The ownership structure of Norwegian firms: Characteristics of an outlier *

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Abstract

This paper first describes the institutional framework for corporate governance in Norway, concluding that its civil law tradition of Roman origin provides a relatively high protection of shareholder rights. Using a data set which is exceptionally rich and accurate by international standards, we next quantify a wide range of ownership structure characteristics for all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. We find that on average, the median owner holds a negligible fraction of a firm's equity, the largest owner holds 29%, the four largest constitute a majority, and financial firms have considerably less concentrated ownership than other firms. International investors, who hold the largest fraction of OSE market cap, are underrepresented among the large owners of voting stock and heavily overrepresented in non-voting stock. Large owners of firms with dual–class shares hold more voting rights than cash flow rights, but still own non–voting equity, possibly due to the legal regime for corporate charter amendments or to reduce potential moral hazard costs faced by minority stockholders. We conclude that the ownership structure of Norwegian firms is fundamentally different from what we find elsewhere in Europe. We speculate that a long social-democratic tradition and strong legal protection of stockholders may partly explain why the personal ownership is so low, why the largest stake is so small, and why the next–to–largest stakes are so big. For Norwegian firms, a key corporate governance issue is whether the low power of the largest owner produces a system of strong managers and weak owners or whether a flat power structure of ownership facilitates cooperative monitoring by owners who are individually weak, but collectively strong.

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1 Introduction

Does corporate governance matter? Judging from existing ownership structures and public policy in many countries, the answer is yes. For instance, national owners control the largest bank in every European country except in Belgium, and the Norwegian government currently thinks the state should hold a blocking minority in the country's largest commercial bank. Until 1995, a regulation applying to all Norwegian firms ruled that international investors as a group could not hold more than one third of a firm's voting shares. Judging from these examples, the identity of the owner is considered so important that the state uses both legislation and funds to ensure that certain owner types are excluded from certain ownership positions.

The size of an equity holding is also of concern in public policy. For instance, no investor can own more than 10% of a Norwegian bank or insurance firm, an investor controlling 40% of a listed firm's voting shares must give a tender offer to all remaining shareholders, and any shareholder has the obligation to be bought out by a majority shareholder who controls at least 90% of the firm.

Public concern for the ownership structure of private firms may be rationally motivated by externalities.[1] In contrast, private investors are primarily concerned with corporate governance because it may influence the firm's economic performance. Ownership structure is a factor of production, and the optimal ownership structure is the one which maximizes firm value. Although such a value-maximizing ownership structure is hard to specify in detail (see e.g. Hart [1995] and Shleifer and Vishny [1997]), a recent summary of the empirical research concludes that corporate governance does matter, as certain ownership structure characteristics vary systematically with firm performance (Gugler [1999]).[2] These characteristics include owner identity (e.g, firm insiders vs. firm outsiders and public vs. private investors), holding size (like the voting power of the largest owner), and the relative size of different share classes (like voting vs. non-voting equity).

Our paper focuses on ownership structure characteristics alone, leaving the relationship between ownership and performance to a companion paper. We think there are two reasons why a descriptive study of Norwegian ownership is interesting *per se*. First, our data set is exceptionally rich and accurate by international standards. For instance, available ownership data from the US, Japan, the UK, and continental Europe are based on only large holdings, as there are no legal requirements to report small stakes. Thus, all stakes below a minimum reporting threshold of 2–5% (depending on the country) are ignored by the researcher. This typically implies that the owners of roughly one third to one half of outstanding equity are excluded from the data base. Moreover, a large holding is only registered when it passes certain thresholds, like 10%, 20% and 50% of outstanding equity. This means all stakes in–between the discrete thresholds are estimated with error. Also, except for the UK and the US, the available international evidence refers to just one or two years in the mid 1990s. In contrast, our data set, which includes every owner of all listed Norwegian firms over the period 1989–1997, offers a rather long time series which suffers neither from the large holdings bias nor the discrete thresholds problem. Apparently, no other country provides a similar opportunity to explore the anatomy of the full ownership structure of publicly listed corporations over an extended time period.

The second reason why ownership of Norwegian firms is worth considering is both national and international. Beyond statistics on aggregate holdings by different investor types published by the

[1] For instance, there may be a negative credit squeeze effect on society as a whole if a national bank with a multinational bank owner rapidly moves the business abroad in bad times. Moreover, the entire equity market may suffer if weak legal protection of ownership rights allows a majority shareholder to extract excessive private benefits at the expense of a weak minority.

[2] This evidence is still not consistent across different ownership structure characteristics and national environments, and the causal relationship between ownership and performance is not well understood.

Oslo Stock Exchange (OSE),[3] no systematic study of ownership structure exists. Thus, although we already know what fraction of Norwegian listed firms is owned by for instance institutional investors as a group, we do not know the size of the typical institutional holding, whether such an investor prefers voting to non-voting shares, or whether the investor tends to be a large or small owner. An international reason for analyzing Norwegian ownership structures is the current trend towards conducting comparative studies of corporate governance systems across many countries (La Porta et al. [1998], Barca and Becht [2000]). This research suggests that a country's legal and regulatory regime influences its corporate governance system. For instance, it seems that the weaker the legal protection of ownership rights, the less developed the equity market, the more concentrated the ownership structure, and the lower the value creation (La Porta et al. [1999]). Accordingly, insights into how the institutional environment influences corporate governance and firm performance cannot be gained without a sufficiently rich set of observations across different regulatory regimes. Adding a new set of detailed observations on the institutional environment and the firms' ownership structures may enhance our ability to better understand the macro-determinants of corporate governance. That would be particularly useful if the country's ownership structure is fundamentally different from what has so far been found elsewhere. Norway turns out to be such a case.

The rest of the paper is organized as follows. Section 2 describes the relative importance of the Norwegian stock market and the elements of the regulatory environment which may matter for ownership structure, such as voting rules at the stockholder meeting, the setup of the corporate board, the mechanisms for separating ownership from control, and the legal rights of minority shareholders. In section 3 we classify investors into five basic types: state, international, individual, financial, and non–financial owners. We document the aggregate holdings of these owner types across firm types and years. Certain sub-categories of the basic types are analyzed separately, such as firm insiders and intercorporate investors. We leave the aggregate holdings and analyze the separate stake per investor in section 4. The concentration of cash flow rights (all shares) is characterized in several ways, such as the size of the largest stake per firm, the aggregate fraction held by the five largest owners, the identity of large owners, the number of stockholders per unit of firm value, and the Herfindahl concentration index. The concentration of voting rights (voting shares) is analyzed in section 5, which also explores how large owners bias their stakes towards voting power by choosing between voting and non-voting stock in firms with dual-class shares. Section 6 relates our findings to existing international evidence, whereas section 7 provides a detailed summary of the findings and concludes the paper.[4]

2 The institutional framework

This section first provides background information on the Norwegian stock market and relates it to the national economy and to stock markets around the world. We next describe regulations which may influence corporate governance in general and ownership structure in particular, such as the board structure, mechanisms for separating cash flow rights from voting rights, and rules for protecting minority stockholders. Finally, we describe the Norwegian system for disclosing ownership information and compare it to systems based on the EU transparency (large holdings) directive.

[3] Most publications from the OSE can be found at their home page www.ose.no.

[4] A separately published data appendix (Bøhren and Ødegaard [2000]) contains a much more comprehensive set of tables than the one presented in the present paper.

2.1 The significance of the stock market in the Norwegian economy

Norway is no exception to the dominating international pattern that most corporations are non-listed. As of year-end 1997, there were 256 000 firms altogether, of which 133 000 were share (limited liability) companies.[5] Just 217 of the share companies were listed, which is roughly 0.08% of all firms and 0.2% of all limited liability firms.[6]

The book value of Norwegian listed firms' equity in 1994 was 17% of all private and state firms' equity.[7] Relative to all limited liability firms in 1996, the subset of listed firms represents 21% of the book equity, 8% of the sales and 8% of the employment.[8].

A different way of comparing listed firms to the overall economy is by the ratio of market cap to GDP. This measure relates the market value of all listed firms to the aggregate gross value added by domestic production in the current period. Figure 1 shows the ratio of market cap to GDP for a select group of countries in 1997.

Table 1

The ratio of stock market capitalization to GDP across the world, 1997.

Source: International Federation of Stock Exchanges (www.fibv.com)

European countries		Non-European countries	
Switzerland	2.26	South Africa	1.64
UK	1.55	US	1.33
Netherlands	1.30	Malaysia	0.95
Sweden	1.16	Chile	0.93
Ireland	0.67	Canada	0.92
Finland	0.61	Australia	0.75
Belgium	0.57	Japan	0.53
Denmark	0.55	Mexico	0.39
Spain	0.55	Peru	0.24
France	0.49	Thailand	0.19
Israel	0.45	Indonesia	0.14
Norway	0.43	Korea	0.09
Germany	0.39		
Portugal	0.36		
Italy	0.30		
Greece	0.28		
Austria	0.18		
Slovenia	0.10		
Poland	0.09		
Average	0.65	Average	0.67
Median	0.49	Median	0.64

According to table 1, the value of the Norwegian listed companies in 1997 is 43% of GDP. This is below the international average of about 65%, but rather close to the European median of 49%. As figure 1 shows, the relative importance of the stock market in the Norwegian economy has increased considerably over the sample period; the ratio of market cap to GDP grew from 25% in

[5]This information was produced for us by Brønnøysundregistrene.

[6]Over the period 1991-1997, the total number of firms increased by 38%, the number of share companies grew by 25%, and the number of listed share companies increased by 87%. This information is available at www.ose.no and in the annual statistics publications of the OSE.

[7]Hageler and Jellum [1995].

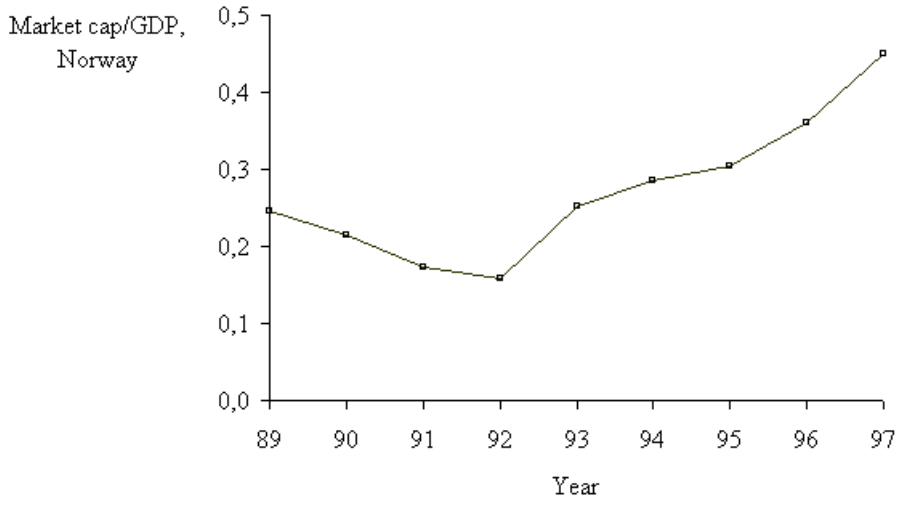
[8][Stortingsmelding 40 97-98, p. 12]

1989 through a low of 17% two years later to 43% in 1997. A similar story is told by the pattern of bank savings vs. stock market investments by private individuals. While stock market investments were 28% of bank account savings in 1989, this ratio had grown to 62% in 1997.[9]

Figure 1

Stock market capitalization to GDP in Norway, 1989-1997.

Sources: The Oslo Stock Exchange (www.ose.no) and Statistics Norway (www.ssb.no)



The absolute size of the Oslo Stock Exchange (OSE) is modest by international standards. As of year-end 1997, the 217 listed firms[10] have an aggregate market capitalization equivalent to 67 bill. USD,[11] which ranks the OSE twelfth among the 21 European stock exchanges for which comparable data is available. Like most European stock markets, the OSE has developed rapidly in the nineties. During our sample period 1989–1997, the number of firms listed grew from 129 to 217, market cap increased by an annual average of 7%, and market liquidity as measured by annual turnover (transaction value/average market value) almost doubled from 0.52 in 1989 to 0.97 in 1997.[12]

To summarize, we find that the Norwegian stock market, which is medium-sized by European standards, plays a rather modest role in the national economy. Nevertheless, the OSE becomes an increasingly liquid market place over the sample period, and its relative importance as measured by market cap to GDP grows considerably.

[9]Information from the Central Bank, available at www.norges-bank.no.

[10]There were 172 firms in the beginning of the year. During 1997, 14 firms were delisted, and 65 firms entered the OSE. Of the 217 firms listed at year-end, 21 were headquartered outside Norway (www.ose.no and annual statistics from the OSE).

[11]Translated using the end of year exchange rate.

[12]These turnover ratios are equally weighted averages across firms. The corresponding value–weighted average stayed fairly constant around 0.6 over the period, suggesting that the increased liquidity primarily occurred in the smaller firms.

2.2 The regulatory environment

According to La Porta et al. [1998] the value of ownership rights attached to corporate equity is related to the country's legal rules and the quality of its law enforcement. For instance, they find that concentrated ownership is more prevalent the lower the protection of shareholders in general and of minority shareholders in particular. Thus, they argue, ownership structure should not be analyzed independently of legal regime.

The world's two major systems of commercial legislation are the common law (of English descent) and the civil law (of Roman origin). The civil law family consists of the French, German, and Scandinavian legal traditions. Norway belongs to the latter, and is thus a civil law country. According to Zweigert and Kotz [1998], the Scandinavian law tradition is less closely related to Roman law than its French and German relatives.

The primary firm-external tools for regulating Norwegian corporate governance are the corporate law (*Aksjeloven*), the securities law (*Verdipapirhandelsloven*), and the listing requirements of the Oslo Stock Exchange (*Børsloven* and *Børsforskriften*). This section outlines and evaluates this judicial system in a corporate governance framework.

2.2.1 The fiduciary duty

No law or public regulation sets it as an explicit duty of the management and board to maximize the value of equity holders' claim. On the other hand, there is no stated obligation to prioritize other stakeholders than owners or to trade off potential conflicts of interest between stakeholder groups, like owners, creditors and employees. Therefore, stockholders cannot rely on the courts to enforce equity value maximization. Still, it may be argued that the general disciplining pressure on management towards equity value maximization has increased over the sample period. This is both due to a growing use of earnings- stock-, and options-based incentive contracts and the trend in Norway and most other European countries to challenge the stakeholder idea by the more narrow stockholder approach to corporate governance.

2.2.2 The board structure

Norwegian listed firms have a two-tier board system. All firms with at least 200 employees must have a supervisory board (*bedriftsforsamling*), where 2/3 of the members are elected by the owners and one third by and among the employees. The supervisory board elects the board (*styre*), where two thirds of the seats are for the owners' candidates and one third is for employee candidates. Besides choosing the board, the supervisory board makes the final decision on significant new investments and rationalizations which reduce the number of employees, which may be passed on from the board.

All votes in the board and the supervisory committee are by simple majority. Therefore, even though the two-tier system explicitly recognizes the employees as a legitimate stakeholder group with seats in both boards, the combined effect of election principles and voting rules still puts the ultimate power in the owners' hands.[13]

[13]The board structure of commercial banks is regulated by both the corporate law and the bank law (*Forretningsbankloven*) These regulations impose the same type of two-tier board structure on banks as we just described for non-banks. The supervisory board of the bank (*representantskap*) elects the regular board, and the control functions of the supervisory board are similar to those of non-bank supervisory boards. 73% (typically 22 out of 30) of the supervisory board members are elected by the stockholder meeting, the employees choosing the rest. Like for non-banks, this setup implies that from a stakeholder point of view, the power is with the owners.

2.2.3 The stockholder meeting

Any owner can put an item on the agenda for the ordinary stockholder meeting. Owners representing at least 10% of the cash flow rights can force an extraordinary stockholder meeting.[14]

Voting rules apply to owners who attend the stockholder meeting rather than to all owners. Thus, ownership without presence produces no power. Changes in the corporate charter (*vedtekter*) requires a super-majority of 2/3, whereas most other issues need a simple majority.

2.2.4 Mechanisms for separating cash flow rights from voting rights

Although one-share-one-vote is the basic principle of the corporate law, it still opens up for two exceptions to this general principle, provided they are explicitly stated in the corporate charter. First, the firm may issue up to 50% of its shares as non-voting.[15] Second, firms may introduce voting caps and temporary restrictions on the right to vote.

It is important to notice that *non-voting shares* (B shares) are not always powerless relative to voting shares. When the corporate charter is up for revision, any change first requires a super-majority of 2/3 of the voting shares. In this context, B shares are indeed powerless. However, the second requirement is that there must also be a 2/3 super-majority among *all* shareholders (*selskapets kapital*), i.e., regardless of whether the shareholder owns voting or non-voting stock. In this setting, non-voting shares have full power.

To illustrate, consider a firm with 600 A shares and 400 B shares outstanding, in which all owners turn up at the stockholder meeting. According to the first voting rule for charter amendments, at least 400 A shares have to vote yes. The second requirement means that besides the 400 votes from the A shareholders, at least 267 additional yes votes have to be cast from A and B shareholders as a group. Thus, at least 67 B votes have to be cast in order for the proposal to be accepted by the shareholder meeting.

Hence, even though owners of B shares cannot vote on matters requiring a simple majority, they enjoy full rights in one of the two voting contexts on matters which require a 2/3 super-majority. Examples are new stock issues, merger proposals, voting right restrictions, and modifications of the corporation's objectives.

Non-voting shares served an additional function until year-end 1994. Until then, international investors could not own more than one third of the voting shares of a company.[16] Under this regime, one way of attracting international owners without violating the ownership cap was by issuing non-voting B shares. However, this regulatory restriction was seldom binding. Among the 33 firms with dual-class shares outstanding in our sample period, only two had filled their quota of voting international investors [Ødegaard, 1999, table A.5]. Hence, non-voting shares were apparently not issued to attract international investors who could not hold voting shares, but rather to give investors in general the choice between holding shares with full or limited ownership rights.

Although there is no general restriction on the use of *voting caps*, an industry-specific regulation states that no investor can own or vote for more than 10% of the share capital in a financial institution. As this rule is stated in terms of both the cash flow right and the voting right, the cap applies to voting shares, non-voting shares, and share-less proxy holders alike. By putting a ceiling

[14] This limit is lowered to 5% in the current corporate law, which was passed 1999.

[15] A permission from the ministry of industry is required if the firm wants to issue non-voting stock. In practice, this appears to be no serious hurdle [Bråthen, 1998, p. 590]. The current corporate law introduced is even less restrictive on this point, as firms are only obliged to apply when more than 50% of the shares are non-voting.

[16] This percentage could be increased by application to the Department of Industry. The regulation was higher, 40% of the voting shares, for shipping firms.

on the maximum gap between the cash flow right and the voting right, this regulation limits the ability to separate these two core components of the ownership power.

Stockholders may increase their power without buying more voting stock by establishing *voting pacts* with other stockholders. This separation mechanism is regulated to a limited extent. If the firm is aware of a voting pact between its shareholders, it must file the pact with the stock exchange. As the parties to the voting pact have no filing obligation, however, public information on voting pacts as provided by the OSE is rather useless. In private communications with former and current OSE officials, we are told that voting pacts between stockholders of Norwegian listed firms are rare phenomenons. Hence, this lack of data may not seriously limit our ability to capture a realistic picture on separation.

Stockholders may also transfer voting right to others or receive other stockholders' voting rights by *proxy votes*. In fact, proxy votes may even be used by someone who is not a stockholder in the firm. There are no restrictions on the use of proxy votes, but their existence can only be observed if they are actually used at the stockholder meeting.

Unlike countries like Italy, which has a cap on how much two firms can reciprocally own in each other, Norway has no general regulation on *intercorporate investments*. However, firms in the financial industry (insurance firms, mutual funds and banks) cannot freely hold other firms' shares. Insurance companies can hold up to 15% of the cash flow or voting rights of other firms, and mutual funds cannot own more than 10%. Banks have no direct restrictions in terms of a maximum percentage holding per firm. Instead, there is one cap on the total amount of equity investments across all firms and another cap on each separate investment. The upper limit on total holdings is a certain percentage of the bank's equity and subordinated debt.[17] The cap on individual holdings is 49%, subject to a range of prudential restrictions based on the bank's risk exposure as a stockholder and a lender. Finally, just like for non-financials, a financial firm is subject to a 10% cap on investments in other financials.[18]

In order to fully capture the effect of intercorporate investments on concentration and separation, all equity stakes in a firm must be traced through all layers of intermediate corporate shareholdings (like mutual funds or interlocking pyramids of listed and unlisted firms) back to the ultimate personal owner. The extent of separation can then be measured by the ratio of voting rights to cash flow rights held both directly and indirectly by the ultimate investor. A recent paper on indirect shareholdings in Norway studies intercorporate investments between listed firms over the period 1980-1994 (Bøhren and Norli [1997]). The overall finding is that on average, listed firms hold 15% of the market value of listed firms' equity. Even though these aggregate intercorporate investments are large by international standards[19], the authors find that each individual holding is still small and short-lived. The mean fraction held is 2.8%, the median is 0.4%, and the mean and median holding period is respectively 1.7 and 1 year. After testing several predictions about potential determinants of intercorporate shareholdings, Bøhren and Norli [1997] conclude that most Norwegian listed firms do not make such investments primarily for strategic or control reasons, but

[17] The general property of this regulation is that the smaller the investing bank and the larger the firms in which it invests, the smaller the maximum fraction that can be owned. Currently, the limit is 25% of the bank's equity and subordinated debt.

[18] These restrictions are not always binding, as the government sometimes allows certain financials to invest beyond the upper limits. Typically, these exceptions would be non-listed subsidiaries of listed financials. One example is the listed bank DnB, which owns 100% of the unlisted insurance firm Vital.

[19] According to estimates for 1990 (French and Poterba [1991]), such investments were 50% of market cap in Japan and 1% in the U.S. In Europe, 1992 figures showed Sweden (26%), Belgium (22%) and France (15%) at the top of the list, whereas Denmark (6%), Greece (2%) and the U.K. (0%) were at the bottom (of Stock Exchanges in the European Community [1993]).

rather as an integral part of their cash management system.

2.2.5 Minority protection

A wide set of regulations have been passed to prevent the unfair transfer of wealth from small to large stockholders. A flagging system informs small investors when ownership rights are transferred to the firm's large investors. Under the rules prevailing at the end of the sample period, an investor passing up or down through the thresholds of 10%, 20%, 33%, 50%, 67% and 90% of the outstanding cash flow or voting rights must notify both the firm and the OSE.[20]

The basic regulatory tool for minority protection is the principle of equal proportional rights for every stockholder. The law states that no corporate charter can limit the owner's right to attend the stockholder meeting, be present by a proxy representative, bring along an advisor, put any case on the agenda for voting, receive the same information as any other stockholder, and to bring decisions made at the stockholder meeting up for the courts. The law also specifies a pre-emptive right for every stockholder to participate in issues of new stock. This right can only be waived by a 2/3 majority vote of outstanding shares in the stockholder meeting.

As for the explicit protection of small stockholders relative to large, investors passing the 45% voting rights threshold (40% after 1 Dec 1997) must give a tender offer to all remaining shareholders. An owner of at least 90% of the shares is obliged to buy the shares from any stockholder who wants to sell.[21] Moreover, the listing requirements ensure a minimum shareholder dispersion at the initial public offering (IPO). At least 25% of the shares must be owned by the general public, and at least 500 investors (50 investors for small firms) must own at least one round lot.[22] Finally, the insider trading rules state that regardless of whether or not you are affiliated with the firm, it is illegal to trade in its shares based on firm-specific private information which is pricing relevant. Certain firm insiders are automatically barred from trading around certain corporate events, like the management team two months before the annual report is published. All such firm insiders must currently report their trades to the OSE no later than the morning after the trading day.[23]

These stockholder protection rights are independent of the number of shares held or whether shares are voting or non-voting. Several additional ownership rights are granted to shareholders who represent a certain minimum of the share capital, again independently of their voting status. In particular, shareholders owning at least 10% of the outstanding share capital can force the appointment of an additional auditor, initiate an extraordinary stockholder meeting, prompt an investigation of management's actions or sue any member of the management team, the two boards, the auditor, and other stockholders in the firm.

Even given this rather wide set of corporate governance characteristics of the Norwegian regulatory regime, it is still not straightforward to make simple conclusions about overall system qualities. Such conclusions would require some external standard in terms of regimes which are either normatively attractive or at least observed elsewhere. Using a much smaller set of characteristics than ours which they consider particularly important for corporate governance, La Porta et al. [1998] recently classified the legal regimes of 49 countries according to their degree of investor protection.

[20] The steps of the flagging rules have changed several times over the sample period. From 1989 to year-end 1993, the lower flagging trigger was 10%, but every change of at least 5 percentage points beyond that level had to be flagged. From 01.01.94 to 01.12.97, the steps were widened to 10, 25, 50 and 75%. After 01.12.97 to the present (May 2000), the thresholds specified in the main text have remained unaltered.

[21] This rule is symmetric, as the 90% majority owner has the right to buy the remaining shares from the minority.

[22] After the IPO, there is no explicit regulation of ownership dispersion except that if a concentrated ownership structure produces a sufficiently low trading volume, the firm may be delisted at the discretion of the OSE.

[23] Before 1997 the regulations allowed a delay of up to 3 months in reporting insider trades.

Their primary finding is that investor protection varies systematically across legal regimes. Investor protection inherent in the commercial law is on average strongest in common law countries (like Argentina, India, the UK, and the US) and weakest in civil law countries of the French type (like Belgium, France, Italy, and Mexico), with the German and Scandinavian civil law traditions in between.

Looking more closely at their ranking of both overall regimes and individual countries within a regime, several findings are relevant to our case. Based on seven characteristics of shareholder rights, Norway gets the highest score in the Scandinavian family.[24] In fact, Norway's score equals the average score of the common-law countries, which top the ranking list. The Norwegian legal tradition also achieves the highest average score on the rule of law, including the best possible score on law enforcement. Finally, the Scandinavian regulatory regime gets the highest average rating on the informativeness of its financial accounting standards. This average rating equals Norway's score.

It seems fair to conclude that compared to most legal regimes around the world, the Norwegian regulatory environment provides a framework where both stockholders as a group and small stockholders as a subgroup can effectively exert their ownership rights.

2.3 Disclosure of ownership information

According to a law issued in 1985 (*Lov om verdipapirsentral*), a listed firm must report every transaction of its outstanding equity securities to the VPS (*Verdipapirsentralen*), which is the securities registry. The notification specifies the identity of the buyer and seller, the exact time of the transaction, the number of securities traded, and the price per security.[25] Any change in the number of securities outstanding must be reported, such as stock splits, treasury stock issues, and issues of new shares.

The VPS system differs from disclosure systems generated by the EU transparency directive[26] in several fundamental ways. First, VPS is based on cash flow rights, whereas the EU directive relates to voting rights. This implies that beyond the impact of non-voting shares, the VPS data base provides no information on how voting rights may differ from cash flow rights via mechanisms like corporate voting restrictions, voting pacts, voting right proxy votes, and indirect shareholdings. All this information must be supplied by the investors in the EU directive countries. However, as the EU directive does not mandate the disclosure of cash flow rights, the relationship between cash flow and voting rights cannot be fully analyzed from such data bases either.[27]

Second, the EU directive dictates the publication of voting blocks, i.e, large holdings of voting rights. The lower notification limit is 5%, and further notice must be given when the investor passes up or down through the thresholds of 10%, 20%, 1/3, 50%, and 2/3 of the voting rights.[28]

[24]The La Porta et al. [1998] criteria were: 1) whether the law explicitly forbids deviations from the one share-one vote principle, 2) whether the law allows voting by mail, 3) whether shares can be traded with their voting rights attached just before stockholder meetings, 4) whether owners can cast all their votes for one board candidate (cumulative voting) or elect board representatives according to their ownership stake (proportional representation), 5) whether oppressed minorities can easily strike back, 6) whether preemptive rights to new security issues exist, and 7) the percentage of outstanding shares required to call an extraordinary shareholder meeting.

[25]Unlike many European countries, Norway does not allow the system of bearer shares. This means the identity of any owner is known from the VPS data base except when international investors deposit their shares in nominee accounts with an investment bank. The nominee account system will be described in section 3.

[26]EU-directive 88/627/EEC, which is also called the large holdings directive.

[27]As the EU directive only specifies minimum disclosure requirements, several countries have added stricter rules. For instance, Dutch firms must disclose both voting rights and cash flow rights.

[28]Inter-country variations exist. For instance, the lower limit is 3% in the UK , and the Dutch thresholds are 5,

This means a considerable portion of the ownership structure is left out from the data base. For instance, table 4 in Gugler et al. [1998] implies that in market value terms, the reporting thresholds of 5%, 10%, 25%, 50%, 75% and 90% only reveal two thirds of the full ownership structure of the average Austrian firm. According to table 1 in de Jong et al. [1998], the Dutch thresholds of 5, 10, 25, 50 and 66 2/3% only pick up 48% of the holdings in a typical Dutch corporation.

The EU system based on the reporting of large blocks at discrete counting intervals creates two potential data base problems. First, as investments below the lower reporting threshold are ignored, any measure of holdings per investor is imprecise and potentially biased. For instance, if personal investors are overrepresented below the lower reporting threshold, the observed fraction of a firm owned by personal investors (i.e., those above the lower threshold) underestimates the true fraction. Second, as one cannot observe the true size of large holdings in-between the reporting thresholds, ownership concentration based on the blocks is estimated with error, like the fraction held by the largest owner. Moreover, the estimate will also be biased unless the true ownership fractions happen to be uniformly distributed between the reporting thresholds.

Because the VPS data contains the full ownership structure, it does not suffer from these two weaknesses. Moreover, it is fully computer readable and has been operative since 1989. It provides a consistent time series of ownership structure data over nine years which seems currently unavailable in other countries.

The Appendix at the end of this paper provides further details on our sources for ownership information, security prices, and accounting figures.

3 Characteristics of aggregate ownership

This section first classifies and broadly characterizes the firms listed on the Oslo Stock Exchange (OSE) and their owners. We next report the aggregate stock holdings of these owner types in the different firm types. Finally, we split the basic investor types into finer subgroups by analyzing the aggregate stock ownership of the firms' insiders and the intercorporate share holdings between listed corporations.

3.1 Firm types and owner types

3.1.1 Firm types

We categorize the listed firms into four types. Table 2 presents the mean and median market cap (in constant 1997 bill. NOK) and the number of firms in each category.

IPO (Initial Public Offering) firms in the fifth column are quoted on a separate list (*SMB listen*) and are subject to less strict listing requirements than the remaining OSE firms, which are on the main list (*Hovedlisten*).[29] The IPO firms are normally young and have recently been brought to the exchange. As shown by the table, IPO firms are also much smaller than most others, as their mean market cap over the sample period is 19% of the average OSE firm size. The number of IPO firms increases strongly from 24 in 1989 to 76 in 1997.

Financials are commercial banks and insurance companies. This firm type is more regulated than others, both in operations (e.g, through minimum capital coverage ratios) and governance (e.g, through caps on maximum holdings per owner). The commercial banks were hit hard by

10, 25, 50 and 66 2/3%.

[29] To be quoted on the main (respectively IPO) lists, the market value of equity must be at least 10 (8) mill. NOK, and at least 500 (50) non-inside investors must own at least one round lot. No firm younger than three years can be on the main list, but there is no such requirement for the IPO list.

Table 2

Mean and median equity market value per firm in constant 1997 bill. NOK.

The table shows the equally weighted average (mean), the median (med) and the number of observations (n).

Year	Firm Type								All	
	Industrials		Financials		Shipping		IPOs			
	Mean (Med)	n	Mean (Med)	N	Mean (Med)	n	Mean (Med)	n	Mean (Med)	n
1989	2.4 (0.5)	55	1.6 (0.9)	13	1.7 (0.5)	23	0.3 (0.1)	24	1.7 (0.4)	115
1990	2.7 (0.5)	47	1.3 (0.5)	11	1.1 (0.6)	27	0.4 (0.2)	19	1.7 (0.4)	104
1991	2.4 (0.5)	47	0.7 (0.2)	12	1 (0.4)	27	0.2 (0.1)	15	1.5 (0.3)	101
1992	2 (0.2)	56	0.7 (0.6)	12	0.6 (0.2)	29	0.1 (0.0)	14	1.3 (0.2)	111
1993	2.9 (0.5)	55	2.4 (1.6)	11	1.1 (0.5)	30	0.2 (0.1)	21	1.9 (0.4)	117
1994	3.1 (0.6)	57	3.5 (1.5)	10	1.2 (0.7)	36	0.2 (0.2)	26	2.1 (0.5)	129
1995	3.2 (0.8)	60	4 (1.9)	10	1.2 (0.6)	35	0.4 (0.3)	36	2 (0.5)	141
1996	4.1 (1.4)	62	5.7 (2.2)	8	2.5 (1.1)	33	0.4 (0.3)	49	2.6 (0.7)	152
1997	4.5 (1.5)	75	8 (3.2)	8	4.5 (1.8)	37	0.5 (0.3)	76	3.1 (0.8)	196
Total	3.1 (0.7)	514	2.8 (1.0)	95	1.7 (0.7)	277	0.4 (0.2)	280	2.1 (0.5)	1166

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data source: Oslo Børsinformasjon (OBI). Numbers in Percent.

a banking crisis which started in the late eighties. The first insolvencies in savings banks and commercials occurred in 1987. Four years later, the state took over the second and third largest banks (respectively Kreditkassen and Fokus Bank). The state also acquired 50% of Norway's largest bank (DnB) and became its sole owner in 1992 (Kaen and Michalsen [1997], Ongena et al. [1999]) The state involvement was reduced towards the end of the sample period. As of 1997, the state holdings in the largest, second largest and third largest banks was respectively 52%, 51% and 0%.[30]

Financials constitute the smallest number of firms in any year, the number of financials decreases over time, and they represent the largest mean firm size towards the end of the sample period. By 1997, the population of OSE financials contains 7 commercial banks and 1 insurance firm, down from respectively 12 and 2 in 1989.

The OSE is the world's largest stock exchange for *shipping* firms, which have historically been dominated by family-owned businesses operating in international product and capital markets. Currently, about every fourth OSE firm is in shipping. The mean size of a shipping firm is close to the market-wide OSE average of 2.1 bill NOK.

We classify the remaining firms as *industrials*. This category contains the largest number of firms, accounting for roughly half the OSE firms. Although financials are on average considerably larger than industrials towards the end of the sample period, the largest firms are found among the industrials. For instance, the largest industrial (Norsk Hydro) in 1997 is 3.7 times the size of the largest financial (DnB) as measured by equity value.

Across every year and firm type, the mean firm size is two to four times the median. This reflects the well-known international pattern that in the population of listed firms, a small number of firms are much larger than the others. For instance, the largest Norwegian industrial in 1997 has a market cap of NOK 82.4 bill, the mean firm size is 4.5 bill, the median is 1.5 bill, and the smallest industrial has a market cap of 0.04 bill. The same story is told by the fact that whereas the equally-weighted mean market cap is NOK 2.1 bill, the value-weighted equivalent is 19.3 bill.

3.1.2 Owner types

Table 3 groups the owners of OSE firms into five types and reports the equally-weighted average number of investors per firm over the years.

Table 3

The average number of owners per firm.

For each firm we calculate the number of owners of each type. The figures in the table are equally weighted averages across firms.

Owner type	Year									All
	1989	1990	1991	1992	1993	1994	1995	1996	1997	
State	3	3	4	4	4	4	4	4	4	4
International	1914	1830	1536	1108	361	290	234	218	184	737
Individuals	3776	4425	5741	5687	4789	4082	3729	3698	3079	4175
Financials	27	30	29	28	37	45	50	59	59	43
Nonfinancials	177	211	224	212	189	180	177	182	189	191

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data source: Verdipapirsentralen (VPS).

[30] It is currently (May 2000) a state policy to ensure national control over key financial institutions, be it through private or state ownership. This is nothing peculiar for Norway, as Belgium is the only European country where the dominating owners are not domestic. The Norwegian state policy is for the state to hold a 1/3 blocking minority in the largest commercial bank.

A *state owner* represents either the central or the local government (*stat* or *kommune*), including their pension funds. According to table 3, this owner type holds on average four equity stakes per firm. Considering the total number of OSE firms, this means the government has about 350 equity investments in the beginning of our sample period and 800 towards the end.

An *international owner* is any organization not registered in Norway or a non-resident individual. This category contains both international investors who register at the VPS by name and international investors who own anonymously through a nominee account.[31] These accounts are organized by large international investment banks. Each account as reported to the VPS contains only aggregate holdings of all investors who have registered their shares with the account manager. Because we cannot identify the underlying owners, each nominee account is counted as one international investor. The sharply declining time series in the second row of table 3 may therefore be rather uninformative as to the true number of international investors. The decline may simply reflect an increasing tendency for international investors to not register their shares openly, but rather through anonymous nominee accounts. We return to this point below when analyzing the aggregate open and anonymous holdings by international investors.

Financial owners are private Norwegian banks, insurance firms, pension funds, and investment trusts (mutual funds). This category, which is often termed institutional investors, represents a small but growing number of stockholders. The average number of financial investors per firm more than doubles from 27 to 59 over the sample period, and the total number of equity positions held by financials more than quadruples over the nine years.

Nonfinancials are private domestic firms which are not classified as financial owners. In terms of the firm type classification we made earlier, a nonfinancial owner is any listed or non-listed domestic firm which is either of the industrial, shipping or IPO type. The average number of equity stakes per firm held by this investor type stays close to 200 over the entire period.

Finally, *individuals* are non-corporate (personal) investors with Norwegian residency. Except for non-corporate members of the international investors category, individuals are the only investors in table 3 representing ultimate owners. The remaining ownership is indirect, as there is at least one layer of corporate equity holdings between the ultimate owner and the OSE firm. The individuals category contains by far the largest number of investors. There are close to four thousand personal investors per firm in the beginning of the sample period, increasing to almost six thousand in the early nineties and gradually declining to about three thousand investors per firm in 1997.

Summarizing this introduction on firm types and investor types, we have found that industrials represent the highest fraction of OSE market cap, the largest firm size, and the highest number of firms. The number of industrial and shipping firms and particularly the much smaller IPO firms is steadily growing, whereas financials become less numerous and relatively larger. The average OSE firm is owned through roughly 0.7 mill. separate equity positions. We assign these holdings to five owner types and find that individual (personal) shareholders hold more than 80% of the positions. Whereas fewer individuals invest directly in the average OSE firm over time, the number of financial owners doubles. The state holds on average four separate equity positions per firm, and domestic non-financial private corporations own about 200. The number of international investors holding their OSE shares openly drops dramatically, as the average number of international investors not owning through anonymous nominee accounts falls by almost 90%.

[31] The identity of investors using nominee accounts is unknown to the public, but it must be revealed to *Kredittilsynet* (the Norwegian equivalent of the SEC) on demand. The voting right of a nominee share cannot be exercised unless the owner's identity is reported to the firm and thus also to the VPS.

3.2 Aggregate ownership by the basic investor types

Table 4 shows the aggregate fraction of firm equity held by the various investor types. Since these aggregates are value-weighted, they also reflect the proportions owned of OSE market cap.

Table 4

The aggregate fraction of OSE market cap held by the five basic owner types.

The fractions represent value weighted averages across firms, using the market value of a firm's equity as weight.

Owner type	Year									All
	1989	1990	1991	1992	1993	1994	1995	1996	1997	
State	13	15	17	22	21	22	20	18	14	18
International	30	29	28	29	28	30	32	33	32	31
Individuals	12	11	10	10	11	10	10	10	8	10
Financials	13	16	17	17	17	16	16	20	21	18
Nonfinancials	32	29	28	22	23	22	22	20	25	24

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data source: Verdipapirsentralen (VPS). Numbers in Percent.

According to table 4, international investors as a group have held the largest equity portfolio at the OSE since 1992, owning 31% of market cap on average.[32] As shown in the separate data appendix (Bøhren and Ødegaard [2000]), there is a certain bias towards industrials (33%) and against financials (24%). It also turns out that the decreasing number of openly registered OSE investments mentioned above is offset by a corresponding increase in the value held through nominee accounts. For instance, the value of nominee accounts is on average 15% of the total OSE value held by international investors in the first five years of the sample period. In the last four years, the average ratio is almost four times higher (56%).

Nonfinancial domestic corporations own 24% of OSE equity, hold a disproportionally large part of shipping companies (40%), and have generally decreased their share over time. Financial owners, who hold 18% and are the third largest owner type, are quite different. They have no aggregate preference for particular firm types, and they increase their holdings from 13% in 1989 to 21% in 1997. However, there are large differences between sub-classes of firms within the financials category. According to figure 2, banks are generally insignificant owners, insurance firms keep an almost constant fraction of 11% throughout, and mutual funds acquire increasing portions of OSE market cap. Starting from a 1% fraction in 1989, mutual funds end up owning 8% of market cap in 1997.

Although the fraction of market cap owned by the state is practically identical to that of financial investors, the portfolio characteristics are quite different. First, the aggregate size of the state portfolio is more unstable, going from 13% in 1989 through 22% in 1994 to 14% in 1997. Second, the data appendix (Bøhren and Ødegaard [2000]) shows that state holdings are heavily concentrated in industrials and financials. Moreover, state ownership in financials increases dramatically over the sample period. This is documented by table 5, which splits financial firms into banks and insurance and shows the annual value-weighted state ownership across firms and also the maximum state ownership in any individual firm.

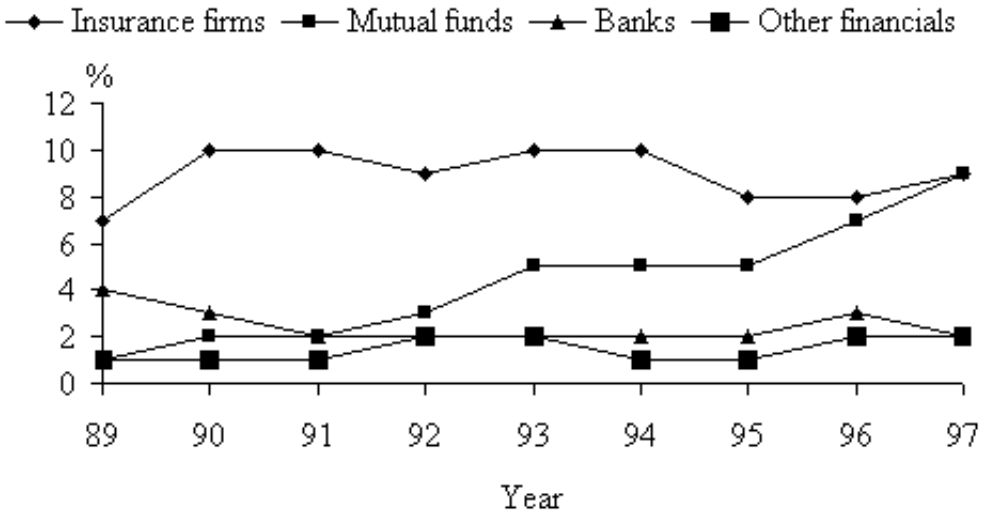
State ownership in financials (banks and insurance firms) is negligible during the first two years, starts growing in 1991 and reaches its maximum of 40% in banks and 12% in insurance two years later. After 1993, state ownership in banks stays high, and is 37% in the final sample

[32] International owners increased their relative holdings substantially during the second half of the eighties, when their fraction of market cap doubled from 15% in 1985 to 30% in 1989.

Figure 2

Fraction of OSE market cap held by subgroups of financial investors.

The figure shows the time series of the percentage equity fraction owned by each subgroup. The fractions are value-weighted averages across firms.



Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS).

Table 5

Fraction of OSE market cap held by state owners.

The table shows the value weighted average (vw) and the maximum ownership fraction (max) for aggregate state holdings per firm type and the number of observations (n) . The firm's equity value is used in the value weighted averages. When averaging across years, we use the firm's equity value in constant 1997 NOK.

Year	Firm type															All		
	Industrials			Banks			Insurance			Shipping			IPOs					
	vw	max	n	vw	max	n	vw	max	n	vw	max	n	vw	max	n	vw	max	n
1989	20	88	57	0	0	12	0	0	2	0	0	23	2	25	24	13	88	118
1990	22	88	47	0	0	9	0	0	3	0	1	29	0	15	19	15	88	107
1991	23	88	48	4	20	7	5	7	4	1	4	28	0	0	15	17	88	102
1992	26	88	56	23	61	8	7	11	3	2	12	30	2	14	14	22	88	111
1993	25	88	56	40	71	8	12	13	2	2	6	34	3	14	21	21	88	121
1994	27	88	58	32	52	7	11	12	3	2	5	36	3	15	26	22	88	130
1995	26	88	62	29	53	8	11	11	3	1	5	36	2	20	37	20	88	146
1996	23	88	63	36	54	7	10	10	1	1	9	35	2	18	49	19	88	155
1997	19	88	75	37	54	7	10	10	1	1	8	37	1	33	79	14	88	199
Total	23	88	522	30	71	73	9	13	22	1	12	288	2	33	284	18	88	1189

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS). Numbers in Percent.

year. A corresponding story is told by the maximum state ownership in any single bank, which is less than 1% in the two first years, increases to 20% in 1991, reaches 71% two years later, and stays above 50% thereafter. As described earlier, this ownership pattern reflects a deep crisis in the Norwegian banking industry and the government's intervention to keep the banks out of bankruptcy by temporarily taking over the three largest banks.[33]

Individual investors, who hold more than 80% of all OSE equity positions own, according to table 4, on average just 10% of market cap. There is a declining trend from 12% in 1989 to 8% nine years later, and it turns out that IPO firms are heavily overrepresented in the portfolio of individual investors. The appendix reveals that individuals' ownership in IPO firms was merely 8% in 1989, reached 40% three years later, and stays around 25% thereafter. Personal investors as a group rebalanced their portfolio in the sample period by gradually increasing the stake in IPO firms at the expense of financials and shipping. The fractions held in financials and shipping in 1989 were 18% and 17%, respectively, declining to just 6% in 1997.

We report the equally-weighted averages in table 6. One reason is that comparable international evidence, to be presented in section 6, is based on equal-weighting rather than value-weighting. Also, by comparing the equally-weighted averages in table 6 to their value-weighted counterparts in table 4, we may uncover size-related ownership patterns in a simple way. Investor types with relatively large fractions of the larger firms will tend to have higher value-weighted than equally-weighted averages. Conversely, equally-weighted averages will be the higher for owner types with relatively high fractions in the smaller firms.

Table 6

Equally weighted equity fractions held by the five basic owner types in OSE firms.
The fractions are constructed by computing the aggregate equity fraction for each owner type in each firm and then averaging across firms and years.

Owner type	Firm type				
	Industrials	Financials	Shipping	IPOs	All
State	9	8	1	2	5
International	23	18	23	20	22
Individuals	16	14	13	28	18
Financials	19	27	14	15	17
Nonfinancials	34	32	51	35	38

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS). Numbers in Percent.

Table 6 reveals that compared to other investor types, international owners and the government are overrepresented in large firms. For instance, the state holding is more than three times higher based on value-weighting than equally-weighting (18% vs. 5%). This is true across all firm types. Conversely, the aggregate individual stake and the aggregate nonfinancial stake are both generally larger in smaller firms. The only exception is in IPO firms, where individual investors as a group are typically larger in the large firms.[34]

[33]Notice that listed banks which were fully taken over by the state were delisted until the state sold out parts of its equity. If these firms were included in the above figures, state holdings in banks would have been even higher.

[34]The comparison of the two tables also illustrates that the equally-weighted averages used in international studies of aggregate equity ownership (Barca and Becht [2000]) may misrepresent both the composition of an owner type's portfolio across firm types and the distribution of value between owner types for a certain firm type. For instance, according to our findings, international investors on average hold 31% (value-weighted) rather than 22% (equally-weighted) of the OSE market portfolio, and individual investors own just 10%, not 18%. Also, nonfinancial

In sum, we have established that international investors is the largest owner type on the OSE. They hold about 30% of market cap every year, increasingly preferring to own shares anonymously through nominee accounts. Non-financial domestic firms own about one-fourth of market cap, more in the beginning than in the end of the sample period. The third largest owner types are financials (institutional investors) and the state, who both hold 18% of market cap on average. Among the financials, banks are quite insignificant owners and insurance firms are the largest. The increase in the share of market cap held by financials is due to the rapid growth of mutual funds. Individual (personal) investors, who represent more than 80% of all owners, hold 10% of market cap on average, decreasing their relative importance over time.

By comparing the aggregates across firm types and contrasting equally weighted and value weighted means, we also find certain relationships between aggregate holdings and OSE firm type and between aggregate holdings and OSE firm size. To explore these patterns more formally, while also allowing for potential multivariate relationships, we estimate the following regression model:

$$AF_{ij} = \beta_0 + \beta_1 FSIZE_j + \beta_2 IFIN_j + \beta_3 ISHIP_j + \beta_4 IIPO_j + \epsilon_{ij} \quad (1)$$

In (1), AF_{ij} is the aggregate equity fraction held by investor type i in firm j, and $FSIZE_j$ is the natural log of the firm's equity value. $IFIN_j$, $ISHIP_j$, and $IIPO_j$ are indicator variables which equals one if and only if firm j is a financial, shipping, and IPO firm, respectively. When all indicators are zero, firm j is an industrial.

A negative β_1 means the investor type's aggregate holding decreases with firm size. The more positive (negative) the sign of the firm type coefficient β_k, $k = 2, 3, 4$, the higher (lower) the aggregate fraction of investor type i in the firm type compared to its aggregate stake in industrials.

Estimating model (1) on the pooled sample produces the findings reported in table 7.

The table documents that the aggregate fraction in an OSE firm held by the state, by international investors, or by financial investors is higher the larger the firm. Conversely, individuals and non–financials own their largest aggregate stakes in smaller firms. Controlling for size, aggregate state holdings gravitate towards industrials and financials, where the involvement in financials is driven by the government's response to a serious banking crisis. International and individual owners both have relatively large aggregate stakes in IPOs, and non-financial investors are biased towards shipping firms.[35]

Notice that these conclusions, like all other findings in section 3, are based on aggregate ownership per investor type. Nothing is implied about holdings per separate investor. For instance, even though international investors as a group own the largest fraction of OSE market cap and own higher aggregate fractions in larger firms than small, there is no implication that a *single* international investor typically holds large stakes or tends to be more involved in larger firms. This is an issue of ownership patterns per investor, which will be analyzed in sections 4 and 5.

corporations do not have the largest claim to the cash flow of the industrials (34%), as the equally-weighted averages may suggest. They are entitled to just 18%, which is about half the claim held by international investors.

[35]The estimates of model (1) are considerably less significant on a year–by–year basis. Sampling errors alone may account for much of this effect, as the average sample size per year is 130 for the whole sample, and there are just 11 financials on average. However, the relationship between aggregate holdings and firm size found in table 7 is significant at the 5% level in most years for most owner types. For instance, individuals are biased towards small firms in every year. Non-financial investors are always overrepresented in shipping firms, but very little of the overall nine–year pattern for financial investors turns up in the annual regressions.

Table 7

The estimated relationship between aggregate holdings per investor type, firm size, and firm type.

The table shows the OLS coefficient estimates, the p–values (in parentheses) and the R^2 of the relationship:

$$AF_{ij} = \beta_0 + \beta_1 FSIZE_j + \beta_2 IFIN_j + \beta_3 ISHIP_j + \beta_4 IIPO_j + \epsilon_{ij}$$

The sample size is 1255, which includes all firms listed on the OSE over the period 1989–1997.

Owner type	β_0	β_1	β_2	β_3	β_4	R^2
State	-0,199	0,014	-0,004	-0,076	-0,046	0,09
	(0,02)	(0,00)	(0,76)	(0,00)	(0,01)	
International	-0,536	0,037	-0,045	0,011	0,034	0,07
	(0,00)	(0,00)	(0,05)	(0,48)	(0,03)	
Individual	0,832	-0,032	-0,031	-0,059	0,050	0,18
	(0,06)	(0,00)	(0,07)	(0,00)	(0,01)	
Financials	-0,141	0,016	0,073	-0,046	-0,018	0,08
	(0,01)	(0,00)	(0,01)	(0,01)	(0,09)	
Non–financials	1,050	-0,036	0,004	0,181	-0,025	0,15
	(0,00)	(0,00)	(0,87)	(0,00)	(0,13)	

3.3 Insider ownership

A corporate insider is either an international owner, a national organization (firm or state agency) or a national individual investor. Thus, insiders as defined in section 2.2 is a subset of the five basic investor types discussed in section 3.2. Table 8 shows the aggregate insider holdings by year and firm type. It should be noticed that because corporate insiders have no obligation to notify the insider register when they are no longer insiders (like when an external board member leaves the board), our data may overestimate the true insider holdings. We will check on this later by comparing the insider data base to dated information on board composition.

The insiders of OSE firms own on average 7% of market cap. The fraction is higher in shipping (10%) and smaller in financials (2%). The overall insider fraction stays rather constant over time, but decreases in shipping and IPOs. For instance, insiders hold 14% of IPO firms' equity in 1989 and 6% nine years later.

The equally-weighted averages are roughly twice their value-weighted counterparts in every year, suggesting that the aggregate fraction of insider holdings is larger in smaller firms.[36] If the number of insiders grows degressively with firm size, this pattern is consistent with the effect of individual budget constraints and lost diversification benefits. These costs of a concentrated equity portfolio are higher for insiders in a large firm than for insiders with a corresponding equity fraction of a smaller firm.

From a corporate governance point of view, the important insiders are the board members and the management team, since these primary insiders control the corporate resources in the short run. The average equity stake held by each of these insider subgroups is shown in table 9. Overall, these primary insiders own roughly two thirds of total insider stakes, and the board members hold three times more than the management team. The low total insider ownership in financials from

[36]Regressing (log) equity value on insider holdings yields a significantly negative relationship ($t = -4.2$).

Table 8

Fraction of OSE market cap held by corporate insiders.

The table shows the value weighted average (vw) and the number of observations (n). The firm's market value of equity is used in the value weighting.

Year	Firm type								All	
	Industrials		Financials		Shipping		IPOs			
	vw	n	vw	n	vw	n	vw	n	vw	n
1989	6	58	6	14	12	23	14	24	7	119
1990	5	48	6	12	24	29	7	20	8	109
1991	6	48	9	12	32	28	15	15	11	103
1992	6	56	6	12	12	30	17	14	7	112
1993	5	56	2	11	14	34	3	22	6	123
1994	6	58	1	10	14	36	10	26	7	130
1995	7	62	2	11	9	36	16	37	7	146
1996	7	63	0	8	6	35	8	49	6	155
1997	6	75	0	8	4	38	6	79	5	200
Total	6	524	2	98	10	289	9	286	7	1197

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data source: Oslo Stock Exchange (OSE). Numbers in Percent.

table 8 shows up once more as negligible holdings by primary insiders in table 9. Notice that across the other firm types, holdings by primary insiders varies considerably less than the total insider holdings from table 8. For instance, total insider stakes in industrials and shipping are on average 6% and 13%, respectively, whereas the primary insiders hold 5% and 6%.

Table 9

Fraction of OSE market cap held by the the management team and the board members (the primary insiders).

The table shows the fraction of market cap held by the management team (mgm) and the board of directors (brd) and the number of observations (n).

Year	Firm type												All		
	Industrials			Financials			Shipping			IPOs					
	mgm	brd	n	mgm	brd	n	mgm	brd	n	mgm	brd	n	mgm	brd	n
1989	0	1	58	0	0	14	11	0	23	3	0	24	3	1	119
1990	0	3	48	0	0	12	2	0	29	4	1	20	1	2	109
1991	0	4	48	0	0	12	9	0	28	7	3	15	2	3	103
1992	0	4	56	0	0	12	2	0	30	0	4	14	1	4	112
1993	0	6	56	0	0	11	3	1	34	0	2	22	1	4	123
1994	0	5	58	0	0	10	6	4	36	1	2	26	1	4	130
1995	1	3	62	0	0	11	9	7	36	10	2	37	2	3	146
1996	2	5	63	0	0	8	0	3	35	3	1	49	2	4	155
1997	1	3	75	0	0	8	0	2	38	2	2	79	1	3	200
Total	1	4	524	0	0	98	3	2	289	3	2	286	1	3	1197

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data source: Oslo Stock Exchange (OSE). Numbers in Percent.

3.4 OSE-listed owners

Corporate owners quoted on the OSE may not be fundamentally different from non-listed corporate owners. The reason we still single them out is the notion of indirect ownership, by which individuals (ultimate owners) hold equity stakes in a firm through one or more layers of other firms. One

potential effect of such an ownership pattern is that the ultimate owner, who sits behind the intermediate corporate layers, may lever up their control rights relative to their cash flow rights along the ownership chain. Thus, stockholders may build ownership pyramids by investing indirectly through a chain of other listed firms. (Bianchi et al. [1998])

To understand how the ultimate owners of OSE firms exercise their ownership rights, we need to know the holdings of all intermediate links in the chain. As we only have access to the ownership structure of the OSE-listed firms which hold equity positions in other OSE firms, this subgroup of corporate owners is our tool for studying indirect ownership.

OSE-listed investors in OSE firms is a subset of the two basic owner types of financials and non-financials. Table 10 shows the aggregate fraction of OSE equity held by these firms.[37] On average across firms and years, indirect ownership through OSE-listed vehicles represent 8% of OSE market cap. Indirect holdings are relatively common in the early years and particularly widespread in IPOs, where in fact 40% of the equity belonged to other OSE firms in 1989.

Table 10

Fraction of market cap in OSE firms held by other OSE firms.

The table shows the value weighted average (vw) and the number of observations (n). The firm's market value of equity is used in the value weighting.

Year	Firm type								All	
	Industrials		Financials		Shipping		IPOs			
	vw	n	vw	n	vw	n	vw	n	vw	n
1989	15	58	15	14	7	23	40	24	14	119
1990	11	48	17	12	8	29	28	20	12	109
1991	11	48	14	12	9	28	16	15	11	103
1992	9	56	8	12	9	30	7	14	9	112
1993	12	56	8	11	10	34	6	22	11	123
1994	9	58	7	10	7	36	8	26	8	130
1995	6	62	6	11	9	36	5	37	6	146
1996	5	63	4	8	5	35	5	49	5	155
1997	5	75	4	8	3	38	6	79	4	200
Total	8	524	7	98	6	289	10	286	8	1197

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data source: Company Annual Reports. Numbers in Percent.

The most striking feature is the decreasing time trend, which is particularly strong in the early nineties. Indirect ownership is reduced by roughly two thirds towards the end of the sample period, and the typical level in any firm type as of 1997 is 5%.

However, This pattern of intercorporate investments in table 10 and the finding by Bøhren and Norli [1997] that the typical intercorporate holding is small (median of 0.4%) collectively suggest that if we ignore indirect ownership and only consider direct holdings by non-listed owners, there is probably a modest misestimation of key characteristics like ownership concentration or the separation between cash flow rights and voting rights. Also, since non-listed firms normally have a considerably more concentrated ownership structure than listed firms,[38] there is limited

[37] As a Norwegian firm could not legally hold its own shares in this period, the figures are not influenced by share repurchases.

[38] Bianchi et al. [1998] analyzed a random sample of 952 Italian non-listed manufacturing firms with at least 50 employees in 1997. They found that on average, the largest shareholder owns 68% of the voting equity, and that the three largest hold 89%. The corresponding concentration figures in the population of all 214 listed companies in 1996 are respectively 48% and 62%.

potential for using minor investments in non-listed firms to lever up the voting power in listed firms. This suggests that ignoring holdings through non-listed firms may be rather inconsequential for separation. We return to these issues in sections 4 and 5.

3.5 Owners of non-voting shares

The ownership rights attached to non-voting equity (B shares) are identical to those of voting equity (A shares) except for voting power. As discussed in section 2, although B shares are conventionally termed non-voting, this is only true for simple majority voting. For corporate charter amendments, which requires a two thirds majority of both voting equity and all equity, owners of A and B shares have equal proportional voting rights in the second round.

As shown in the data appendix 14% of the OSE firms have non-voting shares outstanding. B shares are more common in the beginning of the sample period; 21% of the firms in 1991 vs. 10% in 1997. Non-voting shares were never issued by financials, and only 3% of the IPO firms have floated this security type. Thus, the non-voting stock phenomenon belongs in industrials and shipping, where the security is issued by roughly every fifth firm, and more often by large firms than small.

Non-voting shares constitute on average 10% of OSE market cap. Disregarding firms with voting shares only, table 11 shows the ratio of non-voting equity to total equity for firms with dual-class shares, i.e., firms issuing both voting and non-voting shares.

Table 11

The ratio of non-voting to total equity in OSE firms with dual-class shares.

The table shows the value weighted average (vw) and the number of observations (n). The firm's market value of equity is used in the value weighting.

Year	Firm type								All	
	Industrials		Financials		Shipping		IPOs			
	vw	n	vw	n	vw	n	vw	n	vw	n
1989	28	10		0	27	5		0	28	15
1990	27	14		0	28	7	36	1	27	22
1991	28	14		0	29	7	35	1	28	22
1992	29	13		0	26	8	50	1	29	22
1993	26	11		0	29	7	50	1	27	19
1994	37	10		0	36	6	51	1	37	17
1995	28	9		0	40	7	51	1	30	17
1996	26	9		0	43	9	58	1	31	19
1997	24	9		0	42	8	54	2	28	19
Total	28	99		0	35	64	52	9	29	172

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data source: Oslo Børsinformasjon (OBI). Numbers in Percent.

The table documents that firms with dual-class shares have on average issued 29% of their stock as non-voting and hence 71% as voting. In the two firm types where non-voting shares are actively used, the relative importance of non-voting shares is rather constant over time for industrials and both larger and increasing in shipping. There is a significantly positive relationship (t=10.3) between firm size and the fraction of the firm's equity which is non-voting.

The aggregate ownership of voting and non-voting securities in firms with dual-class shares is reported in table 12. The relative holdings of voting and non-voting shares differs widely across investor types. Overall, international investors own 54% of non-voting equity, which is more than twice their fraction of voting equity. At the opposite end, the state reveals a strong preference for

stocks with voting rights (10% vs. 3%). This tendency also holds for individuals and non-financial domestic corporations. Financial investors is the only owner type holding roughly the same fraction of voting and non-voting shares in the aggregate.

Table 12

Aggregate ownership of voting and non-voting shares.

The table reports the percentage of voting and non-voting equity held by the five basic investor types. We only include firms with dual-class shares, and the ownership fractions are value weighted.

Owner type	Firm type						All	
	Industrials		Shipping		IPOs			
	vo	nvo	vo	nvo	vo	nvo	vo	nvo
State	12	4	2	2	2	2	10	3
International	25	56	24	47	7	15	25	54
Individuals	10	6	24	7	7	63	13	7
Financials	25	23	16	28	9	14	23	24
Nonfinancials	28	12	35	15	65	6	30	12

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS). Numbers in Percent.

As shown in the separate data appendix (Bøhren and Ødegaard [2000]), aggregate international holdings of non-voting stock increases to a maximum of 66% in 1994, and gradually drops off to 47% in the final sample year. We found in section 2.2, however, that very few firms were effectively restricted by the regulatory cap on international ownership, which was lifted in 1995. Thus, it seems that to international investors, voting shares in dual-class firms became more attractive after the cap was lifted, despite the fact that there was practically no restricted access to voting shares before the deregulation. One possible speculation is that the deregulation as such was considered a signal of a more positive attitude to international investors in general. If so, it may have improved the expected payoff to international investors from holding voting shares and expending efforts on corporate governance activities.

To summarize, our reclassification of the five basic owner types shows that OSE insiders own on average 7% of their firms' equity, more in shipping and much less in financials. Intercorporate ownership among OSE firms, which on average accounts for 8% of market cap, is rapidly getting less common. Non-voting shares are issued by 14% of the firms, never by financials and very seldom by IPO firms. These securities, which account for 10% of OSE market cap and 29% of the equity in firms with dual-class shares, are primarily held by international investors (54%) and financials (24%).

4 Ownership concentration

The current corporate governance paradigm predicts that if left unattended, non-owner managers will tend to divert parts of the firm's free cash flow to value-destroying projects. To prevent this from happening, i.e., to ensure that value maximization does occur, certain disciplining mechanisms are required. Concentrated ownership (holders of large equity stakes) is a key such mechanism (Jensen and Meckling [1976]). Unlike the firm's holders of small equity stakes, its large owners have both the incentive (high cash flow rights) and the power (high voting rights) to monitor the management team.[39] Thus, not surprisingly, concentrated ownership is, along with insider

[39]This argument implicitly assumes that the large stockholder owns a high fraction of both the cash flow rights and the voting rights. If these two elements of the ownership right are significantly different, e.g, due to non-voting

holdings, the most frequently studied mechanism in the empirical research on the relationship between corporate governance and economic performance (Gugler [1999]).[40]

In this setting, the aggregate ownership of investor types discussed in section 3 is insufficient to understand how owners influence firm decisions. What matters are holdings *per owner* and particularly for large owners, i.e., the degree of concentrated ownership. This section first establishes a point of reference by documenting the typical (mean and median) equity fraction of OSE investors. The rest of the section analyzes the large ownership stakes, which will be very different from the stake of the typical owner. We document the size of the 1-20 largest holdings, the relationship between them, and the identity of large owners. We also explore other concentration measures, like the number of owners per firm, equity value held per owner, and the Herfindahl concentration index.

This section disregards any difference between cash flow rights and voting rights, leaving the separation issue to section 5. Moreover, we cannot fully account for intercorporate shareholdings between OSE firms in our concentration measures. This is because our data base does not classify an owner by name, but only by type and an anonymous (although unique) ID. Consequently, the equity held by listed firm X in listed firm Y cannot be traced back to the owners of X. If the intercorporate shareholding is large, we may therefore underestimate the ownership concentration in Y because firm X and the owners of X are treated as separate owners in Y. Considering our finding in section 3.4 that aggregate intercorporate shareholdings between OSE firms decreases considerably over time and that the typical holding is small, we expect the resulting underestimation to be minor. Still, aggregate intercorporate shareholdings constitute 4% of market cap at its minimum even in the final sample year, and individual cases of large intercorporate investments do exist. We plan to improve our data set on this point later in order to eliminate this potential downward bias in concentration measures.

Unlike in section 3, which uses value-weighted averages to capture the aggregate claim of an investor type, we now switch to equally-weighting. This is because the focus of this section is on each separate owner's ability to influence an individual firm's actions. As the ownership fraction required to do so is probably independent of firm size and definitely non-transferable between firms, we assign equal weight to each ownership structure in the aggregation.

4.1 The typical owner

Large owners make up the extreme right tail of the distribution of equity stakes in a firm. To get a feeling for the full ownership structure and particularly for the significance of the typical OSE investor, table 13 shows the mean and table 14 shows the median ownership fraction by year and firm type.

Overall, the mean and median ownership stakes are 0.15% and 0.008%, respectively. Thus, as half the stockholders on average own less than one 10 000'th of the firm's equity, the typical OSE investor is all too small to be of any independent significance for corporate governance. This is true across all years and firm types. Although the typical investor in IPO firms tends to be two to

stock, indirect ownership through pyramids, or stockholder voting pacts, a large owner's cash flow incentives may be unaligned with his voting power. Moreover, because small stockholders free ride on the value enhancement caused by large owners' disciplining, monitoring may still be under-supplied unless the large owners reap sufficient private benefits from their monitoring efforts (Grossman and Hart [1980]).

[40]The full set of corporate governance mechanisms includes the legal regime, the competition in the firm's product market, reputation in the managerial labour market, management incentive schemes (bonus, stock, and stock option systems), financing policies (debt financing, dividend payout, and equity issues), accounting and auditing systems, the corporate board, and the firm's ownership structure.

Table 13

The mean ownership fraction.

The table shows the equally weighted average (mean), the standard deviation (std), and the number of observations (n).

Year	Firm type												All		
	Industrials			Financials			Shipping			IPOs					
	mean	std	n	mean	std	n	mean	std	n	mean	std	n	mean	std	n
1989	0.10	0.15	57	0.05	0.08	14	0.18	0.21	23	0.09	0.07	24	0.11	0.15	118
1990	0.07	0.13	47	0.09	0.17	12	0.11	0.13	29	0.09	0.07	19	0.09	0.13	107
1991	0.07	0.07	48	0.11	0.15	11	0.08	0.07	28	0.09	0.07	15	0.08	0.08	102
1992	0.08	0.08	56	0.07	0.08	11	0.08	0.07	30	0.42	0.65	14	0.12	0.27	111
1993	0.09	0.09	56	0.05	0.05	10	0.08	0.06	34	0.57	0.53	21	0.17	0.30	121
1994	0.08	0.06	58	0.05	0.06	10	0.18	0.40	36	0.45	0.43	26	0.18	0.32	130
1995	0.07	0.05	62	0.06	0.06	11	0.16	0.37	36	0.36	0.41	37	0.16	0.30	146
1996	0.07	0.04	63	0.03	0.03	8	0.17	0.43	35	0.26	0.27	49	0.15	0.27	155
1997	0.07	0.07	75	0.04	0.05	8	0.31	1.15	37	0.25	0.31	79	0.19	0.54	199
Total	0.08	0.09	522	0.06	0.10	95	0.16	0.49	288	0.28	0.37	284	0.15	0.32	1189

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data source: Verdipapirsentralen (VPS). Numbers in Percent.

Table 14

The median ownership fraction.

The table shows the equally weighted median (med), the standard deviation of the medians (std) and the number of observations (n).

Year	Firm type												All		
	Industrials			Financials			Shipping			IPOs					
	med	std	n	med	std	n	med	std	n	med	std	n	med	std	n
1989	0.003	0.005	57	0.002	0.002	14	0.008	0.011	23	0.004	0.003	24	0.004	0.006	118
1990	0.002	0.004	47	0.001	0.001	12	0.003	0.004	29	0.003	0.003	19	0.003	0.003	107
1991	0.002	0.003	48	0.003	0.004	11	0.002	0.002	28	0.002	0.003	15	0.002	0.003	102
1992	0.002	0.003	56	0.002	0.004	11	0.003	0.003	30	0.068	0.194	14	0.011	0.072	111
1993	0.003	0.010	56	0.002	0.003	10	0.003	0.003	34	0.061	0.088	21	0.013	0.043	121
1994	0.002	0.003	58	0.002	0.002	10	0.010	0.037	36	0.031	0.055	26	0.010	0.033	130
1995	0.003	0.003	62	0.002	0.003	11	0.007	0.026	36	0.023	0.039	37	0.009	0.025	146
1996	0.002	0.003	63	0.002	0.003	8	0.005	0.012	35	0.020	0.025	49	0.008	0.017	155
1997	0.002	0.002	75	0.001	0.002	8	0.007	0.023	37	0.018	0.038	79	0.009	0.027	199
Total	0.002	0.004	522	0.002	0.003	95	0.005	0.019	288	0.023	0.061	284	0.008	0.033	1189

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data source: Verdipapirsentralen (VPS). Numbers in Percent.

three times larger than in the other firm types, the stake is still miniscule. The only way owners may supervise, correct and support the management team is either by the concerted action of a large number of typical (i.e, very small) owners, by individual actions of a single large owner, or by a coalition of a few relatively large owners.

4.2 Large owners

The most common method for quantifying concentrated ownership is the equity stake held by one or more of the large investors (blockholders). For instance, La Porta et al. [1998] us as proxy for concentrated ownership the cumulative equity fraction held by the three largest investors in the ten largest non-financial listed firms. Table 15 details the equity fraction held by the largest owner in our sample.

Three characteristics emerge from panel A. First, the right column tells us that the largest investor holds on average 28% of outstanding equity per firm. This fraction is quite stable over time. Second, the largest owner in financials holds 18% on average, which is considerably less than in the other firm types. This suggests that the ownership cap in financials is binding in the sense that we may have observed larger holdings without this regulation. In fact, Bergstrøm and Rydqvist [1990a] find that after the ownership cap in Swedish banks was lifted in 1980, concentration gradually rose to a level which was insignificantly different from the average concentration in other firms.

Panel A also tells us that the 10% cap in financials is frequently broken, probably because the regulator grants exceptions rather routinely. This impression is confirmed by panel B, which shows that over the nine years, the median and maximum observation of the largest holding in financials exceed 10% in five and nine years, respectively. A third characteristic is that except in the more regulated financials, the average largest holding converges over time to 25-30% in every firm type. Notice that IPO firms do not differ from industrials, suggesting that the heavily concentrated pre-IPO owners sell out relatively soon after the IPO.

As discussed in section 2.2, the size of an ownership fraction has at least two sets of consequences which are both determined by the legal regime. First, the corporate law specifies how holding size transforms into voting power at the stockholder meeting. Second, holding size may trigger events which are pre-defined by the regulatory environment, like the obligation to flag or to bid for the remaining shares outstanding. This means that certain thresholds may be particularly important to just pass (like a 1/3 super–minority), while others may be important to not pass (like a 90% mandatory bid threshold). One way of visualizing such patterns is by tabulating the cumulative frequency distribution of the largest ownership stake. As this may vary from year to year, and because the relevant regulations may change over time, we may lose important information by aggregating across years. Figure 3 shows an example of such a distribution, which is from 1995. A distribution above (below) the 45 degree line reflects a setting where most fractions held by the largest owner are relatively small (large). In 1995, the flagging thresholds were 10, 25, 50 and 75%. Mandatory bids were triggered at 45% and 90%. Thus, to obtain power without being forced to flag or bid, we would expect investors to flock just below these thresholds. On the other hand, we expect an over-representation just above the voting power limits of 1/3, 1/2 and 2/3. Visual inspection of figure 3 suggests that at least three of these regulations show up in the ownership structure in the predicted manner. First, there is an over-representation of holdings below the lower flagging threshold of 10% (the cumulative distribution is very steep just to the left of 10% and flatter to the right). Second, large investors with holdings around the 45% mandatory bid limit choose to hold fractions just below the limit rather than above. Finally, the simple majority rule

Table 15

The fraction held by the largest owner.

The table shows the equally weighted average (mean), the standard deviation (std), the value weighted average (vw), the number of observations (n), the minimum observation (min), the median observation (med), and the maximum observation (max). The firm's market value of equity is used in the value weighting. When averaging across years, we use the firm's equity market value in constant 1997 kroner. The number of firms in panel B equals the corresponding number of firms in panel A.

Panel A: The average largest fraction

Year	Firm Type												All		
	Industrials			Financials			Shipping			IPOs					
	mean (std)	vw	n	mean (std)	vw	n	mean (std)	vw	n	mean (std)	vw	n	mean (std)	vw	n
1989	35 (23)	34	57	11 (4)	10	14	26 (14)	26	23	31 (14)	43	24	30 (20)	30	118
1990	32 (21)	32	47	17 (13)	11	12	26 (15)	23	29	31 (18)	33	19	29 (19)	29	107
1991	31 (21)	28	48	17 (10)	20	11	26 (16)	22	28	28 (13)	30	15	27 (18)	27	102
1992	32 (20)	30	56	25 (25)	28	11	26 (12)	22	30	26 (18)	20	14	29 (19)	29	111
1993	33 (25)	30	56	18 (20)	30	10	27 (14)	23	34	21 (11)	17	21	28 (21)	29	121
1994	32 (25)	33	58	17 (16)	33	10	28 (18)	25	36	24 (13)	26	26	29 (21)	31	130
1995	31 (24)	32	62	19 (15)	29	11	29 (14)	24	36	25 (18)	24	37	28 (20)	30	146
1996	30 (22)	34	63	19 (15)	30	8	27 (11)	25	35	25 (16)	24	49	27 (18)	31	155
1997	28 (22)	29	75	18 (15)	30	8	28 (16)	26	37	26 (18)	26	79	27 (19)	28	199
Total	31 (23)	31	522	18 (16)	27	95	27 (15)	25	288	26 (16)	27	284	28 (19)	29	1189

Panel B: The minimum, median, and maximum of the largest fraction

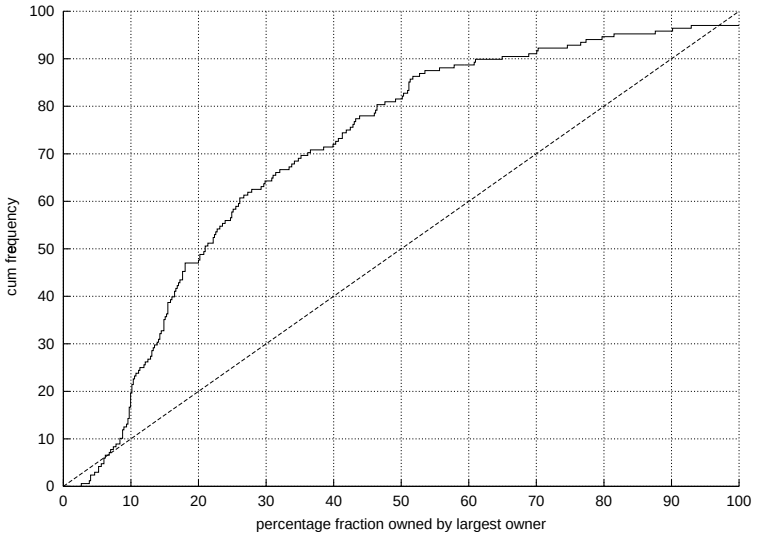
	min	med	max	min	med	max	min	med	max	min	med	max	min	med	max
1989	5	27	87	6	10	20	6	23	70	11	26	63	5	24	87
1990	7	26	87	5	12	47	9	21	67	8	28	79	5	23	87
1991	7	26	87	9	11	44	6	20	82	10	27	53	6	22	87
1992	6	27	87	3	16	91	8	22	49	6	21	77	3	24	91
1993	7	22	89	3	9	69	9	21	67	6	18	44	3	21	89
1994	6	21	89	5	10	50	8	22	92	6	20	52	5	21	92
1995	5	19	93	6	12	51	9	26	77	4	18	90	4	21	93
1996	6	22	87	9	11	51	10	24	51	2	20	68	2	22	87
1997	5	20	87	9	10	51	8	23	99	4	23	96	4	23	99
Total	5	24	93	3	10	91	6	23	99	2	22	96	2	22	99

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS). Numbers in Percent.

of 50% produces a tendency to hold fractions just above 50%.

Figure 3

The cumulative frequency distribution of the largest ownership stake in 1995.



Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data source: Verdipapirsentralen (VPS).

Concentrated ownership concerns powerful stockholders, which may not just include the largest one. Table 16 reports the average equity stake held by the largest, the second, third, fourth, fifth, tenth, and the twentieth largest owner. The rightmost column documents that the largest investor in an OSE firm, who holds 28% of the equity on average, owns 2.5 times more than the second largest owner (11%). There is a decreasing difference between consecutive holding sizes as we move down the ranking list.

Table 16

Equity fractions held by large owners.

The table shows the average fraction held by the given rank (mean) and the total fraction held by the largest down to the given rank (cum). The means are equally weighted.

Owner size rank	Firm type								All	
	Industrials		Financials		Shipping		IPOs			
	mean	cum	mean	cum	mean	cum	mean	cum	mean	cum
1	31	31	18	18	27	27	26	26	28	28
2	10	41	9	27	13	40	11	37	11	39
3	6	48	6	33	8	48	7	44	7	46
4	5	52	5	38	5	53	5	50	5	51
5	4	56	4	42	4	57	4	54	4	55
10	2	67	2	55	2	69	2	66	2	66
20	1	76	1	66	1	79	1	76	1	76

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS). Numbers in Percent.

This table reflects the cash flow rights, which may differ from the corresponding distribution of voting rights. Postponing the analysis of separation until section 5, let us assume that the ownership

distribution of cash flow rights in table 16 is close to the voting rights distribution. Under this assumption, the cumulative holdings in the rightmost column imply that on average, the two largest owners may collectively form a blocking super–minority (1/3), a coalition of the four largest owners creates a simple majority (1/2), and the ten largest may unite into a super–majority (2/3). The twenty largest stockholders on average hold three quarters of the outstanding equity.

Except for financials, this pattern prevails in all firm types. Regardless of the number of large investors included in the concentration measure, large stakes in financials is about ten percentage points lower than in other firms. Consequently, it takes more large investors to create any majority or minority in financials. For instance, while the ten largest owners in the average industrial constitute a super-majority, it takes twice as many in financials. [41]

Who are the large owners? Table 17 answers by documenting how often each investor type is the largest, second, third, fourth, and fifth largest owner.

Table 17

The propensity to hold large equity stakes.

For each owner size rank we find the fraction of firms held by each of the five basic owner types. Each column reports the frequency distribution across owner types for the largest, second, third, fourth and fifth largest equity stake.

	Owner size rank				
Owner type	1	2	3	4	5
State	9	7	5	4	4
International	19	21	23	25	26
Individuals	10	8	9	10	10
Financials	11	21	25	28	30
Nonfinancials	52	43	37	33	30

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data source: Verdipapirsentralen (VPS). Numbers in Percent.

The numbers tell straightforward stories. Nonfinancial domestic corporations, which we know hold 24% of OSE market cap, are heavily overrepresented among the large blockholders. This owner type has the highest stake in 52% of all cases, and is in fact more often than any other owner type the second, third, fourth and fifth largest.[42] Moreover, the higher the rank of a large holding, the higher the probability that its owner is a nonfinancial corporation. For instance, such firms own the second largest stake in 43% of the cases and the fifth largest in 30%.

While nonfinancials are overrepresented among the large owners relative to their total holdings, the pattern is quite the opposite for international investors, who in the aggregate is the largest owner type on the OSE (31% of market cap). Regardless of size rank, such investors are less often a large owner than domestic nonfinancials. Moreover, while the latter prefer the largest stakes among the large, the international owners prefer the smaller. For instance, international investors hold the largest and fifth largest stakes in 19% and 26% of the cases, respectively, compared to 52% and 30% for nonfinancials.

Except for a lower propensity to hold the very largest stake, the financial corporations, who own 18% of market cap, are very similar to international investors in their choice between large positions: The smaller the size of the large holding, the more often it belongs to a domestic financial corporation. However, notice that compared to their aggregate holdings of 18%, financials are considerably more often a large owner than international investors.

[41] The separate data appendix (Bøhren and Ødegaard [2000]) shows that the distribution of the largest holding (but not the others) is positively skewed, as the median is typically six percentage units below the mean.

[42] There is a tie with financials for the fifth largest owner.

State owners, who hold the same aggregate OSE stake as financials, is the least significant investor type in terms of large stakes. Even compared to individual owners, whose aggregate portfolio value is just about half, the state is less frequently a large owner in all rank categories. This consistent underrepresentation suggests that compared to the total commitment of funds, state owners play an anonymous role in corporate governance.

Individuals, who hold the highest number of equity positions and the smallest fraction of market cap, are quite different from other types. The probability that a big investor is an individual is roughly 10% regardless of size rank. This corresponds to the aggregate fraction held of market cap.

Table 17 tells us that the overwhelming majority of large owners are either corporations or the state. This means the management teams of OSE firms are not monitored by their ultimate owners (i.e, those eventually receiving the firms' cash flow), but by the agents of ultimate owners (i.e, other management teams or civil servants). Unlike a simple principal-agent relationship, this is a multiple-agent setting, in which a monitoring agent with low cash flow rights and high voting power will not necessarily share their ultimate owners' concern for value maximization. This may critically depend on whether these agents have sufficient equity stakes in their firm to provide the required incentives and on whether they are monitored by owners who are willing and able to exert sufficient disciplining pressure. Such multiple-agent settings illustrate that, in addition to holding size *per se*, the identity of the holder may also matter for corporate governance. We analyze the importance of this issue in our companion paper on governance and performance.

4.3 Alternative concentration measures

The concentration proxies in section 4.2 focus on the large owners, ignoring the individual or collective power of stockholders whose holdings fall below a given limit. Alternatively, we may use information about the full ownership structure, such as the number of stockholders, the average monetary or fractional investment per stockholder, and the Herfindahl concentration index. This subsection reports key characteristics of such alternative concentration proxies for our sample. Because there is no theoretically superior definition of concentrated ownership, we also analyze whether the alternative concentration proxies pick up similar underlying ownership characteristics to those based on large owners only from section 4.2.

Table 18 shows the average number of stockholders per firm across years and firm types. Because insurance companies have considerably more stockholders than banks, we split financials into two separate groups. The average OSE firm has roughly 5 000 owners. While the number of shareholders in insurance firms has grown rapidly, the overall trend is for the average number of stockholders per firm to decrease.

According to table 19, stockholders at the OSE invest on average NOK 1 mill. per firm (constant 1997 NOK). The monetary commitment is highest in shipping and IPOs and lowest in financials.[43] Except in insurance, there is a consistent growth over time. For instance, investment per owner in industrials grows by 16% on average.

A growing equity investment per owner may not reflect increasing ownership concentration, but rather the firm's earnings growth and dividend policy. There is no such ambiguity in the Herfindahl index, which is independent of monetary terms. This index, which is the sum of the squared ownership fractions (stated as figures between zero and unity) across all shareholders, has a maximum of unity (a single investor owns every share) and approaches a minimum of zero as the ownership structure gets increasingly diffuse. For instance, if the 5 000 shareholders of the

[43]The outlier in shipping in 1997 is due to one firm which had just 20 owners at year-end, and where one owner held almost all the equity.

Table 18

The mean number of owners per firm.

The table shows the equally weighted average (mean), the standard deviation (std), and the number of observations (n).

Year	Firm type										All	
	Industrials		Banks		Insurance		Shipping		IPOs			
	mean (std)	n	mean (std)	n	mean (std)	n	mean (std)	n	mean (std)	n	mean (std)	n
1989	5 950 (10 035)	57	18 308 (19 979)	12	7 694	2	3 908 (11 846)	23	2 343 (2 137)	24	6 105 (11 702)	118
1990	6 978 (10 634)	47	22 405 (27 816)	9	5 369 (5 693)	3	4 475 (11 468)	29	2 158 (1 813)	19	6 696 (13 331)	107
1991	7 803 (13 551)	48	16 271 (29 656)	7	30 535 (50 462)	4	5 308 (12 320)	28	2 252 (1 900)	15	7 774 (17 896)	102
1992	6 739 (12 458)	56	14 483 (27 917)	8	39 596 (54 371)	3	5 326 (12 468)	30	2 249 (2 506)	14	7 237 (17 132)	111
1993	6 370 (12 245)	56	4 813 (4 274)	8	43 044	2	4 798 (12 143)	34	1 268 (2 083)	21	5 546 (12 923)	121
1994	5 725 (10 262)	58	6 098 (5 153)	7	28 426 (37 982)	3	3 958 (8 823)	36	1 101 (1 879)	26	4 855 (10 966)	130
1995	5 319 (9 767)	62	6 811 (5 305)	8	26 758 (36 417)	3	3 919 (8 798)	36	983 (1 496)	37	4 397 (10 145)	146
1996	5 477 (9 652)	63	8 475 (6 688)	7	77 537	1	3 790 (8 942)	35	979 (1 183)	49	4 274 (9 894)	155
1997	4 985 (8 945)	75	8 171 (6 805)	7	75 765	1	3 226 (8 755)	37	1 014 (1 092)	79	3 550 (8 764)	199
Total	6 047 (10 829)	522	12 374 (19 592)	73	30 789 (41 899)	22	4 260 (10 594)	288	1 346 (1 704)	284	5 337 (12 440)	1 189

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS).

Table 19

The mean investment per owner per firm.

The mean and standard deviation are in mill. 1997 NOK.
The table shows the equally weighted average (mean), the standard deviation (std), and the number of observations (n).

Year	Firm type								All	
	Industrials		Financials		Shipping		IPOs			
	mean (std)	n	mean (std)	n	mean (std)	n	mean (std)	n	mean (std)	n
1989	0.3 (0.3)	57	0.4 (0.9)	14	1.0 (0.9)	23	0.2 (0.5)	24	0.4 (0.6)	118
1990	0.4 (0.6)	47	0.5 (1.1)	12	0.6 (0.8)	29	0.3 (0.7)	19	0.4 (0.7)	107
1991	0.4 (0.7)	48	0.3 (0.4)	11	0.4 (0.4)	28	0.1 (0.1)	15	0.4 (0.5)	102
1992	0.3 (0.5)	55	0.5 (0.8)	11	0.2 (0.3)	30	0.5 (1.0)	13	0.3 (0.6)	109
1993	0.7 (1.1)	56	0.6 (0.6)	10	0.6 (0.7)	34	1.3 (2.1)	21	0.8 (1.2)	121
1994	0.7 (1.1)	58	0.5 (0.5)	10	1.6 (4.0)	36	1.2 (1.8)	26	1.0 (2.4)	130
1995	0.7 (0.9)	62	0.7 (0.6)	11	1.7 (5.0)	36	1.2 (1.6)	37	1.1 (2.7)	146
1996	1.1 (1.5)	63	0.5 (0.4)	8	2.4 (5.6)	35	1.2 (2.3)	49	1.4 (3.1)	155
1997	1.2 (1.4)	75	0.9 (0.8)	8	6.1 1(9.4)	36	1.4 (2.8)	79	2.2 (8.7)	198
Total	0.7 (1.1)	521	0.5 (0.8)	95	1.7 (7.7)	287	1.0 (2.1)	283	1.0 (4.0)	1186

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS).

average OSE firm all held the same ownership fraction (i.e., lowest possible concentration), the Herfindahl index would be 0.0002. Table 20 shows the average Herfindahl index by year and firm type. The average index value is 0.15, it is highest in industrials and lowest in financials, and there is a decreasing concentration in industrials over time.

Table 20

The Herfindahl index of ownership concentration.

The Herfindahl index is the sum of the squared ownership fractions across all the firm's stockholders. The table shows the equally weighted average (mean), the standard deviation (std), and the number of observations (n).

Year	Firm type								All	
	Industrials		Financials		Shipping		IPOs			
	mean (std)	n	mean (std)	n	mean (std)	n	mean (std)	n	mean (std)	n
1989	0.21 (0.19)	57	0.04 (0.02)	14	0.13 (0.11)	23	0.15 (0.10)	24	0.16 (0.16)	118
1990	0.18 (0.17)	47	0.07 (0.07)	12	0.13 (0.10)	29	0.16 (0.14)	19	0.15 (0.14)	107
1991	0.17 (0.17)	48	0.07 (0.05)	11	0.13 (0.13)	28	0.14 (0.09)	15	0.14 (0.14)	102
1992	0.17 (0.16)	56	0.15 (0.23)	11	0.12 (0.07)	30	0.14 (0.14)	14	0.15 (0.15)	111
1993	0.19 (0.22)	56	0.1 (0.14)	10	0.13 (0.09)	34	0.09 (0.05)	21	0.15 (0.17)	121
1994	0.19 (0.21)	58	0.08 (0.10)	10	0.15 (0.16)	36	0.12 (0.08)	26	0.15 (0.17)	130
1995	0.18 (0.20)	62	0.08 (0.09)	11	0.14 (0.10)	36	0.13 (0.14)	37	0.15 (0.16)	146
1996	0.16 (0.17)	63	0.08 (0.08)	8	0.13 (0.08)	35	0.11 (0.11)	49	0.13 (0.13)	155
1997	0.15 (0.17)	75	0.09 (0.08)	8	0.15 (0.16)	37	0.13 (0.14)	79	0.14 (0.16)	199
Total	0.18 (0.19)	522	0.08 (0.12)	95	0.13 (0.12)	288	0.13 (0.12)	284	0.15 (0.15)	1189

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS).

Comparing the concentration measures in tables 18, 19 and 20 to those based on large owners only in section 4.2, they all suggest that concentration is lowest in financials. At the opposite end, industrials have the highest concentration according to the Herfindahl index and the holding of the largest and the two largest owners. However, concentration proxies which are not biased towards large owners tend to produce different results for all other firm types than financials. For instance, the average investment per owner indicates that concentration in industrials is low compared to shipping and IPO firms.

Concentration measures are important because they are supposed to reflect the owners' incentives and power to monitor the firm's decisions. Based on our rough comparison above, it seems that except for one industry (financials), the choice of concentration proxy may determine our conclusions about concentration levels across firm types. To explore this relationship more precisely, we compare the concentration measures by a correlation analysis. As there is no reason to expect a linear co-movement, we use the Kendall rank correlation coefficient. The higher the tendency for two proxies to assign the same rank to a given firm, the closer the coefficient to unity. Our findings are reported in table 21, which also includes the mean and median holding as potential

concentration proxies.

Table 21

Rank correlation between alternative measures of ownership concentration

The correlations are Kendall rank correlation coefficients. Details of the Kendall Rank Correlation test are given in [Stuart et al., 1999, §27.26]. Its distribution is normally approximated with variance $\frac{2(2n+5)}{9n(n-1)}$, where n is the number of observations. Using $n = 500$ produces a standard deviation of 0.029, which is used to create a t-statistic. This means a correlation coefficient above $|0.975|$ reflects perfect covariance at the 5% level. Any *difference* in correlation larger than 0.05 is significant at the 5% level.

	Mean	Median	No. owners	Rel. size	Herfin-dahl	1	1–2	1–3	1–4	1–5	1–10
Median	0.57										
No. owners	-1.00	-0.57									
Rel. size	0.26	0.07	-0.26								
Herfindahl	0.12	-0.13	-0.12	0.08							
1	0.08	-0.14	-0.08	0.07	0.87						
1–2	0.10	-0.14	-0.10	0.08	0.91	0.87					
1–3	0.12	-0.14	-0.12	0.08	0.90	0.81	0.92				
1–4	0.14	-0.13	-0.14	0.09	0.88	0.77	0.87	0.95			
1–5	0.15	-0.12	-0.15	0.09	0.86	0.74	0.84	0.91	0.96		
1–10	0.21	-0.08	-0.21	0.11	0.77	0.65	0.73	0.79	0.83	0.87	
1–20	0.28	-0.05	-0.28	0.15	0.67	0.56	0.63	0.69	0.72	0.75	0.87

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS).

This table reveals distinct patterns. The mean and median ownership fraction, the number of owners, and the equity value per owner (rel. size) all have low correlations, both internally and with the remaining set of concentration proxies.[44] Remember that unlike the others, these four proxies do not assign disproportional weight to large stockholders. Therefore, one would expect that the larger the large holding, the more these proxies will deviate from measures based on large holdings alone (like the 1-20 largest) and proxies which consider all holdings, but which still assign more weight to the large ones (like the Herfindahl index).

Another insight is that the Herfindahl index and all the large-owners measures have a strong, positive correlation. The index correlates particularly well with the aggregate stakes of the 1-5 largest owners. Within the set of large-owners measures, the correlation is lower the smaller the relative overlap of owners included. For instance, the proxies based on the largest and the three largest holdings have a correlation coefficient of 0.81, and the correlation between proxies based on the largest and the ten largest owners is 0.65.

The theoretical reason for focusing on concentration measures is that they reflect power. Therefore, unlike the Herfindahl index and the large–owners measures, the four concentration proxies which do not explicitly emphasize large owners relative to small are questionable a priori. Within the former set of proxies, there is no theoretical reason for preferring one over the other. Given our findings in table 21, we would recommend using just one of the proxies which are very strongly correlated (like the Herfindahl index and the holdings of the three largest owners). In addition, to pick up other properties of concentration, one may choose a set of proxies with somewhat lower correlation, like the Herfindahl index and the holdings of the ten largest owners.

So far, we have explored the characteristics of concentration in a simple, uni–variate way by

[44] Not surprisingly, the exceptions are the mean vs. the median (0.57), the mean vs. the number of owners (-1), and the median vs. the number of owners (-0,57)

comparing mean concentration levels across firm types and investor types. To analyze these relationships more rigorously while also allowing for multi–variate relationships between these characteristics and the effect of firm size on concentration, we estimate the following relationship:

$$\begin{aligned} CON_j &= \beta_0 + \beta_1 FSIZE_j + \beta_2 IFIN_j + \beta_3 ISHIP_j + \beta_4 IIPO_j + \\ &\quad \beta_5 IState_j + \beta_6 IInt_j + \beta_7 IFin_j + \beta_8 INonFin_j + \epsilon_j, \end{aligned} \tag{2}$$

In (2), CON_j is the Herfindahl concentration index for firm j, and $FSIZE_j$ is the natural log of the firm's equity value. $IFIN_j$, $ISHIP_j$, and $IIPO_j$ are indicators which are unity if and only if firm j is a financial, shipping, and IPO firm, respectively. As the indicator variable is zero otherwise, firm j is an industrial when all three indicators are zero. To explore whether the identity of the largest owner matters for overall concentration, we set the indicators $IState_j$, $IInt_j$, $IFin_j$, and $INonFin_j$ to unity if and only if the largest owner of cash flow rights in firm j is the state, an international investor, a financial firm, and a non-financial firm, respectively. The largest owner is an individual when all indicators are zero.

The estimates of (2) are presented in table 22.

Table 22

Ownership concentration, firm size, firm type, and the identity of the largest owner. Using the Herfindahl index as the measure of concentration for firm j (CON_j), the table shows the OLS coefficient estimates, the p–values (in parentheses) and the R^2 of the relationship:

$$\begin{aligned} CON_j &= \beta_0 + \beta_1 FSIZE_j + \beta_2 IFIN_j + \beta_3 ISHIP_j + \beta_4 IIPO_j \\ &\quad + \beta_5 IState_j + \beta_6 IInt_j + \beta_7 IFin_j + \beta_8 INonFin_j + \epsilon_j, \end{aligned} \tag{3}$$

The sample size is 1255, which includes all firms listed on the OSE over the period 1989–1997.

β_0	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	R^2
0,336	-0,011	-0,058	-0,022	-0,032	0,126	0,063	-0,029	0,043	0,09
(0,00)	(0,04)	(0,00)	(0,04)	(0,00)	(0,00)	(0,05)	(0,08)	(0,00)	

At a 5% level of significance, concentration is seen to decrease significantly with firm size,[45] and concentration increases significantly as we move from financials (lowest concentration) through IPOs to shipping to industrials (highest). The ownership concentration is lowest when the largest stake belongs to either an individual, an international investor or a financial (no significant differences). The highest concentration tends to occur in firms where the state holds the largest stake.[46]

Let us summarize this section on concentrated ownership based on cash flow rights, i.e., all securities regardless of voting status. We have found that the typical investor neither has the incentives nor the power to be of independent importance in corporate governance. The largest investor, who is very often a bureaucrat or a corporation rather than a personal (ultimate) owner, holds on average 28% of the OSE equity, less in large firms than small firms, considerably less in financials than in other industries, and owns a particularly large stake if this largest investor is the state. A coalition of the four largest owners creates a majority, and it takes the ten largest to establish the 2/3 super–majority required for charter amendments. In financials, the number of large investors needed to reach these power thresholds must be doubled. Non-financial domestic

[45] Due to the state involvement in the largest banks which originated in the crisis years, there is a significantly positive relationship between firm size and concentration in banks.

[46] Just like we found for the aggregate stakes, the year by year estimates are less clear cut. The negative relationship between concentration and size only occurs in three of the nine years, there is hardly any significant relationship between concentration and firm type, and the only association between owner type and concentration is when the largest owner is the state.

corporations are strongly overrepresented among large owners, while international investors and the state are considerably underrepresented. Unlike non-financials and the state, who are more often found at the top of the largest-five list than at the bottom, international investors and financials are found at the bottom. We also find that concentration measures which emphasize large owners (like the fraction held by the three largest owners and the Herfindahl concentration index) correlate more strongly with each other than measures which put equal weight on every stockholder (like the average equity value or the fraction of equity per owner).

We may speculate why some of these patterns are observed. First, the negative association between firm size and concentration is consistent with the notion that concentrated ownership is costly in terms of reduced diversification benefits.[47] That is, the higher the value of the firm, the more of the owner's wealth must be used to buy a given percentage of its equity, and the higher the unsystematic risk of the owner's portfolio. Second, the high aggregate state holding and the low overall concentration in financials is probably driven by a concern for negative externalities of troubled banks and by the legal cap on a single stake, respectively.[48]. Third, the fact that international investors are underrepresented as large owners in general and as the largest owner in particular suggest that these investors may primarily hold equity for portfolio diversification reasons rather than to control firms and participate actively in corporate governance. The disinterest in governance is also consistent with our finding from section 3 that international investors are heavily overrepresented among owners of non–voting shares, and with the fact that they increasingly hold their shares through anonymous nominee accounts rather than openly.[49]

5 Voting rights

Although section 4 on ownership concentration is based on cash flow rights alone, our interpretations were sometimes made in terms of voting rights. For instance, the conclusions on how coalitions of large owners may establish controlling blocks ignored any separation between cash flow rights and voting rights. We assumed that any difference between these two components of the ownership right is so small that the owners' claim on the firm's resources (the cash flow right) is sufficiently close to the right to control these resources (the voting right). This section examines the validity of this assumption, focusing on the large owners.

As discussed in section 2.2, the relevant mechanisms for separating cash flow rights from voting rights include regulatory caps, voting pacts, proxy votes, the corporate charter, intercorporate shareholdings, and dual-class shares. The 10% regulatory ceiling on ownership in financials is irrelevant for separation, as no financial has issued dual–class shares. The cap on international holdings, which barred foreigners as a group from holding less than 1/3 of a firm's equity until 1995, was very seldom binding.[50] Unfortunately, we lack data on voting pacts and proxy votes. As

[47]Notice that this relationship between firm size and ownership concentration cannot be inferred by simply comparing equally weighted and value weighted average concentration measures, like those reported in table 15. In this case, such an approach is too crude compared to a regression, as the means alone tend to wash out the relationship between size and concentration in each individual case.

[48]Since financials are generally more regulated than other firms, it may also be argued that because regulation produces transparency and monitoring, the need for large owners in financials is smaller than elsewhere. This argument is inconsistent with the finding by Bergstrøm and Rydqvist [1990a] that after the ownership cap in financials was lifted, ownership concentration in Swedish banks increased to the overall level of other industries

[49]In order to vote at the stockholder meeting, the owner's identity must be known.

[50]In the rare cases when the cap was binding, an international investor could choose to stay away from the firm because he wanted voting rights which no other international investor would sell at the price offered. Alternatively, he could buy non-voting equity, provided the firm had such securities outstanding.

discussed in section 2.2, we have been told that these mechanisms are not often used at the OSE. Still, we do not have sufficiently precise information to be sure on this point.

Although voting right restrictions are discouraged by the OSE, firms may still have the right to include them in their corporate charter. We plan to analyze firm charters as of 1995 to determine whether the corporate charter is an unimportant separation mechanism. The findings will be included in a later version of the paper. Finally, as explained in section 4, we cannot assign intercorporate shareholdings to the ultimate owners. This means any pyramiding effects caused by an ultimate owner's control over intermediate layers of corporate ownership is neglected. The relatively small aggregate size of listed intercorporate shareholdings suggests that the resulting downward bias is probably moderate.

This means we are left with the direct holdings of voting shares as our tool for studying voting rights concentration. Moreover, our vehicle for exploring separation is the relationship between the directly held voting equity and directly held non-voting equity. We first analyze the concentration of voting rights in section 5.1, focusing on the large owners of voting shares. We next address separation in section 5.2 by studying the relationship between voting rights and cash flow rights for large owners of voting shares.

5.1 Concentration of voting rights

In section 4, we analyzed the concentration of cash flow rights (i.e., all shares) and summarized our findings on the twenty largest owners in table 16. To construct a corresponding table for voting rights, we still include all firms, but ignore non-voting shares in dual-class firms. Table 23 presents our findings.

Table 23

Ownership fractions held by the 1-20 largest owners of voting shares.

The table shows the average fraction held by the given rank (mean) and the total fraction held by the largest down to the given rank (cum). The means are equally weighted.

Owner size rank	Firm type								All	
	Industrials		Financials		Shipping		IPOs			
	mean	cum	mean	cum	mean	cum	mean	cum	mean	cum
1	33	33	18	18	28	28	27	27	29	29
2	10	42	9	27	13	41	11	38	11	39
3	7	48	6	33	8	49	7	45	7	46
4	5	53	5	38	5	54	5	50	5	51
5	4	57	4	42	4	58	4	54	4	55
10	2	68	2	55	2	70	2	66	2	67
20	1	77	1	66	1	80	1	77	1	77

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS). Numbers in Percent.

Compared to the concentration of cash flow rights in table 16, the concentration of voting rights are almost identical. As we know from section 3.5, this must necessarily be the case in financials, where dual-class shares are never used. Even in industrials and shipping, where roughly every fifth firm issues non-voting shares, the concentration figures in the two tables are still almost identical. The only difference is that the largest owner holds a slightly higher fraction of voting shares than of all shares.[51] For the OSE as a whole, the only effect of disregarding non-voting shares is that

[51] 33% vs 31% in industrials, 28% vs 27% in shipping, and 27% vs 26% in IPOs.

the average stake of the largest owner increases from 28% to 29%.[52] Thus, the conclusions based on the concentration of cash flow rights in section 4 carry over to voting rights.

5.2 Separating voting rights from cash flow rights

We analyze separation by the relationship between large owners' holdings of cash flow rights and voting rights. Since we measure voting rights by the direct ownership of voting stock, separation is only relevant in firms with dual-class shares. We already know from section 3.5 that these firms constitute 14% of all OSE firms, that dual–class shares are never used by financials and very seldom in IPO firms, and that such securities are more often issued by large firms than by small. Finally, we found that non-voting shares constitute on average 29% of outstanding equity in dual-class firms.

To quantify separation, we first identify the large owner based on the fraction of voting rights held. For this owner, we find his fraction of cash flow rights, which is the sum of his holdings of voting and non-voting shares in the firm relative to all shares outstanding. Our separation measure s_i for investor i is the ratio between these two fractions, i.e., the fraction of voting rights to the fraction of cash flow rights:

$$s_i = \frac{\frac{v_i}{v}}{\frac{n_i+v_i}{n+v}} = \frac{\frac{v_i}{n_i+v_i}}{\frac{v}{n+v}} \tag{4}$$

where v and n is respectively the number of voting and non-voting shares issued, and v_i and n_i is respectively the number of voting and non-voting shares held by investor i.

Non–separation corresponds to $s_i = 1$, which means:

$$\frac{v_i}{v} = \frac{n_i}{n} \tag{5}$$

There is no separation when a stockholder owns the same percentage of voting as of non-voting shares issued. This means the ratio of voting to non–voting equity held by the investor equals the ratio in which the two security types are issued.

The separation is stronger the more s_i deviates from unity. There is separation (i.e, bias) towards cash flow rights when $s_i < 1$, as the investor holds a larger percentage of non-voting shares than of voting shares. The more voting shares issued by the firm and the less voting shares held by investor i, the smaller the s_i. The minimum s_i is zero, which occurs if i owns non-voting equity only.

Separation towards voting rights means $s_i > 1$, when the ratio of non-voting to voting shares held by i is less than the relative fraction of the two share types outstanding. The maximum s_i is $1 + \frac{n}{v}$, which occurs when i holds voting shares only. The more non-voting stock issued relative to voting, the larger the maximum separation.

To illustrate, consider a firm with 8 mill. voting shares and 2 mill. non-voting shares outstanding, i.e., $\frac{n}{v} = 0.25$. A stockholder with 4 mill. voting shares faces no separation if he owns 1 mill. non-voting shares as well ($s_i = 1$). If he holds voting stock, only, there is maximum separation towards voting rights, and $s_i = 1.25$. If instead the investor held all the 2 mill. non-voting stock issued besides his 4 mill. of voting stock, there is separation towards cash flow rights, and $s_i = 0.63$.

[52] The concentration of voting rights in dual-class firms is identical to what we found for all firms in table 23.

Table 24 summarizes key statistics on the separation of voting rights and cash flow rights for large owners of voting shares in dual-class firms. The table shows the equally weighted average (mean), the standard deviation (std) and the number of observations (n) for the ratio of voting rights to cash flow rights as defined in equation (5). The average separation ratio for all firms stays between 1.1 and 1.3. This means large owners concentrate voting rights, as they may vote for 10–30% more than their cash flow rights would suggest. There is also a tendency that the larger the voting stake, the stronger the separation. For instance, s_i is 1.3 for the largest owner and 1.1 for the fifth largest. Still, large owners do not normally hold voting shares only. This can be inferred from the fact that non-voting shares constitute on average 38% of all shares in dual-class firms.[53] This means the average separation ratio would have been $1 + \frac{n}{v} = 1,6$ if large owners held voting shares only.

Table 24

The ratio of voting rights to cash flow rights for the five largest owners in firms with dual-class shares.

Owner size rank	Firm type									All		
	Industrials			Shipping			IPOs					
	mean (std)	max	n	mean (std)	max	n	mean (std)	max	n	mean (std)	max	n
1	1.3 (0.3)	2.0	99	1.2 (0.4)	2.0	58	2.0 (0.9)	2.7	9	1.3 (0.4)	2.7	166
2	1.2 (0.3)	1.9	90	1.2 (0.5)	2.0	58	1.5 (0.7)	2.7	9	1.2 (0.4)	2.7	157
3	1.2 (0.3)	1.9	90	1.1 (0.5)	2.0	58	1.2 (0.4)	2.0	9	1.2 (0.4)	2.0	157
4	1.2 (0.3)	1.9	90	1.2 (0.4)	2.0	56	1.6 (0.4)	2.5	9	1.2 (0.4)	2.5	155
5	1.1 (0.4)	1.9	90	1.2 (0.4)	2.0	56	1.2 (0.6)	2.5	9	1.1 (0.4)	2.5	155

Data from all firms listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. Data sources: Oslo Børsinformasjon (OBI) and Verdipapirsentralen (VPS).

To get a better understanding for the characteristics of separation we estimate the following regression:

$$s_{ij} = \beta_0 + \beta_1 FSIZE_j + \beta_2 FRACVOT_j + \beta_3 HSIZE_{ij} + \beta_4 ISHIP_j + \beta_5 IState_{ij} + \beta_6 IInt_{ij} + \beta_7 IFin_{ij} + \beta_8 INonFin_{ij} + \epsilon_j, \quad (6)$$

Here, s_{ij} is the separation ratio for investor i in firm j as defined in (5), $FSIZE_j$ is the natural log of the firm's equity value, $FRACVOT_j$ is the fraction of the firm's equity which is voting, and $HSIZE_{ij}$ is the fraction of the firm's voting equity held by investor i. We ignore financials and IPO firms because the former never issue dual–class shares and the latter almost never do. Thus, the indicator variable $ISHIP_j$ is unity when firm j is a shipping company and zero when it is an industrial. The large owner's identity is accounted for by the indicators $IState_{ij}$, $IInt_{ij}$, $IFin_{ij}$, and $INonFin_{ij}$, which are unity if and only if owner i in firm j is the state, an international investor, a financial, and a non-financial, respectively. The owner is an individual when all four indicators are zero.

[53] This is the equally-weighted mean. As shown by table 11, the value-weighted average is 29%.

Table 25

The relationship between separation, firm characteristics, holding size, and investor type for large owners of voting shares in dual–class firms.

The table shows the OLS coefficient estimates, the p–values (in parentheses) and the R^2 of the relationship:

$$s_{ij} = \beta_0 + \beta_1 FSIZE_j + \beta_2 FRACVOT_j + \beta_3 HSIZE_{ij} + \beta_4 ISHIP_j$$

$$+\beta_5 IState_{ij} + \beta_6 IInt_{ij} + \beta_7 IFin_{ij} + \beta_8 INonFin_{ij} + \epsilon_j,$$

The sample size is 149, which includes all industrial and shipping firms with dual–class shares listed on the OSE over the period 1989–1997.

Owner rank	β_0	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	R^2
1	0.096	0.042	-0.045	0.903	0.045	0.105	-0.175	-0.129	0.026	0.35
	(0.82)	(0.02)	(0.82)	(0.00)	(0.44)	(0.27)	(0.18)	(0.56)	(0.72)	
2	1.790	-0.003	-0.681	0.124	-0.303	-0.101	-0.084	-0.077	-0.072	0.07
	(0.01)	(0.93)	(0.01)	(0.88)	(0.72)	(0.46)	(0.65)	(0.56)	(0.54)	
3	1.820	-0.002	-0.939	0.571	-0.138	-0.009	-0.270	-0.027	-0.011	0.12
	(0.00)	(0.93)	(0.00)	(0.62)	(0.06)	(0.52)	(0.09)	(0.81)	(0.92)	
4	2.210	-0.043	-0.640	1.490	-0.186	-0.310	0.286	0.209	0.410	0.19
	(0.02)	(0.05)	(0.01)	(0.36)	(0.01)	(0.02)	(0.04)	(0.01)	(0.00)	
5	1.830	-0.026	-0.640	6.400	-0.017	-0.007	-0.035	0.095	0.062	0.13
	(0.00)	(0.27)	(0.02)	(0.02)	(0.82)	(0.96)	(0.79)	(0.36)	(0.55)	

Table 25 presents our findings. The estimated values of β_4 through β_8 all suggest that neither firm type nor investor type matters for the way large shareholders separate voting rights from cash flow rights.[54] In contrast, both firm size, holding size, and the fraction of voting shares outstanding are informative. In particular, the association between these characteristics and separation is quite different for the largest owner than for the others. First, only the largest owner holds more voting rights per cash flow right when the firm is big ($\beta_{1>0}$) and when his stake is high ($\beta_3 > 0$). This suggests that compared to the others, the largest owner uses separation more actively to obtain high power per unit of cash flow right when power is potentially more valuable (large firm) and when his ability to exercise the power is high (large stake).

The second difference between the largest owner and the others is that while the latter separate less the higher the fraction of voting shares outstanding (β_2 is significantly negative), the s_i of the largest owner is insensitive to this variable. To understand this difference in behavior, remember that as mentioned in section 2.2, the Norwegian corporate law states that the required 2/3 majority for charter amendments applies to both voting rights ($\frac{v_i}{v}$) and cash flow rights ($\frac{v_i+n_i}{v+n}$). It is easily shown that an investor who wants to control k% in both voting rounds should hold k% of both voting and non–voting shares. This implies $s_i = 1$, regardless of the fraction of voting shares outstanding ($\frac{v}{v+n}$) and regardless of k. Thus, consistent with our finding for the largest owner, β_2 will not differ significantly from zero when owners are concerned with controlling the corporate

[54] This is not true for the fourth largest owner, where β_4 through β_8 are significant at the 5% level. In interpreting the findings, we still choose to ignore this case and consider it a candidate for a type 2 error, as we cannot offer any plausible reason why the fourth largest owner should be fundamentally different from all the others along these two dimensions.

charter.

This argument also suggests that the expected separation ratio for power–oriented owners is unity, which is inconsistent with the findings in table 24, where the average $s_i = 1.3$ for the largest owner. However, even if the investor tries to control $k\%$ in both rounds, he may also want to maximize s_i, i.e, he prefers voting shares to non–voting shares. If he does, the investor's problem is to maximize the separation ratio, subject to the two restrictions that the resulting stakes of voting rights and of cash flow rights are both at least $k\%$. This means the investor will not hold non–voting shares unless the cash flow right restriction forces him to do so, which happens whenever $k \geq \frac{v}{v+n}$. It can be shown that when this inequality holds, the optimal s_i is $1/k$, which is indeed independent of $\frac{v}{v+n}$ and larger than unity. However, when the inequality does not hold, s_i decreases with $\frac{v}{v+n}$, which is not consistent with an insignificant β_2.

The bottom line on the insignificance of β_2 for the largest owner is that voting rules and the concern for power may jointly explain why the separation ratio exceeds unity, why the ratio is less than the maximum, and why it is independent of the fraction of voting shares outstanding. However, as the validity of our arguments relies on the exact relationship between the owner's stake and the fraction of shares outstanding, definite conclusions cannot be made until we have analyzed the issue in greater detail. Moreover, the cash flow–based voting rule in charter amendments is not the only reason why large owners may abstain from maximum separation. Generally, large owners may face the problem that small shareholders are unwilling to invest in a firm because they fear the large owners may expropriate their wealth. This may happen if large owners use the firm's resources to obtain private benefits, such as granting themselves excessive compensation for directorships or by making the firm trade at unfair prices with an outside party under the large owners' control(Jensen and Meckling [1976]).

Because minority investors rationally expect this potential for moral hazard, large owners must carry the expected expropriation cost in terms of a correspondingly depressed share price and thus a lower value for the large owners' shares. Therefore, large owners may have an incentive to convince the market that expropriation will not occur. One way of doing this is by not holding a high fraction of voting rights to cash flow rights. Instead, the investor holds a number of non–voting shares which is sufficient to convince the market that any misuse of voting rights to obtain private benefits is indirectly paid for through a reduced cash flow from the owner's stocks. The larger the fraction of cash flow rights (i.e, the smaller the separation ratio), the more credible the signal (Bergstrøm and Rydqvist [1990b]).

Accordingly, large shareholders have an incentive to not maximize their separation ratio, regardless of whether their concern is for power over the corporate charter or for the cases where only voting stock counts (like the appointment of board members). Our finding that the large owners do not maximize the separation ratio is consistent with both a regulatory explanation (the two voting rounds) and a moral hazard story (expropriation). In a study of the separation behavior by the largest voting owners in Swedish firms with dual–class shares, Bergstrøm and Rydqvist [1990b] find that just like in our case, the largest owner does not go for maximum separation. On average, the largest owner of voting rights holds 15% more equity than he would have held if he cared for the voting right alone.

In this section, we have found that if one considers all firms, disregards non-voting shares, and focuses on voting stock only, the conclusions on concentration are practically identical to those of section 4, which is based on all shares (cash flow rights). When we limit the attention to firms with dual-class shares only, the equivalence disappears. We already know from section 4 that while the ownership structure of voting shares does not differ much between firms with and without dual share classes, the ownership structure of non-voting shares is special. For instance, international

investors hold 54% of the non-voting stock on average, and non-financials own just 12%. This section shows that the large owners of voting shares in dual-class firms tend to separate voting rights from cash flow rights, as their holdings of the former exceeds the latter by 20% on average. This tendency to separate is independent of firm type and owner type, and only the largest owner separates more the larger the firm and the larger the stake held, suggesting that he separates more the larger the potential benefit and the larger the probability of obtaining the benefit. Finally, we find that large owners of voting equity hold non-voting shares as well. One possible reason is that because changes in the corporate charter requires a two thirds majority of both voting rights and cash flow rights, the ability to be active in corporate governance requires sufficient power in both share classes. The finding is also consistent with moral hazard, as the large shareholder may hold non–voting equity to credibly signal that his private benefit of expropriating wealth from small shareholders will be offset by a reduced cash flow from his equity stake.

6 The international evidence

We have so far described the ownership structure of Norwegian firms along several dimensions, such as its institutional environment, the aggregate holdings per owner type, the concentration, and the separation between cash flow rights and voting rights. In order to judge whether these characteristics may provide appropriate mechanisms for corporate governance or at least if the characteristics are typical or unique, we need an external standard of comparison. One such yardstick is ownership structure characteristics in other countries.

Comparable international evidence is limited both by the short history of corporate governance research and by the lack of access to reliable data bases. Still, due to recent efforts by the Federation of Stock Exchanges in Europe and the European Corporate Governance Network, certain key ownership patterns may now be compared across a reasonably large number of European countries. This section relates the evidence published by the Federation of Stock Exchanges in Europe [1998] and by Barca and Becht [2000] to our findings on aggregate holdings and concentrated voting rights.[55]

The aggregate holdings of cash flow rights by the five basic owner types in twelve European countries is presented in table 26. The table also shows the equally weighted average (mean) holdings across nine European countries excluding Norway and the UK, and the corresponding average where the UK is included. We report two averages because the UK differs markedly from the other countries.

The table reveals several characteristics of aggregate ownership in Norway. First, compared to other European nations, the 16% state holding in Norwegian listed firms is high. It is almost twice the European average, and only two other countries (Finland and Italy) have a higher state ownership. Second, international owners have a larger aggregate stake than the typical European case (31% vs. 21%). Still, Norway is not exceptional on this dimension. For instance, international investors hold the largest fraction of market cap in four other European countries as well (Belgium, Finland, Spain, and Sweden).

Moving on to individual (personal) investors, Norway is quite extreme. In no other European country do individual investors own a smaller fraction of market cap. The 8% stake is less than

[55] Our comparison may suffer from the potential biases and inaccuracies in the estimates reported by Barca and Becht [2000] as discussed in section 2.3. The findings by the Federation of Stock Exchanges in Europe [1998] have similar weaknesses, as they are mostly based on the large blocks only rather than the entire population or large, random samples Moreover, our Norwegian data does not reflect the effect of indirect ownership, voting by proxy, voting pacts, and voting restrictions in the corporate charter.

Table 26

The aggregate holding by the five basic owner types in eleven European countries.

The table shows the estimated fraction of market cap held. Data sources are Barca and Becht [2000] for Austria and the Federation of Stock Exchanges in Europe [1998] for the remaining countries except Norway. Numbers in Percent.

		Owner type				
Country	Year	State	International	Individuals	Financials	Nonfinancials
Austria	1996	10	16	57	9	8
Belgium	1997	0	34	25	15	27
France	1993	6	22	32	23	16
Finland	1997	21	32	16	12	19
Germany	1997	3	12	17	37	31
Iceland	1996	11	2	33	25	30
Italy	1994	24	7	26	22	22
Spain	1997	6	37	29	23	6
Sweden	1997	8	32	15	31	15
Mean (ex N and UK)		10	22	28	22	19
UK	1997	0	16	25	58	2
Mean (ex N)		9	21	28	26	18
Norway	1997	16	31	8	20	25

one third the European average of 28% and only about half the next-to-smallest fraction (15% in Sweden). Comparing the two extreme cases at either end, the principals (the ultimate owners) directly own more than half the market cap in Austria. In contrast, the ownership rights of principals in the Norwegian stock market are exercised by their intermediate agents (corporations and the state) in firms representing more than 90% of market cap.[56]

Finally, ownership by national corporations (financials and non-financials in the two rightmost columns) account for 45% of market cap in Norway. This a typical European level except in Germany and the UK, where both the overall national ownership by corporations and the fraction held by national financials is considerably higher.

Moving on to concentration, table 27 compares concentration levels internationally by showing the equally weighted average fraction held by the largest, second largest, and the third largest owner of voting equity across ten European countries and the US. The right section of the table shows the pairwise ratios between the largest stakes. The means in the left column are equally weighted across countries.

The first remarkable pattern from table 27 is that the largest average fraction of voting equity held in a Norwegian listed firm is considerably smaller than anywhere else in Europe except in the UK. Disregarding Norway and the UK, the average largest stake in a European listed firm is 48%, which means the largest owner alone is very close to majority control. In contrast, the largest owner in an OSE firm holds just 29%, which does not even establish a blocking minority against charter amendments.

The second characteristic is that although the very highest Norwegian equity stake is small, the other big stakes are large. For instance, in no other country is the second largest stake higher (11%). The third largest stake in OSE firms (7%) is also higher than anywhere else. This pattern is also apparent in the ratios at the right of the table. For instance, while the largest Norwegian

[56]This argument implicitly assumes that all international investors are non-individuals, which is obviously wrong. Since we do not know the identity of international investors who hold their stakes through anonymous nominee accounts, we cannot determine what fraction of the aggregate international holding is made up of individuals.

Table 27

The concentration of voting rights in Europe and the US.

The table shows the average fraction of the firm's outstanding voting equity which is held by the largest, second largest, and third largest owner. For each owner size rank, the fractions are equally weighted across firms, and the international averages are equally weighted across countries. Relative owner size is the ratio between the corresponding ownership fractions. The data source is Barca and Becht [2000] for all countries except Norway. Numbers in Percent.

Country	No. of firms	Year	Owner size rank			Relative owner size		
			1	2	3	1/2	1/3	2/3
Austria	50	1996	54	8	3	6.8	18.0	2.7
Belgium	135	1995	56	7	5	8.0	11.2	1.4
France	674	1996	52	10	4	5.2	13.0	2.5
Germany	372	1996	50	3	1	16.7	50.0	3.0
Italy	214	1996	48	10	4	4.8	12.0	2.5
Netherlands	137	1996	43					
Spain	193	1995	40	11	6	3.6	6.7	1.8
Sweden	304	1998	38	11	6	3.5	6.3	1.8
Mean Europe (ex N and UK)			48	9	4	5.6	11.5	2.1
UK	250	1992	14	7	6	2.0	2.3	1.2
Mean Europe (ex N)			44	8	4	5.2	10.0	1.9
US	2831	1997	3	1	1	3.0	3.0	1.0
Mean Western World (ex N)			40	8	4	5.3	10.0	1.9
Norway	130	1997	29	11	7	2.6	4.1	1.6

holding is four times the third largest, it is ten times higher in the rest of Europe excluding the UK.

The overall conclusion from table 27 is that while the largest ownership stake in European listed firms is generally very large and mostly around 50%, it is considerably smaller in Norway and much smaller in the UK. Moreover, while most European firms have a very peaked power structure of ownership (the largest stake totally dominates the others), it is flat in Norway and the UK: The largest owner is small not just in an absolute sense, but also relative to the others. Finally, this flat power structure of ownership resembles the one found in the US equity market.

Our international comparison of aggregate equity holdings and ownership concentration both suggest that Norway is an outlier by European standards. Aggregate state holdings are unusually large, the aggregate individual ownership is exceptionally low, the largest equity stake is remarkably small, and the power structure of ownership is much flatter than anywhere else except in the UK and the US. These observations raise at least two questions:

- Why is this peculiar ownership pattern observed?
- What is the effect on corporate governance?

As to the first question, the purpose of this paper is to establish descriptive patterns of ownership rather than testing theories of why certain regularities are observed. Still, we may at least speculate on potential explanations. The list of possible determinants include the general political environment, the regulatory regime of the equity market, and investor wealth constraints. We briefly discuss these factors one by one.

Norway has had a social-democratic government for almost 50 out of the 65 last years. As significant public involvement in industry is still a vital component of this political ideology, our finding of a comparatively high state ownership in listed firms is not surprising. Having said that,

it should also be noticed that large state holdings may not be caused by a state policy to own or to control. For instance, the state ownership in commercial banks, which skyrocketed in the early nineties, was driven by a motivation to prevent negative externalities of a collapsing banking system rather than a desire to transfer bank ownership from private to public hands. Moreover, owning a relatively high fraction of market cap does not necessarily mean that the owner is powerful. Section 4 documents that compared to the aggregate size of state holdings on the OSE, the state is underrepresented among the large owners.

The small size of the largest stake and the flat power structure may both be partially driven by regulation. Section 4 concluded that the Norwegian legal regime provides a comparatively high protection of shareholder rights. According to La Porta et al. [1998], such a regulatory framework reduces the need for some owners to be large and also the cost of being smaller than the largest. Hence, it may be argued that because the Norwegian regulatory regime is similar to the UK system in a stockholder protection sense, the low concentration and the flat power structure in both countries is consistent with the idea that the legal framework influences the level as well as the distribution of large ownership stakes.

The low ownership by individual investors may be due to wealth constraints and the consequent high cost of concentrated holdings for such investors. Because of the social–democratic political tradition, Norway has a more even distribution of household income than most other countries (OECD [1998]). Although there is no available international data, we suspect the same holds for the distribution of wealth. If this is correct, even the richest individuals in Norway have relatively low wealth by European standards. This may imply that in order for wealthy individuals to be large owners in an OSE firm, they have to put a very high fraction of their wealth into one single firm. Consequently, the cost of concentrated ownership in terms of lost diversification benefits may be particularly high for individual investors in Norway.

The second fundamental question raised by the findings in tables 26 and 27 is the potential impact of the Norwegian ownership structure on corporate governance. That is, what is the effect on the relationship between principals and agents in a regime of absent individual (personal) owners, a small largest owner and a flat power structure of large owners. And, in particular, is the resulting monitoring different from what we find in the more standard European setting of significant personal ownership, a dominating largest owner, and a peaked power structure?

The dominant stock ownership by Norwegian corporations and the state means that in the vast majority of cases, the ultimate owners' immediate agent (typically the bureaucrat or the intercorporate shareholder's management team) is supposed to monitor the next layer of agents. Thus, while the immediate agent controls the voting rights on behalf of their principal, the agent has only a negligible part of the cash flow right. This misalignment of the two basic components of ownership creates the potential incentive problem that the voting power held by the immediate agent is not used in the principal's best interest. This is a multi–agent version of the classic principal–agent context.

The relatively small stake of the largest owner implies that unlike most European countries, the largest owner of Norwegian firms has insufficient power to discipline management through the stockholder meeting. This is independent of whether the voting right is exercised by intermediate agents or by the ultimate principal. If large stockholders act independently, they may produce a system characterized by strong managers and weak owners, which is the current UK system according to Goergen and Renneboog [1998]. However, as the *group* of large owners in Norwegian firms hold a rather large aggregate stake, the key to effective monitoring is cooperation. To illustrate, even though the largest owner of OSE firms on average owns just 29% of the votes, the three largest as a group are close to a majority (47%). Thus, while the owners in the typical European

listed firm may free–ride on the corporate governance efforts of the largest owner, the ownership structure of most Norwegian firms requires joint efforts by a team of several large owners who are separately weak, but jointly strong. A key question is to what extent this pooling of voting power actually occurs and in whether it matters for the monitoring quality. Our companion paper will address this issue by analyzing whether the owner type (individual vs. non–individual) and the power structure (flat vs. peaked) matters for the relationship between corporate governance and economic performance.

7 Summary and conclusions

The objective of this paper is to describe the basic ownership characteristics of Norwegian listed firms, to compare them with existing international evidence, and to suggest rather than test possible reasons why these empirical regularities are observed and what they may imply for corporate governance. As a detailed summary of our findings is provided in the summary tables A–E below, we just briefly highlight the major points.

Norway is similar to most European countries in the sense that listed firms play a modest but increasingly important role in the national economy. The regulatory regime is somewhat special in the sense that even though the country belongs to the civil law tradition, which is generally considered less investor–protective than common law jurisdictions, Norway's regulatory environment still seems to provide better protection of shareholder rights than in many common law countries. Moreover, the access to high–quality ownership data over several years is rather exceptional, enabling us to map out the full ownership structure of every firm listed on the Oslo Stock Exchange (OSE) over the period 1989–1997. These data tell us that although individual (personal) investors is by far the most numerous group, their aggregate holding of OSE market cap is small and decreasing. Financial investors in general and mutual funds in particular increase their share every year, while international investors hold the largest fraction of market cap. Aggregate state ownership varies considerably over time, mainly due to the rescue of firms considered too important to fail rather than a result of a consistent ownership policy. Indirect ownership through other OSE firms is rapidly declining, OSE insiders are comparable to individual investors in terms of aggregate holdings, and board members hold roughly half the insider stakes.

Only investors with large equity stakes have both the incentive and the power to influence corporate governance. We find that national non–financial corporations are much more often among the large owners than their aggregate holding would suggest, and that the opposite is true for international investors and the state. On average, the largest owner is too small to act even as a blocking minority, it takes the four largest to establish a simple majority, and the ten largest owners may collectively amend the corporate charter. Except in the regulated financials, where large stakes are considerably smaller than in others firms, concentration decreases with increasing firm size.

Voting equity in dual–class firms can be used to separate voting rights from cash flow rights. We find that non–voting shares are never issued by financials, very seldom by the young and small IPO firms, and that non-voting equity is roughly one third of total equity in industrial and shipping firms with dual–class shares. The concentration patterns of voting rights and cash flow rights are practically identical. International investors strongly prefer non-voting stock, both before and after the regulatory restriction on their right to hold voting equity was lifted. Regardless of owner type, the large owners hold more voting rights than cash flow rights. However, they still hold non-voting shares, possibly because the required 2/3 majority for charter amendments applies to voting rights and cash flow rights alike. This ownership characteristic may also reflect a signal to small shareholders that by holding a relatively high fraction of cash flow rights and not just of voting rights, powerful owners will lose if their power is used to divert the firm's resources to their private domain.

Although this paper is concerned with describing ownership structures rather than testing theories of why these characteristics are observed, we still speculate that certain determinants may be at work. First, regulatory detail seems to matter. Taking the overall legal regime as given (the Scandinavian version of civil law), several finer elements of the regulatory environment seem to influence the ownership structure. The low concentration and the absence of dual–class shares

in financials is probably driven by the regulatory maximum on holding size per owner (10%). The law also influences the distribution of large stakes around certain critical points, like the over–representation of large holdings just below flagging thresholds (e.g, 10%) and mandatory bid thresholds (e.g, 40%), and also the over–representation just above key voting thresholds (e.g, 50%). Moreover, financial owners may be underrepresented among the large owners not because they are disinterested in corporate governance, but because regulatory caps restrict them from holding large stakes (15% for insurance firms and 10% for mutual funds). Finally, the fact the large owners of voting shares in dual–class firms hold non–voting shares as well may be partly due to the voting rules for charter amendments specified by the corporate law.

Second, certain regulations considered important in the public debate seem to *not* matter, probably because the owner has other objectives than those implicitly assumed by the regulator. International investors as a group seem to regard equity stakes in OSE firms as elements of international diversification rather than vehicles for the execution of power and active corporate governance. If this is the case, it is not surprising that the cap on aggregate holdings of voting shares by international investors (1/3) was very seldom binding, and that the subsequent lifting of the cap had no fundamental effect on their demand for voting vs non–voting shares. This passive diversification view is supported by our finding that international owners of voting shares often refrain from using their voting right by holding voting shares anonymously, that they are heavily overrepresented in non–voting stock, and that they are underrepresented among the large owners of voting stock.

Compared to other European countries, corporate ownership in Norway is rather peculiar. Corporations and bureaucrats control more voting power in listed firms than anywhere else in Europe, the aggregate state holding is large, the largest owner is unusually small, and the stakes of the other large owners are remarkably big. We speculate that these ownership structure characteristics may be driven by a long period of social-democratic rule and a strong legal protection of shareholder rights. Our findings suggest two basic questions for the functioning of corporate governance mechanisms in Norwegian firms. First, what happens when the vast majority of agents (the management of OSE firms) are monitored by other agents (bureaucrats and the management of non–OSE firms) rather than by the ultimate owners? Second, even if this problem were small because intermediate agents behave like ultimate owners, what corporate governance system is produced by this peculiar power structure? In particular, will the moderate size of the largest stake create a system of strong managers and weak owners, or will the flat power structure generate united owners who are separately weak, but collectively strong. The answer to these two questions seems crucial for understanding the relationship between corporate governance and economic performance.

Summary table A: Institutional environment, data availability, and sample size

Institutional environment

- Like in most European countries, Norwegian listed firms play a modest but increasingly important role in the national economy.
- The Oslo Stock Exchange (OSE), whose market cap is 45% of Norway's GDP in 1997, is medium-sized by European standards. In the nineties, the OSE has grown rapidly, both in terms of market cap, number of firms listed, and market liquidity.
- Norway belongs to the civil law tradition, which is generally considered less protective of shareholders than the common law regime. Still, like inferred by La Porta et al. [1998] from a smaller set of characteristics, we find that the Norwegian regulatory regime provides a relatively high protection of stockholder rights on key governance mechanisms like the two-tiered board, the stockholder meeting, the separation of cash flow rights from voting rights, and the relationship between large and small owners.

Data availability and sample size

- Unlike in almost any other country, owners of Norwegian listed firms must report all their holdings and trades, regardless of size. This regulatory environment produces a particularly rich and accurate data set.
- While ownership data from EU countries and the US is based on direct and indirect holdings of large voting rights (blocks), our data reflects direct ownership of all cash flow rights and voting rights.
- The sample includes every equity investment in every OSE-listed firm (130 firms per year on average) by year-end over the period 1989–1997.
- Industrial firms represent the largest fraction of OSE market cap, the largest average firm size, and the highest number of firms. The number of industrials, shipping firms, and particularly the much smaller IPO firms is steadily growing over time, while financials (commercial banks and insurance companies) become less numerous.

Summary table B: Aggregate ownership

The number of owners

- There are roughly 0.7 mill. owners at the OSE, of which individuals (personal investors) constitute more than 80% on average and less in the end of the sample period than in the beginning.
- The average OSE firm has about 5 000 owners who hold NOK 1 mill. of the firm's equity. The investment per owner is growing, and the number of owners per firm is decreasing except in insurance. Financial (institutional) investors become increasingly more common in the firm's ownership structure.
- The number of international owners holding their shares openly rather than anonymously drops by almost 90% over the sample period.

Aggregate ownership by the five basic owner types

- International investors as a group is the largest owner type and hold almost one third of OSE market cap. Non-financial domestic firms hold about one fourth, the state and financial investors both own roughly one fifth, and individuals hold about one tenth.
- Financial owners increase their share of OSE market cap almost every year due to the rapid growth of mutual funds. Banks are insignificant owners in OSE firms.
- Individuals, who are heavily overrepresented in IPO firms, become gradually less significant. Aggregate state ownership, which is almost non-existent in shipping and IPOs, varies considerably over time, primarily due to the state's rescue of large commercial banks in the early nineties.
- International investors, the state, and non-bank financials hold their largest aggregate stakes in larger firms. Individuals and non-financial corporations gravitate towards smaller firms.

Insiders and OSE–listed owners

- Corporate insiders hold on average 7% of firm equity, more in shipping and IPOs and less in financials, and less in larger firms than in small.
- The primary insiders (board and management) hold roughly two thirds of all insider stakes. The board members own three times more of their firm than the management team.
- OSE listed firms are increasingly reluctant to invest in other OSE firms. Such intercorporate investments drop from 14% of market cap in 1989 to just 4% in 1997.

Summary table C: Concentrated ownership

- The median owner, who holds less than one ten thousandth of the firm's equity, lacks both the incentives and the power to influence corporate governance.
- The largest owner holds on average 28% of the firm's equity. The two largest owners create a blocking super-minority of 1/3; the four largest constitute a simple majority, and the ten largest may jointly establish a 2/3 super-majority.
- Financials have a considerably less concentrated ownership structure than other firms. Typically, it takes twice the number of large owners to create a particular power structure.
- Concentration decreases with increasing firm size. Due to the state's effort to save the largest banks, the opposite is true for banks.
- Relative to their share of OSE market cap, non-financial domestic corporations are strongly overrepresented among the large owners. This investor type is the largest owner in 52% of the firms and is more often among the five largest owners than any other type. Conversely, international investors and the state are underrepresented.
- Unlike non-financials and the state, who are more often found at the top of the largest-five list than at the bottom, international investors and financials prefer the bottom.
- Concentration measures which are biased towards large owners (like the fraction held by the three largest owners and the Herfindahl index) correlate much more than measures putting proportional weight on every stockholder (like the average equity value or equity fraction per owner).

Summary table D: Separation

- Non-voting equity (B shares) are issued by 14% of the firms, never by financials, and very seldom by IPO firms. B shares constitute 10% of OSE market cap and 29% of the equity in dual-class firms.
- International investors, who on average hold 54% of non-voting shares, are heavily overrepresented in this security type, both before and after 1995, when the restriction on international holdings of voting shares was lifted. Conversely, state owners and non-financial corporations strongly prefer voting shares in dual–class firms.
- The structure of large holdings of voting shares is practically identical to what we found for all shares (voting and non-voting) as summarized in summary table C. This is independent of whether or not the firm has dual–class shares.
- In firms with dual-class shares, large owners of voting stock concentrate voting rights relative to cash flow rights, typically voting for 20% more than their cash flow rights would suggest. Still, large voting owners often hold non-voting equity as well, possibly because charter amendments require a two thirds majority from both cash flow and voting rights or because they try to minimize moral hazard costs vis–a–vis small stockholders. The largest owner's separation between voting rights and cash flow rights seems consistent with this view.

Summary table E: Norway vs. other countries

- The government holds a larger fraction of Norwegian listed firms' market cap (16%) than in almost any European country (mean of 9%), and nowhere is the fraction held by individuals smaller (8% vs. mean of 28%).
- The largest owner in an OSE firm holds a much smaller fraction of voting equity (29%) than anywhere else in Europe (mean of 48%) except in the UK (14%).
- Like in the UK, Norwegian firms have a flat power structure of ownership, as the largest stake is small relative to the other large stakes. This differs sharply from the typical peaked power structure found elsewhere in Europe, where the largest owner totally dominates the others.
- We speculate that potential determinants of the Norwegian outlier case may be a long period of social-democratic rule (high state holdings, low individual holdings, and low concentration) and strong legal protection of stockholders (low concentration and flat power structure).
- The ownership structure of Norwegian firms raises two questions for corporate governance and economic performance. One is whether state bureaucrats and corporate managers with high voting rights and negligible cash flow rights are effective monitors. The second question is if the low ownership concentration produces strong managers and weak owners or whether the flat power structure facilitates monitoring by a team of owners who are individually weak, but collectively strong.

A Data source description

The five basic owner types

Based on data in electronic form from the Norwegian Central Securities Depository *(Verdipapirsentralen; VPS* we have a complete database of year–end holdings of all equity owners for companies listed at the Oslo Stock Exchange (OSE). This data is available from 1989 through 1997. The data does not specify the owner's name, but each owner still has a unique ID in our data base. Each owner is classified into one of the five basic types.

Insider owners

Each insider must report his or her transaction to the OSE by 10 am the day after the transaction. The OSE publishes this report, which details the insider's name, position, number of shares bought and sold, and the resulting total holding.

Our insider data base is constructed by manually recording the transactions from the insiders' reports. We infer a time series of total holdings for each insider, adjusting for stock splits.

Insiders who leave the firm have no obligation to report neither this event nor their subsequent transactions in the firm's stock. Consequently, our data base may overestimate the insider holdings. To at least partially eliminate this problem, we intend to cross–check our insider data base with board and CEO data which specifies the dates on which these corporate insiders leave the firm.

OSE–listed owners

According to corporate law, firms owning equity stakes in other firms must specify these holdings as of year–end in their annual reports. We manually collect these data for OSE listed corporate owners and use them to construct the intercorporate shareholdings.

Share prices and shares outstanding

The data base on equity prices, shares outstanding, new equity issues, stock splits, and dividend payments is constructed from data in electronic form provided by the OBI (*Oslo Børs Informasjon*), which is a subsidiary of the OSE.

Accounting information

Accounting data is taken from the OBI electronic data base, which provides all the accounting figures (except for the footnotes) from the annual reports of OSE listed firms. We have also used a large number of annual reports in paper format to supplement the electronic records. For instance, data on intercorporate shareholdings, which is provided in footnotes, must be collected manually.

Company charters

The charters for most listed firms as of 1995 are available in non-electronic form at the OSE.

References

Fabrizio Barca and Marco Becht. *The Control of Corporate Europe*. Forthcoming, Oxford University Press, 2000.

Clas Bergstrøm and Kristian Rydqvist. The determinants of corporate ownership. *Journal of Banking and Finance*, 14:237–253, 1990a.

Clas Bergstrøm and Kristian Rydqvist. Ownership of equity in dual–class firms. *Journal of Banking and Finance*, 14:255–269, 1990b.

Marcello Bianchi, Magda Bianco, and Luca Enriques. Pyramidal groups and the separation between ownership and control in Italy. Working paper, European Corporate Governance Network, October 1998.

Øyvind Bøhren and Øyvind Norli. Determinants of intercorporate shareholdings. *European Finance Review*, 1(2):265–287, 1997.

Øyvind Bøhren and Bernt Arne Ødegaard. The ownership structure of Norwegian firms: Data appendix. Norwegian School of Management, May 2000.

Tore Bråthen. *Personklausuler i aksjeselskaper*. Ad Notam Gyldendal, 1998.

Abe de Jong, Rezaul Kabir, and Ailsa Röell. Ownership and control in the Netherlands. Working paper, European Corporate Governance Network, September 1998.

Federation of Stock Exchanges in Europe. International stock ownership. FESE, November 1998.

Kenneth R. French and James M. Poterba. Were Japanese stock prices too high? *Journal of Financial Economics*, 29:337–363, 1991.

Marc Goergen and Luc Renneboog. Strong managers and passive institutional investors in the UK. Working paper, European Corporate Governance Network, November 1998.

Sanford Grossman and Oliver Hart. Takeover bids, the free-rider problem, and the theory of the corporation. *Bell Journal of Economics*, 11:42–64, 1980.

Klaus Gugler. Corporate governance and economic performance. Manuscript, University of Vienna, December 1999.

Klaus Gugler, Susanne Kalss, Alex Stomper, and Josef Zechner. The separation of ownership and control. An Austrian perspective. Working paper, European Corporate Governance Network, August 1998.

Alf E. Hageler and Knut H. Jellum. Halvparten av norsk næringsliv er i offentlig eie. *Økonomisk Revy*, 3:28–29, 1995.

Oliver Hart. *Firms, Contracts, and Financial Structure*. Oxford University Press, 1995.

Michael C. Jensen and William H. Meckling. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3:305–360, 1976.

Fred Kaen and Dag Michalsen. The effects of the Norwegian banking crisis on Norwegian equities. *Journal of Multinational Financial Management*, 7:83–111, 1997.

Rafael La Porta, Florencio de Silanes, Andrei Shleifer, and Robert W. Vishny. Law and finance. *Journal of Political Economy*, 106:1113–1155, 1998.

Rafael La Porta, Florencio de Silanes, Andrei Shleifer, and Robert W. Vishny. Investor protection and corporate valuation. Harvard University, October 1999.

Bernt Arne Ødegaard. Price differences between equity classes. Corporate control, foreign ownership or liquidity? Evidence from Norway. Working Paper, Norwegian School of Management. Available at http://finance.bi.no/~bernt, June 1999.

OECD. Income distribution and poverty in selected countries. Working paper no. 189, 1998.

Federation of Stock Exchanges in the European Community. Share ownership structure in Europe. FSEEC, 1993.

Steven Ongena, David Smith, and Dag Michalsen. Distressed relationships: Lessons from the Norwegian banking crisis (1988-1991). Working paper, December 1999.

Andrei Shleifer and Robert W. Vishny. A survey of corporate governance. *Journal of Financial Economics*, 52:737–783, 1997.

Stortingsmelding 40 97-98. Eierskap i næringslivet. Stortingsmelding nr 40 1997-98, 1998.

Alan Stuart, J. Keith Ord, and Steven Arnold. *Kendall's Advanced Theory of Statistics: Classical Inference and the Linear Model*. Arnold, volume 2a edition, 1999.

Konrad Zweigert and Hein Kotz. *Introduction to corporate law*. Clarendon, 2nd rev edition, 1998.