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Payout Policy in the Nordic Region[☆]

A study of share repurchases in Sweden, Denmark and Finland

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Abstract

The aim of this thesis is to explain observed differences in the development of payout policy between Sweden, Denmark and Finland. The main discrepancy observed over the sample period is that share repurchases is a more important payout form in Denmark. We find that inflation has an impact on the payout decision and that a high repurchase activity in Denmark can be explained by a relatively high level of inflation. Other variables, such as undervaluation and excess cash that in general theory are considered to affect payout decision, do not seem to have an explanatory impact on payout behavior in Sweden, Denmark and Finland. Although not explicitly tested, we find indications of institutional constraints and tax treatment of private investors having an impact on payout policy.

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I. Introduction

Every year, companies face the decision of whether or not to distribute cash to their shareholders and to what extent to do so. Allen and Michaely (2002) describe the decision of how much and in what form cash should be distributed to owners as a dynamic process, referred to as *payout policy*. Furthermore, they argue that payout policy is important since it is closely related to investment- and financial decisions of companies. Fama and French (2000) identify a change in payout policy, observing that dividend payments are in a decreasing trend. The proportion of companies paying dividends has fallen dramatically from 66.5% in 1978 to 20.8% in 1999. Moreover, Grullon and Michaely (2002) explain that dividends have been the dominant payout method but that share repurchases have become increasingly important as a form of payout.

The studies mentioned above were all performed on the well-examined American market; the focus of this study is payout policy in the Nordic region, a region where empirical evidence on payout policy is limited.

There are two main methods for redistributing cash to the shareholders: *dividends* and *share repurchases*. Through dividends, a fraction of earnings is paid out as direct income to the shareholders according to the capital rights of the shares. Share repurchases, on the other hand, is a process in which a proportion of a company's outstanding shares are repurchased. In addition to the evidence found by Fama and French (2000) saying that the relative importance of share repurchases has increased, Jagannathan, Stephens and Weisbach (1999) find that share repurchases has also increased on an aggregate level.

We examine payout policy in Sweden, Denmark and Finland, three Nordic countries with comparable institutional setting for payout policy. The main focus will be on share repurchases, a payout method that has been available to companies in the

three countries for different number of years. Despite a comparable institutional framework, payout pattern diverge between the three countries.

The aim of this thesis is to explain observed differences in the development of payout policy in Sweden, Denmark and Finland.

In a study by Lasfer (2000), payout policy in European countries is compared and the market valuation of announcements of share repurchases is examined. We have, however, not found any study that actually compares payout policy between countries in the Nordic region. In general, research on payout policies in the Nordic region can be considered limited. Thus, we believe that this thesis will add to the understanding of the concept of payout policy in this region. In a thesis by Ivarsson and Nabseth (2006), they examine the motives behind share repurchases in Sweden, using a qualitative study. Hallenberg and Sandström (2006) examines why both share repurchases and special dividends are in use in the Swedish market, focusing on the usefulness of each method. Gustafsson and Rydell (2004) compared the characteristics of dividends, share repurchases and redemptions¹, examining their effects on certain key ratios and the signalling effects from a theoretical perspective.

1.1 Delimitations

We look at three of the Nordic countries; Sweden, Denmark and Finland. The rationales for analysing and comparing payout policies in these counties are:

- i) Comparable culture and legal systems with many similarities.
- ii) They are members of the European Union, a factor pressing for further convergence in the institutional setting concerning share repurchases.
- iii) From 2006, companies in the three countries trade on the same stock exchange and are subject to the same listing conditions.

¹ Redemptions is an offer directed to all shareholders, giving them the opportunity to sell back a proportion of their shares to the company for a fixed price, usually well above market price.

By our selection criteria, we exclude the two Nordic countries Norway and Iceland. These two countries are not members of the European Union and not subject to the European directives regarding corporate law. Furthermore, Norway is not member of OMX and therefore not bound by their listing requirements.

The selection criteria for the companies included in our study are:

- i) Companies with primary listing on OMX
- ii) Companies listed on either the Large cap or the Mid cap list

We exclude companies with primary listing outside one of the three countries we are studying. The reason for this is that these partly follow legislation in other countries outside the region we are studying. We chose to include only the Large – and Mid cap lists since information is more readily available for companies listed on these.

The structure of this thesis is as follows; in section 2, we present the trends in payout policy in the three countries. Section 3 outlines the theoretical foundations for the thesis. In section 4 our hypotheses are presented, section 5 describes the methodology for testing these and section 6 displays the results. Finally, we discuss our results in section 7 and summarise our findings in the conclusion in section 8.

2. Payout policy in the Nordic Region

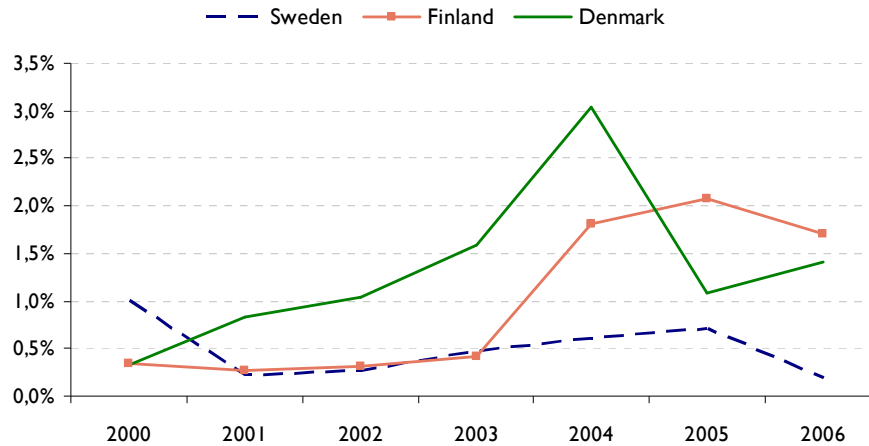
In this section, the payout policies of the three countries will be presented. First, the pattern in the volume of shares repurchased will be presented. Next, the value of the shares repurchased in relation to the value of dividends paid out is presented. Finally, the number of companies repurchasing shares and/or paying dividends is displayed.

2.1 Volume of shares repurchased

In this section we look at the total number of shares bought back in each country in a given year. We put this in relation to the total shares outstanding for the entire sample (figure 1).

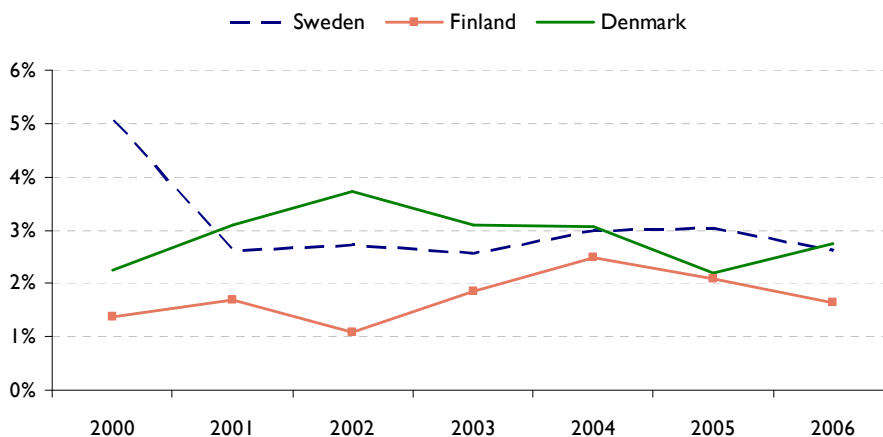
Looking at figure 1, we observe a number of trends. In Sweden, the highest percentage of total shares repurchased was reached in 2000 at a value of 1.01%. From 2001-2005, we see an increasing trend in proportion of outstanding shares repurchased followed by a dip in 2006. In Denmark, the percentage of total shares repurchased is higher and moving in a more strongly positive trend compared to the Swedish market. A large contributing factor for the extreme peak in 2004 is a repurchase programme initiated by TDC, repurchasing 8 % of their outstanding shares and also a programme by Danske Bank, repurchasing almost 6% of the company's outstanding shares. The Finnish market displays sharp year-on-year increases from 2003 to 2006. This trend is much due to Nokia's extensive repurchase programme. Should the trend excluding Nokia be plotted, the proportion of outstanding shares that are repurchased would be the lowest in Finland and in a decreasing trend.

Figure 1: Proportion of total shares outstanding that is repurchased



Since large companies have a large impact on the repurchase market as a whole, it is interesting to study firm behaviour in each country. For the companies repurchasing shares we thus look at the proportion of the company's outstanding shares that they buy back in a given year. We display the average proportion in each year and country (figure 2). The average is not weighted and thus large repurchase programmes by large companies receive the same treatment as smaller ones.

Figure 2: Average proportion of outstanding shares repurchased



The average proportion of total shares repurchased among repurchasing firms is generally highest in Denmark, fluctuating between 2.19 and 3.74%. In Sweden, the highest average proportion repurchased is achieved in 2000 when companies

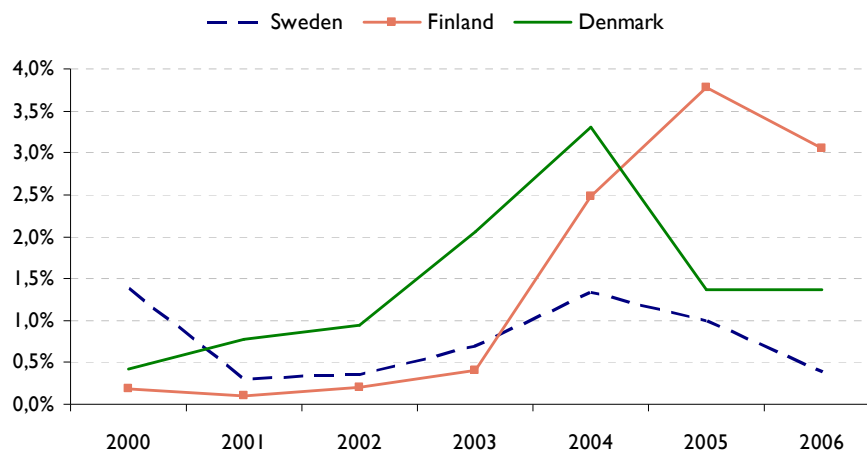
repurchasing shares on average bought 5.06% of their outstanding shares. Excluding this year, the average proportion of shares bought back varies between 2.58 and 3.05%, slightly lower than Denmark. However, we do see a converging trend. In Finland, the development is slightly increasing and varies between 1.01 and 2.09%. This is somewhat lower than in both Sweden and Denmark, indicating that Finnish companies tend to make smaller repurchases.

2.2 Value of shares repurchased and dividends

In this section, the value of shares repurchased and the value of the dividends paid out every year in each country is presented and compared.

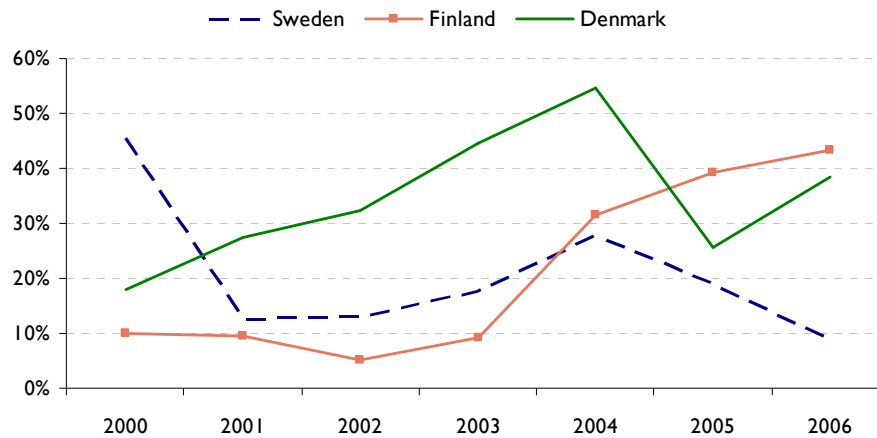
In figure 3, for each year and country, the value of total shares repurchased in relation to the market capitalisation is plotted. The patterns are similar to those in figure 1. It is notable that the proportion of market capitalisation repurchased is generally higher in Denmark. In figure 4, the value of shares repurchased is set in relation to the value of total payout, i.e. the sum of dividends and share repurchase in a given year in each country. This gives a view of the relative importance of each payout form in each country.

Figure 3: Value of repurchased shares in relation to market capitalisation



Looking at the value of shares repurchased in the three countries (Appendix I), we can observe the following; the market value of shares repurchased in Sweden is fairly stable, following a dip between 2000 and 2001 and a sharp increase in 2003 and 2004. These increases are mainly due to extensive programmes by Nordea and TeliaSonera accounting for some 50 % of the total market value of the shares repurchased in each year. Dividends increase strongly during the entire period in Sweden, indicated by the low proportion of total payout that relates to share repurchases (figure 4) implying that the importance of share repurchases decrease.

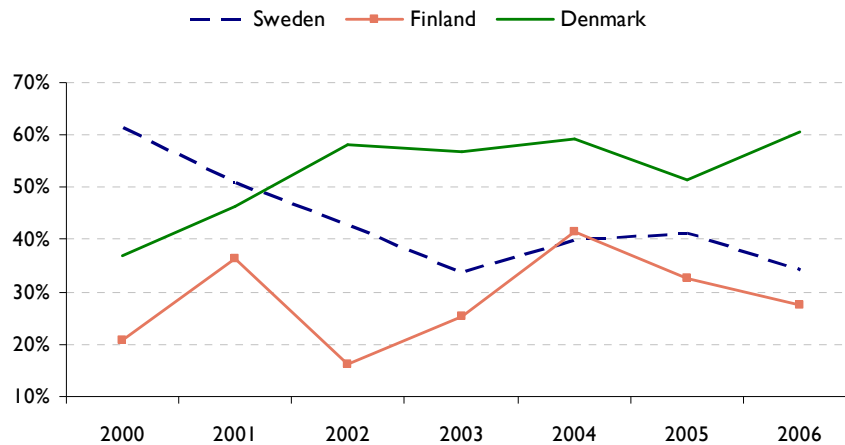
Figure 4: Proportion of total payout amount relating to share repurchases



The proportion of total payout relating to share repurchases is highest in Denmark and in an increasing trend (figure 4). In 2004, there is an extreme peak following large repurchases by TDC and Danske Bank. Looking at Finland, the proportion of total payout relating to share repurchases is generally the lowest. In the period 2004-2006, the proportion is substantially higher than for the rest of the period, caused by Nokia's repurchase programme accounting for some 80% of total value. Disregarding Nokia, the trend is decreasing; value of dividends increase while value of shares repurchased is stable.

It is also interesting to study the trends at the company level; we look at the proportion of a company's individual payout in a given year that relates to share repurchases. The mean value in every year and for each country is plotted in figure 5 below.

Figure 5: Average proportion of total payout relating to buy-backs

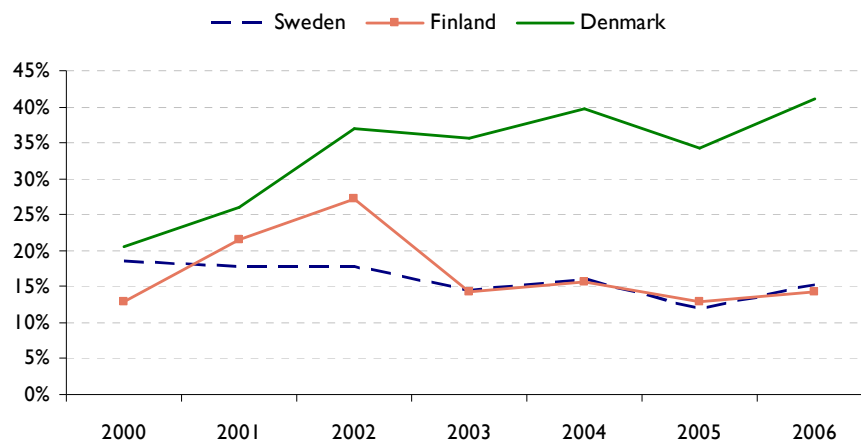


The mean proportion of payout that relates to share repurchases is in a decreasing trend in Sweden, particularly from 2000-2002. In Denmark, we see an increasing trend with a plateau from 2002-2004, indicating that Danish firms have become more inclined to repurchase shares rather than paying dividends. The proportion is substantially higher than in Sweden during the period 2002-2006. This can be seen as an indication that share repurchases are, relative to dividends, more important in Denmark. Looking at the trend for Finland, it is difficult to see a clear pattern; it varies between 16% and 41% (Appendix I). However, it is possible to see that the proportion is generally substantially lower than in Sweden and Denmark.

2.3 Number of firms using each payout form

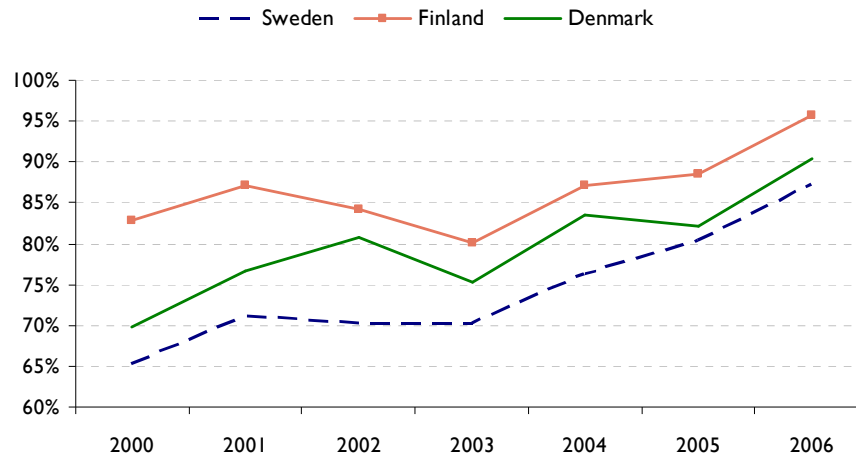
In this section, the number of companies using the different payout forms is presented. In figure 6, the proportion of all companies that repurchase shares in a given year is plotted for each country. Figure 7 plots the same ratio but for the number of companies that use the payout form dividends.

Figure 6: Proportion of companies repurchasing shares



In Sweden, the proportion of companies that repurchase shares is gradually decreasing over the sample period and generally has the lowest proportion among the three countries. Proportion of companies paying dividends is an opposite trend, reaching its peak in 2006. The proportion of companies involved in repurchase programs in Denmark is increasing strongly from 2000 to 2006. The number of companies that pay dividends also increases over the period but not as strongly compared to the proportion of companies repurchasing shares (figure 6 and figure 7). As a result of this, the proportion of companies repurchasing shares increases relative to companies paying dividends (figure 6 and figure 7).

Figure 7: Proportion of companies paying dividends



Looking at the Finnish market, the proportion of companies paying dividends is in an increasing trend indicating that companies tend to be more inclined to pay dividends rather than repurchase shares. Furthermore, the proportion paying dividends is the highest of the three countries. The proportion of companies in 2003-2006 that repurchase shares in Finland is similar to the levels found in Sweden. Looking at both figure 6 and figure 7, it seems as if Swedish firms are the least inclined to pay out cash to their owners. Another observation is that almost all companies repurchasing shares in the three countries also pay dividends (Appendix I).

2.4 Summary of findings

In this section, the main differences in the patterns of payout policy among the three countries are presented.

Most notable is that share repurchase activity is highest in Denmark. The proportion of market capitalisation is higher than in the other two countries and the value of share repurchases is in an increasing trend. Dividends are also in an increasing trend. However, it is not as strong as the increase in the value of share repurchases. The proportion of all companies that repurchase shares is substantially higher in Denmark compared to Finland and Sweden. Furthermore, the average company repurchase to a larger extent, both in absolute terms and in relation to dividends.

An implication of the above is that the importance of share repurchases relative dividends is highest in Denmark, both at an aggregate level and on a company level.

Looking at Sweden, we see a high level of repurchase activity following the legal change in 2000, allowing companies to repurchase shares. Following this peak, share repurchases seem to decline in importance relative dividends. The proportion of companies using repurchases as a payout form is declining while the proportion using dividends is increasing during the same period. At the company level, the average proportion of payout relating to repurchases is decreasing. Interestingly, the total proportion of companies that distribute cash to the owners is lower compared to Denmark and Finland.

In Finland, the trends are volatile and largely influenced by a single company, Nokia. Studying the years when Nokia issues buy-back programmes, we see very large increases on an aggregate level. However, these increases do not necessarily correspond to the pattern we identify at the company level, the indication of company behaviour. It can also be seen that dividends seem to be of higher importance compared to the other two countries. The proportion of companies using dividends as a method of distributing cash to owners is higher in Finland compared to Sweden and Denmark. We also see an increasing trend in this proportion when at the same time the proportion repurchasing shares is decreasing.

As can be seen, there are a number of differences in payout policy between the three countries studied. Following this, we will try to explain why we observe these differences. In the next section, the theoretical framework in which we take our starting point will be presented.

3. Background and theoretical framework

In this section, theories on the payout choice of companies and on trends in payout policy are presented. Furthermore, the regulatory framework for share repurchases is outlined.

3.1 The process of dividends and repurchases

The most frequently used method of distributing capital to owners is to pay dividends; see Fama and French (2000). Normally, the Board of Directors leaves a proposal of dividend before the Annual General Meeting (AGM) and after the financial statements have been agreed upon, the dividend is decided on. According to the law in the Sweden, Finland and Denmark, retained earnings can be distributed to the shareholders given that there is enough capital to cover restricted equity².

The process for repurchasing shares is similar to the dividend decision. In the countries we study, the board announces that it intends to seek approval from the AGM to initiate a buy-back programme. The AGM authorizes the board to decide upon share repurchases within given price- and quantity levels. Authorization from AGM does not, however, oblige the board to initiate a buy-back. This feature offers greater flexibility for the board, something that is discussed by Jagannathan, Stephens and Weisbach (1999). There are three different methods for actually repurchasing shares³, the method of open-market repurchases is clearly dominant and accounting for around 95% of the dollar value of shares repurchased, see Allen and Michaely (2002).

² See ABL, Fin_ABL and ASL

³ Open-market repurchase: Shares are bought, in fractions of total programme size, in the open market at the current market price.

Public tender offer: An offer directed to all shareholders to sell a proportion of their shares back to the company at a fixed price

Dutch auction: Similar to a tender offer but the shareholders individually state their ask-price. The company acquires, starting at the lowest reservation price.

The method of distributing capital to the shareholders in the form of share buy-backs have increased as a proportion of the total transfers in the market, see for instance Jagannathan, Stephens and Weisbach 1999⁴. Fama and French (2000) report the proportion of firms paying cash dividends on the U.S. market to have fallen from 66.5% in 1978 to 20.8% in 1999.

3.2 The choice between repurchasing shares and dividends

Miller and Modigliani (1961) showed that in a perfect and efficient capital market, the value of the firm will not be affected by the payout decision since owners are indifferent to receiving income as cash paid out or as capital gains. Furthermore, what does affect value is the investment policy of the firm, Miller and Modigliani (1961). In addition to this, they argue that when relaxing the assumptions⁵ of their model the payout choice can in fact affect firm value.

Lintner (1956) develops a model where he shows that changes in dividends depend on earnings to a large extent. Furthermore, he shows that the majority of companies tend to smooth dividends and have a target payout ratio. Jagannathan, Stephens and Weisbach (1999) find evidence for this in an empirical study and conclude that dividends and repurchases are used at different times and by different companies; repurchases are significantly more volatile than dividends and seem to depend on business cycle. They argue that:

“The ‘smoothness’ of the dividend pattern compared to the pro-cyclicality of the repurchase series is consistent with the conventional wisdom suggesting that dividends are paid out of sustainable cash flows while repurchases are paid out of temporary cash flows”⁶.

⁴ Study of the American market

⁵ a) No taxes, b) Symmetric information, c) Complete contracts, d) No transaction costs and e) Complete markets

⁶ Jagannathan, Stephens and Weisbach (1999, p.23)

In addition, they also conclude that firms with higher non-operating cash flows are more likely to increase repurchases, the same is said to be true for firms with higher standard deviation of cash flows. Grullon and Michaely (2002) additionally show that young firms have a tendency to repurchase rather than paying dividends. In their study, they also find that repurchases and dividends can be considered substitutes.

A model for shareholder preferences regarding dividend and share repurchases as methods of capital transfer is developed by Brennan and Thakor (1990). In their paper, they argue that corporations will make small payments through dividends, intermediate payouts through open market repurchases and large payouts through tender offer repurchases. If the effective personal income tax rate on dividends is not too high, shareholders with sufficiently low ownership holdings will prefer dividends, whereas those with sufficiently high ownership holdings (and no lower tax rates) will prefer repurchases.

Furthermore, Jagannathan, Stephens and Weisbach (1999) state that repurchases offer flexibility not only in the choice to distribute excess funds but also when to distribute these funds. If the management of a firm has been authorised to buy back shares, it can wait until the price in the market is favourable. On the other hand, the choice to pay dividends is a binding one and thus does not offer any flexibility regarding time and value of the payout.

Fama and French (2000) argue that share repurchases tend to be more common among companies that pay dividends. This is related to the findings of Grullon and Michaely (2002) that dividend payers have substituted dividends for repurchases during recent years. However, the substitution is not perfect: in a study why both special dividends and share repurchases are in use in Sweden, Hallenberg and Sandström (2006) show that the usefulness of either method of distributing cash is contingent on company characteristics. They find no evidence of different signalling power between the announcement of share repurchases and the announcement of special dividends.

3.3 Motives behind share repurchases

Many of the theories concerning the decision to pay dividends can be applied on share repurchases. Below, some of the theories explaining why firms repurchase shares are presented.

3.3.1 Undervaluation and signalling

Miller and Modigliani (1961) describe how payout decisions can be interpreted as signals of future earnings. Miller and Rock (1985) also stipulated that higher-than-expected payouts imply higher earnings. In an empirical study, Grullon and Michaely (2004) show three major results in line with Miller and Modigliani's findings:

1) repurchase announcements should be followed by positive changes in the share price. 2) Announcements should be followed by positive news about profitability and cash flow, even if not immediate. 3) Announcements should be immediately followed by positive changes in the market's expectations of the company's future profitability.

Chowdhry and Nanda (1994) develop a model where firms prefer share repurchases when the firm is undervalued. Investors interpret a repurchase announcement as a sign of undervaluation, bidding the share up until the miss-pricing is eliminated. The accuracy of the valuation and the amount of available information can hence affect firms' repurchase decisions; see for instance Vermaelen (1981). Greater information asymmetry increases the probability for a possible miss-valuation, stimulating the company to repurchase their undervalued shares.

Ofer and Thakor (1987) examine the information contained in the announcement of a share repurchase programme in comparison to dividends. They describe a model where the choice of distributing cash to owners through share repurchases increases the risk for the management compared to when paying dividends. The signalling cost is thus higher for repurchases and hence only used when the discrepancy between actual investment prospects and market expectations is large.

3.3.2 The Free Cash-flow hypothesis

Jensen and Meckling (1976) describe a conflict of interest between managers and owners that affect the dividend policy. Management can distribute excess cash to activities that benefits the managers but not the owners. This is usually referred to as the free cash flow problem. Jensen (1986) suggests a possible solution to this problem: the owners can try to minimize the amount of excess cash available to managers. Companies repurchasing shares give cash to their shareholders in a fast and tax effective way. This reduces the amount of excess cash that can be used to fund negative Net Present Value (NPV) investment projects. Hence, share repurchases can reduce the cash controlled by the managers, thus reducing the free cash flow problem. Furthermore, repurchases increase the relative ownership of management, aligning the interests of managers and owners. An implication of this is a possible decrease of the agency problem, resulting in an increased value of the company.

3.3.3 Tax reasons

According to Miller and Modigliani (1961), different investor groups are taxed differently and the firm should act to minimize the tax burden for all these groups. This affects the payout decision. Furthermore, even if the investors are taxed in a similar way, the capital gains tax can be lower than the tax on dividends, as discussed by Allen and Michaely (2002). The heavier taxation of dividends compared to capital gains is a commonly discussed disadvantage of dividends compared to share repurchases; see Fama and French (2000).

In countries such as Sweden, the capital gains tax paid on capital gains is the same percentage as the tax on dividends. Despite this, some tax advantages can still be achieved in such a situation; in the case of previous capital losses that are tax-deductible, the effective tax rate in the repurchase situation is lower since losses can be deducted from the capital gain through the repurchase price. Furthermore, share

repurchases gives the shareholder more flexibility in when to be exposed to the tax, see for instance Ivarsson and Nabseth (2006).

3.3.4 Leverage and Optimal Leverage Ratio hypothesis

Closely linked to the issue of capital structure, Myers (1984) states that there exists an optimal leverage ratio that maximizes firm value. Taking up debt sufficiently above this optimal ratio will incur costs associated with financial distress, decreasing the value of the firm. With the same reasoning, having a leverage ratio below the optimal one results in the firm not benefiting fully from tax shields and hence does not maximize value.

The Optimal Leverage Ratio hypothesis states that if an optimal leverage ratio exists, firms may repurchase shares in order to approach this, see Bagwell and Shoven (1988). The reason for this is that when a firm repurchases its stocks, it decreases its equity, increasing the debt-to-equity ratio. As a result of this, the decision to repurchase stock can be affected by the firm's capital structure.

3.3.5 Other motives for share repurchases:

Despite the main arguments behind share repurchases described above, there are a number of arguments explaining the increased popularity of this payout form. In this section, two of these arguments are presented.

Stultz (1988) find that companies may acquire their own shares in an attempt to make a potential takeover more expensive; the larger stake of the shares controlled by the management, the higher the premium is likely to become in a takeover attempt. This motive can be found in Sweden, see Ivarsson and Nabseth (2006).

In a normal dividend situation, a portion of the firms cash is transferred to its shareholders, causing the per share price to decrease by the amount of the total transfer per share. The share price as such affects the value of the company's

options, creating a particular situation for companies with a lot of outstanding options. In some companies, as argued by Allen and Michaely (2002), the managers' incentives not to dilute the per-share value of the firm can affect the company's decision to repurchase or pay dividend. Ivarsson and Nabseth (2006) found that the proportion of companies in Sweden that repurchase shares is similar between companies that have outstanding options and companies with no outstanding options. Thus, they found no evidence for this hypothesis in Sweden.

3.4 Empirical trends and external factors

3.4.1 Trends in payout policy

According to Fama and French (2000), 52.8% of the publicly traded companies on NYSE, AMEX and NASDAQ paid dividends in 1978, the same figure in 1999 was only 20.8%. Changing firm characteristics is one important reason for this but even when controlling for differences in firm characteristics, companies have become less likely to pay dividends. According to Fama and French (2000), this indicates a declining benefit of dividends. Possible explanations to this are; a) lower transaction costs for selling stocks for consumption purposes, b) larger holdings of stock options by managers and c) more widespread use of stock options to control the agency problems.

In their study of the Swedish market, Ivarsson and Nabseth (2006) find a rather contradicting pattern; they conclude that dividends have increased during the period 2000-2005 while share repurchases have been more volatile. The number of companies paying out dividends has increased while the number of companies using share repurchases as a distribution method has decreased.

3.4.2 Institutional constraints

In the U.S., the number and value of repurchase programme announcements have grown at an annual, compounded, rate of 23 % from 1985 to 1996, see Jagannathan, Stephens and Weisbach (1999). According to Lasfer (2000), share repurchases are

not as commonly used in Europe however. She argues that these geographical differences are due mainly to institutional and cultural constraints. Looking at difference in repurchase activity between European countries, Lafer points at three major factors explaining these:

1. Legal differences
2. Differences in personal income taxation
3. Differences in company taxation

Allen and Michaely (2002) also highlight that institutional constraints should be taken into account by the management when forming payout policy. Institutional constraints are imperfections that have been used to explain deviations from the findings of Miller and Modigliani (1961) regarding payout policy.

3.4.3 Business Cycle and Business Climate

Empirical studies show that there is a connection between repurchase activity and the business cycle. Jagannathan, Stephens and Weisbach (1999) show that share repurchases are paid with temporary cash flows and are more volatile than dividends. This since dividends are paid through sustainable cash flows and smoothed in line with Lintner's (1956) hypothesis.

Furthermore Dittmar and Dittmar (2007) show that business cycle related factors to some extent drive repurchase activity. Companies tend to build investments in the first phase of the economic cycle. In later stages of the cycle, excess cash is accumulated. Furthermore, Gwiliym et al. (2007) show that inflation influences companies' decisions on capital structure and show that inflation historically has been positively correlated to earnings growth. In a study by Gulati and Zantout (1997), it is shown that companies change their capital structures as an attempt to protect themselves against inflation.

3.4 Legal framework

Since institutional constraints can affect the payout decision, it is important to present the theoretical framework for payout policy in Sweden, Denmark and Finland. In this section, an outline of the legal framework regarding share repurchases in each country is presented.

3.4.1 Swedish Law

A Swedish Publikt Aktiebolag (public limited company) has traditionally not been allowed to repurchase its own shares⁷. On March 10 2000, Sweden, as one of the last countries in Europe, abolished the prohibition for companies to repurchase their own shares. The new rules are applicable on companies that are publicly listed on a stock exchange, an authorised market place or corresponding regulated market, see Tivéus (2000). However, buy-backs are still regulated in a number of ways.

Companies are allowed to acquire shares both through open-market repurchase and tender offers. An open-market repurchase requires the approval of two thirds of the votes at a General Meeting. The Shareholders' meeting can either decide to repurchase shares or, most commonly used, authorize the board to repurchase of shares within certain restrictions. An authorization of this sort lasts until the next ordinary Annual General Meeting, (ABL).

The maximum quantity that is allowed to own is 10% of outstanding shares, imposing a limit on the maximum amount of shares that can be repurchased. Shares that are acquired illegally must be sold within six months or they shall be ruled worthless by the company. Furthermore, companies are not allowed to repurchase shares to an extent that the restricted equity is not fully covered⁸, (ABL).

⁷ Some special exceptions have been allowed.

⁸ The latest approved Financial Statement is the foundation for concluding this

3.4.2 Danish law

In Denmark, there has never been a prohibition against share repurchases. In the Danish Law of Public Companies⁹(ASL) of 1995, it is stated that a Danish Public company is allowed to acquire own shares at a maximum level of 10% of the issued share capital. Should the company have acquired more than 10% of the share capital, excess shares must be sold within three years.

The General meeting gives the board authorisation, valid for a maximum period of 18 months, to repurchase shares. Following a share repurchase, share capital less own shares held must amount to not less than DKK 500,000¹⁰, the limit for restricted equity in Denmark (ASL).

Requirements from OMX on disclosing information and regarding the trading of own shares are similar to the requirements in Sweden.

3.4.3 Finnish law

In the Law of Public Companies, passed in 1978, firms were not allowed to acquire own shares. In 1997, the law was changed, allowing public companies to repurchase own shares to the limit of 5% of the company's share capital or voting rights. In 2006, this limit was raised to 10% of outstanding shares (Fin_ABL).

As in Sweden, repurchases may only be made with the use of the unrestricted equity. Own shares do not entitle the company to vote at the meetings of shareholders and the shares must generally be disposed of or redeemed within three years of the purchase (Fin_ABL).

The decision process for share repurchases is also similar to the one in Sweden. The board announces in the notification of the General Meeting that they intend to seek shareholders' approval for acquiring shares. A qualified majority (2/3 of the votes) is required to get the authorization and it lasts for a maximum of 18 months.

⁹ Bekendtgørelse af lov om aktieselskaber

¹⁰ 500 000 DKK ≈ EUR 67 000

Requirements from OMX regarding disclosure of information and trading of own shares are similar to the requirements for Sweden.

Table 1: Regulatory comparison

Regulation	Sweden	Denmark	Finland
Allowed since	2000	-	1997 10% ('06-) 5% ('97-'05)
Maximum percentage	10%	10%	5% ('97-'05)
AGM decision necessary	2/3 majority	2/3 majority	2/3 majority
Authorization length	Until next AGM	18 months	18 months
Excess sold	6 months	3 years	3 years

4. Hypotheses

As presented in section 2, there are differences in the trends in payout policy among the three countries. Most notably is that in Denmark, the importance of share repurchases is higher compared to Sweden and Finland. The differences in the importance of share repurchases are substantial and we will hence focus on the high repurchase activity¹¹ in Denmark.

As described in section 3, both dividends and share repurchases are used as signals for future earnings. Firms tend to prefer share repurchases when management believes that the company is undervalued. The larger the discrepancy between the actual and perceived value, the higher the probability of share repurchases. Theories describing these issues are provided by, among others, Miller and Modigliani (1961), Chowdhry and Nanda (1994) and Vermaelen (1981). Our first hypotheses aim at explaining the observed differences in share repurchase activity by the level and development of the degree of undervaluation:

H₁: The higher activity is due to differences in the level of undervaluation of companies

According to theory, there is an agency conflict between owners and managers when the company has excess cash. By distributing cash to the owners, the company can reduce this problem in that the flexibility for management to undertake negative NPV investment opportunities is reduced. The main theories on this subject are provided by Jensen and Meckling (1976) and Jensen (1986). Companies with high levels of excess cash can hence be assumed to be more inclined to repurchase shares. Our second hypothesis aim at explaining the observed differences in share repurchase activity by the level of excess cash available in the company:

H₂: The higher activity is due to differences in the levels of excess cash in the companies

¹¹ By activity, we refer to both the frequency of share repurchases and the relative value of shares repurchased compared to dividends

Dividends tend to be paid out using sustainable cash flows since companies tend to have a target payout ratio and are reluctant to change the dividend yield. Temporary cash flows on the other hand are used for share repurchases. Recent empirical studies show that in line with these arguments, companies tend to increase the repurchase activity in certain stages of the business cycle. Main theories on this area are supplied by Lintner (1956), Jagannathan et al. (1999) and Dittmar and Dittmar (2007). When the economy is in a high phase of the business cycle, firms increase the repurchase activity and hence our third hypothesis aim at explaining the observed differences in payout policy by the level of economic growth:

H₃: The higher activity is due to differences in the level of economic growth between the countries

Inflation has empirically shown to be factor influencing firms' strategic decisions, in particular the decision to alter capital structure. Furthermore, there is a positive correlation between inflation and earnings growth. Share repurchases can be argued to primarily be paid for by temporary cash flows. Main findings on this topic are provided by Jagannathan et al. (1999), Gulati and Zantout (1997) and Gwiliym et al. (2007). Following the above reasoning, we expect inflation to be important in firms' payout decisions. Hence, our fourth hypothesis try to explain the observed differences in share repurchase activity by the level of inflation in each country:

H₄: The higher activity is due to differences in the level of inflation between the countries

The hypotheses stated above are not mutually exclusive and hence more than one of the hypothesis can help explaining the observed differences. Should one or more fail to explain the observed difference, it does not alter the validity of the others. The null hypothesis to each of our hypotheses is that the specific factor tested cannot explain the observed activity in share repurchases.

5. Methodology and models

This section will be divided in four sections. First, the method for collecting the data used when describing payout policy in each country (section 2) will be presented. Second, the choice of method and variables for testing our hypotheses will be explained. Following this, our models used for testing the hypotheses will be outlined. Finally we describe how the collection of the variables was done.

5.1 Data sampling for describing payout policy

Our sample consists of 118 Swedish, 73 Danish and 70 Finnish companies. For every company and each country we collected the following data for the period 2000-2006:

Table 2: Data collected for the sample

Number of shares outstanding	Dividends per share
Number of shares repurchased	Market capitalization
Value of shares repurchased	Total dividends

For all companies, the number of outstanding shares was retrieved from annual reports. Shares repurchased and the value of those shares in Sweden was taken from OMX repurchase statistics. When the repurchase was conducted as a tender offer, we used data from the Swedish Tax Authorities. For 2000, the value of repurchased shares was not available and we thus estimated the value by multiplying the number of shares repurchased by the average share price during the buy-back period. We claim that this is a fair estimate since companies repurchasing shares in an open market repurchase programme do so at the quoted market price. For Denmark and Finland, we went through annual reports and press-releases to find the number and the value of repurchased shares. As a control function, we calculated the number of shares from DataStream and investigated year-to-year changes in outstanding shares.

Dividend per share and the market capitalization was collected from DataStream. In order to find the total dividends per year we multiplied the dividend per share with the number of shares for the relevant year.

5.2 Choice of variables

In order to test our four hypotheses, we use regression models to find the coefficient and significance of each variable. Furthermore, we plot the development of the variables in each country to see if they can explain the observed differences in repurchase activity. In this section, the choice of proxy and control variables will be presented.

5.2.1 Choice of proxy variables

In this section, the proxy variables for testing the hypotheses are outlined in conjunction with the relevant hypothesis.

H₁: The higher activity is due to differences in the level of undervaluation of companies

Market-to-Book:

Empirical studies investigating the effect of undervaluation on share repurchases commonly use the variable Market-to-Book (MTB) to estimate undervaluation, see for instance Dittmar (2000). In line with her study, we use MTB at the beginning of the year as a proxy for undervaluation. Following that a lower MTB indicate a higher degree of undervaluation and thus a higher buy-back activity, we expect a negative coefficient.

H₂: The higher activity is due to differences in the levels of excess cash in the companies

Cash and cash equivalent:

Empirical studies testing for theories on the impact of excess cash on the payout decision commonly use the variable cash and cash equivalents as a proxy for excess

cash, see for instance Dittmar (2000). In line with this, we include the variable CASH, defined as cash and equivalents to total assets at the beginning of the year. High levels of excess cash can potentially worsen the agency problem described by Jensen and Meckling (1976), pushing for increased distribution for shareholders in order to reduce this conflict. Following this, a high level of excess cash will have a positive effect on share repurchases and we thus expect a positive coefficient.

H₃: The higher activity is due to differences in the level of economic growth between the countries

Growth in Gross Domestic Product

In order to investigate the impact of growth on repurchase activity, real growth in Gross Domestic Product (GDP) can be used as a proxy, see Dittmar and Dittmar (2007). We include the variable GROWTH to test for the impact of real growth in GDP on repurchase activity. Since we anticipate repurchase activity to increase when the economy is in a state in the business cycle with high growth levels, we expect a positive coefficient for this variable.

H₄: The higher activity is due to differences in the level of inflation between the countries

Consumer Price Index

When investigating the impact of inflation on share repurchase activity, the year-to-year change in Consumer Price Index (CPI) can be used to measure the level of inflation, see Gwilym et al. (2007). We include the variable INFL, to measure the level of inflation in each year. Since inflation historically has been positively correlated with earnings growth, which in turn can increase repurchase activity, we expect a positive coefficient.

In table 3 below, the proxy variables used and expected signs on the coefficients are presented:

Table 3: Summary of proxy variables

Hypothesis	Proxy variable	Expected sign
Undervaluation	MTB	-
Excess cash	CASH	+
Economic growth	GROWTH	+
Inflation	INFL	+

5.2.2 Choice of control variables

In order to increase the validity of our regression model and hence capture the intended effect of our variables, we include a number of control variables.

Capital Structure:

Share repurchases can alter the capital structure of a company through decreasing the equity base and thus increase the leverage ratio. Myers (1984) examines the capital structure of companies and finds that there is an optimal leverage ratio for companies. Furthermore, Bagwell and Shoven (1988) show that firms tend to repurchase shares when they are below this ratio in order to approach the optimal leverage ratio. This is often tested empirically by estimating the difference between actual and optimal leverage, see Dittmar (2000). Recognizing that capital structure and leverage in particular have an impact on the payout decision of firms, we include the control variable LEV. This is the net debt-to-equity ratio in the beginning of the year.

Dividends:

Dividends and share repurchases can be seen as two substitute methods of distributing cash to owners, Allen and Michaely (2002). Miller and Modigliani (1961) states that in perfect and efficient capital markets, the payout decision has no impact on firm value. Fama and French (2000) show that the relative importance of dividends on the U.S. market is declining. Furthermore they argue that companies repurchasing shares also pay dividends, indicating that these methods are not perfect

substitutes. In our empirical data we find evidence for that the majority of repurchasing companies also pay dividends. Recognizing that there is a relation between repurchase activity and dividends, we include the dummy variable DIV. This takes a value of 1 for the years that dividends are paid out and 0 if the company pays no dividends in a given year.

Firm size:

Allen and Michaely (2002) states that it has been shown empirically that large companies tend have higher payout ratios. Furthermore, studies have shown evidence for large firms substituting dividends for share repurchases. In an empirical study by Gryglwicz (2004), he argues that firm size can act as a proxy for the level of asymmetric information and level of the valuation of the firm¹². Following that firm size seems to matter, we include the dummy variable LIST. This variable takes a value of 1 if the company is listed on the Large cap list and 0 if it is listed on the Mid cap list.

Temporary cash flows:

Companies have a tendency to smooth dividends and thus use sustainable cash flows to finance these, see Lintner (1956). Jagannathan et al. (1999) find empirical evidence that companies use share repurchases when distributing temporary cash flows. To control for the impact of temporary cash flows, we include the variable CASHFLOW, defined as the net cash flow-to-equity at the beginning of the year.

Bear and bull markets:

Empirical evidence show that repurchase activity increase during periods when there is a downward pressure on share prices, see Allen and Michaely (2002). This is in line with theories that valuation of shares affects the payout decisions of firms. We include the variable INDEX, defined as the return on the market index in each country. This variable is an indication of whether or not the stock market is bearish or bullish and thus a control for a downward or upward pressure on stocks.

¹² Undervaluation and asymmetric information is described in section 3.3.1

Institutional constraints:

The institutions regulating payout policy is a factor that affects firms in their payout decisions; see Allen and Michaely (2002) and Lasfer (2000). In Finland until 2006, companies were only allowed to repurchase up to 5% of their outstanding shares as compared to the 10% limit in Sweden and Denmark. We thus include the dummy variable D_5PER to control for this institutional constraint. This variable takes a value of 1 for Finland during the years that the limit is in place. For all other observations, the variable equals 0.

In table 4 below, our control variables are presented:

Table 4: Summary of control variables

Factor	Proxy variable
Capital structure	LEV
Dividends	DIV
Firm size	LIST
Temporary cash flows	CASHFLOWS
Bear or bull market	INDEX
Institutional constraints	D_5PER

5.3 Models

In order to test our hypotheses we will use three different regression models. In this section these are presented and explained.

Ordinary Least Square Regression

In the Ordinary Least Square (OLS) regression, the dependent variable for each company will be the proportion of outstanding shares that were repurchased by companies initiating buy-back programmes:

Equation 1: OLS regression¹³

$$\text{prop_rep}_i = \alpha + \beta_1 \text{MTB} + \beta_2 \text{CASH} + \beta_3 \text{GROWTH} + \beta_4 \text{INFL} + \theta_1 \text{LEV} + \theta_2 \text{DIV} + \theta_3 \text{LIST} + \theta_4 \text{CASHFLOW} + \theta_5 \text{INDEX} + \theta_6 \text{D_5PER}$$

In this model, the dependent variable is the proportion of shares repurchased by repurchasing companies. The OLS model is however not very efficient in explaining the type of data set that we use. Many empirical studies use two other regression models, the Binary Logistic and the Tobit model in order to get significant results. These models will be presented next.

Binary Logistic Regression

Another way to investigate company differences is to use the Binary Logistic Regression model. This model estimates the probability of a certain event occurring. Furthermore, this model has less severe assumptions compared to the OLS but does not, however, calculate changes in the dependent variable. When using the logistical regression we use an dependent variable taking the value of 1 for companies repurchasing shares and zero for non-repurchasing companies:

$$(\text{rep} = 1) = \alpha + \beta_1 \text{MTB} + \beta_2 \text{CASH} + \beta_3 \text{GROWTH} + \beta_4 \text{INFL} + \theta_1 \text{LEV} + \theta_2 \text{DIV} + \theta_3 \text{LIST} + \theta_4 \text{CASHFLOW} + \theta_5 \text{INDEX} + \theta_6 \text{D_5PER}$$

Tobit Regression

In the pursuit of a model with stronger explanatory power, we use a Tobit-regression, a model with less severe assumptions compared to the OLS and that allows for changes in the dependent variable. We estimate the following model:

$$\text{prop_rep}_i = \alpha + \beta_1 \text{MTB} + \beta_2 \text{CASH} + \beta_3 \text{GROWTH} + \beta_4 \text{INFL} + \theta_1 \text{LEV} + \theta_2 \text{DIV} + \theta_3 \text{LIST} + \theta_4 \text{CASHFLOW} + \theta_5 \text{INDEX} + \theta_6 \text{D_5PER}$$

¹³ β = coefficient for proxy variables θ = coefficient for control variables

In this model, the depended variable is zero for non-repurchasing companies. For repurchasing companies, the value is the proportion of outstanding shares repurchased.

5.4 Data collection

In order to test the above models, data for all variables was collected for every company in each year. Data for the variables MTB and DIV was collected using DataStream. The variables CASH, LEV, CASHFLOW, INFL and INDEX were calculated using data collected from DataStream. As indices for calculating the INDEX variable, we used broad market indices for each market. In order to find the level of growth used for the variable GROWTH, statistics on real GDP published on the Eurostat webpage was used. To compute the variable LIST, we used the lists available on the OMX Groups webpage.

6. Results

In this section, the descriptive statistics for the variables used in our models and the regression results from the Binary Logistic Regression and Tobit model are presented. The results from the OLS regression and country specific regressions can be found in Appendix VII.

6.1 Descriptive statistics

In this section, trends in our proxy variables are presented.

In figure 8, the trend in development in the average value of MTB is plotted for the three countries. As we can see, the mean MTB ratio is the lowest in Denmark. The increase in Denmark from 2004 can be a result of the increased repurchase amount, inflating the MTB ratios. Looking at Sweden that has one of the lowest repurchase volumes, the mean MTB is at the highest value and in the most clearly increasing trend.

Figure 8: Trend in MTB

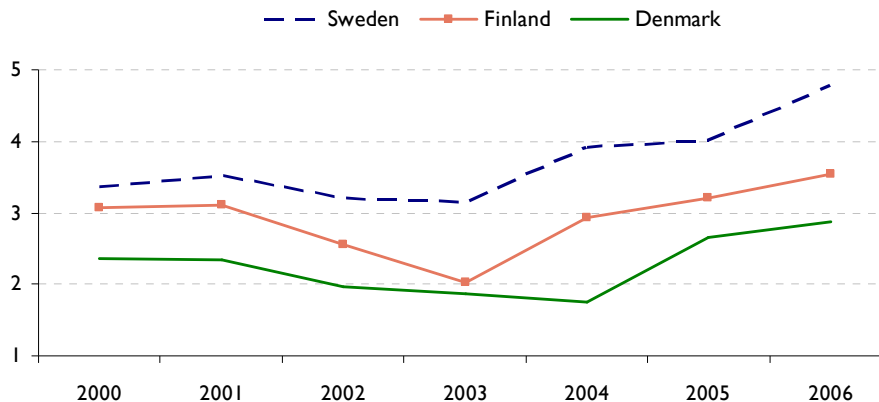
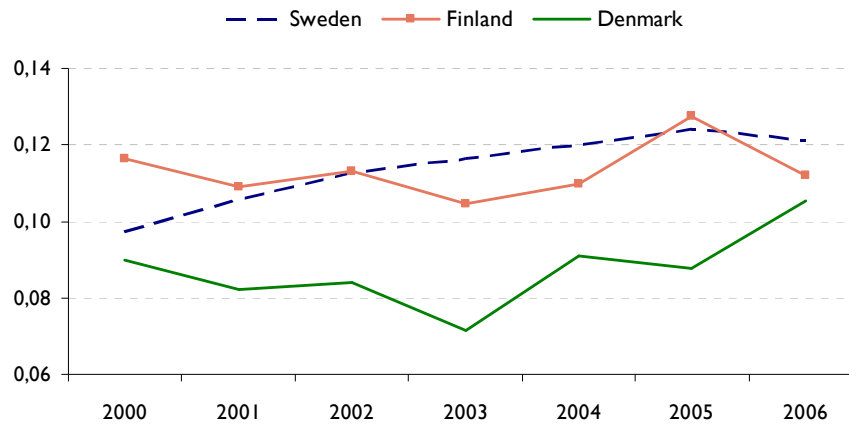


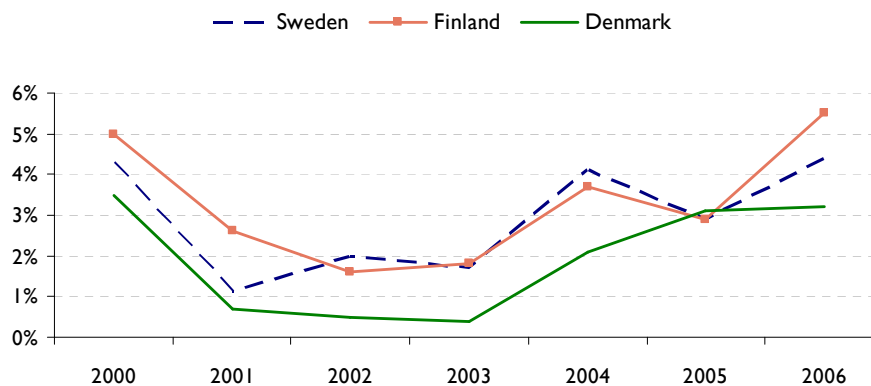
Figure 9 shows the trends in the mean value of the variable CASH. Finland and Sweden show the highest levels for these variables and both show an increasing trend. In Denmark, the mean CASH is substantially lower but also in an increasing trend.

Figure 9: Trend in CASH



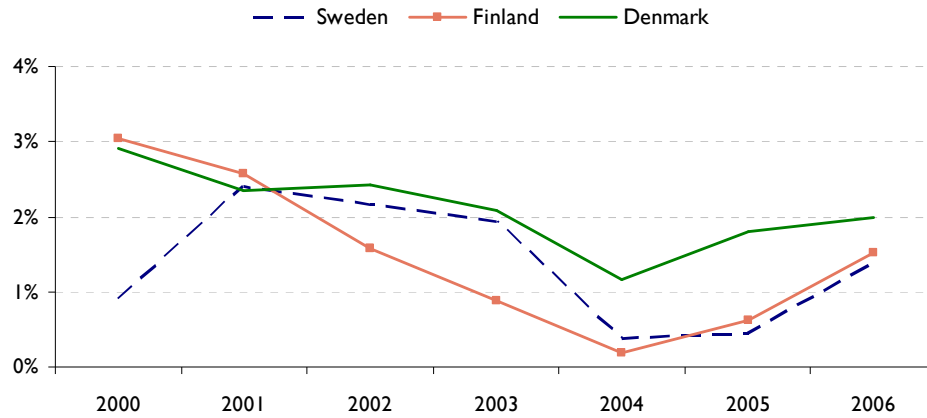
As indicated by Figure 10, Finland displays the highest level of economic growth over the sample period. All three countries display increasing levels of growth from 2003-2006 following a decline from 2000-2002. Denmark displays the lowest level of growth over almost the entire sample period and hence has the lowest accumulated growth over the period.

Figure 10: Real economic growth



As can be seen in figure 11, Denmark shows the highest level of inflation from 2002 to 2006. Inflation in Finland is in a decreasing trend from 2000 to 2004 and shows the lowest level of inflation from 2002 to 2004. Inflation in Sweden is mostly at a level in between Finland and Denmark.

Figure 11: Inflation



6.2 Regression results

The Binary Logistic and a Tobit regression that were performed obtained the same significant variables. The results for all countries combined are presented below and the results from the OLS regression can be found in Appendix VII.

Table 5: Regression results

Variable	Logit			Tobit		
	Coef.	P> z		Coef.	P> z	
MTB	0,002	0,560		0,000	0,802	
CASH	-0,345	0,542		-0,014	0,369	
GROWTH	7,184	0,066	**	0,182	0,087	**
INFL	0,339	0,000	*	0,008	0,002	*
LEV	0,062	0,022	*	0,002	0,037	*
DIV	0,742	0,000	*	0,014	0,010	*
LIST	0,409	0,002	*	0,012	0,001	*
CASHFLOW	0,223	0,258		0,004	0,536	
INDEX	0,261	0,373		0,001	0,944	
D_5PER	-0,701	0,003	*	-0,024	0,000	*
Constant	-2,823	0,000	*	-0,071	0,000	*
Sigma				0,050	n.a	

* significant at the 5%-level ** significant at the 10%-level

Our results show that neither MTB nor CASH are significant and in addition, both coefficients show opposite signs to what could have been expected from theory. The variable GROWTH proved to be significant at the 10%-level and showed a positive sign which is in line with what we expected. INFL turned out to be significant at the 5%-level and the coefficient is also in line with what we anticipated. Interestingly, four out of our six control variables showed significant results, all at the 5%-level. The variables LEV, DIV and LIST all show positive coefficients while the dummy variable D_5PER yields a negative coefficient.

7. Discussion of results

In this section, our results displayed in section 6 are discussed. The discussion is divided in four parts according to our hypotheses. At the end of this section, additional findings that were not explicitly hypothesized are discussed.

7.1 Hypothesis 1: Undervaluation

Looking at the average market-to-book value for each of the countries during the period 2000-2006 (figure 8), we see that the level is the lowest in Denmark. This observation would indicate more severe undervaluation of Danish firms compared to Swedish and Finnish companies. According to theory, this could help to explain why repurchase activity is highest in Denmark. However, the variable does not show any significance in any of our regression results. Furthermore, the sign of the coefficients differ from what we expected. Thus, we fail to reject the null hypothesis and find no evidence that the high repurchase activity in Denmark can be explained by differences in undervaluation.

7.2 Hypothesis 2: Excess cash

Looking at the mean value of cash and cash equivalents to assets for each of the countries during the period 2000-2006 (figure 9), we see that Denmark displays the lowest level. From a theoretical perspective, this is not in line with that Danish firms show a higher repurchase activity compared to Swedish and Finnish firms. The trend is positive in Denmark, something that is in line with the increasing trend in repurchase activity displayed in the country. However, the proxy variable CASH does not show any significant results in our regressions. In addition to this, the coefficients are of opposite sign to what we expected. We fail to find supportive evidence for our second hypothesis that the higher repurchase activity in Denmark can be explained by a higher level of excess cash. The null hypothesis is not rejected.

7.3 Hypothesis 3: Economic growth

Studying figure 10, displaying the level of economic growth in each country for the years 2000-2006, we see Denmark shows the lowest level of growth among the three countries. Sweden and Finland display similar levels of growth and the trend is similar for the three countries. From a theoretical perspective, the fact that growth is lower in Denmark compared to the other countries is not in line with the higher importance of share repurchases displayed. All three countries show an increasing trend from 2003 to 2006. This can help to explain why the value of total payout (Appendix I) and the proportion of companies distributing cash to their owners (figure 6 and 7) are increasing over this period.

The variable GROWTH shows significant results in our regression models and displays the expected sign of the coefficients. Economic growth can be said to help explaining changes in payout activity in the three countries. Furthermore it is affecting the payout decisions of firms. It cannot however explain why Danish firms repurchase shares to a larger extent compared to companies in Sweden and Finland. We fail to find supportive evidence for our third hypothesis.

7.4 Hypothesis 4: Inflation

Looking at figure 11, displaying the level of inflation in each of the countries for the years 2000-2006, we see that Denmark generally show a higher level compared to the other two countries. We see a decreasing trend from 2001-2004, most dramatically in Finland. From a theoretical perspective and in line with previous studies, the higher level of inflation in Denmark can help explaining the high repurchase activity among Danish firms. The higher level of inflation stimulates, to a larger extent, companies to alter their capital structure. As inflation is positively correlated to earnings growth, companies have more means for distributing wealth to shareholders. Companies tend to be reluctant to alter their dividend ratio and thus share repurchases can be a preferred method for distributing temporary high earnings to their owners.

The variable INFL is highly significant in our regressions and displays the expected sign of the coefficients. This gives us sufficient evidence to support our fourth hypothesis that the higher repurchase activity in Denmark is due to a higher level of inflation. We thus reject the null hypothesis.

7.5 Other findings

Four of our six control variables proved to be significant and therefore deserve some discussion. We investigate the signs of the coefficients and the trends in these variables to see if they can help to explain the observed differences in trends in payout policy in the three countries.

The variable LEV is significant for both the Binary Logistic- and the Tobit regression and the coefficients are positive. Looking at figure 12 in Appendix VI we see that the mean level of leverage is clearly higher in Denmark. Empirically, this would imply that firm leverage can help to explain the higher repurchase activity in Denmark. Leverage as such does not tell us much about the difference in payout policy. To investigate the effect of leverage in the context of optimal leverage described by Myers (1984) can, however, help to explain the observed differences in payout policy in the three countries. This is an interesting variable for future research on the region.

The result of the variable DIV are significant and with positive coefficients. Although this does not explain the high frequency of share repurchases in Denmark, this is an interesting finding. The impact of the variable in combination with the observation that a clear majority of repurchasing firms also pay dividends is in line with the findings of Fama and French (2000), observing that repurchases is generally the territory of dividend payers.

The dummy variable D_5PER, intended to capture the effects of the repurchase limit present in Finland until 2006, proved to be significant with a negative coefficient. This can help to explain the low repurchase activity in Finland and is in line with theories saying that institutional constraints can alter the payout policy in different countries.

Another aspect of differences in institutional constraints between countries is the taxation of investors, see Lasfer (2000). In table 6, the personal tax situation in each country is summarized:

Table 6: Personal tax situation

	Sweden	Finland	Denmark
Tax-free disposal	-	-	136 000 ¹⁴ DKK
Capital gains tax	0,3	0,28	28%* / 43%**
Dividend tax	0,3	0,28	28%* / 43%**
Pension schemes	0,3	0,28	0,15

* < 45500 DKK ** > 45500 DKK

Denmark is the only country that provides tax benefits related to repurchases (see Appendix VIII for discussion). The favourable treatment of share repurchases in Denmark is a possible explanation to the higher repurchase frequency in the country.

Another institutional constraint that differs among the three countries is for how many years share repurchases have been allowed. In Denmark, share repurchases has been an option of wealth distribution to companies for a longer time period compared to Finland and Sweden. The Danish market can thus be considered more mature in handling share repurchases. Fama and French (2000) investigate another mature repurchase market, the U.S., and find that the relative importance of share repurchases has increased. The reason behind this trend is an interesting topic for further research and may help explain the higher repurchase activity in Denmark.

¹⁴ Approximately EUR 18 250

8. Conclusion

The purpose of this thesis is to explain the observed differences in the level and development of payout policy between Sweden, Denmark and Finland. The main difference identified is the relatively higher importance of share repurchases in Denmark. The hypotheses stipulated to explain this pattern, and the results from our tests, are displayed in the table below.

Table 7: Summary of hypothesis and results

Hypothesis	Result
<i>H1: The higher activity is due to differences in the level of undervaluation of companies</i>	Rejected
<i>H2: The higher activity is due to differences in the levels of excess cash in the companies</i>	Rejected
<i>H3: The higher activity is due to differences in the level of economic growth between the countries</i>	Rejected
<i>H4: The higher activity is due to differences in the level of inflation between the countries</i>	Not Rejected

We failed to find supportive evidence for three of our hypothesis. On the other hand, we do find support for our fourth hypothesis, stating that the higher activity in Denmark is due to differences in the level of inflation between the countries. The higher repurchase activity corresponds to a higher level of inflation in Denmark. This finding is in line with that inflation stimulates companies to alter their capital structure, Gulati and Zantout (1997). In addition inflation is positively correlated to earnings growth, Gwilym et al. (1997). This can in turn be linked to the finding of Jagannathan et al (1999) that high temporary earnings stimulate repurchase activity.

There are a number of observations that motivate future research on this topic. Our control variable for capital structure show a significant positive coefficient, indicating that there is an impact of leverage on repurchase activity.

The low repurchase activity observed in Finland before the strict repurchase limit was lifted motivates further investigation of the impact of institutional constraints on repurchase activity in the Nordic region.

Finally, even though not explicitly tested, the favourable tax treatment of share repurchases for private investors in Denmark and that the Danish market is mature regarding share repurchases seem to carry explanatory power for the repurchase activity.

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Laws and rules

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Denmark: Aktieselskabsloven (ASL), http://www.eogs.dk/graphics/selskaber/AS_en.html

OMX Listing Requirements

http://www.omxgroup.com/digitalAssets/6918_Listing_agreement_with_guidance_060701_se.pdf

Swedish Financial Supervisory Authority, Finansinspektionen

http://www.fi.se/upload/30_Regler/10_FFFS/2005/FFFS0506.pdf

Data Sources

Eurostat

Datastream

Annual Reports

OMX Repurchase statistics

Riksskatteverket (Swedish Tax Authorities)

10. Appendix

Appendix I: Additional tables for section 2

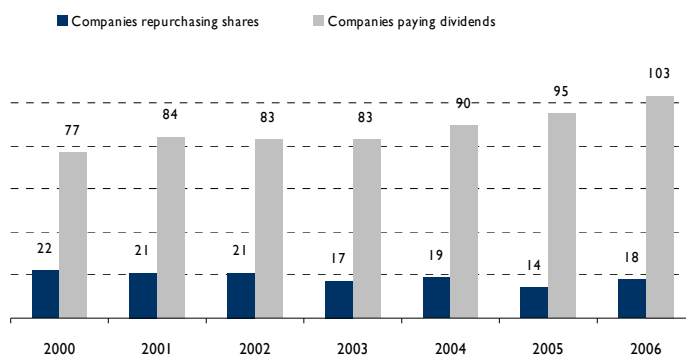
Sweden	2000	2001	2002	2003	2004	2005	2006
Tot. number shares (mm)	20 727	31 366	33 970	33 851	39 532	39 636	39 776
Shares repurchased (mm)	209	69	91	162	243	280	79
Percentage total shares	1,01%	0,22%	0,27%	0,48%	0,62%	0,71%	0,20%
Average percentage company's shares	5,06%	2,63%	2,72%	2,58%	2,97%	3,05%	2,61%
Repurchased amount (SEK mm)	31 494	7 346	7 067	10 196	23 779	21 151	10 849
Dividends (SEK mm)	36 778	51 325	47 322	46 388	58 400	78 163	107 224
Total payout (SEK mm)	69 350	58 671	54 390	57 609	86 110	110 745	122 772
Proportion total	45,41%	12,52%	12,99%	17,70%	27,61%	19,10%	8,84%
Average proportion per company	61,49%	50,86%	42,83%	33,76%	39,83%	41,15%	34,19%
Companies repurchasing shares	22	21	21	17	19	14	18
Companies paying dividends	77	84	83	83	90	95	103
Companies using both	21	18	20	17	18	13	18
Proportion repurchasing shares	18,64%	17,80%	17,80%	14,41%	16,10%	11,86%	15,25%
Proportion paying dividends	65,25%	71,19%	70,34%	70,34%	76,27%	80,51%	87,29%
Proportion of companies using both	17,80%	15,25%	16,95%	14,41%	15,25%	11,02%	15,25%

Denmark	2000	2001	2002	2003	2004	2005	2006
Tot. number shares (mm)	2 641	2 784	3 045	3 095	3 060	2 997	2 932
Shares repurchased (mm)	8	23	31	49	93	33	41
Percentage total shares	0,32%	0,83%	1,03%	1,59%	3,04%	1,09%	1,41%
Average percentage company's shares	2,25%	3,08%	3,74%	3,10%	3,07%	2,19%	2,75%
Repurchased amount (DKKmm)	1 561	3 953	4 749	8 086	16 464	8 262	11 100
Dividends (DKK mm)	7 128	10 510	9 946	10 054	13 734	23 858	17 829
Total payout (DKK mm)	8 689	14 463	14 696	18 140	30 198	32 120	28 930
Proportion total	17,96%	27,33%	32,32%	44,58%	54,52%	25,72%	38,37%
Average proportion per company	36,90%	46,41%	58,07%	56,77%	59,37%	51,57%	60,50%
Companies repurchasing shares	15	19	27	26	29	25	30
Companies paying dividends	51	56	59	55	61	60	66
Companies using both	14	17	20	23	24	24	25
Proportion repurchasing shares	20,55%	26,03%	36,99%	35,62%	39,73%	34,25%	41,10%
Proportion paying dividends	69,86%	76,71%	80,82%	75,34%	83,56%	82,19%	90,41%
Proportion of companies using both	19,18%	23,29%	27,40%	31,51%	32,88%	32,88%	34,25%

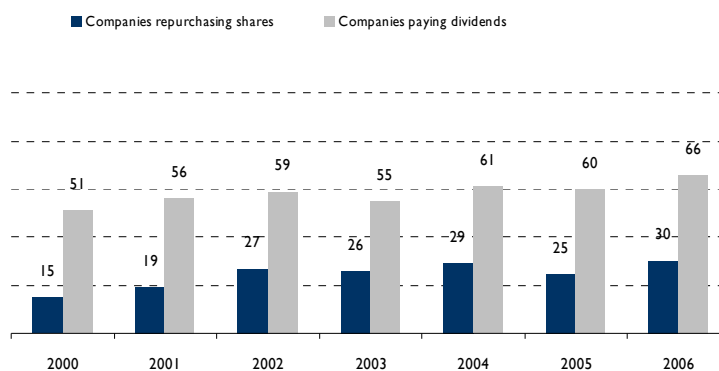
Finland	2000	2001	2002	2003	2004	2005	2006
Tot. number shares (mm)	11 385	12 357	12 976	13 635	13 846	17 102	13 543
Shares repurchased (mm)	38	33	41	57	251	354	230
Percentage total shares	0,33%	0,27%	0,32%	0,42%	1,81%	2,07%	1,70%
Average percentage company's shares	1,37%	1,70%	1,09%	1,84%	2,49%	2,09%	1,65%
Repurchased amount (EUR mm)	493	282	387	486	3 065	4 758	5 103
Dividends (EUR mm)	4 421	4 510	4 910	4 748	5 522	5 412	6 660
Total payout (EUR mm)	4 914	4 792	5 298	5 235	8 587	10 170	11 763
Proportion total	10,03%	9,38%	5,02%	9,29%	31,66%	39,34%	43,38%
Average proportion per company	20,79%	36,23%	16,14%	25,34%	41,41%	32,53%	27,46%
Companies repurchasing shares	9	15	19	10	11	9	10
Companies paying dividends	58	61	59	56	61	62	67
Companies using both	9	14	18	9	10	8	10
Proportion repurchasing shares	12,86%	21,43%	27,14%	14,29%	15,71%	12,86%	14,29%
Proportion paying dividends	82,86%	87,14%	84,29%	80,00%	87,14%	88,57%	95,71%
Proportion of companies using both	12,86%	20,00%	25,71%	12,86%	14,29%	11,43%	14,29%

Appendix II: Additional figures for section 2

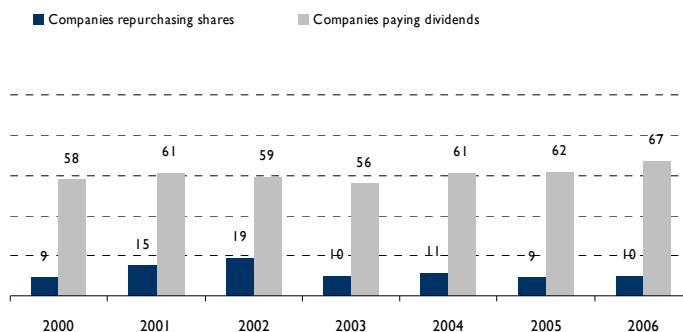
Number of companies Sweden



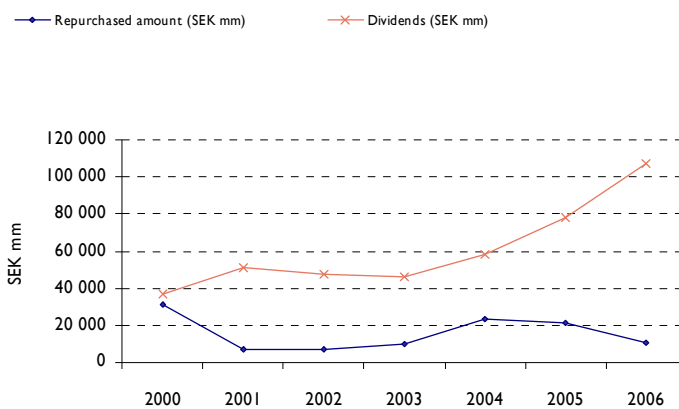
Number of companies Denmark



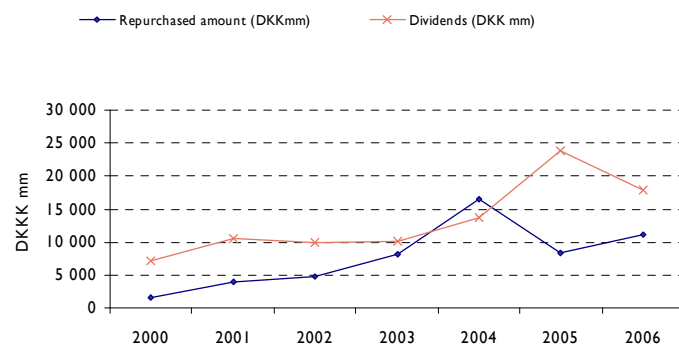
Number of companies Finland



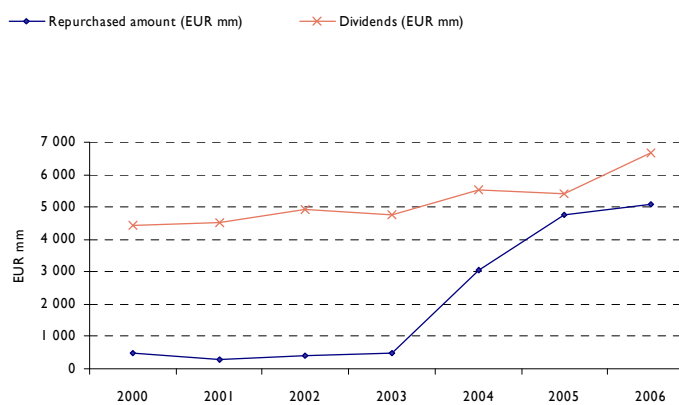
Value of payout, Sweden



Value of payout, Denmark



Value of payout, Finland



Appendix III: Summary of OMX listing rules for Sweden (see section 2.1)

In addition to formal legislation on this area, a number of clauses are provided in the contract that all listed companies on Stockholm Stock Exchange have to sign. Some key points are provided below¹⁵:

- The decision to start repurchasing shares must immediately be made public by the means of a press release.
- The trading must be done within the Bid/Ask spread.
- A company's buying or selling of own shares can only amount to 25% of the daily volume, calculated over the latest four calendar weeks before the week of the repurchasing. Block trades can be executed regardless of these rules.
- The company must report all acquisitions of own shares as soon as possible and 30 minutes before opening of the next trading day at the latest.

In addition, companies acquiring their own shares are seen as insiders and must report to the Swedish Financial Supervisory Authority (Finansinspektionen).

¹⁵ For a complete list, see Listing Requirements for Stockholm Stock Exchange

Appendix IV: Explanation of the Binary Logistic regression model¹⁶

The model is used to find the probability that a dichotomous variable will take one of two values and it applies maximum likelihood estimation. In this way, logistic regression estimates the probability of a certain event occurring. A main difference between this measure and OLS is that the former calculates changes in the log odds of the dependent variable, not changes in the dependent itself as OLS regression does. Another is that, unlike OLS regression, logistic regression does not assume linearity of relationship between the independent variables and the dependent, does not require normally distributed variables, does not assume homoscedasticity, and in general, has less stringent requirements. However, it requires that observations are independent and that the independent variables be linearly related to the logit of the dependent.

Appendix V: Explanation of the Tobit regression model¹⁷

Tobit is a qualitative response model that is an extension of the probit model. The model is preferred over the OLS when you have a censored data sample, where information on the regressand is available only for some observations. Regressing only on the available regressands, as the OLS does, would leave the sample biased and as well as inconsistent. In order to remedy the bias the model divides the observations into two groups and uses a maximum likelihood method to estimate the true mean.

¹⁶ Gujarati (2003)

¹⁷ Gujarati (2003)

Appendix VI: Descriptive statistics – control variables

Figure 12: Trends in LEV

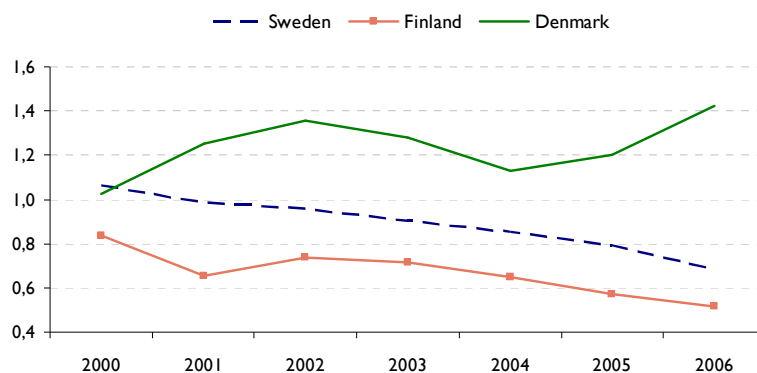


Figure 13: Trends in CASHFLOW

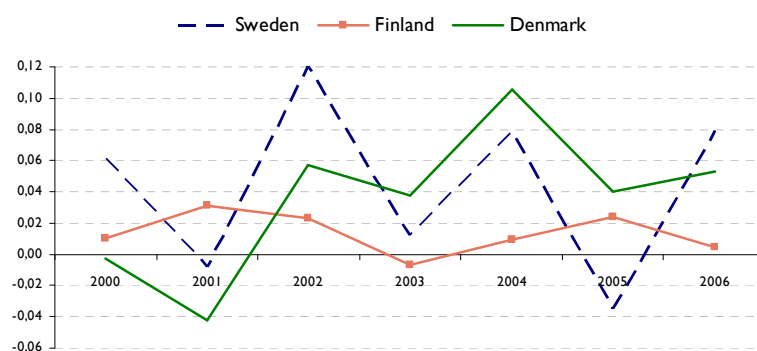


Figure 14: Index return

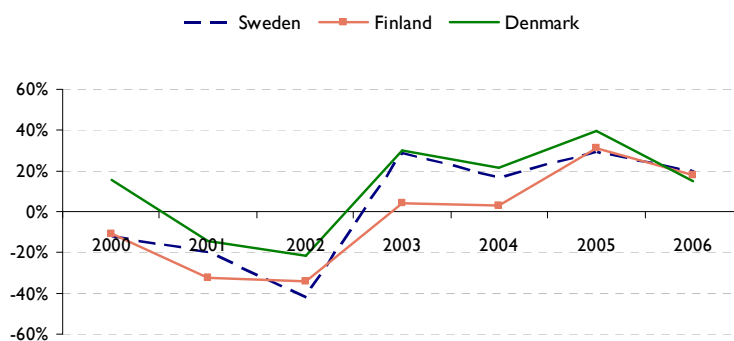


Table 8: Proportion of companies on Large cap list

Sweden	Denmark	Finland
49%	34%	45%

Appendix VII: Results from OLS regression

Table 9: Results from OLS regression

OLS	Coef.	P> t	
MTB	0,000	0,179	
LEV	0,000	0,793	
CASH	-0,002	0,881	
CASHFLOW	-0,004	0,439	
DIV	-0,018	0,000	*
LIST	0,004	0,203	
GROWTH	-0,032	0,719	
INFL	-0,003	0,137	
INDEX	-0,012	0,064	
D_5PER	-0,014	0,007	
_cons	0,053	0,000	*

* significant at the 5%-level ** significant at the 10%-level

Appendix VIII: Country specific personal tax situation

	Sweden	Finland	Denmark
Tax-free disposal	-	-	136 000 ¹⁸ DKK
Capital gains tax	0,3	0,28	28%* / 43%**
Dividend tax	0,3	0,28	28%* / 43%**
Pension schemes	0,3	0,28	0,15

In Denmark, a common way for private citizens to hold shares is through pension schemes. Returns from these schemes are taxed at 15%, significantly lower than returns on privately held shares. A progressive tax-scale applies on privately owned shares, 28% up to a level of 45 500¹⁹ DKK and 43% above. However, when selling shares that have been held for at least three years, proceeds lower than 136 000²⁰ DKK are tax-free. Dividend is taxed in the same way and losses are tax-deductible.

In Sweden, a tax-rate of 30% is applied on both dividends and proceeds from disposal. Losses are tax-deductible. Finland applies a tax rate of 28% on capital gains, including dividends and proceeds from disposal. Losses are tax-deductible.

¹⁸ Approximately EUR 18 250 according to exchange rates on www.di.se, 2007-05-23

¹⁹ Approximately EUR 6 100 according to exchange rates on www.di.se, 2007-05-23

As can be seen, the tax rules for personal investors are more favourable in Denmark for share repurchases. They can experience a capital gain of 136 000 DKK without any tax at all. In Sweden and Finland, this would have been immediately taxed at 30 and 28% respectively.