownership structure and voting rights. We also investigate the decision powers conferred on boards and use the allocation of authority to infer their roles. In much of the empirical analysis we rely on share denomination as a proxy for ownership structure because information about owners is available only for a subsample of firms.

The relationships uncovered by our analysis reveal the costs, benefits, and roles of boards, because they arise in a setting where firms can freely choose their governance rules. Five main patterns emerge which we briefly describe before providing our explanation of how "it all fits together."

First, one-quarter of the sample firms install boards whereas the other firms choose not to have them.

Second, in a subsample of firms for which we observe individual owners, large shareholders are ubiquitous and present also in firms with boards. The distinctive ownership characteristic of firms with boards is a large heterogeneous shareholder base that includes numerous small shareholders who collectively own a majority stake.

Third, the majority of firms adopt voting restrictions (capped or graduated voting schemes).[1] In particular, low voting-cap thresholds of 2.5% or 5% of paid-in equity are common, and firms with boards tend to adopt the most stringent voting restrictions.

Fourth, boards are given significant decision powers at the expense of management and GMs. They are usually endowed with the power to take one or several important strategic decisions and nearly always determine dividends. Furthermore, boards in firms with more stringent voting restrictions have greater decision-making powers.

Fifth, boards with above-median decision-making powers are required to collect information by, e.g., having to inspect the company books and cash balance. By contrast, boards in firms where management is given greater power are given have more advisory duties.

What do these governance patterns tell us about boards and their roles? Separation between ownership and control is commonly associated with a lack of monitoring by dispersed shareholders and the risk that managers pursue their own interests to the detriment of shareholders (e.g. Hart (1995)). Boards, endowed with the power to approve important decisions, provide one mechanism with which to mitigate managerial agency problems. Partial concentration of share ownership in the hands of large investors, who have incentives to monitor, is another such mechanism (e.g., Shleifer and Vishny (1986)).

In light of the notion that large shareholders and boards are substitutes for monitoring management, our first two findings are surprising: Firms that install boards also have (multiple) large shareholders. Thus, boards appear less associated with the lack of large shareholders and more with having large and heterogeneous shareholder bases. This suggests that boards do more than compensate for a lack of large shareholder monitoring.

[1] Under graduated voting, the number of votes exercisable by a shareholder increase disproportionately less than the number of shares, while a capped voting scheme imposes an upper ceiling on the total number of votes a single shareholder can exercise regardless of the amount of stock held. A voting cap of, say, 5% of paid-in equity implies that the upper ceiling is reached when a shareholders owns a number of shares that correspond to 5 percent of the outstanding number of shares.

We propose that boards also play a role vis-á-vis shareholders as mediators of conflicts between heterogenous owners. This role involves making compromise decisions by taking into account the preferences and opinions of all shareholders, that is, governing with a balanced objective function. The potential for conflicts between large and small shareholders is evident in our firms, but conflicts over corporate decisions can exist also between shareholders with similar ownership stakes. Arguably, conflicts and diverging opinions become likelier and more pervasive when a firm's shareholder base is larger, rendering decision-making (collective action) in the GM very costly.

Balancing shareholder interests requires that boards are represent the entire shareholder base and cannot be captured by large shareholders. We posit this as the rationale underlying the third observation: Voting restrictions dilute the influence of large shareholders and empower small shareholders in board elections and other votes taken by GMs. Notably, firms with boards have more stringent voting restrictions, which we interpret as a means of promoting a balanced board composition to ensure that small shareholders' interests receive weight. Indeed, in firms where we observe the board composition, large shareholders are far from dominant. Board members come from diverse backgrounds and the majority owns less than a one percent stake.

The mediation role of boards requires authority vis-á-vis shareholders, enabling a board to push through compromise solutions. Our fourth observation is that both management and shareholders cede decision-making powers to boards, and board powers are larger when voting restrictions are tighter. In our view, voting restrictions are not merely a safeguard for minority shareholders (e.g., Armour et al. (2017)), but also reflect the potential for conflict between shareholders. Thus, it is consistent with their mediation role that boards hold more power when the potential for shareholder disagreement is greater. In these instances, the delegation of decision-making to a mediating body, a board, seems most warranted. We see further evidence of the mediation role in the fact that boards almost always determine dividends. Dividend policy can be particularly contentious (e.g., Eckbo and Verma (1994)), notably when equity markets are less liquid.

Once equipped with authority to mediate between shareholders, boards also has authority

vis-á-vis management and is empowered to monitor. The power to ratify decisions enables boards to stop managerial initiatives that go against shareholders' interests. Mediation and monitoring are, therefore, intrinsically linked, as both roles rely on authority. The fifth observation, that boards with greater powers are obliged to become informed, is consistent with the monitoring role. Being informed about the business is more important for boards that must take, or approve, more decisions. Furthermore, we find that boards with above-median powers are required to meet more frequently. By contrast, in firms which confer greater authority on management, boards are larger and are assigned more advise-related functions, in support of the notion that (contemporary) friendly boards are better suited to fulfill the advisory role (Adams and Ferreira (2007)).

Our overall proposition is that firms with a large and heterogeneous shareholder base install boards in a mediation role to address conflicts between shareholders. The fact that firms with a smaller shareholder base do not install boards, suggests that boards generate not only benefits but also costs. A boards adds an agency layer to the organizational structure of a firm and erodes direct shareholder control. This, in turn, begs the question: why do some firms raise much of their equity funding from small investors and therefore have to install a board?

We attribute this funding mode to wealth constraints. The demand for capital at the turn of the twentieth century simply exceeded the wealth of affluent individuals in Norway, as it did in other countries (e.g., Berle and Means (1932)). Some firms are forced to raise much of their equity capital from the bourgeoisie (middle class) and end up with large, heterogeneous shareholder bases.

The interpretation that boards arise as the constrained optimal governance choice for a given shareholder base implies the presence of a causal relation running from ownership structure to board installment. Yet, our main analysis does not include exogenous variation in ownership, raising the possibility that omitted variables could explain the correlation between numerous small shareholders and boards. We address such causality concerns in two ways. First, we rule out alternative explanations, such as bank credit and trust (Franks, Mayer, and Rossi (2009)), as inconsistent with key aspects of our findings. Second, we provide quantitative evidence of causality by exploiting regional variation in the supply of small investor finance.

We show that a larger (local) supply has a strong positive effect on the likelihood of having a board.

The mediation role of boards is largely overlooked in the economics and finance literature. The potential for boards to manage shareholder relations by making compromise decisions and protecting minority interests arises whenever shareholders disagree about firm policies. Mediation is relevant also in modern-day corporations, because shareholder heterogeneity may be the rule rather than the exception, as several recent papers have demonstrated.[2]

The governance literature traditionally emphasizes heterogeneity in the form of conflicts of interests between large and small owners (e.g., LaPorta et al. (1998)), and boards would believably play a role as protectors of minority shareholder interests in firms with large blockholders.[3] Shareholder conflicts, however, materialize along many other dimensions and hence the scope for board mediation is much broader than the classic conflict between large and small shareholders.

Legal protection of minority shareholders has greatly expanded since the time of our setting. But regulatory standards, such as equal treatment, or constraints on particular actions, such as related-party transactions, will never eliminate all discretionary leeway in decision-making and consequently also not alter the scope to favor controlling shareholders, or, in general, any one shareholder group over others. Our findings suggest that diluting (or augmenting) the appointment rights of certain shareholder groups can help a firm achieve a balanced board that make consensual decisions in the interests of all shareholders.

The mediation role of boards also has bearing on the current shareholder empowerment

[2] Shareholders have varying tax positions (Eckbo and Verma (1994), Desai and Jin (2012)) and varying exposures due to hedging (Martin and Partnoy (2005)). Institutional investors differ in their support for management (Matvos and Ostrovsky (2010)) and have varying time horizons (Gaspar, Massa, and Matos (2005), Chen, Harford, and Li (2007)). Further, shareholders may differ in their views because they represent particular constituencies, such as unions (Matsusaka, Ozbas, and Yi (2019), Agrawal (2012)) or public pension funds (Romano (1993)). Li, Maug, and Schwartz-Ziv (2019) and Bolton et al. (2019) show how shareholder disagreement is reflected in their voting patterns. Schwartz-Ziv and Volkova (2020) find that having multiple heterogeneous blockholders impacts firm performance detrimentally and exacerbates disagreement in shareholder meetings.

[3] Two prominent examples of boards intervening to protect minority shareholders' interests against overreach by a majority shareholder are the the proposed merger of CBS and Viacom by the controlling Redstone family and the excessive outlays of the CEO and chairman of Hollinger International's board, Conrad Black. (E.g. "CBS sues Shari Redstone, its controlling owner," CNN Business, May 14, 2018, and "Report slams Hollinger's Black for a 'corporate kleptocracy'", Wall Street Journal, September 1, 2004).

debate.[4] Some critics argue that shareholders empowerment is unlikely to benefit shareholders as a class because of private interests (e.g., Anabtawi (2006)). We find that boards assume powers at the expense of GMs exactly when the potential for shareholder disagreement is great, suggesting that mediation is a reason for having boards with strong governance powers.

The paper proceeds as follows. In Section 1 we discuss our study's relation to the existing literature. In Sections 2and 3 we describes the data and the statutes. In Section 4 we characterize firms that install boards and, in Section 5 we explain how voting restrictions are related to shareholder conflicts. Section 6 discusses the roles of boards, which we infer from the allocation of authority within firms. In Section 7 we discuss why firms have small shareholders, address issues of causality, and provide some suggestive evidence for the matching up of firms and large investors. Concluding remarks are provided in Section 8. In the appendices we provide a brief account of the institutional corporate setting for our sample, summary statistics for the statute provisions, and examples of provisions pertaining to the functioning of boards and management.

1 Literature

Our paper is related to several bodies of literature, most directly to the large and continuously growing literature on corporate boards (Adams (2017)). The economics and finance literature considers monitoring and advising the main roles of boards (Fama and Jensen (1983), Adams et al. (2010)). The monitoring role is the subject of a wealth of empirical studies many of which focus on the characteristics make boards effective monitors (e.g., Weisbach (1988) Yermack (1996)). More recently, the literature has also begun examining the advisory role of boards, pointing out tension between the two roles (e.g., Holmström (2005), Harris and Raviv (2005), Adams and Ferreira (2007), Faleye, Hoitash, and Hoitash (2011), Schmidt (2015)). We argue that boards play a role not only vis-á-vis management, whether through monitoring or advising, but also vis-á-vis shareholders, mediating between shareholders with differing ownership stakes, preferences, and opinions.

[4] Bebchuck (2005) makes the case for shareholder empowerment in U.S. corporate law which grant shareholders fewer corporate governance rights than other common law jurisdictions (Hill (2019)).

The potential for mediation by boards has been largely overlooked, with a few exceptions. Bennedsen (2002) and Villalonga et al. (2019) study closely-held firms and propose that boards are installed to alleviate conflicts between controlling and non-controlling shareholders. Our sample firms are not closely held and their much larger shareholder bases include multiple large, but not controlling, shareholders. In addition, the separation of ownership and control requires boards in our public firms to address managerial agency problems. A group of recent papers examine the notion that unbiased individual board members can serve as mediators between the other directors. Broughman (2010, 2013) shows that independent directors can arbitrate disputes between the entrepreneur and the VC investor in privately held start-up firms. Ewens and Malenko (2020) present evidence that independent directors play both an advising and a mediating role over the lifecycle of start-ups. Ng and Roberts (2007) report that independent directors arbitrate between controlling and minority owners in family-controlled Asian companies. In these papers, the mediating role arises from the addition of unbiased directors to a board. In our (larger) firms, mediation comes about because boards represent all shareholder groups but do not include designated arbitrators.

The mediation role of boards has been recognized in the law literature. According to Gevurtz (2004), predecessors of corporate boards in e.g. merchant societies, were bodies of representatives practicing collective governance to mediate between the various constituencies. The historical origins suggest that mediation may still serve an important function on modern corporate boards. Questioning the merits of shareholder primacy, Blair and Stout (2001) argue that boards should be charged with the role of balancing the competing claims of various corporate constituencies such as shareholders, employees, creditors, and customers. In this role, boards provide the organizational solution to the problem that one constituency may appropriate profits to the detriment of others and thus discourage firm-specific investment by any group. Closer to our line of reasoning, Anabtawi (2006) points to the need for mediation to balance the private interests of various shareholders as a rationale for granting decision-making authority to boards.

In addition to advocating mediation, we also differ from the extant board literature in how we infer the roles of boards. Empirical studies commonly use board characteristics,

such as independence, size, busyness, or CEO duality, to determine whether a board is more monitoring- or advisory-oriented. By contrast, we identify board roles from the allocation of decision-making powers. Boards endowed with decision-making powers monitor and mediate whereas, in firms where management has authority, boards advise. In addition, our paper is, as far as we can establish, unique in being able to address the preceding, more fundamental question, of why or when public firms may voluntarily want to install boards in the first place.

Our paper is also related to the theoretical literature on delegation in organizations. Delegation of formal authority is commonly rationalized by costs of acquiring, processing, and communicating information (Bolton and Dewatripont (2013)). When agent and principal preferences diverge, delegation is costly. At the same time, retaining authority also comes with costs, because it can hinder informative communication (Dessein (2002)) or undermine the agent's incentives (Aghion and Tirole (1997), Burkart, Gromb, and Panunzi (1997)). Delegation models typically examine (productive) inefficiencies caused by asymmetric information or incentive problems within two-layer hierarchies. Such models speak to the allocation of authority in firms without boards, but they do not address our focal question of when to install a board.

To the best of our knowledge, the same applies to the theoretical board literature as well as to the corporate governance literature in general. By way of illustration, Harris and Raviv (2008) examine a two-tier principal-agent structure to develop their argument that insider-dominated boards are desirable if outsiders have large informational disadvantages. The choice to move from a two- to a three-layer organization is taken up in the organization theory literature, albeit not specifically for boards. In Tirole (1986), the supervisor is, by assumption, better informed than the principal, has no authority, and her task is to report the agent's productivity when she observes it. In Dessein (2002) a three-layer organization is superior to either no delegation or delegation to the agent when the bias of the supervisor is moderate. In both models, the principal is assumed to be a monolithic actor whereas our firms have numerous heterogeneous owners. The need to mitigate collective action problems that our boards address, is therefore, absent from these models.

Incentive and information-based theories of delegation identify the costs and benefits of

delegation. Predictions regarding when decisions should (not) be delegated to the agent typically depend on variables that are hard to observe, such as the congruence of preferences or the agent's informational advantage, and are not easily testable. Notwithstanding this difficulty, authority allocation matters, as two recent papers illustrate. Cornelli, Kominek, and Ljungqvist (2013) show that a legal shift in authority to fire the CEO from the GM to the board increases the correlation between CEO turnover and firm performance. Examining a Swiss reform, Wagner and Wenk (2017) document how allowing shareholders to have a binding say on directors' pay causes negative stock-price reactions.

Finally, our paper is related to research in the law and finance tradition which uses historical data from periods similar to ours (Coffee (2000), Cheffins (2006), Musacchio (2008), Franks et al. (2009)). In general, these studies tend to emphasize the necessity of statutory law for good governance (LaPorta et al. (1998)), whereas we focus on the role of boards. Guinnane, Harris, and Lamoreaux (2014) study the statutes of UK historical firms. Their sample firms seem to tilt the balance of power in favor of managers and do not display the heterogeneity in authority allocation that characterizes our firms.

2 Data

The data are hand-collected from Carl Kierulf's annual *Handbook of Norwegian Bonds and Stocks* (*Haandbog over Norske Obligationer og Aktier*), the historical *Norwegian trade register* (*Brønnøy-sundregistrene*), and individual company records kept in national and local archives. The Kierulf Handbook, first published in 1900, reports rudimentary financial information for publicly traded companies, including year-end dividend payments and January stock prices dating back three to five years. The first volume also contains company statutes. Additional company statutes and financial statements are collected from archives and the trade register. Firms were not required to disclose their financial statements, so accounting variables are not available in all years for many firms and are completely missing for several firms.

Overall, our sample comprises company statutes of 85 industrial corporations and firm-

level financial data covering the period 1896-1920.[5] For all but three firms, the statutes are those in effect in 1900 (one firm was incorporated in 1905, and the earliest statutes available for the two other firms are from 1907 and 1908, respectively). The shares of the companies were traded on the curb in Oslo by multiple brokers, and the brokers' association published bi-weekly price lists for the most liquid shares. While the shares were traded in Oslo, the firms are located around the country.

We map the corporate statutes into a codeable set of categorical and numeric governance variables which capture several features of the governance structures. In particular, we record the existence of a board, the voting rules, and the decision-making powers conferred on the corporate bodies.

For a subsample of 17 of the firms, we know the ownership structure because the archives contain shareholder protocols with lists of owners and their equity holdings.[6] We analyse this subsample separately, and in regressions on the entire sample we use a proxy for ownership structure, which we discuss in Section 4.1. In addition, we know the names of the board chairmen in all 22 firms with boards and the names of individual board members for four of the firms in the subsample.

Finally, we record whether a founder is part of the management group as the data include the names of the managers. We identify founders and families through internet searches and archive information. In 18 firms the founder is a manager and in 46 firms he is not. For the remaining 21 firms we are unable to establish which is the case.

In Appendix A we provide a brief account of the legal background for our setting. Appendix B lists the governance variables and shows descriptive sample figures and statistics.

3 Statutes and corporate bodies

A statute first identifies a firm as a limited liability company, states the amount of paid-in equity and the nominal share denomination, and typically also outlines rules for transferring

[5] Some of these data were collected in Ostergaard and Smith (2011).

[6] The listed stockholdings do not quite add up to the total number of shares for five of the 17 firms. We assume that unaccounted-for shares are held in stakes equal to the average stake of the listed shareholders. The fraction of unaccounted-for shares ranges form 1–12 percent, with an average of about 6 percent.

shares and issuing new ones. The individual provisions follow in numbered paragraphs, defining the corporate bodies, their powers and duties, and rules pertaining to the execution of these powers. All the firms hold annual GMs of shareholders and have a management group, called the board of directors. In addition, some firms set up an intermediary body—the board of representatives—which corresponds to modern-day boards. The statutes confer formal authority over various corporate decisions on these bodies. We describe each corporate body in turn.

In the GM, shareholders vote on those corporate decisions over which they hold formal authority and elect members to the board of representatives and management. Meetings are carefully described, including rules for announcing and conducting them, as well as voting procedures (Section 5 describes the voting rules in detail). Meeting protocols from archives reveal that, in new corporations, the first set of statutes are approved as the first item in the inaugural shareholder meeting. Voting and elections to the board and management occur subsequently, pursuant to the rules specified in the statutes.

The boards of directors in the sample are, despite their names, closely involved in the operational aspects of their firms and have the character of management groups. This contrasts with modern-day boards of directors but was at the time common also in other countries (e.g., Hilt (2008)). To avoid confusion with modern-day boards, we refer to them as the management group or just management henceforth.[7]

Management groups vary in size from two to nine members, with a median of three members, and are typically elected for staggered two-year terms. Managers are almost always shareholders. Some statutes (33 percent) stipulate a minimum meeting frequency, ranging from four to 52 times a year. Most statutes also mention the hiring of a superintendent or supervisor who is in charge of day-to-day management. Superintendents take directions from

[7]It is evident from the tasks given to the boards of directors that they are deeply involved in operations. For example, the statutes of Union, a mineral water producer (§10), reads: "The board of directors meets at least once every two weeks. Negotiations and decisions must be protocolled. The board of directors must 1) carry out the necessary investigations and suggest building sites, determine the building plan, choose the master builder, and must carry these plans as determined together with the board of representatives; 2) decide and carry out everything deemed necessary for the management of the business, use the company's credit to raise additional working capital, if such is needed, decide the price of the products, and in general manage the company and its operations." Another example is La Compania de Maderas (see Appendix C).

management and may participate in management meetings, but never have direct power over strategic decisions.

Operating between the management group and the GM, some firms set up boards of representatives which share fundamental characteristics with modern-day one-tier boards of directors. We refer to them as "boards" throughout the paper. Like modern-day boards, they are formally distinct from both management and the GM and has multiple members who are elected by and among the shareholders. The boards are frequently afforded power over strategic corporate decisions and hence have power to manage a company as well as to supervise its management group, in contrast to German-style pure supervisory boards. Boards may also be given the power to elect managers (82 percent of boards) and half of the boards include the managers, who participate and vote in board meetings.

Board sizes range from five to 27 members, with a median size of 12, and members are typically elected for two years with staggered terms. The majority of firms with boards (68 percent) stipulate a minimum meeting frequency, ranging from two to four times a year. The statutes do not mention compensation for board members, in contrast to managers' remuneration, suggesting that the former are not paid for their services (beyond the return on their stock holdings).

The directives for boards vary substantially across firms. For some firms, the statutes provide detailed instructions, as for instance those of the Christiania Joint Stock Beer Brewery. Other statutes, such as those of Christiania Swine Slaughterhouse, are kept more general, and yet others are very brief, e.g. Christiania News and Advertisement Periodical (all reproduced in Appendix C). The responsibilities and powers conferred on boards also vary considerably. In addition to having formal authority over important strategic decisions, boards sometimes elect the members of the management group, determine their salaries, hire auditors, set the auditors' salaries, approve the financial statements, and inspect the company books and cash holdings, among other functions (Section 6 elaborates).

4 Which firms choose boards?

4.1 Share denominations and ownership structures

As discussed in the introduction, the common notion is that boards address managerial agency problems associated with dispersed ownership. It seems logical therefore to begin by looking at the relation between board choice and ownership structure. As we lack shareholder lists for much of the sample, we use share denomination as a proxy for ownership structure: a firm with small-denomination shares is more likely to have a broad shareholder base comprising mostly small investors. We later show that the subsample of 17 firms, for which we know the ownership structure corroborates the validity of our proxy.

Share denominations vary noticeably across firms in our sample, ranging from 100 to 10,000 NOK, or equivalently, from 830 to 82,972 USD in 2017 figures.[8] We split firms into a large-denomination, a mid-denomination, and a small-denomination group according to the tertiles of the distribution. A total of 40 firms comprise the small-denomination group, with share values ranging from 100–500 NOK; 40 firms are in the large-denomination group, with share values ranging from 1,000–10,000 NOK. The remaining five firms are in the mid-denomination group, with values ranging from 501–999 NOK. The split does not result in groups of equal size due to observation ties at the thresholds of 500 and 1,000 NOK. Figure B1 depicts the distribution in denominations.

Firms with large share denominations are unlikely to have many small shareholders because investors in such firms must put up a considerably larger amount of money to acquire a share. Share denominations and market values are highly correlated and large-denomination shares are prohibitively costly for individuals from most social groups.[9] This point is illustrated by the annual gross salary of a well-paid government official which, in 1900, ranges from 1,100 NOK to 6,000 NOK (Grytten (2007)). Hence, large-denomination firms are bound to have

[8] These figures are adjusted for inflation and are translated into US dollars using the US dollar-Norwegian krone exchange rate of 8.2050 as of December 31, 2017. Inflation is computed according to the Norwegian Consumer Price Index published by the Central Bank of Norway.

[9] The correlation seems to stem from a preference, at that time, for having shares trade at prices close to their nominal values, which tend to be written up or down in adjustment to (persistent) changes in market value. We have examples from GM protocols where shareholders carefully set the magnitude of equity write-ups to avoid having shares trade below par.

wealthier owners while small-denomination shares are affordable for individuals with fewer financial resources.[10]

Furthermore, a share in a large-denomination firm constitutes a larger investment when measured in terms of percentage ownership stake or in value. In our sample, one large-denomination share amounts, on average, to 0.51% of the firm's equity, compared with 0.18% in a small-denomination firm, a three-fold difference. Holdings involving both higher percentage and monetary value entail stronger incentives for investors to become active owners (Edmans and Holderness (2017)).

4.2 Firms with boards

The fact that not all firms choose to set up boards, suggests that boards have costs as well as benefits. As discussed earlier, delegating authority to a board is costly because it adds an additional agency layer to the organizational structure and entails a loss of direct shareholder control. In our sample, 22 firms have boards, while three-quarters choose not to have boards. Table 1 compares firms with and without boards as well as large and small-denomination firms along basic dimensions.

We note first that boards are significantly more present in small-denomination firms (45 percent). In fact, the group of large-denomination firms contains only one firm with a board. (The mid-denomination group contains three firms with boards.) Firms with boards have considerably smaller share denominations and a larger number of shares than firms without boards, suggesting that they can accommodate a larger number of shareholders.

Firms with boards are on average not significantly different in size, measured by paid-in equity, than firms without boards (0.830 vs. 0.705 million NOK), but large-denomination firms are significantly larger than small-denomination firms (0.912 vs. 0.567 million NOK). Since firms with boards are primarily small-denomination, they are among the largest small-denomination firms. This relationship also holds when we measurer size by total assets. The amount of paid-in equity in firms with boards is not far below that of large-denomination

[10] Calomiris and Oh (2018) document a similar relation between share price and ownership structure for U.S. firms in the 1920s, and illustrates how network connections between wealthy individuals determines the shareholder base of Citibank.

firms. Thus, firms with boards are among those that raise the most capital. While paid-in equity is observed for all firms in all years, missing observations lead us to we estimate total assets as the average of all available firm-level data over the 1896-1910 period. Using averages, we can estimate total assets for 44 firms. The correlation between estimated total assets and paid-in equity for these 44 firms is high (0.90).[11]

Firms with boards tend to operate in industries with a higher ratio of fixed-to-total assets (0.68 vs. 0.57). This suggest that, together with their larger size, they have greater capital needs. Our measure of fixed-to-total assets is industry-based as a result of missing observations (see Table B1 for details). Leverage ratios hover around 35 percent, and there are no significant differences in leverage across firms. Variations in total assets thus seems to stem mostly from differences in paid-in equity. Also, there are no significant differences in profitability, measured as return-on-assets (ROA) for firms with and without boards, although large-denomination firms seem to have lower ROA. There are only 11 observations in this group, however, so the estimate is less reliable. Because of missing observations, we estimate total debt and ROA as the average of firm-level observations over the 1896-1910 period. This generates debt-to-total assets ratios for 43 firms, debt-equity ratios for 45 firms, and ROA ratios for 41 firms. We tend to have less complete accounting figures for large-denomination firms, another fact that is consistent with their having smaller shareholder bases.

Firms with boards tend to be younger (14.9 vs. 22.3 years). Lastly, founders are present in 20-30 percent of firms, with no significant differences across firm types. That is, firms without boards and large-denomination firms do not appear to be more likely to be run by founders. Overall, the main difference between firms with and without boards seems related to their share denominations and to some extent to their age.

To interpret share denomination as a proxy for ownership structure, paid-in equity must be held constant—otherwise, large-denominations firms may simply be firms that issue larger amounts of equity. Table 2 presents the results from logit regressions of board existence on share denomination for the entire sample, controlling for paid-in equity, henceforth referred to

[11] If we instead estimate firm-level total assets with information up to 1900 only, the correlation is 0.81 across 34 observations.

as firm size, fixed assets, and firm age according to founding year. As can be seen in column (1), share denomination has a large negative effect on the existence of a board, confirming the univariate results reported in Table 1. A one-standard deviation increase around its mean is associated with a 37 percent lower probability of a board. Columns (2) and (3) show that large-denomination firms are 49 percent less likely to have a board, and small-denomination firms are 34 percent more likely to have boards than the rest of firms. All estimates are significant at the 1 percent level.

The control variables also enable us to capture possible alternative explanations of board existence. As complex organizations are more challenging to manage, larger firms may install boards to overcome monitoring difficulties and/or to support management with advice and counsel. The marginal effects of firm size are 8-16 percent and very significant. The results reject operational complexity as the primary reason for boards, however, because the large economic effect of share denomination is in addition to the effect of firm size. Also, large denomination firms do not have boards, despite being the largest. The results also do not support firm age as the prime reason for having a board. Young age may proxy for novelty of technology or governance practices may have evolved towards having boards as a standard. While young firms are more likely to have boards, the effect is economically smaller and much less significant than that of firm size. Fixed assets-to-total assets is another proxy for technology, but it fall far short of statistical significance.

The presence of a founder may determine whether a firm adopts a board. Boards may be more likely to mitigate the risk that founders entrench themselves. Conversely, entrenched founders may oppose boards to avoid being scrutinized. Column (4) shows that founder-managed firms are less likely to install boards but the inclusion of a founder dummy does not change the marginal effect of small denomination. In column (5), we include leverage in the regression to explore whether boards may be used by creditors to safeguard their interests by e.g. vetoing excessive dividend payouts. The coefficients are far from significant. The results are similar if we use long-term leverage instead. Overall, the results reported above are in line with the common notion that boards are installed to overcome collective action problems stemming from dispersed ownership.

4.3 Ownership structures in the subsample

We now examine the ownership structure of the subsample of 17 firms for which we have shareholder lists. This allows us to evaluate the validity of the share denomination proxy and provides further insights into the firms' ownership structures.

Table 3 shows that firms with boards have substantially more shareholders than firms without boards—on average 443.6 shareholders compared with 82.6 for firms without boards. The difference is significant at the 10 percent level. Moreover, small-denomination firms have more shareholders than large-denomination firms (309.2 vs. 38.9 shareholders), and the difference is significant at the 5 percent level. The subsample thus suggests that share denomination is indeed a valid proxy for the number of small shareholders. The table shows results from t-tests of differences in means. Because of the very small sample size, we verify that the differences are also significant with the nonparametric Wilcoxon rank sum test but do not display those tests in the tables.

Table 3 also shows that shareholders in firms with boards own considerably smaller stakes than shareholders in firms without boards. The stakes of the median owner in firms with and without boards are 0.15 and 1.47 percent, respectively, and the stakes of the smallest owners are 0.04 and 0.38 percent, respectively. Both differences are highly significant. The pattern between small and large-denomination firms is similar, but for the sake of brevity, we henceforth discuss only differences between firms with and without boards. We refer the reader to the tables for comparisons between small and large-denomination firms.

Surprisingly, all firms have both large and small shareholders, and the stakes of individual large owners are approximately similar across firms. For instance, the average stake of the largest shareholder in firms with a board is not significantly different from that in firms without boards (16.7 vs. 21.3 percent). The pattern is unchanged when we consider the monetary values of the stakes.

In Table 4 we compare the collective ownership of large and small shareholders, the latter defined as investors owning stakes of less than 2.5%. In no firm do the three or five largest shareholders own 50 percent or more of the shares and their combined blocks do not differ

significantly across firm types. For example, the three largest shareholders together own 30.9 percent of the shares in firms with boards. This is rather surprising because it conflicts with the common notion that boards fulfill the monitoring role because of the absence of large shareholders. Small shareholders collectively own a majority of the shares in firms with boards but well below the majority in firms without boards (64.6 vs. 36.0 percent) All reported differences are significant also when we use the Wilcoxon rank sum test.

The bottom secion of Table 4 displays the combined ownership stakes of management groups. In firms with boards, management owns less than 10 percent of shares, and even in large-denomination firms their stake is merely 26.4 percent. Large shareholders, therefore, exist also outside of management. This confirms that there is considerable separation of ownership and control in all firm types and rules out the idea that firms without boards are closely held. Hence, managerial agency problems ought to be a concern in all firms.

The economic implication of the above observations is that boards do not arise as substitutes for large shareholders, as large shareholders are ubiquitous. Rather, boards seem closely linked to heterogeneous shareholder bases with numerous small shareholders.

Small shareholders have few incentives to become active owners, making them poor monitors of management and unable to meaningfully vote on complex decisions. In addition, when their numbers are large, collective decision-making becomes costly and encumbers concerted action. While large shareholders have incentives to become active owners, it is costly for small shareholders to leave monitoring and decision-making to the large shareholders because of potential conflicts of interest (Shleifer and Vishny (1997), Becht, Bolton, and Roell (2003)).[12] Boards, therefore, cannot be established *only* to compensate for a lack of (large) shareholder oversight but seem also be a response to conflicts of interest. We posit that mediation between shareholders with conflicting preferences is an important additional role of the boards in our sample.

Large and small shareholders exist together in all firms, but boards notably arise where, in addition, (small) shareholders are numerous. The collective action problems associated with

[12] Assigning decision-making to managers is not a valid solution either, because of the separation between ownership and control.

shareholder conflicts make the GM a poor decision-making body, and boards are installed in response. Boards are then supposed to arbitrate between shareholders and reach compromise solutions, carrying out "balanced governance." This capacity has two prerequisites: boards must represent shareholder population and also must have decision-making power. In the next sections, we discuss how such representative boards are achieved and investigate the powers given to boards.

5 Voting restrictions and shareholder conflicts

To mediate, boards must represent the entire shareholder base. Thus, large shareholders must be prevented from capturing or dominating a board. This is achieved through the use of voting restrictions which limit their voting power. The severity of voting restrictions is both a measure of the degree of conflicts of interests as well as a remedy.

The voting rules of the sample firms commonly involve caps that limit the votes a single shareholder can exercise, and graduated voting, wherein the exercisable votes increase less than proportionally with the number of shares. For example, Akers Mechanical Workshop, a shipbuilder and iron works company, has the following graduated voting rules: one to two shares qualify for one vote, three to five shares qualify for two votes, six to 10 shares qualify for three votes, 11 to 15 shares qualify for four votes, and 16 to 20 shares qualify for five votes. Thereafter, any additional 10 shares provide one more vote but no shareholder can have more than 10 votes.[13]

The statutes specify that only shareholders may be elected to the board. GM protocols show that firms use a first-past-the-post electoral system, such that votes are cast simultaneously for all candidates and the candidates who receives the most votes are elected. This, and the voting restrictions, improve small shareholders' ability to elect their preferred candidates, and once on the board their voting power is equal to that of any other director.

[13]Similar voting arrangements are known historically from many other countries (e.g. Dunlavy (2004), Hannah (2007), Hilt (2008), and Musacchio (2008)) and persists in Dutch, French, and Swiss corporations. Today, voting caps are permitted in U.S. and U.K. corporate law but not in German and Japanese law (Armour et al. (2017)).

5.1 Which firms have voting restrictions?

Table 5 indicates the pervasiveness of voting restrictions in the sample. Voting restrictions are by far most severe in firms with boards. In particular, 41 percent of firms with boards cap votes at 2.5% of paid-in equity or lower, compared with 5 percent of firms without boards.[14] No large-denomination firms impose caps at such a low level. Firms without boards also impose caps, but typically at higher levels. Small-denomination firms without boards, in turn, impose stricter voting caps than large-denomination firms. For example, 40 percent of large-denomination firms impose caps at the 10%-threshold or below, compared with 70 percent of small-denomination firms and 77 percent of firms with boards. The variable votes per share overall, as seen in the last line of the table, measures voting restrictions as the ratio of the votes attained if one shareholder held all shares. It captures both the graduation of the voting scheme and voting caps, if adopted. When this measure is further below one, the voting scheme deviates more from the one-share-one-vote rule. Firms with boards have significantly lower votes per share overall than firms without boards (0.12 vs. 0.20).

The top section of Table 6 illustrates how the more stringent voting restrictions in firms with boards empower small shareholders. Comparing the cumulative votes of the three (five) largest shareholders to the votes held by the small shareholders shows that the voting power of the latter is considerably enhanced relative to their ownership stakes. The three (five) largest shareholders own 30.9 (37.2) percent of the shares in firms with boards (Table 4), but control only 11.0 (15.9) percent of the votes. Small shareholders own 64.6 percent of shares, but control 85.3 percent of the votes. Furthermore, small shareholders control significantly more votes in firms with boards than in firms without boards (85.3 vs. 44.0 percent of the vote). Large shareholders, in contrast, control significantly more votes in firms without boards. The bottom section of the table displays the relationship between votes and ownership. In firms with boards, the largest shareholder has on average only 19 percent of the votes he would have had under a one-vote-per-share rule, whereas the median and smallest shareholder posses 167

[14] A 2.5% voting cap threshold (our calculation) means that the upper limit on votes kicks in at a point where a shareholder owns a number of shares corresponding to 2.5 percent of outstanding shares. In the Akers Mechanical Workshop example, the upper limit of 10 votes is reached when a shareholder owns 66 shares. This corresponds to 5.5 percent of the 1,200 outstanding shares.

and 316 percent more votes, respectively. This reveals that small shareholders' majority in firms with boards comes not just from the collective stake they hold but also, to a considerable extent, from vote restrictions.

Table 7 displays results from logit regressions of board existence, including a dummy variable for voting caps with various threshold levels. Strict voting caps at the 2.5% and 5%-thresholds are associated with a positive and very significant higher likelihood of having a board. The marginal effect is as large as that of small share denomination: voting caps at the 2.5% threshold are associated with a 29 percent increase in the likelihood of having a board. The magnitude and significance of share denomination is virtually unaffected by the inclusion of the voting cap indicators. Voting caps at the 5% and 7.5% thresholds are also associated with a higher likelihood of having a board and the marginal effect of vote capping is increasing in the strictness of the cap.

These results establish that boards do not only when shareholders are numerous, as captured by share denomination, but also when there are potential conflicts of interest between large and small shareholders, as captured by the (strict) voting caps. Both of these channels are determinants of boards and the regression estimates the separate (orthogonal) effects of each. It can also be ruled out that a voting cap is just another proxy for small shareholders, because the marginal effects of share denomination are virtually unaffected by its inclusion.

More generally, the prominent use of voting restrictions by the sample firms suggests that the (fear of) conflicts of interest is widespread. Indeed, in the subsample of firms with known ownership structures, we observe small and large shareholders in all types of firms. Voting restrictions, by nature, address conflicts related to ownerships stakes, but conflicts can also arise between shareholders with similar equity stakes resulting from, e.g., differences in opinion. Such conflicts can arise between small as well as between large shareholders (cf. footnote 2).

Firms with voting restrictions that do not set up boards are firms where shareholder conflicts are not serious enough to warrant the cost of a board. It seems reasonable that a larger shareholder base is more prone to harbour disagreement between shareholders with similar stakes, or between large and small shareholders. When large shareholders collectively own a majority stake or more, they are more closely aligned with the interests of small shareholders

(Jensen and Meckling (1976)). In small-denomination firms without boards, small shareholders' collective stake tends to be larger than in large-denomination firms, as a result of which the interests of large and small shareholders diverge. Conflicts of interest are managed by diminishing the voting power of large shareholders in the GM. Indeed, Table 5 shows that small-denomination firms without boards impose stricter voting caps. But in a firm without a board, the voting restrictions must be sufficiently lax to avoid discouraging large shareholders from being active owners, in order to strike the "right balance between managerial discretion and small shareholder protection" (Becht et al. (2003)). In a large-denomination firm, large shareholders own a clear majority and their interests are better aligned with small shareholders' interests. Hence, the need to protect small shareholders seems smaller and voting restrictions are correspondingly laxer.

Because lax voting caps limit the power only of owners with sufficiently large stakes, one could imagine that voting restrictions serve another role in large-denomination firms—maintaining a balance of power between blockholders by preventing any one owner from becoming too dominant. If balance of power is indeed a concern, one could imagine that the statutes of large-denomination firms contain other provisions that serve to prevent the emergence of a dominant owner, such as share-transfer restrictions. Transfer restrictions, however, are rare in our sample. Four firms impose restrictions, and only one of them is a large-denomination firm. The absence of such provisions may indicate that either balance of power is not a serious concern or that lax voting caps are sufficient for maintaining the balance.

Voting caps are not the only means of promoting the representation of small shareholders, or any other shareholder group, in the board room. Today, a number of jurisdictions allow or mandate privileged director appointment rights—Italy, for example mandates board representation for minority shareholders in listed companies. Cumulative voting rights are also widely used and apply, e.g., in the state of California. The voting restrictions observed in our sample do not only promote board representation of small shareholders but also overweigh their votes in all matters on which the GM decides. Such general empowerment provides greater protection than most modern appointment rights, but seems called for in our setting without statutory minority shareholder protection.

5.2 Board composition

Boards must represent the shareholder base to bridge differences of opinions. This was recognized at the time, as illustrated e.g. by the lectures on corporate law given by Oscar Platou, a prominent legal scholar: "(...) it is easily thinkable that [exclusion of small shareholder representatives on the board] will infer damage on small shareholders if it is conferred to the board to elect both management and decide the allocation of the surplus (...)" (Platou (1911), pp. 200).

We uncovered board member lists for four of the five firms with boards in the subsample of firms with known ownership structures and can determine the board members' ownership stakes. For the fifth firm we only know the chairman's stake. Table 8 shows the board composition in terms of ownership stakes, including the number of members with stakes of less than 0.1 percent, less then 1 percent, and less then 5 percent. The boards contain both large and small shareholders, but most members are small shareholders with stakes below one percent. Also, the chairman's stake is typically small, except in one case where it is 11.8 percent.

Table 9 details the holdings of the individual board members and also identifies executive board members, i.e., those who are managers and can vote in the board meetings. Small shareholders are widely represented on all the boards, but the tendency of large shareholders to sit on the board varies across firms. For example, in Hansa Brewery, the executive board members tend to be large shareholders, although three of the five largest non-executive owners do not sit on the board. In other firms, e.g., in Holmenkollen Tramway and Bodø Brewery, the three largest owners have stakes ranging from 6-13 percent and 3-14 percent, respectively, but none of them is on the board or in management. In Bergen Mechanical Workshop, in contrast, the chairman is the second largest owner. The table also denotes the job titles of the board members. Judging from their titles, most seem to belong to the educated middle class. Lawyers and merchants dominate, but there are also, e.g., shopkeepers and farmers. One board (Kristiania Electrical Tramway) even records a "machine worker" among its members. Furthermore, the majority of members appear to be independent in the sense that they are

unlikely to be employed by the firm. Overall, the small sample size renders it difficult to draw general conclusions about the presence of large shareholders on these boards, but it seems reasonable to conclude that boards do not appear to be dominated by them.

6 What roles are boards set up to perform?

A unique feature of our setting, in addition to the optionality of boards, is that the powers conferred on boards are not prescribed by corporate law but chosen by the individual firms. This free allocation of decision-making powers to boards and the other corporate bodies allows us to infer the role(s) of boards. The corporate body that controls a decision does not necessarily have to carry it out, but can choose to delegate its implementation to a subordinate body or person. The importance of authority, though, is that it entails the right to overrule the subordinate (ratification).[15]

6.1 Authority of boards

Five strategic corporate decisions are regularly mentioned in the statutes of our sample: (1) purchases/sales of company assets, (2) borrowing secured by company assets or real estate, (3) equity issuance, (4) liquidation, and (5) dividends. These decisions largely coincide with those major executive decisions that modern-day corporate law reserves for special regulations, namely mergers and consolidations, voluntary dissolutions, new share issues, and distributions of capital (Armour et al. (2017)). In some cases authority over a decision is shared between management and either the board or the GM.[16] Statutes also assign authority over the hiring of the bookkeeper, the auditor, and their salaries, or over operational decisions, such as inventory management, negotiations with third parties, and the pricing of products. We refer

[15] As pointed out by Coase (1937), transactions inside firms are based on authority. Fama and Jensen (1983) label authority over decision initiation and implementation "decision management," and the authority to ratify, monitor, and reward decisions "decision control."

[16] A few statutes are silent on the control over one or more of these decisions, most often the decision to liquidate a firm. Some statutes also assign authority indirectly, through a general statement conferring all authority on a particular body. Christiania Handle and Lock Factory is such an example: "Management holds any authority that is not reserved to the general meeting." If a statute does not specifically allocate authority over one of the five strategic decisions to a particular body but contains a general delegation statement, the authority index assigns authority over that decision to the body to which it is indirectly conferred.

to such authority as "occasional authority," as the individual decisions appear irregularly in the statutes and are not of the broad strategic nature as the decisions mentioned above.[17] Authority to amend statutes is always assigned to GMs, so we disregard that decision in both indices for lack of variation.

Figure 1 displays the distribution of authority over the five strategic decisions in firms with boards. Its records exclusive authority, where only one corporate body controls a decision, as well as joint authority, where the board or the GM controls the decision together with management.[18] Despite a small sample of only 22 boards, the figure shows that there is considerable heterogeneity in the distribution of board powers over decisions, whether measured by exclusive authority or total (exclusive plus joint) authority. The total authority distribution is shifted to the right because boards have more powers when measured as total as opposed to exclusive authority.

Table 10 compares authority structures in firms with and without boards. There are two main observations. First, when a board is installed, the GM loses power, and also management has less power. In firms without boards, the GM controls, on average, 3.30 decisions exclusively and management controls 0.92 decisions exclusively. In firms with boards, the GM controls only 1.81 decisions and management controls 0.32 decisions. The differences between firms with and without boards are highly significant. When installed, boards control 1.50 decisions on average. Boards thus seize decision-making power from both GMs and management. Considering exclusive and joint authority together, the board is the body with the most authority in the group of firms with boards. It controls 2.23 decisions compared to 1.95 decisions controlled by the GM and 1.05 decisions controlled by management. The second observation is that management overall has relatively little power. Thus, in firms without boards, GMs are the most powerful bodies.

What can be inferred about the roles of boards from the abovementioned allocation of

[17] Boards are occationally authorized to take the following decisions: Determining managers' authority, setting the maximum amount for which managers can bind a firm (*procura*), resolving disputes among managers, deciding or approving minor business decisions (e.g. product prices), giving directions to the superintendent, electing the auditor, writing the instructions for the auditor, hiring the bookkeeper, hiring the treasurer, determining the amount of collateral posted by the treasurer.

[18] Boards never has joint authority with GMs, which by itself is evidence of the mediation role.

authority? The considerable controls that GMs wield in firms without boards suggest that (large) shareholder monitoring of management is mostly effective. Otherwise it would make more sense to empower management, rather than allowing GMs to take poor decisions. Boards, thus, do not seem to emerge primarily for the purpose of monitoring, but rather to perform an additional role. We propose that this is mediation between heterogenous and numerous shareholders, as discussed above. Once shareholders are not perceived or assumed to be a monolithic group but individuals with divergent equity stakes and preferences, there is a role for boards to mediate between often competing opinions and interests. The mediation role requires boards to have power vis-a-vis shareholders, i.e. GMs, so that they can push through compromise decisions. Table 10 shows that boards are generally given considerable authority over important decisions.

Mediation ensures that a firm is run with a balanced objective function that weights the interests of the various shareholder groups, in particular the interests of small shareholders. Restricted voting rights implement such balanced governance by ensuring that small shareholders, respectively their representatives, participate in the boards' decision making. Mediation differs from many other forms of minority shareholder protection, e.g., equal treatment, proxy by mail, the ability to challenge management or GM decisions (La Porta, de Silanes, Shleifer, and Vishny (1998)), that impose legal duties on corporate insiders or allocate to minorities particular legal rights. The nature of mediation is to give the minority a seat at the board table for the purpose of achieving compromise decisions.

6.2 Mediation, monitoring, and advice

If boards mediate, do they also monitor? The answer is that a board typically performs both functions. With the authority to mediate comes also the power needed to monitor, i.e. the ability to overrule management. Thus, mediation and monitoring are intrinsically linked as both roles result from empowering a board. Moreover, relying on board monitoring is sensible because strict vote capping diminishes the incentives of large shareholders to be active. The advising role of boards, in contrast, does not rely on a board's authority over decisions. On the contrary, the lack of board power encourages information exchange between management

and a board, thereby facilitating advice (Adams and Ferreira (2007)).

This reasoning gives rise to three testable hypotheses: First, if boards mediate, they should have more power when the potential for conflict is larger. Second, empowered boards should also be monitoring. Third, boards with weak powers should advise rather than mediate/monitor.

To explore the first hypothesis, we examine the correlation between voting restrictions and board powers in the subsample of 22 firms with boards. Insofar as the severity of voting restrictions can be used as a measure of the potential for conflict between large and small shareholders, we expect to observe a positive correlation. Table 11 displays such a positive relation between the number of decisions controlled by the board and voting-cap thresholds, as well as votes per share overall. The sample size is very small, yet the pattern is significant. The results are similar when we use the rank sum test.

Firms with more stringent voting schemes assign more decisions exclusively to their boards than firms with less stringent schemes. For instance, for voting caps at or below the 2.5% threshold the difference is 2.00 vs. 1.21 decisions, for voting caps at or below the 5% threshold the difference is 1.64 vs. 1.25 decisions, and for average votes per share the difference is 2.00 vs. 1.00 decisions. The difference at the 5% threshold is not significant, whereas the difference in votes per share is significant at the 5 percent level. The pattern is similar, albeit somewhat weaker, when considering joint and exclusive authority together. For occasional authority, the correlations are all strongly significant. At the 2.5% threshold the difference is 3.50 vs. 2.36 decisions, for the 5% threshold the difference is 3.21 vs. 2.00 decisions, and for average votes per share the difference is 3.64 vs. 1.91 decisions.

We find additional evidence for the mediation hypothesis through a closer examination of which of the five strategic decisions is most likely controlled by the boards. Figure 2 shows the fraction of boards that have authority over each decision. Boards are most often given the power to determine dividends—exclusively so in the vast majority of firms with a board (73 percent). We interpret this as further and direct evidence of the mediation role. Dividend income is an important source of income for many investors in early financial markets and equity markets are much less liquid at the time, making selling stocks a poor substitute

for dividends (e.g. Baskin (1988) and Cheffins (2006)). Small and large shareholders are therefore likely to attribute unequal values to a constant dividend stream. For instance, Platou (1911) writes: "Small shareholders' interest will often be towards a stable annual dividends, whereas for wealthy board members it is irrelevant if they for the moment do not receive dividend and prefer an expansion of the business and therefore allocate revenues to a future expansion." Board deliberations over dividends were news-worthy. For example, the major business magazine at the time, *Farmand*, reports that the board of Christiania Brewery voted to lower dividends in response to adverse circumstances, rejecting a proposal to use reserve funds to keep dividends unchanged.[19] Dividends decisions can also be contentious nowadays because of varying marginal tax rates, heterogenous information, or because owner-managers prefer retained earnings to payouts (Eckbo and Verma (1994)).

Other than dividends, board powers relate mostly to the use of firms' assets. Thus, many boards have exclusive authority over secured borrowing and acquisition/sale of assets (36 and 36 percent) and many boards control these decisions together with management (28 and 23 percent). Boards have only weak control over equity issuance and liquidation.

For evidence of the second and third hypothesis—that empowered boards monitor and that board with weak powers advise, respectively—we examine additional provisions in the statutes that relate to these two potential functions but do not constitute decision-making authority over corporate policies. We code such provisions separately in an information index, an manager career index, and an advice index. In addition, we code provisions regarding board size and meeting frequency.

Monitoring must be based on information to be meaningful. Without information, boards may blindly reject value-increasing proposals or simply rubber-stamping them, leaving the real authority with management (Aghion and Tirole (1997)).[20] Thus, we expect board authority and information flow to go hand in hand. The information index captures board members' obligation and entitlement to become informed. A value of one is added to the index for each of the following provisions: The board must approve the annual financial statement (73 percent of

[19] Farmand, November 17 1900, p. 966.

[20] Cornelli et al. (2013) and Duchin, Matsusaka, and Ozbas (2010) provide evidence indicating how boards use information in monitoring.

boards), managers must prepare a status report (usually annually) for the board (68 percent), and board members are required to make (unannounced) inspections of the company books and cash balance (32 percent). Also, the power to hire and fire managers is part of monitoring (Hermalin and Weisbach (1998)). The manager career index captures boards' influence over managers' careers. A value of one is added to the index for each of the following provisions: The board elects the managers (82 percent), The board decides managers' salaries (68 percent), the board can fire the managers (5 percent). Thus, we expect boards with a high degree of authority also to have a higher career index value.

As regard the advising role, boards that primarily advise must commit to not overruling management to elicit information from managers (Adams and Ferreira (2007), Harris and Raviv (2008)). In contemporary boards, this is achieved by selecting friendly directors. Since firms can chose how to allocate authority in our setting, communication can be advanced by withholding authority from the board. Even stronger, the statutes can give authority directly to management, which then cannot be overruled. Thus, we expect boards with authority to carry out fewer advice-related functions and that boards in firms where management have decision power should have more advice-related functions. The advice index counts functions that foster cooperation between board and management. A value of one is added to the index for each of the following provisions: The board must decide on issues brought to it by managers (50 percent of boards), managers participate in board meetings (55 percent), and managers vote in board meetings (50 percent). (Typically, management is precluded from voting on issues concerning itself.) Figure B2 plots the distributions of the three indices. Despite the small sample size, they display substantial variation.

With regards to the meeting frequency of board meeting and board size, we expect boards that monitor to be required to meet more frequently. Also, small boards have been shown to be more effective in monitoring (Yermack (1996)).

Table 12 shows t-tests of differences in the average index value for boards with high and low levels of authority. Boards with above-median exclusive authority carry out significantly more information-related functions than boards with below-median authority (2.20 vs. 1.33 decisions). The difference is significant at the 5% level. Considering exclusive and joint author-

ity together (2.80 vs. 1.41 decisions), the difference is significant at the 1% level. Board with above-median authority also have more influence over managers' careers, and the difference is strongly significant in the case of exclusive and joint authority (2.00 vs. 1.23 decisions).

We do not observe a negative or significant correlation between board authority and advice-related functions, but in firms where management has authority, boards carry out more advice-related functions (3.00 vs. 1.42 decisions), and the the difference is significant at the 1%-level. Such boards also have less influence over managers' careers, although the difference is insignificant. Considering board size and meeting frequency, average board size does not vary much with authority but boards with above-median authority are required to meet more frequently than those with below-median authority. The difference (3.86 vs. 2.5 times annually) is significant at the 1% level when considering exclusive and joint authority together. In contrast, boards in firms where management has authority are larger than those in other firms (20.7 vs. 12.4 members) and are required to meet less frequently (2.67 vs. 3.25 times annually), although the latter difference is not significant. This pattern is what we would expect of boards that primarily advise. As an (unreported) reassurance test, we verify that none of the firms where management has authority impose voting caps at the 2.5% threshold, indicating the absence of strong conflicts of interest between shareholders and a need for mediation. Rank sum tests yield similar results.

Summing up, we find evidence that boards endowed with authority are required to become informed and meet more frequently, which is consistent with the monitoring role. Boards with little authority, in contrast, are not required to become informed, which is consistent with the role of advice.

7 Wealth distribution and shareholder base

Above we have argued that a large heterogeneous shareholder base with numerous small owners induces a firm to establish a board. A heterogeneous shareholder base gives rise to collective action problems and conflicts of interest between shareholders. Boards are installed to mitigate these problems but also entail costs—they add an agency problem to a firm's organizational

structure and imply a direct loss of control for shareholders. An alternative ownership structure, comprised predominantly of large shareholders, would seem to eschew collective action problems. This raises the question why the firms in our sample raise finance from small shareholders at all.

We conjecture that the limited wealth of rich individuals is the primary reason. Demand for capital from corporations simply exceeds the wealth of affluent individuals. Consequently, some firms have to tap public equity markets and cater to small(er) investors from the middle class (bourgeoisie) who have some savings. This argument has been made by Berle and Means (1932) and Warshow (1924) for the U.S. and Foreman-Peck and Hannah (2011) for the U.K., among others, to explain the rise of the modern corporation with its separation between ownership and control. Prior historical quantitative evidence for this channel in Norway does not seem to exist, but there is plenty anecdotal evidence in *Farmand*, which regularly comments on the lack of domestic capital.[21] We provide (novel) evidence consistent with this wealth-constraint story below.[22] The wealth-constraints hypothesis implies that firms which raise most of their capital from rich investors will choose large-denomination shares. Firms that want to raise substantial amounts of initial capital, but have little connection or access to rich individuals, are forced to raise equity capital from numerous small investors. Consequently, the supply of small investor finance is a constraint on the growth, or even emergence, of poorly connected firms. These outcomes are consistent with the size pattern documented in Table 1, where the largest firms are large-denomination firms and small-denomination firms with boards, while the remaining small-denomination firms are relatively small.

A related question concerns why firms that cannot raise enough capital from rich investors do not turn to bank debt?[23] Debt might be a preferable funding source compared with small

[21]For example, lacking Norwegian investors, the The Ankerske Marble Quarry, a company in our data set, is mentioned as having been forced to raise two-thirds of its 1.5 million kroner equity capital abroad (Farmand, June 8 1895, pp. 415).

[22]The literature proposes several other theories of optimal ownership concentration, e.g., diversification, liquidity (Bolton and von Thadden (1998)), and the incentivization of managers (Burkart et al. (1997), but the theories are mute on establishing boards. Boards, therefore, must be motivated by reasons that fall outside these models, for instance, with the same arguments that we propose—collective action problems and conflicts within diverse shareholder bases.

[23]The tax benefit of debt cannot be a reason to prefer bank credit because interest expenses were not deductable at the time.

shareholders because it avoids the costs associated with collective action problems. If this is the case, we would expect firms to exhaust their debt capacity before turning to small investors. Hence, firms with many small shareholders ought to carry more debt. Table 1 shows that there is no statistically significant difference between leverage or debt-to-equity ratios across firm types, suggesting that firms with boards either do not prefer more debt or that more debt is not available. A limited supply of bank credit seems a likely explanation because the Norwegian commercial banking system at that time is not well developed or even backward (Egge (1983) and Nordvik (1993)). Also, *Farmand* complains that Norwegian banks were slower to adopt the practice of lombard loans than German and Danish banks.[24]

7.1 Causality

The above reasoning implies that firms choose their governance structures with regard to their shareholder base. That is, the provisions in the statutes, including the decision to establish a board, are constrained optimal governance choices for a given shareholder base. The estimated coefficients in the preceding analysis reflect equilibrium relations between share denomination, voting caps, and the decision to install a board, although they cannot be given a causal interpretation because we do not have exogenous variation in share-denomination. The relationships are, nevertheless, informative about the costs, benefits, and roles of boards because they arise in a setting where firms can freely choose their own governance rules.

The lack of causal assertion, however, raises the issue whether a left-out variable could be driving ownership structure. For an omitted variable to explain our results it must not only explain the presence of numerous small shareholders but also the simultaneous presence of a board. Below we address such causality concerns in two ways. First, we discuss whether trust can be an explanation for the observed correlations. Second, we use proxies for the geographic variation in the supply of small investor finance and estimate the effects of supply on share denomination choice and board existence. As we will argue, it is difficult to conceive of an alternative story that is consistent with our results.

Trust in local communities has been advanced as a substitute for legal investor protection

[24] See, for example, Farmand, 28. September 1895, pp. 701.

that enabled early U.K. corporations to raise financing from small investors (Franks et al. (2009)). When corporate insiders are trusted, local residents provide finance without fear of being expropriated. Hence, ownership structure should reflect the local distribution of wealth, such in areas with concentrated wealth mostly large-denomination firms would operate while in areas with a larger middle class, more small-denomination firms would operate.

It is less clear why large small-denomination firms would need boards since trust annihilates the need to monitor management or large shareholders. Yet one could imagine that boards are set up as a forum of interaction and communication between insiders and shareholder representatives. That could explain why boards exist primarily in firms with numerous shareholders—effective communication with GMs would be prohibitively cumbersome. But this hypothesis is undermined by our finding that boards are given powers and are installed in firms with stricter voting rules. Both are superfluous in a trusting environment. Furthermore, family firms are less likely to have boards, as can be seen in Table 1. While this could indicate greater trust, it would imply that boards are associated with less—not more—trust, contradicting the starting point. Thus, trust does not seem to offer an explanation as to why large firms with small-denomination shares have boards.

We now examine whether regional variation in the supply of small investor finance can account for choices in share denomination and governance structures, exploiting that fact that shareholders are often local (e.g., Franks et al. (2009)). For the subsample of firms where shareholder lists are available, we can directly observe that many investors are indeed local. Furthermore, recorded titles attest that many belong to the middle class (e.g. doctors, lawyers, lieutenants, inspectors). Because the size of the middle class varies geographically, so does the supply of small investor finance. We expect small-denomination firms to be more prevalent in areas where the middle class is larger.

Ideally, we would use the distribution of wealth within a region to measure the size of the middle class. Because this information is not available for the years around 1900, we use the number of tax payers in a region as a proxy of its size. At that time, individuals were predominantly taxed on income, wealth, and property, but only above a certain threshold depending on the number of children in their families (Gerdrup (1998)). This taxation regime

had applied to rural areas and towns since the 1882 tax reform. A higher number of tax payers in the population implies that wealth is dispersed more widely, ceteris paribus. If we simultaneously control for the level of wealth, tax payers per capita can therefore proxy for the relative size of the middle class. The periodical *Norway's municipal finances*[25] reports aggregate wealth and the number of tax payers in 1900 for the then 13 Norwegian regions and the regional population is available from the 1900 census.

One may have reservations about the exogeneity of tax-payers per capita because wealth and income are related to economic activity. We therefore also collect an arguably more exogenous measure of the size of the middle class, the number of civil servants per capita, taken from the 1900 census which records occupational employment. Civil servants comprise a part of the middle class that does not depend directly on economic activity. Even if the public sector grows with the economy, its growth typically lags behind. The correlation across regions between tax payers per capita and civil servants per capita is 0.07. We discuss the exogeneity of our proxies further in the context of the regression results we report below.

Table 13 displays summary statistics for tax-payers per capita and the other regional variables used in the regressions. On average, 29 percent of the population in a region pays tax and wealth per capita is 1,070 kroner. The average region has 13 civil servants per 1,000 inhabitants. As a test of reassurance, we find that the correlation between tax payers per capita and wealth per tax payer is negative, at -0.22, suggesting that the number of tax payers per capita is inversely related to the concentration of wealth. For each region we compute the average share denomination of its firms and the proportion of sample firms with small- and large-denomination shares. The standard deviations and the distances between minimum and maximum values indicate that there is considerable variation in each variable. Also, the mean and the median values are very close for all variables, except for the fraction of firms with boards.

Figure 3 displays the main relations between share denomination and tax payers per capita for the 13 regions. The highest number of tax payers (40 percent) is in Bergen, a wealthy city with strong trading ties to the Hanseatic League since medieval times. The figure displays a

[25] Norges Kommunale Finantser.

clear negative relationship between share denomination and tax payers per capita. The sizes of the circles indicate the weight of the region in the full sample of 85 firms. One observation is hidden behind Oslo, where 52 percent of the sample firms are located.

Regression estimates associated with this relation are shown in Table 14. With just 13 regions, we control only for the level of wealth per capita, which is important to ensure that its variation is not picked up by the number of tax payers, although the correlation between the two variables is low (0.09).

The first four columns show a negative and highly significant relationship between the average share denomination in the region and the number of tax payers, suggesting that firms issue more affordable shares in regions where the middle class is larger. The coefficient of 8.75 implies that a one-percentage-point increase in the number of tax payers lowers the average share denomination by 87.5 NOK. Measured by the fraction of large- and small-denomination firms, the relationship to the number of tax payers is similar, although the small-denomination effect is significant only at the 16 percent level. The coefficients imply that a one-percentage-point increase in the number of tax payers lowers the fraction of large-denomination firms by 5.92 percentage points, and increases the fraction of small-denomination firms by 3.5 percentage points. The regressions also show that the fraction of firms with a board is positively and significantly related to tax payers per capita.[26] If we control for income per capita instead of wealth per capita, the results are similar.

Because wealth is correlated with economic growth, regional differences in small investor finance may simply reflect differences in economic growth. Even so, one would still have to explain why share denomination covaries with economic growth, which is less straightforward, although one may argue that newly founded firms tend to issue shares with lower denominations for reasons unrelated to the scarcity of affluent investors. For example, small-denomination shares may be the new norm, and people become wealthier as the (regional) economy grows.

[26]The relationship between board existence and tax payers should be interpreted with some care, because it relies on the inclusion of the region of Bergen. There are two firms from Bergen in the sample and both have boards. If we omit Bergen, the effect of tax-payers per capita on the fraction of firms with boards disappears, but the effect of tax-payers per capita on the small denomination dummy becomes highly significant. The regressions in the first two columns are unchanged when omitting Bergen. The sensitivity of the results to the Bergen firms is likely to reflect the low number of observations and the averaging across firms in a region. With civil servants as the regressor, the results are unaffected when Bergen is omitted.

While this explains the positive correlation between tax payers and small-denomination firms, it has no direct implications for boards. The argument that boards are installed in newly founded firms because these firms have small shareholders is analogous to our claim that boards arise in firms with large and heterogeneous shareholder bases. Alternatively, one may postulate that boards could also become the new norm, unrelated to wealth constraints or shareholder base. This alternative explanation of joint new norms, however, fails to explain why small-denomination firms have numerous small owners and large-denomination firms do not, since wealthy investors can acquire large blocks by purchasing many small-denomination shares.

In the last four columns of Table 14 we substitute tax-payers per capita with the number of civil servants per capita. The results are qualitatively similar, although average share denomination is no longer significant. The alternative joint new norm explanation is now even less convincing because civil servants per capita is less closely tied to economic growth. Under the alternative explanation, the firms which follow the new norm of small denominations are younger and belong to regions which experienced economic growth most recently. But these regions are exactly those where the civil administration has had the least time to adjust to economic growth.

For Table 15 we re-estimate the main regression of board existence, Table 2, replacing the regressor of share denomination with tax-payers per capita and civil servants per capita in the full sample of 85 firms (columns (1)-(2)). The regressions yield results that are qualitatively similar to those reported in Table 2, implying that a one-standard-deviation increase in the instrument generates a 7-8 percent increase in the likelihood of having a board. For columns (3) we add a control for regional wealth and, for column (4), a further control for the city of Oslo insofar as 52 percent of the sample firms are located in the capital. Controlling for wealth increases the marginal effects of the proxy variables, tax-payer per capita and civil servants per capita, to 22 and 30 percent, respectively. Omitting the firms located in Bergen does not change the results.

7.2 Matching of firms and large investors

The previous section shows that different regions have different capacities for large-denomination firms. More large-denomination firms can be financed when there are more affluent individuals residing in a region. This, in turn, raises the question of which firms (within a region) attract more large investors—that is, how are firms and large investors matched? Large investors may go predominantly to firms with particular characteristics or the allocation of investors may be random, that is, unrelated to firm characteristics. We search for common characteristics among large-denomination firms. The results are presented in Table 16.

Firm founding age may be a common characteristic. If large shareholders matched with firms on a first-come first-served basis, older firms should have more large shareholders. In fact, this pattern was already established in Table 1 and is replicated in Table 16. Large-denomination firms are on average almost 8 years older than small-denomination firms and the difference is significant at the 10 percent level.

A second possibility is that investors have a preference for investing in businesses with which they are familiar.[27] Small investors are, as consumers, familiar with retail and consumer-oriented firms, whereas large investors, who are often business men, know a wider range of firms. Hence, retail and consumer-oriented firms face a higher supply of small investor finance than firms in business-to-business industries.[28] We find strong support for this hypothesis. A much higher percent of large-denomination firms transact predominantly with other companies rather than with consumers (73 vs. 18 percent). The difference is significant at the 1 percent level.

This result is also consistent with the alternative interpretation that the business-to-business variable is a proxy for opportunities for self-dealing. Diversion of corporate resources may be easier in firms that transact primarily with other firms, because, e.g., some shareholders are on both sides of the deal.[29] In this interpretation, ownership structures with multiple

[27] Frieder and Subrahmanyam (2005) show that individual investors prefer to invest in stocks with easily recognized brand names.

[28] We characterize firms engaged in the following types of production as business-to-business firms: chemicals, basic materials and resources, industrial construction and materials, industrial goods, utilities. Firms in the business-to-business segment make up 45 percent of the sample.

[29] Johnson et al. (2000) describe asset sales as a common form of tunneling.

blockholders are more prevalent in business-to-business industries because mutual monitoring and the size of blokholders' combined stakes make diversion of resources unattractive. In other words, concentrated ownership tends to arise in firms with the most severe inherent agency problems. If so, the allocation of shareholders would be efficient in the sense of minimizing economy-wide agency costs.

We explore this hypothesis further and look for other characteristics which may reflect managerial agency problems. In eight firms the statutes entrench a particular person (often the founder) as a permanent member of management, enabling them to engage more easily in self-serving actions. This conjecture, however, is not supported because these provisions are equally present in large- and small-denomination firms. One could also imagine that more large shareholders are present in firms where monitoring is particularly difficult, e.g. in firms where the underlying business risk is larger. We estimate the average firm-level volatility of stock returns as a proxy for business risk and find that large-denomination firms exhibit higher annual volatility than small-denomination firms (5.56 vs. 3.90 percent), but the difference is far from significant.[30]

Another hypothesis is that large investors, being in excess demand, select the firms which they believe to be the most profitable. We compute the average realized stock returns for each firm up to 1900 and also up to 1910 to obtain more observations. We find no significant difference between the returns of large- and small-denomination firms for either measure, as the variation in returns across firms is large. The negative average 1900 return for large-denomination shares is caused by the utility sector, and especially one firm that loses over 80 percent of its value shortly after being founded. The return becomes positive if we omit the utility sector, but the difference is still nonsignificant.

We also compute Tobin's Q to test whether large investors select firms with higher growth potential, although limited observations of debt shrink the sample considerably. Tobin's Q, however, is very similar for large- and small-denomination firms. The table reports the 1910 measure only, but the 1900 measure is very similar. Several additional measures were at-

[30] Annual stock returns include dividends and are estimated as the standard deviation over 1896-1910 due to missing observations. Returns are not delevered due to limited observations of debt, but differences in volatility do not seem to be driven by differences in leverage, as leverage is relatively stable across firms (cf. Table 1).

tempted, e.g. distance from Oslo and sector growth rates, but did not yield significant patterns and are not reported.

Overall, the strongest evidence of a common trait among large denomination firms in the data is their prevalence in the primary and industrial sectors. Mechanical workshops were among the first corporations to emerge in Norway, which to some extent explains why large-denomination firms tend to be older. In unreported multivariate regressions of share denomination on business-to-business and age, the business-to-business variable continues to have high explanatory power, whereas age does not.

Taken together with the results reported in the previous section, our findings suggest that small investor finance is more readily available to firms in areas with larger middle classes and firms in the retail industries, or alternatively, firms that face less severe self-dealing problems.

8 Conclusion

We study how owners, free from the constraints of corporate law, design the governance structure of publicly traded firms. We focus on the choice of installing a board and, if installed, what roles it is meant to perform. Surprisingly, firms with boards in our sample have large shareholders. In fact, large shareholders seem to be ubiquitous in our sample, and firms with large and numerous small shareholders who collectively own majority stakes chose to have boards.

This suggests that there is more to boards than compensating for the lack of large shareholder monitoring. We argue that an important role of boards is to mediate between competing interests of heterogenous shareholder bases to overcome collective action problems associated with large and small shareholders governing together. Such mediation requires that a board represents a firm's shareholder base and not be captured by blockholders. In our view, this is the reason for the strict voting restrictions we observe in firms with boards.

A board can reconcile divergent shareholder interests if it has the power to take or approve decisions. That is, the mediation role requires boards to have power vis-á-vis shareholders, i.e. the GM. Boards, when installed, are indeed given significant decision-making powers at the

expense of management and GMs. Similarly, the monitoring role requires boards to have the authority to approve managerial proposals. Thus, mediation and monitoring are intrinsically linked as both roles result from giving authority to boards, and we find evidence that boards with power also monitor. Most of the boards in our sample have considerable authority and appear to mediate and monitor. A few boards hold little power, and seem mostly to advise.

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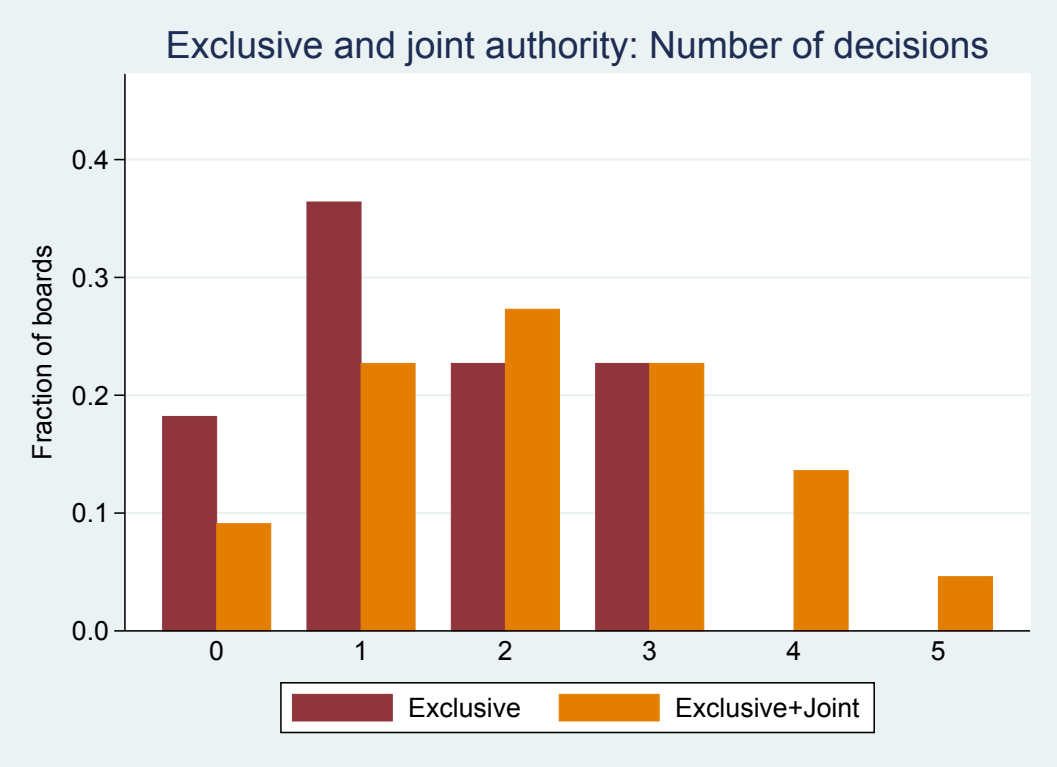
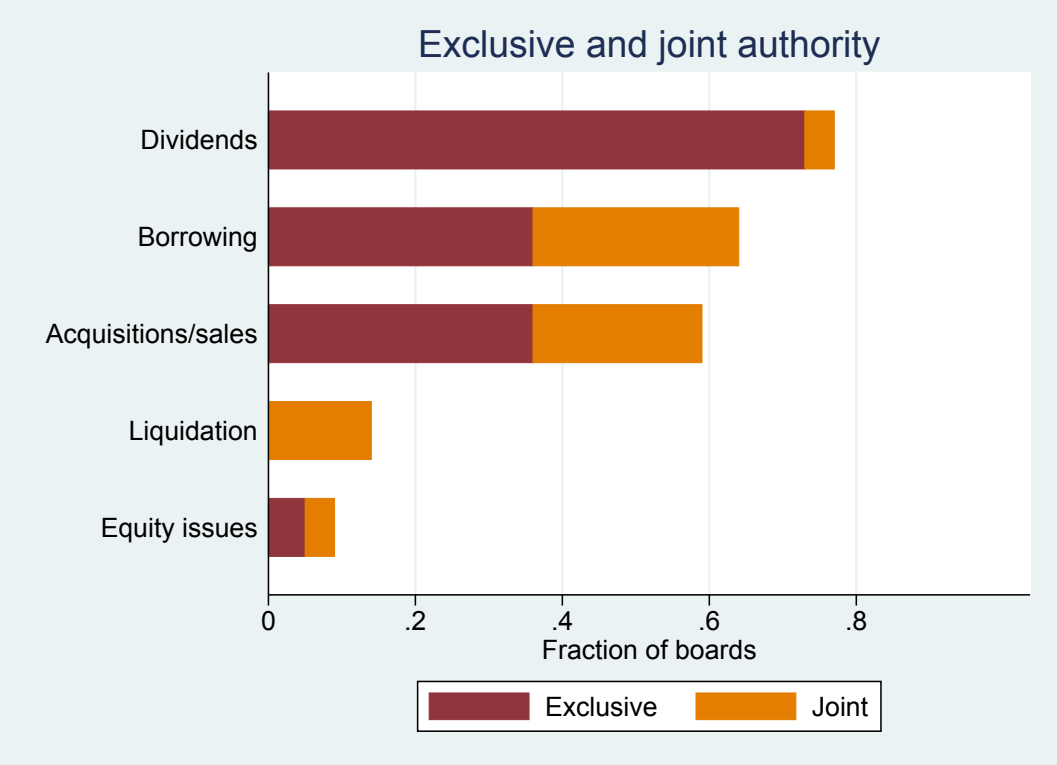
Figure 1: **Distribution of Boards' Decision Authority**



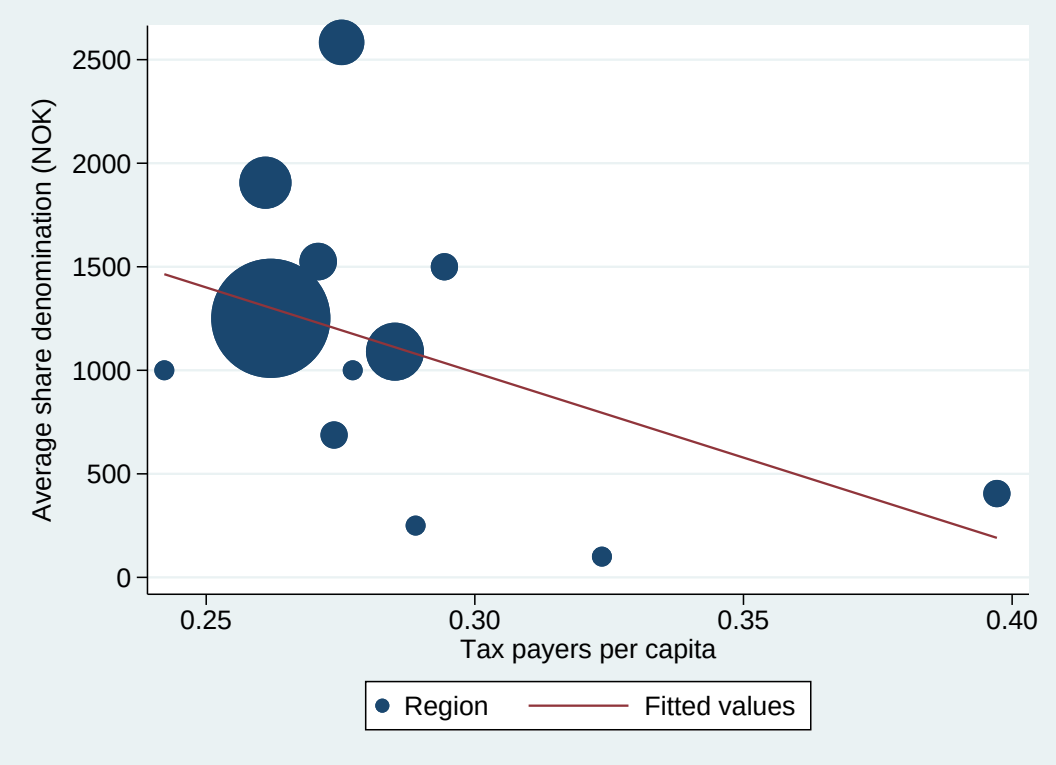
The figure shows the frequency distribution of boards' authority over the five strategic business decisions. Boards may have exclusive authority or may share authority with management. The strategic decisions are acquisitions/sales of assets, borrowing against the assets, equity issuance, liquidation, and dividend payments.

Figure 2: **Board Authority over Five Strategic Decisions**



The figure shows the fraction of firms with boards that allocate either exclusive or joint authority over the individual strategic decisions to their boards. The strategic decisions are acquisitions/sales of assets, borrowing against firm assets, equity issuance, liquidation, and dividend payments.

Figure 3: **Tax-payers and Share Denomination in Regions**



The figure shows the relationship between the average share denomination and the number of tax payers per capita in the 13 regions (one observation is hidden). The size of each observation reflects the relative number of sample firms in each region, the largest being Oslo.

Table 1: **Firm Characteristics**

	Firms with boards	Firms without boards	Difference in means (p-value)	Small-denomination firms	Large-denomination firms	Difference in means (p-value)
Board existence	–	–	–	0.45	0.03	-0.43***
	–	–	–	(0.08)	(0.03)	(0.000)
Share denomination	426	1,657	-1,231***	381	2371	-1,991***
	(49)	(237)	(0.000)	(25)	(322)	(0.000)
Number of shares	2,242	648	1,594***	1558	553	1,005***
	(438)	(85)	(0.002)	(277)	(106)	(0.001)
Paid-in equity (million)	0.830	0.705	-0.125	0.567	0.912	-0.345*
	(0.116)	(0.107)	(0.431)	(0.074)	(0.159)	(0.056)
Total assets (million)	1.662	1.729	-0.067	1.395	2.728	-1.334+
	(0.275)	(0.334)	(0.878)	(0.193)	(0.754)	(0.114)
Fixed assets ratio	0.68	0.57	0.11+	0.63	0.56	0.07
	(0.07)	(0.03)	(0.142)	(0.04)	(0.04)	(0.260)
Leverage ratio	0.33	0.37	-0.03	0.35	0.39	-0.04
	(0.05)	(0.04)	(0.645)	(0.04)	(0.04)	(0.468)
Debt-equity ratio	0.77	1.04	-0.27	1.03	0.86	0.17
	(0.21)	(0.20)	(0.364)	(0.24)	(0.11)	(0.523)
ROA	0.07	0.06	0.01	0.08	0.04	0.04+
	(0.03)	(0.02)	(0.891)	(0.02)	(0.01)	(0.131)
Firm age in 1900 (found.)	14.9	22.3	-7.4*	15.6	23.8	-8.2*
	(3.3)	(2.6)	(0.086)	(2.6)	(3.5)	(0.062)
Firm age in 1900 (incorp.)	10.7	13.3	-2.5	10.5	12.8	-2.4
	(2.5)	(1.7)	(0.412)	(1.93)	(2.02)	(0.398)
Founder in management	0.23	0.33	-0.10	0.32	0.33	-0.01
	(0.12)	(0.07)	(0.468)	(0.09)	(0.08)	(0.923)

The table compares characteristics of firms with a board (22 firms) to firms without a board (63 firms), and small-denomination firms (40 firms) to large-denomination firms (40 firms), respectively. The characteristic variables are defined in Table B1. Standard errors are reported in parentheses for the group averages. p-values are reported in parentheses for a two-sided t-test of the difference in means with unequal variances. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Table 2: **Board Existence**

	(1)	(2)	(3)	(4)	(5)
Share denomination	-0.37***				
	(0.00)				
Large denomination dummy		-0.49***			
		(0.00)			
Small denomination dummy			0.34***	0.34***	0.50***
			(0.00)	(0.00)	(0.00)
Size (log)		0.14***	0.12***	0.12***	0.11**
		(0.00)	(0.00)	(0.00)	(0.05)
Firm age in 1900		-0.08*	-0.06	-0.07+	
		(0.09)	(0.19)	(0.11)	
Fixed assets ratio		0.01	0.02	0.01	
		(0.79)	(0.60)	(0.75)	
Founder in mangement				-0.16*	
				(0.08)	
Leverage ratio					-0.05
					(0.42)
Constant	0.98*	1.17	-2.02**	-1.53+	-2.08*
	(0.09)	(0.35)	(0.03)	(0.14)	(0.08)
Obs.	85	85	85	85	43
p-value	0.00	0.00	0.00	0.00	0.08
Pseudo R-squared	0.24	0.39	0.25	0.28	0.18

The table presents the marginal effects from firm-level logit regressions of the existence of a board on share denomination, a dummy for large (small)-denomination firms, and control variables. Control variables include firm size (log), firm age in 1900 by founding year, and the industry average ratio of fixed to total assets. For share denomination, size, age, and fixed assets ratio, the reported marginal effect is the increase in the probability of a board from a one standard deviation increase around their respective means. For the small and large-denomination dummies, the marginal effects are the changes in the probability of a board from a change in the value of the dummy from zero to one. The variables are defined in Table B1. The p-values for the marginal effects, based on robust standard errors, are reported in parentheses. In addition, the table reports the p-value from a test of joint significance of the explanatory variables and McFadden's pseudo R-squared values. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Table 3: **Ownership Structure in Subsample**

	All firms (mean)	Firms with boards	Firms without boards	Difference in means	p-value	Small denomination firms	Large denomination firms	Difference in means	p-value
Number of shareholders	188.8	443.6	82.6	361.0*	0.086	309.2	38.9	270.4**	0.028
		(159.5)	(21.1)			(101.1)	(6.97)		
Herfindahl index	0.097	0.054	0.115	-0.061	0.263	0.105	0.089	0.017	0.817
		(0.019)	(0.049)			(0.066)	(0.023)		
Ownership (equity stake in percent)									
smallest shareholder	0.28	0.04	0.38	-0.34**	0.012	0.10	0.55	-0.44**	0.035
		(0.01)	(0.11)			(0.05)	(0.16)		
median shareholder	1.08	0.15	1.47	-1.32***	0.004	0.57	1.86	-1.29**	0.031
		(0.05)	(0.37)			(0.40)	(0.36)		
largest shareholder	19.9	16.7	21.3	-4.67	0.541	19.5	20.2	-0.67	0.943
		(4.29)	(6.10)			(7.83)	(4.71)		
Nominal value of stake (NOK/'000)									
smallest shareholder	1.61	0.29	2.16	-1.87**	0.013	0.37	3.36	-2.99**	0.011
		(0.07)	(0.63)			(0.05)	(0.82)		
median shareholder	4.98	1.01	6.62	-5.62***	0.002	1.37	10.0	-8.63***	0.000
		(0.34)	(1.36)			(0.36)	(1.05)		
largest shareholder	200.3	142.3	224.5	-82.2	0.531	226.2	161.6	64.6	0.706
		(52.2)	(116.8)			(151.6)	(70.1)		

The table compares the ownership structures of firms with boards to firms without boards, and small-denomination firms to large-denomination firms, respectively, in a subsample of 17 firms whose shareholder lists are available. Of the 17 firms, seven firms are large-denomination firms, nine firms are small-denomination firms, and one firm falls in the mid-denomination group. Five firms have boards: four small-denomination firms and the mid-denomination firm. The variables are defined in Table B1. Standard errors are reported in parentheses for the group averages. p-values are reported for a two-sided t-test of the difference in means with unequal variances. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Table 4: **Shareholder Blocks in Subsample**

	All firms (mean)	Firms with boards	Firms without boards	Difference in means	*p*-value	Small denomination firms	Large denomination firms	Difference in means	*p*-value
Aggregate ownership (percent of equity)									
3 largest shareholders	33.9	30.9	35.3	-4.3	0.656	30.9	36.4	-5.54	0.566
		(7.35)	(5.89)			(7.67)	(5.45)		
5 largest shareholders	42.2	37.2	44.3	-7.1	0.504	37.5	46.7	-9.18	0.342
		(8.38)	(5.67)			(7.56)	(5.44)		
small shareholders (individual ownership <2.5%)	44.4	64.6	36.0	28.6**	0.041	57.6	27.1	30.5**	0.021
		(9.49)	(7.49)			(9.41)	(6.99)		
inside shareholders (managers)	14.8	7.16	17.9	-10.7+	0.134	6.97	26.4	-19.4*	0.055
		(3.70)	(5.69)			(2.91)	(8.05)		

The table compares the cumulative ownership stake of different shareholder groups in firms with boards to firms without boards, and small-denomination firms to large-denomination firms, respectively, in a subsample of 17 firms whose shareholder lists are available. Of the 17 firms, seven firms are large-denomination firms, nine firms are small-denomination firms, and one firm falls in the mid-denomination group. Five firms have boards: four small-denomination firms and the mid-denomination firm. The variables considered are the aggregate percentage equity owned by, in turn, the largest 3, the largest 5, all small (individual stake < 2.5%), and all inside (managers) shareholders. The variables are defined in Table B1. Standard errors are reported in parentheses for the group averages. p-values are reported for a two-sided t-test of the difference in means with unequal variances. Statistical significance is reported at the 15% (+), 10% (*), 5% (**), and 1% (***) levels.

Table 5: **Voting Restrictions**

	Firms with boards	Firms without boards	Difference in means (p-value)	Small-denomination firms	Large-denomination firms	Difference in means (p-value)
Vote capping at 2.5% and below	0.41	0.05	0.36***	0.23	0.00	0.23***
	(0.03)	(0.11)	(0.000)	(0.07)	(0.00)	(0.002)
Vote capping at 5% and below	0.64	0.24	0.40***	0.50	0.13	0.38***
	(0.10)	(0.05)	(0.001)	(0.08)	(0.05)	(0.002)
Vote capping at 7.5% and below	0.68	0.35	0.33***	0.58	0.23	0.35***
	(0.10)	(0.06)	(0.007)	(0.08)	(0.07)	(0.001)
Vote capping at 10% and below	0.77	0.51	0.26**	0.70	0.40	0.30***
	(0.09)	(0.06)	(0.032)	(0.07)	(0.08)	(0.007)
Votes per share overall	0.12	0.20	-0.08***	0.18	0.20	-0.03
	(0.06)	(0.04)	(0.001)	(0.06)	(0.05)	(0.739)

The table compares the strictness of voting restrictions for firms with boards (22 firms) to firms without boards (63 firms), and small-denomination firms (40 firms) to large-denomination firms (40 firms), respectively. Vote capping at α% or below is a dummy variable that takes the value of one if a voting cap is in effect for shareholders with an equity stake corresponding to α% or less of paid-in equity. Votes per share overall measures voting restrictions as the ratio of the total number of votes to the total number of shares attained by a shareholder owning all shares. The remaining variables are defined in Table B1. Standard errors are reported in parentheses for the group averages. p-values are reported in parentheses for a two-sided t-test of the difference in means with unequal variances. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Table 6: **Voting Rights in Subsample**

	Firms with boards	Firms without boards	Difference in means	p-value
Aggregate votes (as percentage of total)				
3 largest shareholders	11.0	28.4	-17.3*	0.062
	(5.41)	(6.60)		
5 largest shareholders	15.9	36.4	-20.5*	0.067
	(7.43)	(6.78)		
small shareholders	85.3	44.0	41.4***	0.003
(individual ownership <2.5%)	(7.12)	(9.12)		
Ratio between votes and ownership (V/O)				
smallest shareholder	3.16	2.35	0.81	0.372
	(0.69)	(0.51)		
median shareholder	1.67	1.17	0.51*	0.092
	(0.23)	(0.05)		
largest shareholder	0.19	0.68	0.49***	0.000
	(0.05)	(0.07)		

The table compares the cummulative voting rights of different shareholder groups in firms with boards to firms without boards in a subsample of 17 firms whose shareholder lists are available. The variables considered are the aggregate votes (as a percentage of total votes) held by, in turn, the largest 3, the largest 5, and all small (individual stake $< 2.5\%$) shareholders. The variables are defined in Table B1. Standard errors are reported in parentheses for the group averages. p-values are reported in parentheses for a two-sided t-test of the difference in means with unequal variances. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Table 7: **Board Existence and Vote Capping**

	(1)	(2)	(3)	(4)	(5)	(6)
Small denomination dummy	0.30***	0.28***	0.31***	0.32***	0.34***	0.34***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Vote capping at 2.5% and below	0.29***					
	(0.00)					
Vote capping at 5% and below		0.20***				
		(0.00)				
Vote capping at 7.5% and below			0.15*			
			(0.06)			
Vote capping at 10% and below				0.11		
				(0.22)		
Votes per share overall					-0.15	
					(0.31)	
Controls	yes	yes	yes	yes	yes	yes
Constant	yes	yes	yes	yes	yes	yes
Obs.	85	85	85	85	85	85
p-value	0.00	0.00	0.00	0.00	0.00	0.00
Pseudo R-squared	0.35	0.32	0.29	0.27	0.27	0.26

The table presents the marginal effects from firm-level logit regressions of the existence of a board on share denomination, measures of the severity of vote capping, and control variables. Control variables include firm size (log), firm age in 1900 by founding year, and the industry average ratio of fixed-to-total assets (cf. table 2). Vote capping at α% or below is a dummy variable taking the value of one if a voting cap is in effect for shareholders with an equity stake corresponding to α% or less of paid-in equity. Votes per share overall measures voting restrictions as the ratio of the total number of votes to the total number of shares attained by a shareholder owning all shares. The remaining variables are defined in Table B1. For the small denomination and vote capping dummies, the marginal effect is the change in the probability of a board from a change in the value of the dummy from zero to one. For votes per share overall, the reported marginal effect is the increase in the probability of a board from a one standard deviation increase around its mean. The p-values for the marginal effects, based on robust standard errors, are reported in parentheses. In addition, the table reports the p-values from a test of joint significance of the explanatory variables and McFadden's pseudo R-squared. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Table 8: **Ownership Stakes of Board Members**

	Board size (members +deputies)	Members with known ownership	Members among top 10 owners	Chairman of board (percent)	Members with stakes ≤0.1%	Members with stakes ≤1%	Members with stakes ≤5%
Bergen Mechanical Workshop*	5	1	1	11.8	n/a	n/a	n/a
Bodø Brewery	9+3	10	0	0.32	0	10	10
Hansa Brewery	12+4	15	4	0.05	3	11	12
Holmenkollen Tramway	15	8	0	0.50	5	8	8
Kristiania Electrical Tramway	15+5	18	2	0.18	8	16	18

The table presents board compositions in firms where board members as well as their ownership stakes are available. The variables considered are board size as the number of board members plus the number of deputy members (where available), the number of members (incl. deputy members) whose ownership stake is known, the number of members (incl. deputy members) who belong to the 10 percent largest owners, the ownership stake of the board chairman, and the number of members (incl. deputy members) with ownership stakes below 0.1, 1, and 5% of paid-in equity, respectively. Missing information is indicated by n/a. *For Bergens Mechanical Workshop only the ownership stake of the chairman is known.

Table 9: **Board Members**

Name	Ownership (percent)	Top 10 owners	Profession
Bergens Mechanical Workshop			
H. Monrad-Krohn (Chair)	11.76	Y	Pharmacist
Bodø Brewery			
R. M. B. Schjølberg (Chair) (M)	0.32	–	Prosecutor
Chr. Jakhelln jr.	0.96	–	n/a
O. A. Aarnseth (M)	0.32	–	Engineer
J. Thaulow Aubert	0.96	–	Prosecutor
Johan Lund (M)	0.16	–	Bank manager
A. J. Berg (M)	0.64	–	Doctor
Fredrik Moe (M)	0.16	–	Merchant
Oscar Fredriksen	0.96	–	Bookseller
Otto Koch	n/a	n/a	Consul
Th. Wittenberg	0.80	–	n/a
Ragnar Schjølberg	n/a	n/a	n/a
N. Falck*	0.64	–	n/a
A. J. Berg (Deputy)	0.64	–	Doctor
Oscar Fredriksen (Deputy)	0.96	–	Bookseller
Otto Koch (Deputy)	n/a	n/a	n/a
Hansa Brewery			
A. C. Mohr (Chair)	0.05	–	Merchant
O. R. Bonnevie Angel (M)	12.48	Y	Attorney
Amund Arnet	0.20	–	Merchant
Frantz H. Olsen	0.55	–	Merchant
Johan L. von Tangen	0.15	–	Merchant
Einar Blaauw	0.30	–	Merchant
C. Ege	0.05	–	Bank manager
Frantz Isdahl (M)	0.30	–	Entrepreneur
L. P. Johannesen	0.15	–	Consul
Dr. Sandberg	0.35	–	Doctor
Platou (M)	7.30	Y	Manager
Bjarne W. Smith (Deputy)	2.00	Y	Inspector
E. Engelsen* (Deputy)	0.20	–	Merchant
Knud Næsgaared (Deputy)	n/a	n/a	Cork-maker
James Hansen (Deputy)	0.05	–	Engineer
Holmenkollen Tramway			
Karl Lous (Chair)	0.50	–	Lawyer
Ole Nielsen	0.05	–	Inspector
Næss*	0.05	–	Merchant
Harbitz	n/a	n/a	Minister
F. G. Gundersen	0.08	–	Master builder
Weidmann	0.03	–	Manager
Holmen	n/a	n/a	Farmer
Harald Bjerke	0.50	–	Engineer
Sætern* (M)	0.20	–	Manager
Boe	0.03	–	Manager

The table continues on the next page.

Table 9: **(Continued) Board Members**

Name	Ownership (percent)	Top 10 owners	Profession
Kristiania Electrical Tramway			
A. Motzfeldt (Chair)*	0.18	–	Lieutenant colonel
G. Hartman	0.28	–	Engineer
Mellbye*	0.10	–	n/a
Ths. Fearnly	0.03	–	Landowner
Wilhelm Andersen	0.13	–	Lawyer
Ivar Breder*	0.08	–	Manager
K. Karlsen*	0.03	–	Machine worker
Skattebøl (M)	0.03	–	Supreme court assessor
H. J. Barstad	n/a	n/a	Lieutenant colonel
P. Messel*	0.03	–	Secretary
Harald Boe	0.13	–	Manager
Jens Printz	0.10	–	Secretary
Heyerdahl*	1.48	Y	Executive officer
Jacob Jacobsen*	0.10	–	Merchant in chemicals
Ole A. Stang (Deputy)	1.28	Y	n/a
Hagabart Rasmussen* (Deputy)	0.30	–	Merchant
Ferd. Melsom (Deputy)	0.15	–	Shipowner
Ambrosius Hansen (Deputy)	0.15	–	Merchant
Gerh. Gade (Deputy)	0.23	–	Consul

The table presents the identity of individual board members in firms where board members as well as their ownership stakes are available. The table states a member's name, ownership stake, profession, and whether he belongs to the 10 percent largest owners. Missing information is indicated by n/a. *Indicates that shareholder protocols do not contain a record of the member's exact name but do contain shareholders with the same last name. In these cases, we indicate the cumulative ownership of the shareholders with the same last name.

Table 10: **Authority Structures in Firms With and Without Boards**

	Firms with boards	Firms without boards	Difference in means	p-value
Average number of decisions assigned to the GM exclusively	1.81	3.30	-1.48***	0.000
	(0.30)	(0.14)		(0.000)
a board exclusively	1.5	–	–	–
	(0.23)	–		–
management exclusively	0.32	0.92	-0.60**	0.024
	(0.17)	(0.20)		(0.133)
the GM exclusively or jointly	1.95	3.79	-1.84***	0.000
	(0.32)	(0.18)		(0.000)
a board exclusively or jointly	2.23	–	–	–
	(0.29)	–		–
management exclusively or jointly	1.05	0.98	0.06	0.877
	(0.34)	(0.20)		(0.936)

The table compares the average number of strategic decisions conferred to the general meeting, the board, and management in firms with a board to firms without a board. The table considers decisions that a corporate body controls exclusively as well as decisions that it controls jointly with another corporate body. Strategic decisions are acquisitions/sales of assets, borrowing against the firm's assets, equity issuance, firm liquidation, and dividend payments. Standard errors are reported in parentheses for the group averages. p-values are reported in parentheses for a two-sided t-test of the difference in means with unequal variances. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Table 11: **Board Authority and Voting Restrictions in Firms With Boards**

	Authority assigned to boards exclusively (no. decisions)	Difference in means (p-value)	Authority assigned to boards exclusively or jointly (no. decisions)	Difference in means (p-value)	Occasional authority assigned to boards (no. decisions)	Difference in means (p-value)
Voting caps at 2.5%						
firms at threshold or below	2.00		2.38		3.50	
	(0.33)		(0.38)		(0.52)	
firms above threshold	1.21	0.79*	2.01	0.30	2.36	1.14+
	(0.28)	(0.087)	(0.41)	(0.592)	(0.45)	(0.122)
Voting caps at 5.0%						
firms at threshold or below	1.64		2.57		3.21	
	(0.29)		(0.34)		(0.49)	
firms above threshold	1.25	0.39	1.63	0.95+	2.00	1.21*
	(0.37)	(0.413)	(0.50)	(0.136)	(0.38)	(0.065)
Votes per share overall						
firms below median	2.00		2.82		3.64	
	(0.27)		(0.38)		(0.53)	
firms above median	1.00	1.00**	1.64	1.18**	1.91	1.72***
	(0.30)	(0.023)	(0.36)	(0.035)	(0.34)	(0.014)

The table compares the authority conferred to boards in firms with "strict" versus "lax" voting restrictions. The severity of voting restrictions is measured according to three thresholds: voting caps at 2.5%, voting caps at 5%, and the median value of the overall number of votes per share. Vote capping at α% or below is a dummy variable taking the value of one if a voting cap is in effect for shareholders with share ownership corresponding to α% or less of paid-in equity. Votes per share overall measures voting restrictions as the ratio of the total number of votes to the total number of shares attained by a shareholder owning all shares. The table considers decisions that a corporate body controls exclusively, decisions that it controls jointly with another corporate body, and occasional authority. Strategic decisions are acquisitions/sales of assets, borrowing against the firm's assets, equity issuance, firm liquidation, and dividend payments. Occasional authority and the remaining variables are defined in Table B1. Standard errors are reported in parentheses for the group averages. p-values are reported in parentheses for a two-sided t-test of the difference in means with unequal variances. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Table 12: **Board Authority and Board Characteristics**

	Boards with above-median exclusive authority	Rest of boards	Difference in means (p-value)	Boards with above-median exclusive or joint authority	Rest of boards	Difference in means (p-value)	Boards in firms where management has authority	Rest of boards	Difference in means (p-value)
Information-related provisions	2.20	1.33	0.87**	2.33	1.31	1.03**	1.00	1.84	-0.84
	(0.33)	(0.26)	(0.051)	(0.29)	(0.26)	(0.017)	(0.58)	(0.23)	(0.278)
Manager career-related provisions	1.70	1.42	0.28	2.00	1.23	0.77***	1.33	1.58	-0.25
	(0.15)	(0.26)	(0.362)	(0.17)	(1.20)	(0.008)	(0.33)	(0.18)	(0.558)
Advice-related provisions	1.70	1.58	0.12	2.00	1.38	0.62	3.00	1.42	1.58***
	(0.40)	(0.36)	(0.829)	(0.37)	(0.35)	(0.244)	(0.00)	(0.27)	(0.000)
Board size	12.4	11.7	0.73	10.7	12.9	-2.25+	20.7	12.4	8.25+
	(1.42)	(0.85)	(0.664)	(0.55)	(1.21)	(0.110)	(3.48)	(0.68)	(0.137)
Meeting frequency (annual)	3.34	2.86	0.52	3.86	2.50	1.35***	2.67	3.25	-0.58
	(0.32)	(0.40)	(0.337)	(0.14)	(0.33)	(0.004)	(0.67)	(0.41)	(0.484)

The table compares the average number of information and advice-related provisions pertaining to the functioning of boards, as well as the average board size and meeting frequency, for boards with "high" versus "low" authority. The level of authority is measured according to the median number of strategic decisions controlled exclusively by boards, the median number of decisions controlled exclusively or jointly by boards, as well as an indicator for boards in firms where management controls one or more of the five strategic corporate decisions. Strategic decisions are acquisitions/sales of assets, borrowing against the firm's assets, equity issuance, firm liquidation, and dividend payments. Information-related provisions include: (1) the board must approve the firm's annual financial statements, (2) managers must prepare and present to the board a periodical (typically annual) report on the firm's situation, and (3) board members are required to make unannounced inspections of the company's books and cash balance. Manager career-related provisions include: (1) the board elects the managers, (2) the board decides managers' salaries, (3) the board can fire the managers. Advice-related provisions include: (1) the board must decide on issues brought to it by the managers, (2) managers participate in board meetings, and (3) managers vote in board meetings except on matters that concern the actions or decisions of the management group. Standard errors are reported in parentheses for the group averages, p-values are reported in parentheses for a two-sided t-test of the difference in means with unequal variances. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Table 13: **Regional Variables in 1900: Summary Statistics**

	Obs.	Mean	Median	Std.Dev.	Min	Max
Tax-payers per capita	13	0.29	0.28	0.04	0.24	0.40
Wealth per capita	13	1.07	1.11	0.43	0.31	1.86
Civil servants per capita	13	0.013	0.012	0.004	0.008	0.025
Average share denomination	13	1.11	1.09	0.68	0.10	2.58
Fraction of large-denomination firms	13	0.48	0.50	0.37	0.00	1.00
Fraction of small-denomination firms	13	0.45	0.50	0.34	0.00	1.00
Fraction of firms with a board	13	0.23	0.10	0.36	0.00	1.00

The table presents summary statistics for the variables employed in the regional regressions. Tax-payers, wealth, and civil servants per capita are defined in Table B1. Average share denomination is the average denomination of sample firms located in a given region. Fraction of large (small)-denomination firms is the fraction of sample firms located in a given region whose shares are of large (small) denomination. Fraction of firms with a board is the fraction of sample firms located in a given region that have a board.

Table 14: **Regional Wealth Dispersion and Ownership Structure**

	Average denomination	Fraction of large denomination firms	Fraction of small denomination firms	Fraction of firms with boards	Average denomination	Fraction of large denomination firms	Fraction of small denomination firms	Fraction of firms with boards
Tax-payers per capita	-8.75***	-5.92***	3.50	5.55**				
	(0.00)	(0.01)	(0.16)	(0.03)				
Civil servants per capita					-80.0	-75.0**	59.7*	57.4**
					(0.31)	(0.03)	(0.07)	(0.04)
Wealth per capita	0.54+	0.21	-0.27	-0.14	1.15	0.80**	-0.75*	-0.59
	(0.15)	(0.37)	(0.32)	(0.68)	(0.19)	(0.05)	(0.08)	(0.17)
Constant	3.03***	1.93***	-0.26	-1.20**	0.93*	0.60*	-0.47+	0.11
	(0.00)	(0.00)	(0.71)	(0.04)	(0.10)	(0.07)	(0.12)	(0.75)
Obs.	13	13	13	13	13	13	13	13
p-value	0.01	0.02	0.29	0.05	0.37	0.08	0.16	0.12
R-squared	0.61	0.42	0.26	0.38	0.17	0.29	0.29	0.17

The table presents results from regional regressions of governance structures on variables proxying for the size of the middle class (Tax payers per capital, Civil servants per capita), controlling for the level of wealth (Wealth per capita). Regional governance structures are measured as average share denomination in the region, the fraction of large (small)-denomination sample firms in the region, as well as the fraction of sample firms in the region that has a board. Tax-payers, wealth, and civil servants per capita are defined in Table B1. Average share denomination is the average denomination of sample firms located in a given region. Fraction of large (small)-denomination firms is the fraction of sample firms located in a given region whose shares are of large (small) denomination. Fraction of firms with a board is the fraction of sample firms located in a given region that have a board. Robust standard errors are reported in parentheses. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Table 15: **Board Existence Instrumented With Civil Servants**

	(1)	(2)	(3)	(4)
Tax-payers per capita in region, 1900	0.07**			
	(0.02)			
Civil servants per capita in region, 1900		0.08*	0.22**	0.30***
		(0.09)	(0.02)	(0.00)
Wealth per capita in region, 1900			-0.14+	-0.14
			(0.11)	(0.19)
Oslo-dummy				-0.34
				(0.48)
Size (log)	0.08*	0.07*	0.08*	0.09*
	(0.09)	(0.10)	(0.06)	(0.06)
Firm age in 1900	-0.09*	-0.09*	-0.09*	-0.09*
	(0.06)	(0.07)	(0.07)	(0.06)
Fixed assets ratio	0.10**	0.09*	0.08+	0.08+
	(0.04)	(0.08)	(0.12)	(0.11)
Constant	-6.71***	-3.03***	-2.41*	-4.44
	(0.01)	(0.01)	(0.06)	(0.21)
Obs.	85	85	85	85
p-value	0.06	0.01	0.01	0.02
Pseudo R-squared	0.14	0.14	0.15	0.16

The table presents the marginal effects from firm-level logit regressions of the existence of a board on proxies for the regional supply of small investor finance, controlling for firm size, age, and the industry average fixed-asset ratio (cf. Table 2). The variables are defined in Table B1. Column (1) proxies the supply of finance with the number of tax payers per capita in the region. Columns (2)-(4) proxy the supply of finance with the number of civil servants per capita. Columns (3)-(4) control for the regional level of wealth, and column (4) controls for firms located in Oslo. Reported coefficients are average marginal effects. For tax payers, civil servants, wealth, size, age, and fixed-asset ratio the reported marginal effect is the increase in the probability of a board from a one standard deviation increase around their respective means. For the Oslo-dummy, the marginal effects is the change in the probability of a board from a change in the value of the dummy from zero to one. The p-values for the marginal effects, based on robust standard errors, are reported in parentheses. In addition, the table reports the p-value from a test of joint significance of the explanatory variables and McFadden's pseudo R-squared values. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Table 16: **Characteristics of Large-Denomination Firms**

	Large-denomination firms	Small-denomination firms	Difference in means (p-value)	Obs. (LD,SD)
Firm age in 1900 (found.)	23.8 (3.5)	15.6 (2.6)	8.18* (0.062)	(40,40)
Business-to-business dummy	0.73 (0.07)	0.18 (0.06)	0.55*** (0.000)	(40,40)
Volatility of stock return (1896-1910)	5.56 (1.92)	3.90 (2.59)	1.66 (0.610)	(36,37)
Stock return (up to 1900)	-1.75 (4.21)	4.38 (3.43)	-6.13 (0.265)	(25,33)
Stock return (up to 1910)	5.55 (1.93)	3.90 (2.59)	1.66 (0.610)	(36,37)
Tobin's Q (up to 1910)	0.97 (0.01)	0.99 (0.03)	-0.02 (0.457)	(9,23)

The table compares characteristics of large and small-denomination firms. Firm age in 1900 is according to the firm's founding year. Business-to-business is a dummy variable that equals one if a firm belongs to an industry where companies predominantly transact with other companies rather than directly with consumers. The computations of stock returns, their volatility, and Tobin's Q are detailed in Table B1. The last column indicates the number of observations available for the computation of the variable as "(#large-denomination firms, #small-denomination firms)." Standard errors are reported in parentheses for the group averages, p-values are reported in parentheses for a two-sided t-test of the difference in means with unequal variances. Statistical significance is reported at the 15% ($^{+}$), 10% (*), 5% (**), and 1% (***) levels.

Appendix A Legal and institutional background

Around 1900, Norwegian stock markets flourished, and dispersed corporate ownership had emerged in a fashion similar to that of other industrialized nations (Killi (1996)). Norwegian courts had permitted the free establishment of joint stock companies as legal persons without the need for a government concession in the early nineteenth century (Michalsen (2011)), and beginning in 1840, joint stock companies began emerging in large numbers.[31]

Public unfamiliarity with the new company form and episodes of outright fraud led authorities to require registration of firms for the purpose of protecting third parties and increase public confidence in the integrity of business (Langeland (2005)). The 1874 Law of Company Registry was modeled on the English 1844 Joint Stock Companies Registration and Regulation Act. By making basic information available to the public, third parties could seek out the legal nature of a firm and the identity of the individuals behind it, but still carried the burden of assessing the soundness of the business as there were no requirements for the reporting of capitalization. Failure to accurately disclose the legal form, made owners personally liable.

The law was replaced with a more extensive law, the 1890 Law of Trade Registry, Firms, and Procura, requiring the reporting of additional information, including the amount of paid-in equity, whether shares were fully paid in, and the identity of individuals with the power to sign for the firm. The articles of association had to be attached to the registration along with proof of identification of directors (Beichmann (1890).

Norwegian authorities and scholars were well aware of legal developments in other countries, and Swedish, U.K., and German legislation, in particular, were debated intensely. Businesses and, especially the shipping industry, however, resisted a more comprehensive regulation of the joint stock company form, fearing restrictions on their livelihoods. A drafting commission for a corporate law was deployed in 1881, but it would take another 30 years before a law was finally enacted in 1911 (Villars-Dahl (1984)).

The principle of contractual freedom applied in Norway from the late 17th century and

[31] As a result of war, Norway was in a union with Sweden from 1814 to 1904, but during this time the Norwegian parliament enacted its own legislation. Thus, the Swedish corporate law of 1895 did not apply to Norway.

was strongly upheld by the courts (Michalsen (2011)). Evidence we collected for this paper, suggests that the articles of associations adopted by Norwegian corporations were indeed enforced by the courts. Contemporary rulings from the city court of Oslo suggest that the court interpreted companies' statutes to the letter.[32] For example, a ruling issued by the Oslo Town Court in 1888 concerns a conflict between shareholders over an individual's transfer of a share to his son as a gift. While the company's statutes assigned a first right of purchase to the other shareholders, the court rejected the latter's complaint with reference to the fact that the statutes referred only to the *sale* of shares.[33]

Eventually, the pressure for a statutory law became untenable. In 1911, parliament passed the Limited Liability Companies Act, but neither this nor later acts mandated the board of representatives ("the board" in our analysis). Its decision-powers were significantly reduced over time, however, as the law concentrated powers in the board of directors ("the management group") and the CEO. In particular, the 1957 Limited Liability Companies Act targeted the widespread praxis of splitting executive responsibilities between the board of directors and and the board of representatives, seeking to avoid a blurring of accountability. The latter was defined as a predominantly controlling body with powers to elect and fire directors, and were permitted to share authority with the board of directors over special decisions only.

Today, the board of representatives no longer exists in large (over 200 employees) and publicly listed corporations. It has been replaced by a corporate assembly, whose members are elected by the employees (one third) and the shareholders (two thirds), as is responsible for electing and firing directors. The board of representatives remains an option for smaller and unlisted companies, but is mandated in financial institutions and shipping firms. The modern Norwegian corporate governance system, thus, is a hybrid of the Anglo-Saxon one-tier structure and the German two-tier structure (Bråthen (2019)).

[32] A search through all rulings by the Oslo city court in the 1867-1905 period reveals three rulings with direct reference to the company's articles of association. We have not found any cases that involves a firm included in our data set. Most legal disputes concerned the position of creditors against the firm and its owners.

[33] Oslo Byret: Ruling 1429 of 20. August 1888, case no. 476/87.

Appendix B The sample

Table B1: **List of variables**

Variable	Description
Advice-related provisions	Index that counts the number of advice-related statute provisions pertaining to a board: (1) The board must decide on issues brought to it by the managers, (2) managers participate in board meetings, and (3) managers vote in board meetings except on matters that concern the actions or decisions of the management group.
Authority index	Index that counts the number of strategic corporate decisions over which boards may be granted authority. Decisions include (1) purchases/sales of company assets, (2) borrowing secured by company assets or real estate, (3) distribution of dividends, (4) equity issuance, and (5) liquidation. The index values range from zero to five.
Board existence	Dummy variable taking the value of one if statutes stipulate that a board must be established.
Board size	The number of members on a board, excluding deputy members unless otherwise indicated. For boards where managers can vote in meetings, the members include the managers.
Business-to-business	Dummy variable taking the value of one if a firm is engaged in the following types of production: chemicals, basic materials and resources, industrial construction and materials, industrial goods, utilities.
Civil servants per capita	The number of individuals above 15 years of age in region i occupied as state officials or public servants relative to the total population in region i.
Debt-equity ratio	Firm-level ratio of total loans to paid-in equity computed as the average of all observations of the ratio available for a firm over the 1896-1910 period.
Founder in management	Dummy variable taking the value of one if the founder of a firm is a member of the management group.
Firm age in 1900 (found.)	The firm's age in 1900 measured relative to the year a firm was founded.
Firm age in 1900 (incorp.)	The firm's age in 1900 measured relative to the year a firm was incorporated.
Firm size	The nominal value of paid-in equity (in millions of NOK) in the year a firm's statutes were adopted.

The table continues on the next page.

Table B1: **(Continued) List of variables**

Variable	Description
Fixed assets ratio	Ratio of industry-level tangible assets to total assets computed as the average of all observations of the ratio available for firms in an industry over the 1896-1910 period. For two industries, tangible assets are not available for any firm before 1910. We therefore employ accounting data up to 1920 for these two industries. If the cross-sectional distribution of fixed asset ratios does not change much over time, this should not cause any systematic error in the regressions.
Information-related provisions	Index that counts the number of information-related statute provisions pertaining to a board: (1) The board must approve the firm's annual financial statements, (2) managers must prepare and present to the board a periodical (typically annual) report on the firm's situation, and (3) board members are required to make unannounced inspections of the company's books and cash balance.
Large-denomination dummy	Dummy variable taking the value of one if the share denomination is larger or equal to 1,000 NOK.
Leverage ratio	Firm-level ratio of total loans to total assets computed as the average of all observations of the ratio available for the firm over the 1896-1910 period.
Market-to-book ratio	The ratio of the quoted stock price (ultimo year) to share denomination.
Manager career-related provisions	Index that counts the number of managerial employment-related statute provisions pertaining to a board: (1) the board elects the managers, (2) the board decides managers' salaries, (3) the board can fire the managers.
Number of shares	The number of shares constructed as the value of paid-in equity divided by the nominal value of the shares (in 1,000 NOK).
Occasional authorithy index	Index that counts the number of firm-specific decisions over which boards in some statutes are given authority. Decisions include: (1) determining managers' authority over certain decisions, (2) setting the maximum amount for which managers can bind a firm (*procura*), (3) resolving disputes between managers, (4) firing of managers, (5) selecting managers from amongst the board, (6) setting managers' salaries, (7) deciding or approving minor business decisions (e.g. product prices), (8) giving directions to the superintendent, (9) electing the auditor, (10) writing the instructions for the auditor, (11) hiring the bookkeeper, (12) hiring the treasurer, (12) determining amount of collateral to be posted by the treasurer.
Ownership (equity stake in percent)	Share of paid-in equity owned by a given shareholder. Can be computed for the subsample of firms for which shareholder lists are available.
Paid-in equity	The nominal value of paid-in (common and preferential) equity in (1,000,000 NOK).
Ratio between votes and ownership (V/O)	Ratio between the voting rights and the cash-flow rights for a given shareholder. Can be computed for the subsample of firms for which shareholder lists are available.

The table continues on the next page.

Table B1: **(Continued) List of variables**

Variable	Description
ROA (return on assets)	Firm-level net income over total assets computed as the average of all observations of the ratio available for a firm over the 1896-1910 period.
Size	Firm-level paid-in equity. The variable is logged in the regressions.
Share denomination	The nominal value of a common share (in NOK).
Small-denomination dummy	Dummy variable taking the value of one if the share denomination is smaller than or equal to 500 NOK.
Stock returns	The average annual return on common stock computed using all firm-level observations over the 1896–1910 period. Stock returns include paid-out dividends and are measured in percentages.
Tax payers per capita	The number of individuals in region i that pay income, wealth, or property taxes relative to the total population in region i.
Total assets	Total assets computed as the average of all observations available for a firm over the 1896-1910 period.
Volatility of stock return	The standard deviation of all firm-level observations of annual stock returns (in percent) over the 1896–1910 period. Stock returns include paid-out dividends.
Vote capping at α%	Dummy variable taking the value of one if a voting cap is in effect (the maximum number of votes) for shareholders with share ownership corresponding to α% of paid-in equity.
Votes per share overall	The ratio of the votes attained over the total number of shares if one shareholder held all shares. The closer the ratio is to zero, the larger is the deviation from one vote per share.
Wealth per capita	Private wealth of individuals in region i relative to that of the total population in region i.

Table B2: **Sample Statistics**

	Obs.	Mean	Median	Std Dev.	Min	Max
Share denomination (NOK)	85	1,338	700	1,705	100	10,000
Number of shares	85	1,058	600	1,373	27	10,000
Paid-in equity ('000,000 NOK)	85	0.737	0.583	0.781	0.008	6
Paid-in equity ('000,000 USD)	85	0.197	0.156	0.209	0.002	1.60
Total assets ('000,000 NOK)	44	1.707	1.225	1.608	0.034	8.28
Leverage	43	0.355	0.375	0.197	0.023	0.772
Debt-equity ratio	45	0.958	0.776	1.043	0.034	5.883
Fixed assets ratio	85	0.501	0.469	0.181	0.130	0.818
Firm age in 1900 (estbl.)	85	20.4	12	19.5	1	85
Firm age in 1900 (inc.)	85	12.6	8	13.0	-5	49
Founder in management	85	0.21	0	0.41	0	1
Vote capping at 2.5%	85	0.13	0	0.34	0	1
Vote capping at 5%	85	0.34	0	0.48	0	1
Vote capping at 7.5%	85	0.44	0	0.50	0	1
Vote capping at 10%	85	0.58	1	0.50	0	1
Votes per share overall	85	0.18	0.03	0.33	0.001	1
Board dummy	85	0.26	0	0.44	0	1
Board information index	22	1.72	2	1.03	0	3
Board manager career index	22	1.54	2	0.74	0	3
Board advice index	22	1.63	1.5	1.21	0	3
Board authority						
Exclusive	22	1.50	1	1.06	0	3
Exclusive + joint	22	2.23	2	1.34	0	5
Occasional	22	4.27	4	2.12	0	9

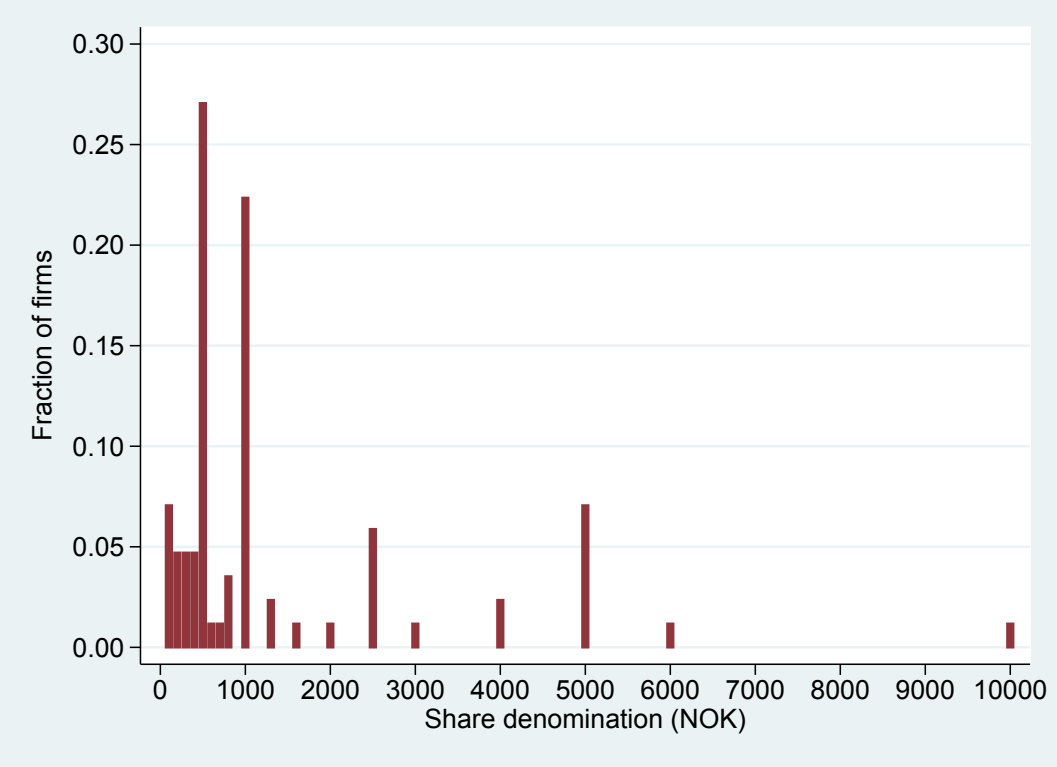
The table presents summary statistics for the main variables. Firm size in 1900 Norwegian kroner (NOK) is translated into 1900 US dollars using an average 1900 exchange rate of 3.74 NOK per US dollar, obtained from Norges Banks historical monetary statistics (www.norges-bank.no). For comparison, Hilt (2008, Table 2) reports that for 1826/27 the New York-based manufacturing companies in his sample have an average level of paid-in equity of 57,405 USD.

Table B3: **Sample Firms by Industry**

	Number of firms	Percent of sample	Paid-in equity (million)	Board existence (percent)
Corn mills, food, drink, tobacco	18	21.2	0.530	61.1
Forestry, saw mills, paper	16	18.9	1.159	6.25
Metal products, machinery, equip.	11	12.9	0.618	0
Textile, clothing, shoes	8	9.4	0.718	12.5
Chemical products	7	8.2	0.530	0
Publishing	5	5.9	0.503	20.0
Transportation	4	4.7	0.684	50.0
Real estate	4	4.7	0.445	50.0
Services	4	4.7	0.445	25.0
Ship-building	3	3.5	0.725	33.3
Telecom	2	2.4	1.003	50.0
Utilities	3	3.5	1.783	33.3
Total	85	100.0		

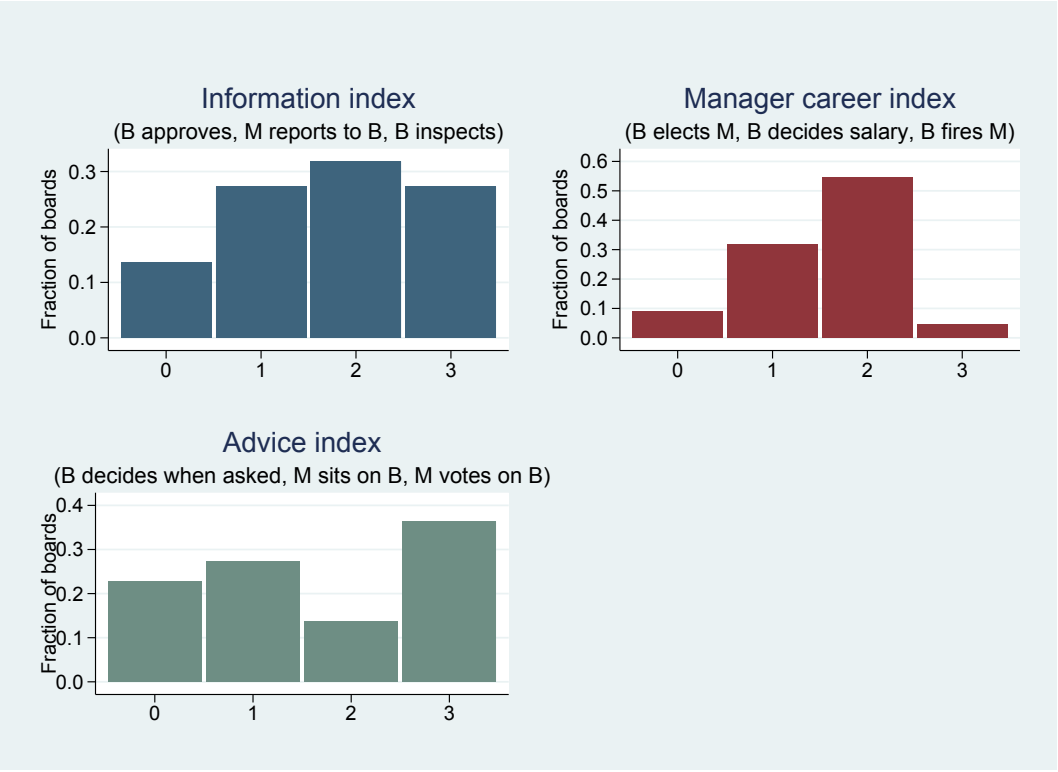
The table presents the industry composition of the sample firms. Firms are classified into 12 different industries based on the NACE classification system. Producers of consumer goods encompass a wide variety of firms, including breweries (mostly beer), corn mills, textile mills, and manufacturers of products as diverse as shoes, tobacco, furniture, locks, matches, sailcloth, and crackers. Industrials encompasses ironworks and shipbuilders, firms involved in commercial maritime transportation, and producers of marble, nails, horseshoe nails, and rifles. Consumer services include hotels, steamship and rail transportation companies in travel and leisure, printing companies, and a public cafeteria. Basic resources comprises mostly forestry and sawmills, and chemicals are dominated by firms converting wood products into paper, including companies using sulphite-based technologies for converting cellulose into paper pulp, as well as a nitroglycerin producer. The telecommunications industry consists of two telephone exchanges, and utilities are producers of hydroelectricity. Firms in the real estate sector earn revenue through rents from land and buildings.

Figure B1: **Distribution of Share Denomination**



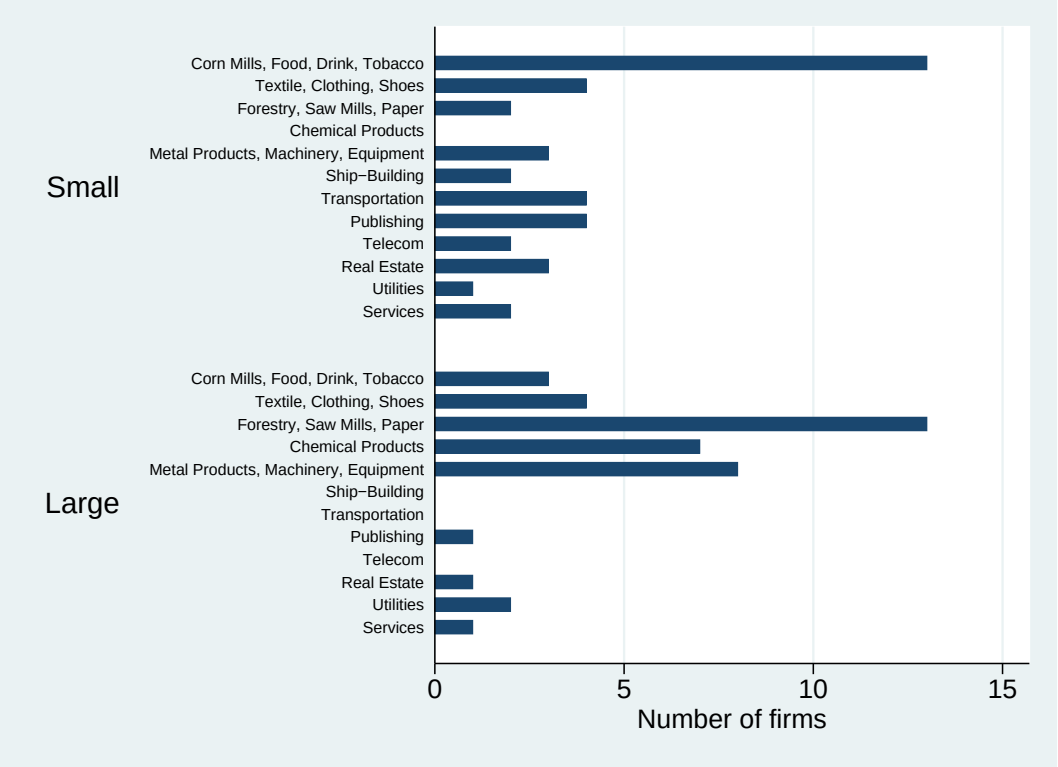
The figure shows the frequency distribution of share denominations across the sample firms.

Figure B2: **Information and Advice-Related Board Duties**



The figure shows the frequency distribution of information, manager career, and advice-related functions assigned to boards. A value of one is added to the information index for each of the following statute requirements: (1) the board approves the annual financial statements, (2) managers prepare a periodic report to the board, (3)board members are required to make unannounced inspections of company books and cash balances. A value of one is added to the manager career index for each of the following provisions: (1) The board elects the managers, (2) the board decides managers' salaries, (3) the board can fire the managers. A value of one is added to the advice index for each of the following statute requirements: (1) the board must decide on issues brought to it by the managers, (2) managers participate in board meetings, (3) managers vote in board meetings.

Figure B3: **Industry Composition by Share Denomination**



The figure shows industry composition according to share denomination. Industries are based on the NACE-classification code.

Appendix C Excerpts from statutes

Table B4: **Examples of statute provisions pertaining to boards and management**

Management (board of directors):

La Compania de Maderas, importer of processed wood from Spain (§10):
The board of directors hires and fires the superintendents in the Spanish branches and other required clerks, determines their salaries and assigns the necessary powers of attorney. The board itself carries out purchases and sales of timber and what is otherwise required for the operations of the firm, and carries out in all instances the interests of the company in accordance with its laws.

Boards (board of representatives:

Christiana Joint Stock Beer Brewery (§20):
It is the responsibility of the board or representatives to a) elect directors and determine their salary, cf. §11, b) approbate the board of directors' election of the officers mentioned in §16 and, together with the board of directors, determine their salary, c) make a decision in questionable cases presented [to it] by the board of directors, d) quarterly inform itself of the exact operation and situation of the brewery, e) several times a year and at random times and without warning conduct examinations of the books and cash holdings, f) together with the board of directors make decisions regarding acquisitions of land, building plans and builder, acquisitions of fixed assets, and the brewery's assumption of collateralized debt, g) hire an auditor of the brewery's books and accounts and decide his salary, h) accredit the accounts, i) annually present the GM with a complete summary of the brewery's business, and j) together with the board of directors, decide how much of the year's surplus should be paid out as dividend.

Christiania Swine Slaughterhouse (§11):
The board of representatives must make a decision in cases presented to it by the board of directors, make a decision about the distribution of the year's surplus, make a decision to convene ordinary and extraordinary GMs, the latter also when requested by the board of directors or by shareholders representing a fifth of the equity capital, make a decision about any disposition that involves the use of the company's reserve fund, arrange for auditing of the company's accounts by a paid auditor whom it hires to accredit vulnerable [sensitive] items.

Christiania News and Advertisement Periodical (§6):
The board of representatives decides on the use of surplus from operations. Its opinion should be obtained by the board of directors in important cases.

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