# Price differences between equity classes. Corporate Control, Foreign Ownership or Liquidity?

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**Abstract**

This paper is the first comprehensive study of price differences for dual class equity at the Oslo Stock Exchange. It analyzes the relative importance of corporate control, foreign ownership restrictions and stock market liquidity for the price differences. The Norwegian market has the peculiar feature that in part of the sample period nonvoting shares were trading at a premium to voting shares, i.e., what is usually termed the "voting premium" was negative. This result can be rationalized by restrictions on foreign ownership. In the later part of the period, with no regulatory restrictions on foreign ownership, the voting premium is positive, and related to corporate governance and liquidity.

*Key words:* Dual class equity, Corporate governance, Foreign ownership restrictions, Stock market liquidity.

Recent years have seen a resurgence of research interest in "dual class" stocks, equity issued by the same corporation with equal cash flow rights, but differing along some other dimension, such as voting rights. A prime reason for this resurgence is the increased interest in corporate governance, and the potential

for dual class shares to measure corporate governance variables, in particular private benefits of control.

Much of the recent empirical literature takes the broad view, analyzing the topic of interest using a multi-country crossection.[2] Such multi-country studies have the benefit of a relatively large sample, but run the risk of only imperfectly controlling for country specificity. Many of the effects studied in this literature are results of country specific regulation. Using broad measures of country specificity, such as the Law and Finance variables of La Porta, Lopez-de Silanes, Shleifer, and Vishny (1998), may only imperfectly control for differences across countries in the effects of regulation. It is therefore important to complement these multi-country studies with single-country studies, in which the regulatory environment is held constant.

The present paper is the first to take a close look at dual class equity at the Oslo Stock Exchange (OSE). The Norwegian case has some unique features that contradict prior research. In particular, for part of the period analyzed, nonvoting stock were trading at a premium to voting stock, making the "voting premium" negative!

**Fig. 1** The "Voting Premium" at the Oslo Stock Exchange
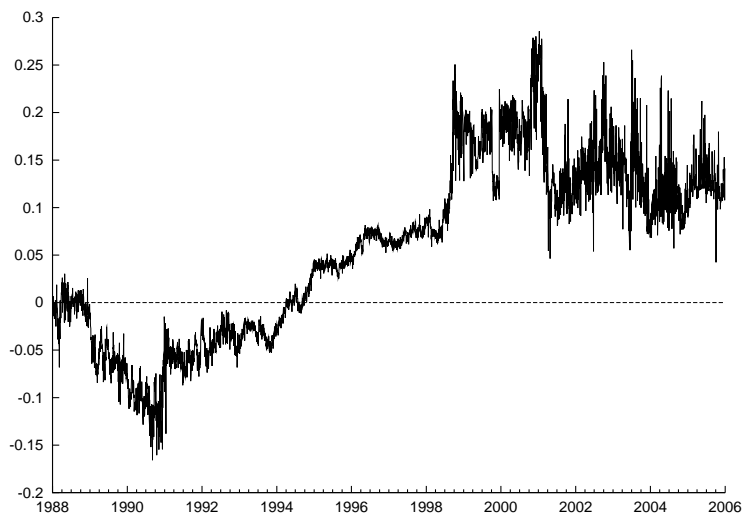


Value weighted average percentage price differentials between voting and nonvoting shares. The price differential is defined as $(P_{A,it} - P_{B,it})/P_{A,it}$, where $P_{A,it}$ is the price of the voting (A) share for stock $i$ at time $t$, and $P_{B,it}$ the corresponding price of the nonvoting (B) shares. At each date $t$ the relative price differential is calculated only for those companies in which both classes actually traded. A value weighted average is calculated of these observations, using total firm capitalization as weights. The figure uses data for all dual class stocks at the Oslo Stock Exchange in the period 1988 to 2005.

As a preview and summary of the paper, figure 1 shows the evolution of what is usually called the "voting premium" in this literature, the relative price difference between voting and nonvoting shares, for the Oslo Stock Exchange

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[2]  See for example Bailey, Chung, and Kang (1999), Faccio and Lang (2002), Nenova (2003), Doidge (2004) and Pajuste (2004).

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in the period 1988 to 2005. Financial theory would argue that the voting premium should be positive or zero, since the voting shares have additional options relative to the nonvoting shares. However, this intuition does not seem to hold in the Norwegian market, at least for the 88-94 period. Note also the sudden shift in the time series for the relation. There seems to be a structural change around 1994. The early period is characterized by a negative "voting premium," which changes to the positive premium observed in almost every other market. As will be shown later, this result can be rationalized by a change in regulation in 1995, at which date a restriction on foreign ownership of voting stock was lifted.

The most important contribution of the paper is that I document the existence of a negative voting rights premium, contradicting both intuition and observations from other countries. I show that this negative voting rights premium is a result of the interaction of three effects: Corporate control, market segmentation of foreign and domestic equity owners, and stock liquidity. The first pushes the voting rights premium up, the second pushes it down. In the Norwegian case, when foreign owners are subject to regulation rationing their access to Norwegian equities, the second effect dominates the first. When the regulation is lifted control issues become dominant. Liquidity further complicates the picture, with the most liquid stock class having a liquidity premium. The results of the paper show that the effects stemming from market segmentation are important enough to outweigh effects of corporate governance, serving as a useful reminder that corporate governance researchers analysing dual class shares need to be careful about controlling for other features likely to affect the relationship. The results of this paper are also important since Norwegian equities are included in many multi-country studies. The way the different causes of price differences interact in the Norwegian market can therefore help in interpreting some of the multi-country results.

The paper is structured as follows. Section 1 introduces the research problems and discusses the theoretical and empirical literature. Section 2 presents the relevant regulation of the Norwegian equity market, while section 3 lists the data sources. Section 4 describes price differences and identifies the determinants of the price differences observed on the Oslo Stock Exchange. Section 5 concludes.

# 1 Theory and Literature

Broadly, the finance literature has seen four distinct issues studied using dual class equity.[3] The problem that has seen the most focus is the valuation of voting rights, or more broadly, corporate governance issues. The other three issues are market segmentation, taxes and liquidity. Since the Norwegian case studied in this paper potentially intersects all these issues, this section surveys the most relevant theoretical and empirical work on all four issues.

## 1.1 Corporate governance

At the general level, corporate governance problems arise when outside investors with a stake in a corporation attempt to assert control differently from the manager in control of the firm (Becht, Bolton, and Roell, 2003). Equities of different classes affect the governance problem because owners of different class equity have different power in their attempts to assert control. In particular, owners of equities with more voting power can potentially influence management more.

The starting point for theory in this field is the results on the optimality of the one share – one vote structure, put forward in Grossman and Hart (1988) and Harris and Raviv (1988, 1989). Essentially, these papers are takeover models, with two contestants for control of a corporation, each with potential private benefits of control. In the presence of stock with superior voting power, the value of the private benefits are only reflected in the price of voting stocks necessary to gain control. A structure with one share – one vote will force an acquirer to pay the full amount of private benefits to gain control.

The optimality of one-share one-vote relies on the private benefits remaining private. If, in addition to the private benefits, the acquirer would increase the value of the firm, it may be optimal to allow dual class stock to induce mergers that increase firm value beyond the private benefits. Such arguments leads to explanations related to ownership concentration and monitoring. The corporate governance literature points to the potential benefit of having a large owner in a firm with increased incentives for monitoring. Concentrated owners which own superior voting shares will also have increased power to influence

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[3] I will use dual class equity as a general term to encompass equity issued by the same corporation, but with different terms. Each distinct equity is said to belong in a "class". This usage seems to be the most common in the literature, even though, strictly speaking, firms may have more than two different classes. Alternative terminology in the literature is "multiple-class stock" and "separation of voting rights from cash flow rights."

management, to go along with the monitoring incentives. Such arguments may justify the common occurrence of family controlled firms being listed with the founding family retaining control through superior voting share structures (DeAngelo and DeAngelo, 1985). It is, however, a general counterargument to such stories that superior voting structures also increases the potential for self dealing and collusion with management (Bebchuk, Kraakman, and Triantis, 2000).

The main prediction of corporate governance arguments is that superior voting shares trades at a premium, either because it reflects the potential premium in a takeover, or a premium that reflects the improvement in firm value brought on by the monitoring activities of the concentrated owner.

The hypothesis that superior voting stock trades at a premium to inferior voting stock, tested by comparing the price levels of the two classes, is clearly the one that has seen the most empirical testing. Starting with the US work of Lease, McConnell, and Mikkelson (1983), who found an average 5% voting premium for US companies, such studies have been conducted for stock markets all over the world. Almost without exception the voting premium is found to be significantly positive, but with large crossectional and time series variation. The largest premium, of 80%, is found in Italy.[4] The multicountry study by Nenova (2003) also finds significantly positive voting premia.

A problem with studies analyzing differences in price levels is that there may be other explanations of the price differences. The typical answer to such problems in empirical corporate finance research is to isolate the effects around events where the features of interest change. The first strand of such research looks at dual class recapitalizations, cases where firms move from a one share – one vote structure to a structure including nonvoting shares, often in takeover situations. The early evidence on this is mixed, some showing a weakly negative effect, some a positive effect of such recapitalizations.[5] More recently Dimitrov and Jain (2004) argue that such recapitalizations are value enhancing.

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[4] Countries considered include Canada (Smith and Amoako-Adu, 1995), Denmark (Bechmann and Raaballe, 2003; Neumann, 2003), France (Muus, 1998), Germany (Hoffmann-Burchardi, 1999; Dittmann, 2003), Italy (Zingales, 1994; Caprio and Croci, 2006), Israel (Levy, 1982), Russia (Goetzmann, Spiegel, and Ukhov, 2002; Muravyev, 2004), Switzerland (Horner, 1988; Gardiol, Gibson-Asner, and Tuchsmid, 1997), Sweden (Rydqvist, 1987, 1996) and the UK (Megginson, 1990). Later work on the US include Zingales (1995), Cox and Roden (2002) and Gompers, Ishii, and Metrick (2006).

[5] See for example DeAngelo and DeAngelo (1985), Jarrell and Poulsen (1988), Ang and Megginson (1989), Lehn, Netter, and Poulsen (1990) and Moyer, Rao, and Sisneros (1992).

Alternatively to looking at cases where dual class equity is created, one can look at the opposite phenomenom, dual class unifications, cases where firms announce that different classes will be merged into one. Overall the evidence is in favor of a positive announcement effect of such unifications.[6]

It is hard to see how one can have both positive effects when dual class equity is created and when it disappears. Pajuste (2004) argues for a life-cycle hypothesis, dual class stock is an optimal governance mechanism at some points in a firm's life. This may be times when concentrated ownership/monitoring is desired. Such arguments are supported by the evidence of IPOs of dual class firms. Smart and Zutter (2003) show that already at the IPO voting stock trades at a premium, but have less underpricing then single class stock. Smart, Thirumalai, and Zutter (2005) find that dual class firms have less turnover among their CEO's.[7] These results are consistent with a story where the choice of dual class equity is a rational solution to corporate governance problems.

In concluding this survey of the corporate governance reasons for a "voting premium", it may be useful to quote the conclusions about empirical estimates of the equity premium in the survey by Becht et al. (2003):

> "...Empirical estimates of voting premia range from 5.4 to 82% and, taken at face value, suggest that the value of corporate control is large in Italy and relatively small in Korea, Sweden and the USA. In practice the studies at best imperfectly control for all the factors affecting the price differential, making it an unreliable measure of "the value of corporate control". Time-series evidence also suggest that dual class premia should be interpreted with caution."

## 1.2 Market segmentation

Markets become segmented when the same good trades in different, physically separated markets. In such settings prices may be different across markets because the marginal evaluation of market participants differ. In financial markets it is hard to argue that markets are physically separate, since the costs of moving financial assets are close to zero. What can induce separation is therefore regulation, either at the government or corporate level. Regulation can create barriers that stop prices of similar assets aligning to match their marginal valuations.

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[6] See for example Amoako-Adu and Smith (2001), Hauser and Lauterbach (2004), Dittmann and Ulbricht (2004), Ehrhardt, Kuklinski, and Nowak (2005) and Pajuste (2004).

[7] See also similar evidence in Taylor and Whittred (1998).

The market segmentation of interest in the present paper is when ownership of stock is discriminated on the basis of country of origin. The first paper looking at this was Hietala (1989), which used data from the Finnish stock market, and analyzed the effect of separation of domestic and foreign owners. This has ben followed by numerous other papers. The typical result in these studies is that the price is higher for the group that is relatively rationed, which usually means that stocks available to foreigners have a higher price.[8] An exception to this pattern is China, which seem to have the opposite pattern. However, this may be explainable by the *domestic* owners being relatively rationed.[9]

The rationing can also be done at the corporate level. The Nestlé case is a well known example of how changes in ownership regulations in the corporate charter affect price differences.[10] Price differences between two equity classes in Nestlé disappeared when the company lifted restrictions on foreign ownership, making the classes equally accessible to foreign and domestic investors.

## 1.3  Taxes

Different tax treatment across classes may also produce price differences which merely reflect differences in after-tax cashflows. A classical case study of tax effects is Citizen Utility, which has one class paying stock dividends and another paying cash dividends. The tax treatment of dividends differs across the classes and induces price differences.[11]

## 1.4  Liquidity

The existence of a link between asset prices and liquidity is the focus of a large literature in market microstructure. While there is discussion of the magnitude of a liquidity premium, that less liquid stocks demand a return premium is by now well established.[12] Translating this to prices, less liquid

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[8]  Countries with a higher price on stocks available to foreigners include Thailand (Bailey and Jagtiani, 1994), Mexico (Domowitz, Glen, and Madhavan, 1997) and Singapore (Bailey et al., 1999).

[9]  For research on China see Bailey (1994), Ma (1996), Sun and Tong (2000), Fung, Lee, and Leung (2000), Chen, Lee, and Rui (2001), Chan, Menkveld, and Yang (2004), Wang and Jiang (2004), Yang and Lau (2005), Chung and Wei (2005), Mei, Scheinkman, and Xiong (2005) and Li, Yan, and Greco (2006).

[10] See Loderer and Jacobs (1995) and Stulz and Wasserfallen (1996).

[11] See Long (1978), Poterba (1986) and Hubbard and Michaely (1997). A similar feature is found in a Canadian case discussed by Bailey (1988).

[12] This viewpoint is particularly well articulated by Maureen O'Hara's 2003 presidential address at the AFA.

assets are expected to have lower prices than more liquid assets. Dual class equity are potentially good testing laboratories for such ideas, since they are equal along most other dimensions. There are a few studies which have such a direct microstructure focus, [13] but most of the literature on dual class equity treats liquidity more as a control variable rather than the focus of interest. [14]

## 2 Stock classes at the Oslo Stock Exchange

The firms in this sample are listed on the Oslo Stock Exchange (OSE) during the period 1988–2005. The Oslo Stock Exchange (OSE) is moderately sized by international standards. In 1997 (about the midpoint of the sample), the 217 listed firms had an aggregate market capitalization which ranked the OSE twelfth among the 21 European stock exchanges for which comparable data is available. In terms of investor protection La Porta et al. (1998) puts Norway at the average of countries in the Scandinavian group. The Scandinavian legal tradition is between the US and European traditions, with relatively strong investor protection. [15]

There are three equity classes of interest in the Norwegian market: A, B and F(free) shares. The classes have identical cash flow rights, with equal claims to future dividends. Let me first consider the differences between equity classes in terms of voting rights and start with the A and B shares. The A share is fully voting, the B share has restricted voting rights. In the normal case the B shares have no voting power at the annual meeting. However, in situations where the corporate charter is modified, owners of B shares have some voting power. Such situations require a super-majority of 2/3, and there is a sequence of votes. First 2/3 of all *voting* stock (A shares) must vote in favor of a proposal. If the proposal passes this vote there is a second vote, where 2/3 of *all* stock (A and B shares) must vote in favor for the proposal to pass. B shares thus have limited voting rights, which are only triggered in cases requiring a super-majority to change the corporate charter. Examples of decisions requiring a change to the corporate charter are issues of new capital, a change in the lines of business in which the company operates, and takeover bid acceptances. These examples are also situations where private benefits have been thought to be important.

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[13] See for example Chan et al. (2004), Chung and Wei (2005), and Bailey, Mao, and Sirodom (2006)

[14] Papers using liquidity in this manner include Gardiol et al. (1997), Domowitz et al. (1997) and Neumann (2003).

[15] A detailed description of the Norwegian stock market and Norwegian corporate governance regulations can be found in Bøhren and Ødegaard (2000, 2001).

Before 1995, the ability of foreign companies and individuals to own shares in Norwegian companies was regulated. Foreign investors as a group could not hold more than one third of a Norwegian company's voting shares.[16] To simplify keeping track of foreign/domestic fractions, some companies split their voting shares into A shares and F shares. The fraction of F shares issued corresponded to the third that could be owned by foreigners, and foreigners could not hold A shares in these companies. The checking of whether the quota of foreign investors was filled thus became automatic. For companies without F shares, foreign investors could buy up a third of the A shares. The regulation allowing the creation of the F class was introduced in 1988. Both A and F shares had full voting rights. At the end of 1994, restrictions on foreign ownership were removed as Norway considered membership of the European Union. This led to the merging of the A and F classes, the F shares were relabeled A shares.[17] Although Norway did not join the Union, restrictions on foreign ownership were not reintroduced. Throughout the period, there were no restrictions on foreign ownership of B shares.

Another piece of relevant regulation is taxation. Up to 1992 domestic investors were subject to a flat tax on dividend and capital gains income. In the post 1992 period domestic investors are not taxed on dividends, and only partly taxed on capital gains. The tax treatment for a foreign investor depends on the investor's tax domicile, which for most countries implies that both capital gains and dividend income are taxable. Foreign investors may thus want to avoid holding Norwegian equities around the ex-dividend date, which is usually in the early summer.[18] These tax rules make it more costly for foreign investors to hold Norwegian shares relative to domestic investors, and will act to segment foreign and domestic investors. However, the tax treatment is symmetrical across equity classes. Thus, although taxes may influence the segmentation of foreign and domestic investors, there are no taxation differences across classes.

An often cited reason for prices of classes differing is that they can get different payment in takeovers and going private transactions. For this to be a relevant

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[16] Any company could apply to the Department of Industry to have this maximal fraction increased. While it was not possible this long after to identify whether this happened, I have looked at the actual ownership stakes, and there is no company with a foreign ownership stake above 33%, although there are some cases where it hits 33%. In addition to the 33% rule there were additional regulations on the foreign ownership of financial institutions, as well as on companies with access to waterfalls.

[17] There is no date which is *the* date at which the market became aware of this, it became gradually clear during 1994 that the restrictions on foreign ownership would be lifted. In the regressions involving the F shares I therefore remove the last year to avoid any period where the market *knows* the restriction will be lifted.

[18] There is anecdotal evidence of short term, tax motivated, trading of Norwegian equities around the ex dividend date, in which foreign investors "park" their shares with Norwegian owners for a short period. See Dai (2005).

reason there must be no rules outlawing this. In the Norwegian case there are no direct regulation that forbids it, but there may be investor protection rules that indirectly limits the differences. To show the possibility of differential payment, and the potential for investor protection, the firm Aker RGI can be mentioned as an example. In 2000, Kjell Inge Røkke, the largest owner of the firm, took the firm private in a transaction where he first gave an offer to buy the remaining shares at prices of NOK 120 for the A shares and NOK 110 for the B shares. After getting control of 90.08% of the votes he could then force the remaining owners to hand over their shares at prices of NOK 105 for A shares and NOK 97 for B shares. Some of the shareholders later sued Røkke, claiming that the latter prices were too low. They were judged a higher price by a lower court, but the case is still making its way through the judicial system. This case illustrates both a potential for differential payment and uncertainty in regulation. The uncertainty comes from the outcome of the court case being partly judgment based.

While it is not a formal regulation, the stock exchange has in recent years encouraged listed firms to simplify their share structure. This follows recommendations of one share – one vote in the EU. Many Norwegian companies have therefore merged their A and B share classes. This is apparent in the data, with most of the nonvoting (B) shares disappearing in 2000 or 2001, and only 4 listed companies with nonvoting shares left in 2005.

While nonvoting shares have a long history in Norway, it was only in the late eighties that some of the large companies listed on the Oslo Stock exchange started issuing significant quantities of nonvoting shares. An explicitly stated reason by many companies was a desire to attract foreign capital. Nonvoting shares were a means of avoiding restrictions on foreign ownership of voting equity. Most of the B classes were created as seasoned equity offerings. 1988 is therefore chosen as the starting point for the analysis. With one exception all listed Norwegian firms with multiple classes of equity in the period are used.[19] The sample contains 36 A shares, 30 B shares and 13 F shares. The number of active companies changes over time.[20] The companies in the sample account for between 28% and 50% of total market value of the OSE in the period, which means they include some of the largest firms on the OSE. One feature which is peculiar for Norway is that the fraction of the firms' shares which is nonvoting shares is relatively low. On average this is 12.7%, which is a lower number than most other markets, and may be due to the stated reason for introducing B shares, namely the wish to attract foreign investors.

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[19] I exclude one company, Freia, because it was involved in a long takeover battle, during which the stock essentially did not trade.
[20] A detailed list of the companies, listing periods, and stock classes used is given in the appendix.

## 3   Data sources

Daily stock prices, data on dividends, daily trading volume and number of shares outstanding are collected from the OSE data service (Oslo Børs Informasjon, OBI).

In addition to the stock market data I use data on corporate ownership. All equities traded at the OSE are listed in a common Securities Registry (Verdipapirsentralen, VPS). From this data source I obtain complete year-end records of the ownership structure for all listed companies in the period 1989 to 2003. For each owner I observe the number of shares held and various details about the owner. These data allow the calculation of the fraction of the company held by foreigners, as well as measures of ownership concentration. Since this data includes all owners, it is much more complete than one can gather from public sources, which typically contain only the large owners (block-holders) who have to declare their ownership.

In addition to these ownership data I use the public records of trades by corporate insiders. All transactions by a corporation's legal insiders (management, board members and their immediate families) must be disclosed to the OSE. These reported trades are then used to estimate the fraction of shares owned by insiders. In the analysis I concentrate on the holdings of primary insiders, which are the officers and directors.

## 4   Determinants of price differences

The purpose of the analysis of this section is to establish the important determinants of price differences between dual class shares in the Norwegian market. The methods are the traditional methods in studies of this kind, regressions where the price differences are explained using various proxies for the hypothesed explanations. The regressions can be compactly formulated as:

Price difference $= f$ ( Corporate governance, Market segmentation, Taxes, Liquidity)

### 4.1   Which explanations are relevant for which price differences?

Let me first discuss how the Norwegian regulations affects price differences, and which explanations are relevant for which price differences. Recall that the Norwegian market has three different equity classes, A, B and F shares,

with the A and F shares having superior voting power to the B shares, and the B and F shares being more accessible for foreign investors.

Let me start with corporate governance. For such considerations what matter is the distinction between voting (A,F) shares and nonvoting (B) shares. Corporate governance considerations should induce the A and F shares to be trading at a premium to the B shares. On the governance dimension the A and F shares are equivalent, corporate governance considerations should not induce price differences between classes with equal voting power.

The second issue is market segmentation induced by a differential treatment of foreign and domestic investors. Since the F and B shares are more easily accessible to foreigners than the A shares, one expects market segmentation to cause a lower A share price than B and F share prices. Regarding the third issue, liquidity, the expectation is that the more liquid shares have a higher price. To make any prediction of which classes have a liquidity premium/discount it is necessary to measure liquidity. The final issue is taxation. As argued before, taxation is symmetric across classes, but taxation differs for foreign and domestic investors, resulting in taxation being another factor adding to the segmentation of domestic and foreign investors.

To help the reader keep track of the various classes and hypotheses, table 1 gives a summary of the expected links between the different classes and potential explanations of price differences.

**Table 1** The potential explanations of price differences

| Classes | Explanation for price differences | | | |
| | Corporate governance | Segmentation domestic/foreign | Liquidity | Taxes |
| --- | --- | --- | --- | --- |
| Difference A/B | X | X | X | |
| Difference A/F | | X | X | |
| Difference F/B | X | | X | |

The table summarizes the link between price differences and potential explanations. A shares have full voting rights, while B shares have restricted voting rights. In companies with F shares, the A shares are available to domestic owners only, while the F shares are also available to foreign owners. The column on the left indicates which classes are compared, e.g. A/B looks at price differences between A and B shares. An X indicates that the explanation listed at the top of the column is relevant for this particular price difference.

*4.2 Describing the price differences*

The focus of the analysis is the *relative price differential* between two equity classes, calculated as the difference between the prices of the two equities in

percent of the current stock price. Table 2 and figure 2 give various descriptive views of the price differences. Consider first the differences between the A and B shares. Panel A of table 2 shows the averages of the premia for the whole period and for two sub-periods. Comparing the voting A and nonvoting B shares, the A shares are priced at a premium of 5.6% in the whole period 1988–2005. This average masks significant time series variation, which is shown in the time series plots in panel A of figure 2, and also in the year by year averages in panels B and C of table 2. The change in regulation of foreign investors at the beginning of 1995 motivates the splitting of the data in two periods, 1988–1994 and 1995–2005. The averages of the premia for the sub-periods in panel A of table 2 show that in the first period the premium is statistically indistinguishable from zero, although the value weighted average is −3.4%. In the second period the A shares have an average premium of 9.7% over the B shares.

The number of companies with B shares declines sharply in the post 1999 period, induced by the stock exchange discouraging dual class structures. By 2003 there are only 4 companies left on the exchange with both A and B shares, as shown by the number of observations in panel B and C of table 2. This fact is the cause of the apparent increase in the volatility of the time series in figure 2, as the averages are taken over fewer and fewer shares, and one non-trading stock can disturb the average significantly.[21]

The time series show that there have been significant changes in the pricing relationship between the A and the B shares. In the early part of the period the average nonvoting B share was at times priced higher than the voting A share. This is most clearly seen in the value weighted average, implying that negative premia were most prevalent in the largest companies. Corporate control considerations will clearly not be able to explain a negative voting rights premium. Note that the negative premium turns positive in 1995. This is also the year restrictions on foreign ownership were lifted.

Consider next price differences between the A and the F shares. As shown in Panel A of table 2, the average F share is priced 9.1% higher than the average A share, which is also apparent in the time series in Panel B of figure 2. The F shares, with no restrictions on foreign ownership, are priced higher than the A shares. The shares have the same voting power, potential explanations are therefore market segmentation and liquidity. From a market efficiency point of view it is reassuring to note that the average price differential ends up at zero at the end of 1994, when the F shares were changed into A shares.[22]

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[21] The regressions use the annual average price differential for each company in a given year, as shown in table 2, which is not as sensitive to non-trading.
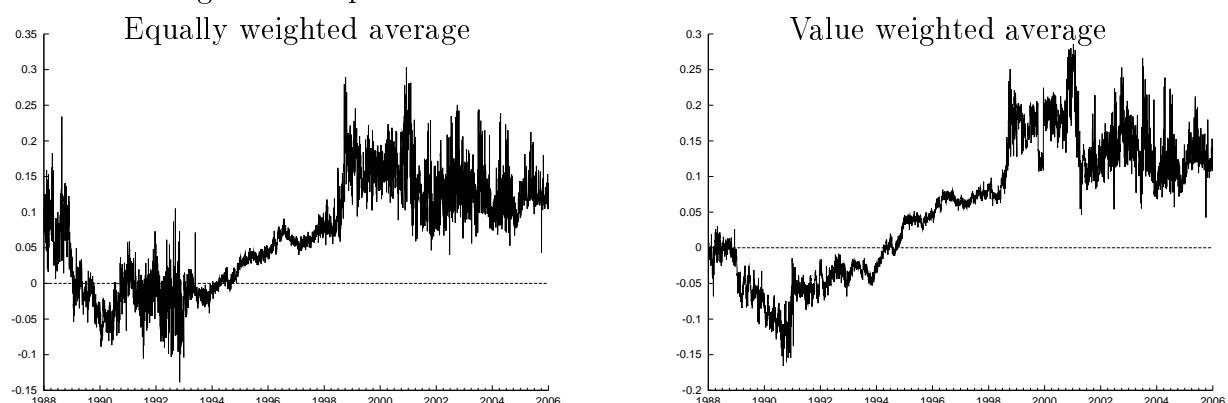
[22] As mentioned before, it became gradually clear to the market during 1994 that these restrictions would be lifted. In the regressions involving F shares 1994 is therefore left out.

**Fig. 2** Average relative price differentials

Panel A: Average relative price differential for A and B shares



Panel B: Average relative price differential for A and F shares
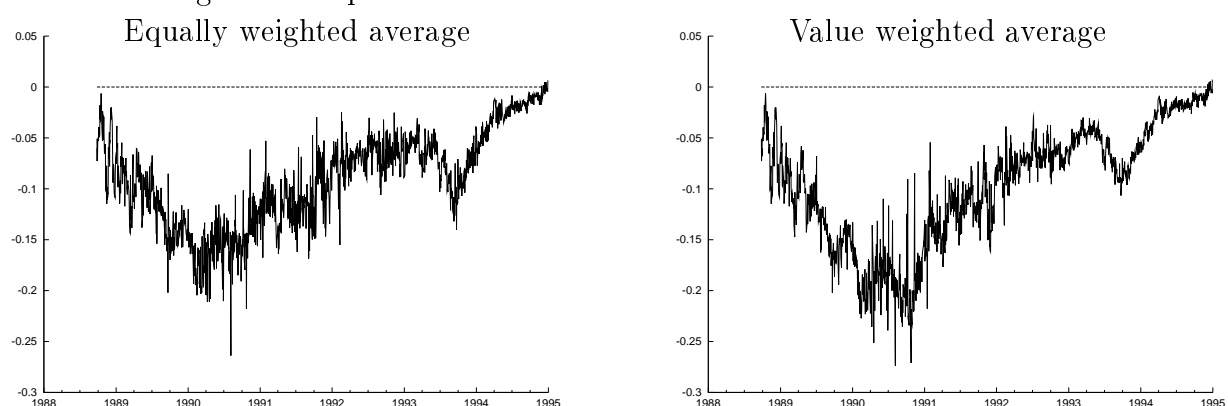


Panel C: Average relative price differential for F and B shares
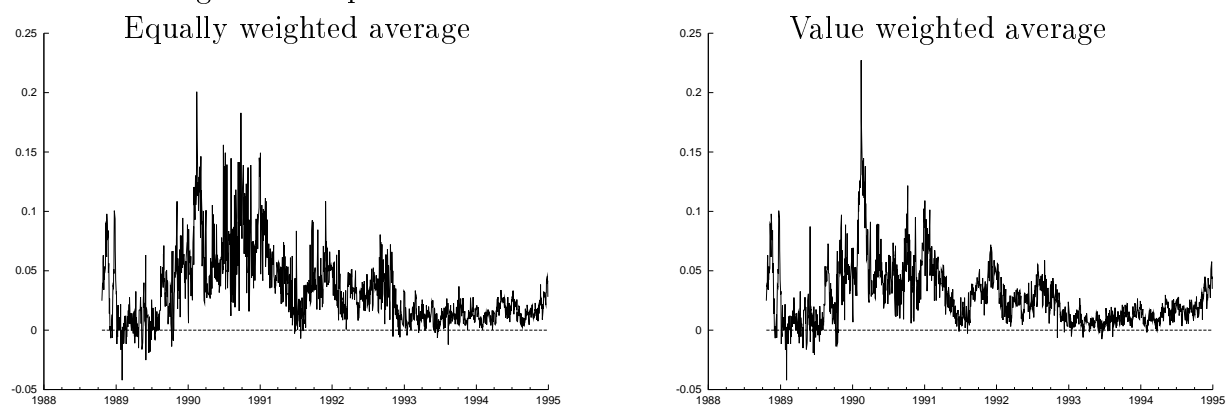


Average relative price differentials, defined as $(P_{A,it} - P_{B,it})/P_{A,it}$ for A and B shares, $(P_{A,it} - P_{F,it})/P_{A,it}$ for A and F shares, and $(P_{F,it} - P_{B,it})/P_{F,it}$ for F and B shares. A and F shares have full voting rights, while B shares have restricted voting rights. In companies with F shares foreigners can only hold F shares, while domestic owners can hold both F and A shares. In companies without F shares foreigners can hold up to 33% of the company's voting equity. There are no restrictions on ownership of B shares. The classes have equal dividend rights. $P_{A,it}(P_{B,it}, P_{F,t})$ is the stock price of an A(B,F) share in company $i$ at time $t$. At each date $t$ I first calculate the relative price differential only for those companies in which both classes actually traded, and then average across companies. Note that non-trading may induce some volatility in this average. In each panel, the picture on the left is an equally weighted average, and the one on the right is a value weighted average, where the company market value is used as weights. Data for companies traded on the Oslo Stock Exchange in the period 1988–2005.

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**Table 2** Averages of relative price differentials

Panel A. Subperiod averages

| | | 1988–1994 | | 1995-2005 | | 1988–2005 | |
|---|---|---|---|---|---|---|---|
| | | mean | [pvalue] | mean | [pvalue] | mean | [pvalue] |
| Difference A/B | ew | 1.5 | [0.12] | 9.7 | [0.00] | 5.6 | [0.00] |
| | vw | -3.4 | | 10.0 | | 5.6 | |
| | $n$ | 111 | | 115 | | 226 | |
| Difference A/F | ew | -9.1 | [0.00] | | | | |
| | vw | -9.5 | | | | | |
| | $n$ | 62 | | | | | |
| Difference F/B | ew | 4.9 | [0.00] | | | | |
| | vw | 3.7 | | | | | |
| | $n$ | 36 | | | | | |

Panel B. Annual Observations 1988–1994

| | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|---|
| Difference A/B | ew | 5.5 | -2.2 | -0.0 | 4.2 | 2.8 | 0.4 | 1.0 |
| | vw | 0.2 | -5.9 | -7.0 | -4.0 | -2.6 | -2.7 | 0.4 |
| | $n$ | 5 | 13 | 20 | 20 | 20 | 18 | 15 |
| Difference A/F | ew | -5.8 | -11.8 | -14.6 | -9.7 | -7.3 | -7.9 | -2.4 |
| | vw | -5.8 | -12.8 | -18.1 | -11.0 | -7.2 | -6.8 | -2.1 |
| | $n$ | 1 | 10 | 12 | 10 | 9 | 10 | 10 |
| Difference F/B | ew | 4.7 | 5.8 | 12.4 | 4.1 | 3.5 | 1.3 | 1.7 |
| | vw | 4.7 | 5.2 | 9.0 | 3.8 | 2.7 | 1.0 | 1.5 |
| | $n$ | 1 | 4 | 7 | 6 | 6 | 6 | 6 |

Panel C. Annual Observations 1995–2005

| | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Difference A/B | ew | 3.2 | 5.4 | 6.8 | 11.6 | 15.3 | 12.9 | 12.5 | 10.6 | 10.6 | 9.2 | 12.0 |
| | vw | 3.9 | 6.5 | 6.9 | 9.4 | 14.7 | 14.9 | 12.8 | 13.7 | 11.3 | 9.0 | 12.3 |
| | $n$ | 14 | 15 | 15 | 15 | 12 | 10 | 9 | 6 | 4 | 4 | 4 |

Averages of percentage relative price differentials. *ew*: Equally weighted average; *vw*: Value weighted average; *n*: number of observations. For each year in the sample period I calculate the annual average of the daily relative price differential for the various combination of classes. Panel A shows subperiod averages, while Panels B and C shows annual averages. The *p*-values in panel A are results of a test of the null that the average is zero. *Difference A/B* is the relative price difference $(P_{A,it} - P_{B,it})/P_{A,it}$, where $P_{A_{it}}$ is the price of an A share in company $i$ at time $t$ and the $P_{B,it}$ is the price of a B share in the same company at the same date. Similarly, *Difference A/F* is the relative price difference $(P_{A,it} - P_{F,it})/P_{A,it}$ and *Difference F/B* the relative price difference $(P_{F,it} - P_{B,it})/P_{F,it}$. A and F shares are fully voting, while B shares have limited voting rights. In companies with F shares the A shares are available only to domestic investors, while the F shares are also accessible to foreigners. B shares are equally accessible to all investors. All classes have equal dividend rights. In calculating the averages in this table I first find the annual average for each company, before taking the average across companies. This will limit noise due to non-trading which is apparent in figure 2. The value weighted averages are calculated on the basis of the total market value of shares outstanding for the company. Data for companies traded on the Oslo Stock Exchange in the period 1988–2005.

Finally, consider the F and the B shares. As shown in panel A of table 2, the average F share is priced 4.9% above the average B share. This is also shown in the time series in panel C of figure 2. Recall that the F shares have full voting rights while the B shares have limited voting rights. Neither of these share classes have restrictions on foreign ownership. The candidate explanations of

these price differences are therefore corporate governance and liquidity. The F shares are on average priced higher than the B shares, meaning that the superior voting shares are more valuable. This is in the same period when the B shares trade at a premium to the A shares. Taken together, this may be used to argue that votes are valuable also in the pre-95 period, they are merely not important enough to outweigh the effects of segmentation for the A and B shares. The difference between the F and B shares can thus be viewed as a better estimate of the voting rights premium than the difference between the A and B shares, since the F/B difference abstracts from foreign ownership.

## 4.3  Construction of proxies

To more formally test the hypothesized explanations of the various price differences I run a number of regressions with the price difference as the dependent variable and various proxies for corporate governance, market segmentation and liquidity as explanatory variables. This section describes the chosen proxies. Table 3 gives some descriptive statistics for the various proxies.

**Table 3** Descriptive statistics for the explanatory variables

| | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | All obs. mean | (stdev) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fraction nonvoting (B) | 10.0 | 15.8 | 15.1 | 18.2 | 15.0 | 14.6 | 12.9 | 14.5 | 15.9 | 13.8 | 11.0 | 8.6 | 6.8 | 5.8 | 5.1 | 12.7 | (15.9) |
| Largest owner | 23.6 | 19.9 | 27.3 | 25.1 | 23.4 | 21.7 | 25.0 | 29.1 | 22.3 | 21.4 | 33.0 | 30.5 | 20.4 | 32.1 | 29.5 | 25.4 | (20.3) |
| Largest owner, fraction voting | 91.5 | 88.4 | 90.1 | 92.1 | 96.7 | 95.3 | 96.0 | 92.3 | 93.3 | 93.4 | 91.2 | 92.3 | 95.7 | 94.4 | 93.0 | 93.0 | (12.8) |
| Primary insider fraction | 4.6 | 7.3 | 6.0 | 3.8 | 3.2 | 5.4 | 6.9 | 9.6 | 7.6 | 9.3 | 8.7 | 9.1 | 8.8 | 11.1 | 6.8 | 7.0 | (19.4) |
| Fraction foreigners, voting shares | 25.7 | 18.9 | 17.3 | 15.6 | 13.8 | 15.8 | 23.0 | 24.1 | 22.8 | 29.3 | 32.2 | 30.7 | 26.4 | 28.7 | 23.4 | 22.8 | (19.0) |
| Fraction foreigners, A shares | 18.7 | 15.2 | 14.6 | 11.9 | 9.0 | 17.9 | 23.1 | 21.5 | 21.6 | 23.3 | 28.0 | 25.3 | 28.7 | 26.4 | 22.2 | 20.1 | (23.4) |
| Fraction foreigners, B shares | 55.0 | 43.8 | 44.6 | 47.4 | 38.7 | 46.0 | 38.9 | 34.2 | 29.9 | 22.3 | 27.6 | 20.4 | 26.6 | 23.4 | 9.4 | 35.4 | (29.5) |
| Fraction foreigners, F shares | 62.5 | 48.1 | 52.4 | 57.8 | 63.0 | 15.3 | | | | | | | | | | 55.7 | (28.5) |
| Turnover A shares | 66.6 | 41.6 | 35.9 | 41.1 | 75.7 | 65.6 | 66.5 | 74.4 | 72.1 | 62.4 | 83.1 | 74.4 | 93.3 | 77.8 | 70.4 | 65.2 | (58.8) |
| Turnover B shares | 45.7 | 71.6 | 79.2 | 66.4 | 125.1 | 100.0 | 79.7 | 102.3 | 80.2 | 56.5 | 49.5 | 54.3 | 42.8 | 26.2 | 61.5 | 73.6 | (61.0) |
| Turnover F shares | 89.9 | 54.8 | 59.4 | 72.4 | 114.3 | 92.1 | | | | | | | | | | 78.7 | (79.2) |
| B/A Spread A shares | 2.9 | 3.3 | 5.3 | 11.2 | 6.1 | 3.5 | 3.6 | 2.5 | 2.2 | 3.2 | 3.6 | 3.9 | 4.1 | 4.4 | 4.7 | 4.3 | (6.3) |
| B/A Spread B shares | 4.9 | 4.6 | 5.6 | 11.2 | 5.3 | 3.1 | 3.3 | 1.8 | 2.6 | 4.0 | 4.9 | 6.6 | 7.8 | 9.0 | 4.5 | 5.2 | (6.8) |
| B/A Spread F shares | 2.6 | 4.6 | 6.0 | 4.8 | 2.5 | 2.0 | | | | | | | | | | 3.9 | (4.0) |

The table list descriptive statistics for the various explanatory variables. *Fraction Nonvoting*: The fraction of the company's equity which is limited voting (B) shares, *Largest Owner*: Fraction of the company's voting stock owned by the largest owner, *Largest owner, fraction voting*: The fraction of the holdings of the largest owner which is voting shares. *Insider Fraction*: Fraction of the company's stock owned by the firm's primary insiders, *Fraction foreign*: The fraction owned by foreign investors, *Turnover*: The fraction of a company's equity which is traded in a given year, *B/A Spread*: The bid ask spread is calculated as (Bid − Ask)/Trade Price.. All variables except turnover and bid/ask spread are measured at yearend. In constructing the table the Bid Ask spread for a security is calculated as the average during the year. All averages are equally weighted. Data for companies traded on the Oslo Stock Exchange in the period 1988–2005.

As proxies relevant for corporate governance I use variables which have been shown to matter for corporate governance, namely ownership concentration

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and insider holdings. These are typical variables in crossectional studies of whether corporate governance matters, [23] and have also been shown to matter for Norwegian corporate governance (Bøhren and Ødegaard, 2006). The typical results from corporate governance studies are that there is a difference between inside and outside concentration, inside concentration having a positive effect on firm performance, measured by Q, and outside concentration having a negative or neutral effect on firm performance. A measure of ownership concentration is also a typical variable in studies of dual class equity because it is related to the potential for extracting benefits, since concentration of voting stock makes it easier to get a majority. [24]

The average firm has the largest owner holding 25% of its voting stock. The largest owner tends to hold mainly voting stock, only 7% of the largest owner's equity stake is in nonvoting shares. On average 7% of the firm's equity is owned by its primary insiders (the corporation's directors and board members).

The prime explanatory variable related to market segmentation is the fraction of voting shares held by international owners. Prior to 1995 this had a regulatory maximum of one third. There is no regulatory limit on foreign ownership in the post-94 period. Over the whole period foreign owners owned an average of 22.8% of the voting equity in firms with dual class structures. While the average is well below the 33% limit, this number varies, both over time and across firms, and there are companies where at times the 33% constraint is binding.

The final proxies are for liquidity, where I use both share turnover and bid/ask spread as proxies. The annual turnover per class is measured as the fraction of stocks outstanding traded during the year. In regressions explaining price differences between two classes, the relative turnover between the two classes is used as the explanatory variable. Turnover is calculated for each class. The relative turnover is one divided by the other. A premium on classes with higher liquidity implies a positive coefficient on this variable. Table 3 shows the annual averages of the stock turnover. Note the difference in the time series evolution of liquidity across classes. In the beginning the B shares seem most liquid, with a turnover as high as 125% in 1993. However, the turnovers of the B shares then show a steady decline, while the turnovers of the A shares increase, in particular after the F shares are merged with the A shares in 1995. This differential evolution of liquidity the table is also shown by the other liquidity measure, the relative bid/ask spread, where the bid/ask spread

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[23] See for example Demsetz and Lehn (1985), Morck, Shleifer, and Vishny (1988) and McConnell and Servaes (1990).

[24] An alternative governance proxy would have been a measure of family control. However, for the Norwegian companies with dual class stock there are only a handful of shipping companies where the founding family retains control. This proxy is therefore not feasible for Norway.

for the A shares is lower than for the B shares after 1995, whereas before 1995 the bid/ask spreads were similar in magnitude.

In all regressions I add firm size (company market value) as an explanatory variable to control for firm heterogeneity not captured in the other explanatory variables. Most of the companies in the sample are among the largest on the OSE, but there are some smaller and medium sized companies, particularly among those that have issued B shares.

## 4.4   Regression results

### 4.4.1   Price differences between A and B shares

Panel A of table 4 shows the results of regressing the relative price differences of the A and B shares on the above proxies, using data for the whole period. To account for the change in regulation of foreign ownership at the end of 1994 the regressions include a dummy variable equal to one if the observation was prior to 1995. This dummy is highly significant, consistent with the regulatory restriction on foreign ownership having a pricing impact. I therefore split the data into the two sub-periods, before and after 1/1/95, and discuss the results separately for these two sub-periods, using the estimates shown in panels B and C of table 4.

The most striking finding in the first subperiod is the highly significant, negative coefficient on the foreign ownership variable. As predicted, the closer the international ownership is to the regulatory limit, the higher the premium foreigners are willing to pay. Except for the coefficient on firm size, none of the other explanatory variables are significant. The regressions therefore confirm the hypothesis that the prime cause of the price differences between the A and B shares in this period is foreign ownership restrictions.

The pattern in the second subperiod is different. While the foreign ownership variable is still significant, both corporate governance variables and liquidity are also significant determinants of the voting premium. The coefficients on fraction owned by the largest owner and the relative turnover are both significantly positive, results which are consistent with the offered explanations.

The most likely explanation of the pattern of price differences between A and B shares, in particular the time series shift in 1995, is that when foreigners had restricted access to the Norwegian equity market, this induced a premium on shares accessible to foreigners. This effect is large enough to outweigh the value of the superior votes for the A shares. In 1995 voting shares start trading at a premium to limited voting shares. The corporate control explanation becomes more prominent when restrictions on foreign ownership are lifted, but it was

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**Table 4** Regressions explaining price differences between A and B shares.

Panel A: Whole period 1989–2003.

|  | coeff | [pvalue] | coeff | [pvalue] |
|---|---|---|---|---|
| Constant | 0.136 | [0.31] | 0.066 | [0.64] |
| Largest owner | 0.159 | [0.03] | 0.152 | [0.04] |
| Insider fraction | -0.020 | [0.61] | 0.003 | [0.98] |
| Foreign fraction | -0.153 | [0.00] | -0.148 | [0.00] |
| Before 95 | -0.089 | [0.00] | -0.085 | [0.00] |
| Relative turnover A/B | -0.000 | [0.93] |  |  |
| Relative bid-ask spread A/B |  |  | 0.022 | [0.36] |
| log company value | -0.001 | [0.82] | 0.001 | [0.89] |
| $n$ | 206 |  | 206 |  |
| $\bar{R}^2$ | 0.25 |  | 0.25 |  |

Panel B: Subperiod 1989–1994:

|  | coeff | [pvalue] | coeff | [pvalue] |
|---|---|---|---|---|
| Constant | 0.509 | [0.00] | 0.393 | [0.02] |
| Largest owner | -0.060 | [0.55] | -0.056 | [0.57] |
| Insider fraction | -0.016 | [0.76] | -0.008 | [0.96] |
| Foreign fraction | -0.232 | [0.00] | -0.243 | [0.00] |
| Relative turnover A/B | -0.002 | [0.38] |  |  |
| Relative bid-ask spread A/B |  |  | 0.045 | [0.20] |
| log company value | -0.020 | [0.00] | -0.016 | [0.02] |
| $n$ | 101 |  | 101 |  |
| $\bar{R}^2$ | 0.28 |  | 0.28 |  |

Panel C: Subperiod 1995–2003:

|  | coeff | [pvalue] | coeff | [pvalue] |
|---|---|---|---|---|
| Constant | -0.548 | [0.03] | -0.456 | [0.07] |
| Largest owner | 0.300 | [0.00] | 0.260 | [0.02] |
| Insider fraction | 0.030 | [0.59] | 0.011 | [0.95] |
| Foreign fraction | -0.205 | [0.00] | -0.174 | [0.02] |
| Relative turnover A/B | 0.043 | [0.00] |  |  |
| Relative bid-ask spread A/B |  |  | 0.014 | [0.68] |
| log company value | 0.027 | [0.02] | 0.024 | [0.03] |
| $n$ | 105 |  | 105 |  |
| $\bar{R}^2$ | 0.18 |  | 0.10 |  |

Regressions explaining relative price differences between A and B shares. The dependent variable is the average relative Price differential $(P_{A,it} - P_{B,it})/P_{A,it}$ for a given year. All classes have equal dividend rights. The A shares have full voting rights, while the B shares have limited voting rights. *Largest Owner*: Fraction of the company's voting stock owned by the largest owner, *Insider Fraction*: Fraction of the company's stock owned by the firm's primary insiders, *Before 95*: Dummy variable equal to one if the date is before 1/1/1995, *Foreign fraction*: The fraction of the company's voting stock which is owned by foreigners, *Relative Turnover*: Divides the turnover of the first class by the turnover of the second, *Relative B/A Spread*: The relative bid/ask spread. The bid ask spread is calculated as $(Bid - Ask)/Trade\ Price$. The relative bid ask spread of two stocks is the quotient of the two bid ask spreads, *Company value*: The market

most likely present also in the pre-95 period, which will later be investigated using the price differences between F and B shares.

### 4.4.2 Price differences between A and F shares

Table 5 shows the results of regressions where the relative price differences of the A and F shares are the dependent variables. Due to the removal of the F class in 1994, the sample period for this regression is 1989–93, corresponding to the first subperiod in table 4. This unfortunately limits the sample size to 51 observations. The sample is also small because there are fewer companies that have issued F shares.

**Table 5** Regression explaining price differences between A and F shares.

|  | coeff | [pvalue] | coeff | [pvalue] |
|---|---|---|---|---|
| Constant | 0.322 | [0.26] | -0.154 | [0.52] |
| Largest owner | -0.066 | [0.69] | 0.096 | [0.49] |
| Insider fraction | 11.865 | [0.06] | -0.036 | [1.00] |
| Foreign fraction | -0.093 | [0.47] | 0.036 | [0.73] |
| Relative turnover A/F | 0.000 | [0.85] |  |  |
| Relative bid-ask spread A/F |  |  | 0.229 | [0.00] |
| log company value | -0.019 | [0.17] | -0.004 | [0.69] |
| $n$ | 51 |  | 51 |  |
| $\bar{R}^2$ | 0.13 |  | 0.42 |  |

Regressions explaining relative price differences between A and F shares. The dependent variable is the average relative price differential $\left(P_{A,it} - P_{F,it}\right)/P_{A,it}$ for the year. The two share classes have equal voting and dividend rights, but only the F shares are available to foreigners. *Largest Owner*: Fraction of the company's voting stock owned by the largest owner, *Insider Fraction*: Fraction of the company's stock owned by the firm's primary insiders, *Foreign fraction*: The fraction of the company's voting stock which is owned by foreigners, *Relative Turnover*: Divides the turnover of the first class by the turnover of the second, *Relative B/A Spread*: The relative bid/ask spread. The bid ask spread is calculated as $(Bid - Ask)$/Trade Price. The relative bid ask spread of two stocks is the quotient of the two bid ask spreads, *Company value*: The market value of the firm's equity. Except for turnover and bid-ask spread all explanatory variables are measured at yearend. The turnover is calculated for the whole year. The bid-ask spread is an annual average. The table lists the coefficient estimate and $p$-value for each explanatory variable, together with the number of observations $n$ and the adjusted $R^2$ for the regression. Data for companies traded on the Oslo Stock Exchange in the period 1988–1994. Data for 1994 is not included since the F shares by then were known to be disappearing.

Looking across the two regressions, we see that the only case of a significant determinant is liquidity measured by the relative bid/ask spread. The remaining variable are insignificant and also varies in sign across the two regressions. This small sample may be a prime reason for this. This lack of significance may also be related to a relatively low crossectional variability in some of the explanatory variables, such as the foreign ownership. [25]

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[25] The foreign ownership fraction variable does not vary a lot in the companies with

Summarizing, there is a large price difference between the A and F shares. The F shares, which are the only ones accessible to foreign investors, have a substantial premium. While the regressions do not support it, the sign and magnitude of the premium reinforces the findings of the A/B case, where, in the same period, foreign ownership was a significant determinant of the price difference between the A and B shares. This difference between the A and the B shares goes in the same direction; the B share, which is more easily available to foreign investors, is priced higher than the A share, in spite of the A share's superior voting power.

### 4.4.3  Price differences between B and F shares

Table 6 shows the results of a regression explaining the price difference between the F and B shares, using data for the period 1989–94. Note also here the relatively short sample, with only 29 observations, which makes it hard to put a lot of weight on these results. With that reservation, observe that both ownership concentration and foreign ownership are significant determinants of price differences. The ownership concentration variable is consistent with a corporate governance explanation. The significance of the foreign ownership is more surprising; foreign ownership should not matter for these two classes, as they are equally accessible to foreigners. It may however be an artifact of the link between prices of A and F shares.

## 5   Conclusion

This paper is the only academic study of price differences between dual class equity on the Oslo Stock Exchange. I simultaneously consider three explanations for price differences: Corporate governance, market segmentation between domestic and foreign investors, and liquidity.

To summarize the results, consider first the two classes A and B. The A shares have full voting rights, the B shares have limited voting rights. A time series plot of the price difference between the fully voting A shares and the nonvoting B shares shows that, in the first sub-period of the sample, the B shares at times traded at a premium to the A shares. The difference gradually shrinks until the A shares start trading at a premium. The change to a positive "voting rights premium" coincides with the lifting of restrictions on foreign ownership. Regression analysis confirm that the prime explanatory factor for the price

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issued F shares, as they are all among the largest companies on the OSE. These are also the companies which have the most foreign ownership. The turnovers for A and F shares are also similar in magnitude.

**Table 6** Regression explaining price differences between F and B shares

| | coeff | [pvalue] | coeff | [pvalue] |
|---|---|---|---|---|
| Constant | 0.343 | [0.53] | 0.616 | [0.24] |
| Largest owner | 0.707 | [0.06] | 0.350 | [0.36] |
| Insider fraction | 1.991 | [0.74] | 3.214 | [0.64] |
| Foreign fraction | -0.329 | [0.03] | -0.290 | [0.03] |
| Relative turnover F/B | -0.005 | [0.36] | | |
| Relative bid-ask spread F/B | | | 0.036 | [0.25] |
| log company value | -0.013 | [0.61] | -0.026 | [0.28] |
| $n$ | 29 | | 29 | |
| $\bar{R}^2$ | 0.36 | | 0.38 | |

Regressions explaining relative price differential between F and B shares. The dependent variable is the average relative price differential $\left(P_{F,it} - P_{B,it}\right)/P_{F,it}$ for a given year. The classes have equal dividend rights. Both the B and the F shares are equally accessible to foreign investors. The F shares have full voting rights, the B shares have limited voting rights. *Largest Owner*: Fraction of the company's voting stock owned by the largest owner, *Insider Fraction*: Fraction of the company's stock owned by the firm's primary insiders, *Foreign fraction*: The fraction of the company's voting stock which is owned by foreigners, *Relative Turnover*: Divides the turnover of the first class by the turnover of the second, *Relative B/A Spread*: The relative bid/ask spread. The bid ask spread is calculated as $(Bid - Ask)/$Trade Price. The relative bid ask spread of two stocks is the quotient of the two bid ask spreads, *Company value*: The market value of the firm's equity. Except for turnover and bid-ask spread all explanatory variables are measured at yearend. The table lists the coefficient estimate and $p$-value for each explanatory variable, together with the number of observations $n$ and the adjusted $R^2$ for the regression. Data for companies traded on the Oslo Stock Exchange in the period 1988–1994. The turnover is calculated for the whole year. The bid-ask spread is an annual average. Data for 1994 are not included since the F shares by then were known to be disappearing.

difference in the pre-95 period is the fraction of the firm's shares held by foreigners. The price difference is larger the larger the holdings of foreign investors. In the post-94 period corporate governance and stock liquidity are both significant determinants of price differences.

That votes are valuable also in the pre-95 period is confirmed by the price differences between the F and B shares, which are equally accessible to foreign investors. The F shares are voting, while the B shares have limited voting rights. Throughout the pre-95 period the F shares are trading at a premium to B shares. Although the regressions show only marginal significance on corporate governance variables, the magnitude of the positive premium on the F shares can be used to argue that votes, and hence corporate governance, are important also in this period.

The importance of the regulatory restrictions on foreign ownership is similarly confirmed by the large price differences between the A and F shares. Both classes have full voting rights, but only the F shares are available to foreign investors. The F shares are trading at a substantial premium to A shares the whole pre-95 period.

Concluding, the paper shows results which are familiar from other markets. Corporate governance considerations produce a premium on voting shares. Rationing of foreign investors produces a premium on shares available to foreigners. More liquid stock trades at a premium. The paper shows that *all* of these factors are important causes of price differences of dual class shares. The novelty of the Norwegian case is that when these effects are mixed together, they produce results that seem counter-intuitive, in particular the negative "voting premium," which is shown to be explainable as the effect of segmentation of foreigners dominating the corporate governance effects.

An important lesson of the paper is the need for single country studies to *really* figure out what goes on in a country/market, and also to temper the conclusions of large, multi-country studies by a healthy skepticism in asking whether *all* the relevant country specific differences have been taken care of.

The results of the paper are also important for practical uses of dual class price differences. For example, in a textbook valuation context, Damodaran (2005) shows how to use dual class equity to estimate the value of control, also in an international setting. The need to account for other potential sources of price differences than corporate control is not mentioned. Depending on country, such uses could lead to very misleading valuations, either over or under-estimating the value of control. The point that one needs to consider alternative influences than corporate control on dual class price differences apparently needs to be made yet again.

# Appendix
# Companies used in the analysis

The table lists the company name, the security classes, and the time periods for which each security is listed. Dashes indicate that the stock was trading before and after the sample period, respectively. There are three classes of equity: A, B and F. The A and F shares have full voting rights. The B shares have limited voting rights. In companies with F shares the A shares are not accessible to foreigners, while F shares are equally accessible to foreign and domestic investors. In companies without F shares only 33% of A shares can be owned by foreigners. Restrictions on foreign ownership were lifted at the end of 1994. At the same time the F shares were relabeled A shares. All classes have equal dividend rights. Data for companies traded on the

Oslo Stock Exchange in the period 1988–2005.

| Company | Equity Class | Listing Period From | To |
|---|---|---|---|
| AF Gruppen | A | 1997 | – |
| | B | 1997 | 1999 |
| Adelsten | A | 1992 | 1999 |
| | B | 1992 | 1999 |
| Aker | A | – | 2000 |
| | B | – | 2000 |
| | F | – | 1994 |
| Awilco | A | – | 2003 |
| | B | – | 2003 |
| Bergesen | A | – | 2003 |
| | B | – | 2003 |
| Bik Bok | A | – | 1989 |
| | B | – | 1989 |
| Borgestad | A | – | – |
| | B | 1990 | 2003 |
| Christiania | A | – | 1991 |
| | F | – | 1991 |
| DNO | A | – | – |
| | B | – | 1992 |
| Elkem | A | – | – |
| | F | – | 1994 |
| Fokus Bank | A | – | 1991 |
| | F | – | 1991 |
| Goodtech | A | – | – |
| | B | – | 1992 |
| Grand Hotel | A | – | 1996 |
| | F | 1990 | 1994 |
| Hafslund Nycomed | A | – | – |
| | B | – | – |
| | F | – | 1994 |
| Havtor | A | – | 1996 |
| | B | 1990 | 1993 |
| Hydralift | A | 1996 | 2003 |
| | B | 1998 | 2001 |
| Kværner | A | – | – |
| | B | – | 2000 |
| | F | – | 1994 |
| Mosvold Shipping | A | 1990 | 1997 |
| | B | 1990 | 1997 |

| Company | Equity Class | Listing Period From | To |
|---|---|---|---|
| Nora Industrier | A | – | 1991 |
| | B | 1990 | 1991 |
| | F | – | 1991 |
| Norsk Data | A | – | 1993 |
| | B | – | 1993 |
| Norske Skog | A | – | – |
| | B | 1990 | 2001 |
| | F | 1990 | 1994 |
| Nycomed | A | 1996 | 1997 |
| | B | 1996 | 1997 |
| Nycomed Amersham | A | 1997 | 1998 |
| | B | 1997 | 1998 |
| Nydalens compagnie | A | – | 1999 |
| | B | 1992 | 1994 |
| Orkla | A | – | – |
| | B | 1990 | 1999 |
| | F | – | 1994 |
| Rieber | A | – | – |
| | B | 1990 | 2001 |
| Saga Petroleum | A | – | 1999 |
| | B | – | 1998 |
| | F | – | 1994 |
| Scanvest Ring | A | – | 1989 |
| | B | – | 1989 |
| Simrad | A | – | 1996 |
| | B | – | 1996 |
| Smedvig | A | 1990 | – |
| | B | 1996 | – |
| Storebrand | A | – | – |
| | F | – | 1994 |
| Storli | A | – | – |
| | B | – | – |
| Søndenfjeldske | A | – | 2002 |
| | B | 1990 | 1993 |
| Vard | A | – | 2000 |
| | B | – | 1992 |
| Vital Forsikring | A | 1991 | 1996 |
| | F | 1991 | 1994 |
| Wilh. Wilhelmsen | A | – | – |
| | B | – | – |

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